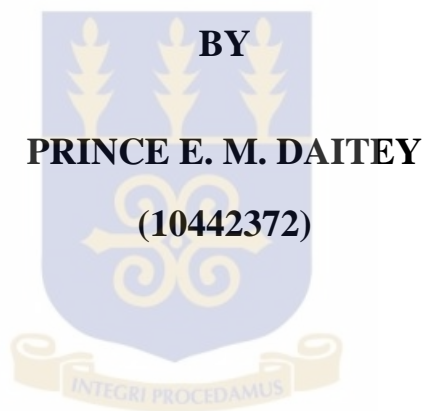


**SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA**

**ASSESSMENT OF WORK RELATED HYPERTENSION AMONG BANK
WORKERS IN ACCRA**



**THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF
GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE AWARD OF MPH DEGREE**

JULY, 2014

DECLARATION

I, Prince E. M. Daitey, declare that except for the other people's investigations which have been duly acknowledged, this work is the result of my own original research, and that this dissertation, either in whole or in part has not been presented elsewhere for another degree.

.....
PRINCE E. M. DAITEY
(STUDENT)

.....
DATE

.....
DR. JUDITH STEPHENS
(SUPERVISOR)

.....
DATE



DEDICATION

I dedicate this work to my Heavenly Father, the source of Strength, Knowledge and Understanding. Also, to my Wife, who has always been supportive and very understanding. Thank you always.



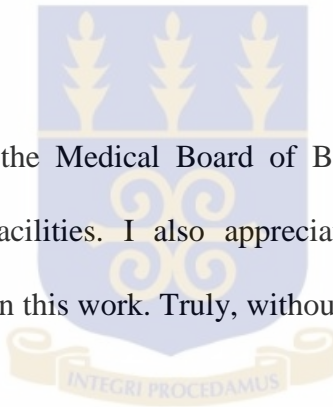
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ABSTRACT

Hypertension is one of the leading causes of cardiovascular diseases and premature mortality in the world. It is also a leading cause of death and disability causing 13.5% of the world's premature death and 6% disability. Hypertension is commonly seen amongst sedentary workers like bank employees. In Ghana, it is common knowledge that most people are not even aware of their blood pressure, hence their inability to monitor and control it. The purpose of this study was to assess work-related hypertension among Bank staff in Accra. A cross-sectional study was conducted that looked at the relationship between work schedule and hypertension, assessed the levels of physical activity among the bank employees and determined the level of knowledge on diet and its effects on health among the staff. The data for this study was collected using a questionnaire on demography, dietary knowledge, physical activities, work schedule and alcohol consumption. Respondents Body Mass Index (BMI) and Blood Cholesterol levels were also checked. One was considered Hypertensive if he or she has been so previously diagnosed and is on treatment or the blood pressure (BP) is greater than 140/90 mmHg on two different occasions. The BP readings were taken while seated or at rest with the use of a mercury sphygmomanometer. The study consisted of 150 participants (hypertension=57; non-hypertension=93) with 100 males and 50 females. The results of the study showed a 38% prevalence of hypertension among respondents. The study also found a significant difference in the level of knowledge of diet on health among respondents who were hypertensive. There was a significant association between education and hypertension prevalence at a significance level of $p = 0.05$. Out of the 57 respondents who are hypertensive, almost 95% of them have tertiary education. Similarly, a significant association was reported between the cholesterol levels and hypertension of respondents

($p = 0.001$) and the BMI and hypertension ($p = 0.001$) respectively. However, the present study did not find any significant relationship between work schedule and hypertension. Also, no significant difference was found between hypertension respondents and non-hypertension respondents on physical activities. Hypertension is a real health hazard especially among professional workers. The study observed an association between poor diet (cholesterol and BMI) and hypertension among respondents. The prevalence of 38% found among respondents indicates that hypertension is a major health problem that requires not only medication but also regular education for its prevention and control.

Keywords: Body Mass Index, Blood Pressure, Work Related Hypertension

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LIST OF ACRONYMS

AmBP	Ambulatory Blood Pressure
BMI	Body Mass Index
BP	Blood Pressure
CHD	Chronic Heart Disease
CVD	Cerebrovascular Disease
DASH	Dietary Approach to Stop Hypertension
DBP	Diastolic Blood Pressure
EE	Energy Expenditure
HDL	High Density Lipoprotein
HTN	Hypertension
IQ	Intelligence Quotient
JNC	Joint National Committee
LDL	Low Density Lipoprotein
P A-C	Physical Activity Accumulation
P Accum	One Day lifestyle Physical Activity
SBP	Systolic Blood Pressure
WHO	World Health Organization
WHF	World Heart Federation
WHR	Waist Hip Ratio

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Hypertension is known to be one of the leading causes of cardiovascular diseases and premature mortality in the world (Murray & Lopez, 1997; Redon *et al.*, 2009). High blood pressure is also known as a leading cause of death and disability causing 13.5% of the world's premature death and 6% of its disability. Studies have shown that 50% of all the cases of all strokes and ischemic heart disease can be attributed to high blood pressure (Lawes, *et al.*, 2008). For some few decades, hypertension has been widely reported in Africa and has also been identified as the most common cause of cardiovascular disease on the continent (Cooper & Rotimi, 1993).

According to Van de Vijver *et al.*, (2013) hypertension has been widely reported in Africa with prevalence higher in urban than in rural settings. The authors also found hypertension detection in rural Cameroon was as low as 11% and South African 47%. They also noted the level of treatment to be 32% in Ghana and 10% in urban Cameroon. Again, those who achieved control were between 0.4% and 16.8% respectively. Hypertension is more pronounced in males than in females when the disease is considered in Africa (Addo *et al.*, 2007). Aside this, hypertensive females are more likely to be detected and be put on treatment than their male counterparts (Opie & Seedat, 2005).

According to the WHO's World health statistics report, 1 in 3 adults worldwide, has raised blood pressure and at least 970 million people, globally have elevated blood pressure – a condition that is responsible for about 50% of all deaths from stroke and heart disease (WHO, 2012). The report further indicated that nearly 330 million and 640 million people have hypertension in the developed and the developing world respectively. The global prevalence of hypertension for gender is 40.6% for men and 35.8% for women with the prevalence of raised blood pressure highest in the African Region (46%) and lowest in the Region of the Americas (35%). The WHO (2011) regional prevalence of hypertension by gender were; African (males – 46.7%; females – 44.6%), America (males – 39.9%; females – 31.5%), Eastern Mediterranean (males – 41.0%; females – 38.6%), Europe (males – 44.5%; females – 37.1%), South-Asia (males – 37.3%; females – 34.9%) and Western Pacific (males – 40.3%; females – 34.7%). Hypertension is a major factor in the high mortality of adults in sub-Saharan Africa (WHO, 2002). It is obvious that Africa and for that matter, Ghana is at risk of more cases of high blood pressure and must be given the needed attention at all levels.

Hypertension, according to the World Heart Federation, is also considered a major risk factor for coronary heart disease and the single most important risk factor for stroke. It causes about half of all ischaemic strokes and contributes highly to the chance of getting hemorrhagic stroke (WHF, 2014). Over the past decades, Ghana has reported hypertensive renal disease as a common complication in both Kumasi and Accra (Mate-Kole *et al.*, 2011; Plange-Rhule *et al.*, 1999). However the widespread

diagnosis and treatment of hypertension with low-cost medication in high-income countries, have significantly reduced mean blood pressure across developed populations and have led to the reduction in deaths from heart disease. Unfortunately, in Africa, a little over 40% of adults in many countries including Ghana are estimated to have high blood pressure. Most of these people remain undiagnosed, although many of these cases could be treated with low-cost medications, which would subsequently reduce the risk of death and disability from heart disease and stroke to significant levels (WHO, 2012). Blood pressure related disease is reported to have a significant impact on health care expenditure with an estimated 10% of the health care spending, directly related to increased blood pressure and its complications (Gaziano *et al.*, 2009).

Generally, most jobs present with stress and their attendant high blood pressure (Chandola *et al.*, 2008). However, the highly intricate nature of the banking job, the lack of time for family and personal care, insufficient training and career uncertainties, performance constraints and pressures, surveillance, unwanted criticism, travels and transfers, and family obligations, have been found affecting the physical and mental health of bank employees (Kang & Sandhu, 2012). Professionals like engineers, architects, bankers and even healthcare workers are usually found working for longer hours outside their normal or regulatory working hours (Barger *et al.*, 2005) and this situation has been associated with both physical and psychological health challenges (De Castro *et al.*, 2008).

Hypertension is commonly seen amongst employees of the profession where working is mostly sedentary like bank employees (Momin *et al.*, 2012). The health condition of bankers has been an issue of much concern in recent times. In a study of 316 bankers between the ages of 24 to 59 years, 40 of them complained of high blood pressure, headache -38, diabetes -55, physical weakness – 52 and the rest complained of other physical and mental conditions (Kang & Sandhu, 2012).

In Ghana, it is common knowledge that most people are not even aware of their blood pressure, hence their inability to monitor and control it. Available data indicate that hypertension awareness, treatment, and control are unacceptably low around the world (Ibrahim *et al.*, 1995; Cappuccio *et al.*, 2004) and specifically lower in Ghana (Amoah, 2003).

Hypertension is now considered a global worry with many more countries around the world showing escalating rates of hypertension. In Europe for instance, the prevalence of hypertension with metabolic syndrome in the general population of Germany, Spain and Italy has been reported as 36%, 11% and 10% respectively. The economic burden to the health service of metabolic syndrome in patients with hypertension has been estimated at €24,427, €1,900 and €4,877 million in Germany, Spain and Italy and this predicted to rise by 59%, 179% and 157% respectively by 2020 (Scholze *et al.*, 2010).

Several factors including, lack of or insufficient exercise or physical activity, unhealthy eating habits, age, gender obesity, smoking and alcohol intake have been identified as risk for the development and maintenance of hypertension. Obesity, a major risk factor for hypertension, has reached pandemic proportions in many parts of the world (Groves, 2006). Lack of or insufficient physical activity is seen as a common factor accounting for the many reported cases of hypertension in several populations (Woodcock *et al.*, 2011). Physical inactivity, the reverse of physical activity is reported as the fourth-leading risk factor for global mortality (WHO, 2011). Physical inactivity has also been responsible for 6% of deaths globally – around 3.2 million deaths per year, including 2.6 million in low- and middle income countries, and 670,000 of these deaths are premature (Woodcock *et al.*, 2011). Despite these harmful evidences of hypertension, very few data exist on the condition in relation to prevention among the society especially bankers in Ghana.

Long work hours have the probability of increasing the risk of development of hypertension through several pathways. In fact, working longer hours implies shorter time available for recovery, and insufficient time for sleep as this is thought to be related to disruption in psychological process (Gangwisch *et al.*, 2006). Long work hours also expose workers for longer periods of time to noxious psychosocial factors in the work environment, such as job strain and effort–reward imbalance, which are believed to be biological arousal. These risk factors, in turn, may lead to permanent physiological changes, such as hypertension (Van der Hulst, 2003). There is therefore some evidence to implicate stress in the development of hypertension. Due to this, the

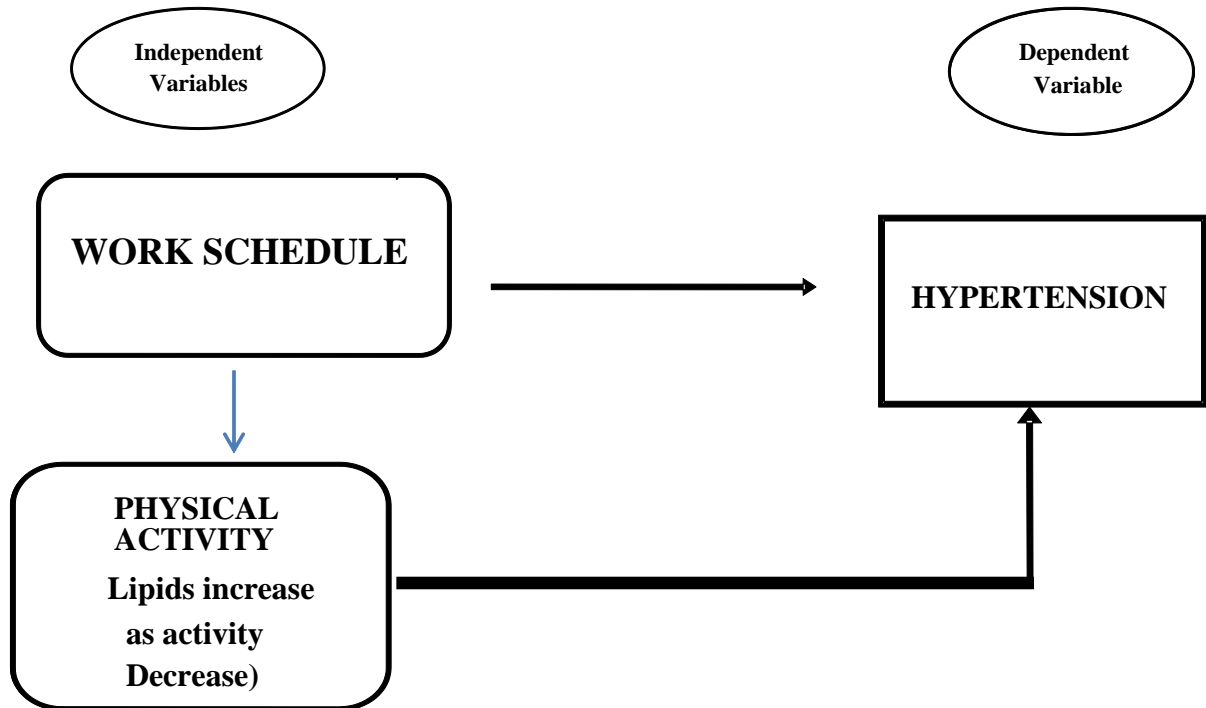
application of lifestyle techniques has been suggested in management of hypertension (Brill, 2011).

1.2 Problem Statement

In recent years the growing banking industry is offering a good number of lucrative jobs to young graduates. Young people who join the fraternity of bankers soon develop hypertension. Hypertension has modifiable risk factors which are strongly linked to life style. Although hypertension is generally on the ascendency, the rate among Bank staff has not been fully assessed. Indeed the risk factors associated with hypertension are prevalent in the bank and these calls for concern. These factors increase the risk of cardiovascular disease, type 2 diabetes and eventually mortality. As most of these bank employees works under sedentary lifestyles, they are at higher risk of hypertension and related medical implications.

1.3 Conceptual Framework

Figure 1. 1: Conceptual Framework



The conceptual framework above indicates a relationship between work schedules (the number of hours people spend at the workplace working) and hypertension. It also attempts to identify the relationship between work schedules and physical activity and subsequently hypertension.

1.4 Justification of Study

Research in the area of hypertension have indicated the need to take the condition seriously as it has been seen as a risk factor for cardiovascular diseases (Lawes *et al.*, 2008) and risk for both coronary disease and stroke increases progressively with incremental increases in blood pressure above 115/75 mmHg, as shown in numerous epidemiologic studies (Pletcher *et al.*, 2008; Lewington *et al.*, 2002). In Ghana for instance, studies have supported the common view that most people do not even know their blood pressure status let alone take steps to treat or control it (Amoah, 2003) and those who know do not receive adequate management (Addo *et al.*, 2007).

It is necessary for a study to look specifically into the work-related hypertension among bankers and auxiliary staff of the banks especially when studies have indicated higher prevalence of hypertension among this population (Desai & Kavishwar, 2009; Momin, *et al.*, 2012; Kang & Sandhu, 2012). Members of this population are also said to be very sedentary in their work even against the background that physical activity has been seen as reducing systolic blood pressure, heart rate and total cholesterol (Muhihi *et al.* 2012). It is common to find bankers in Ghana displaying this same sedentary behavior probably because they do not know the implication of this behavior on their health. There is therefore the need for a study to investigate the prevalence of hypertension and the risk factors so as to address this challenge among the banking staff.

1.5 Objectives

1.5.1 General Objective

- To identify and describe the factors that predicts hypertension among different categories of Bank staff in Accra.

1.5.2 Specific Objectives

- To determine the prevalence of hypertension among different categories of Bank workers;
- To determine the relationship between work schedule and hypertension among the bank employees and
- To assess the level of physical activity among bank staff.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Prevalence of hypertension in Ghana

Amoah (2003) undertook a study to determine the prevalence of hypertension, and the extent to which it is treated and controlled, among adult Ghanaians. The researcher recruited 6300 adults, aged 25 years and older, through random cluster sampling, using electoral enumeration areas in three communities in the greater Accra region of Ghana. A total of 4733 male and female subjects participated in the study. The analysis used the mean of 2 blood pressure readings, taken with a mercury sphygmomanometer after a 10-minute rest. Hypertension was defined as having blood pressure $>$ or $=$ 140/90 mm Hg, or currently undergoing anti-hypertensive treatment. The study found a crude prevalence of hypertension among this Ghanaian population to be 28.3% with the age-standardized prevalence to be 28.4%. Amoah also reported that mean systolic and diastolic blood pressures increased with age and also noted that, of the 1337 subjects with hypertension, 34% were aware of their condition, 18% were treated, and 4% were controlled. Agyemang *et al.* (2006) reported that the overall prevalence of hypertension was 29.4%. Of these, 34% were aware of their condition, 28% were receiving treatment, and 6.2% were controlled. The situation in Ghana becomes more serious especially when hypertension is becoming a major public health burden in sub-Saharan/Africa but awareness, treatment, and control is lagging behind. They also noted after a multivariate analysis that old age was independently associated with higher hypertension awareness and overweight were independently associated with

pharmacological treatment of hypertension. Agyemang *et al.*, (2006) finally reported that trading was independently associated with adequate blood pressure (BP) control but old age was independently associated with inadequate BP control.

Earlier, Cappuccio *et al.*, (2004) studied the prevalence, detection, management, and control of hypertension in 385 men and 628 women of aged 55 years residing in 12 villages in Ashanti region of Ghana. 532 lived in semi-urban and 481 in rural villages. The study revealed that women were heavier than men. Also, participants in semi-urban areas were heavier and had significantly higher BP (129/76) mmHg than in rural areas (121/72) mmHg. Prevalence of hypertension was reported as 28.7% overall by and comparable in men and women, but higher in semi-urban villages and increased with age. Detection rate was lower in men than women. The study also revealed that treatment and control rates were low in both males and females whilst detection, treatment, and control rates were higher in semi-urban (25.7%, 14.3%, and 3.4%) than in rural villages (16.4%, 6.9%, and 1.7%).

However, in a recent systematic review by Bosu (2010), on the epidemic of hypertension in Ghana, the age and sex composition of study populations, sampling strategy, measurement of blood pressure, definition of hypertension varied between studies. It was found that the prevalence of hypertension (BP \geq 140/90 mmHg +/- antihypertensive treatment) ranged from 19% to 48% between studies. Sex differences were generally minimal whereas urban populations tended to have higher prevalence than rural population in studies with mixed population types.

Bosu (2010) also noted that factors independently associated with hypertension included older age group, over-nutrition and alcohol consumption. Finally, the report indicated that there was a trend towards improved awareness, treatment and control between 1972 and 2005, less than one-third of hypertensive subjects were aware they had hypertension and less than one-tenth had their blood pressures controlled in most studies.

In a review of population-based studies on hypertension in Ghana, Addo *et al.*, (2012) conducted a search of the PUBMED database, supplemented by a manual search of bibliographies of the identified articles and through the Ghana Medical Journal. The review involved 11 studies published on hypertension with surveys conducted between 1973 and 2009 were identified. The prevalence of hypertension was found to be higher in urban (54.6%) than rural areas (19.3%). Factors associated with high blood pressure included increasing body mass index, increased salt consumption, family history of hypertension and excessive alcohol intake. The levels of hypertension detection, treatment and control were generally, ranging from 1.7% to 12.7%.

2.2 Prevalence of hypertension in Africa

The prevalence of hypertension, diabetes and obesity in The Gambia was assessed in a 1% population sample of 6048 adults over 15 years of age by Van Der Sande *et al.*, (2007), 572 (9.5%) subjects were hypertensive according to WHO criteria of a diastolic blood pressure (DBP) of 95 mmHg or above and/or a systolic blood

pressure (SBP) of 160 mmHg or above). The researchers found 325 (5.4%) of the participants had a DBP of 95 mmHg or above, and 39 (2.3%) a DBP of 105 mmHg or above; 428 (7.1%) had a SBP of 160 mmHg or above. By less conservative criteria (a DBP of 90 mmHg or above and/or SBP of 140 mmHg or above), 24.2% of subjects were hypertensive. The prevalence of hypertension was similar in the major ethnic groups and in urban and rural communities. Age and obesity were risk factors for hypertension; female sex was an additional risk factor for diastolic hypertension. The study found that several communities had a prevalence of diastolic hypertension which doubled the national rate.

Van de Vijver *et al.*, (2013) conducted a literature search on PubMed on a broad range of topics regarding hypertension in Africa, including data collection from related documents from the World Health Organization and other relevant organizations that are available on hypertension in Africa. Their findings showed that hypertension is the number one risk factor for CVD in Africa and that cardiovascular disease (CVD) has taken over as number one cause of death in Africa. The study also reported that the total numbers will further increase in the next decades due to the growing urbanization and related lifestyle changes on the continent.

2.3 Hypertension among bankers

Very few studies have looked at the nature and assessment of hypertension among bankers around the world and it is almost non-existent in Ghana. However, Momin *et al.*, (2012) have indicated the prevalence of hypertension among bankers at 30.4% and prehypertension at 34.5% in a cross-sectional study of 1493 bank employees of Surat city of India which was conducted during August, 2004 to September, 2005. The researchers also reported that out of 455 found as hypertensive, 258 (56.70%) were not having any symptoms at the time of examination. Prevalence was high among persons with age 50 years and above (48.5%); among male (32.5%) as compared to female (23.1%); among employees having small family size; among separated or divorcee person (40.0%). Prevalence of hypertension increased with seniority of the official position of bank employee with highest prevalence among managers (45.9%). To study the magnitude of the problem of hypertension among bank employees, the effect of body mass index (BMI) and body fat distribution as measured by waist-to-hip ratio (WHR) on prevalence of hypertension among bank employees of Surat city and the effect of different types of food habits and exercise on the prevalence of hypertension, Desai & Kavishwar (2009), undertook a cross sectional study carried out from August, 2004 to September, 2005. A total of 1493 bank employees were studied (1177 males and 316 females). A pre-tested semi structured questionnaire was used, which collected information on demographic characteristics and risk factors for hypertension. Hypertension was defined on the basis of 7th report of Joint National Committee (JNC). Data on lifestyle habits (smoking and physical activity), body

weight, body height, waist and hip circumferences and blood pressure measured using standardized protocols. The overall prevalence of hypertension was found to be 30.4 % (455/1493). Among 455(30.4%) hypertensive, only 197(43%) were aware about their hypertensive status, and 139(70.5%) were on regular treatment. 71(51%) were having controlled hypertension among the employees who were on regular treatment. Prevalence of hypertension was higher 40.1% (149) among alcohol consumer than non- drinker 27.2% (306). This study also found the prevalence of hypertension to be significantly higher among employees who were not having any healthy habit like walking, jogging, exercise.

In a recent study to assess the prevalence and risk factors of hypertension among bank employees, Ganesh and Deivanai (2014) undertook a cross-sectional study of 128 male and 64 female bank employees from 12 nationalized banks in urban Puducherry, India. Blood pressure was measured and classified according to the Joint National Committee (JNC) VII criteria. Data on risk factors of hypertension, including consumption of extra salt while dining, eating high-salt food, junk food, servings of fruits and vegetables, smoking, alcohol use, physical activity, and body mass index, were obtained for each participant using a standard questionnaire. Stress level was assessed by Cohen's Perceived Stress scale. The prevalence of hypertension and pre-hypertension was found to be 44.3% and 41.1% respectively. Out of 85 participants with hypertension, 47 (55%) was known cases and 38 (45%) were newly diagnosed. The study also found that living in the 4th or 6th decade of

life, consumption of extra salt, and physical activity ≥ 2 hours per day were associated with hypertension among bank employees.

2.4 Physical Activity, Lifestyle and Hypertension

A study in Cameroon, to evaluate and compare physical activity patterns of urban and rural dwellers in Cameroon, and their relationship with obesity, diabetes and hypertension, (Sobngwi *et al.*, 2002) diagnosed obesity in 17.1 and 3.0% urban and rural women, respectively, and in 5.4 vs 1.2% urban and rural men, respectively. The prevalence of hypertension was significantly higher (11.4) in urban than rural dwellers (17.6) and 17.6 and 9.1% in women and men. Urban subjects had significantly lower physical activity, light occupation, high prevalence of multiple occupations, and reduced walking and cycling time compared to rural subjects. Univariate analysis also showed significant associations between both physical inactivity and obesity and high blood pressure. The relationship of physical inactivity with hypertension and obesity were independent in both urban and rural men, but not in women. Body mass index, blood pressure and glycaemia were higher in the first compared with the fourth quartiles of energy expenditure. The prevalence of hypertension was significantly higher in urban (11.4) than rural dwellers (6.6%) and in women (17.6) than men (9.1%).

Padilla *et al.*, (2005) investigated the magnitude and duration of ambulatory blood Pressure (AmBP) reduction after the accumulation of one day of lifestyle physical activity (PAaccum) in normotension, prehypertension, and hypertension and also

determined the relationship between energy expenditure (EE) and BP reduction. The study found out significant difference in Blood Pressure (BP) after the Physical Activity Accumulation (PA-C) were found for prehypertensives for 6 hours and for hypertensives (for 8 hours; area was significantly different between groups. They however found no correlation between Energy Expenditure (PA-C) and BP reduction.

Parker *et al.*, (2007) conducted a study with a total of 3993 Black and White men and women at baseline and 2, 5, 7, 10, and 15 years later. Participants had their blood pressure and physical activity measured at each examination. 634 cases of incident hypertension over 15 years of were followed up. This study shown that those who were more physically active experienced a reduced risk for incident hypertension compared to those who are less active physically after adjusting for race, sex, age, education, and family history of high blood pressure.

The mean energy expenditure in a Tanzanian city population was $6,466 \pm 252$ kcal/week. More than half (53.6%) of the participants had energy expenditure of 4,000 kcal/week. Only three (3.1%) had energy expenditure below the recommended 1,000 kcal/week (Muhihi *et al.*, 2012) have also indicated that physical activity energy expenditure had an inverse relationship with systolic blood pressure, heart rate, total cholesterol, HDL-cholesterol, LDL-cholesterol, when the level of physical activity and its relationship with CVD risk factors among young

and middle aged men was assessed in a fast growing city of Mwanza in Tanzania. Physical activity was assessed among 97 healthy men aged 20-50years using the Sub-Saharan Africa Activity Questionnaire. Energy expenditure was calculated using Harris Benedict equation and anthropometric measurements, blood pressure, fasting blood glucose and serum lipids were also measured. The finding showed that, except for hypertension, prevalence of CVD risk factors was low in this population with hypertension rating 23.7%, low HDL cholesterol 10.3%, high LDL-cholesterol 9.3% and obesity 4.1%.

Sedentary behaviours and lifestyles have been associated with hypertension among some employees. This is related to the number of hours one spends performing his or her work. Some employees spend their working hours in sedentary endeavors whilst others spend theirs moving from place to place. In the USA, Matthews *et al.*, (2008) evaluated participants from the 2003–2004 National Health and Nutrition Examination Survey aged ≥ 6 years who wore an activity monitor for up to 7 days. Among 6,329 participants with at least one 10-hour day of monitor wear, the average monitor-wearing time was 13.9 hours/day. Overall, participants spent 54.9% of their monitored time, or 7.7 hours/day, in sedentary behaviors. Their study showed that the most sedentary groups in the United States were older adolescents and adults aged ≥ 60 years, and they spent over 50% of their waking time in sedentary activities. Females were found to be more sedentary than males before age 30 years, but this pattern was reversed after age 60 years. These data provide the first objective measure of the amount of time spent in sedentary behavior in the

US population and indicate that Americans spend the majority of their time in behaviors that expend very little energy.

The use of healthy lifestyle modifications has proven to be highly effective in both the prevention of new-onset HTN and in the treatment of those diagnosed with HTN. In view of the continuing epidemic of HTN and blood pressure (BP)–related diseases and the invaluable role of applying nonpharmacological therapy in the prevention and management of HTN, a review of current therapeutic lifestyle strategies appears warranted. Brill (2011) reviewed 6 well-established nonpharmacological lifestyle modifications for preventing and managing HTN in addition to 3 novel lifestyle interventions that show promise as effective adjunct strategies for lowering BP. These lifestyle interventions include; weight loss, the Dietary Approach to Stop hypertension (DASH), sodium restriction, increase potassium intake, moderate alcohol consumption and regular aerobic exercise.

2.5. Stress, work schedules and hypertension

Job - related stress has become a very important risk factor for hypertension. There is evidence of a positive association between work hours and hypertension in working populations. Work-related risk factor for hypertension identified in the past few years is work hours. In a quantitative study, Yang *et al.*, (2006) investigated work hours and self-reported hypertension among the working population in the state of California, USA. The study used data from the Public Use File of the 2001

California Health Interview Survey. The finding indicated a positive association between hours worked per week and likelihood of having self-reported hypertension. Compared with those working between 11 and 39 hours per week, individuals working 40 hours per week were 14% more likely to report hypertension, those who worked between 41 and 50 hours per week were 17% more likely to report hypertension, and those who worked 51 hours per week were 29% more likely to report hypertension after controlling for various potentially confounding variables, including demographic and biological risk factors and socioeconomic status.

Very limited data exist on the duration of work or number of hours an employee spends at work and hypertension. However, in a study to find out the effect of exposure to occupational noise and shift working on blood pressure, Attarchi *et al.*, (2012) collected demographic, medical and occupational data from a group of 331 workers of Yazd in Iran. The participants were put into four groups according to work shift and noise exposure severity, from non-noise exposed day time workers (Group1) to noise exposed shift workers (Group 4). Finally, systolic and diastolic blood pressure levels were compared among these four groups. The findings showed a significant difference between average systolic and diastolic BP and hypertension (HTN) frequency across the groups. The highest rate of HTN and mean systolic and diastolic BP were observed among shift workers who were exposed to noise higher than permissible limit. Also the results of logistic regression analysis revealed a significant relationship between simultaneous

exposures to noise more than the permitted limit and shift work with HTN and also that shift working and simultaneous exposure to noise have an additive effect on occurrence of HTN.

2.6. Dietary knowledge and hypertension

Reddy & Katan (2004) have noted that dietary fats associated with an increased risk of chronic heart disease (CHD), include trans-fats and saturated fats, while polyunsaturated fats are known to be protective. The researchers also found out that dietary sodium is associated with elevation of blood pressure, while dietary potassium lowers the risk of hypertension and stroke. Regular frequent intake of fruits and vegetables is protective against hypertension, CHD and stroke. Composite diets (such as DASH diets, Mediterranean diet, and 'prudent' diet) have been demonstrated to reduce the risk of hypertension and CHD.

Demaio (2013) used a multi-stage, random cluster sampling method to collect data on 3450 households across Mongolia. The results of the study showed that one fifth of the participants reported having never heard the term 'blood pressure'. This absence of health knowledge was significantly higher in men, and particularly younger men. The majority of participants recognized high blood pressure to be a threat to health, with a higher level of risk awareness among urban individuals. Education level on diet was generally associated with a heightened knowledge and risk perception. Roughly seven in ten participants were aware of the relationship

between salt and blood pressure. Finally, the study revealed that the participants perceived medication and exercise as the only interventions to be moderately effective at preventing high blood pressure.

Wood (2008) conducted a study to describe the information resources, level of knowledge on diet and hypertension, and health promoting behaviors (diet and exercise) of young African American women, and to determine whether there was a relationship between their knowledge level and health promoting behaviors (diet and exercise). The study consisted of 31 African American women 18 to 30 years old through the use of a demographic questionnaire, High Blood Pressure IQ Quiz, and the Health Promoting Lifestyle Profile II. The findings showed that participants received majority of their information from doctors, family, television, and schools. Also, participants scored an average of 70% on the High Blood Pressure IQ Quiz. There was however no significant positive correlation between knowledge level of participants their and health promoting behaviors diet and exercise.

Svetkey *et al.*, (2003) conducted a study on subjects in an uncontrolled setting comparing the combined effects of lifestyle changes: exercise, weight loss, reduced sodium intake, and limited alcohol intake, with a healthy diet or the DASH eating plan. The control in this study was the type of interventions the groups received. The interventions were advice to make lifestyle changes and eating a healthy diet, individual/group behavioral counseling and eating a healthy diet, or individual/group behavioral counseling and following the DASH eating plan. Participants in each group demonstrated a reduction in blood pressure by 5-

10mmHg (Svetkey *et al.*, 2003). The results from this study encourages healthcare providers to educate their patients to implement the DASH eating plan along with sodium reduction and other lifestyle modifications, as a way of life and not a short term treatment (Svetkey *et al.*, 2003). These land mark studies provided non-drug approaches for controlling blood pressure.

Appel *et al.*, (2006) have noted that well-established dietary modifications that lower BP are reduced salt intake, weight loss, and moderation of alcohol consumption (among those who drink). Over the past decade, increased potassium intake and consumption of dietary patterns based on the “DASH diet” have emerged as effective strategies that also lower BP. Of substantial public health relevance are findings related to blacks and older individuals. Specifically, blacks are especially sensitive to the BP-lowering effects of reduced salt intake, increased potassium intake, and the DASH diet. Appel *et al.*, (2006) also reported that, in non-hypertensive individuals, dietary changes can lower BP and prevent hypertension. In uncomplicated stage I hypertension (systolic BP of 140 to 159 mm Hg or diastolic BP of 90 to 99 mm Hg), dietary changes serve as initial treatment before drug therapy. In those hypertensive patients already on drug therapy, lifestyle modifications, particularly a reduced salt intake, can further lower BP.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Area

The study was conducted at the Bank of Ghana clinic in Accra where staffs of the Bank of Ghana normally attend to their basic health needs.

3.2. Population

The population for the study was staff of the Bank of Ghana in Accra who were made up of four hundred and fifty (450) senior and one hundred and fifty (150) junior staff. The organizational structure for employees has senior staff which was made up of ranks such as officer II, officer I, assistant manager, deputy manager, manager, deputy chief, chief, assistant director, director, advisor and governor whilst the junior staff comprised the cleaner, messenger, cash operative, clerk, senior clerk and sub-officer.

3.3 Sampling

3.3.1 Sample Size

The sample size for the study was calculated by the ratio proposed by Israel (1992) as cited in Watson (2004). The calculation estimates sample size required (n) from the number of study population (N), the estimated variance which was expressed as a decimal of 0.3 (P), precision desired, also expressed as a decimal of 0.05 (A), critical value for C. I, 95% as 1.96 (Z) and an estimated response rate expressed as a

decimal 150 0.9 (R). From this ratio, the sample size used for this study was 150 patients.

$$SS = (Z^2) P(1-P)/C^2$$

$$\text{New SS} = SS/1 + (SS-1)/N$$

3.3.2 Sampling Procedure

A simple random sampling technique was used to select the 150 staff members who attended the Bank of Ghana clinic from the population of 600 staff who attend the clinic. Averagely, 40 -50 clients are seen daily at the clinic. 10 people were selected daily over the 3 week period. Every fourth person attending the clinic each day was selected to be part of the study until 10 people were obtained daily. This gave an accurate representation of the population reporting to the clinic.

3.4 Study Design

A cross-sectional research design through the use of survey questionnaires was used to collect data on hypertension, physical activity, lipid profile, BMI, nutritional knowledge, socio-demographic characteristics, self-reported medical history and the other variables.

3.5 Definition of Terms

Elevated blood pressure: Systolic blood pressure \geq 140mm Hg and/or diastolic blood pressure \geq 90mm Hg.

Normal work schedule: Participants who work within 7 hours per day.

Extra work schedule: Participants who work more than 7 hours per day.

Physically active: The engagement in a moderate to vigorous activity for at least 20 minutes on a daily basis.

Alcohol consumers: These are participants who are currently consuming drinks which contain alcohol at least on an occasional basis.

3.6 Data Collection- Method and Tool

3.6.1 Socio-demographic characteristics

Socio-demographic characteristics such as age, sex, marital status, years of education, household size, area of residence were obtained from the questionnaire.

3.6.2 Self-Reported Medical History

Participants reported the diagnosis of hypertension, hyperlipidaemia, diabetes, use of alcohol and smoking.

3.6.3 Blood Pressure Measurement

The blood pressure of participants was assessed with the help of trained nurses who functioned as research assistants and they used a mercury sphygmomanometer (Accosson- MK.3 by A. C Cossor and son (surgical) Ltd, England). The Blood Pressure measurement was taken twice; one on the arm with the participant seated and then another one after the participant had rested for 10 minutes. The

measurements were done twice at 10 minutes intervals and recorded to the nearest \pm 5mm Hg (Addo *et al.*, 2008).

3.6.4 Work Schedule

Work schedule was assessed by the duration of hours spent on work per day. This was done through the use of structured questionnaire.

3.6.5 Physical Activity Measure

An assessment of participants' level of physical activities was obtained through items from a modified version of the International Physical Activity Questionnaire (IPAQ, 2002).

3.6.6 Lipid profile

Blood samples were collected by a qualified laboratory technician and were used to determine the lipid profile of the participants. Two to three milliliters of venous blood drawn from the ante-cubital surface of the cuffed arm of participants with the aid of a sterile syringe was put in a test tube. The blood was centrifuged and the plasma or serum was placed in a semi-automated Chemical Analyzer for analysis.

3.6.7 Nutritional knowledge

Questions relating to diet and eating and their implication on hypertension were asked. The questions were derived from a modified version of the nutrition knowledge of doctors in the US (Leslie, 2009). Nine (9) questions in all were asked

and scored at 1-2 points for each question with a maximum point of 15 scores. Those who scored less than 5 were categorized as low knowledge, those from 5-10 as satisfactory knowledge, above 10 as high knowledge.

3.6.8 Body Mass Index

Body mass index (BMI), was calculated by a ratio of weight in kilogram and height in meters square (kg/m^2). This was done by the use of a small electronic weighing scale 22 which had a digital display (precision of ± 0.1 kg) to measure weight. Standing height was also measured without shoes to the nearest 0.1 cm with a stadiometer with participants standing upright in a relaxed position and arms hanging freely (UK National Institute for Clinical Excellence-NICE, 2007).

3.7 Quality Control

The quality of the study was assured through the recruitment and training of research assistants on the specific objectives and methodologies of the study. Also, the basic skills needed in data collection in order to reduce error to an acceptable margin were provided for all assistants. Lab technicians were also provided with guidelines on the collection of blood samples and supervised so as to maximize adherence to procedures prescribed. The questionnaires were also cross-checked for errors, completeness and any identified errors addressed immediately before participants were allowed to leave the study center.

3.8 Data Processing and Analysis

Mean of blood pressure readings and physical activity levels were calculated and a descriptive table presented. Again the work schedule of the participants was put into two (2) categories; normal work schedule and extra work schedule.

3.8.1 Statistical Technique

Data collected was analyzed by the use of Statistical Package for Social Sciences (SPSS) version 16.0. The data was analyzed for cross tabulations. Logistic regression model was done to determine the relationship between elevated blood pressure and risk factors as alcoholism, smoking, obesity, work schedule (duration of work) and level of physical activity. The significance of these associations was also looked at.

3.9 Ethical Consideration

The study proposal was reviewed by the Ghana Health Service Ethical Committee for permission and approval. Aside this, the researcher also sought for permission from the medical boards of Bank of Ghana before data and blood samples were collected from its staff. In order to meet ethical standards in research, the following ethical issues were considered; an informed consent form was made available for participants inviting them to participate in the study. The consent also included a description of the project and of the procedure involved, possible risks, inconveniences and benefits of the study to both participants and the general public. Issues of confidentiality of information given, voluntary participation, and the right

to drop out of the study were considered. Finally, the researcher made contacts available for additional information for the sake of further clarification by the participants.

3.10 Pilot Study

The questionnaire and the protocols regarding the conduct of the study will be pre-tested on 30 persons who work in a banking institution in Accra so as to determine the validity and applicability of the questions, procedures and instructions on this banking population. This study will also help the researcher to identify early the problems related to the questionnaire and get them corrected before the full scale study.

CHAPTER FOUR

4.0 RESULTS

This cross sectional study was conducted to assess Hypertension among Bank of Ghana staff in Accra. The investigator used a representative sample size of about 150 respondents who work with the Bank of Ghana in Accra. Data collection was through self-administered structured questionnaires. The results presented below are from 150 (100%) completed questionnaires.

4.1 Socio- Demographic Characteristics of Respondents

This section presents the description of the socio-demographic characteristics of the study respondents. The participants comprised of staff members from various departments such as 66 (44.4%) from Banking, 40 (26.7%) Human Resource, 22 (14.7%) Transport, 14 (9.30%) Research and 8 (5.30%) Risk departments. The study comprised of 100 (66.7%) males and 50 (33.3%) females. The average age of participants was 46 years with a Standard Deviation of 9.0. Almost half (46.7%) of the respondents were within the 40 - 50 years age group. The highest level of education attained by respondent was tertiary level, 132(88.0%). Most of the respondent were Ga-Adangbe 54(36.0%) followed by Akan 47 (31.3%) and Ewe 45(30.0%). Majority (85.3%). of the respondents were married. Most of the respondents reported they have household size of 4 – 5 size 58(38.7%) followed by above 5 size 48(32.0%). The study shows that the average number of years a respondent has been employed in the institution is 17 years

Table 4. 1: Socio- demographic characteristics of the respondents

		Frequency(N=150)	%
Nature of Work	Banking	66	44.00
	Research	14	9.30
	Human Resource	40	26.00
	Risk	8	5.30
	Driver	22	14.70
	Sub-Total	150	100.00
Education	SHS	18	12.00
	Tertiary	132	88.00
	Sub-Total	150	100
Age Group Mean = 46 SD = 9	Below 40	35	23.30
	40 – 50	70	46.70
	Above 50	45	30.00
	Sub-Total	150	100.00
Ethnicity	Akan	47	31.30
	Ga-Adangbe	54	36.00
	Ewe	45	30.00
	Other	4	2.70
	Sub-Total	150	100.00
Sex	Male	100	66.70
	Female	50	33.30
	Sub-Total	150	100.00
Household size	1 – 3	44	29.30
	4 -5	58	38.70
	Above 5	48	32.00
	Sub-Total	150	100.00
Current Marital Status	Married	128	85.30
	Not Married	22	14.70
	Sub-Total	150	100.00
Duration employment Mean = 17 SD = 10	Less than 5	31	20.70
	5 - 15 years	33	22.00
	16 - 25 years	58	38.70
	More than 25	28	18.70
	Sub-Total	150	100.00

4.2 Medical History of participants

When participants were asked if biological parents have been diagnosed of Hypertension and diabetes, the results shows that for hypertension, majority 57.7% of the 150 participants indicated that one of their parents have been diagnosed followed by 22.0% indicating yes both parents, 12.7% none of them and 12.0% indicating don't know. Also for diabetes, majority indicated one of the parents (41.3% of the 150 participants) followed by 38.7% indicating none of them while 14.0% indicated don't know, however 6.0% indicated yes both parents (Figure 4.1)

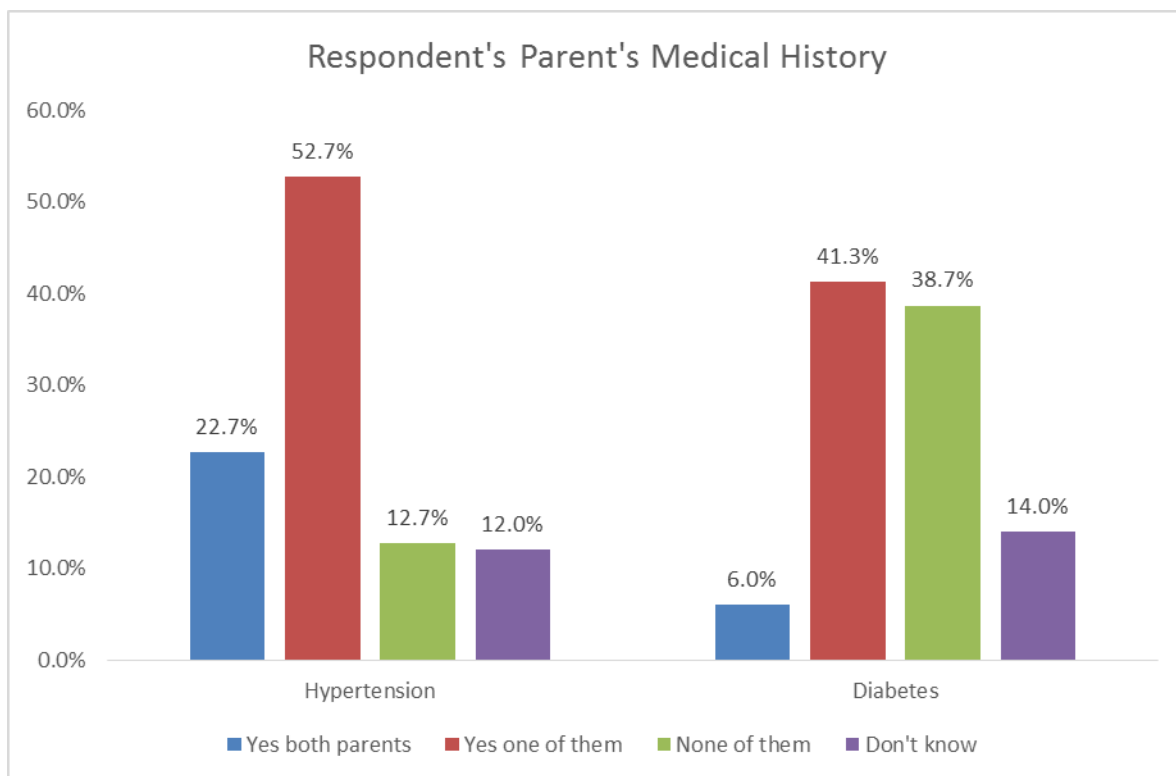


Figure 4. 1: Respondent's Parent's Medical History

4.3 Awareness of hypertensive status among bank workers

The results show that 38% of the respondents knew their hypertensive status while the rest (62%) did not know their status as shown in figure 4.2

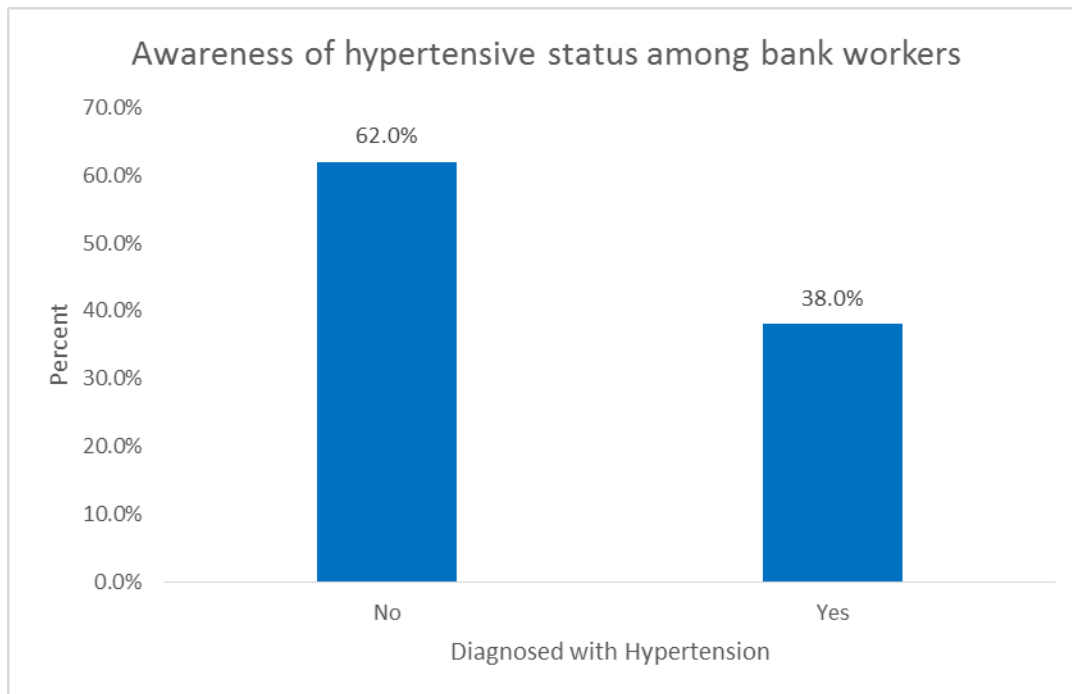


Figure 4. 2: Awareness of Hypertensive Status

Table 4. 2: Descriptive characteristics of respondent's diagnosed with Hypertension

Diagnosis	Age		Cholesterol		BMI	
	Mean	SD	Mean	SD	Mean	SD
Hypertensive (57)	46	9	5.70	0.97	31.37	4.57
Non Hypertensive (93)	46	9	4.89	1.08	27.22	3.20
Overall (N=150)	46	9	5.27	1.11	29.19	4.42

Table 4. 3: Descriptive characteristics of respondent's Blood Pressure readings of participants

Participants	Systolic		Diastolic	
	Mean	SD	Mean	SD
Hypertensive (57)	160	21.05	90	12.00
Non Hypertensive (93)	122	16.26	71	9.46
Overall (150)	141	18.8	80.5	10.73

4.4 Relationship between Socio-Demographic Characteristics of participants and Hypertension

A Pearson chi square test for relationship indicated that there exist a significant relationship between the level of education ($\chi^2 = 3.95$, p-value = 0.047), Cholesterol ($\chi^2 = 26.35$, p-value = 0.001) and BMI ($\chi^2 = 63.85$, p-value = 0.001) with the dependent variable Hypertension. Detailed results are shown in Table 4.4.

Table 4. 4: Relationship between Socio-Characteristics of participants and Hypertension

		Hypertension				Chi-square	df	Sig.	
		Yes	No						
		Freq.	Column N %	Freq.	Column N %				
Age Group	Below 40	12	21.10	23	24.70	1.322	2	0.516	
	40 – 50	30	52.60	40	43.00				
	Above 50	15	26.30	30	32.30				
	Total	57	38.0	93.0	62.0				
Sex	Male	35	61.40	65	69.90	1.146	1	0.284	
	Female	22	38.60	2988	30.10				
	Total	57	38.0	93.0	62.0				
Education	SHS	3	5.30	15	16.10	3.951	1	0.047	
	Tertiary	54	94.70	78	83.90				
	total	57	38.0	93.0	62.00				
Nature of Work	Banking	30	52.60	36	38.70	3.313	4	0.507	
	Research	4	7.00	10	10.80				
	Human Resource	14	24.60	26	28.00				
	Risk	3	5.30	5	5.40				
	Driver	6	10.50	16	17.20				
	total	57	38.0	93.00	100.00				
Cholesterol (mmol/L)	Normal (< 5.2)	18	31.60	69	74.20	26.345	1	0.001	
	High (> 5.2)	39	68.40	24	25.80				
	total	57	38.0	93.00	62.00				63.848
BMI	Ideal Weight (21 - 24.99)	0	0.00	43	46.20				
	Overweight (25 - 29.9)	22	38.60	43	46.20				
	Obese (29.9 - 39.90)	32	56.10	7	7.50				
	Morbid Obesity (> 40)	3	5.30	0	0.00				
	Total	57		93	100.00				
		100.00							

A further result using binary logistic regression model indicated that participants with High Cholesterol ($> 5.2\text{mmol/L}$) were 6.23 times at risk of getting hypertension as compared participants with Normal Cholesterol ($< 5.2\text{ mmol/L}$) (OR=6.23, 95% CI= 3.01 – 12.88). Also in the case of BMI participant that were obese (29.9 – 39.9) were 0.11 times at risk of hypertension as compared to ideal weight (21 – 24.99) which is shown in Table 4.5.

Table 4. 5: Binary Logistic Regression of selected factors at risk with Hypertension

Factors		Odds Ratio (95% Conf. Interval)	P> z p-value
Cholesterol	High (> 5.2)	6.23(3.01 – 12.88)	0.001
	mmol/L Normal (< 5.2)	1	
BMI	Ideal Weight (21 - 24.99)	1	0.001
	Overweight (25 - 29.9)		
	Obese (29.9 - 39.90)	0.11(0.42 – 0.29)	
	Morbid Obesity (> 40)		

Binary Logistic Regression findings show significant association between the cholesterol levels and hypertension of respondents ($p=0.001$). Out of the 57 hypertensive respondents almost 70% have high cholesterol levels with slightly above 30% having normal cholesterol levels compared to about 75% normal cholesterol and about 26% high cholesterol of the 93 non-hypertensive respondents (table 4.5). The association between BMI and hypertension was also significant ($p=0.001$). The finding showed that almost 60% (32) respondents with hypertension are obese, nearly 40% (22) are overweight and

0% none has the ideal weight compared to about 8% (7) obese, 46% (43) overweight and ideal weight among respondent without hypertension (tables 4.2 and 4.4).

4.5 Knowledge on diet and its effect on health among participants

The results shows a significant relationship between level of Knowledge on diet and its effect on health with hypertension ($\chi^2 = 41.43$, p-value = 0.001). The results further shows that respondents with hypertension have a higher level of knowledge on diet and its effect on health (84.29%) as compared to participants with no hypertension (32.3%). Detailed comparison is shown in Figure 4.3 and Table 4.5.

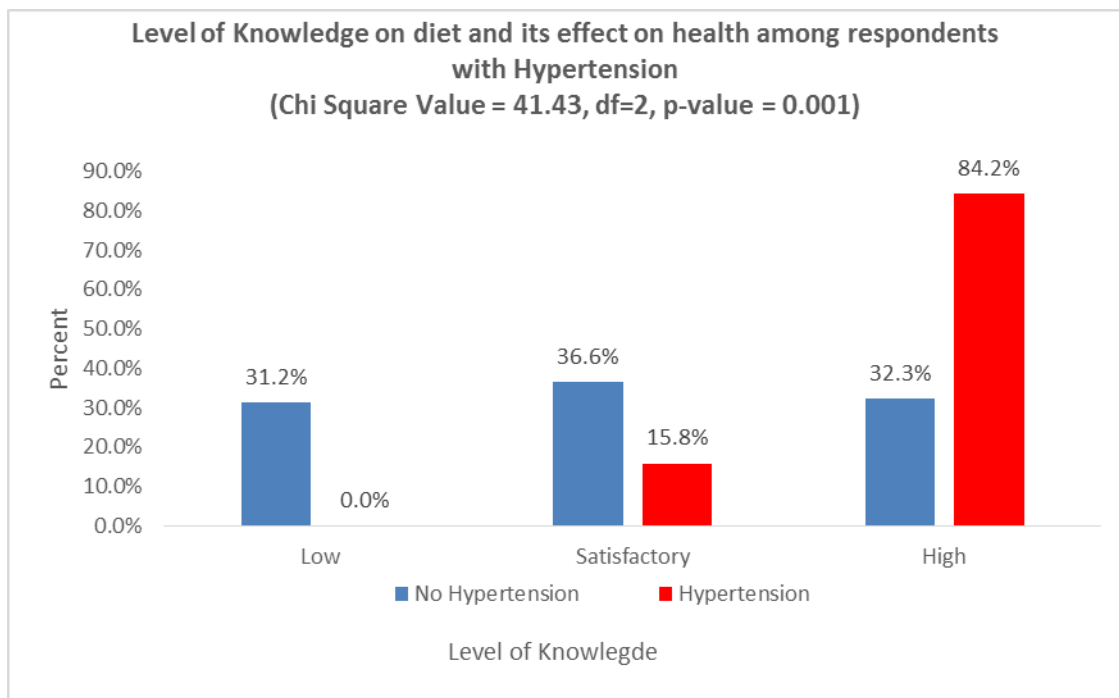


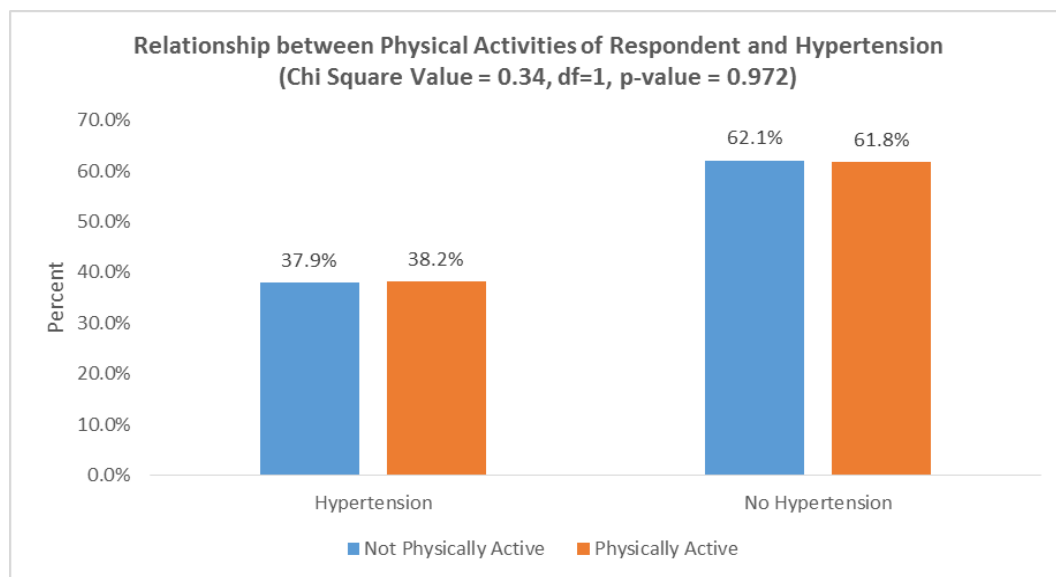
Figure 4. 3: Knowledge on diet and its effect on health among participants

Table 4. 6: Binary Logistic Regression On Dietary Knowledge

Factors		Odds Ratio (95% Conf. Interval)	P> z p-value
Knowledge	Satisfactory	-	0.001
	High	0.17(0.07 – 0.39)	
	Low	1	

Relationship between Physical Activities of Respondents and Hypertension

The results shows that participant physical activeness has no significant relationship with hypertension ($\chi^2 = 0.34$, p-value = 0.972). This means whether participants were physically active or not, there is no direct impact on Hypertension. Detailed comparison is shown in Figure 4.4

**Figure 4. 4: Relationship between Physical Activities of Respondents and Hypertension**

4.6 Relationship between Alcohol Consumption among participants and Hypertension

The result showed no significant relationship between participants alcohol consumption and hypertension (Chi Square Value = 0.13, p-value = 0.719). This means that there is no direct impact of alcohol consumption on hypertension in the study. Detailed comparison is shown in Figure 4.5

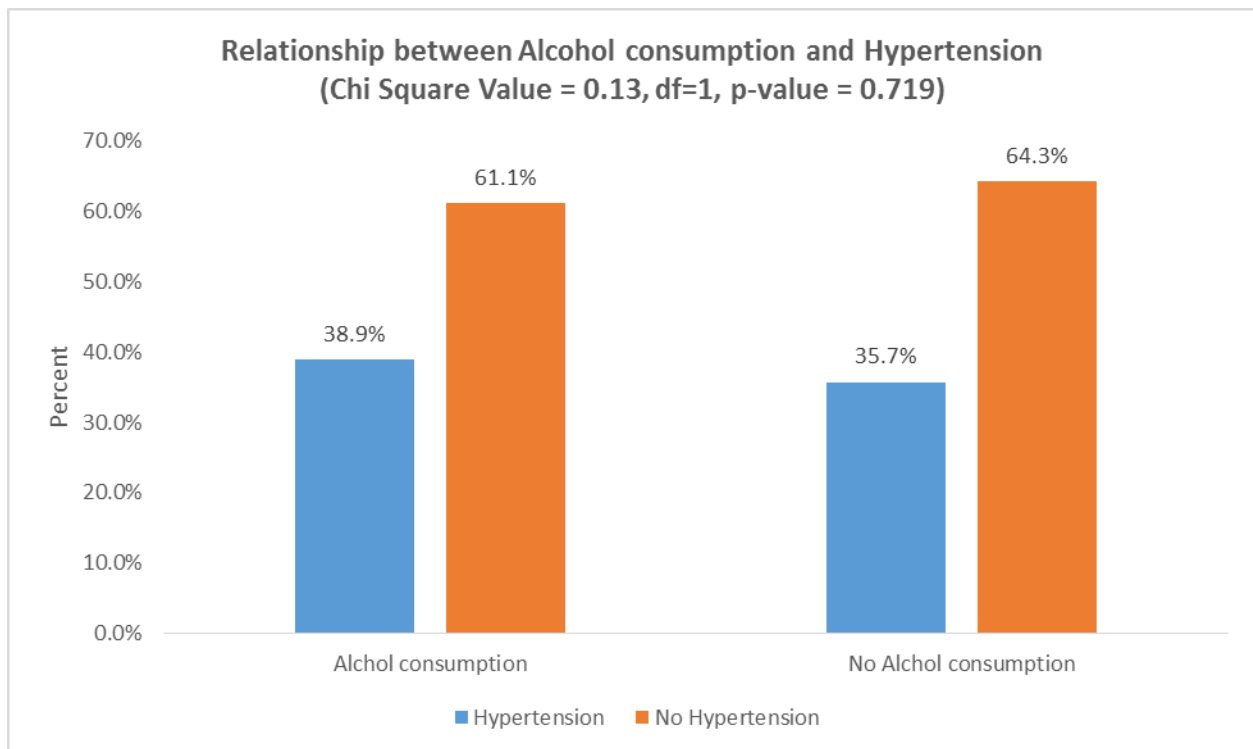


Figure 4. 5: Alcohol Consumption and Hypertension

4.7 Relationship between Dietary habits among participants and Hypertension

The results also showed that there is no significant relationship between participants' dietary habits and hypertension ($\chi^2 = 0.02$, p-value = 0.899). This means that there is no

direct impact of dietary Habits on Hypertension in the study. Detailed comparison is shown in Figure 4.6 and Table 4.6

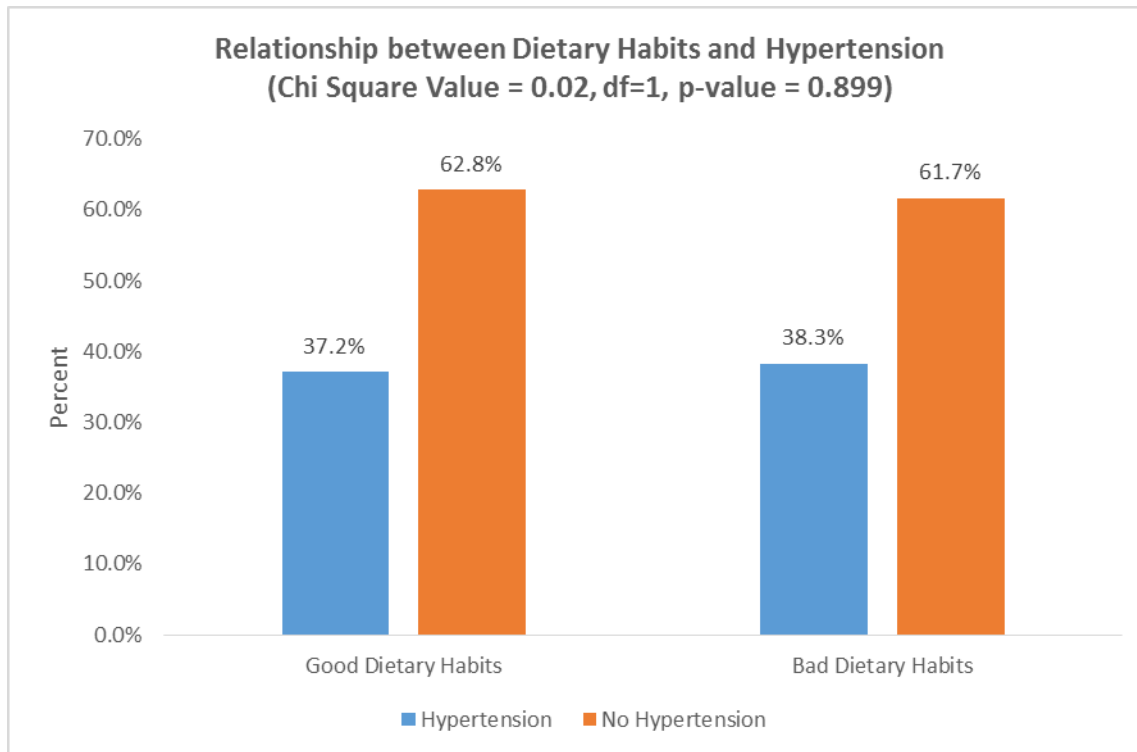


Figure 4. 6: Relationship between Dietary Habits and Hypertension

The above figure shows that 37.2% of respondents diagnosed of hypertension have good dietary habits compared to 62.8% respondents of non-hypertensive. On the other hand, few hypertensive respondents (38.3%) have bad dietary habits compared to 61.7% of non-hypertensive respondents. Overall, hypertensive respondents have poor dietary habits compared to non-hypertensive respondents (figure 4.4). However the difference is not significant ($F=0.02$, $p=0.899$).

4.8 Relationship between Work schedule among participants and Hypertension

The results also showed that there is no significant relationship between participants' Work schedule and hypertension ($\chi^2 = 1.186$, $p\text{-value}=0.276$). This means that there is no direct impact of work schedule on Hypertension in the study. Detailed comparison is shown in Figure 4.7 and Table 4.6.

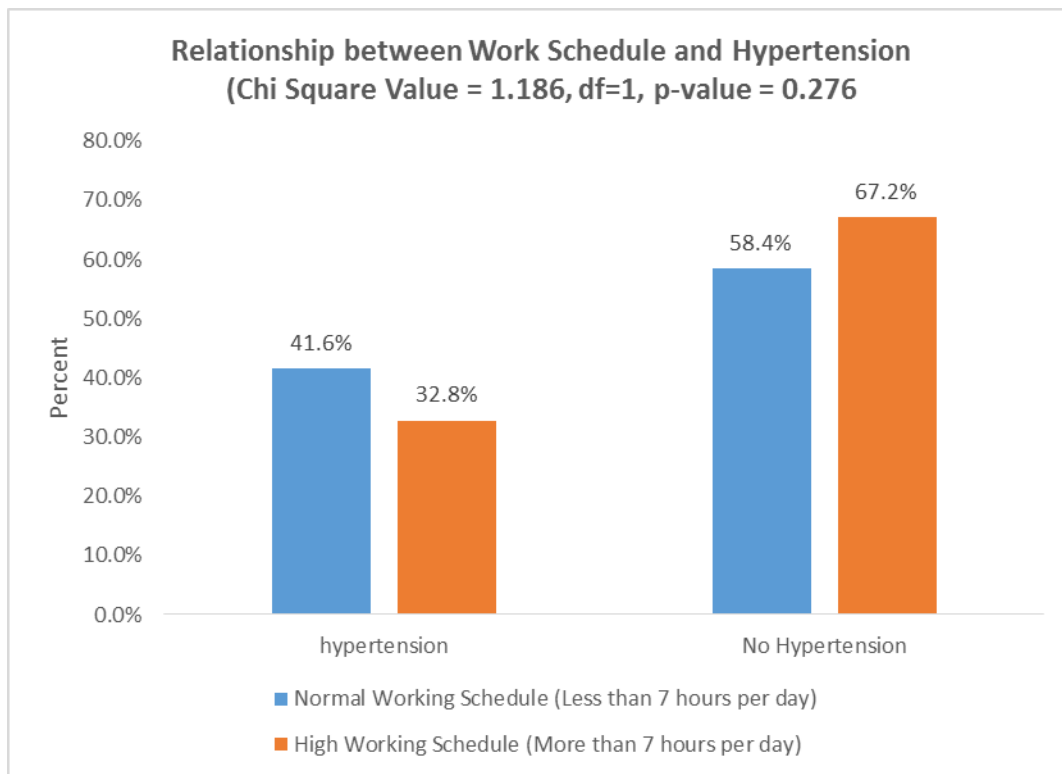


Figure 4. 7: Relationship between Work Schedule and Hypertension

Table 4. 7 Summary Test results of Risk factors of Hypertension

Risk Factors	Chi-Square Value	df	p-value
Knowledge	41.43	2	0.001*
Physical Activity	0.34	1	0.972 ^{ns}
Alcohol Consumption	0.13	1	0.719 ^{ns}
Dietary Habits	0.02	1	0.899 ^{ns}
Work Schedule	1.19	1	0.276 ^{ns}

**Significance level $p < .01$; ns = not significant relationship*

CHAPTER FIVE

5.0 DISCUSSION

5.1 Prevalence of hypertension among different categories of Bank of Ghana workers

The present study examined the prevalence of hypertension among Bank of Ghana employees in Accra. The findings of this study showed that 38% of the respondents are hypertensive whilst 62% were not hypertensive. The prevalence of 38% is quite high considering the fact that hypertension is seen as a risk factor for stroke and heart diseases (WHO, 2012). Van de Vijver *et al.*, (2013) have reported hypertension as the number one risk factor for cardiovascular disease in Africa and that (CVD) has taken over as the most important cause of death in Africa. Previous studies in Ghana have put the prevalence of hypertension below 30% with a study among three communities in Accra reporting a prevalence of 28.4% (Amoah, 2003). Agyemang *et al.*, (2006) have also reported the overall prevalence of hypertension to be 29.4%.

Cappuccio *et al.* (2004) have indicated that the overall prevalence of hypertension was 28.7% and comparable in men and women, but higher in semi-urban villages and increased with age. This prevalence was a result of a study on hypertension among 385 men and 628 women aged 55 years in 12 villages in Ashanti region of Ghana. It is not rare to have such a high prevalence of hypertension in this banking population. In fact in a recent systematic review, Bosu (2010) observed that the prevalence of hypertension among different

populations ranged from 19% to 48% between these studies. In addition, Addo *et al.*,(2012) concluded after a review involving 11 studies published on hypertension between the period of 1973 and 2009 that the prevalence of hypertension was higher in urban (54.6%) than rural areas (19.3%).

Moreover, it was observed in this study that most of the hypertensive respondents were obese whilst persons of ideal weight were found to be highest among non-hypertensive. The present finding did indicate statistically significant difference in BMI between hypertensive and non-hypertensive respondents. This means that higher body mass index is associated with hypertension and bankers are recommended to reduce their weight for good health. In a study in India, the researcher reported a prevalence of hypertension among bankers at 30.4% and prehypertension at 34.5% in a cross-sectional study of 1493 bank employees of Surat city (Momin *et al.*, 2012).

5.2. Relationship between work schedule and hypertension among bank employees

The result of this study did not find a significant relationship between high work schedule like working for more than 7 hours in a day and hypertension. The present finding contradicts the work of Yang *et al.*, (2006) who reported a positive association between hours worked per week and likelihood of having self-reported hypertension. In this study, 41.6% of hypertensive respondents have normal working schedule compared to 58.4% of non-hypertensive respondents. However, 67.2% of non-hypertensive respondents have high working schedule

compared to 32.8% of hypertensive respondents. This finding is an indication that non-hypertensive respondents rather have higher working schedule than hypertensive respondents, although this difference was not significant. This finding implies that even if an intervention has to be put in place then it has to be for those who do not have hypertension too.

According to Yang *et al.* (2006) however, when they compared those working between 11 and 39 hours per week with individuals working 40 hours per week, they noticed a significant difference. They also found out that those who worked 40 hours per week are 14 more likely to report hypertension and also those who worked between 41 and 50 hours per week were 17% more likely to report hypertension. Yang *et al.*, (2006) finally noted that those who worked 51 hours per week were 29% more likely to report hypertension after they controlled for confounding variables, including demographic and biological risk factors and socioeconomic status. In a recent study on work and hypertension, Attarchi *et al.*, (2012) found the highest rate of HTN and mean systolic and diastolic BP among shift workers who were also exposed to noise higher than permissible limit.

5.3 The levels of physical activity among Bank of Ghana staff

The results of this study indicated that 62.1% of the non-hypertensive respondents are more physically inactive when compared to 37.9% of the hypertensive respondents. In addition, non-hypertensive respondents were more physically

active (61.8%) when compared to the hypertensive (38.2%). However, this study did not find any significant differences in activity levels between hypertensive and non-hypertensive respondents. Contrarily, a number of studies have reported significant relationship between physical activity and hypertension (Padilla *et al.*, 2005; Parker *et al.*, 2007; Muhihi *et al.*, 2012; Ganesh & Deivanai, 2014).

Although this study found no significant relationship between physical activity and high blood pressure, Muhihi *et al.*, (2012) indicated that physical activity and high energy expenditure had inverse relationships on systolic blood pressure, heart rate, total cholesterol, when they assessed level of physical activity and its relationship with CVD risk factors among young and middle aged men in a city in Tanzania. It has also been shown that those who are more physically active are more likely to experience a reduced risk for incident hypertension compared to those who are less physically active even after the factors of race, sex, age, education, and family history of high blood pressure have been adjusted for.

Whether the duration of physical activities has any effect on elevated blood pressure is a matter of great concern to workers whose work is highly sedentary. In this regard, Padilla *et al.*, (2005) found significant difference in blood pressure after physical activity accumulation for pre hypertensive for 6 hours and 8 hours for hypertensive. Padilla *et al.*, (2005) found that there was no relationship between energy expenditure and blood pressure reduction among the participants

they studied. It has been recently reported that 2 hours or less of physical activities per day was associated with hypertension among bank employees (Ganesh & Deivanai, 2014).

It is important however, to report that the result of the present study indicated some differences in physical activities among hypertensive and non-hypertensive respondents. In this study, physical activities were higher among non-hypertensive respondents compared to hypertensive respondents, although the difference was not statistically significant. In addition, non-hypertensive respondents were more physically inactive compared to their hypertensive respondents. The slight differences observed in this study could be as a result of the education that hypertensive patients receive as part of the treatment programs in the management of their elevated blood pressures.

5.4. The level of knowledge on diet and its effects on health among the staff

The level of knowledge on diet and its effect on health among hypertension revealed interesting findings. The present study put the knowledge of respondents on diet and health into three categories: low, satisfactory and high. This study found that more non- hypertensive respondents (31.2%) had low level of diet knowledge on health compared to hypertensive respondents (0.0%). On the category of satisfactory knowledge level, non- hypertensive respondents (36.6%) were more knowledgeable compared to their hypertensive counterparts (15.8%). However, it was interesting to note that, far more hypertensive respondents

(84.2%) had high knowledge on diet and health compared to non-hypertensive respondents (32.3%). This result showed a significant difference in level of knowledge of diet on health among respondents on the category of high level of knowledge among the respondents. This means that individuals with hypertension have higher knowledge on diet and its effect on their health conditions compared to their non-hypertensive counterparts. Hypertensive patients have become more knowledgeable about their health and related issues due to the mandatory inclusion of dietitians in the management of lifestyle diseases (hypertension and diabetes).

Some studies have confirmed the findings in this study although others have revealed opposing associations between diet knowledge and hypertension (Appel *et al.*, 2006; Wood, 2008; Demaio, 2013). In the study of Demaio (2013) for instance showed that the educational level on diet of individuals was generally associated with a heightened knowledge and risk perception of hypertension. Although Demaio did not compare diet knowledge between hypertensive and non-hypertensive respondents, the idea that his participants perceived medication and exercise as the only interventions to be moderately effective at preventing high blood pressure was intriguing.

Contrary to the findings on diet knowledge in the present study, Wood (2008) found no significant positive link between knowledge level of participants and their health promoting behaviors on diet and exercise. Wood (2008)

however noted that individuals received majority of their information about hypertension and health from doctors, family, television, and schools, a situation that is encouraging. It is obvious that dietary knowledge is essential to the continuous fight against hypertension. According to Appel *et al.*, (2006), increased potassium intake and consumption of dietary patterns based on the “DASH diet”, weight loss and moderation of alcohol consumption have emerged as effective strategies that also lower BP. Appel *et al.*, (2006), have finally recommended that in the management of uncomplicated stage I hypertension (systolic BP of 140 to 159 mm Hg or diastolic BP of 90 to 99 mm Hg), dietary changes should serve as initial treatment before drug therapy. Indeed, among individuals with hypertension who are already on drug therapy, lifestyle modifications, particularly a reduced salt intake, can further reduce blood pressure

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

The purpose of this study was to assess work-related hypertension among Bank of Ghana staff in Accra. The study enrolled 150 participants who were between ages 27 to 59 years. There were 57 hypertensive and 93 non-hypertensive with 100 males and 50 females.

Two (2) out of the four (4) objectives were significant statistically. The results of the study showed that the prevalence of hypertension among staff of Bank of Ghana, Accra was 38% representing 57 of the respondents. The study also found a significant difference in the level of knowledge of diet on health among respondents on the category of high level of knowledge among the respondents. However, the present study did not find any significant relationship between work schedule and hypertension. Also, no significant difference was found between hypertension respondent and non-hypertension respondent on physical activities.

6.2 Limitations

The results of this research cannot be definitive, and it has some limitations. The study could be replicated with some more robust measures of the variables. In the case of the predictor variable (work schedule) for example, it could be looked at in other ways. It could be seen as shift work and the responsibilities assigned to an employee.

It is also possible that many factors apart from the two main variables (work schedule and physical activity) studied can predict or relate to hypertension. More efficacious means of controlling those variables could be introduced. For instance age, gender and education has been found to highly influence hypertension.

Another limitation is that, because the participants were taken from a clinical setting (those who have reported for treatment), it will not be appropriate to extrapolate these results to all other hypertensive patients. That is it is possible that those who have reported for treatment have gained some form of knowledge about hypertension compared to those who have not reported.

Finally, because the method used for data collection was a survey and was specifically meant to look at relationships, the findings cannot propose causal relationship among the variables.

6. 3 Recommendations

The following recommendations are as a result of the findings in the present study which are meant to enhance the management of hypertension among the Bank of Ghana staff. Plans need to be put in place to increase awareness of hypertension and its management so as so as to help promote healthy lifestyles at the work place especially among non-hypertensive workers.

The level of knowledge on diet and its effect on health should be promoted in order to facilitate good dietary behaviours among the staff.

Finally, periodic hypertension screening exercises should be organized to help identify undiagnosed hypertension so as to further facilitate the early management of the disease among this population.

Most workers are overweight and obese with hypercholesterolemia and measures like a well monitored exercise regimen and a controlled Diet plan with BMI monitored reward system put must be put in place to address this problem.

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APPENDIX 1

Consent Form

Investigator: Prince Daitey

Address: Department of Environmental, Occupational and Behavioral Sciences,

School of Public Health, College of Health Sciences,

University of Ghana, Legon

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General information about the research

The research seeks to assess work-related hypertension among Bank of Ghana staff. The objective of the study is to determine the prevalence of hypertension among different categories of Bank of Ghana workers; determine the relationship between work schedule and high blood pressure and assess the levels of physical activity among Bank of Ghana staff. A sample of 150 participants will be drawn from the population of about 600 employees of the Bank of Ghana through the use of a stratified and a simple random sampling technique.

Possible risks and Discomforts

Description of risks

This study poses minimum risk to participants. Blood sample will be taken to check blood cholesterol levels in participants who do not know their cholesterol status. Interviews will relate to the knowledge and experience of the participants as it relates to hypertension.

Description of measures to minimize risks

Participants may decline to answer any question or discuss any topic that they do not wish to discuss. In addition, the researcher will continuously remind the participant of their ability to decline participation at any point. The person conducting the interview will be trained in moderating and interviewing skills when dealing with such topics.

Possible benefits

Participants who will appreciate the possible risks of hypertension and be able to better manage their condition.

Description of possible benefits

There will be no direct benefit to respondents. However, the information they provide will contribute to the furtherance of the Hypertension care.

Confidentiality

Data Security: - All study materials (questionnaire, informed consent form, key informant interview guide) will be locked in the office of the investigator. Data that will be electronic files will be made accessible only to the researcher.

Plans for Record Keeping:- Study materials (questionnaire, informed consent form, key informant interview guide) will not be labeled and interviews will be given a unique study identification number for each study participant.

Person Responsible and Telephone Number:- The person responsible for data storage will be Prince Daitey, Investigator, of the School of Public Health, Legon. Tel: 0243866714

Where Data Will Be Stored For Security:- During data collection, all materials related to the study will be stored in locked cabinet in the Investigator's office.

Who will have Access to the Data? Only members of the research team (Investigator, and assistants) will have access to the data.

Compensation

Eligible persons who consent to participate in this study will not be given any monetary compensation.

Voluntary Participation and Right to Leave the Research

Potential study participants will be told that participating in the study is entirely voluntary, and that declining to enter the study, declining to answer a question or terminating the interview will have no negative consequence.

Contacts for Additional Information

Please call the person responsible for this study in your community, Prince Daitey, 0243866714, if you have questions about the study.

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title (Assessment of work-related hypertension among Bank of Ghana staff). has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I consent voluntarily to participate as a subject in this study and understand that I have the right to withdraw from the study at any time. I agree to participate as a volunteer.

Date

Signature or mark of participant

If volunteer cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read and explained to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

Date

Signature of Witness

I certify that the name of the nature and purpose, the potential benefits, and possible risks associated with participating in this research have explained to the above individual.

Date

Signature of Person Who Obtained Consent

APPENDIX 2
QUESTIONNAIRE

A. Socio-demographic data**Date of interview:**

Area of residence.....

Years of Education.....

Age.....

Ethnicity.....

Sex.....

Household size.....

Marital status.....

How long have you been employed here?.....yrs.....moths.....

B. Medical History

1a) Has any of your biological parents been diagnosed with any of the following diseases?

Hypertension: Yes both parents Yes on of them None of them Don't know

Diabetes: Yes both parents Yes on of them None of them Don't know

1b) Would you describe your any of your parents has overweight/obese?

Yes both parents Yes on of them None of them Don't know

2a) Have you been diagnosed of as having any of the following diseases?

Diabetes Hypertension No Don't know

Others Specify

2b) If yes, are you on any medication? Yes No

2c) Have you been at any time been considered by close friends as overweight/obese?

Yes No

2d) Do you consider yourself as overweight/obese? Yes No Don't know

C. Knowledge on diet and its effect on health

1. Have you ever enrolled in a course in which nutrition was the subject matter?

Yes, full nutrition course Yes, part of a course No

Tick the appropriate answer(s)

2. Identify one food item from the list below with the highest level of saturated fat

Butter Margarine Groundnut Paste Don't know

3. Identify from the list which one food item is not suitable for diabetics to consume

Table sugar Fufu Oranges All None Don't know

4. Select all foods which when consumed frequently, increases the risk of overweight or obesity

Tubers/plantain Fruits & vegetable Cereals & grains Fats & oils

Bread & pastries Don't know

5. Identify the nutrients associated with increased risk of hypertension

Sodium Vitamin B12 Iron Potassium Don't know

6. What percentage of daily energy should come from fat?

Don't know

7. Which of the following foods provide the most calories per gram?

Table sugar Vegetable oil Potato chip Fried rice Don't know

8. List the 6 main foods group that contribute to a balanced

diet?.....

.....

 Don't know

9. In your opinion what contributes to a balanced diet?.....

.....
 Don't know

10. List components of the Regenerative Health program.....

.....
 Don't know

D. Physical Activities

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activity refers to activities that take hard physical effort and make you breath harder than normal. Think only about those activities that you did for at least 10 minutes at a time

1. During the last 7 days, on how many days did you do vigorous physical activities such as aerobics, heavy lifting, digging or fast cycling?..... days per week.

1b. How much time did you usually spend doing vigorous activities on those days?.....

hours per day.....minutes per day Don't know

Think about all the time that you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place or any other walking that you might do solely for recreation, exercise or leisure.

2. During the last 7 days, on how many days did you walk at least 10 minutes at a time.....days per week

2b. How much time did you usually spend walking on those days?..... hours per day.....minutes per day Don't know

Think about all the time that you spent walking in the last 7 days. This includes at work and at home, while driving to work and during leisure time This may include time spent sitting at a desk, visiting friends or sitting or lying down to watch television.

3. During the last 7 days, on how many days did you spend sitting on a week day.....hours per weekday.....minutes per weekday
3b. Hours per weekend.....minutes per weekend.....
Don't know

E Smoking History

1. Have you ever smoked cigarette /used tobacco?
Yes, currently Yes, but stopped Never smoked

F Alcohol Consumption

1. Have you ever consumed a drink that contains alcohol such as beer, spirits, palmwine, pito etc?
Yes No
2. Currently, how often do you consume drinks that contain alcohol?
Daily More than three times per week Two to three times a week
Rarely/Occasionally

G Dietary Habits

1. In the last 7 days, on how many times did you eat breakfast? (*breakfast is any meal taken before 9 a.m*)
At home..... At work..... Skipped.....
2. Excluding snacks, how many meals do you usually have on a weekday?.....
(*snacks include pastries, nuts, soft drinks/beverages, tea, milo, coffee etc.*)

- 2b. Excluding snacks, how many meals do you usually have on weekends?.....
(*snacks include pastries, nuts, soft drinks/beverages, tea, milo, coffee etc.*)
3. How many times do you have snacks in a day?.....
(*snacks include pastries, nuts, soft drinks/beverages, tea, milo, coffee etc.*)
4. When eating, you add salt to your already prepared meal?
Always Sometimes Rarely Never
5. At what time do usually have lunch?.....
6. At what time do usually have supper?.....
7. How often do you eat food from fast food joint/outlet? (*fast food meals include fried rice, burger, steak etc*)
Always Sometimes Rarely Never
8. In the last 7 days, on how many times have you bought/eaten fast food? (*fast food meals include fried rice, burger, steak etc*).....

H. Work Schedule

Recall all the work that you did in the last 6 months. Work schedule refer to the duration it takes to perform your job on any given day.

1. How much time do you usually spend doing your daily work?
A) Less than 4 hours B) between 4 and 7 hours C) Exactly 7 hours D) More than 7 hours
2. How often do you travel outside of your office for work in a week?
A) Rarely B) 1-2times C)3 times D) More than 3 times
3. How many days in a week do you have to stay beyond working hours to meet deadlines?
A) Rarely B) 1-2 times C) 3 times D) More than 3 times
4. How many times in a week do you have to carry office jobs to the house to get it Completed?
A)| Rarely B) 1-2 times C) 3 times D) More than 3 times
5. How often do you have to skip lunch time in order to get the day's duties completed?

- A) Rarely B) 1-2 times C) 3 times D) More than 3 times
6. How often do you have to work on weekends to meet deadlines in a month?
Rarely B) 1-2 times C) 3 times D) More than 3 times