RISK FACTORS FOR NON-COMMUNICABLE DISEASES AMONG CIVIL SERVANTS IN IBADAN

BY

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CERTIFICATION PAGE

I hereby certify that this research work was carried out by Olawuyi. Abisola Tairat in the Department of Epidemiology and Medical Statistics. University of Ibadan. Ibadan Nigeria. under the supervision

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DEDICATION

To the one has never failed me, God the father, God the son, God the Holy Spirit.

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ABSTRACT

Non-communicable diseases (NCDs) have become a global public health problem. which threatens Sub- Sahara Africa (SSA) including Nigeria. four hehavioural and four cardio-metabolic risks factors have been associated with the major NCDs (cardiovascular diseases. diabetes. cancers and chronic pulmonary diseases). Civil servants are engaged in a stress related work resulting from change in government and non-payment of salaries. besides the sedentary nature of their work. increases the worker's risk of NCDs. There is a poor documentation of information on the behavioural & cardio metabolic risk factor among civil servants in Ibadan. Therefore this study investigates the prevalence and risk factors among civil servants in Ibadan using the WHO step wise approach.

A cross-sectional study design was used to select 644 civil servants using a two-stage sampling of twelve out of twenty ministries. and cluster sampling was used to select an average of 50 respondent from each. Pre-tested, semi structured interviewer- administered questionnaires were used to collect Information on their- socio-demographic characteristic. dietary habit. tobacco use and alcohol consumption. physical activity. blood pressure. blood glucose. waist circumference. weight and height measurcment. Overweight and obesity was defined as a BMI of 25.0-29.9kg/m^2 and ≥30kg/m^2 respectively. Diabetes was defined as fasting blood glucose level ≥126mg/dl or being on diabetes medication. abdominal obesity was defined as waist circumference >102inches for men and >88 for women. hypertension was described as blood pressure ≥140/90mmHg. unhealthy diet was defined as low intake of vegetables and fruits. Physical inactivity was <600 MET-MIN/DAY. binge drinking was described as ≥5bottles of alcohol at one sitting for men and ≥4 bottles for women. Data was analysed using descriptive statistics and logistic regression at p=0.05.

Respondents' mean age was 44±9.57 years and males were 53.7%. Majority were Yoruba's (93.3%) and 88% were married. 51.6% were mid-level staff. Prevalence of behaviour and cardio metabolic risk factors were- physical inactivity (66.5%). unhealthy diet (57%). tobacco use (6.2%). harmful use of alcohol (6.5%). hypertension (21.25%). diabetes (8.3%). abdominal obesity (37.1%). overweight (34.7%). and obesity (23.9%). Females had a greater likelihood for abdominal obesity (OR=18.299 CI=7.968-42.025 p=<0.05). and overweight / obesity (OR= 5.465 CI=3.492-5.465 p=<0.05) compared to males. Those ≥40

three time more at risk of hypertension than those lower (AOR=2.70 CI= 1.38-5.06). Hypertension was the only significant predictor for diabetes mellitus. Respondent that have high BP are five times more at risk of bring diabetic than non-hypertensive respondent(OR= 4.465 CI= 1.578-12.632).

Non communicable diseases and its risk factors were prevalent among civil servants in Ibadan. Awareness campaigns on the benefits of regular physical exercise, healthy eating and cessation of cigarette smoking should be conducted.

Keywords: Non-communicable diseases, risk factors, civil servants.

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LIST OF ACRONYMS

1) BMI- body mass index
2) BP- blood pressure
3) CI= confidence interval
4) CVD- Cardiovascular disease
5) DBP- diastolic blood pressure
6) LMIC- low and middle income countries
7) NCD- non communicable diseases
8) OR-Odds ratio
9) SBP- systolic blood pressure
10) SPSS- statistical package for social science
11) SSA- Sub Sahara Africa
12) UN- united nations
13) WHO- world health organisation
14) X^2- Chi square

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Recently, non-communicable diseases have emerged as a significant public health threat with an increase in the prevalence globally. NCDs are chronic diseases conditions that are not transmissible from persons to person. In 2000, there were 31 million NCD deaths, this has increased by 87%, in 2012, out 56 million deaths globally, and NCD accounted for 38million of the deaths (WHO 2014a). And three quarter (28 million) of the deaths occur in low and middle income countries (WHO 2014). Low and middle income countries are worst hit by this emerging global epidemic, because of their weak health system. Apart from the high mortality and morbidity associated with NCD, these diseases impoverish, because of the high cost of treatment. NCDs threatened progress towards the UN Millennium Development Goals and post-2015 development agenda (WHO 2014a). Epidemiological transition which is a shift from predominantly infectious disease pattern to chronic diseases results from urbanization, industrialization, nutritional transition, and adoption of western life style. NCDs coupled with the already existing infectious diseases like malaria, typhoid, and cholera led to the double burden of diseases currently faced by most developing countries

According to WHO 2014 global report on NCDs, out of all NCD deaths, four major group of diseases accounted for 82% of all NCD deaths. Cardiovascular diseases, cancers, respiratory diseases, and diabetes (WHO 2014a). In 2012, cardiovascular diseases caused 17.5 million deaths/46.2% of NCD deaths, cancers were responsible for 8.2 million/ 21.7% of NCD deaths, respiratory diseases, including asthma and chronic obstructive pulmonary disease accounted for 4.0 million,/10.7% of NCD deaths) and diabetes (1.5 million, or 4% of NCD deaths) (WHO 2014a).

These non-communicable diseases have been linked to four modifiable behavioural risk factor (tobacco use, unhealthy diet, harmful alcohol use, physical inactivity) and four modifiable metabolic risk factors (obesity/overweight, raised blood pressure, high blood glucose, and raised cholesterol level).

Evidence has shown that morbidity and mortality from NCDs can be reduced by elimination of the modifiable risk factors of these diseases. In September 2011, UN world leaders established a multi-sectorial action plan & policies for the prevention of NCDs, one of the global action is to monitor the trend and the determinant of NCDs and evaluate the progress in their prevention and control. The standard surveillance method recommended is the integrated WHO Stepwise approach, this method ensures comparability of results and it's a cost effective method of prevention recommended for developing countries.

A healthy workforce is essential for sustainable economic development, productivity, adequate household income, and social wellbeing. The civil service plays a major role in economy growth. The Nigerian Civil service is a body of government employees entrusted with the administration of the country, and mandated to carry out the policies of the government of the day (Nwanolue & Iwuoha 2012). Data on risk factor prevalence among this population in sparse. This study surveyed the prevalence of behavioural and metabolic risk factors for non-communicable disease among civil servants in Ibadan.

1.2. Problem Statement

According to WHO 2014 global report on NCDs, NCD deaths are projected to increase from 38million in 2012 to 52 million by 2030. Statistics have shown that mortality from NCDs are higher in developing countries compared to developed countries of the world. Approximately 48% of NCD deaths in low- and middle income countries and 28% in high-income countries were in individuals aged under 70 years. According to WHO, the chances of a Nigerian dying from a NCD between age 30-70 is 19.8% (WHO 2014a). The actual mortality from NCDs have surpassed statistical projections reported by WHO, in 2013, WHO projected that by 2030, NCDs death in low and middle income countries will be 5,116,000 million using 2011 death by cause as a factor (WHO 2013) . But by 2012, the mortality from NCDs surpassed the 2030 projections. For example, in 2012, NCD mortality from African region alone in was 28million.

In 2005, about 400 million dollars was estimated to have been lost from premature deaths due to NCDs. This economic cost was estimated to rise to about eight billion dollars by the end of 2015 (Tagurum et al, 2015). LMICs bear a high financial burden from out of pocket

health expenditure from the use of household income and savings, borrowing, taking loans or mortgages, and selling assets to meet spending. (Khurshid & Mahal 2014).

The occurrence of NCDs among the working population may lead to economic losses, house hold poverty and reduction in productivity hence the need to pay attention to the occurrence of NCDs among the working class group.

Some studies in Nigeria have accessed the risk factors for individual NCDs, Few studies have documented information about the cluster of risk factors for the four major NCDs using the WHO risk factor surveillance stepwise approach within the workforce especially among the civil servants. This WHO approach ensures proper documentation, its enables comparability of data from different regions.

1.3. Justification

In addition to increased morbidity and mortality, NCDs are capable of adversely affecting various aspects of human life. The World Economic Forum 20 ranked NCDs as one of the top global threats to economic development. These economic effects of NCDs add up to a substantial drain on society's economic potential by adversely affecting the four main factors of economic growth—i.e., labour supply, productivity, investment, and education (Beaglehole et al. 2011). The impact on households is worse on vulnerable households in whom 30%- 50% of their household incomes may be spent on chronic illnesses (Bosu.K.W 2014), However, because NCDs affect adults in their productive years, and require long term treatment and often cause disability, they can have more severe economic consequences for the individual and his or her family, including decrease or loss of household income, impoverishment, loss of savings and assets, and reduced opportunities than other illnesses (THE WORLD BANK 2011). Workers with NCDs have an increased likelihood of missing work, underperforming at work, or becoming disabled and leaving the workforce before retirement.

Several strategies have been put forward in the control of NCDs for instance in 2013. World Health Assembly adopted 9 voluntary global action plan for the prevention and control of NCDs by 2025. For example "25×25" which advocates a "25% reduction in overall

mortality from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases as one of the targets and its objective. This also includes monitoring the trends and determinants of NCDs as well as considering of platforms outside the health system for prevention and control as was implemented in the control of the HIV pandemic.

The work place provides a platform for NCDs prevention in order not to overwhelm the health system. The workplace is particularly important as identified by the WHO/World Economic Assembly, in setting up NCDs prevention and risk reduction interventions, by virtue the fact that it has the capacity to reach quite a large section of adult population through adoption of workplace wellness program. Employees who participated in the wellness program reported reductions in absenteeism, improved productivity and therefore bring about a decrease in associated costs (WHO, 2008). Employment and working conditions are powerful determinants of health outcomes and access to health care. Workplaces that are safe and promote wellness are a key part of ensuring a healthy and sustainable workforce(WHO 2014b). Non-communicable diseases have a significant impact on productivity, absenteeism and the wider economy, and there are significant business benefits from taking action for their prevention and control at the workplace.

Examining risk factor among workforce will help formulate necessary intervention. Similar studies have shown that working people spends up to 60% of their waking hours in their workplaces and the focus of occupational health has shifted in recent years from occupational exposures to non-communicable diseases, and the consequent impact on individual health, and economic costs to companies (Kolbe-Alexander et al. 2012; Kolbe-Alexander et al. 2013). This study in which an assessment of both behavioural and cardio metabolic risk factors among Oyo state civil servants in Ibadan will provide information on the magnitude of the risk factors for NCDs among civil servants in Ibadan, which will help monitor the trends, guide decision making, and introduction and appropriate intervention.

Research Questions

1. What is the prevalence of NCDs risk factors among civil servants?
2. What is the prevalence of self-reported NCDs
3. What are the predictors of cardio-metabolic risk factors?

1.4. General Objectives

- To assess the prevalence of risk factors for NCD among civil servants In Ibadan

1.5. Specific Objectives

1. To estimate the prevalence of NCDs risk factor among civil servants Ibadan
2. To determine the factors associated with cardio-metabolic risk factors
3. To assess the prevalence of self-reported NCDs among civil servant in Ibadan
4. To determine the prevalence of self-reported cancer screenings among civil servants.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Epidemiological and demographic transition towards NCDs as resulted in NCDs in developing countries despite the rise in communicable diseases leading to a double burden of diseases. Emergence of NCDs in developing countries dispelled the popular myth that NCDs afflict mostly the developed countries, Although, the developed countries are also experiencing the scourge, developing countries are facing a double burden of disease because of the co-existence of communicable to non-communicable diseases (Ekpenyong et al. 2012).These double burden of diseases however has become a huge problem in the health sector, coupled with the in-adequate manpower and lack of basic equipment for effective diagnosis and treatment. The financial burden on the fragile health systems of developing countries is enormous. Owing to their chronic course, incurability, and general high cost of treatment, NCDs are able to tip households into poverty or to maintain them in poverty. And as the prevalence of NCDs rises, there will be greater demand for NCD-related health care, which will create increasing pressures for health expenditures and additional health financing challenges (THE WORLD BANK 2011).

NCDs are highly preventable. This can be achieved by prevention of the modifiable risk factor. WHO prescribed a mechanism for monitoring the risk factors using the step-wise approach. WHO has reported that four major disease groups-—cancer, cardiovascular diseases, chronic respiratory diseases, and diabetes—are responsible for 82% of the NCD-related deaths. Among them, cardiovascular diseases accounted for almost one-half of the deaths (17.5 million), followed by cancers (8.2 million), respiratory diseases such as asthma and chronic obstructive pulmonary disease (4.0 million), and diabetes (1.5 million) (WHO 2014a), which also are the commonest NCDs in Nigeria. 8 million Nigerians suffer from hypertension and 4 million has diabetes; 100, 000 new cases of cancers are diagnosed each year in Nigeria. (Ekpenyong et al. 2012).

2.2 The "Big Four" Non Communicable Diseases

2.2.1 Cardiovascular Diseases

Cardiovascular disease (CVD) refers to all diseases and conditions involving the heart and blood vessels. Types of CVD include coronary heart disease, hypertension, congestive heart failure, stroke, congenital cardiovascular defects, hardening or narrowing (atherosclerosis) of the blood vessels, including the coronary arteries, and other diseases of the circulatory system. In Europe, CVD was responsible 51% of deaths among women and 42% among men compared with 19 and 23%, respectively, for all cancers(Nichols et al. 2014).

Commonest cardiovascular diseases like hypertension are increasing in developing countries, Hypertension is defined as a sustained elevation (average systolic blood pressure greater than or equal to 140 mmHg or an average diastolic blood pressure of greater than or equal to 90 mmHg) in blood pressure. Hypertension is a modern day's epidemic and it is an increasingly important medical and public health issue. and it has been estimated that CVD will be the major cause of morbidity and mortality in developing countries by the year 2020 (Momin et al. 2012). In Nigeria, a prevalence study of hypertension among adults was 44.9% [95% confidence interval (CI): 43.5–46.3%](Murthy et al. 2013).

2.2.2 Diabetes Mellitus

Diabetes mellitus (DM) is a group of diseases marked by high levels of blood glucose resulting from inadequate insulin production or insulin action. DM can cause serious complications like ketoacidosis, recurrent infection, weight loss, cardiovascular diseases, diabetic neuropathy, diabetic retinopathy and premature death. Diabetes mellitus is an increasing problem in throughout the world. This is believed to be due to increases in longevity, obesity and sedentary lifestyles(IDF 2014). The diabetes statistics of the International Diabetic Federation (IDF) showed that Nigeria has the highest number of people living with diabetes and impaired fasting glucose (IFG) in Africa (385 million)(IDF 2003) The prevalence of diabetes complications such as limb amputation, retinopathy and neuropathy is also on the increase (Isara & Okundia 2015) The Framingham study revealed that the burden of DM, which also increases the risk for CVD, has remained fairly constant over the last 50 years, Similar to other developing countries, Nigeria is experiencing a rise

in the incidence of DM, as shown by an increase from 2.0% in 1992 to 2.2% in 1997 (Maiyaki & Garbato 2014). Kyari et al diabetic prevalence study detected that the age-adjusted prevalence of diabetes in Nigeria was 3.25% (95%CI 2.50-4.30) and over 10% of people with diabetes aged ≥40 years had sight-threatening-diabetic retinopathy (Kyari et al. 2014). In 2015, Oguoma *et al*'s study showed the prevalence as risen to 5.4% (Oguoma et al. 2015)

2.2.3 Chronic Respiratory Diseases

Chronic respiratory diseases represent a spectrum of airway ailments, ranging from reversible airway obstruction, like bronchial asthma (BA), to irreversible airway diseases like emphysema. There are no community-based surveys of chronic respiratory diseases in Nigeria; thus, most reports were hospital-based, in addition to estimates by extrapolation of data from other developed countries. In the time span from 2006 to 2009, studies on respiratory disease prevalence in urban areas showed a prevalence of chronic bronchitis in Nigeria as 0.3%, with that of BA varying between 14% and 18% (Maiyaki & Garbato 2014).

2.2.4 Cancer

The burden of cancer in unknown in Nigeria, mainly because of lack of records or under reporting (Popoola et al. 2013). In a study of cancer registry literature updated from all over the world. only 1% of the literature emanated from Africa compare to 34% and 42% from Europe and Asia respectively. A cross-sectional study conducted among cancer patients in the oncology clinic of Lagos teaching hospital showed that breast cancer has the highest prevalence, followed by colorectal cancer, prostate. Ovarian cancer, bone cancer, endometrial cancer, liver, and lung cancer (Popoola et al. 2013). In Ibadan cancer registry, the most common cancers in men in Ibadan for all ages were cancer of the prostate (21.7%), colorectal (7.6%), non-melanoma skin cancer (NMSC) (6.4%), liver (6.1%) and non-Hodgkin's lymphoma (NHL) (4.8%). For women of all ages in rank order, the most common cancers in IBCR were, breast 40.8%, cervix 24%, ovary 3%, colorectal 2.9% and NMSC 2.4% (Agba et al. 2013).

2.3 Risk Factors for Non- Communicable Diseases

Eight major modifiable risk factors has been identified to be common to these four main NCDs. Four behavioural risk factors (physical inactivity, unhealthy diet, smoking and alcohol intake) and four biochemical risk factor (obesity, high blood pressure, high blood glucose, and high blood lipid).

2.3.1 Unhealthy Diet

A healthy diet is essential for the prevention of all major chronic non-communicable disease. Globally, low fruit and vegetable intake is estimated to contribute to the development of approximately 31% of coronary heart disease and 11% of ischemic stroke (Tagurum et al. 2015). High salt consumption (more than 5 g per day) contributes to raised blood pressure and increases the risk of heart disease and stroke (WHO 2014a).

The traditional diet in Nigeria had been largely made of fibre-rich carbohydrates, minimal fat, and sparring protein. This trend has changed in the last 10 years with the rapid increase in urbanization and globalization and with free trade agreements leading to the opening of Nigerian markets to foreign foods. Often these foreign meals are energy-dense, high in salt, and high-sugar containing meals. Furthermore, they are easily accessible compared to those locally sourced. Changes in food consumption of such a manner is called nutrition transition. Nigeria has witnessed a rise in the number of fast food restaurants - serving meals with high salt and sugar content, often also containing saturated fat. This goes hand in hand with an increase in the availability of bottled drinks. Series of regression studies, it was observed that increases in consumption of processed food and soft drinks do in fact statistically explain large increases in obesity and type 2 diabetes that have been observed in low- and middle-income countries over the past several decades(Basu 2013), Furthermore, canned fruit juices are becoming fashionable and are replacing natural fruits. These eateries are patronized by people across all economic bands in the society. The fortunes brought about by recent economic gains have brought about an emerging middle class with an enhanced purchasing capacity. The working class and the wealthy in Nigeria consider eating outside as trendy; as such, people of limited resources also tend to follow the emerging trend (Maiyaki & Garbato 2014).

According to WHO, Globally, 2010, 1.7 million annual deaths from cardiovascular causes have been attributed to excess salt/sodium intake(WHO 2014a). Poor dietary habit was associated with 4.23 and 4.96 odds for prevalent NCDs in males and females respectively (Ekpenyong et al. 2012). A risk factor cross sectional study conducted in plateau state detected that forty-four percent rarely take fruits and vegetables, 18.6% add raw salt to already-prepared meals; 82.1% take sweet/soft drinks with 12.1% who take at least 5 times a week, and 16.9% take snacks daily (Tagurum et al. 2015). Dietary and lifestyle habits revealed that majority of the adults (82.9%) ate thrice a day. Most of them (68.6%) consumed snacks at least twice a week and this was significantly higher in females (84.2% vs. 50.0%) ($p<0.05$). Carbonated drinks were mainly consumed by 91.4%, about (34.3%) consumed alcoholic beverages twice a week(Okafor et al. 2014).

In Kaduna, the prevalence of unhealthy diet among civil servant was 90.4% owing to the high intake of red meat, soft drinks, fried food, pastries etc. (Oladimeji et al. 2014). A study conducted in Ilorin among bankers and traffic warden showed that fatty diet was being regularly taken by 77.8% of the bankers, and 69.4% of the traffic warden that participated in the study (Salaudeen et al. 2014). Awosan *et al* 's study also showed that consumption of fatty foods was more prevalent among bankers (77.1%), than teachers (61.9%), and the difference was found to be statistically significant ($x2 = 5.753$, $p = 0.012$) (Awosan et al. 2013). A community based study conducted in Abia stated showed that 90% of the subjects consume fruits but only 15.9% on a daily basis. Only 175(6.1%) consume uncooked vegetables daily while 1350(47.2%) consume cooked vegetables every day. Consumption of sodas, sweet/chocolate, coffee/tea and fast foods is low in our population (2.0%, 1.8%, 8.3% and 2.5% respectively). About 5% add extra salt to already prepared food on a daily basis. However, the use of salt in prepared food is very high (78.1%). Also, there is low consumption of protein rich diet while the consumption of carbohydrate is high (Ogah et al. 2012). In Plateau state, 18.6% add raw salt to already-prepared meals, 82.1% take sweet/soft drinks with 12.1% who take at least 5 times a week, and 16.9% take snacks daily(Tagurum et al. 2015)

Reduction in salt intake has been identified as one of the most cost effective measures for improving population health. A meta-analysis of 36 studies found that decreased sodium

intake resulted in a decrease in resting systolic blood pressure of 3.4 mmHg and a decrease in resting diastolic blood pressure of 1.5 mmHg. WHO recommends a reduction in salt intake to less than 5 g/day (sodium 2 g/day) to reduce blood pressure and the risk of coronary heart disease and stroke. And one of the key measures to reduce salt consumption is monitoring population sodium intake, sodium content of manufactured products, sources of sodium/salt in the diet, and consumer knowledge, attitudes and behaviours relating to the consumption of products containing sodium/ salt, in order to inform policy decisions(WHO 2014a).

2.3.2 Tobacco Use

Tobacco use is causally linked with a number of chronic diseases including several cancer, chronic respiratory disease and cardiovascular diseases. Tobacco use remains the cause of 6 million preventable deaths per year globally (WHO 2014a). The globalization of cigarette consumption and promotion has increased the burden of tobacco-related diseases, mostly NCDs, even as the burden is not evenly distributed. The higher burden of tobacco is borne by such countries (like Nigeria) that have opened their markets to global investors in the hope of increasing their national income(Maiyaki & Garbato 2014). In 2012 there were some 1.1 billion smokers worldwide, with over 8 out of 10 tobacco smokers smoking daily (WHO 2014a).

Different studies conducted among civil servants has shown the presence of this risk among this group. In Abakaliki, south western Nigeria, 5.9% of the study participant consume tobacco (Ugwuja et al. 2013). Oladimeji *et al* recorded a prevalence of 6% in Kaduna among civil servants (Oladimeji et al. 2014), similar study conducted in Abakaliki 5.9%(Ugwuja et al. 2013). However, the prevalence recorded in other work force differs. Bankers and teachers tobacco consumption prevalence was s 7.6% and 4.8 respectively (Awosan et al. 2013), among traders in Sokoto, the prevalence was 5.2%(Awosan et al. 2014), among university staff, the prevalence was 1.9%(Ige et al. 2013).

2.3.3 Alcohol Intake

Alcohol abuse is a major contributor to the global burden of NCDs. Worldwide, it accounts for 4% of DALYs(Maiyaki & Garbato 2014). Harmful use of alcohol is associated with a risk of developing non communicable diseases, mental and behavioural disorders, including alcohol dependence, as well as unintentional and intentional injuries, including those due to road traffic accidents and violence. Alcoholic drinks and the problem they endanger have been a familiar fixtures in human societies since the beginning of recorded history. Studies has contributed immensely to the understanding of the relation of drinking to specific disorders, and has shown that the relation between alcohol consumption and health outcomes is complex (Oladimeji et al. 2014). There is also a causal relationship between harmful use of alcohol and incidence of infectious diseases such as tuberculosis. Alcohol consumption by an expectant mother may cause foetal alcohol syndrome and pre-term birth complications. In 2012, an estimated 3.3 million deaths, or 5.9 % of all deaths worldwide, were attributable to alcohol consumption. More than half of these deaths resulted from NCDs, An estimated 5.1% of the global burden of disease –as measured in disability-adjusted life-years (DALYs) – is attributed to alcohol consumption (WHO 2014).

Treatment research shows that early intervention are available in primary care is feasible and effective, and a variety of behavioural and pharmacological interventions are available to treat alcohol dependence this evidence suggests that treatment of alcohol based problems should be incorporated into public health response to alcohol pattern(Oladimeji et al. 2014)

The prevalence of alcohol consumption is 40.6 % in a rural local government area Oyo state (Abdulsalam et al. 2014). In Abia, a community study, showed that Out of the 2,978 subjects who responded to the question on alcohol, 55.8% had ever used alcohol, 84.2% of these did so in the last one year 89.4% of them consume three bottles/ shots/ glass or less. Alcohol drinking was commoner in men (67.9%), urban dwellers, and those within the age group of 20-52 years (Ogah et al. 2013). Tagurum *et al*'s study in Plateau state recorded a prevalence of 3.1%(Tagurum et al. 2015). Among traders in sokoto,10.8% of 390 of the traders had consumed alcohol within the past 30 days (Awosan et al. 2014). Alcohol consumption among bankers and teachers in Sokoto was 27.6% and (3.8%) respectively (Awosan et al. 2013). Among university community in Ibadan study participant, the prevalence was 5.1%(Ige et al. 2013). Oladimeji *et al* recorded 2% alcohol consumption

among civil servants in Kaduna (Oladimeji et al. 2014). a prevalence of 23.9% was found in Abakaliki among civil servants(Ugwuja et al. 2013) .

2.3.4 Insufficient Physical Exercise

Insufficient physical activity is one of the 10 leading risk factors for global mortality, causing 3.2 million deaths each year (WHO 2014). In 2010, insufficient physical activity caused 69.3 million DALYs – 2.8% of the total – globally. Globally, in 2010, 20% of adult men and 27% of adult women did not meet, WHO recommendations on physical activity for health. Amongst adolescents, aged 11–17 years, 78% of boys and 84% of girls did not meet these recommendations (WHO 2014).

Heightened rural-urban migrations lead to the formation of urban slums and overstretching of urban facilities. It also leads to an increased demand for lodging services. This scenario puts pressure on land demand and ultimately restricts the options for physical activity by having limited or no parks in some cities, lack of proper sidewalks, and exercise services such as gymnasium and football pitches. The ever-increasing automation of activities, both domestic and at places of work, limits physical activity. Easy access to computers and other sedentary lifestyles would mean that more people would be exercising less. In Nigeria, this has become more pronounced among the young, creating childhood obesity and its attendant implications. (Maiyaki & Garbato 2014).

Studies have shown the prevalence of physical inactivity to be as high as 40% among young Nigerian adults similarly, In Uyo, the prevalence of physical inactivity was 49.1(Ekpenyong et al. 2012), a study conducted in Sokoto among bankers and teachers showed that Sedentary lifestyle (by virtue of; use of motor cycle or car to work, lack of moderate physical activity at work, and lack of moderate leisure exercise) was about 6 times more prevalent among bankers (33.3%) than teachers (5.7%)(Awosan et al. 2013).however, the prevalence of physical inactivity among civil servant is very high, in Kaduna, physical inactivity was 91% (Oladimeji et al. 2014)

2.3.5 Obesity

The link between obesity, poor health outcomes and all-cause mortality is well established. Obesity increases the likelihood of diabetes, hypertension, coronary heart disease, strok e, certain cancers, obstructive sleep apnoea and osteoarthritis. It also negatively affects reproductive performance. Overweight and obesity – i.e. BMI ≥25 kg/m2 and ≥30 kg/m2 respectively – were estimated to account for 3.4 million deaths per year and 93.6 million DALYs in 2010(WHO 2014a). Visceral fat accumulation, which often accompany obesity. is associated with increased secretion of free fatty acids, hyperinsulinaemia, insulin resistance, hypertension, hyperglyceamia and dyslipidaemia(Ejike, C et al. 2009). Traditional Nigerian societies are highly mobile, often walking several miles to visit relations, access markets, or just for leisure. Furthermore, a significant proportion of the society was, in the past, engaged in non-mechanized farming and other energy-demanding endeavours .These have been replaced by a sedentary lifestyle and low energy-demanding vocations, facilitated by the availability of mass transportation systems across various parts of the country, and further complemented by more people using private vehicles to commute. Advancements in technologies, such as live television broadcasts, computers, the internet, and electronic games, have also made the Nigerian populace less ambulatory. Cultural preferences for an obese phenotype as a marker of affluence or wellbeing in Nigeria and other parts of Africa have helped in fuelling the growing obesity epidemic and its attendant comorbidities. In some parts of Nigeria, young women are kept in fattening homes where they are fed high-calorie energy-dense fatty meals with minimal physical activity as part of preparations for a wedding ceremony. An ever-increasing working class mothers, who, similar to their male counterparts, have to live up to the demands of a modern workplace. These events not only bring about stress to the involved families, but also disrupt the opportunity of a regular traditional meal, which takes longer time to prepare. (Maiyaki & Garbato 2014).

Obesity has been increasing in all countries. In 2014, 39% of adults aged 18 years and older (38% of men and 40% of women) were overweight. The worldwide prevalence of obesity nearly doubled between 1980 and 2014. In 2014, 11% of men and 15% of women worldwide were obese. Thus, more than half a billion adults worldwide are classed as obese(WHO 2014a). Recent studies on obesity in Nigeria has shown that there have been

an increase in the prevalence of obesity. In Ibadan, obesity and overweight prevalence was 1.9% and 2.0% respectively(Oladapo et al. 2010), in Abia state, a community study showed the prevalence of obesity and overweight was 13.8%. 28.2% overweight respectively(Ogah et al. 2013), similarly, in Plateau state, the prevalence of obesity was present 27.2% (Tagurum et al. 2015), Ekpenyong *et al* recorded a prevalence of 25% in Uyo (Ekpenyong et al. 2012). Shivaramakrishna *et al*'s study among bankers showed that overweight / obesity (BMI >25 kg/m2) 33% and 26% of the study subjects (Shivaramakrishna et al. 2010). In kwara state, a similar study among bankers and traffic wardens showed that 14.4% bankers were overweight and 20.0% were obese while traffic wardens were 35.6% were overweight and 15.5% were obese(Salaudeen et al. 2014). Study conducted among civil servants in Kaduna recorded overweight and obesity to be 35%, 27% respectively(Oladimeji et al. 2014) In Abakaliki, prevalent rates of overweight and obesity were 34.2% (70/205) and 6.8% (14/205), respectively (Ugwuja et al. 2013). Out of 280 civil servants that participated in a similar study in Lagos,, 198 (70.7%) were overweight and obese(Ajani et al. 2015)

2.3.6 Hypertension

Raised blood pressure is one of the leading risk factors for global mortality and is estimated to have caused 9.4 million deaths and 7% of disease burden – as measured in disability-adjusted life years in 2010. The global prevalence of raised blood pressure (defined as systolic and/or diastolic blood pressure ≥140/90 mmHg) in adults aged 18 years and over was around 22% in 2014.(WHO 2014a). The proportion of the world's population with high blood pressure or uncontrolled hypertension fell modestly between 1980 and 2010. However, because of population growth and ageing, the number of people with uncontrolled hypertension has risen over the years (WHO 2014a).

A meta-analysis of studies on the prevalence of hypertension in south western Nigeria between 1999 and 2009 was 22% (Ekwunife &Aguwa 2011). A population-based survey in south western part of Nigeria detected a 20.8% prevalence rate of hypertension(Oladapo et al. 2010). Oguoma *et al*'s study among adult Nigerians, consisting of 422 participants (149 males and 273 females) found the prevalence of hypertension to be 35.7% (Oguoma et al. 2015). In Sokoto, the prevalence of hypertension among bankers and teachers was 22.9% and 33.3% respectively(Awosan et al. 2013). In a university community in Ibadan, the

prevalence of hypertension was 21.5%(Ige et al. 2013). Out of 801 participants (civil servants) in Kaduna, 193 were hypertensive (24.1%) (Oladimeji et al. 2014).

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2.4 Predictors of Cardio metabolic Risk Factors

Cardio-metabolic risk factors represents the general possibilities of developing type 2 diabetes or cardiovascular diseases. risk factors such as smoking, high LDL, hypertension, elevated blood glucose and emerging risk factors closely related to abdominal obesity (especially intra-abdominal adiposity), such as insulin resistance, low HDL, high triglycerides and inflammatory markers. Cardio metabolic risk is diagnosed by identification of waist circumference greater than 102inches in males and 88inches in females, fasting blood glucose level ≥126mg/dl and random blood glucose of ≥200mg/dl, blood pressure ≥140/90mmHg, HDL <40mg/dl for men, <50mg/dl for women, LDL >70mg/dl, triglyceride ≥150mg/dl.

Several studies have document different predictors in several population. In south-south Nigeria, Akpan et al derived the predictors of hypertension to be location, age, gender, BMI, diabetes status and proteinuria status (Akpan et al. 2015). Among adult Nigerians, the predictors of hypertension, diabetes, abnormal cholesterol level and obesity were age, gender, level of income. In the eastern part of Nigeria, abdominal obesity was predicted by family history of obesity, inadequate fruit intake (Iloh et al. 2013). Among non-obese people in the northern part of Nigeria, waist-hip ratio, BMI, and waist circumference predicts hypertension (Sharaye, et al. 2014). Among 6th graders cardiometabolic risk were predicted by BMI, maternal smoking, paternal history of early cardiovascular diseases, parental age (Peterson et al. 2012)

2.5 Cancer screenings

Breast and cervical. cancer is the most common cause of cancer related death among women and prostate cancer are the most common in men(American-Cancer--Society 2015). Self-breast examination, clinical breast examination and mammography are the secondary preventive methods used for investigation in early detection of breast cancer, while prostate examination is a primary prevention method for prostate cancer. Oche *et al*'s study showed that 54% of them performing regular self-breast examination.

However, the low awareness about mammography and the low mammographic screening rate reported (Oche et al. 2012). Among female health workers, mammography screening was found to be 3.1% and self –breast examination was 45.5%(Akhigbe & Omuemu 2009).

Papanicolaou cytological testing (Pap smear) permits cervical lesions to be detected before they become cancerous. Nigeria has not had a great deal of success in implementing effective cervical cancer screening. The delivery of cervical cancer screening in the country is usually conducted in an opportunistic manner, whereby screening depends on the initiative of the woman and or health care provider(Ubajaka et al. 2015) in Anambra state, the prevalence of pap smear screening is 21% (Ubajaka et al. 2015). among female health workers in Anambra, the prevalence was 10%(Oche et al. 2012).

Prostate cancer screening is an attempt to diagnose prostate cancer in asymptomatic men. Primary prevention strategies include screening at the asymptomatic stage of the development of the disease and lifestyle adjustments that may include dietary regimen and supplements. Screening involves the use of DRE, PSA assay, trans-rectal ultrasound and biopsy. The principle for screening is to reduce morbidity and mortality at the asymptomatic stage of any disease by early detection and treatment at a cost that is affordable rather than at a stage when the disease has been well established, requiring expensive interventions. Onunaa et al documented that out of 652 men in Anambra state, only 6.2% has done prostrate screening in the past 1year (Onunaa et al. 2012). in Uganda however screening for prostate cancer was 2.8% (Nakandi et al. 2013)

World employment has changed dramatically in the last three decades of the 20th Century. Employees are expected to give more in terms of time, efforts, commitment and flexibility while they receive less in terms of job security (Amanda et al. 2013). Civil servants are exposed to a number of stressors, ranging from office politics, promotion (or whom you are not), lack of opportunity for decision making, eye service or favouritism (or the lack thereof), delay in promotion, salary & victimization. Civil servants with the unknown nature of their job, and high job strain are high risk group for NCDs.

CHAPTER THREE

METHODOLOGY

3.1 Study Area

The study was carried out within the Oyo state secretariat, Ibadan. Which is the state capital of Oyo state, located in southwest region of Nigeria, it came to existence when bands of Yoruba renegades following the collapse of the Yoruba Oyo empire, began settling in the area towards the end of 18th century. Ibadan grew into an impressive and sprawling urban centre so much by the end of 1829. It had been the centre of administration of the old Western Region since the days of the British colonial rule, the city is surrounded by seven hills, and parts of the city's ancient protective walls still stand to this day. The principal inhabitants of the city are the Yorubas. The city ranges in elevation from 150 m in the valley area, to 275 m above sea level on the major north-south ridge which crosses the central part of the city. Its total area is 1,190sqm (3,080) km2, with a population of over 3million, it has 11 local government (5 urban and 6 semi-urban). 128 km inland northeast of Lagos and 530 km southwest of Abuja, the federal capital, and is a prominent transit point between the coastal region and the areas to the north, It's a semi urban city with a mixture of literate and semi illiterate people. Ibadan is the home to one of Africa's premier university (University of Ibadan), and television station (Nigeria television authority).Also, Nigeria's first teaching hospital (UCH) an, first sky scrapper (Cocoa house). The city is a major centre for trade in cassava, cocoa, cotton, timber, rubber and palm oil.

The Oyo state secretariat in Ibadan is located in Agodi Ibadan, at a latitude of 7.4106652 and a longitude of 3.9090729. Within the secretariat is the governor's office, state house of assembly, government agencies and ministries. The state has 20 state ministries, namely; ministry of economic planning and budgeting, ministry of agriculture. ministry of culture and tourism. ministry of education, ministry of habitat, ministry of establishment and training. ministry of finance, ministry of health, ministry of information and orientation. ministry of justice, ministry of lands and housing. ministry of local government and chieftaincy matters, ministry of physical planning and urban development, ministry of special duties, ministry of trade, investment and cooperatives, ministry of water resources,

ministry women affairs, ministry of works and transport. ministry of youth and sports. ministry of applied science and technology.

The ministry have various department or units with all cadres of staff in each of the units. The political head of a ministry is the commissioner. while the permanent secretary is administrative head who receives support from heading various department/units and reports to the political head.

3.2 Study population

The study population were Oyo state civil servants in Ibadan. Civil service as an organization lies at the Centre of Public Administration structure. It is the major instrument through which government; federal, state or local manage development (Olu-Adeyemi, 2009). This group of people are adults representing the workforce of the state. They are employed under different ministries and agencies. cutting across salary grade levels to seventeen of Nigeria civil salary scale. The study was conducted in the various offices in each ministry. it was conducted between 7:30am -10am. from Tuesdays to Fridays when activities are reduced.

Inclusion criteria

All civil servants on the payroll of the selected ministries, and are available as at the time of the study was enrolled

Exclusion criteria

Non consenting members of staff, all pregnant women, and absent, and sick civil servants were excluded from the study.

3.3 Study Design

A Descriptive cross- sectional study.

3.4 Sample Size Determination

A cross sectional study conducted in Kaduna by Oladimeji et al 2014, found the prevalence of hypertension to be 29% among civil servants. The sample size is estimated at 95% confidence level

$$N = \frac{Z_{\alpha}^{2} pq}{d^{2}}$$

P = 27%

(Prevalence of overweight among civil servants in Kaduna (Oladimeji et al. 2014)

Z_{α} = 1.96 at 95%CI

d = 5% degree of precision

$$N = \frac{1.96^{2} \times 0.29 \times 0.71}{0.05^{2}} = 316$$

Adjusting for nonresponse rate of 20%

$$N = \frac{N}{1 - n_{r}} = \frac{316}{1 - 0.20}$$ = 395 study participants

Using design effect, G of 1.5

Total sample size = N × G

Total study participants = 1.5 × 395 = 592 study participants.

3.5 Sampling Technique

A total of 644 participants was recruited for the study using a two- stage cluster sampling technique.

Stage 1: 12 out of 20 ministries were selected using simple random sampling.

Stage 2: due to unavailability of sampling frame for various ministries, cluster sampling method was used to select an average of 50 respondents from each ministry by consecutive selection.

3.6 Instruments for Data Collection

Data was collected using validated data collection tool from;

1. WHO step wise integrated approach system for surveillance of chronic disease risk factors
2. International physical activity questionnaire (IPAQ).

WHO step wise integrated approach system is designed for implementation in low-and middle income countries which involves collecting information on behavioural and biological measurement, in three different steps.

STEP 1: information on behavioural risk factors; this will be collected using a semi structured interviewer administered questionnaire. Questions were adapted from WHO risk factor assessment questionnaire and international physical activity questionnaire. Information collected includes;

1) **Socio –demographic characteristic**: this section consists of questions highlighting the age, sex, job, cadre, marital status, educational status, current ministry of employment, year of resumption, average monthly income.

2) **Behavioural risk factors**

a) **Tobacco use;** alcohol consumption was restricted to cigarette and weed, questions on whether the respondent take cigarette now or ever was asked, the estimated number of sticks consumed, and current frequency of smoking; daily or sometimes in a week

b) **Alcohol consumption:** alcohol consumption was assessed by asking questions on whether the civil servants take alcohol at all or not, what quantity was taken at each sitting, the maximum quantity taken at a sitting, 30days prior to the study.

c) **Dietary Habit (Fruit, salt and vegetable consumption):** dietary frequency was assessed by the frequency of intake of certain foods; these food items include vegetables, fruits, dairy products, food containing refined sugar, fries and so on. The respondents were asked if they eat the food never, 1-2times weekly, 3-4times weekly, and 5-7 times weekly.

d) **Physical inactivity:** physical activities was determined by asking if the civil servants engage in leisure or occupational related physical activities 7days prior to the study. The job description was also determined; if it's predominantly sedentary, walking around, climbing of stairs. Physical activities was categorized as either moderate or vigorous. Frequency of exercise per week was also determined by the number of days and the duration of time in a week the respondent engage in the identified activity.

3) **Individual history of hypertension and diabetes:** Respondent were asked if they have ever been diagnosed with either hypertension or diabetes, also if they are currently on any medication or life style modification treatment.

4) **Family history of high BP, Cancer and diabetes:** the civil servants were asked if they have first degree sibling of parent(s) with diagnosed hypertension, diabetes and cancer.

5) **Screening:** civil servants were asked if they have ever done cancer screenings like mammography, Pap smear, self-breast examination and prostate examination.

6) **Availability of workplace health promotion programs;** questions about-Free/subsidized health screening, health Walk, Endurance Trek ,Occupational Health Services (e.g. Staff Health Clinic), Availability of Health Insurance Scheme, Health Talk/Free Health Living Advice, Smoking and Drinking Cessation Facilities, Stress management/Counselling Session, Work Free Days/Sick Leave were asked.

STEP 2: Physical body measurements (anthropometry)

a) Weight measurement

Weight was measured using an analogue weighing scale (HANA) placed on a flat hard surface. The research assistant ensured the pointer of the machine is on zero. Study participants were instructed to remove any heavy clothing (such as coats) and shoes and stand still, their foot on both sides of the weighing scale, with hands by their sides and looking straight ahead. After the study participants had been correctly positioned and the pointer on measuring device becomes stable, then measurement was taken to the nearest 1kg. The weighing scales were calibrated daily according to manufacturer's instructions.

b) Height measurement

Height was measured with the aid of a calibrated meter rule, while the participant is facing directly ahead. Patients was instructed to remove their shoes, caps or head scarfs, keep their feet together, and stand with their arms by the sides. Measurement was taken with heels, buttocks and upper back in contact with the meter rule.

c) Waist Circumference

The waist circumference was determined using a non-extendable measuring tape, it was wound around the subject, but not to the point that the tape is constricting. Midpoint between the lower margin of the last rib and the superior border of the iliac crest at the mid axillary line was used as a reference point (WHO 2008).

STEP 3: Biochemical measurements

a) Blood pressure (BP) Measurements

Blood pressure was measured while patients were seated, it was collected after the respondent had completed the questionnaire, and this period allows room for at least 10minutes of rest time before taking blood pressure. Blood pressure be taken using an M4 Omron automatic blood pressure device, the cuff of the machine will be wound around the respondent upper arm, covering two-third of the arm. The blood pressure reading was consistently taken from the left arm, three times at 3 minutes interval. The average of the two last readings will be estimated and used in the analysis.

Blood Test

All participants were informed to fast overnight for at least 8 hours prior to collection of the fasting blood sample. Those who reported to have fasted less than 8 hours were tested using their random blood sample (as described by the American Diabetes Association. Specimen for biochemical analysis were fresh capillary blood collected from a finger

prick. Accu-check digital blood sugar machine was used to measure blood glucose level according to manufacturer's instruction.

Data Collection

Research assistants were trained prior to the commencement of data collection on the importance of confidentiality, and ways of protecting the information provided by research participants. Also, they were trained on how to use the instrument correctly. Fluency in English/Yoruba was a pre-requisite for recruitment. Before final data collection, instruments was field tested for necessary amendments.

Signed informed consent was collected from study participants, they were provided with all necessary information that allowed them to make voluntary decisions.

Data was collected using a semi structured interviewer administered questionnaire with opened and closed end questions. Questions were adapted from WHO non-communicable disease risk factors surveillance questionnaire. The questions covered stated under the specific objectives.

3.7 Study Variables

1. DEPENDENT VARIABLES: Abdominal obesity, Overweight, Obesity, Hypertension, Hyperglycemia
2. INDEPENDENT VARIABLES: Educational Status, Sex, Income Quintile, Physical Inactivity, Unhealthy diet, Alcohol Use, Tobacco Smoking, Anthropometric Variable.

3.8 Data Management and Analysis

Data collected was analysed using statistical package for social science (SPSS) version 16. Data were entered and cleaned daily after data collection, Information on prevalence of NCD risk factors will be tested using proportion, mean and standard deviation.

Determination of the factors associated with cardio metabolic risk factor was analysed using chi-square, binary logistics regression.

3.9 Definition of Study Variables

1. **Job cadre:** civil servants on the salary scale between grades 1-6 were classified as junior staff, 7-12 as mid-level staff, and 13-17 as senior staff.
2. **Hypertension:** Raised blood pressure is defined as systolic blood pressure ≥140mmHg and/or diastolic blood pressure ≥90 mmHg among persons aged 18+ years.
3. **Tobacco use:** Tobacco use is defined as current use of any tobacco product in either smoked or smokeless form
4. **In-sufficient physical exercise:** insufficient physical activity in persons aged 18 years and over, defined as NOT meeting an equivalent combination of moderate- and vigorous-intensity physical activity, accumulating at least 600 MET-minutes 1 per week (WHO 2014a)
5. **Body mass index BMI:** it was derived by dividing weight (kg) by height squared (m^2). BMI was categorised based on the WHO classification,

- Underweight = <18.5kg/m^2
- Normal (healthy weight) = 18.5-24.9kg/m^2
- Overweight = 25.0- 29.9kg/m^2
- Obesity = ≥ 30kg/m^2

6 **Diabetes:** it was diagnosed either by a history of previously known diabetes, being on medication for raised blood glucose or a fasting plasma glucose of ≥ 126 mg/dl, and ≥200mg/dl for random blood sugar (Association-American-Diabetes- 2014) (WHO 2014a)

7 **Abdominal obesity:** it was defined as waist circumference (WC) value > 102 cm and > 88 cm for men and women, respectively.

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7 **Abdominal obesity:** it was defined as waist circumference (WC) value > 102 cm and > 88 cm for men and women, respectively.

8 **Binge drinking**: Any male civil servant who report having ≥5 drinks or female with ≥ 4 drinks on one or more occasions, within 30days prior to study. A drink is defined as a bottle or one glass of wine or a shot of any of the spirit e.g. gin, red wine.

9 **Unhealthy diet**: Absence or low intake of vegetables, fruits in the diets of the civil servants. Or high intake of carbonated drinks, pastries and carbohydrates.

3.10 Ethical Consideration

Ethical Approval: approval for the study was obtained from the Oyo state Ministry of health. Ethical Review board (attached as appendix)

Consent: Verbal / written consent was gotten from each ministry's permanent secretary to conduct the research in the ministry. Informed written consent was gotten from individual respondent before commencement of the research.

Confidentiality: Identifiers were removed from the questionnaire to ensure confidentiality of study participants. They were assured that their information will be kept confidential. Information on the system was password protected and accessible to members of the research team only.

Beneficence: All participants were assessed and informed on their individual behavioural and cardio-metabolic risk factors with a view to assist them on taking informed decisions on their health.

Non – maleficence to participants: The risk of harm to the study participants was low, participant with hyperglycemia were informed and advised to seek medical help. Password protected computerised system was used to manage data

Voluntariness: participation in this research was entirely voluntary. Eligible individuals were assured of their choice to either participate in the study or not.

Dissemination of results: The result of the study will be disseminated to the health administration (permanent secretaries and directors in MOH) and policy makers of health in the state.

CHAPTER FOUR

RESULTS

4.1 Prevalence of non-communicable disease risk factors

4.1.1Socio-demographic characteristics

Table1 shows the socio-demographic characteristic of the respondent. Six hundred and forty-four civil servants participated in the study, 346 (53.7%) were males. The mean age was 44years ±9.573, 205(33.6%) were between 40-49years, 10(1.6%) were ≥60years. 558 (88%) were currently married at the time of the study. 469 (74.9%) had a minimum of tertiary education. 594(93.2%) were Yoruba, 39(6.0%) were Igbo. Junior staff (Cadre 1-6) were191 (31.3%), mid- level staffs were 315(51.6%), senior staffs were 104 (17%). 88(14.8%) had an average monthly income of <#21,000/, 203(34.2%) had an average monthly income #21,000-#40,000, and >#100.000 was collected by 61(10.3%).

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Table 3: Prevalence of Unhealthy Diet

variable	Frequency(N-644)	Percentage (%)
Vegetable		
<5times	504	78.3
≥5	140	21.7
Carbonated drinks		
<5times	615	95.5
≥5	29	4.5
Fruits		
<5times	561	87.1
≥5	83	12.9
Fried foods		
<5times	614	95.3
≥5	30	4.7
Pastries		
<5times	629	97,7
≥5	15	2.3
Legume		
<5times	561	87.1
≥5	83	12.9
Extra salt in cooked food		
Yes	152	23.6%
No	492	76.4%

4.1.4 Tobacco Consumption

Table 4 shows the smoking pattern among civil servants. Forty of the civil servants (6.2%) are current smokers, 12(1.9%) had consumed 5 sticks or more daily, 70% (28) of the current smokers smoked daily.

Table 4: Prevalence of smoking among civil servants

Cigarette smoking history	FREQUENCY (N=644)	PERCENTAGE (%)
Current smoker		
Yes	40	6.2
No	604	91.9
Smoking frequency		
Daily	26	65
Weekly	10	25
Monthly	4	10
Cigarette sticks taken at once		
None	604	93.8
1-4 packs	28	4.3
5packs or more	12	1.9

Distribution Of Current Smoking Status

Table 5 shows the smoking distribution among respondents. Majority of the smokers are males, civil servants with secondary school level and above, junior staff, and people earn from #21,000 - #40,000 per month constituted a higher percentage of the smokers.

Table.5 Distribution Of Current Smoking Status

Variable	Frequency (n=40)	Percentage (%)
Age (in years)		
<40	14	36.8
≥40	24	63.2
Educational status		
None & primary	8	20
Secondary	16	40
Tertiary	16	16
Cadre		
Junior	24	63.2
Mid-level	10	26.3
Senior	4	10.5
Monthly income		
<20,000	12	32.4
21,000-40,000	14	37.8
41,000=60,000	6	16.2
>60,000	5	13.5
Gender		
Male	33	82.5
Female	7	17.5

4.1.5 Harmful Alcohol Use

Table 6. Shows the prevalence of alcohol consumption among civil servants. One hundred and fifty (23.3%) of the civil servants are consume alcohol, forty (6.5%) are binge drinkers, they consume more than 5 bottles of alcoholic drink in one sitting. 60(40%) consume alcohol up to 1-2times a week, 33(22%) consume alcohol every day, 30(20%) consume alcohol less than once a week, and 27(18%) consume alcohol 3-6times a week.

Table 6: Alcohol Consumption among Civil Servants

	Frequency(N=150)	Percentage%
Alcohol Consumers		
Yes	150	23.3
No	494	76.7
Binge Drinkers		
Yes	42	6.5
No	602	93.5
Drinking Frequency		
Less than once a Week	30	20
1-2 times a Week	60	40
3-6 times a Week	27	18
Everyday	3	22

Socio-demographic distribution of harmful alcohol usage among civil servants

Table 7 shows the distribution of harmful alcohol use among civil servants. Male are more binge drinkers compared to females.

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Table 7: Social Demographic Characteristics and Harmful Alcohol Use

	Binge Drinking	
Variable	**Yes (n=42)**	**Percentage %**
Gender		
Male	41	97.6
Female	1	0.3
Age		
<40	13	31.0
≥40	29	69
Educational Level		
None& Primary	7	17.5
Secondary	8	20
Tertiary	25	62.5
Income Level		
<21,000	10	25.6
21-40,000	5	12.8
41,000-60,000	10	25.6
>60,000	14	35.9
Job Cadre		
Junior	18	43.9
Mid-level	13	31.7
Senior	10	24.4

4.1.6 Prevalence of Hypertension

Table 8 shows the prevalence of hypertension among respondents. The mean systolic pressure (SBP) of the respondent was 125.94 ±20.57 while the mean diastolic pressure was 80.42 ±21.71. One hundred and thirty-five (21.2%) had a blood pressure of ≥140/90. Forty-seven (9.4%) had a blood pressure of <140/90 but are on anti-hypertensive drugs. Out of the 182 hypertensive civil servants (≥140/90+ antihypertensive drugs with l<140/90), 132(72.5%) were aware of their status, while fifty (27.5%) are newly diagnosed.

Table8: Hypertension among Civil Servants

Variable	Frequency(637)	Percentage %
Blood Pressure		
<140/90	135	21.25
≥140/90	502	78.8
Previously diagnosed of hypertension by health worker.		
Yes	132	20.5
No	512	79.5
Hypertension Medication		
Yes	89	13.8
No	555	86.2

4.1.7 Prevalence of Overweight and Obesity

Figl shows the prevalence of overweight and obesity among civil servants. 221(34.7%) out of 628 were overweight, 152(23.9%) were obese. Thereby by making the prevalence of obesity and overweight 58.6%. 9 of the civil servants were underweight, while 225 (39.6%) had a normal BMI.

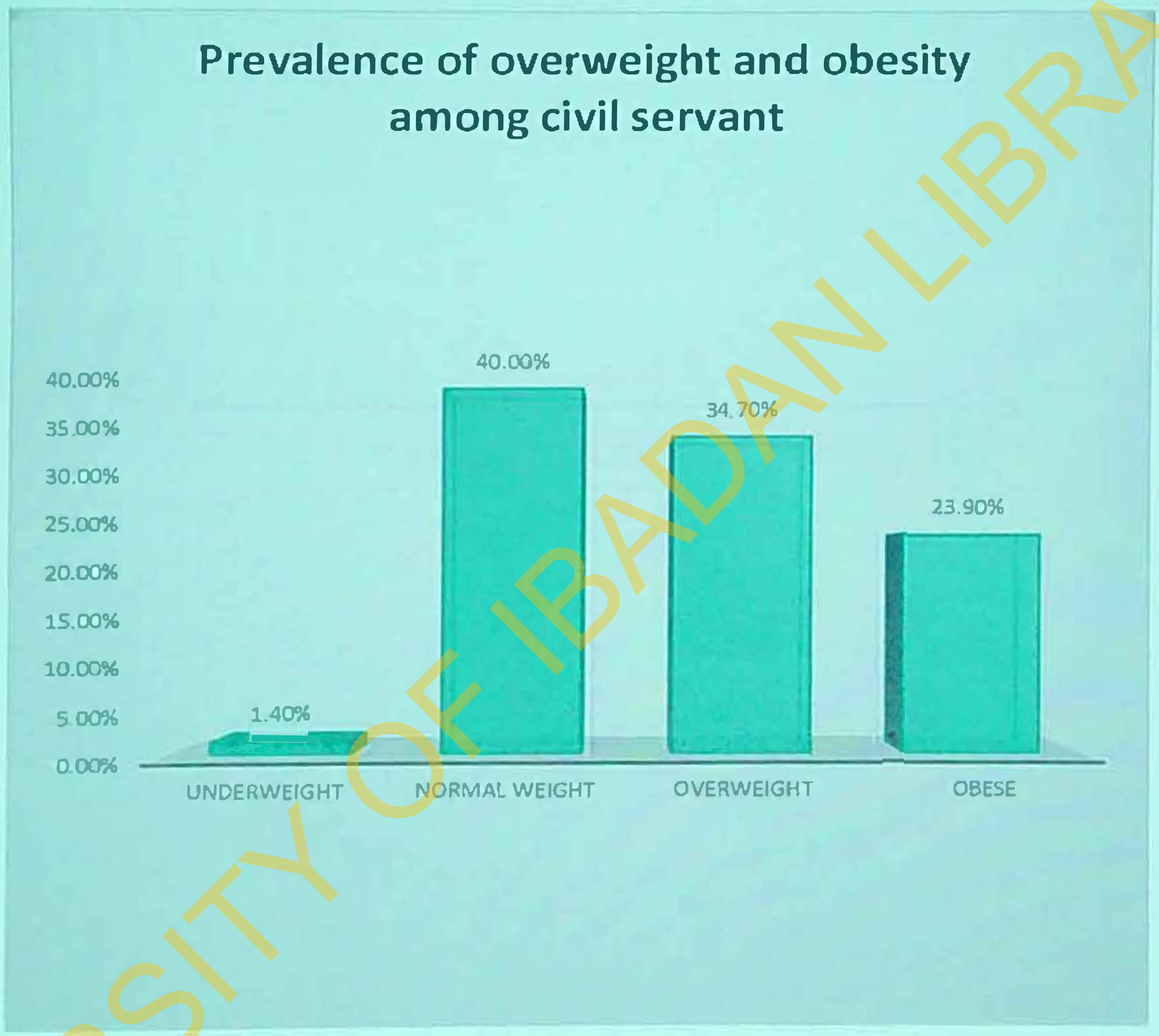

Fig 4 3 prevalence of obesity and overweight among civil servant

4.1.8 Prevalence of Abdominal obesity

Table 9 shows the prevalence of abdominal obesity among civil servants. The prevalence of abdominal obesity among civil servants is 37.1% (230), while 62.9% (390) had a normal waist circumference.

Table 9 Prevalence Of Abdominal Obesity

Variable	Frequency (N=620)	Percentage (%)
Abdominal obesity		
Yes	230	37.1
No	390	62.9

4.1.9 Prevalence of diabetes among civil servants

Table 10. Shows the prevalence of diabetes among civil servants. Out of 505 civil servants that agreed to take the blood sugar test, 22(4.4%) were diabetic. Forty (6.2%) have been told before that they are diabetic, and 29(4.5%) are on diabetes medication, out of the 29 people on medication, 20 had normal blood glucose, and 9 had an abnormal blood glucose. Out of 604(93.8%) respondent with no diabetes history, 13 (with no diabetes history or diabetes medication) were newly diagnosed from the study. Making the total prevalence of diabetes among civil servants to be 42(8.3%).

Table 10: Prevalence of diabetes

Variable	Frequency	Percent (%)
Blood Glucose		
Normal	483	95.6%
Abnormal	22	4.4%
Previously diagnosed of diabetes		
Yes	40	6.2%
No	604	93.8%
Currently on diabetes medication		
Yes	29	4.5
No	615	95.5%

4.1.10 family history of diabetes, hypertension and cancer

Fig.2 shows the prevalence of the family history of diabetes, cancer, and hypertension. Seventy three (11%), 53(8.2%), 115(24.1%) have family history of diabetes, cancer and hypertension respectively.

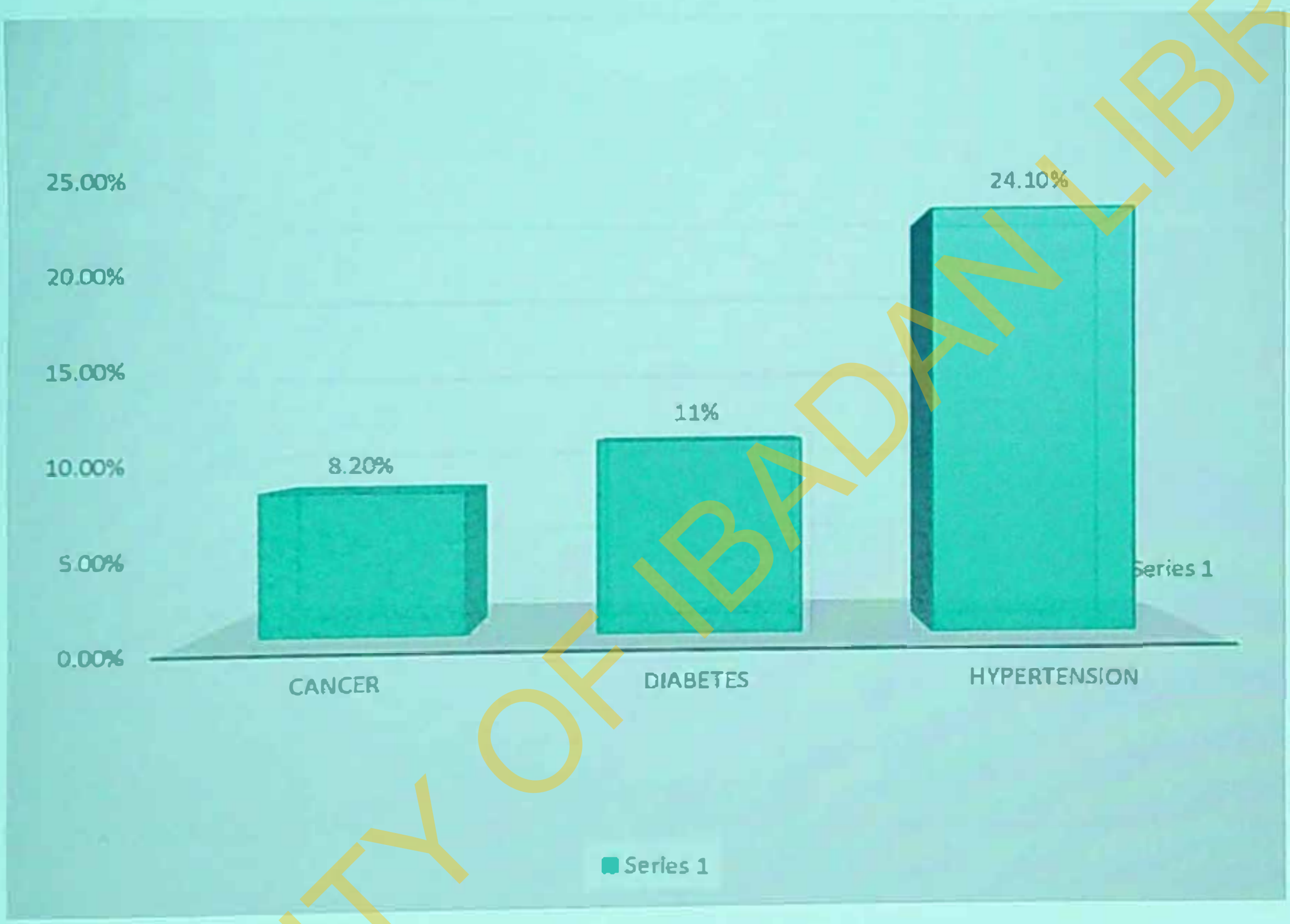

Fig 2 shows the prevalence of family history of cancer, diabetes and hypertension.

4.1.10 family history of diabetes, hypertension and cancer

Fig.2 shows the prevalence of the family history of diabetes, cancer, and hypertension. Seventy three (11%), 53(8.2%), 115(24.1%) have family history of diabetes, cancer and hypertension respectively.

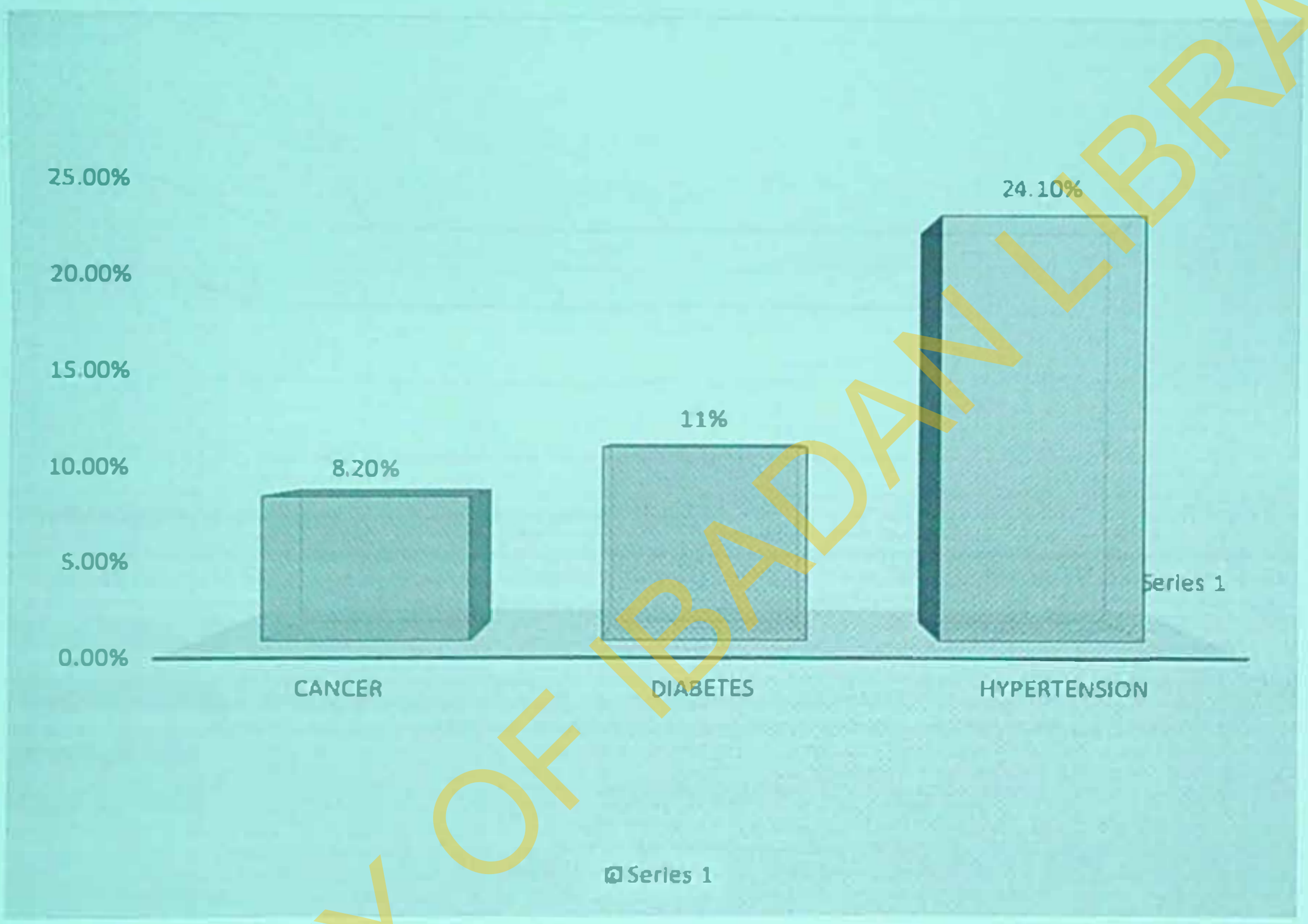

Fig 2 shows the prevalence of family history of cancer, diabetes and hypertension.

4.2 Prevalence of Self-Reported Non Communicable Diseases

Table 11 shows the prevalence of self-reported NCD among civil servants. Out of six hundred and forty- four, one hundred and fifty-five (24.1%) reported that they have been diagnosed of hypertension before by a health worker. while forty (6.2%) reported that they have been diagnosed of diabetes by a health worker before.

Table 4.11: Prevalence of self-reported NCD

Variable	frequency	Percentage (%)
Previously diagnosed of hypertension by health worker		
Yes	155	24.1%
no	489	75.9%
previously diagnosed of diabetes by health worker		
Yes		
No	40	6.2%
	604	93.8%

4.3 Prevalence of cancer screenings among civil servants

Table 12 shows the prevalence of cancer screening among civil servants. One hundred and forty-four (48.3%) out of two hundred and ninety-eight female civil servants have ever conducted self-breast examination. 21(7%) has done mammography before in the past. Also, Pap smear has only been done by 27(9.1%) of the female civil servants. Among a total of 346 males, only 14(4%) has ever done prostate examination.

Table12: Prevalence of cancer screenings among civil servants

variable	Frequency n= 298	Percentage (%)
Self -breast examination		
Yes	144	48.3%
No	154	51.7%
Mammography		
Yes	21	7%
No	277	93%
Pap smear		
Yes	27	9.1%
No	271	90.9%
Prostate examination		
Yes	14	4%
No	332	96%

4.4 Test of Association

4.4.1 Result of Test of Association between socio-demographic characteristic and hypertension

Table 13. Below shows the association between socio demographic characteristic and blood pressure status. There was a significant association ($p<0.05$) between blood pressure status and cadre, age, level of education, family history, and level of income. A significant number of respondent aged 40 and above were hypertensive compared to those less than 40 years of age (28.3% vs 8% p= 0.0001), Mid-level civil servant had a significantly higher prevalence compared to junior and senior staff (27.2% vs 9% & 25.5% p= 0.0001). Hypertension reduces with increased level of education (19%vs 26.4% & 38.7%. p=0.012).Civil servants with family history of hypertension had a higher prevalence than those with no history (27.3% vs 19.8% p= 0.034). Also respondents that earn ≥61,000 had a significantly higher prevalence than those that earn <60,000 (30.2% vs 27.7%, 12%, 18.2% p= 0.0001)

Table 13: Association between the socio demographic status of civil servants and hypertension

	Variable	Hypertensive (N=135)%	Non-hypertensive(502)%	X^2	p-value
1	**Gender**				
	Male	66(19.4)	275(80.6)	1.485	0.223
	Female	69(23.3)	227(76.7)		
2	**Age**				
	<40	18(8.0)	206(92)	35.811	0.0001
	≥40	117(28.3)	296(71.7)		
3	**Job Cadre**				
	Junior	17(9.0)	172(91.0)	24.776	0.0001
	Mid-level	85(27.2)	227(72.8)		
	Senior	26(25.5)	76(74.5)		
4	**Level of education**				0.012
	None & primary	12(38.7)	19(61.3)	8.928	
	Secondary	33(26.4)	92(73.6)		
	tertiary	88(19)	375(81)		
5	**Income level**				
	<21,000	16(18.2)	72(81.8)	21.476	0.0001
	21,000-40,000	24(12)	176(88)		
	41,000-60,000	39(27.7)	102(72.3)		
	≥61,000	48(30.2)	111(69.8)		
6	**Marital status**				
	Unmarried	14(18.4)	62(81.6)	0.403	0.525
	married	119(21.6)	432(78.4)		
7	**Family history of hypertension**				
	Yes	42(27.3)	112(72.7)	4.495	0.034
	no	87(19.8)	353(80.2)		

*statistically significant at p<0.005

4.4.2 Association between behavioural, metabolic risk factors and hypertension

Table 14. Shows an association between metabolic, behavioural risk factors and hypertension. Physical activity, body mass index and waist circumference are the only significant association. A higher proportion of physically active civil servants were hypertensive, than those that are not (26%vsl 8.6% p= 0.026), respondent with abdominal obesity had a higher prevalence of hypertension than those with no abdominal obesity this association is significant (28.3% vs 16.2% p=0.0001), also the association between body mass index is also significant, overweight people had a higher prevalence compared with those obese and normal (30.5%vs, 27% vs9.5% p=0.0001)

Table14: Association between behavioural, metabolic risk factors and hypertension

S/N	Variable	Hypertensive (n=135)%	Non-Hypertensive(n=604)%	X^2	p-value
1	**Eating habit**				
	Unhealthy eating	62(21.1)	232(78.9)	0.333	0.564
	Healthy eating	66(23.1)	220(76.9)		
2	**Binge drinkers**				
	Yes	13(31)	29(69)	2.564	0.109
	No	122(20.5)	473(79.5)		
3	**Tobacco use**				
	Yes	9(22.5)	31(77.5)	0.044	0.835
	no	126(21.1)	471(78.9)		
4	**Physical activity**				
	Physically inactive	79(18.6)	345(81.4)	4.980	0.026*
	Physically active	56(26.3)	157(73.7)		
5	**Extra salt**				
	Yes	31(20.4)	121(79.6)	0.076	0.783
	no	104(21.4)	381(78.6)		
6	**Body-mass index**				
	Normal	24(9.5)	229(90.5)	35.187	0.0001*
	Overweight	67(30.5)	153(69.5)		
	obese	41(27)	111(73)		
7	**Abdominal obesity**				
	No	63(16.2)	325(83.8)	12.712	0.0001
	Yes	65(28.3)	165(71.7)		

*statistically significant at $p<0.005$

4.4.3 Association between socio demographic characteristic of civil servants and blood glucose level

Table 15 shows that none of the socio-demographic variables are significantly associated with blood glucose level ($p \geq 0.05$). None of the variable was statistically significant.

Table 15: Association between socio demographic characteristic of civil servants and blood glucose level

Variable	Normal(N=464)%	Abnormal(40)%	X^2	P-value
Gender				
Male	243(92.4)	20(7.6)	0.348	0.628
Female	221(52.4)	22(47.6)		
Age				
<40	166(93.8)	11(6.2)	1.556	0.240
≥40	298(90.6)	31(9.4)		
Cadre				
Junior	141(32.0)	11(28.2)	0.494	0.781
Mid-level	227(51.5)	20(51.3)		
Senior	73(16.6)	8(20.5)		
Level of education				
None & primary	19(82.6)	4(17.4)	3.777	0.151
Secondary	90(90.0)	10(10)		
Tertiary	346(93)	26(7)		
Income level				
<21,000	63(91.3)	6(8.7)	7.075	0.070
21,000-40,000	150(93.8)	10(6.2)		
41,000-60,000	107(86.3)	17(13.7)		
>60,000	109(94.8)	6(5.2)		
Family history of diabetes				
Yes	6(10.2)	53(89.8)	0.307	0.580
No	36(8.1)	411(91.9)		

*statistically significant at $p<0.005$

4.4.4 Association between behavioural, metabolic risk factors and blood glucose level

Table 16 shows that metabolic risk factor (body mass index and waist circumference), and hypertension are significantly associated with blood glucose level. Diabetes prevalence rises with increase in BMI, Obese respondent are more diabetic than overweight and normal weight people (13.4% vs 6.5% and 5.1% p= 0.018). Respondent with abdominal obesity had a higher prevalence of diabetes than those with normal (11.9% vs 6.4% p= 0.036), also hypertensive civil servant had a higher prevalence of diabetes than non-hypertensive respondent (16.2% vs 6.3% p=0.001)

Table 16: Association between behavioural, anthropometric risk factors and diabetes

S/N	Variable	Diabetic (N=40)%	Non-diabetic(464)%	X^2	P-value
1	**Bing drinkers**				
	Yes	4(11.4)	31(88.6)	00.483	0.487
	no	38(8.1)	433(91.9)		
2	**Physical activity**				
	Physically inactive	33(9.6)	311(90.4)	2.359	0.125
	Physical active	9(5.6)	153(94.4)		
3	**Eating habit**				
	Unhealthy habit	21(8.9)	269(91.1)	3.647	0.561
	Healthy habit	15(6.6)	194(93.4)		
4	**Tobacco usage**				
	Yes	0(0)	33(100)	3.195	0.740
	no	42(8.9)	431(91.1)		
5	**Body mass index**				
	Normal	10(5.1)	187(94.9)	8.054	0.018*
	Overweight	11(6.5)	159(93.5)		
	obese	17(13.4)	110(86.6)		
6	**Abdominal obesity**				
	No	19(6.4)	227(93.6)	4.420	0.036*
	Yes	23(11.9)	171(88.1)		
7	**Hypertensive**				
	Yes	17(16.2%)	88(83.8%)	10.601	0.001*
	No	25(6.3%)	372(93.7%)		

*statistically significant at p<0.005

4.4.5 Association between socio-demographic characteristic of civil servant and waist circumference

Table 17 shows the association between socio-demographic characteristic and waist circumference. Gender, age, level of education, income level, and cadre were significantly associated with waist circumference. Larger percentage of Females are obese around the abdomen (68.5% vs 11.4% p= 0.001), those 40 years and above had a higher prevalence of abnormal waist circumference (42.1% vs 27.8% p= 0.0001), those with secondary education had a larger waist circumference than those with tertiary and no or primary education (41.3% vs 37.8% & 9.75 p= 0.004). Mid-level civil servants had a higher prevalence of abdominal obesity than senior and junior staff (42.9%, vs 28.9%, 29.3% p= 0.003). Level of income also was significant with those within 41,000- 60,000 salary scale had an abnormal waist circumference than those in other categories (48.9% vs 39.6%, 31.45, 16.5% p= 0.0001).

Table 17: Association between socio-demographic characteristic of civil servant and abdominal obesity

S/N	VARIABLE	NORMAL (N=390)%	ABNORMAL (N=230)%	X^2	P-VALUE
1	**Gender**				
	Male	202(88.6)	39(11.4)	2.138	0.0001*
	female	88(31.5)	191(68.5)		
2	**Age**				
	<40	156(72.2)	60(27.8)	12.337	0.0001*
	≥40	234(57.9)	170(42.1)		
3	**Level of education**				
	None & primary	28(90.3)	3(9.7)	11.020	0.004*
	Secondary	71(58.7)	50(41.3)		
	tertiary	281(62.2)	171(37.8)		
4	**Level of income**				
	<21,000	71(83.5)	14(16.5)	26.291	0.0001*
	21,000-40,000	119(60.4)	78(39.6)		
	41,000-60,000	69(51.1)	66(48.9)		
	>60,000	107(68.6)	49(31.4)		
5	**Marital status**				
	Unmarried	50(66.7)	25(33.3)	0.408	0.523
	married	337(62.9)	199(37.1)		
6	**Cadre**				
	Junior	130(70.7)	54(29.3)	11.887	0.003*
	Mid-level	176(57.1)	132(42.9)		
	Senior	69(71.1%)	28(28.9)		

*statistically significant at p≤0.005

4.4.6 Association between behavioural, metabolic risk factors and waist circumference

Table 18 shows the association between behavioural and anthropometric risk factor and abdominal obesity. Harmful use of alcohol, tobacco, and body mass index were significant. Obese people had a higher prevalence than overweight and normal respondents (94% vs 39.2% & 2.4% p= 0.0001), non-tobacco user had a higher prevalence than those who consume tobacco, (38.8% vs 12.5% p= 0.001) and those who do not take harmful alcohol (binge drinkers) had a higher prevalence than those who do not (39% vs 9.8% p= 0.0001).

Table 18: Association between behavioural, metabolic risk factors and abdominal obesity

S/N	VARIABLE	NORMAL (n=390)%	ABNORMAL (n=230)%	X^2	P-value
1	**Eating habit**				
	Unhealthy diet	231(65.1)	124(34.9)	1.768	0.184
	Healthy diet	158(59.8)	106(40.2)		
2	**Physical activity**				
	Physically inactive	256(62.7)	152(36.8)	0.013	0.910
	Physically active	134(63.2)	78(36.8)		
3	**Binge drinkers**				
	Yes	37(90.25)	4(9.8)	14.064	0.0001*
	No	353(61)	226(39)		
4	**Tobacco usage**				
	Yes	35(87.5)	5(12.5)	11.086	0.001*
	No	355(61.2)	225(38.8)		
5	**Body mass index**				
	Normal	242(97.6)	6(2.4)	3.353	0.0001*
	Overweight	127(60)	82(39.2)		
	obese	9(6)	142(94)		

*statistically significant at $p<0.005$

4.4.7 Association between socio-demographic characteristic and body mass index

Table 19 shows that age, cadre, level of education, income level, marital status were significant. Females are more obese and overweight than males (42.1% & 36.3% vs 28.6%& 34.2% p= 0.001), those aged 40 and above were more obese and overweight than those below 40 (26.7%& 7 38.9% vs 19.6% & 28.3% p- 0.001). Senior staff were also more overweight and obese than those in lower cadre (43.1%& 23.5% vs 36.2% & 22.5% vs 31.5% & 16.8%), those with highest level of education and income have the highest prevalence of overweight in their subgroup (35.75vs 32.8%, 31% p= 0.009) and (45.2% vs 39.1%, 30.8%,and 26.2% p= 0.0001) respectively. Married civil servants are more obese and overweight those unmarried (23.9% & 37.3% vs 24.3% & 20.3% p= 0.008)

Table 19: Association between socio demographic characteristics and body mass index

Variable	Healthy Weight (N=255)%	Overweight (N=221)%	Obese (N=152)%	X^2	P-value
Gender					
Male	192(57.1)	115(34.2)	29(8.6)	1.213	0.0001*
Female	63(21.6)	106(36.3)	123(42.1)		
Age					
<40	114(52.1)	62(28.3)	43(19.6)	18.281	0.0001*
≥40	141(34.5)	159(38.9)	109(26.7)		
Cadre					
Junior	95(51.6)	58(31.5)	31(16.8)	15.29	0.004*
Mid-level	114(36.9)	112(36.2)	83(22.9)		
Senior	34(40.8)	44(43.1)	24(23.5)		
Level of education					
None & primary	20(69)	9(31.0)	0(0)	16.32	0.009*
Secondary	52(41.6)	41(32.8)	32(25.6)		
Tertiary	179(39.2)	163(35.7)	115(25.2)		
Monthly income					
<21,000	53(63.1)	22(26.2)	9(10.7)	30.376	0.0001*
21,000-40,000	91(45.3)	62(30.8)	48(23.9)		
41,000-60,000	47(34.1)	54(39.1)	37(26.8)		
>60,000	49(31.2)	71(45.2)	37(23.6)		
Marital status					
Unmarried	41(55.4)	15(20.3)	18(24.3)	9.782	0.008*
Married	211(38.8)	203(37.3)	130(23.9)		

*statistically significant at p<0.005

4.4.8 Association between behavioural risk factor and body mass index

Table 20 shows that tobacco smoking is significantly associated with body mass index. Those who do not smoke are more overweight and obese than those who smoke (35.5% & 25.5% vs 30% & 5% p= 0.001)

Table 20: Association between behavioural risk, metabolic risk factor and body mass index

Variable	Normal (N=255)%	Overweight (N=221)%	Obese (N=152)%	X^2	P-Value
Tobacco usage					
No	229(38.9)	209(35.5)	150(25.5)	14.013	0.001*
Yes	26(65)	12(30)	2(5)		
Eating habit					
Unhealthy	142(39.3)	134(37.1)	85(23.5)	1.313	0.520
Healthy	112(42.1)	87(32.7)	67(25.2)		
Physical activity					
Inactive	170(41.2)	138(33.4)	105(25.4)	1.916	0.384
active	85(39.5)	83(38.6)	47(21.9)		
Binge drinker					
Yes	20(51.3)	15(38.5)	4(10.3)	4.636	0.098
no	235(39.9)	206(35)	148(25.1%)		

4.5.1 Multivariate analysis to determine the predictors of hypertension.

Table 21. Shows the predictors of hypertension. After adjusting for confounders, age, family history of hypertension, cadre, level of education, level of income blood glucose level, body mass index were independent predictors of hypertension. Civil servants aged 40years and above are three times more likely to be hypertensive than those less than 40 years old (OR = 2.7, 95% CI 1.38-5.06 p= <0.05). Respondent with family history of hypertension are two times more likely to have hypertension than respondent who don't have the history (OR = 1.75, 95% CI = 1.039- 2.933, p= <0.05). Civil servants within the salary scale #41,000-#60,000 are two times less likely to have hypertension than those who earn less than #20,000 a month (OR= 0.0416, 95% CI=0.185-0.932, p= <0.05). Those within cadres mid-level are three times more likely to be hypertensive than those within junior cadres (OR= 3.25, 95% CI= 1.532-6.90), those with primary education and below are five times more likely to be hypertensive than those with tertiary education and those with secondary education are two time more likely than those with tertiary education (OR=4.978, 95% CI= 1.618-15.313, 0R= 2.293, CI=1.161-4.528 p= <0.05), Obese and overweight respondent are also four times more likely to be hypertensive than those with a normal BMI (OR= 43.606. 95% CI= 2,284-5.693, P<0.05)

Table 21: Adjusted odd ratios and 95%CI for predictors of hypertension

variable	OR	CI	P-value
Age			
<40(ref)	1		
≥40	2.7	1.38-5.06	0.003
Family history of hypertension			
No(ref)	1		
Yes	1.75	1.039-2.933	0.035
Level of income			
<21,000(ref)	1		
21,000-40,000	0.907	0.316-2.596	0.855
41,000-60,000	0.416	0.185-0.932	0.033
>60,000	0.719	0.368-1.406	0.335
Cadre			
Junior(ref)	1		
Mid-level	3.25	1.532-6.90	0.002
Senior	2.225	0.812-6.098	0.120
Physical activity			
Active(ref)	1		
inactive	0.699	0.428-1.141	0.152
Level of education			
Tertiary (ref)	1		
None & primary	4.978	1.618-4.978	0.005
secondary	2.293	1.161-2.293	0.017
Body mass index			
Normal(ref)	1		
Overweight & obese	3.606	2.511.-5.693	0.0001
Abdominal obesity			
Normal(ref)	1		
abnormal	1.183	0.683-2.051	0.549

4.5.2 Multivariate analysis to determine the predictors of diabetes

Table 22 shows predictors of diabetes, the model included level of income blood pressure level. Only blood pressure level was statistically significant hypertensive adult persons are three times more likely to be diabetic than non-hypertensive respondents (COR= 3.166, 95% CI= 1.290-8.266, p = 0.013).

Multivariate analysis to determine the predictors of abdominal obesity,

Table 23 shows the predictors of abnormal waist circumference, the model included gender, age, marital status, level of income, cadre, eating habit, tobacco usage, binge drinking, and body mass index. After removal of all confounders. Age, level of income, binge drinking, eating habit, body mass index were statistically significant; i.e. They are independent predictors of abnormal waist circumference. Those aged 40 years and above are three times more to have an abnormal waist circumference than those less than 40 years (OR= 3.32, 95% CI= 1.288-8531 $p<0.05$). civil servants within #41,000- #60,000 are four times more likely to have an abnormal waist circumference than those who earn < #20,000 (OR=4.048, 95% CI = 2.003-8.179 $p<0.05$), Harmful alcohol users are five times more likely to have abdominal obesity than does who don't (OR=5.076, CI= 1.747-14.745.$p<0.05$. Finally obese and overweight respondent are twenty four times more likely to have abnormal waist circumference than those who don't. (OR=11-792-50.640, $P<0.05$)

Table 23: Adjusted odds ratio of predictors of abdominal obesity

variables	OR	CI	P-value
Gender			
Male(ref)	1		
female	18.299	7.968-42.025	0.0001*
Age			
<40(ref)	1		
≥40	3.32	1.288-8.531	0.013*
Marital status			
Unmarried(ref)	1		
married	0.407	0.706-2.181	0.294
Level of income			
<21,000(ref)	1		
21,000-40,000	3.149	1.605-6.175	0.001*
41,000-60,000	4.048	2.003-8.179	0.0001*
>60,000	2.289	1.170-4.479	0.016*
Cadre			
Junior(ref)	1		
Mid-level	1.061	0.356-3.160	0.915
senior	1.065	0.240-1.065	0.934
Eating habit			
Healthy(ref)	1		
Unhealthy	0.750	0.472-1.194	0.225
Tobacco usage			
No(ref)	1		
Yes	0.655	0.51-8.373	0.745
Binge drinker			
No	1		
Yes(ref)	5.076	1.747-14.745	0.003*
Body mass index			
Normal(ref)	1		
Overweight & Obese	24.436	11.792-50.640	0.0001*

Multivariate analysis for the predictors of overweight and obesity

Table4.24 shows the predictors of obesity. The model included gender, age, and level of income, marital status, cadre, level of education, tobacco usage and hypertension status. Only gender, level of income, cadre, and hypertension were statistically significant (i.e. independent predictors). Female civil servants are six times more likely than their male counterparts to be overweight and obese (OR= 5.465, 955 CI= 3.492-5.465 p<005), those who earn more than #60,000 a month are five times more likely than those who earn #20,000 to be obese or overweight(OR= 5.310, 95% CI =2,035-5.310, P<0.05) those who earn< #20,000 between #41,000-#60,000 are three times more likely than those who earn #20.000 to be obese or overweight. While those who earn #21,000-#40,000 are two times more likely than those who earn <#20,000O (OR=2.187, 95%CI= 1.080-4.428 p<0.005), finally, hypertensive civil servants are four times more likely to be obese than non-hypertensive civil servants (OR = 3.646, 95% CI = 2.222-5.983 p<0.05)

Table 24: Adjusted odds ratio for the predictors of obesity and overweight

variables	OR	CI	P-Value
Gender			
Male(ref)	1		
female	5.465	3.492-5.465	0.0001*
Age			
<40(ref)	1		
≥40	1.125	0.601-2.107	0.712
Marital status			
Unmarried(ref)	1		
married	0.886	0.320-2.459	0.817
Level of income			
<21,000(ref)	1		
21,000-40,000	2.187	1.080-4.428	0.030*
41,000-60,000	2.746	1.207-2.746	0.016*
>60,000	5.310	2.035-5.310	0.001*
Cadre			
Junior(ref)	1		
Mid-level	0.699	0.400-1.221	0.208
senior	0.739	0.313-0.739	0.491
Level of education			
None & primary(ref)	1		
Secondary	3.88	0.0001-	0.999
tertiary	4.111	0.0001-	0.999
Tobacco usage			
No(ref)	1		
Yes	143	0.14-1.452	0.100

CHAPTER FIVE

DISCUSSION

NCDs have been projected to be a leading cause of mortality and morbidity in Nigeria by 2030. There is a paucity of evidence on behavioural & cardio metabolic risk factors among Oyo state civil servants. Therefore this study investigated the prevalence and risk factors among civil servants in Ibadan using the WHO step wise approach. A representative sample of civil servants in an urban setting, using a cross-sectional survey design. The study showed that NCDs, and some behavioural and metabolic risk factors were prevalent among civil servants. Physical inactivity is the most prevalent risk factor among civil servants (Oladimeji et al. 2014), followed by abdominal obesity and unhealthy eating habit. Binge drinking was predominantly among males. Physical inactivity, increasing age, diabetes, obesity, overweight, and family history of hypertension were independent predictors of elevated blood pressure. Diabetes was predicted by elevated blood pressure. Being female, increasing age, unhealthy eating, binge drinking, overweight and obesity were independent predictors for abdominal obesity, level of income, hypertension and being a female were predictors of obesity and overweight. Hypertension is the most prevalent self-reported NCD among civil servants. The most common cancer screening among female civil servants was self- breast examination.

PREVALENCE OF NCD RISK FACTOR

Physical activity and regular exercise is thought to be protective against cardiovascular diseases, obesity/ overweight, Type 2 diabetes breast and colon cancer. In urban centres, the prevalence of physical activity has reduced drastically, this resulted from regular use of cars, motor cycle and elevators. Physical inactivity is the risk factor with the highest prevalence among state civil servants in Ibadan, Abakaliki and Kaduna. Although the prevalence differs, in this study, the prevalence was 66.5%, in Abakaliki. the prevalence was 90.7% (Ugwuja et al. 2013) and 99.5% in Kaduna (Oladimeji et al. 2014).the difference might be due to compulsory environmental activity embarked upon in the Oyo state civil service and barring of commercial vehicle and motor cycle within the secretariat.

Excess consumption of salt, foods high in cholesterol, carbonated drinks. low vegetable intake have been associated with increased risk cardiovascular disease. cancers, diabetes and chronic pulmonary diseases. Nowadays in most urban centres, people rarely take home made meals especially breakfast, there really on foods from canteens and fast food joints for their meal, which at times are high in cholesterol, and salt. Unhealthy eating habit was recorded to be 51.1% among civil servants in Ibadan when compared to the prevalence recorded from the population study in Oyo state of 82.9% by Oladapo et al (Oladapo et al. 2010) the difference might be due to inclusion of younger people in the study <18 who feed mostly on junks and carbonated drinks.

The general prevalence of alcohol consumption from this study was 23.3%which differs from the 32.2% prevalence documented by Leshi *et al* in Ibadan among bankers(Leshi & Fadupin 2013). Harmful consumption of alcohol was 6.5% although, it was predominantly among males. Harmful alcohol use was higher among civil servants in Ibadan compared to what was documented in Plateau state, Nigeria (6.5% vs 3.1%) these difference might be because a larger proportion of the study respondents were females. Tobacco consumption among respondent (6.2%) is close to the prevalence recorded among the same population in Abakaliki (5.9%) although when compared to prevalence among university community in Nigeria study conducted in UCH Ibadan (1.9%) , the difference might be because the respondent are more aware of the dangers of tobacco..

Overweight is more prevalent than obesity, (34.7% vs 23.9%) the prevalence of overweight documented in this study is close to what was recorded in Kaduna and Abakaliki among civil servants (35% and 34.2% respectively) (Oladimeji et al. 2014) (Ugwuja et al. 2013). Obesity in Ibadan and Kaduna were close (23.9% and 27%) but differs from what was recorded in Abakaliki (6.7%). However, the crude prevalence of obesity and overweight was 57.9% when compared with 70.7% prevalence from Lagos (Ajani et al. 2015), this difference may be as a result of better economic status (regular salary of civil servants in Lagos).

The prevalence of hypertension obtained from this study was (21.2%) corresponds with what was documented in a rural community in Surulere local government in Oyo state (22.9%) (Abdulsalam et al. 2014). 22.9% documented among Yoruba population by

Oladapo et al (Oladapo et al. 2010), also Awosan *et al* recorded a prevalence of 29.1% in Sokoto among traders (Awosan et al. 2014) . Although a higher prevalence was recorded among civil servants in Lagos (42.9%) (Ajani et al. 2015). This difference in prevalence may be due to the stressful lifestyle of Lagos or there was a higher proportion of older people in the study. Similarly, Ige *et al* also found out that a higher proportion of hypertensive respondents were 40years (Ige et al. 2013).

Diabetes is a well-recognised cause of premature death and disability, increases the risk of cardiovascular disease, kidney failure, blindness and lower limb amputation. The prevalence has been accelerated particularly in LIMC. This rise is driven particularly by physical in activity, overweight and obesity. Its prevalence among civil servants in Ibadan was 8.3% which was higher than what Oguoma documented among adult Nigerians (5.4%) (Oguoma et al. 2015), this result was collated from different regions of the country, the difference in prevalence may be as a result of diverse food consumption in each region.. However, the result corresponded with the prevalence documented by Awosan et al among bankers (8.6%) (Awosan et al. 2013).

Abdominal obesity is socially acceptable among Nigerians, it's culturally perceived as a symbol of good health and wealth, therefore it's usually not seen as a health risk. It is associated with cardiovascular disease and type 3 diabetes. Among civil servants in Ibadan, the prevalence was (37.1%) which differs from the prevalence recorded by Oladapo in south west Nigeria (14.7%), the difference in prevalence could be because Oladapo *et al* 's study had both adults and under aged respondent.

PREDICTORS OF CARDIOMETABOLIC RISK FACTORS

Increase in age have shown to be a risk factor for hypertension. due to physiological changes in the cardiovascular system the heart becomes enlarged from extra work and arteries becomes stiffer. this was demonstrated in this study with older aged people ≥40 years having a higher a prevalence, this corresponds with the findings in Kaduna among civil servants (Oladimeji et al. 2014) and bankers in Surat (Momin et al. 2012) , respondent aged 40 and above are three times more likely to be hypertensive than younger respondents.

High blood pressure tends to run in families. Children of hypertensive parent may become hypertensive earlier than their mates without such history. The family concordance of blood pressure may be explained in parts by shared environmental influence. Respondent with positive family history of hypertension are 2-fold at risk of being hypertensive, findings is consistence with findings from a community study in Oyo state(Abdulsalam et al. 2014) .

Mid-level civil servants were also discovered to be three times more likely to be hypertensive than junior staff, finding may be due sleep deprivation among this group as a result of higher work load, irregular salary vs high cost of living, which leaves them stressed psychologically, leading to the release of cortisol which constricts blood vessels and increases blood pressure.

Civil servants that are obese and overweight are four folds more likely to have hypertension than those who have normal body mass index this was similar to the findings in Kaduna (Oladimeji et al. 2014) and Akwa-Ibom (Akpan et al. 2015), evidence have shown a relationship hypertension and obesity. Fat plaques can narrow or block the arteries, the force of blood pushing against the wall of the arteries as the heart pumps blood, leading to an increase in blood pressure.

Diabetic was also a predictor for hypertension, finding corresponds to results documented among teachers and bankers in Sokoto (Awosan et al. 2013). Diabetic respondents are three fold more likely to be diabetic than those with normal blood sugar. Diabetes narrows the artery or cause arthrosclerosis, which can damage the blood vessels, cause heart failure or heart attack.

Level of education was discovered to be protective factor for hypertension, Civil servants with no or primary education are five times more likely to be hypertensive than those with tertiary education, also those with secondary school education are two times more likely than those with tertiary education, this corresponds with result documented in national survey study in Saudi Arabia(Saeed et al. 2011). People who have completed more level of education tends to have more income, live in better neighbourhood, and have the knowledge needed to give them a deeper understanding of public health messages.

The only significant predictor of diabetes was hypertension, hypertensive respondents are three times more likely to be diabetic (OR=2.566, CI=1.250-5.266, p<0.05), this is in accord with findings from Awosan *et al*'s study in Sokoto (Awosan et al. 2013). Diabetes can stimulate the sympathetic nervous system and renin-angiotensin retention thereby promoting sodium retention. Obese individual are more at risk than overweight people to have diabetes although this association was not statistically significant as it was in. Isara et al's study, they documented BM I to an independent predictor of diabetes (Isara & Okundia 2015).

Abdominal obesity was predicted by age, gender, binge drinking, obesity, and overweight. A larger proportion of females have abdominal obesity, and these relationship was statistically significant, making females are ''high risk group'' for abdominal obesity, these result has been documented in various studies both among civil servants and general population (Oladapo et al. 2010) (Ekpenyong et al. 2012) (Momin et al. 2012). Abdominal obesity is characteristically more prevalent in females and reason behind this may be as result of multiple child birth, decrease in oestrogen level as they age which influences fat distribution in the body.

The risk of having abdominal obesity also increases with age, those aged 40years and above are more at risk of having abdominal obesity, those ≥40 are three times at risk more than those that are less. Ageing plays role in muscle mass, it typically disappears with age while fat deposit increases. The reason for this increase in fat deposit in this area may be because most people are less physically active in this years, and coupled the high carbohydrate consumption (cassava flour and ponded yam etc.).

Harmful alcohol use was a predictor of abdominal obesity, binge drinkers are 5 times more likely to have abdominal obesity than those who don't, this is similar to the findings documented in korea(Ryu et al. 2010), this finding is in accordance with the knowledge of the association between harmful alcohol use and abdominal obesity. Alcohol beverages are energy dense and add to total daily energy intake, this feature could promote fat storage in the abdomen.

From the study, it was documented that BMI predicts abdominal obesity. Overweight or obese civil servants are 5times more likely than those with normal BMI. Giernach et al and

Chinedu et al study also documented this relationship (Gierach et al. 2014) (Chinedu et al. 2013).

Obesity and overweigh were discovered to be predicted by gender, and level of income. Just as gender was a statistically significant of waist circumference, being a female was documented to be a risk factor for obesity and overweight, other studies have also documented this relationship (Mondo et al. 2013). Females are six –fold at more likely to be obese or overweight than males. This is in contrast with findings from Ugwuja et al's study where male were more obese than females (Ugwuja et al. 2013) . The high prevalence seen in women may be due to weight gain from pregnancy, family planning, evidence of socio-economic status or physical inactivity, because they tend to send their house help, Children on errands, rather than doing it themselves.

High monthly income was documented to be a predictor of obesity and overweight, this may lead to them consuming more of pastries and carbonated food, reduce their exercise minutes (walk for less than 10mins) because they have cars etc.

PREVALENCE OF SELF REPORTED NCD

Among the civil servants, the prevalence of those that have been diagnosed of hypertension by an health worker was 24.1% which is close to what Ige et al's among university community in Ibadan (21.5%) (Ige et al. 2013), but differs from what Tagurum got in plateau, the prevalence of self- reported hypertension was 41 %(Tagurum et al. 2015) this difference may be because the respondent were mainly older people. The prevalence of self-reported hypertension in China (16%) (Pan et al. 2014) was also different (16%), low level of obesity might be the reason for this reduction.

Among civil servants, the prevalent of self-reported diabetes (6.2%) was similar to Tagurum et al and Pan et al's prevalence (5.1%) and (6.8) respectively.(Tagurum et al. 2015)(Pan et al. 2014) but is lower to what Ige et al got among university community staffs in university college hospital Ibadan (11%)(Ige et al. 2013). the difference in the prevalence may be due to high intake of carbonated drinks among UCH staffs in Ibadan.

PREVALANCE OF SELF –REPORTED CANCER SCREENINGS

The prevalence of self-breast examination among female civil servant in Ibadan was 48.3%, this is low when compared to other studies in Nigeria, Akhigbe et al recorded a prevalence of77.6% (Akhigbe & Omuemu 2009) and also Oche et al documented a prevalence of 54%(Oche et al. 2012), the reason for this difference may be because both studies were conducted among female health workers, the level of awareness among this population is quit high.

Mammography screening is low in Nigeria, among civil servants in Ibadan, the prevalence is 7%, Akhigbe et al documented a prevalence of 3.1 % among health workers (Akhigbe & Omuemu 2009), Oche et al's study documented that only 9 out 100 health worker has ever done a mammography screening(Oche et al. 2012), this result among health workers may rule out awareness as a reason for the low level of screening. This may be caused by the fact that it's expensive, ease of assess, and the technicality of the machine, level of awareness can also be a factor among non-health workers.

Pap smear examination was however also low among the civil servants (9.1%), in a study conducted in Anambra state, the prevalence was found to be 20.5% although still low(Ubajaka et al. 2015). Level of awareness, health seeking behaviour of the people.

From our study, the prevalence of prostate examination among male civil was 4%, similar studies conducted in Anambra and Uganda documented a prevalence of 6.4 %(Oranusi et al. 2012) and 2.8%(Nakandi et al. 2013) respectively. From this study, it was noticed that the level of awareness about prostate cancer was very low.

LIMITATIONS

This study nevertheless has a number of limitations

1. The cross-sectional study employed does not allow for the establishment of causality or temporality between the independent variables and outcome variables
2. The study is only a representative of civil servants in Ibadan city as such findings from this survey may not be generalizable to other urban settings within the country, Nigeria.
3. The elicited risk behaviour were self-reported as such respondent might tend to give answers that convey more favourable social behaviour.
4. Unavailability of a sampling frame. The list and total number of staff at the state secretariat could not be accessed due to the continuously on going staff validation at the time of the research.
5. Reliance on self-reported data on age, smoking status, alcohol consumption, salt intake and physical activity may have affected the findings by social desirability bias.

Despite the above listed limitations, this study provides information on the risk factor and prevalence of non-communicable diseases through the cadre of civil servants in Ibadan, highlights the need for preventive and promoting health care services and work place health promotion activities.

CONCLUSION

This study assessed the prevalence of risk factors for NCDs among 644 civil servants in Ibadan. Physical inactivity, unhealthy diet, high blood pressure, abdominal obesity, overweight & obesity were the most prevalent risk factors. Tobacco consumption and harmful use of alcohol was predominantly among men. While abdominal obesity, being overweight or obese was common among women.

Most of the cardio metabolic risk factors were associated with increasing age and ware gender specific. The predictors of hypertension among the population were age, family history of hypertension, level of education and obesity. The only predictor for diabetes was hypertension. Harmful use of alcohol, gender, age, and overweight/ obesity were predictors of abdominal obesity. Gender and level of income predicted obesity/overweight.

Self-reported hypertension had the highest prevalence, most these had been previously diagnosed before the study. However previous diagnosis of diabetes was low compared to hypertension.

Cancer screening practice among civil servants was very low. Especially among men, the prevalence of prostrate examination was extremely low. Mammography and Pap smear examination practice was also little. Although self-breast examination was practiced by almost half of the female respondents among the civil servant.

RECOMMENDATIONS

1. Awareness campaign and tailored nutrition education, with emphasis on the benefits of healthy eating for prevention of the burden of chronic diseases should be carried out among civil servants.

2. Effective smoking cessation programme should be introduced into the work environment to assist cigarette smokers quit smoking.

3. Age and gender specific public health strategies to promote healthy-living in the workplace are to be advocated for with concerned authorities.

4. There should also be an increase in awareness of the advantages of cancer screenings among the civil servants.

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/___

5th November, 2015

The Principal Investigator,
Department of Epidemiology& Medical Statistic,
Faculty of medicine,
University of Ibadan,
Ibadan.

Attention: Olawuyi Abisola

ETHICAL APPROVAL FOR THE IMPLEMENTATION OF YOUR RESEARCH PROPOSAL IN OYO STATE

This is to acknowledge that your Research Proposal titled: "Surveillance of Non-Communicable diseases Risk Factors among Civil Servants in Ibadan" has been reviewed by the Oyo state Review Ethical Committees.

2. The committee has noted your compliance. In the light of this, I am pleased to convey to you the full approval by the committee for the implementation of the Research Proposal in Oyo State, Nigeria.

3. Please note that the National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations, in line with this, 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 findings as this will help in policy making in the health sector.

4. Wishing you all the best.

OYO STATE RESEARCH ETHICS

Signature & Date

(Dr.) Abbas Gbolahan
Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethical Review Committee

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Questionnaire No: _____

SURVEILLANCE OF NCDS RISK FACTORS AMONG CIVIL SERVANTS IN IBADAN.

Respondent consent form

I am Olawuyi, Abisola. A postgraduate student of Epidemiology and Medical Statistics, Faculty of Public Health, College of Medicine, University of Ibadan. In partial fulfilment of the requirements for the award of the degree of Masters in Public Health, I am carrying out a research on Risk Factors for non-communicable diseases among civil servants in Ibadan.

Your sincere response is encouraged as participation in this study is voluntary, absolute anonymity and confidentiality shall be maintained the information provided will only be used for the research purpose if you have accepted to participate in the study.

Please indicate your interest by acknowledging the verbal consent.

Verbal consent; 1. Yes 2. No

_____ _____

Signature/Thumbprint of Participant Interview Date

	SECTION A: SOCIO DEMOGRAPHIC CHARACTERISTICS	
1	Sex	Male ☐ Female ☐
2	Age (at last birthday)	
3	Your ethnicity	Hausa ☐ Igbo ☐ Yoruba ☐ Others (specify) _____
4	Year of Birth	

5	Highest level of education	☐ No Formal Education ☐ Primary ☐ Secondary ☐Tertiary
6	Marital status	☐ Single ☐Married ☐Widowed ☐ Divorced
7	Average income in a month	☐< 20,000 ☐ 21,000 – 40,000 ☐ 41,000 – 60,000 ☐ 61,000- 80,000 ☐ 81,000-100,000 ☐ ≥100,000
8	Ministry	
9	Year of assumption of duty	
10	Cadre/grade/level	☐1-6 ☐ 7-12 ☐ 13-17

SECTION B NUTRITION AND DIETARY PATTERN

Please state the types of food **(past 24hrs dietary recall)**

1	Breakfast	
2	Lunch	
3	Dinner	

In the past 7 days, how many times did you consume any of the below

		Never	1-2 times	3-4times	5-7times
1	Vegetable e.g. ewedu, eforiro				
2	Starch e.g. Rice, Eba, Yam, amala				
3	Fried Foods e.g. potato chips, chinchin, fried plantain				
4	Dairy Products e.g. Milk, Cheese, Yogurt.				
5	Cereals e.g. Pap, Custard, Oat, Semovita, Wheat.				
6	Fruits e.g. Orange, Apple.				
7	Legumes e.g. Beans, Moinmoin, Soya.				
8	Carbonated Drinks e.g. Coke, Pepsi, Fanta.				
9	Beverages e.g. Malt, Malta Guinness.				
10	Pastries e.g. Meat pie, Dough nuts, hamburger.				
11	Do you regularly add salt to your already cooked meal	Yes ☐	No ☐		

PLEASE TICK/ FILL AS APPROPRIATE

SECTION C PHYSICAL ACTIVITY		
24	During the last 7 days, how many times were you at work	
25	How many hours do you normally sit on a typical day	
26	Which of the following best describes you activity at work	☐ Mainly Sedentary (Mostly Sitting with paper or computer) ☐Predominantly walking at one level (no heavy lifting) ☐ Climbing Stairs, Walking Uphill ☐ Lifting Heavy
27	Over the last 7days, how many days do you engage in carrying heavy loads, digging, soccer, jogging	_____ days per week (If Not applicable go to next question)
28	How much time did you usually spend doing this activity on a typical day	_____ hours/day _____ minutes/day
29	Thinking over the last 7 days, how many days do you engage in activities like cleaning, washing cloth/car, sweeping, climbing stairs	_____days per week (If Not applicable go to next question)
30	How much time did you usually spend doing this activity on a typical day	_____ hours per day _____ minutes per day
31	During the last 7 days, on how many days did you walk for at least 10 minutes at a time?	_____ days per week
32	How much time did you usually spend walking on one of those days?	_____ hours per day _____ minutes per day
33	During the last 7 days how much time did you spend sitting (e.g. at desk/computer, visiting friends, driving, watching TV/Movie)	_____ hours per day _____ minutes per day

SECTION D: BEHAVIORAL MEASUREMENT PART 1: TOBACCO USE		
	Do you currently take any tobacco products	☐ Yes ☐ No if no, move to Qu 41
35	If yes, which tobacco product do you take regularly	☐ Cigarette ☐ Marijuana ☐ Snuff ☐ Others (Specify) .....
36	If Cigarette, what is the name of the brand	
37	How frequently do you take this	☐ Daily ☐ Weekly ☐ Monthly
38	How frequently have you smoked in the last 30 days	☐ Less than once a week ☐ 1 – 2 times/week ☐ 3 – 6 times/week ☐ Everyday
39	If cigarette, how many sticks do you take per day	
40	At what age did you start smoking	
41	In the past, did you ever smoke	☐ Yes ☐ No (if NO, go to section E)
42	How old were you when you stopped smoking	
SECTION E ALCOHOL CONSUMPTION		
43	Do you currently take an alcoholic drink	☐ Yes ☐ No If No, go to qu50)
44	Which alcoholic drink do you frequently take (brand name)	
45	At what age did you start drinking	
46	Have you consumed an alcoholic drink within the past 30 days	Yes ☐ No ☐
47	In the last 30 days, how frequently did you take an alcoholic drink	☐ Less than once a week ☐ 1 – 2 times/week ☐ 3 – 6 times/week ☐ Everyday
48	During the past 30 days, how many standard alcoholic drinks bottles/can did you have during one drinking occasion	

49	Have you consumed more than 5 alcoholic drinks at a single sitting in the last 30days	Yes ☐ No ☐
50	Did you drink in the past	Yes ☐ No ☐
51	If yes, at what age did you start drinking	
52	How old were you when you stopped	

SECTION F HIGH BLOOD PRESSURE

53	Have you ever been told by a doctor or other health worker that you have high blood pressure or hypertension?	☐ Yes	☐ No
54	Are you currently receiving any of the following treatments/advice for high blood pressure prescribed by a doctor or other health worker?		
	1. Drugs (anti-hypertensive medication) that you have taken in the past two weeks:	☐ Yes	☐ No
	2. Advice to reduce salt intake	☐ Yes	☐ No
	3. Advice or treatment to lose weight	☐ Yes	☐ No
	4. Advice or treatment to stop smoking	☐ Yes	☐ No
	5. Advice to start or do more exercise	☐ Yes	☐ No
55	Is there any family history of hypertension among your first degree relatives	☐ Yes	☐ No
56	Have you ever been told by a doctor or other health worker that you have raised blood sugar or diabetes	☐ Yes	☐ No
57	Are you currently receiving any of the following treatments/advice for diabetes prescribed by a doctor or other health worker?		
	1. Drugs (medication) that you have taken in the past:	☐ Yes	☐ No
	2. Specially prescribed diet	☐ Yes	☐ No
	3. Advice or treatment to lose weight	☐ Yes	☐ No
	4. Advice or treatment to stop smoking	☐ Yes	☐ No
	5. Advice to start or do more exercise	☐ Yes	☐ No
58	Is there any family history of diabetes among your first degree relatives	☐ Yes	☐ No

SECTION G SCREENING (Tick as appropriate)

59	Female	Self-Breast Examination	☐ Yes	☐ No
		Mammography	☐ Yes	☐ No
		Pap Smear	☐ Yes	☐ No
60	Male	Prostate	☐ Yes	☐ No
		If yes which one_____		
61	Is there any family history of cancer	☐ Yes ☐ No		
	SECTION II; AVAILABILITY OF WORKPLACE HEALTH PROMOTION PROGRAMS ;			
62	Which of the following is available in your place of work			
	Free/subsidized health screening	☐ Yes	☐ No	
	Health Walk, Endurance Trek	☐ Yes	☐ No	
	Occupational Health Services (e.g. Staff Health Clinic)	☐ Yes	☐ No	
	Availability of Health Insurance Scheme	☐ Yes	☐ No	
	Health Talk/Free Health Living Advice	☐ Yes	☐ No	
	Smoking and Drinking Cessation Facilities	☐ Yes	☐ No	
	Stress management/Counselling Session	☐ Yes	☐ No	
	Work Free Days/Sick Leave	☐ Yes	☐ No	
FOR OFFICAL USE ONLY				
63	Weight			
64	Height			
65	Waist Circumference			
66	Hip Circumference			
67	Blood Pressure Reading 1 Systolic Diastolic			
68	Blood Pressure Reading 2 Systolic Diastolic			
69	Fasting Blood Sugar			