PREVALENCE AND RISK FACTORS OF HYPERTENSION AMONG LOCAL GOVERNMENT EMPLOYEES IN OGBOMOSO SOUTH LOCAL GOVERNMENT AREA, OYO STATE

BY

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DEDICATION

This work is dedicated to Almighty God, who made it possible for me to start and finish this programme and to my dearest wife Oluwafunmilayo Eunice OWOADE, for her encouragement since I embarked on this course.

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ABSTRACT

Hypertension is one of the leading causes of adult morbidity and mortality in Nigeria. Civil servants including local government employees are predisposed to risk factors that could lead to hypertension. Several studies have been conducted on knowledge, awareness and predisposing factors to hypertension among local government employees in urban settings but few in semi-urban areas. Hence, this study was designed to determine the prevalence and risk factors of hypertension among Local Government Employees (LGEs) in Ogbomoso South Local Government Area, Oyo State, Nigeria.

A descriptive cross-sectional design was adopted; using a four-stage random sampling technique to select 250 consenting respondents from all departments (8 departments) in the local government secretariat. A semi-structured, interviewer-administered questionnaire which included questions on socio-demographic characteristics, a 30-point hypertension knowledge and 14-point practices (sedentary lifestyle, smoking, alcohol consumption and eating food with seasoning) scales were used for data collection. Knowledge scores of ≤10, >10-20 and >20 were rated as poor, fair and good, respectively. Practice score of <7 and ≥7 were categorised as poor and good, respectively. Respondents Blood Pressure (BP) were measured using mercury sphygmomanometer and BP of <140/90mmHg was considered as a normal BP. Weight and height were measured and a Body Mass Index (BMI) of ≥30kg/m^2 was regarded as obese (normal value = 18.5-24.9kg/m^{2}while 25-29.9kg/m^2 regarded as overweight). Data were analysed using descriptive statistics, Chi-square test and logistic regression model at p= 0.05

Age of respondents was 42.0±7.4 years. 54.4% were females and 84.4% were Christians. Respondents' year of service was 13.3±5.9, 84.8% were married and 39.6% had post-secondary education. Prevalence of hypertension was 25.6%, out of which 27.2% were males. Respondents' knowledge score was 21.7±7.2. Those with poor, fair and good knowledge were 18.8%, 48.0% and 33.2%, respectively. Respondents' practices score was 10.2±4.2 and majority (64.4%) had good practices which could prevent hypertension. Only 1.6% of employee were underweight, 36.0% had normal weight, 42.0% were overweight, while 22.7% were obese. A significantly higher proportion of respondents aged 50-59 years (42.0%) compared with those aged 20-29 (13.0%), 30-39 (18.0.0%) and 40-49 years (27.0%) had hypertension. Also, a

significantly higher proportion of respondents with good practices (64.4%) compared to those with poor practices (35.6%) had hypertension. Respondents' years of service was not significantly associated with the prevalence of hypertension. Respondents aged 50-59 years were more likely to have hypertension than those aged 40-49 years (OR: 3.23; CI: 1.42-7.37). Respondents with poor practices were 2 times more likely to have hypertension (OR: 2.38; CI: 1.27-4.44) compared to those with good practices.

Prevalence of hypertension was high among Ogbomoso South Local Government Employees and the workers within 50-59 years were at risk of hypertension, despite good practices of prevention. Workplace health promotion services such as health education on hypertension-related risk factors should be promoted among local government employees.

Keywords: Hypertension, Body Mass Index, Local Government Employees, Sedentary lifestyle

Word count: 463

CERTIFICATION

I certify that this study was carried out by Adesola Simeon OWOADE in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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BP	Blood Pressure
SBP	Systolic Blood Pressure
DBP	Diastolic Blood Pressure
BMI	Body Mass Index
CVD	Cardiovascular Disorder
DALY	Disability Adjusted Life Years
JNC	Joint National Committee
LGA	Local Government Area
LGE	Local Government Employees
NHBPEP	Nation High Blood Pressure Education Programme
NNMB	National Nutrition Monitoring Bureau
NCD	Non Communicable Disease
RAs	Research Assistants
SPSS	Statistical Package for Social Science
WC	Waist Circumference
WHO	World Health Organization
IEC	Information, Education and Communication
ESH	European Society of Hypertension
BHS	British Hypertension Society

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Hypertension sometimes called arterial hypertension is a chronic medical condition in which the blood pressure in the arteries is elevated (Chobanian *et al.* 2003). It is the commonest Cardiovascular Disorder (CVD) and now regarded as major public health problem. Hypertension is the persistent increase in systematic arterial pressure. This requires the heart to work harder than normal to circulate blood through the blood vessels. Blood pressure is summarised by two measurements, systolic and diastolic, which depend on whether the heart muscle is contracting (systole) or relaxed between beats (diastole). Normal blood pressure at rest is within the range of 100-140mmHg systolic (top reading) and 60-90mmHg diastolic (bottom reading). High blood pressure is said to be present if it is persistently at or above 140/90 mm Hg (Sembulingam, 2004). The exact causes of high blood pressure are unknown, but several factors may play a role in its development which include smoking, lack of physical activity, consumption of too much salt in the diet, too much alcohol consumption, genetic, old age and family history of high blood pressure (Fisher *et al*, 2005 and Marshall *et al*, 2012).

Hypertension is classified as either primary (essential) or secondary; about 90–95% of cases are categorized as "primary hypertension" which means high blood pressure with no obvious underlying medical cause (Fisher *et al*, 2005). The remaining 5–10% of cases (secondary hypertension) is caused by other conditions that affect the kidneys, arteries, heart or endocrine system. Some of the known risk factors for primary hypertension like age, heredity and gender are non-modifiable. However, majority of the other risk factors like consumption of tobacco and alcohol, unhealthy diet, physical inactivity, overweight and obesity can be effectively prevented (Marshall *et al*, 2012).

Hypertension can lead to stroke, myocardial infarction (heart attacks), heart failure, aneurysms of the arteries (e.g. aortic aneurysm) and peripheral arterial disease. It is a cause of chronic kidney disease. Even moderate elevation of arterial blood pressure is associated with a shortened life expectancy.

Hypertension is rarely accompanied by any noticeable symptoms, and its identification is usually through screening or when seeking healthcare for an unrelated problem and that is why it is commonly referred to as a "silent killer". However, proportion of people with high blood

pressure report headaches (particularly at the back of the head and in the morning), as well as light-headedness, vertigo, tinnitus (buzzing or hissing in the ears), altered vision or fainting episodes (Dalal *et al*, 2011). These symptoms however are more likely to be associated with anxiety than the high blood pressure itself (De- Graft *et al*, 2011).

Hypertension is one of the non-communicable diseases (NCDs) and it is also one of the leading causes of adult mortality globally (Alwan *et al*, 2010, Unwin *et al*, 2006). The increasing incidence of chronic diseases in low-income countries of Sub-Saharan Africa (SSA) poses a growing challenge to their national health systems (Dalal *et al*, 2011), given that infectious diseases are still highly prevalent in these settings. The increase is attributed to interrelated changes in demographic and socio-economic determinants, influenced by globalization (Maher *et al*, 2010). Propelling the upsurge of cardiovascular disorder in Africa is the growing prevalence of risk factors, including obesity and hypertension among others (Addo *et al*, 2007). In some countries (e.g. Ghana, South Africa and Cameroon), CVD risk factors have increased to epidemic proportions (Bosu *et al*, 2010). Prevalence of hypertension varies across countries and states. It is multifactorial disease, influenced by genetic, racial, geographic, cultural and dietary patterns. Dietary and lifestyle changes can improve blood pressure control and decrease the risk of associated health complications, although drug treatment is often necessary in people for whom lifestyle changes prove ineffective or insufficient.

1.2 Statement of the Problem

Several community based investigation revealed that hypertension is rapidly emerging as a public health problem in developing countries (Fuentes *et al*, 2005 and Kearney *et al*, 2005). Hypertension is an important public health challenge worldwide because as at 2000, nearly one billion people or 26% of the adult population of the world had hypertension (Kearney *et al*, 2005). It was common in both developed and undeveloped countries. The prevalence of hypertension varies within different countries.

Over 20 million people were affected by the hypertension in Sub-Saharan Africa annually (Kadiri, 2005). Also, various reports from Africa have revealed that the prevalence rate of hypertension in Africa is between 7% and 20% while the prevalence may be as high as 15% in West African sub region (Akinkugbe *et al*, 1999).

In Nigeria over 4.3million people above 15years of age were classified as being hypertensive (Akinkugbe, 2003 and Ike, 2009). The total number of estimated deaths resulting from all types

of cardiovascular diseases and hypertensive heart disease recorded for Nigeria was 20.500 and 10,700 respectively which placed Nigeria in the 16th position globally in 2004 (WHO, 2004).

The prevalence of hypertension among the urbanized workers in Nigeria is estimated to be 9.3% (Kadiri et al, 1999). Also, the study has revealed that there is high prevalence of hypertension among salary earners which local government employees are among in Nigeria (Oghagbon *et al*, 2008). The prevalence of hypertension increases each year among the salary earners. it may be connected with job stress's (Landsteris *et al*, 2003 and Markovitz *et al*, 2004). The increase in prevalence of hypertension among the salary earners bring physical health problems which affect the manpower and services rendered at the local government level as absenteeism become more common among the employees without notices. Olusayo *et al*, (2011) showed that Ogbomoso in Oyo state has greater prevalence of hypertension most especially among the skilled labour and unskilled labour which include Local Government employees as a result of physical inactivity and consumption of high calorie diets. In addition, unpublished report from medical unit of Ogbomoso South Local Government shows that health week exercise organized by Ogbomoso South local government in year 2008 revealed that there is high prevalence of hypertension among the local government employees, which makes them to perform below expectations in the services rendered by them without people noticing it. Only 33.8% of hypertensive patients are aware of their condition (Familoni, 2002 and Kadiri, 2000).

Incidentally, most civil servants in this country are aware of hypertension without knowing the contributory factors to high blood pressure (Familoni, 2002 and Kadiri, 2000). There is concern today in the state that lack of knowledge on hypertension has contributed greatly to the increase in the prevalence of hypertension among the LG Employees in Nigeria.

1.3 Justification

Developing countries are experiencing epidemiological transition from communicable to non-communicable chronic diseases. An non-communicable diseases are currently responsible for at least 20% of all deaths in Nigeria (WHO, 2005) and constitute up to 60% of the patients admitted into the medical wards of most tertiary hospitals in Nigeria (Unachukwu *et al*, 2005).

There is need to assess the state of health of local government employees on hypertension because urbanized workers, exposed to high risk behaviour that may predispose them to hypertension (Kadiri, 2005). Unfortunately, they do not usually present for medical examination

(Olusayo *et al*, 2011). Presently, there is no concrete information on the prevalence of hypertension and its risk factors among employees in local government level in Nigeria. Hence, this study sought to establish the prevalence and risk factors of hypertension among local government employees in Ogbomoso South Local Government Area, Oyo State.

Also, Local Government Secretariat was used in this study because it is a workplace which serves as a health promoting setting due to employees are captured audience to promote health, there is establishment of mode of communication, stressor in the workplace can be handled through stress management force, counselling services and employees' assistance programme to help people to adopt new skills, easy to follow intervention and monitoring, Peer pressure and group support.

Reliable information on the knowledge of hypertension is crucial in the development of health policies for prevention, control and early diagnosis of hypertension (Iyalomhe, 2010). Lastly, the data from this study will also help to provide relevant data which can be used for development of health policies for prevention, control and early diagnosis of hypertension among the local government employees.

1.4 Research Questions

1. What is the prevalence of hypertension among local government employees?
2. What is the level of knowledge on causes, prevention and treatment of hypertension among local government employees?
3. What are the lifestyle practices that may predispose local government employees to hypertension?
4. What are the available structures in the LG Secretariat that can be used to prevent and manage hypertension among the employees?

1.5 Broad Objective

To investigate the prevalence and risk factors of hypertension among local government employees in Ogbomoso South Local Government Area.

1.6 Specific Objectives

1. To determine the prevalence of hypertension among local government employees
2. To assess the level of knowledge of hypertension among local government employees
3. To determine lifestyle practices that put LG employees to risk of hypertension
4. To document the available structure in the LG Secretariat that can be used to prevent and manage hypertension among the employees

1.7 Hypotheses

The following Null Hypotheses were tested

1. H_o There is no significant relationship between age and prevalence of hypertension among local government employees in Ogbomoso South LGA.
2. H_o There is no significant relationship between lifestyle practices and prevalence of hypertension among local government employees in Ogbomoso South LGA.
3. H_o There is no significant relationship between year of service and prevalence of hypertension among local government employees in Ogbomoso South LGA

CHAPTER TWO

2.0 LITERATURE REVIEW

The literature review is organised under the following sub-headings or section:

i. Blood pressure and factors that affect blood pressure

ii. Hypertension

iii. Prevalence of hypertension and risk factor of hypertension

iv. Knowledge of hypertension

v. Trend of hypertension

vi. Hypertensive crisis

vii. Hypertension in adult

ix. Prevention of hypertension

x. Management of hypertension

xi. Impact of hypertension on coronary heart disease and stroke

xii Conceptual framework

2.1 Blood Pressure

Blood pressure may be defined as the force or pressure which the blood exerts on the walls of the blood vessels in which it is contained and it is usually measured with a device called a sphygmomanometer which consists of an inflatable rubber cuff, an air pump, and a column of mercury or a dial or digital readout reflecting pressure in an air column. Blood pressure is summarised by two measurements, systolic and diastolic, which depend on whether the heart muscle is contracting (systole) or relaxed between beats (diastole) (Chobanian et al, 2003). The blood pressure can be expressed as systolic blood pressure and diastolic blood pressure. Readings are expressed in millimeters of mercury or mmHg (Sembulingan, 2004)

Blood pressure is essential for life and nobody could survive without it because it pushes against the blood vessels that carry oxygen and nutrient-rich blood from the heart to the rest of body (Sembulingan, 2004). The normal range of systolic blood pressure is between 110 and 140 mmHg and the normal range of diastolic blood pressure is between 60 and 90 mmHg but when the systolic blood pressure rises above 150mmHg and diastolic rises above 90mmHg persistently, it is considered as hypertension (WHO, 2005). The risk of heart or blood vessel problems increases as blood pressure rises above normal levels, regardless of age. The higher the pressure, the greater the risk. Any reading above the "normal" level requires follow up and

possible treatment. One or two elevated blood pressure readings, even just to levels of 140–145/90–95 mm Hg, may indicate something about the future. These numbers cannot be ignored. Untreated, even higher levels of blood pressure may develop, and the risk of kidney failure, a heart attack, or stroke is increased (Omuemu et al, 2007)

2.2. Factors Affecting Blood Pressure

2.2.1 Exercise

Regular exercise, along with an active lifestyle, may decrease blood pressure. To significantly reduce the risk of developing high blood pressure, it is recommended that adults participate in 150 minutes a week of cardiovascular exercise such as walking, cycling and swimming. Increasing daily activity by walking to and from class and work (rather than taking the bus) and walking up and down stairs (versus riding the elevator), will also contribute to an active, healthy lifestyle (Sembulingan, 2004).

2.2.2 Nutrition

Several researches have shown that diet affects the development of high blood pressure (hypertension). The DASH (Dietary Approaches to Stop Hypertension) eating plan is recommended if your blood pressure is high or if you are at risk for high blood pressure. DASH is a combination diet that is low in fat and rich in fruits and vegetables. It is low in cholesterol and saturated fat, high in dietary fiber, potassium, calcium and magnesium and moderately high in protein. Two to three servings of low fat dairy products per day contribute calcium and protein to DASH. Whole grains from cereals, breads and crackers contribute fibre and energy. Lean meat, poultry and fish (less than six ounces per day) provide more potassium and protein. To boost potassium, fibre, and protein andenergy intake even more, DASH recommends nuts, seeds or cooked dried beans 4-5 times per week. Healthy weight management and appropriate intake of salt (sodium) are both very important in blood pressure control (Sembulingan, 2004).

2.2.3 Alcohol

Alcohol is a drug and regular over-consumption can raise blood pressure dramatically, as well as cause an elevation upon withdrawal. Also, alcohol intake can be a factor in weight gain Oridinlola (2013).

A study carried out by Ravi et al (2015) which investigated high blood pressure due to alcohol among the factory workers, has shown that alcohol consumption, documented with a 1-week retrospective diary was divided into two categories recent and previous intake. Recent intake was denned as the amount consumed on days 1 and 3 immediately preceding blood pressure

measurements. Previous intake was denned as the amount consumed on days 4, 5, and 6 preceding blood pressure measurement high recent alcohol intake significantly raised systolic and diastolic blood pressure in both men and women. Previous alcohol intake, however, did not appear to influence blood pressure. They concluded that the effect of alcohol on blood pressure appears to be predominantly due to alcohol consumed in the few days immediately preceding blood pressure measurement, with alcohol consumption before those few days exerting little effect on blood pressure.

Another study conducted by Stephen (2015) investigated that 25% of studies, elevations in blood pressure were also reported at lower levels of consumption; in about 40%, the blood pressure of non-drinkers was greater than that of those consuming one to two drinks per day. In two studies, one from the United States and one from Australia, the maximum contribution to the prevalence of hypertension of alcohol consumption greater than two drinks per day were estimated to be 5 to 7%; the contribution in men (11%) was greater than that in women because of their greater alcohol consumption. A prospective association of alcohol consumption with change in blood pressure was observed in five studies. In a small number of experimental studies, short-term falls in blood pressure accompanied alcohol restriction in both normotensive and hypertensive subjects. Uncontrolled observations in heavy drinking populations suggest that the effect on blood pressure of alcohol withdrawal may be lasting. He concluded that the long-term effects of alcohol restriction, particularly in moderate consumers who represent a large proportion in many populations, must await long-term controlled trials.

2.2.4 Stress

The effects of stress can vary, but long-term, chronic stress appears to raise blood pressure. Various relaxation techniques such as deep breathing, progressive relaxation, massage and psychological therapy can help to manage stress and help lower stress-induced blood pressure elevations (Sembulingan, 2004).

Stress can cause hypertension through repeated blood pressure elevations as well as by stimulation of the nervous system to produce large amounts of vasoconstricting hormones that increase blood pressure. Factors affecting blood pressure through stress include white coat hypertension, job strain, race, social environment, and emotional distress. Furthermore, when one risk factor is coupled with other stress producing factors, the effect on blood pressure is multiplied. Overall, studies show that stress does not directly cause hypertension, but can have an effect on its development. A variety of non-pharmacologic treatments to manage stress have been found effective in reducing blood pressure and development of hypertension, examples of which are meditation, acupressure, biofeedback and music therapy. Recent results from the National Health and Nutrition Examination Survey indicate that 50 million American adults have hypertension. In 95% of these cases, the cause of hypertension is unknown and they are categorized as "essential" hypertension. Although a single cause may not be identified, the general consensus is that various factors contribute to blood pressure elevation in essential hypertension. In these days of 70 hour work weeks, pagers, fax machines, and endless committee meetings, stress has become a prevalent part of people's lives; therefore the effect of stress on blood pressure is of increasing relevance and importance. Although stress may not directly cause hypertension, it can lead to repeated blood pressure elevations, which eventually may lead to hypertension (Kuikami et al, 1997).

A study carried out by Bernard et al (2014) which investigated relationship between psychosocial stress and hypertension among Ghanaian in Amsterdam, Netherlands. They reported that the overall prevalence of hypertension was 54.7%. About two thirds of the study population experienced a moderate (31%) or high (36%) level of discrimination. 20.0% of the participants had mild depressive symptoms, whilst 9% had moderate depressive symptoms. The prevalence of financial stress was 34.8%. They assessed that psychosocial stresses were not significantly associated with hypertension. They finally concluded that there is no evidence for the association between psychosocial stress and hypertension among recent SSA migrants.

According to Daniela et al (2007) which investigated stress management at the worksite, revealed that work stress may increase cardiovascular risk either indirectly, by inducing

unhealthy life styles, or directly, by affecting the autonomic nervous system and arterial pressure. They hypothesized that, before any apparent sign of disease, work-related stress is already accompanied by alterations of R R variability profile and that a simple on site stress management program based on cognitive restructuring and relaxation training could reduce the level of stress symptoms, revert stress-related autonomic nervous system dysregulation, and lower arterial pressure. They also compared 91white-collar workers, enrolled at a time of work downsizing (hence, in a stress condition), with 79 healthy control subjects. They also tested a simple onsite stress management program (cognitive restructuring and relaxation training) in a subgroup of workers compared with a sham subgroup (sham program). Workers presented an elevated level of stress-related symptoms and an altered variability profile as compared with control subjects. These alterations were largely reverted by the stress management program, which also slightly lowered systolic arterial pressure. No changes were observed in the sham program group. This study indicated that work stress is associated with unpleasant symptoms and with an altered autonomic profile and suggests that a stress management program could be implemented at the worksite, with possible preventive advantages for hypertension. Another study showed that individualized stress management is associated with reduced arterial blood pressure. Treatment effects were replicated and further improved by follow-up. Reductions in psychological stress and improved anger coping strategies appear to mediate reductions in blood pressure change (Linden et al, 2001).

2.2.5. Smoking

Smoking is the third leading cause of death globally. Smoking causes peripheral vascular disease (narrowing of the vessels that carry blood to the legs and arms), as well as hardening of the arteries. These conditions clearly can lead to heart disease and stroke and are contributing factors in high blood pressure (Dickinson et al, 2006).

A study which investigated the association between smoking and high blood pressure in a population-based sample of Vietnamese men revealed that high blood pressure was associated with smoking in a dose- response manner when characterized as number of years of smoking and lifetime cigarette consumption, but was not associated with current smoking status (Au DiehThuy et al 2010).

2.3 Hypertension

Hypertension means high blood pressure. It is sometimes called arterial hypertension, because it is a chronic medical condition in which the blood pressure in the arteries is elevated. This requires the heart to work harder than normal to circulate blood through the blood vessels. The occurrence of hypertension, a chronic condition, is increasing in developing countries such as Nigeria due to the sociological, political and economic changes and the associated alterations in people's lifestyles (Chobanian et al, 2003).

Hypertension is one of the important public health challenges worldwide because of its high frequency and concomitant risks of cardiovascular and kidney disease (Whelton, 1997). It has been identified as a leading risk factor for mortality and ranked third as a cause of disability adjusted life-years (Ezzati et al 2002). The accelerating epidemic of hypertension in India was documented by studies done at various places across the country (Gupta, 2004). The National Nutrition Monitoring Bureau (NNMB), which monitors the nutritional status of the population in nine States of India has estimated the prevalence of hypertension among the rural adult (aged 18 and above) population of India to be 25 per cent during 2004-2005 (NNMB Technical Report, 2004).

The proportion of the global burden of disease attributable to hypertension has significantly increased from 4.5 % in the year 2000, to 7 % in 2010. Early diagnosis of hypertension is important in order to avoid potentially life threatening complications. Hypertension is also high in people with risk factors like tobacco use, physical inactivity, unhealthy diet, obesity, diabetes, high cholesterol, low socioeconomic status and family history (WHO, 2010).

The WHO 2012 report highlighted the growing burden of non-communicable diseases worldwhile. Hypertension causes around half of all stroke and heart disease related deaths. About 7.1 million or 6 % of deaths worldwide was attributed to hypertension. High blood pressure (BP) is responsible for 62 % of cerebrovascular disease and 49 % of ischemic heart disease (WHO, 2013).

Hypertension was once thought to be rare in Africa, but it is now recognized as one of the most common causes of cerebrovascular diseases accounting for about 40 % of cerebrovascular diseases on the African continent (WHO, 2010). There is an urgent need to develop strategies to prevent, diagnose, and treat hypertension more effectively in Africa (Addo et al, 2007). Today, there are approximately 80 million adults with hypertension in Africa and projections based on

current epidemiological data suggest that this figure will rise to 1.50 million by 2025 (Vijver et al, 2013).

Various risk factors have been associated with hypertension, including age, sex, race, physical activity, and socioeconomic class. Vast majority of cases of uncontrolled hypertension are amongst individuals more than 60 years of age (Thomas & Ramachandran, 2005). Population studies have also shown that blood pressure correlates with body mass index (BMI) and other anthropometric indices of obesity such as waist-hip ratio. In the Framingham Study, 70% of new cases of hypertension were related to excess body fat (Kotsis et al., 2005).

Hypertension has been linked with a number of risk factors, for example, urbanization, dietary factors and metabolic disorders (Davidson, 2004). Even though the same NCD risk factors may be prevailing globally, the causal relationship between them and the development of hypertension has never been resolved. Initially, the pathophysiology of essential hypertension was thought to occur through the insulin resistance common pathway, but the existence of hypertension in lean subjects has somewhat clouded this hypothesis and called for alternative mechanisms, including increased psychosocial stress (Mufunda et, al 1998).

Hypertension is a major risk factor for stroke, myocardial infarction (heart attacks), heart failure, aneurysms of the arteries (e.g. aortic aneurysm), peripheral arterial disease and is a cause of chronic kidney disease. Even moderate elevation of arterial blood pressure is associated with a shortened life expectancy. Dietary and lifestyle changes can improve blood pressure control and decrease the risk of associated health complications, although drug treatment is often necessary in people for whom lifestyle changes prove ineffective or insufficient (Chobanian et al, 2003).

2.4 Classification of Hypertension

Hypertension classification can be based on cause. Classification according to cause is termed primary and secondary hypertension.

2.4.1. Primary Hypertension

Primary hypertension is the most common form of hypertension, accounting from 90-95% of all cases of hypertension (Carretero et al., 2000). In almost all contemporary societies, blood pressure rises with aging and the risk of becoming hypertensive in later life is considerable (Vasan et al, 2002). Hypertension results from a complex interaction of genes and environmental

factors. Numerous common genetic variants with small effects on blood pressure have been identified as well as some rare genetic variants with large effects on blood pressure but the genetic basis of hypertension is still poorly understood (Carretero et al., 2000).

Some of the known risk factors for primary hypertension like age, heredity, and gender are non-modifiable. However, the majority of the other risk factors like tobacco use, alcohol use, unhealthy diet, physical inactivity, overweight and obesity can be effectively prevented (WHO, 1998). Hypertension is the most common cardiovascular disorder affecting approximately 1 billion people globally and accounts for approximately 7.1 million deaths annually (Brundtland, 2002). Until recently, hypertension has been given low priority in Africa. The condition is now being widely reported in many parts of Africa and is the most common cause of cardiovascular disease on the continent (Brundtland, 2002).

Several environmental factors influence blood pressure. Lifestyle factors that lower blood pressure include reduced dietary salt intake, increased consumption of fruits and low fat products, exercise, weight loss and reduced alcohol intake (Dickinson et al, 2006, Haslamet et al, 2005). Stress appears to play a minor role with specific relaxation techniques not supported by the evidence. The possible role of other factors such as caffeine consumption and vitamin D deficiency are less clear cut (Vaidya et al. 2010). Insulin resistance, which is common in obesity and is also thought to contribute to hypertension (Sorof et al., 2002). Recent studies have also implicated events in early life (e.g low birth weight, maternal smoking and lack of breast feeding) which serve as risk factors for adult essential hypertension, although the mechanisms linking these exposures to adult hypertension remain obscure (Lawlor *et al*, 2005).

2.4.2. Secondary Hypertension

Secondary hypertension results from an identifiable cause. It accounts for 5% - 10% of all hypertension persons. Renal disease is the most common secondary cause of hypertension (O'Brien *et al*, 2007). Hypertension can also be caused by endocrine conditions, such as Cushing's syndrome, hyperthyroidism, hypothyroidism, acromegaly, Conn's syndrome or hyperaldosteronism, hyperparathyroidism and pheochromocytoma. Other causes of secondary hypertension include obesity, sleep apnea, pregnancy, coarctation of the aorta, excessive liquorice consumption and certain prescription medicines, herbal remedies and illegal drugs (O'Brien *et al*, 2007).

2.5. Signs and Symptoms

Hypertension is rarely accompanied by any symptoms and its identification is usually through screening, or when seeking healthcare for an unrelated problem. A proportion of people with high blood pressure report headaches (particularly at the back of the head and in the morning), as well as lightheadedness, vertigo, tinnitus (buzzing or hissing in the ears), altered vision or fainting episodes (Fisher et al. 2005) These symptoms however are more likely to be related to associated anxiety than the high blood pressure itself (Marshall et al. 2012).

Other clinical effects only appear until complications develop as a result of vascular changes in target organs. These include Left ventricular hypertrophy, Angina Myocardial infarction, Heart failure, Stroke, Transient ischemic attack, Nephropathy, Peripheral arterial disease and Retinopathy.

2.6. Prevalence of Hypertension

The prevalence of hypertension varies across countries and states. It is multi-factorial disease, influenced by genetic, racial, geographic, cultural and dietary patterns. High blood pressure is estimated to cause 7.1 million deaths annually accounting for 13% of all deaths globally. It is being recognized that high blood pressure is an important public health problem in developing countries (Fuentes *et al*, 2000). One study has reported that prevalence of hypertension is 22% in Canada, of which 16% is controlled; it is 26.3% in Egypt, of which 8% is controlled, and it is 13.6% in China, of which 3% is controlled (Albert; 2011). Recent studies conducted in Africa have revealed prevalence ranging from 7.5% in Sudan, to as high as 37.7% in Tanzania (Addo et al 2007, Edwards et al 2000).

Hypertension is increasingly being recognised as an important public health problem in sub-Saharan Africa, with 26.9% of men and 28.4% of women in 2000 being estimated to have hypertension. Although lower than the prevalence in high-income countries (37.1% in men and 37.2% in women), in terms of numbers of people affected, the burden of hypertension in low- and middle-income countries is greater due to the large population (Kearney et al, 2005)

Hypertension has been recognised as a strong independent risk factor for heart disease and stroke and a predictor of premature death and disability from cardiovascular complications. It has been reported that 13.5% of deaths and 6% of disability-adjusted life years (DALYs) were attributed to hypertension globally, and for low- and middle income people, these figures were 12.9 and 5.6%, respectively over the period 1990 to 2001 (Lopez et al, 2006). Although infectious

diseases remain the leading cause of mortality and morbidity in sub-Saharan Africa, the prevalence of cardiovascular disease and hypertension is rising rapidly (Seedat, 2000).

It has been emphasised that urbanisation is a key reason for the increasing rates of hypertension, as evidenced by the higher prevalence of hypertension in urban areas (Mathenge et al. 2010). Urban lifestyles, characterised by sedentary living, increased salt intake, obesity and stress contribute to these differences. With the urban population in sub-Saharan Africa projected to increase, a greater risk of hypertension is anticipated (Addo et al, 2007).

Studies on the association between ethnicity and hypertension in high-income countries have documented a higher prevalence of hypertension in black ethnic groups compared to white ethnic groups (Harris et al, 2000, Kramer et al. 2004 and Chiu et al, 2010). Reasons for this association are complex, unclear and much debated, reflecting genetic and biochemical mechanisms, and environmental and socio-economic factors (Opaill et al, 2005, Jamerson et al, 2004). There is limited evidence regarding differences in the prevalence of hypertension between ethnic groups within the broader classification of black ethnicity (De Ramirez et al, 2010).

Prevalence of hypertension among Nicobarese Aborigenes

Sathya et al (2011) which investigated that the prevalence of hypertension among Nicobarese aborigenes was 50.5 per cent (M: 50.7%; F: 50.3%)]. The prevalence of tobacco, alcohol consumption, and overweight/obesity was 88, 54, and 37 per cent respectively. The bivariate analysis has shown association between hypertension and age, education subcategories, alcohol consumption, and overweight/obesity. The increasing trend in the prevalence of hypertension with increasing age and decreasing educational status was statistically significant. MLR analysis revealed a significant association between hypertension and various age categories and overweight/obesity. They concluded that there is high prevalence of hypertension among Nicobarese aborigenes.

Prevalence of hypertension among Indian workers

The age and sex adjusted prevalence of hypertension was 32.2 per cent and pre-hypertension was 32.3 per cent. In contrast to hypertension, which was highest in the age group 60-69 year (64%), prehypertension was highest (36%) in the group 30-39 years. There was a high prevalence of cardiovascular risk factors in the general population (i.e central obesity (86.7%), cholesterol (22.8%), abnormal glucose tolerance (41.6%) and smoking (20.3%). Two or more of the cardiovascular risk factors were present in a higher proportion of hypertensive and pre-

hypertensive compared to normotensive subjects (39%). Subjects with pre-hypertension had body mass index, waist-hip ratio and frequency of glucose intolerance, which was intermediate between normotensive and hypertensive subjects. In multiple logistic regression analysis. increasing age, body mass index, waist hip ratio and impaired glucose tolerance/diabetes were independent risk factors for both hypertension and pre-hypertension. They concluded that a high prevalence of pre-hypertension and hypertension were noted in affluent urban north Indians. Increasing age, body mass index, central obesity and impaired glucose tolerance/diabetes were significantly associated with both hypertension and pre-hypertension. Prehypertension was associated with an increased prevalence of cardiovascular risk factors (Yadav et al 2008).

A study was conducted on 192 (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 & apos's Perceived Stress scale. Data was analyzed by Chi-square test and multiple logistic regression analysis. The study showed that the age of the participants was 39.5±10.6 years. The prevalence of hypertension and pre-hypertension was 44.3% and 41.1% respectively. Of 85 participants with hypertension, 47 (55%) was known case and 38 (45%) were newly diagnosed. Multiple logistic regression analysis revealed that living in the 4th (OR: 3.13) or 6th (OR: 3.11) decade of life, consumption of extra salt (OR: 2.49), and physical activity ≥2 hours per day (OR: 0.21) were associated with hypertension among bank employees. In the conclusion prevalence of hypertension is high among bank employees (Shinichi et al, 2002).

Prevalence of hypertension among council employees in Zimbabwe

According to Amon, (2010) which investigated prevalence and risk factors for hypertension among Bulawayo city council employees in Zimbabwe, has shown that mean systolic BP was 134.1±18.6mmHg and mean diastolic BP was 83.3±19mmHg. Prevalence of hypertension was 38.4%. The prevalence of hypertension was higher in females than males. Prevalence of undiagnosed hypertension was 14.2%. Seventy three (80%) of hypertensive participants were on treatment but only (39%) of them had well controlled BP. Independent risk factors for hypertension were being aged 40 years or older, being obese, current tobacco smoking, family history of hypertension and being married. He concluded that there was a high prevalence of both diagnosed and undiagnosed hypertension. Despite high percentage of treatment among

hypertensive participants, majority were at risk of developing complications because of poor control. Another study revealed that there was high prevalence among employee of mega industry of south Gujarat. Hypertension was more in general shift workers and in certain section (transport, finance, account and security). Prevalence was high in people who were overweight, consuming alcohol and tobacco (Predeep et al 2002).

Prevalence of hypertension in Nigeria

Studies in Nigeria and sub-Saharan Africa have mainly involved specific geographical areas or have focused on sub-groups of the population (Seedat, 2000). The results from these studies reported that prevalence of hypertension ranging from 20.2 to 36.6%, but all have involved participants with different age ranges (Andy et al, 2012, Ogah et al, 2013)

A 2003 study carried in urban Lagos by Nigerian Heart Foundation had recorded a prevalence of hypertension of 44.3%, while the prevalence in rural communities in Rivers State and Edo State were 27.9% and 20.2% respectively (Wakoma, 2011, Omuemu et al, 2007). Another study revealed that the prevalence of hypertension is higher in men than in women (Olusayo *et al*, 2011).

The study carried out in an Urban and rural area of Nigeria which investigated prevalence of hypertension showed that the prevalence of hypertension was higher in the urban area than rural area. In the study there were 229 participants. Males were 113 in number and females were 116 in number. 113 of the participants were from urban location and 116 from rural area. The mean age of the males was 43.04 ± 14.34 while that of the females was 42.09 ± 14.36. The mean weight, body mass index, waist circumference, systolic blood pressure (SBP) and diastolic blood pressure (DBP) were significantly higher in the urban dwellers than the rural dwellers. There was no significant difference in the mean age of the participants by gender and locality. Females were shorter than males with higher body mass index and WC in both urban and rural dwellers. Systolic blood pressure (SBP) increased with age with a peak in the 60-69 age groups. Diastolic blood pressure (DBP) peaked in the 40 – 49 age groups. There was no significant difference in the mean SBP or DBP in both sexes. There were 52 hypertensive, 37 from urban and 15 from rural area. They consisted of 24 males and 28 females. The overall prevalence of hypertension was 22.7%. Hypertension was significantly more prevalent in the urban than in the rural village with rates of 32.7% and 12.9% respectively. Hypertension prevalence differed little in men and women with rates of 21.2% versus 22.4% respectively. However more females had hypertension

than males. The prevalence rate increased with age amongst all the participants (Adediran et al, 2013).

Prevalence of hypertension among Nigerian salary earners

A study carried out by Bunker et al (1992) which investigated factors associated with hypertension among Nigerian civil servants. Five hundred fifty-nine urban civil servants, ages 25-54, were recruited from six ministries of Bendel State, Nigeria. Blood pressure, physical measurements, urinary protein and glucose, fasting blood glucose, and demographic data were collected at the workplace. Subjects were classified as senior staff (professionals or administrators) or junior staff (non-administrators). The result from the study showed that 172 male senior staff, the age-adjusted rate of hypertension (diastolic blood pressure > or = 90 mm Hg, systolic blood pressure > or = 140 mm Hg, or on an antihypertensive medication) was 43% and occurrence rose dramatically from 21 to 63% across age groups 25-34 to 45-54, respectively. Among 266 male junior staff, the age-adjusted rate of hypertension was 23%, and occurrence did not rise with age. Logistic regression showed that body mass index (kg/m2), age, alcohol drinking, and being senior staff were all independently related to hypertension in men. On the other hand, the age-adjusted rate of hypertension in 121 women was 20% and was significantly related only to body mass index. They concluded that male urban civil servants appeared to have a risk for hypertension similar to that of U.S. black males. Age, body mass index, alcohol drinking, and other unidentified factors related to higher socioeconomic status were strong determinants of hypertension in this population.

The study carried out among employees of tertiary hospital in Yenogoa, Nigeria showed that the crude and age-adjusted prevalence of hypertension among the hospital employee was 21.3% and 23.8% respectively. Age, marital status, educational level, body mass index, waist circumference and waist hip ratio showed significant association with HTN in the univariate analysis. However, in multivariate regression analysis, only older age and abnormal waist circumference. The study underscores the need for introduction of HTN screening programs among hospital employees especially staff that are older with truncal obesity. They concluded that the prevalence of hypertension among the hospital employees compared with reports in other population and was predicted by advancing age and abnormal waist circumference. The study underscores the need for introduction of HTN screening programs among hospital employees especially staff that are older with truncal obesity (Egbi et al, 2015).

Another study carried out among civil servant in Bayelsa state, Nigeria by Egbi et al, (2013) which investigated the prevalence of hypertension in urban civil servant. Result from the study showed that the prevalence of hypertension was 27.8%. Obesity was found in 22.0% of participants. Age, body mass index and blood glucose were positively associated with blood pressure. Pulse pressure elevation was found in 46.7% of the participants. The prevalence of hypertension in the study was high but consistent with published data in other parts of Nigeria and across the globe. It was more common among Civil servants who were elderly and obese. Blood glucose was positively associated with blood pressure. Elevation of pulse pressure was also common especially among the older and obese individual.

Another study carried out in 2013 by Ordinioha among the lecturers shows that there is lower prevalence of hypertension among the lecturers compared with the prevalence in the general population in the urban centres of Nigeria, and this might be due to the better health-seeking behaviour of the lecturers, especially as 75% of those that were found to be hypertensive were already aware of their condition, and had taken concrete steps to control the hypertension (Amira et al, 2007).

Another study carried out by Oghagbon *et al*, (2008) which Investigated Prevalence of hypertension and associated variables In paid workers in Nigeria shown that the prevalence of hypertension was 27.1% In the population, being 28.4% In males and 22.9% In females. Mean SBP and DBP were significantly higher in females than in males. The prevalence of hypertension increased with age and BMI. Obesity prevalence was 13.2% consisting of males (5.3%) and females (7.8%). They concluded that there was higher prevalence of hypertension among salary earners In Nigeria and this is common among the male workers and also stated that obesity is major factor that bring the degree of increase In blood pressure among the workers. Also, a study carried out by Kumar et al, (2002) shows that the high prevalence of hypertension discovered among the government employee is due to their age, various duties, department of working, grade of obesity and various habits.

2.7. Risk Factors for Hypertension

Study carried out by Roy William *et al*, (2000) showed that the modifiable factors that associated with hypertension include location of residence, being overweight and life style. The same study revealed that sex, age and family history have great impact on being hypertensive. The same study has shown that non-modifiable factors found to be associated with being hypertensive include sex, age and family history. The study also revealed that age progressive is associated with being hypertensive and this may be related to increase in sedentoriness with age, which is o modifiable factor (Najdl *et al*. 2011). Another study concluded that increasing age, body mass index, central obesity and impaired glucose tolerance/diabetes were significantly associated with both hypertension and pre-hypertension. Prehypertension was associated with an increased prevalence of cardiovascular risk factors (Yadav et al, 2008).

Vaidya *et al*, (2007) in their study showed age, physical inactivity and obesity as independent risk factors of hypertension which keep up with their study but unlike their study where positive correlation between smoking, alcohol consumption and high blood pressure has been reported, their study does not show significant association between the use of tobacco and alcohol with hypertension (Vaidya *et al*, 2007). Kumar *et al*, (2002) found in their study that smoking and alcohol consumption are independent and significant risk factors of hypertension. Shanthirani *et al*, (2003) came up with the conclusion that although smoking has positive association with high blood pressure but alcohol consumption did not show significant association with hypertension.

Although, it cannot be assumed from these studies that cigarette smoking contributes to hypertension, smoking in patients with hypertension contributes to complications such as thickness, narrowness and stiffness of the carotid artery (Liang et al, 2001 and Feign et al., 2005), and decreased lifespan (Simons et al, 2005). Wang et al, (2002) in their study found that subjects with a history of current alcohol consumption had higher risk of hypertension than those who do not. Criqui et al, (1981) in their study in North American populations found blood pressure to be positively and significantly related to alcohol consumption. Hazarika et al, (2002) in their study found that consumption of locally prepared alcohol is an independent determinant of hypertension.

The study which investigated the risk factors associated with essential arterial hypertension in adolescents revealed that body mass index was associated with hypertension. Height had a positive association with hypertension only among the girls. There was no evidence of an

association between pubertal development and birth weight with arterial hypertension in adolescence. In contrast, family history, particularly when both parents had hypertension, exhibited a robust association, both among the boys and the girls. The study concluded that overweight, obesity and family history of hypertension (father and mother with hypertension) were the principal risk factors for arterial hypertension in adolescents (Maria et al, 2007).

Another study showed that reasonable number of individuals were either hypertensive or in the risk of development of hypertension, in which the prevalence of hypertension was more in females with advancing age and with the exposure to risk factors i.e. alcohol and smoking. With increase in smoking there was increase in the incidence of pre-hypertension and hypertension, majority of the study population was non-alcoholic and most of the population with pre-hypertension and hypertension were in the same group, with alcoholics it was observed that the incidence of hypertension and pre-hypertension increases with the increase in the alcohol consumption. The study concluded that there is a direct relationship between the risk factors and hypertension (Rajesh et al 2013).

Numerous studies have established a close relationship between alcohol consumption and hypertension (Thadhani et al, 2002, Klatsky et al, 2006). Heavy alcohol consumption has been demonstrated to be associated with an increased risk of hypertension (Fuchs et al, 2001). A meta-analysis of randomized controlled trials reported that a reduction in alcohol intake among heavy drinkers significantly reduces systolic and diastolic blood pressure (Xin et al. 2001). However, the association between light to moderate alcohol consumption and hypertension is unclear. Some studies have shown that light to moderate alcohol intake can decrease the risk of hypertension (Witteman et al, 1990, Marmot et al, 1994, Klatsky et al, 2006). Others have indicated that the effect of light to moderate alcohol intake on the risk of hypertension may be harmful or insignificant (Gillman et al, 1995, Ohmori et al, 2002, Wakabayashi et al, 2010).

It has been suggested that there are differences in pathophysiology and pattern of hypertension between young and elderly hypertensive patients (Canonico et al, 1990, Wakabayashi et al, 1993). Therefore, it is needed to verify whether the relationship between alcohol consumption and hypertension is affected by age. A few studies have shown that the association between alcohol intake and hypertension may be different between age groups (Wakabayashi et al. 2002). Other studies, however, have indicated that heavy drinking is positively associated with hypertension irrespective of age (Xin et al, 2001).

The rural populations being the marginalized and vulnerable communities in developing country facing considerable disparity as compared to urban populations in terms of health facilities, education and economic pursuits. Non exposure to risk factors like physical inactivity and obesity might be prevalent among the rural population but exposure to risk factors like smoking and alcohol consumption are on the rise in lower socioeconomic strata (Mahmood et al, 2011)

All over the world the life expectation of people is increasing. Unfortunately, the rapidity of population ageing is expected to continue to outpace social and economic development in developing countries particularly in countries (Ashok et al, 2012). Moreover, these developments have reduced the physical activity of the people to a very large extent and increased the alcohol and tobacco use (Tiwari et al, 2010).

Furthermore, the prevalence of hypertension is much higher among people aged above 45 years than those under and has not been clarified whether this aging-associated phenomenon is due to an accumulative effect of environmental exposures or a naturally occurring process or the interaction of both. It is also not known whether the clinical characteristics are similar in hypertensive patients of different genders, given similar environment factors (Chen et al, 2004)

However CVD presents differently in men and women and there is evidence that treatment efficacy is different between genders; for example, compared with male patients, aspirin is more effective in female patients in preventing stroke whereas it is less effective in preventing myocardial infarction. However, it has been shown that antihypertensive treatment can be as effective in women as in men (Vehier et al, 2012).

Alcoholism is a worldwide social problem, with severe effects on public health (Ceccanti et al 2006). Several factors complicate the interactions between tobacco and alcohol on cardiovascular disease. The relationship between smoking and risk of cardiovascular disease is dose dependent more tobacco leads to more disease but for alcohol consumption, the issue is more complex. Most evidence suggests that consumption in the range of 3 to 14 drinks per week is associated with lower risk of heart attack. Acutely, alcohol causes a modest fall in blood pressure but continued consumption of more than two usual portions a day results in a dose-dependent rise in blood pressure. In both experimental and observational studies of alcohol consumption and cardiovascular disease, cigarette smoking is treated as a confounder or nuisance parameter. Evidence for cardiovascular benefits of light drinking has been challenged

by a recent meta-analysis i.e. researchers recognize that smoking is common among drinkers and that it is a strong risk factor for heart disease that could cloud the true effect of alcohol consumption.

Moreover, cigarette smoking among alcohol drinkers may be related both to share lifestyle habits and to direct effects of alcohol (Mukamal et al, 2006, Huang et al, 2008). Smoking causes an immediate increase in blood pressure (both systolic and diastolic) and heart rate that persists for more than 15 minutes after one cigarette when compared to non-smokers. Although smoking is known to increase the risk of developing hypertension, there is currently no evidence that smoking cessation directly reduces blood pressure in people with hypertension. Epidemiological data show a linear relationship between alcohol consumption and hypertension prevalence (Mukamal et al, 2006, Huang et al, 2008). As mentioned above, rural areas in developing countries are in transitional phase. This increases the risk of conditions like hypertension in rural areas. Even today there is scarcity of the studies in rural areas of developing countries (Kokiwar et al, 2012).

The Framingham study demonstrated that, during 18-20 years of observation, middle-aged men with high levels of tension or anxiety were 2.19 times more susceptible to hypertension than those without stress factors (Rozanski et al, 2005). According to Pickering, the extent of an increase in the blood pressure level is greater among men with a high workload and no discretionary powers (Rosengren et al, 2004). These days, hypertension is considered a multifactorial genetic disease that is triggered by interactions between environmental and genetic factors (Kivimaki et al, 2002). In other words, hypertension is believed to develop as a result of a combination of predisposition to hypertension and environmental factors such as stress, dietary habits, obesity, hyperlipidemia, smoking and alcohol consumption. It is easier to be understood that stress responses in the cardiovascular system result from interactions between environmental stimuli and individual situational cognition, as stated by Steptoe (McEwen et al, 1998).

Risk Factors for Hypertension among Government Employees

High blood pressure has many risk factors, including:

Age.

The risk of high blood pressure increases as age progresses. Through early middle age, high blood pressure is more common in men. Women are more likely to develop high blood pressure

after menopause. Several studies have shown that age progressive is a risk factor of hypertension among the government employees. A study carried out by Ordinioha (2013) in Port Harcourt, Nigeria shows that age progressive is one of the risk factor for hypertension among government employees which also supporting the study carried out by Kumar et al, (2002) which stated that age progressive predispose government employees to hypertension.

Overweight or obesity

There is a close association of obesity with hypertension through mechanisms not now understood. Hypertension occurs frequently in industrialized societies where weight gain with advancing years is a common feature and is rare in primitive societies where weight and age are negatively correlated. Hemodynamically, obesity is characterized by an expanded blood volume and increased cardiac output. Hypertension results if/when systemic vascular resistance fails to decrease as cardiac output increases. When calorie restriction leads to weight loss, both blood volume and cardiac output decrease; when the blood pressure falls, this is because peripheral resistance is unchanged. Weight loss programs are helpful for the obese hypertensive because when hypertension is mild, blood pressure often (but not always) normalizes. Also, weight loss has been shown to decrease antihypertensive drug requirements. Interest in obesity-associated hypertension focuses on hyperinsulinemia/insulin resistance as causative factors. Although the evidence is tempting, it is far from conclusive and it seems likely that the mechanism of this type of hypertension is as multifactorial as those of other types.

The more individual weigh, the more blood needs to supply oxygen and nutrients to the tissues of an individual. As the volume of blood circulated through the blood vessels increases, so does the pressure on the artery walls. Kumar *et al*, (2002) and Ordinloha (2013) found in their study that overweight is significantly a risk factors ofhypertension among the government employees both in Nigeria and India. The overweight and obesity are established risk factors for hypertension and other non-communicable diseases (WHO Report, 2002).

Alcohol

Over time, heavy drinking can damage the heart. Several studies revealed that having excessive alcoholic drinks a day can raise blood pressure. Ordinloha (2013) found in his study that alcohol consumption is independent and significant risk factors of hypertension among the government employees in Nigeria.

Smoking

Not only does smoking or chewing tobacco immediately raise blood pressure temporarily, but the chemicals in tobacco can damage the lining of artery walls. This can cause arteries to narrow

and this lead to increasing blood pressure. Cigarette smoking is said to be responsible for at least 12% of all vascular diseases, including hypertension (WHO report, 2002). The finding by Ordinioha (2013) and Kumar *et al*, (2002) shows that the prevalence of hypertension among government employee is associated with smoking habit among them.

The other risk factors for hypertension among the government employees include the various duties carried out by government employee and department of working (Kumar *et al*, (2002).

Personal and environmental factors

The personal factors that contribute to the prevalence of hypertension among the people include biological vulnerability, psychosocial factors (i.e. the people's perceived severity, benefit and barriers of hypertension), behavioural indicators and demographic characteristics.

The environmental factors that bring the prevalence of hypertension among the people include family and friend support, physical environment which included accessibility ofphysical activity and health care facilities and access to healthy foods (Cassandra et al, 2010).

2.8. Knowledge of Hypertension

Study carried out by Iyalomhe (2010) showed that there is poor knowledge of hypertension among hypertensive patient due to poor educational background and these also contribute to their negative attitudes to treatment and their life-style practices are grossly inadequate. Study conducted by Adika et al, (2011) revealed that majority of employees in Niger Delta in Nigeria had a fair knowledge about complications of hypertension. The same study revealed that knowledge of hypertension has increased among sub urban dwellers.

Majority of academic and non-academic employees of University of Ibadan had a fair knowledge about the complications of hypertension. The same study revealed that knowledge about the risk factors of hypertension among the employees of University of Ibadan, Nigeria is poor (Abdulahi et al, 2011).

The study which investigated hypertension-related knowledge, practice and drug adherence among inpatients of a hospital in Samark and Uzbekistan showed that 61.6% of patients had good or adequate and 35.5% had inadequate knowledge about hypertension. Good knowledge of patients was significantly associated with controlled BP and drug adherence. The study concluded that the inpatients of the secondary hospital had sufficient general knowledge about hypertension, but they had inadequate knowledge about specific issues such as treatment for and symptoms of hypertension. Both drug adherence and BP control rate were suboptimal and significantly associated with hypertension knowledge. These study specifies potential areas of hypertension education that could be improved by patients' knowledge of hypertension (Amonov et al, 2014).

2.9. Trends of hypertension

Word wide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. This account for 57million disability adjusted life years (DALYS) or 3.7% of the total DALYS. Raised B.P is major risk factor for coronary heart disease and ischemic as well as hemorrhagic stroke. Blood pressure levels have been shown to be positively and continuously related to the risk for stroke and coronary heart disease. In some age groups, the risk of cardiovascular disease double for each increment of 20/10 mmHg of BP, starting as low as 115/75mmHg.

Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008. The proportion of the world population with high blood pressure is increasing

hypertension fell modestly between 1980 and 2008. However, because of population growth and ageing, the number of people with uncontrolled hypertension rose from 600 million in 1980 to nearly 1 billion in 2008.

Across the WHO regions, the prevalence of raised blood pressure was highest in Africa, where it was 46% for both sexes combined. Both men and women have high rates of raised BP in the Africa region, with prevalence rates over 40%. The lowest prevalence of raised blood pressure was in the WHO region of the Americas at 35% for both sexes. Men in this region had higher prevalence than women (39% for men and 32% for women). In all WHO regions, men have slightly higher prevalence of raised blood pressure than women. This difference was only statistically significant in the Americas and Europe.

2.10. Hypertensive crisis

Severely elevated blood pressure (equal to or greater than a systolic 180 or diastolic of 110 sometime termed malignant or accelerated hypertension) is referred to as a hypertensive crisis. as blood pressures above these levels are known to confer a high risk of complications. People with blood pressures in this range may have no symptoms, but are more likely to report headaches (22% of cases) and dizziness than the general population (Fisher et al. 2005). Other symptoms accompanying a hypertensive crisis may include visual deterioration or breathlessness due to heart failure or a general feeling of malaise due to renal failure. Most people with a hypertensive crisis are known to have elevated blood pressure, but additional triggers may have led to a sudden rise (Wong et al. 2007).

A hypertensive emergency, previously malignant hypertension, is diagnosed when there is evidence of direct damage to one or more organs as a result of the severely elevated blood pressure. This may include hypertensive encephalopathy, caused by brain swelling and dysfunction, and characterized by headaches and an altered level of consciousness (confusion or drowsiness). Retinal papilloedema and flindal hemorrhages and exudates are another sign of target organ damage. Chest pain may indicate heart muscle damage (which may progress to myocardial infarction) or sometimes aortic dissection, the tearing of the inner wall of the aorta. Breathlessness, cough, and the expectoration of blood-stained sputum are characteristic signs of pulmonary edema, the swelling of lung tissue due to left ventricular failure an inability of the left ventricle of the heart to adequately pump blood from the lungs into the arterial system (Fisher et al. 2005). Rapid deterioration of kidney function (acute kidney injury)

and microangiopathic haemolytic anaemia (destruction of blood cells) may also occur. In these situations, rapid reduction of the blood pressure is mandated to stop ongoing organ damage (Fisher et al, 2005). In contrast there is no evidence that blood pressure needs to be lowered rapidly in hypertensive urgencies where there is no evidence of target organ damage and over aggressive reduction of blood pressure is not without risks (Wong et al, 2007). Use of oral medications to lower the BP gradually over 24 to 48 h is advocated in hypertensive urgencies (Fisher et al, 2005).

2.11. Hypertension in Adults

In people aged 18 years or older hypertension is defined as a systolic and a diastolic blood pressure measurement consistently higher than an accepted normal value (currently 139 mmHg systolic, 89 mmHg diastolic). Lower thresholds are used (135 mmHg systolic or 85 mmHg diastolic) if measurements are derived from 24-hour ambulatory or home monitoring (National Clinical Guideline Centre 2011). Recent International hypertension guidelines have also created categories below the hypertensive range to indicate a continuum of risk with higher blood pressures in the normal range. JNC7 (2003) uses the term prehypertension for blood pressure in the range 120-139 mmHg systolic and 80-89 mmHg diastolic, while ESH-ESC Guidelines (2007) and BHS IV (2004) use optimal, normal and high normal categories to subdivide pressures below 140 mmHg systolic and 90 mmHg diastolic (Mancia et al, 2011).

Hypertension is also sub-classified into hypertension stage I, hypertension stage II, and isolated systolic hypertension. Isolated systolic hypertension refers to elevated systolic pressure with normal diastolic pressure and is common in the elderly (Chobanian et al, 2003). The ESH-ESC Guidelines (2007) and BHS IV (2004), additionally define a third stage (stage III hypertension) for people with systolic blood pressure exceeding 179 mmHg or a diastolic pressure over 109 mmHg (Mancia et al, 2011 and Williams et al. 2004). Hypertension is classified as "resistant" if medications do not reduce blood pressure to normal levels (Chobanian et al, 2003).

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2.12. Prevention of hypertension

Much of the disease burden of high blood pressure is experienced by people who are not labeled as hypertensive (North of England Hypertension Guideline Development Group 2004). Lifestyle changes are recommended to lower blood pressure, before starting drug therapy. The 2004 British Hypertension Society guidelines proposed the following lifestyle changes consistent with those outlined by the US National High BP Education Program in 2002 for the primary prevention of hypertension include maintain normal body weight for adults (e.g. body mass index 20–25 kg/m^2), reduce dietary sodium intake to <100 mmol/ day (<6 g of sodium chloride or <2.4 g of sodium per day), engage in regular aerobic physical activity such as brisk walking (≥30 min per day, most days of the week), limit alcohol consumption to no more than 3 units/day in men and no more than 2 units/day in women, consume a diet rich in fruit and vegetables (e.g. at least five portions per day); effective lifestyle modification may lower blood pressure as much as an individual antihypertensive drug. Combinations of two or more lifestyle modifications can achieve even better results (North of England Hypertension Guideline Development Group, 2004).

2.13. Management of hypertension

The first line of treatment for hypertension is identical to the recommended preventive lifestyle changes and includes dietary changes physical exercise, and weight loss. These have all been shown to significantly reduce blood pressure in people with hypertension (Mancia et al. 2011). Their potential effectiveness is similar to using a single medication. If hypertension is high

enough to justify immediate use of medication, lifestyle changes are still recommended in conjunction with medication (Hennekens et al. 2006).

Dietary change such as a low sodium diet is beneficial. A long term (more than 4 weeks) low sodium diet in Caucasians is effective in reducing blood pressure, both in people with hypertension and in people with normal blood pressure (Chiolero et al. 2013). Also, the DASH diet, a diet rich in nuts, whole grains, fish, poultry, fruits and vegetables lowers blood pressure. A major feature of the plan is limiting intake of sodium, although the diet is also rich in potassium, magnesium, calcium, as well as protein (Daniel et al. 2013). Different programs aimed to reduce psychological stress such a biofeedback, relaxation or meditation are advertised to reduce hypertension. However, overall efficacy is not greater than health education, with evidence being generally of low quality (Chiolero et al. 2013).

2.14. Impact of Hypertension on Coronary Heart Disease and Stroke

It is recognized now that blood pressure is a very important predictor of future cardiovascular risk. Ker (2000) explains that in the past hypertension was classified according to diastolic pressure only because of the risk associated with it, despite that systolic pressure was a predictor of future cardiovascular risk.

In 1993 the JNC (Joint National Committee in the USA) recognized the importance of systolic blood pressure and made it equal in importance to diastolic blood pressure (Ker 2000). Ker (2000) further explains that usually until the eight decade of life systolic pressure is rising in contrast with diastolic pressure that rises only until the middle age. This could explain why with advancing in age the pulse pressure and the prevalence of isolated systolic hypertension rise. Franklin (2002) confirms that according to the Framingham Heart Study, diastolic blood pressure was the strongest predictor below the age of 50, for coronary heart disease and that all three pressures were comparable predictor between 50 - 59 years. From the age 60 years and onwards pulse pressure (the difference between the systolic and diastolic blood pressure) was the best predictor and diastolic pressure was negatively related to coronary heart disease (Linden et al 2000).

Ker (2000) also confirms that in the elderly, systolic hypertension is a very important modifiable cardiovascular risk factor. In systolic hypertension the systolic blood pressure is usually more than 140 mmHg and the diastolic less than 90 mmHg. In people older than 60 years, in 15 % of

people isolated systolic hypertension occurs and increases your risk for stroke and cardiovascular disease. People with isolated systolic hypertension benefit from drug treatment and lifestyle modifications. The Framingham Heart Study confirms that hypertension causes heart failure (Lindsay & Gaw 2004). The damage caused by hypertension can be classified as either coronary artery disease or left ventricular hypertrophy. Hypertension patients are more likely to develop angina and myocardial infarction than normotensive persons. Kaplan (2005) explains that the lack of adequate microcirculation can be related to angina and that in hypertensive person's myocardial infarction is more common. There is a continuous association between increasing blood pressure and the risk of cardiovascular disease, especially coronary heart disease. Vasan et al (2002) also confirms that the presence of hypertension enhances the development of atherosclerosis and heart attacks, kidney damage, and rupture of a cerebral blood vessel, which causes localized brain damage in other words a stroke. Urden et al (2000) describes coronary heart disease as follows: "It is an insidious, progressive disease that results in coronary arterial narrowing or complete occlusion. Coronary heart disease is caused by atherosclerosis, the thickening and the hardening of the inside walls of the arteries".

According to Burgess, Sulzer and Doubell (2006) atherosclerosis is one of the most prevalent causes of death and disability throughout the world. Atherosclerosis begins in childhood and is a process that starts early in life, progressing silently and slowly and only manifested clinically in the middle age. Risk factors like a lifelong burden of dyslipidaemic trait, obesity and hypertension is risk factors since childhood that persist into adulthood and has a major impact on the silent phase of this disease. Both morbidity and mortality can be reduced by lifestyle changes and primary risk factor modification.

According to Urden et al (2000) the greatest risk factor for ischemic stroke, is hypertension. Ischemic stroke results because of an occlusion of a blood vessel and low cerebral blood flow exists. This occlusion can be thrombotic or embolic. Thrombotic strokes results at the bifurcations or curves of the vessel, because of accumulation of atherosclerotic plaque in the vessel lumen. Usually at the bifurcation of the carotid artery, origins of the middle and anterior cerebral arteries, and the origins of the vertebral arteries. An embolic stroke results in a loss of blood supply because of an embolus that occurs from the heart or lower circulation which travels distally and lodges in a small vessel.

2.15 Gaps observed from reviewed Literatures

Majority of the studies about hypertension in Nigeria were carried out among the bankers, academic staff of university, non-academic staff of university, employees of tertiary hospital and other urbanized workers but there were few hypertension study conducted among Local Government employees in Nigeria. Also, some of the hypertension studies conducted in Nigeria were based on personal factors (e.g risk factors, lifestyle practices, knowledge of cause, symptoms and prevention of hypertension) that contribute to the prevalence of hypertension among the civil servant but there were few study that considered environmental factors (availability of clinic in workplace and hypertension screening center, accessibility to recreational facilities) that can prevent hypertension or manage hypertension in the workplace.

2.16 Conceptual Frame Work

The conceptual frame work used for this study was ecological model. The ecological perspective emphasizes the interaction between factors within and across all levels of a health issues. It highlights people's interactions with their physical and socio-cultural environments and it addressed five levels of influence: Intrapersonal factors, Interpersonal factors, Institutional factors or Organizational factors, Community factors and Public policy. Risk factors for the case of hypertension among local government employees will be identify and this will be used in future to prevent local government employees from having hypertension and also reduce the prevalence of hypertension. Instead of blaming the individuals, the environmental influences and lifestyle that leads to the problem are addressed (Brieger, 2002).

2.16.1 Intrapersonal factors

The characteristics of the individual such as knowledge, attitudes, behaviour, belief about hypertension, age and lifestyle modification etc. This also includes the developmental history of the individual.

2.16.2 Interpersonal factors

The influence of significant others is analysed at this level. This involves relationship with family members, neighbours, social networks and social support systems. including family, work group and friendship. The antitude and beliefs of families and work place can influence the lifestyles which can predispose hypertension among the local government employees.

2.16.3 Institutional factors

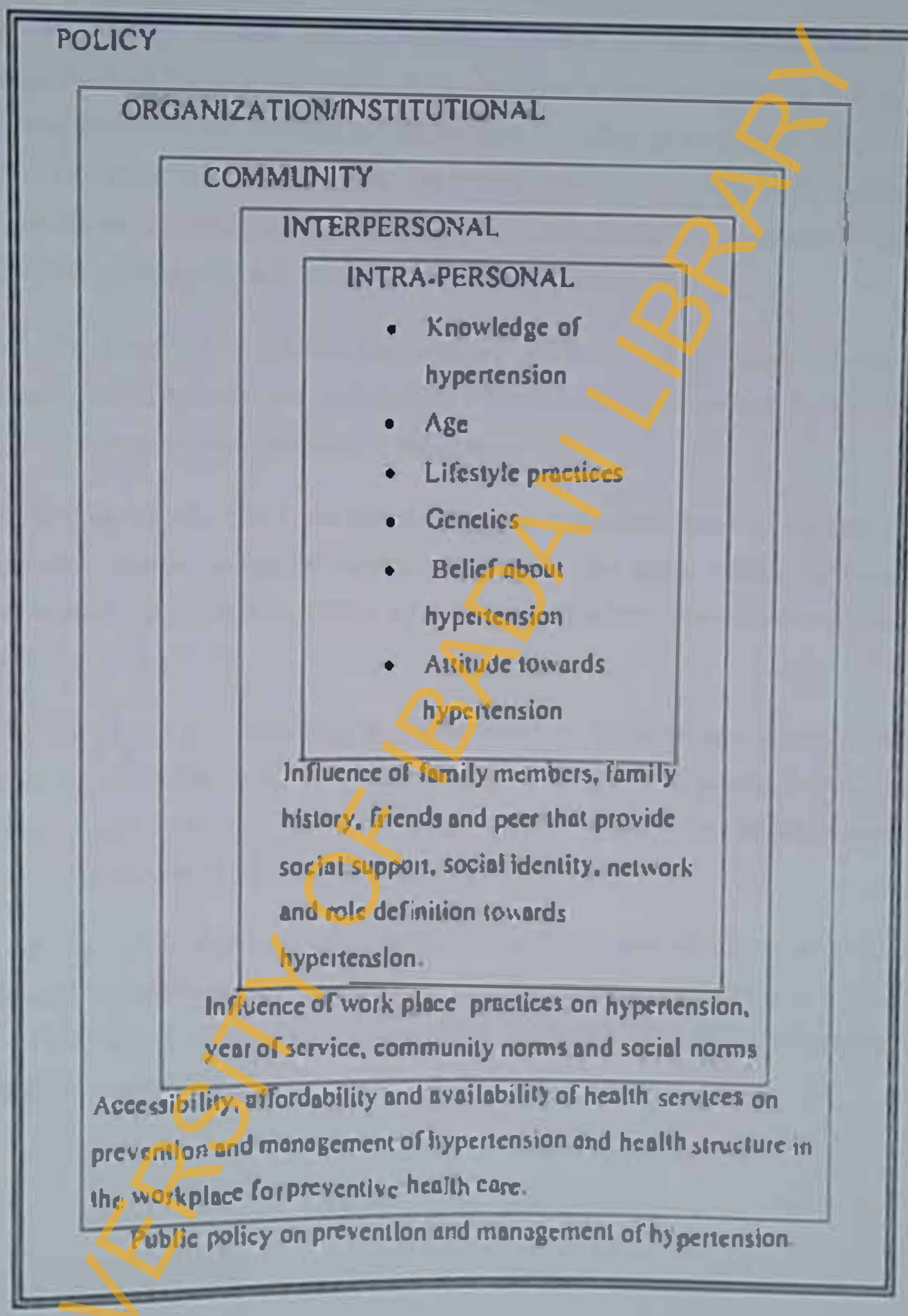
This level is very important and necessary for the support of long-term change in lifestyle that predisposes local government employees and possible adherence to the belief about hypertension. Organisational change is an essential component of creating an organizational culture that will reduce the prevalence of hypertension among the employees and lifestyle that predisposes hypertension but the organization of health promotion programme for the local government employees will enhance all this. Relevant organizations' include NULGE and other social institutions with organizational characteristics, and formal or informal rules and regulations for operation (Swearer, 2003).

2.16.4 Community factors

Community encompasses groups to which individuals belong, the relationship among groups or organizations within political and geographical entity determine the opinion of issues among the inhabitants. Relationship among organizations, institutions and informal networks with defined boundaries. The social norms can influence the lifestyles which can predispose hypertension among the local government employees.

2.16.5 Public policy

Policies and law made at the local level will influence the prevalence of hypertension among the local government employees and also lifestyle practices that predispose hypertension among them. The local government needs to make the policy that will ensure provision of health facilities for the prevention and management of hypertension among the local government employee.



An Ecological Perspective

Figure 2.1: Application of ecological Model to the risk factors that predisposes local government employees to hypertension in Orbomoso South local government area.

Ecological model may explain how interaction between different factors results into hypertension. Each of the five box (figure 2.1), represents a level or group of factors. The innermost box represents the intrapersonal factors that can place an individual at the risk of hypertension (see table 2.1 for details). Relevant intrapersonal factors in this study include age of study participants, knowledge of hypertension and lifestyle practices (e.g sedentary lifestyle, smoking, alcohol consumption and eating food with seasoning).

The second box (figure 2.1), represents the immediate context which facilitates hypertension Relevant interpersonal factors in this study include influence of family members, family history, social identity, friends and peer that provide social support.

The third box (figure 2.1), refers to the factors in the community that influence the occurrence of hypertension. Related ecological variables applied to this study include influence of workplace practices, year of service, societal norms and response that could influence occurrence of hypertension.

The fourth box (figure 2.1), represents the institutional or organizational factors in which relationships are embedded. Questions were asked on the structure on ground to prevent and manage hypertension at the L.G secretariat (i.e availability, accessibility and affordability of health services on prevention and management of hypertension)

The fifth box (figure 2.1), represents existing applicable policies issues related to prevention and management of hypertension. Related ecological variables include roles of various bodies like government and Nigeria Union of Local Government Employees (NULGE) in prevention and management of hypertension.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design

A descriptive cross sectional study was used to document prevalence and risk factors of hypertension among local government employees in Ogbomoso South LG area of Oyo state

3.2 Study Site

Ogbomoso South LGA constituted the study setting. The LGA is one of the two local governments in Ogbomoso metropolis. Ogbomoso is a second largest town in Oyo state Ogbomoso South local government was created in September 1991 out of the defunct Ogbomoso municipal local government. The secretariat of the local government is located at Sunsun, Arowomole Area of Ogbomoso. The local government is bounded in the North by Ogbomoso North local government, South by Ogo-Oluwa local government, East by Surulere local government and in the West by Orire local government.

The local government was selected because unpublished report from medical unit of Ogbomoso South Local Government revealed that there is high prevalence of hypertension among local government employees and also this study has never been conducted in Ogbomoso South Local Government before. This L.G secretariat was not a health promoting community because there were no recreational facilities, health club, health screening services, nor is there any health promoting posters.

3.3 Scope of the Study

The study focused on the prevalence and risk factors of hypertension among LG employees in Ogbomoso South LG area of Oyo state.

3.4 Study Population

The study was carried out among male and female local government employees of Ogbomoso South LGA, Oyo State. Eligible participants were employees of the local government.

3.5 Sample Size

The sample size (n) was determined by using Lwanga and Lemeshow (1991) sample size formula

$n = Z\alpha^2 p(1-p)/d^2$

Where n = minimum sample size required

Z= the standard normal deviation set at 1.96 (which correspond to the 95% confidence interval).

P= 9.3% (Kadiri *et al*., 1999).

d= the degree of accuracy set at 0.05

$$n = \frac{1.96^2 \times 0.093 \times 0.907}{0.05^2}$$

= 129.61

Approximately = 130

The calculated sample size was increased to 250 so as to make provision for non-response and promote generalization of findings.

3.6 Sampling Technique

Ogbomoso South Local Government has three hundred and sixty eight workers (368) as 1 January, 2014. This local government comprises of eight departments. Each of the department has the following number of workers:

Table 3.1: Distribution of workers in each department in Ogbomoso South Local Government

DEPARTMENT	NUMBER OF WORKERS	NUMBER SELECTED
Budget, planning and statistic	6	4
Agricultural	9	6
Environmental	10	7
Works	41	28
Medical	56	38
Finance and supply	60	41
Education	61	41
Administration	125	85
Total number of workers	368	250

The total staff strength of the local government was culled from nominal roll obtained from the NULGE office of Ogbomoso South Local Government.

A two stage sampling technique was used in the selection of the local government workers. This is to give every member of the target population an equal and independent opportunity of being selected for the study.

The stages include:

Stage1: Total population sampling was used to select the workers from all the eight (8) departments in the local government.

Proportion of worker that was selected from each department =

$$\frac{\text{Total number of worker in each department (n)}}{\text{Total numbers of workers in Ogbomoso South LGA (N)}} * \text{Sample size}$$

Stage 2: Systematic random sampling method was used to select workers that participated in the study. Employment register from 8 department in the local government served as sampling frame where the respondent was selected for the study using the following sub-steps below:

a. The list of all the departments in the local government served as a sample frame
b. Calculating a value for 'K' using the formula (K=N/n), where k is a constant i.e value within which the first respondent was selected. 'N' is the population of the entire worker in Ogbomoso South LGA (368) and 'n' is the sample size of the entire worker that were selected for the study (250).

Hence K = 368/250 = 1.5 approximately. Systematic random sampling was used to select the first respondent within the range of estimated kth (i.e sampling interval). Upon selection the first respondent i.e. x (where x represent the first respondent), the next respondent will be x plus kth. this procedure was repeated until the required sample size is reached

3.7 Data Collection Instrument

A semi-structured questionnaire with both closed and open-ended questions was used for data collection. The questionnaire consisted of four sections labelled A-D. Section A sought information on socio-demographic characteristics of the respondents, department, designation, weight, height and blood pressure of the respondent that were used to determine the prevalence of hypertension. Section B contained questions that determined the level of knowledge of hypertension among Local Government Employees. Section C sought information on lifestyle practices that may predispose LG employees to hypertension. Section D focused on elicited information's on the available structure at the LG Secretariat that can be used to prevent and manage hypertension among the employees.

3.8 Validity

Validity was ensured through the development of drafts instruments by consulting relevant literature written on issues relating to prevalence and risk factors of hypertension. The drafts instrument was subjected to independent, peer and expert reviews particularly expert in Public Health, in the field of Community Medicine, Environmental Health and the colleagues in the department of Health Promotion and Education. Comment from supervisor was used to enhance the quality of the instrument.

Corrections were made after the pre-test exercise and the analysis of the result of the pre-test was used to improve the quality of instrument. To promote the validity of data collected training of Research Assistants (RAs) was done. Weighing scale was calibrated by weighing standard mass of 50gram on it before the scale was used.

A total of four RAs were recruited trained in the use of mercury sphygmanometer to measure blood pressure and administration of questionnaire. The trainees were also involved in the pre-test of the questionnaire. This was a learning opportunity created to sharpen the RAs interviewing skills and to acquaint them with possible challenges of conducting interviews

3.9 Reliability

To confirm the reliability of the instrument, analysis of pre-test data was done using Cronbach's Alpha coefficient of the Statistical Package for Social Sciences (SPSS). This was done to ascertain the psychometric properties of the instrument. The instrument was pre-tested on 25 local government employee (10% of the sample size) in Ogbomoso North Local Government area because the study site has similar characteristics with the community in terms of level of social amenities, lifestyle, level of education and available structure to prevent and manage the hypertension. The result of analysis of the data collected during the pre-test was 0.825 which showed that the instrument was very reliable.

3.10 Data Collection Procedure

The researchers with the four trained research assistants administered the questionnaires to the respondents in Ogbomoso South Local Government Area of Oyo state. The research assistants were trained in the following areas: the objectives of the study, the Sampling procedure, how to secure respondents informed consent; important of collecting valid data; procedures for questionnaire administration and techniques for reviewing questionnaires for reviewing of the items on the questionnaire to have adequate understanding of the instrument and completeness. The manual of field operation was prepared to explain how entries would be made, the number of questionnaires to be administered and how variables would be code. The research assistants with the researcher were involved in the collection of the data. Short debriefing sessions were also held at the end of each day where the day's work was reviewed and the next plan of action disseminated to the research assistants. The data collection process included the following steps: visit to each of department, coupled with identification visit to each of the department to the heads of each of the selected respondents to seek a permission to conduct interviews and administer questionnaire on the respondents.

3.10.1 Measurement of Variables

3.10.1.1 Blood pressure

The study participant were allowed to rest (relax) for 15 minutes then two blood pressure measurements were taken three minutes apart in a relaxed position. The blood pressure was measured on the left upper arm. The participants were positioned so that the left upper arm was at the same level with the heart (DHHS, 2004). To minimize measurement and inter-observer variability, mercury sphygmomanometer was used throughout the study. Hypertension was defined as average systolic blood pressure (SBP) of 140 mmHg or higher and average diastolic blood pressure (DBP) of 90mmHg or higher.

3.10.1.2 Weight and Height

Weight was measured to the nearest 0.1 kg, using a portable weighing scale (bathroom scal while height also measured to the nearest 0.1 cm in the standing position with no shoes using a portable height board. The body mass index (BMI) for each of the subjects was then calculated from weight (in kilogram), divided by a square of the height (in meter); and classified as obese when the BMI is greater or equal to 30, overweight was when the BMI was between 25.0 and 29.9, normal weight when the BMI was between 18.5 and 24.9, and underweight when the BMI was less than 18.5 (WHO, 2006).

3.11 Method of Data Analysis

The researcher checked all the administered questionnaires one by one and edited them for purpose of completeness and accuracy. Serial number was written on the questionnaires for easy identification and recall of any instrument with problems. Serial number was assigned to each questionnaire for identification and for correct data entry and analysis. Administered copies of questionnaires were edited and coded. A coding guide was developed after carefully reviewing the responses and appropriate scoring done .The data were manually coded and entered into the computer for analysis.

Knowledge scale was developed to measure the knowledge of each respondent. The Knowledge variables were scored (knowledge on the causes and prevention of hypertension) an incorrect answer or no responses had a score of 0. The scores were then summed up to give a composite knowledge score for each respondent. The 30- point knowledge scale was used in this study. Knowledge of respondents was categorised into, good, fair and poor (those that scored 0-10 had poor knowledge, those that scored >10-20 had fair knowledge while those that scored >20 had

good knowledge). The practice of each respondent was also scored. The scores was then sum up to give a composite lifestyle for each respondent. The 14- point lifestyle practice scale was used in this study. Lifestyle practice of respondents was categorised into good and bad (i.e those that scored 0-6 have bad practice while those that scored >6 have good practice).

Mercury sphygmanometer was used to measure blood pressure in order to determine the prevalence of hypertension among the LG Employees and also using a portable height board to measure the height and validated bathroom scale to measure the weight. Both height and weight were used to determine body mass index (BMI).

The questionnaires were stored in a place that will be safe from destruction of water or fire or where an unauthorized person will not have acccss to them. Quantitative data were entered into the computer and analysis was done using descriptive statistics. Inferential statistics of Chi-Square test was used for the analysis. Finally, findings were summarized and presented in tables and charts.

3.11 Ethical Consideration

Ethical approval for the study was obtained from Oyo State ethical review committee. The following ethical requirements were stringently ensured during and after the study. Informed consent was obtained from the participants by given them an informed consent form to fill by explaining it to the best of their understanding. The informed consent form was states out the title of the study, purpose of the study, justification for doing the study as well as the benefit that will be derived by the respondents at end of the study. A potential respondent's right to refuse to participate in the study was not infringed upon. Those participants found hypertensive were advised and linked to the nearby health institution for diagnosis and treatment.

CHAPTER FOUR

4.0 RESULTS

The results are presented under the following sections. Section one depicts the socio-demographic characteristics of the local government employees. Section two depicts the prevalence of hypertension among the local government employees. Section three sought to know the level of knowledge of hypertension among the local government employees. Section four depicts practices of local government employees. Section five sought to know the structures on ground to prevent hypertension among employees in the Local Government.

4.1. Socio-Demographic Characteristics of Respondents

A completed response rate of 100% (250 out of 250) was obtained with the questionnaire among local government employees selected for the study. the ages of the local government employees ranged from 20 to 59 years and the mean age of 42.7±7.3 years respectively. (Fig 4.1) shows the distribution age of the local government employees. The participants were 114 males (45.6%) and 136 females (54.4%). Majority 212 (84.8%) of the respondents were married. 32 (12.8%) were singles and 6(2.4%) were widowed. The distribution of respondents by religion showed that the majority 211 (84.4%) of respondents were Christians and 39 (15.6%) Muslims

Majority of participant had post-secondary education not to university level (99. 39.6%) Respondents within the age range of 21-25 years were 39.2%. 26-30 years were 34.0%. 31-35 years were 15.6%. 36-40 years were 7.2%. 41-45 years were 2.8% and 46-50 years were 1.2%. Respondents that had been staff within the year range of 1-15 years were 72.0%. 16-30 years were 27.2% and above 30 years were 0.8%.

Medical staffs constituted 15.2% of the study participants. Works staff constituted 11.2%. Agriculture staff constituted 2.4%. Finance and supply staff constituted 16.4%. Budget, planning and statistics staff constituted 1.6%. Education constituted 16.4%. Environmental staff constituted 2.8% and Administration staff constituted majority study participants (34.0%). More than half (51.2%) of the respondents were middle staff. This was followed by junior staff (32.4%) while respondents belonging to senior staff were 16.4%.

The nature of job of majority respondents (54.8%) does not allow them to close early while minority of respondents whose job allows them to close early were 45.2%. Findings also showed

that 21.6% of employees had secondary job after office work while 78.4% of employees did not do any other job after office work.

Table 4.1: Respondents socio-demographic characteristics distribution

(n=250)

Variable	Response options	Frequency	Percentage
Age	20-29	8	3.2
	30-39	89	35.6
	40-49	112	44.8
	50-59	41	16.4
Sex	Male	114	45.6
	Female	136	54.4
Religion	Christian	211	84.4
	Islam	39	15.6
Marital status	Single	32	12.3
	Married	212	84.8
	Widowed	6	2.9
Level of education	Primary education	20	8.0
	Secondary education	39	15.6
	Post-secondary education	99	39.6
	University	92	36.8
Age at employment	21-25	98	39.2
	26-30	85	34.0
	31-35	39	15.6
	36-40	18	7.2
	41-45	7	2.8
	46-50	3	1.2
Length of time been a staff	1-15	180	72.0
	16-30	68	27.2
	Above 30	2	0.8
Department	Medical	38	15.2
	Works	28	11.2
	Agriculture	6	2.4
	Finance and supply	41	16.4
	Administration	85	34.0
	Education	41	16.4
	Environmental	7	2.8
	Budget and planning	4	1.6
Designation	Junior staff	81	32.4
	Middle staff	128	51.2
	Senior staff	41	16.4
You usually close early from office	Yes	113	45.2
	No	137	54.8
Any addition of job after official hour	Yes	54	21.6
	No	196	78.4

4.2. Distribution of Blood Pressure

The overall mean systolic blood pressure was 129.4 ± 18.9mmHg, with mean systolic of 130.9±19.2mmHg and 127.9±18.6mmHg among males and females, respectively. The overall mean diastolic blood pressure was 82.1±11.4, with mean diastolic blood pressures of 82.2±11.8mmHg and 82.0±11.1mmHg among males and females, respectively. About 30.8% of the participants had normal blood pressure, 43.6% had pre-hypertension, and 25.6% had hypertension. Both mean systolic and mean diastolic blood pressures rose steadily with age as shown on table below

Table 4.2: Distribution of mean systolic and diastolic blood pressure across the age group among Ogbomoso South Local Government Employees

Age Group (Years)	Frequency (n)	Mean Systolic BP±SD (mmHg)	Mean Diastolic BP±SD (mmHg)
21-29	8	123.5±17.9	80.6±12.4
30-39	89	125.3±17.4	79.9±12.0
40-49	112	130.2±19.8	81.9±10.9
Above 50	41	136.8±17.8	87.7±9.8

4.3. Prevalence of hypertension

The overall prevalence of pre hypertension was 43.6% with 52.3 % among females and 47.7% among males. The overall prevalence of hypertension was 25.6%. The prevalence of hypertension was higher among males 27.2 % than females 48.4 %.

Table 4.3: The prevalence of hypertension by sex among Ogbomoso South Local Government Employees

Variable	Male	Female	Overall
	N= 114 (%)	N= 136 (%)	N= 250 (%)
Normal	31 (27.2)	46 (33.8)	77 (30.8)
Prehypertension	52 (45.6)	57 (41.9)	109 (43.6)
Hypertension	31(27.2)	33 (24.3)	64 (25.6)

The prevalence of hypertension was higher in the older age groups as shown on the figure below. The prevalence of hypertension within age range of 21-29 was 13.0%. It rose to 18.0%, 27% and 42.0% for the age groups 30-39 years, 40-49 years and 5 0-59 years, respectively.

Table 4.4: Distribution of prevalence of hypertension by age group among Ogbomoso South Local Government Employee N= 250

Age group (years)	Total population	Frequency	Prevalence %
20-29	8	1	13.0
30-39	89	16	18.0
40-49	112	30	27.0
50-59	41	17	42.0
Total	250	64	100%

4.4. Respondents' knowledge of hypertension

Majority (84.8%) respondents knew that hypertension is the same as high blood pressure and 63.6% knew that hypertension is hereditary. Minority (36.4%) respondents knew that hypertension can be caused by high sodium intake, especially the use of monosodium glutamate seasoning and 72.8% knew that too much of stress can result to hypertension. Majority (64.0%) respondent knew that high salt diet can lead to hypertension. Minority (42.8%) respondent knew that excessive sweating is one of the symptoms of hypertension while majority (61.6%) respondents knew that frontal headache is one of the symptoms of hypertension. Minority (38.4%) respondent knew that hypertension is symptomless and 44.8% knew that dizziness is a symptom of hypertension.

Also, 78.0% of respondents knew that inability to sleep well is one of the symptoms of hypertension. Majority respondents (86.0%) knew that intake of fruit and vegetable helps to prevent hypertension and also 58.4% knew that adherence to weight loss will help to prevent hypertension. Majority (65.6%) knew that intake of low fat diets will help to prevent hypertension and 69.2% know that regular exercise prevent hypertension. Some respondents (34.8%) knew the best way to monitor or detect hypertension. The overall mean knowledge score by the respondents was 21.7 ± 7.2. Few respondent (18.8%) had a poor knowledge, many (48.0%) respondents had a fair knowledge and the remaining 33.2% had good knowledge.

Table 4.5: Respondents' knowledge of hypertension

Variable	Yes (n %)	No (n %)
Hypertension is the same as high blood pressure	212(84.8)	38(15.2)
Hypertension is hereditary	91(36.4)	159(63.6)
Hypertension can caused by seasoning	96(38.4)	154(61.6)
Too much stress can cause hypertension	182(72.8)	68(27.2)
High salt diet can cause hypertension	160(64.0)	90(36.0)
Excessive sweating	107(42.8)	143(57.2)
Frontal headache	154(61.6)	96(38.4)
Symptomless	69(27.6)	181(72.4)
Dizziness	112(44.8)	138(55.2)
Difficult sleeping	175(78.0)	55(22.0)
Intake of fruit and vegetable helps to prevent hypertension	215(86.0%)	35(14.0)
Adherence to weight loss help to prevent hypertension	146(58.4)	104(41.6)
Intake of low fat diets will help to prevent hypertension	164(65.6)	86(34.4)
Regular exercise prevent hypertension	173(69.2)	77(30.8)
Best way to monitor hypertension		
By checking BP regularly	87(34.8)	
By going to the clinic	63(25.2)	
No idea	100(40.0)	

4.5. Respondents body mass index (BMI)

Only (36.0%) of the employees were of normal weight. 42.0% were overweight, 20.4% were obese, while 1.6% were underweight.

Table 4.6: Respondents body mass index (BMI)

N= 250

Variable	Frequency	%
>30kg/m^2 (Obese)	51	20.4
25-29.9kg/m^2 (Overweight)	105	42.0
18.5-24.9kg/m^2 (Normal)	90	36.0
<18.5kg/m^2 (Underweight)	4	1.6

4.6. Distribution of body mass index across the sex among Ogbomoso South Local Government Employee

Only 15.8% of male employees were obese, while 24.3% of female employees were obese.

Majority of male employees were overweight (42.9%)

Table 4.7: Distribution of body mass index across the sex

Variable		Sex		
		Male (n %)	Female (n %)	Total
BMI	>30kg/m² (Obese)	18 (15.8)	33(24.3)	51
	25-29.9kg/m² (Overweight)	49 (42.9)	56 (41.1)	105
	18.5-24.9kg/m² (Normal)	46 (40.4)	44 (32.4)	90
	<18.5kg/m² (Underweight)	1 (0.9)	3 (2.2)	4
Total		114 (45.6)	136 (54.4)	250

4.7. Respondents' social practices

Majority of respondent did not smoke tobacco (73.2%) and did not consume alcohol (68.4%) respectively. Most (42.0%) of respondents consumed plenty of vegetable daily and few of them (47.2%) ate plenty of fruits daily. Many (58.8%) respondents ate food with seasoning daily. 50.8% of respondents did not exercise regularly while 65.6% of respondents slept for about six hour daily.

Table 4.8: Respondent's social practices

N= 250

Variable	Yes (n %)	No (n %)
Smoke tobacco	67(26.8)	183(73.2)
Consumes alcohol	79(31.9)	171(68.4)
Eats plenty vegetable daily	105(42.0)	142(58.0)
Eats plenty fruit daily	118(472)	132(52.8)
Eats food with seasoning daily	147(58.8)	103(41.2)
Exercises regularly	123(49.2)	127(50.8)
Sleeps for about six hours daily	164(65.6)	86(34.4)

4.8. The structure on ground to prevent hypertension in the local government

A few (22.8%) respondent reported that there was a functioning clinic inside the secretariat while 22.0% of respondents indicated that hypertension screening services were available in the clinic.

Few (10.8%) respondents indicated that there were recreational facilities in the secretariat and 32.2% respondents indicated that there was any health promoting poster on dangers of hypertension in the secretariat. Minority (24.4%) respondents affirmed that they have had health education on hypertension before.

Table 4.9: The structure on ground to prevent hypertension in the local government

Variable	Frequency	%
We have clinic inside the secretariat	57	22.8
Clinic is functioning	57	22.8
Hypertension screening services are available in the clinic	55	22.0
Every member of staff have access to hypertension screening service	48	19.2
The hypertension screening service is free	52	20.8
We have recreational facilities in the secretariat	27	10.8
Every member of the staff have access to the recreational facilities	19	7.6
We have time to access it	25	10.0
We have had health education on hypertension in the Local Government	61	24.4

4.9. Test of Hypotheses

The following hypotheses were tested for level of significance:

Ho1 There is no significant relationship between age and prevalence of hypertension

Ho2 There is no significant relationship between lifestyle practices and prevalence of hypertension

Ho3 There is no significant relationship between year of services and prevalence of hypertension

Testing of hypothesis 1

The first hypothesis states that there is no significant relationship between age and prevalence of hypertension.

From the result of this testing, the p-value is less than the pre-specified significance level (0.05). This suggests that the hypothesis is not true and is therefore rejected. The alternate hypothesis is hereby accepted that age is associated with prevalence of hypertension. Respondents in age range 50-59 years have hypertension more than other age group.

Table 4.10: Relationship between age and prevalence of hypertension

Age group	Prevalence					
	Hypertension (n %)	Prehypertension (n %)	Normal BP (n %)	X^2	Df	p-value
20-29	1(13.0)	4(3.8)	4(5.1)			
30-39	16(18.0)	39(36.8)	34(43.6)			
40-49	30(27.0)	46(43.4)	36(46.2)	4.801	6	0.022
50-59	17(42.0)	17(16.0)	4(5.1)			

Testing of hypothesis 2

The second hypothesis states that there is no significant relationship between practices and prevalence of hypertension

From the result of this testing, the p-value is less than the pre-specified significance level (0.05). This suggests that the hypothesis is not true and is therefore rejected. The alternate hypothesis is hereby accepted that practices are associated with prevalence of hypertension. Respondents with good practices have hypertension more than those with bad practices.

Table 4.11: Relationship between practices and prevalence of hypertension

Type of practices	Prevalence Hypertension (n %)	Pre-hypertension	Normal BP	X^2	Df	p-value
Bad practices	17(26.6)	49(45.0)	37(48.1)	7.789	2	0.020
Good practices	47(73.4)	60(55.0)	40(51.9)			

Testing of hypothesis 3

The third hypothesis states that there is no significant relationship between years of service and prevalence of hypertension.

From the result of this testing, the p-value is greater than the pre-specified significance level (0.05). Thus, the hypothesis which states that there is no significant relationship between the years of service and prevalence of hypertension is accepted. It can therefore be inferred that year of service has nothing to do with prevalence of hypertension among local government employees.

Table 4.12: Relationship between year of service and prevalence of hypertension

Year of service	Prevalence (n %)			X^2	Df	p value
1-15	41(64.1)	75(68.8)	63(72.4)			
16-30	20(31.3)	32(29.4)	11(12.7)	6.469	4	0.167
>30	3(4.6)	2(1.8)	13(14.9)			

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Hypertension is a public health problem which is common among salary earners and has important adverse effects on employees' lives (Oghagbon *et al*, 2008). It is a non-communicable disease which kills employees' unexpectedlly and also affects the health of employees. This chapter is therefore organised into six sub-sections as follow: socio-demographic characteristics of respondents, prevalence of hypertension among local government employees, respondents' knowledge of hypertension, practices of local government employees and structure on ground in the secretariat to prevent hypertension. Implication of the finding for health education, conclusion and recommendations were presented in the chapter too.

Finding from this study shows that 25.6% of the local government employees were hypertensive. These result was in line with studies following similar protocols and procedures such as ordinioha (2013).

5.1. Prevalence of hypertension

The overall prevalence of hypertension was 25.6%. This is much lower than the prevalence in the general population in the urban centre of Nigeria (NHF, 2003) but consistent with the prevalence in the rural and semi-urban communities of Nigeria that were mainly populated by farmers, fisherfolks, traders and artisans (Wokoma et al, 2011 and Adefuye et al, 2009). But the prevalence found in this study was higher than the prevalence found in the south region of Nigeria among lecturers (Ordinioha, 2013). A study carried out among bank worker in Benin Nigeria found the prevalence as 17.7% which is lower than the prevalence recorded from this study. The high prevalence of hypertension which was recorded from this study may be due to the age, overweight and fair knowledge of hypertension.

The prevalence of hypertension was higher in male (27.2%) than in female (24.3%). This findings is contrary to the previous study in Zimbabwe among council employee where the prevalence of hypertension was higher in female (44.4%) than male (31.2%) (Amon, 2010). The higher prevalence in male could be due to the higher level of overweight which was more common among males than females.

Among Ogbomoso south L. G employees, the prevalence of hypertension was higher among older age group (50-59 years) with 42.0%. This may be due to the biological effect of increased

arterial resistance due to thickening arterial wall that comes with age and the accumulated effect of various factors (Amon, 2010). The higher prevalence of hypertension was found among age group 50-59 years which is in line with the previous studies on the prevalence of hypertension among the council employees in Zimbabwe and urbanized workers in Ibadan, Nigeria (Akinkugbe et al, 2003, Amon, 2010).

5.2. Respondent's knowledge of hypertension

The respondent had a fair knowledge of hypertension. Majority of the respondents knew that hypertension is the same as high blood pressure. This corresponds with findings of Adika et al (2011) on the hypertension knowledge among non-Academics Employees. Majority of the respondents identified too much stress and high salt diet as the causes of hypertension. This findings also corresponds with finding of Adika et al 2011 where non-academic employees identified stress and high salt diets as a cause of hypertension. Some inadequate knowledge was also recorded among the respondents where many of them knew that hereditary and seasoning cannot be the causes of hypertension. This may be due to fair knowledge they have about causes of hypertension. In a study carried out by Abdullahi et al (2011) on knowledge of hypertension among the staff of University of Ibadan, it was related that the knowledge of risk factors toward the hypertension was low among them.

This study also revealed that majority of respondents knew that frontal headache and difficult sleeping are symptoms of hypertension. This does not correspond with findings of Iyalomhe et al (2010). Some of the respondents in this findings do not know that excessive sweating, symptomless and dizziness are symptoms of hypertension. This corresponds with the finding of Iyalomhe et al (2010) where majority of hypertensive patients do not know that excessive sweating, symptomless and dizziness are symptoms of hypertension.

Majority of the respondents knew that intake of low fat diet, intake of fruit and vegetable, regular exercise and adherences to weigh loss will help to prevent hypertension. This complies with the results of survey on hypertension knowledge among Non-Academic employees of Niger Delta University, Nigeria where the majority respondents knew that intake of fruit and vegetables, regular exercise and intake of low fat diet will prevent hypertension (Adika et al, 2011). Some of the respondents did not know the best way to detect hypertension. This is not in line with the study by Adika et al, (2011) where majority of respondents knew that the best way to monitor hypertension is by checking blood pressure regularly.

5.3. Respondent's Social Practices

The respondents had good practices which could prevent hypertension. Majority of the respondents do not smoke tobacco and do not consume alcohol. This corresponds with finding of ordinfoha (2013) where the use of alcohol and smoking of tobacco among the lecturers was much lower than that in the general population.

This study revealed that majority of the participants did not eat vegetables and fruits daily. This is in line with the study by Iyalomhe et al, (2011) which found that a hypertensive patients did not take vegetables and fruits daily. Majority of the respondents eat food with seasoning daily. This finding is also consistent with Iyalomhe et al. (2011) where hypertensive patients were found to use condiment in cooking daily.

Many respondents did not exercise regularly. This is in line with the study by Ordinkola (20) where large proportion of lecturers had exercise regularly.

5.4. Structure on ground in the secretariat to prevent hypertension

Majority of respondents said there was no clinic in the secretariat and no hypertension screening services. Also, majority stated that there was no recreation material and IEC materials on hypertension in the secretariat. This showed that Ogbomoso South L.G. Secretariat lacks health promoting infrastructure like clinic, hypertension screening services, IEC material on hypertension and recreation material. This is not in line with WHO setting for health promoting workplace where clinic, hypertension screening services, IEC materials on hypertension and recreation material should be put in place at the workplace. The WHO considers work place as one of the priority setting for health promotion in the 21st century because it influences physical, mental, economic and social wellbeing and offers an ideal setting and infrastructure to support the promotion of health of a large audience. The WHO setting for health promoting workplace include availability of clinic, health screening services, health risk assessment programmes, health education and conducive working environment to support healthy lifestyles.

5.5. Implications of findings for health promotion and education

Health education focuses on the modification of people's behaviour and behavioural antecedents (Green and Kreuter, 1991). Health education is thus concerned with helping people to change their negative attitudes to positive once (WHO, 1998). Health education principles and strategies can be used to address the challenges identified in this study.

Results from this study document a higher prevalence of hypertension among Local government employees. Majority knew that hypertension to be caused by sedentary lifestyle. Effective health promotion and education strategies such public enlightenment through the information education and communication media, provision of well-equipped recreational facility in the secretariat will help to address the scourge in the study area and the country at large.

Hypertension is commonest cardiovascular disorder and now regarded as major public health problem. This requires intervention at a population level. An understanding of the problem begins with prevalence estimates in states and national comparisons. More knowledge about the aetiology of hypertension, prevention of hypertension, behavioural determinants and the role of contextual factors are needed, including prospective and national studies of actiology (Brieger, 2002). There is a growing need for more intensive international collaboration in both research and the development of preventive strategies so that we can be more effective in reducing this public health problem.

The respondents had good practices which could prevent hypertension. Majority of the respondents did not smoke and did not consume alcohol. There are valuable lessons that could be learned from current research conducted in countries where the reported prevalence of hypertension among the local government employees is low that could be adapted for use in countries with higher prevalence.

The respondents had a fair knowledge of hypertension. Therefore health promotion and preventive strategies such as awareness, advocacy and seminar are needed to address hypertension problems to make the world safer for all local government employees

5.6. Conclusion

The prevalence of hypertension among Ogbomoso South local government employees was high. The higher prevalence of hypertension may due to age, overweight and sedentary lifestyle. The prevalence of hypertension was higher in males than females due to overweight which was more common among female.

There was also high prevalence of hypertension among the range of 50-59years due to biological effect of increased arterial resistance which brought about thickening arterial wall that causes

with age and the accumulated effect of various factors. The higher prevalence of hypertension which was recorded among age group of 50-59year may also be due to mental stress and financial embarrassment which is common among the age group.

The study reported that there was fairly good knowledge of hypertension among local government employees in Ogbomoso South Local Government. This study also showed that majority of local government employees were at risk of hypertension, despite good practices which were common among them.

5.7. Recommendations

Reducing and preventing hypertension requires the policy makers and administrators of local government, NULGE executive, employees, family of employees and community members. Thus, for hypertension to be reduced to its barest minimum level the following recommendations are made:

i. The medical official of health services in the local government should set up a program for health education and promotion of awareness and management of hypertension. NULGE executive should also organise programme that will enlighten their member on prevention of hypertension, this can be done by inviting health educator to their monthly meeting.

ii. Local government administrators should provide clinic that have hypertension screening services for employees inside the local government secretariat.

iii. There should be provision of IEC material (such as posters and bill board) on causes, sign and symptoms, prevention of hypertension in the local government secretariat.

iv. Local government administrators should provide recreational material (such as playing ground and gym centre) in the secretariat. This will encourage the employees to exercise themselves regularly.

5.8 Limitation to the study

Ascertaining the genuineness of responses provided by the study participants is a daunting challenge in survey research and this study was no exception. Participants were informed that this study was purely for research purposes and their anonymity was guaranteed. The study focused prevalence, knowledge and practices which are personal and sensitive. Some respondents were not willing to give all the information required by the research because of the fear of being penalized. Efforts were however made to reduce this problem by assuring them of the confidentiality of all information provided. It is assumed therefore, that all responses were made in honesty.

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APPENDICES

APPENDIX I

QUESTIONNAIRE ON PREVALENCE AND RISK FACTORS FOR HYPERTENSION AMONG LOCAL GOVERNMENT EMPLOYEES

I am ..... From the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. I am conducting a research focusing on prevalence and risk factors associated with hypertension among local government employee of Ogbomoso South L.G. the information gathered will be useful for planning educational programme relating to the way of prevention and treatment of hypertension among Ogbomoso South L.G employee in future. I wish to kindly request your voluntary participation by providing answers to the following questions honestly as this will increase the quality of the findings. Please be assured that all information provided by you will be kept strictly confidential and will not be used against you or your association.

Thanks for your cooperation

FOR OFFICIAL USE ONLY

Serial number .....

Date .....

Section A: Socio – demographic characteristics

INSTRUCTIONS

- Please tick (✓) only on option to the appropriate boxes
- Do not write your name
- Answer all the questions

1. Age at last birthday .....
2. Sex: Male 1 ☐ 2. Female ☐
3. Religion: 1. Christianity ☐ 2. Islam ☐ 3.Traditional ☐ 4. Other ☐
4. Marital status: 1. Single ☐ 2. Married ☐ 3. Divorced ☐
   4. Widowed ☐ 5. Widower ☐ 6. Separate ☐

5. Level of education 1.Primary education ☐ 2.Secondary education ☐

3. Post-Secondary Education but not to university level ☐ 4.University Education ☐

5. Others (specify) .....

6. How long have you been staff here? .....

7. At what age did you become an employee? .....

8. Which department are you? 1. Medical ☐ 2.Works ☐ 3.Agriculture ☐

4. Finance and Supply ☐ 5.Administration ☐ 6.Education ☐ 7.Statistics ☐

8. Budget and planning ☐

9. What is your designation? .....

10. Does your job allow you to close early? 1. Yes ☐ 2. No ☐

11. Do you have any other job after the office work? 1. Yes ☐ 2. No ☐

12. Weight ..... kg

13. Height ..... cm

14. BMI..... kg/cm

15. BP 1st reading.....mmHg 2nd reading..... mmHg. Average.....mmHg

Section B: Level of knowledge on causes, symptoms and prevention of hypertension

Knowledge on causes of hypertension

Which of the following statement is right about the causes of hypertension? (Tick either yes or no or I don't know)

SN	STATEMENT	YES (1)	NO (2)	I DON'T KNOW (3)
16.	Hypertension is the same as high blood pressure			
17.	Hypertension is hereditary			
18.	Hypertension is caused by condiments			
19.	Too much stress can result into hypertension			
20.	High salt diet can cause hypertension			

	Total score	10
21.	Score obtained	
22.	Code	

Knowledge on symptoms of hypertension

Which of the following statement is right about the symptoms of hypertension? (Tick either yes or no or I don't know)

SN	STATEMENT	YES (1)	NO (2)	I DON'T KNOW (3)
23.	Sweating			
24.	Frontal headache			
25.	Symptomless			
26.	Dizziness			
27.	Difficult sleeping			

	Total score	10
28.	Scoreobtained	
29.	Code	

Knowledge on prevention of hypertension

Which of the following statement is right about the prevention of hypertension? (Tick either yes or no or I don't know)

SN	STATEMENT	YES (1)	NO (2)	I DON'T KNOW (3)
30.	Intake of fruit and vegetable help to prevent hypertension			
31.	Adherences to weight loss will help to prevent hypertension			
32.	Intake of low fat diet will help to prevent hypertension			
33.	Regular exercise prevent hypertension			

34. Mention the best way to monitor / detect hypertension

.....

	Total score	10
35.	Score obtained	
36.	Code	

Section C: Practices that expose hypertension

37. I smoke tobacco — 1. Yes☐ 2. No☐
38. I consume alcoholic drink — 1. Yes☐ 2. No☐
39. I eat plenty of vegetables daily — 1. Yes☐ 2. No☐
40. I eat plenty of fruits daily — 1. Yes☐ 2. No☐

41. I eat food with condiment daily 1. Yes ☐2. No ☐

42. I exercise myself daily 1. Yes ☐2. No ☐

43. I sleep for about six hours daily 1. Yes ☐2. No ☐

	Total score	12
44.	Score obtained	
45.	Code	

Section D: Structure on ground to prevent hypertension in the Local Goverment

Tick either yes or no or I don't know

SN	STATEMENT	YES (1)	NO (2)	I DON'T KNOW (3)
46.	We have clinic inside the secretariat			
47.	Is it functioning?			
48.	Hypertension screening services are available in the clinic			
49.	Every member of staff have access to hypertension screening services			
50.	Is the service free?			
51.	Is there any recreational facility in the secretariat?			
52.	Every member of staff have access to the recreational facilities			
53.	Do you have time to access it?			
54.	Is there any posters that showing the dangers of hypertension in the secretariat?			
55.	We have had health education on hypertension in the Local Government before			

56. How often do you have health education on hypertension in the local Government?

APPENDIX II

CODING GUIDE

Serial Number	VARIABLES
1	Age (put actual age) Age group 20-29 30-39 40-49 50-59
2	1=Male 2=Female
3	Religion 1=Christianity 2=Islam 3=Traditional 4=Other
4	Marital status 1=Single 2=Married 3=Divorced 4=Windowed 5=Widower 6=Separated
5	Level of education 1=Primary education 2=Secondary education 3=Post-secondary education but not to university level 4=University education 5=Other
6	How long have been staff here? 1=1-15year 2=16-30year
7	What age did you become employee? 1=21-25year 2=26-30year 3=31-35year 4=36-40year 5=41-45year 6=46-50year
8	Department 1=Medical 2=Works 3=Agriculture 4=Finance and supply 5=Administration 6=Education 7=Statistics 8=Budget and planning

9	Designation 1=Junior staff Store keeper Clerical Officer Office assistant Typist Driver Security 2=Middle staff Estate officer Community development Inspector Chief clerical Officer Executive Officer Health Officer 3=Senior staff Director Deputy director Principal community development Inspector Principal estate Officer Principal executive Office Higher executive Officer
10	Does your job allow you to close early? 1=Yes 2=No
11	Do you do any other job after office work? 1=Yes 2=No
12	BMI 1= ≥ 30 (Obese) 2= 25-29.9 (Overweight) 3= 18.5-24.9 (Normal) 4= < 18.5 (Underweight)
13	Blood Pressure Systolic 1= Hypotension <90 2= Normal BP 90-119 3= Pre-hypertension 120-139 4= Hypertension ≥140 Diastolic 1=Hypotension <60 2=Normal BP 60-79 3=Pre-hypertension 80-89 4=Hypertension >90
14	Knowledge on causes of hypertension Q 16-20 (Maximum for score for each question is 2mark) 1=Yes 2=No 3=I don't know
15	Score obtained on knowledge of causes Q21-22 1= 0-3 (poor) 2= 4-6 (fair) 3= 7-10 (Good)
16	Knowledge on symptoms of hypertension Q23-27 (Maximum score for correct answer for) each question is 2mark 1= Yes

	2= No 3= I don't know
17	Score obtained on knowledge of symptoms (Q28-29) 1= 0-3 (poor) 2= 4-6 (fair) 3= 7-10 (good)
18	Knowledge of prevention of hypertension Q30-33 (Maximum score for correct answer for each question is 2mark) 1= Yes 2= No 3= I don't know
19	Mention the best way to monitor/detect hypertension (Q34) 1= Going to the clinic (1mark) 2= Going for medical check-up (1 mark) 3= Checking BP regularly (2mark) 4= No idea (0 mark)
20	Score obtained on knowledge of prevention (Q35-36) 1= 0-3 (Poor) 2= 2-6 (fair) 3= 7-10(good)
21	Question on practices (Q37-43) 1= Yes 2= No
22	Scored obtained from the practices (Q43-45) 1= 0-6 (Bad practices) 2= 7-14(Good practices)
23	Question on structure on the ground to prevent hypertension in the local government (Q46-55) 1= Yes 2= No 3= I don't know
24	How often do you have health education on hypertension in the local government (Q56) 1= Once in a year 2= Twice in a year 3= Three times in a year 4= Once in a month 5= Occasionally 6= Not implemented 7= We have never had health education on hypertension 8= No idea 9= I don't know 10= Once in a while

TELEGRAMS..... TELEPHONE.....

MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION

PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No. .....

All communications should be addressed to the Honorable Commissioner quoting

Our Ref. No. AD 13/ 479/ 638

March, 2015

The Principal Investigator,
Department of Health Promotion and Education
Faculty of Public Health,
College of Medicine,
University of Ibadan,
Ibadan.

Attention: Owoade Adesola

Ethical Approval for the Implementation of your Research Proposal in Oyo State

This acknowledges the receipt of the corrected version of your Research Proposal titled: "Prevalence and Risk Factors of Hypertension among Local Government Employees in Ogbomoso South Local Government, Oyo State."

2. The committee has noted your compliance with all the ethical concerns raised in the initial review of the proposal. In the light of this, I am pleased to convey to you the approval of committee for the implementation of the Research Proposal in Oyo State, Nigeria.

3. Please note that the committee will monitor closely and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of the findings as this will help in policy making in the health sector.

4. Wishing you all the best,

OYO STATE RESEARCH ETHICAL REVIEW COMMITTEE

Signature & Date

Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethical Review Committee