PREVALENCE OF HYPERTENSION AND DIABETES AMONG COMMERCIAL DRIVERS IN IBADAN METROPOLIS SOUTHWEST NIGERIA

BY

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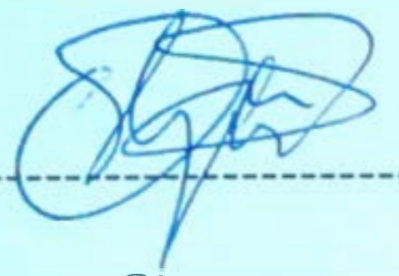

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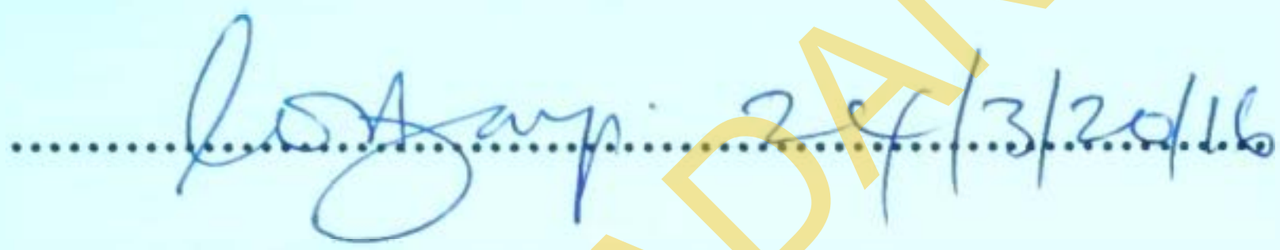

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DEDICATION

This work is dedicated to everyone living with hypertension and diabetes within the Ibadan Metropolis.

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ABSTRACT

Background: The incidences of hypertension and diabetes, major cardio-metabolic risk factors, are continually on the increase and contributing largely to global morbidity and mortality.The commercial drivers, by virtue of their job activities and environment are prone to the risk factors for these diseases. Due to the asymptomatic nature of these diseases, sufferers live with them undetected leading to cardio-vascular and cerebrovascular complications which could reduce productivity, and be fatal if it occurs while a driver is on duty resulting in accident. However, hypertension and diabetes have not been adequately studied among commercial drivers. Thus, this study was conducted to determine the prevalence of hypertension and diabetes among commercial drivers in Ibadan metropolis, South-West Nigeria.

Method: A cross-sectional study was conducted among 305 male commercial drivers selectedfrom the parks across the Ibadan metropolis using multistage sampling technique. A semi-structured interviewer-administered questionnaire was used to collect data on respondents' socio-demographic characteristics, work related characteristics, knowledge about hypertension and diabetes, family history of hypertension and diabetes and physical activity. Alcohol consumption and tobacco use were also assessed. The blood pressure, waist circumference, hip circumference, body weight, height and blood sugar level of respondents were also measured. Hypertension was defined as systolic blood pressure ≥140mmHg and diastolic blood pressure of ≥90mmHg and diabetes was defined as ≥126mg/dl fasting blood sugar. Data was analysed using descriptive statistics such as means, standard deviation and proportion. Association between categorical variable was tested using Chi square test.Level of significance was set at 5%.

Results: The mean age of respondents was 45.3±10.5 years. Majority, (92.1%) were married and 42.6% had secondary education. The commercial drivers drove for an average of six hours per day. 17.4% used stimulants. Overall, 40.0% of respondents had good knowledge about hypertension while 35.4% had good knowledge about diabetes. About 49.0% reported to have ever smoked while 77.7% had consumed alcohol and 31.1% and 22.0% reported frequent (≥4 days) fruits and vegetable consumption, respectively. About 41.0% and 56.1% reported they used palm oil and vegetable oil, re espectisly. The

prevalence of hypertension was 27.7% and diabetes was 3.4% while 42.9% of those with diabetes had comorbid state with hypertension. About 9.1% of those who had abdominal obesity had fasting blood sugar ≥126mg/dl compared to 6.1% of those who were not (p=0.003). Respondents with obesity (BMI >30kg/m^2) were one and a half times more likely to have hypertension compared with those who were not obese (AOR=1.5, CI95%: 0.61-3.83). The association between intake of extra salt (AOR= 0.06), consumption of vegetable oil (AOR= 0.03) and palm oil (AOR=0.01) with diabetes were also significant.

Conclusion: There was a high prevalence of hypertension and relatively low prevalence of diabetes among commercial drivers in Ibadan metropolis. Therefore, health awareness campaign and free health screening for early detection should be encouraged to reduce the incidences of diabetes and hypertension and their risk factors among this group of people.

Key Words: Commercial drivers, Ibadan metropolis, hypertension, diabetes, risk factors

Word Count: 474

LIST OF ABBREVIATIONS

NCDs – Non-Communicable Diseases

CDC – Centre for Disease Control

PWC - Price-Water House Cooper

NURTW - National Union of Road Transport Workers

JNCH - Joint National Committee on Hypertension and Treatment of High blood pressure

IDF – International Diabetes Federation

IPAQ - International Physical Activity Questionnaire

GDP - Gross Domestic Product

HSPH MIRT- Harvard School of Public Health Multidisciplinary International Research Training

BoL – Bureau of Labour.

LMICs - Low and Middle Income Countries

SSA - sub-Sahara Africa

SPSS - Statistical Package for Social Sciences

UNAIDS – United Nations Programme on HIV/AIDS

WHO – World Health Organisation

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Non-communicable diseases (NCDs) such as diabetes, hypertension, cardiovascular diseases and cancer have been reported as the major cause of death globally, and they accounted for 36 million (63%) of the 57 million deaths in 2008 (WHO, 2011). Non-Communicable Diseases have been associated with high morbidity and mortality rates with a surging burden in the sub-Sahara Africa, especially in the low-and-middle income countries (LMICs) where they make up 80% of the disease burden (HSPH MIRT, 2012).Risk factors such as physical inactivity, obesity, unhealthy diet, alcohol consumption, and cigarette smoking have been implicated in the epidemiology of NCDs.According to the WHO report on non-communicable diseases country profiles (2014), NCDs accounted for 24% of total deaths in Nigeria (WHO, 2014). Thus, a resident Nigerian has a 20% probability of dying from any of these major NCDs.

Hypertension and diabetes are the leading cause of cardiovascular diseases in the world (Kearney *et al.*, 2004; Kearney *et al.*, 2005). In Nigeria, hypertension is one of the major NCDs of public health importance which in adults has a huge effect on the quality of life of individuals and the economy (Castelli, 1984). It is a chronic medical condition, majorly of the heart. it is defined as a systolic blood pressure of ≥140mmHg and diastolic blood pressure of ≥90mmHg according to Joint National Committee on Hypertension and Treatment of High blood Pressure (JNCH, 1993). In view of the nature of their professional activity which involves exposure to stress, a sitting working mode, a shift and night work. the commercial drivers are at a higher risk of obesity and hypertension, and thus, indirectly, of carbohydrate metabolism disorders. such as diabetes mellitus (Zimmet *et al.*, 2001) leading to consistent absence from work which indirectly affects the individual's quality of life and the economy at large (Schmitt *et al.*, 2004).

The transportation industry makes a significant contribution to the development of any nation and can also serve as a proxy for measuring urbanization, and industrialization

(Olubomehin, 2012). In LMICs, the transportation industry is both a thriving and growing industry. With increased need to commute between places as a result of lifestyle changes, this has necessitated the increased demand for public transportation as many cannot afford to buy a vehicle or may prefer to commute. Furthermore, the transportation industry has employed a large number of teeming youths leading to a reduction in unemployment in most LMICs. However, the mental and physical health of some of these commercial drivers have been reported to be generally poor (Yan et al, 2014) as they usually have a challenging lifestyle due to the nature of their job; which includes distant travels, with long hours of sitting, little or no sleep, increased physical inactivity and unhealthy eating habit' (McDonough et al, 2014). In 2012, commercial driving was reported as the leading causes of occupation-related deaths among all-occupational deaths accounting for about 50% of all-work injury deaths in the U.S (Statistics BoL, 2013).

Risk factors such as obesity, physical inactivity, unhealthy eating, high blood pressure, sleep apnoea, diabetes and tobacco use have also been reported to be common among drivers, which not only affect but may impact on the costs, productivity and safety of the industry (Greene et al, 2009; Katzmarzyk and Janessen, 2004; PWC, 2008).

In a study carried out among bus and truck drivers in Iran reported that 42.9% and 7% of the respondents had hypertension and diabetes respectively (Saberi *et al.*, 2011). Makanjuola reported the prevalence of current use of alcohol among tanker drivers in Lagos, Nigeria as 57.6% and life-time tobacco use as 68.9% (Makanjuola *et al.*,2014). In China, a study conducted among taxi drivers reported a high prevalence in the behavioural risk factors for NCDs among the participants (76.5% were current smokers, 10.3% took alcohol frequently, 66.9% had irregular diets, and 85% reported no regular exercise; the average working time was 10.5 hours per day and the average sleeping time was 6.9 hours per day) and 44.7 percent of the study population reported chronic diseases (Yan et al, 2014). Oyeniyi in 2014 reported 9% prevalence for hypertension among commercial drivers in Jabi Park, Abuja. In the same study, the average driving time was 8 hours per day, 35% were past alcohol users while past smokers were 22%.

1.2 Problem Statement

Non-communicable diseases (NCDs) presently make up about 43% of the burden of diseases globally and it is projectedat 73% of all deaths by 2020. Moreover, more than 20 percent increase in NCD deaths has been projected between 2010 and 2020 in LMICs especially the African region (WHO, 2011). Many developing countries undergoing epidemiological transition are experiencing a rising prevalence in their NCD burden especially hypertension and diabetes which are also parts of the components of cardio-metabolic risk factors due to a wide adoption of westernized lifestyle.

In Nigeria, NCDs account for an annual death of about 36 million with cardiovascular diseases constituting about 17.3 million deaths followed by cancer - 7.6 million deaths, respiratory diseases- 4.2 million death and diabetes, 1.3 million deaths. Presently, 8 million Nigerians suffer from hypertension and 100,000 new cases of cancer are diagnosed every year in Nigeria (Nigeria Pilot, 2013).

Of the many risk factors that are implicated in the epidemiology of hypertension and diabetes, behavioural and physiological risk factors have been more prevalent. The behavioural risk factors include smoking, alcohol consumption, unhealthy diet and physical inactivity while the concerned physiological risk factors are obesity, increased waist to hip ratio, high blood pressure, hyperglycaemia and increased cholesterol level.

Transport workers have been reported to be at greater risk of an unhealthy diet and sedentary behaviour. Studies conducted among transport workers have reported increasing trend in the prevalence of these risk factors and their implications among professional drivers and those who carry both goods and passengers [Malinauskiene, (2003); Bigert et al., (2004); Uchsen et al., (2006)]. A recent study conducted among transport drivers in rural India showed that nearly half of all respondents consumed unhealthy diets, tobacco and alcohol; while majority lived sedentary lifestyles due to the nature of the job (Sharvanan et al., 2014). Makanjuola *et al.*, 2014 also reported a prevalence of 57.6% of alcohol consumption among tanker drivers in Lagos.

Therefore, there is a need to look into the prevalence of hypertension, diabetes and their risk factors among commercial drivers in order to provide the necessary information that

may inform instituting the right intervention which can be targeted towards this group in combating these risk factors.

1.3 Justification

Transportation makes up an important part of man's day to day activities, especially in the search for his basic needs of food, cloth and shelter, which synergizes to form the platform for all socio-economic interactions. It has an important place in the process of economic development. Road transport has made a significant contribution on the Nigeria economy especially in reducing unemployment, since the 1980s and it has been estimated that over 1.5 million people are engaged in the road transport sector and accounts for 90 percent of the sub-sector's contribution to the Gross Domestic Product (GDP) (Nigeria Bureau of Statistics, 2013).

People in the low socio-economic group are mostly affected by NCDs as a result of their poor access to policies, legislations, regulations and healthcare services meant to combat NCDs.However, drivers are more at risk of developing risk factors for cardiovascular diseases, especially hypertension and diabetes, and their corresponding complications due to the nature of their working condition, which poses imminent danger; not only to them, but that of the community – a trend which will eventually takes its toll on the economy - as they are more exposed to factors such as physical inactivity, prolonged working hours, and poor dietary pattern (Zimmet *et al.*, 2001). This results in loss of productivity by a decreasing labour force with implications at the macroeconomic level.

For effective preventive strategies in fighting NCDs, there is need for the provision of information on the distribution of the risk factors and their burden among different populations. Thus, conducting surveys among different vulnerable groups will provide evidence based decision making on what, and monitoring of intervention to combat the menace of NCDs.

Also, no comparative study has been carried out between the intra city and intercity drivers to ascertain whether there is a difference in the level of exposure to the risk factors

of cardiovascular diseases or prevalence of any of hypertension and diabetes as well as their specific risk factors.

Thus finding out the prevalenceof hypertension and diabetes among commercial drivers and comparing this prevalence among inter and intra-city commercial drivers for any difference in exposure may identify focus of intervention and also suggest that the use of a universal intervention for all drivers may not be appropriate in combating the menace of hypertension and diabetes.

1.4 Research Questions

1. What are the risk factors for hypertension and diabetes among commercial drivers in Ibadan metropolis?
2. What is the level of knowledge of risk factors that may predispose to hypertension and diabetes among the commercial drivers?
3. What are the attitudes of commercial drivers towards the risk factors for hypertension and diabetes?
4. Is there any association between travel distance and the prevalence of these risk factors
5. Do commercial drivers engage in prevention practices for hypertension and diabetes?

1.5 OBJECTIVES

Broad Objective

To determine the prevalence of hypertension and diabetes, as well as their risk factorsamong commercial drivers in Ibadan.

Specific Objectives

1. To determine the prevalence of hypertension and diabetes among commercial drivers.
2. To assess the level of knowledge of risk factors for hypertension and diabetes among commercial drivers.

3. To identify the factors which independently associate with hypertension and diabetes among commercial drivers.
4. To determinethe association between travel distance and occurrence of road traffic accidents.

CHAPTER TWO

LITERATURE REVIEW

2.1 What are Non-Communicable Diseases (NCDs)?

These are chronic conditions that do not result from an (acute) infectious process with a prolonged course, that does not resolve spontaneously, and for which a complete cure is rarely achieved (McKenna, et al, 1998). Their characteristics are complex etiology (causes), multiple risk factors, long latency period, non-contagious origin (non-communicable), prolonged course of illness and functional impairment or disability.

Non communicable diseases (NCDs) are the leading cause of morbidity and mortality worldwide. NCDs, which include cancer, diabetes, cardiovascular diseases, back pain among others have been associated with multiple risk factors and behavioural change like smoking, unhealthy diet, physical inactivity and alcohol consumption. Of the 57million deaths that occurred globally in 2008, 36 million (almost two thirds) were due to NCDs, comprising mainly cardiovascular diseases, cancers, diabetes and chronic lung diseases (Sharvanan *et al.*, 2014). Of all global deaths, 31 percent (15 million deaths per year) is represented by cardiovascular diseases and stroke, 79 percent (11 million) of which is from the developing countries (Salin *et al.*, 2001). In South Africa, a study conducted among a group of older adults (50 years and above) reported 51.8 percent prevalence of NCDs (Nancy *et al.*, 2013).World Health Organization (WHO) reported a huge 53 percent mortality and 44 percent of disability adjusted life-years (DALYs) lost in 2004 due to NCDs (Reddy *et al.*, 2005), and it has been predicted to cause the death of two thirds of the India population in 2030 (Patel *et al.*, 2011).

The majority of cardiovascular disease (CVD) is caused by modifiable risk factors, such as high blood pressure, cholesterol, overweight /obesity, tobacco use, lack of physical activity and diabetes. In terms of attributable deaths, the leading CVD risk factor is raised blood pressure (to which 13 per cent of global deaths is attributed), followed by tobacco use (9 per cent), raised blood glucose (6 per cent), physical inactivity (6 per cent) and overweight and obesity (5 per cent) (Mendis *et al.*, 2011). In Nigeria, a study reported the prevalence of hypertension and diabetes mellitus in a community survey to be 31.8% and

3.9% respectively (Ogah *et al.*, 2013); and obesity as 27% (Oladimeji *et al.*, 2014). Oyeniyi 2014 (unpublished), reported a prevalence of hypertension and diabetes in a study carried out commercial drivers in Abuja to be 9% and 9.9%, respectively.

2.2 HYPERTENSION

Hypertension is a chronic medical condition, majorly of the heart, defined when the blood pressure is increased to a systolic blood pressure of ≥140mmHg and diastolic blood pressure of ≥90mmHg according to Joint National Committee on Hypertension and Treatment of High blood Pressure (JNCH, 1993). It is a major important global public health menace (Wolf-Maier *et al.*, 2003) which has been reported to be a main threat to the sub-Saharan Africa population resulting in high morbidity and mortality among them (Cooper and Rotimi, 1997) and by 2025, the developing countries will make up about 75% of the world's hypertensive population (Kearney *et al.*, 2005). It is one of the major risk factors for cardiovascular diseases (Cavagioni and Pierin, 2010) which are the main causes of morbidity and mortality in developed countries and are arising as a leading public health problem in developing countries(WHO, 2002).Globally, around 22% of adults aged 18 and over had raised blood pressure in 2014 (WHO, 2014). Hypertension is the most common cardiovascular disease in Nigeria (Mukadas and Misbau, 2009). The prevalence of hypertension ranges from 8% to 46.4% in Nigeria (Ogah *et al.*,2012), was 47.5% in Cameroun (Dzudie *et al.*,2012), 25.4% to 41.1% in Tanzania (Edwards *et al.*,2000), 28.7% in Accra (Amoah, 2003) to 32.6% for blacks in the United States (Olatunbosun *et al.*, 2000). Hypertension has been associated with various factors, including age, gender, family history, alcohol consumption, smoking, obesity, level of education, and occupation. In a National Survey Report (Whitworth and WHO, 2003), the prevalence of hypertension in the rural and urban were reported to be 5-7% and 17-20% respectively which is obviously high in the urban setting. Also, a review carried out by Ogah *et al* (2012) reported the prevalence of hypertension inthe urban (8.1%-42.0%) and rural setting (13.5%-46.4%).Among commercial drivers, hypertension has also been implicated in increased risk for acute life-threatening events, thus resulting in heightened auto-crash risk (Hegmann *et al.*, 2012). In a study conducted among drivers who carry loads over a long distant in Brazil, the prevalence of hypertension was found to be 37.2%

(Cavagioni and Pierin, 2010). In Nigeria, hypertension is the main risk factor for stroke, heart failure, ischemic heart disease, and kidney failure. With an increasing adult population as well as rising prevalence of hypertension, Nigeria will experience economic and health challenges due to the disease if the trend is not arrested (Ogah *et al.*, 2012). Hypertension is usually asymptomatic, thus it is been called the "silent killer" because it often go undetected with no warning signs or symptoms (CDC, 2011) and thus, responsible for many accidents by commercial driver suffering from hypertension.

Good knowledge of blood pressure play an important role in the effective control of hypertension and the prevention of complications related to the disease (Kjellgren *et al.*, 1997). However, studies have reported lack of adequate knowledge of hypertension even among professional (Mitwalli *et al.*,2013) but in a study conducted among pharmacists in Jos reported that 90% of the respondents had good knowledge of hypertension and its associated risk factors (Abah *et al.*,2014).

2.2.1 Risk Factors of Hypertension

2.2.1.1 Behavioural Factors

Such risk factors that have been implicated in the incidence of high blood pressure include smoking, alcohol consumption, poor dietary intake and physical inactivity which have all been found to be prevalent among individuals in the transportation sector espccially commercial drivers. These factors known as behavioural factors contribute immensely to the occurrence of road traffic accidents among commercial drivers which, according to WHO, estimated deaths from road traffic accidents is expected to increase by 65% by 2020 and as high as 80% in developing countries (Ghaffar, 2013).

Increased prevalence of smoking, alcohol consumption among commercial drivers (Oyeniyi, 2014) as well as obesity may also result in musculoskeletal compromise, and the association with elevated body mass index (BMI) and crashes has been documentcd (Wiegand *et al.*, 2009). These and other medical conditions pose potential risk for the drivers and other individuals on the road while the driver is on duty (Abu Dabrh *et al.*, 2014).Alcohol use for a long period of time may be directly responsible for some organ

diseases, or contribute to the development of liver cirrhosis; cancer of the mouth, pharynx, oesophagus and pancreas and result in increased risk of accidents and suicide.

The rising level of sodium intake, taken as common or table salt, has been implicated in the prevalence of raised blood pressure and some other cardiovascular health issues. Level of salt intake has been associated to rise with increasing age (Ian *et al.*, 2009). Three-quarter or more of the sodium intake level has been attributed to the sodium content in processed restaurant foods (James *et al.*, 1987; Mattes and Donnelly, 1991).

Globally, 30% of preventable morbidity and mortality from all NCDs, including hypertension, were attributable to physical inactivity and consumption of unhealthy diet (World Health Day, 2015). The promotion of foods made up of fruits, vegetables, low-fat dairy products and reduction of meat consumption, sweets, sugar and salt has been said to reduce the mean population blood pressure (Appel *et al.*,2006; Srinath and Katan, 2004). Increased body mass index and waist-hip ratio has been said to be caused by over-weight due to sedentary lifestyle which are associated with hypertension and other cardiovascular diseases (Mushtaq *et al.*,2011).

2.2.1.2 Other risk factors

These include diabetes mellitus, target organ damage, associated cardiovascular and renal diseases which greatly increases the risk of developing hypertension. Also, family history of cardiovascular diseases and dyslipidaemia are also implicated in the epidemiology of hypertension (Stamler *et al.*, 1986). Socio-demographic factors such as age and socio-economic status have also been labelled as risk factors for the development of hypertension.

2.2.1.3 Classification of Hypertension

Classifying hypertension is dependent on the mean of two or more blood pressure readings properly taken in a seated position at two or more visits. For adults, ≥18 years, normal blood pressure is defined as systolic blood pressure <120mmHg or diastolic blood pressure <80mmHg. Systolic blood pressure of 120-139mmHg or diastolic blood pressure

80-89mmHg is classified as prehypertension. Hypertension is defined as systolic blood pressure ≥140mmHg or diastolic blood pressure ≥90mmHg. It is categorised into two:

- Stage 1 hypertension which is defined as systolic blood pressure 140-159mmHg or diastolic blood pressure 90-99mmHg.
- Stage 2 hypertension is defined as systolic blood pressure ≥160mmHg or diastolic blood pressure ≥100mmHg (WHO, 2004).

Table 2.1: Classification of blood pressure for adults aged ≥18years

BP Classification	Systolic BP (mmHg)		Diastolic BP (mmHg)
Normal	<120	Or	<80
Prehypertension	120-139	Or	80-89
Stage 1 hypertension	140-159	Or	90-99
Stage 2 hypertension	≥160	Or	≥100
Isolated systolic hypertension	≥140	And	<90

Source: Chobanian et al., 2003.

2.2.1.4 Signs and Symptoms of Hypertension

Usually, hypertension is asymptomatic but general symptoms include headache, confusion, vision disorders, drowsiness, nausea, excessive sweating and vomiting. Commercial drivers suffering from hypertension may develop these symptoms which could lead to road traffic accidents. This does not endanger only their lifes but that of the passengers and other peadestrians.

2.3 DIABETES

One of the major emerging health problems in the world is diabetes, a condition due to glucose impairment as a result of the pancreas not being able to secrete a hormone called insulin or because cells do not respond to the insulin that is produced (Shoback, 2011). Fasting blood sugar ≥126 mg/dl was defined as diabetes (WHO). Worldwide, its incidence and prevalence is increasingat an alarming rate and reaching epidemic rates (Unadike and

Chinenye, 2009).Globally, around 9% of adults aged 18 and over had raised blood glucose in 2014 (WHO, 2014). Overall it is estimated that 8% to 10% of people over 50 years old worldwide have diabetes (Dirks and Robinson, 2006). It was estimated that, in 2004 and 2010, 3.4 million people died from the result of diabetes (WHO, 2009 and WHO, 2013), more than 80% of the deaths occurred in the LMICs (Mathers and Loncar, 2006). In 2011, the WHO African region reported that 14.7 million adults were suffering from diabetes causing 344,000 deaths (WHO, 2013). In Nigeria, there is a rising trend in the prevalence of diabetes ranging from0.65% in rural Mangu village, Plateau State to 11.0% in urban Lagos (Akinkugbe, 1997) while in 2003, it was estimated to be about 2.2% (Nyenwe *et al*., 2003). According to the report by International Diabetes Federation (IDF) in 2013, there were 3.9 million cases of diabetes in Nigeria, the highest in Africa, with a national prevalence of 4.9% showing that 80% of diabetes deaths occurred in the LMICs and by 2030, diabetes will be the 7th leading cause of death in the region (IDF, 2013).

Factors responsible for this increase include urbanization, adoption of unhealthy Western lifestyles with reduced physical activity, sedentary lifestyles, and excessive intake of calories which contributes a high quota to the incidence of obesity, risk factor for the development of diabetes.Diabetic individuals are at a high risk of different disease states such as heart diseases, blindness, nerve disorders, kidney diseases, gangrene(Adetuyibi, 1976, Alberti et al 1975, Hamstem and Steiner 1994, Amos et al 1997, Edward and Raffaele 1996).

In some of the poorest regions in the world such as Africa, where infectious diseases have traditionally been the focus of healthcare systems, diabetes cases are expected to increase by 90% by 2030 (International Diabetes Federation , 2012). At least 78% of people in Africa are undiagnosed and do not know they are living with diabetes (International Diabetes Federation, 2012). Saberi et al, in 2011, reported a prevalence of 7% for diabetes in a study conducted among bus and truck drivers in Iran. In a study carried out among interstate commercial drivers in Jabi park, Abuja, 9.9% of the respondents were reported to have a high fasting sugar (Oyeniyi, 2014 unpublished) while Marcinkiewicz and Szosland in 2010 reported a prevalence of 47.5% among transport drivers in Poland.

2.3.1 Risk factors of Diabetes

Factors implicated in the epidemiology of diabetes are obesity (Isara and Okundia, 2015), hypertension (Marcinkiewicz and Szosland, 2010), and increasing age (Akinjimi *et al.*, 2014). Individuals with body mass index $\geq$30kg/m^2 are more at risk of developing diabetes. Marcinkiewicz and Szosland, in a study carried out among bus drivers in Poland, reported the odd of developing diabetes among people 45 years and above as 2.91 and that 39.3% of the study population had both obesity and hypertension. Also, their study revealed that obesity is an independent risk factor for hyperglycaemia especially when combined with hypertension.

In a study conducted among older adults (18 years and above) in New Delhi, it was found that 26% were consuming alcohol and 17% were smoking, 77.5% had a raised waist circumference, fasting blood sugar levels were found to be raised in 18% of the study population (Ankur et al, 2014).

2.4 Risk Factors of Cardiovascular Diseases

A risk factor is defined as an attribute, characteristic or exposure of an individual which increases the likelihood of developing a disease or injury. Risk factors are either non-modifiable such as genetic endowment, race, age and sex or are modifiable by behaviour or other interventions such as changing diet, use of exercise and reduction of tobacco and alcohol use.

Some of the NCD risk factors are usually represented in individuals, usually in synergy with others (e.g. physicalinactivity often clustering with poor diet and smoking). Furthermore, a relatively limited set of risk factors account for a large fraction of the risk of NCD in the population. It has been estimated, for example, that, social class, tobacco and alcohol use, obesity, blood pressure and diabetes explain about half of the variance in stroke in men and two thirds in women.

2.4.1 Alcohol Consumption

Alcohol use for a long period of time may be directly responsible for some organ diseases, or contribute to the development of liver cirrhosis; cancer of the mouth, pharynx, oesophagus and pancreas and result in increased risk of accidents and suicide.

The harmful use of alcohol results in the death of 3.3 million people annually. There are 60 different types of diseases where alcohol has a significant causal role. It also causes harm to the well-being and health of people around the drinker. In 2010, the worldwide total consumption was equal to 6.2 litres of pure alcohol per person 15 years and older

InNigeria, the common use of alcohol (and other psychoactivesubstances) among commercial and long distance vehicle drivers has been reported from many studies(Makanjuola *et al.*, 2007). Omolase et al, 2011 found aprevalence of 32% of alcohol drinking prior to driving.The Global action onHamful drinking reported the prevalence of current drinking by commercialdrivers in Nigeria (from Port Harcourt and Ile-Ife) as 67.2%. Of thosedrivers, 47% were "heavy" users, 15.3% were "moderate" users and 37.7%were occasional or "mild" users. In addition, Gboyega (2012) found thatbetween 60% and 70% of commercial drivers engage in drinking anddriving. Makanjuola *et al.*, (2007) reported that driving was done inconjunction with the use of the following psychoactive drugs: alcohol(15.9%), tobacco (30.4%), cannabis (4.3%), caffeine (31.9%), sedatives(10.1%) and solvents (8.7%).

2.4.2 Diet

Parks, 2009 highlighted the significant of nutrition as the cornerstone of socio-economic development, as the science of food and its relationship to health.

Poor quality of diet - especially increased salt intake, high intake of saturated fats, and low consumption of fruits and vegetables – is a key risk factor for the development of NCDs (Cecchini *et al.*, 2010) leading to mortality worldwide (Lim *et al.*, 2012). Reduction in salt intake to 6g/day could lead to a annual reduction of about 2.5 million deaths globally (He *et al.*, 2010), and a 15 percent reduction in salt intake for over a decade will prevent about 3.1 million deaths in LMICs (Asaria *et al.*, 2007). Inadequate consumption of fruits and

vegetables contributes to 2.7 million NCD related deaths annually (Hall *et al.*, 2009). A highly saturated fat diet increases blood cholesterol concentration by 15 to 25 percent (Arthur and John, 2000).

2.4.3 Smoking

Continuous smoking has been implicated in the development of lung and other respiratory diseases. A study conducted among staff of an urban University in South-West Nigeria reported a prevalence of 1.9% smoking as one of the risk factors of NCDs (Ige *et al.*, 2013). In 2007, Makanjuola *et al* reported that long distant drivers use psychoactive active drugs, especially when on the job, such as include alcohol, tobacco, cannabis, caffeine, sedatives and solvents, of which tobacco use had a prevalence as high as 30.4% (Makanjuola *et al.*, 2007). Among taxi drivers in Jinchang, China, approximately 76.5% of the respondents reported current smoking (Yan *et al.*, 2014). Smoking was reported to be the cause of 5 million premature deaths in the world, 4 million of who were men (Ezzati and Lopez, 2003).

2.4.4 Physical Inactivity

About 31% of the world's population does not get enough physical activity. This is as a result of the social and economic changes like aging populations, transportation, and communicationtechnology, thus contributing to this trend (*http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html*). In 2010, about 23% of adults (18 years and above) were reported to be insufficiently active physically (WHO, 2014). The lack of sufficient physical activities has been implicated, in conjunction with other behavioural risk factors, in the aetiology of obesity. The physical activity transition currently taking place in most urban cities is complicated by socio cultural beliefs in which obesity and overweight are admired traits and seen as a sign of wealth, prestige and the 'good life'.About 6-10 percent of the major NCDs worldwide is attributable to physical inactivity (Lee *et al.*, 2012).

2.4.5 Body Mass Index (BMI)

Globally, around 39% of adults aged 18 and over were overweight (BMI >25 but <30kg/m^2) in 2014 (WHO, 2014). For each 10% increase in body weight, there is an approximate 20% increase in the incidence of coronary heart diseases (Lotufo, 2000). Obesity (BMI ≥30kg/m^2) is one of the main risk factors for other non-transmissible illnesses like type 2 diabetes mellitus and should be considered a chronic illness and a public health problem (Cavagioni and Pierin, 2010). An increase in the BMI is an increase in the risk of developing health complications. Doll *et al* in 2002 reported that systolic and diastolic blood pressure increase linearly over the BMI range and obesity has been recognize to be an independent risk factor for the development of cardiovascular diseases (Wofford *et al*., 2012), diabetes inclusive.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Area and Site

Ibadan is the capital of Oyo State, located in south-western, Nigeria. It is the third largest city in Nigeria by population after Lagos and Kano with a population of 2.949 million according to the 2011 estimates (Nigeria Demographic Profle, 2014). At Nigeria's Independence, it was the largest and most populous city in the country and the third in Sub-saharaAfrica (SSA) after Cairo and Johannesburg. The inhabitants of the city are predominantly of the Yoruba ethnic group and the city is presently made up of eleven (11) local government areas. Ibadan is made up of several institutions: academics (University of Ibadan, The Polytechnic Ibadan, Lead City University among others); health (University College Hospital, General Hospital Adeoyo, Molly Private Hospital among others) just to mention a few. The commercial transport system is governed by the umbrella of the National Union of Road Transport Workers (NURTW), although private transport companies also exist. This study recruited its participants from the parks governed by NURTW. There are approximately 25 NURTW operated parks each of which has taxi and interstate units. The parks are located at strategic areas in the city where passengers can easily access them. Various activities go on at these parks as they do not only accommodate commercial drivers, union workers and touts("agberos") also perform their specific functions. Drivers wait on queue/ turn in a consecutive manner to collect tallies for their loading position in order to get passengers to transport. The union workers give out tallies to the registered members of their park while the touts ("agberos") are the ones who direct passengers to the vehicle going to their destination and also help them with their luggages. though their activities have been associated with thefts, pocket lifting. missing luggages etc. Traders, made up of food vendors, hawkers of different kinds of goods, those who sell cigarettes and alcohol as well as herbal concoctions made of alcoholas well as those who deal in illegal goods and even illicit drugs are always found in the parks.

3.2 Study Design

A cross sectional study design was used for this study.

3.3 Study Population

Intra-city and Inter-city motor and bus drivers in motor parks within the Ibadan metropolis constituted the study population in this study.

3.3.1 Inclusion Criteria

- All drivers who were >18 years of age
- All drivers in the selected parks, registered with NURTW.

3.3.2 Exclusion criteria

Drivers not available for interview over the period of the visit

3.4 Sample Size Determination

Using $N = \frac{Z^2_{\alpha/2} pq}{d^2}$ (Kish, 1965)

where N = number of participants to be enrolled

z = standard normal deviate set at 1.96 [corresponding to 95% confidence interval];

p = 9% prevalence of hypertension among commercial driversfrom a previous study (Oyeniyi, 2014)

q = 1-p; (0.91)

d = degree of accuracy desired at 0.04 level).

$$\frac{(1.96)^2 \times 0.09 \times 0.91}{(0.04)^2}$$

$$= 196$$

Adjusting for a 10% non- response rate:

N(r/1-r)

Minimum number of respondents = 196 *x* 1.11111

= 218

Therefore, a minimum number of 218 commercial drivers were recruited for this study.

3.5Sampling Technique

A multistage sampling technique was used to select the subjects for this study

Stage 1: The NURTW has about 25 parks within Ibadan metropolis. 15 of these parks were selected randomly from the list of all the parks.

Stage 2: Proportionate allocation was used to determine the number of respondents (n) selected from each park, the sample size (N) was divided by the number of selected parks

Sample size (N) = 218 = 15 drivers.
Number of parks 15

Stage 3: A total of 15 drivers were recruited from each park.Respondents from each park were randomly selected by ballotingusing the list of drivers who were in the park on the day of interview.In a park, five different drivers were selected for the study everyday for three days. Repetition of respondents was prevented by using their union identification cards for registration. This procedure was repeated for all the 15 parks visited.

3.6 Data Collection Method

Data was collected from respondents using a semi-structuredinterviewer administered questionnaire (see Appendix 2). Information on socio-demographic characteristics, dietary pattern, physical activities, alcohol consumption, smoking habits (past and/or present) and knowledge of the risk factors for hypertension and diabetes were elicited from respondents. Assessment of respondents' biochemical indices (fasting blood glucose); anthropometric measures (weight, height, and waist and hip circumference) and blood pressure were also determined using standard instruments. The questionnaire was adapted

from the WHO STEPwise questionnaire (WHO, 2012).The WHO Stepwise questionnaire is an instrument used for NCD risk factors surveillance among different populations. It was developed for developing countries to monitor and evaluate various interventions for combating NCDs. It is divided into 3 different steps/sections?

Step 1 consisted of general, socio-demographic information and behavioural lifestyle; Step 2 consisted of physical and anthropometric measurement; Step 3 included information on biochemical parameters.

The questionnaire was translated to the local language of the community, Yoruba and back-translated to English to ensure accuracy of translation. Also, the questionnaire was pretested among 20 commercial drivers in Ikire town to ensure comprehensibility, clarity as well as identify other issues peculiar to the population which were not included in the questionnaire before using it for this study which aided the reduction of threats to reliability. The internal consistency of each item on the questionnaire was 0.873 using Cronbach's Alpha on SPSS version 16.

Four research assistants were recruited and trained to carry out the interview in this study. One-day training was carried out for them on how to interview the respondents and encourage them to respond to all the questions and on the issue of confidentiality of the respondents' information.

Data management plan involved data entry and protection, data cleaning, and data back-up to an external hard-drive.

3.7 Blood Pressure and Anthropometry measurements

3.7.1 Blood pressure (BP) Measurements

Blood pressure was measured while participants were in a sitting position, using an M4 Omron automatic blood pressure device. This was done after the respondent had had about 15mins of rest with legs uncrossed after whichthe blood pressure readings, made up of the systolic and diastolic blood pressure readings, were consistently taken from the left arm, three times at 5 minutes interval between 6 am and 8am. The average of the last two readings was estimated and used in the analysis (WHO Guideline, 2012). High blood pressure was classified as BP of ≥140/90 mmHg (JNCH, 1993).

3.7.2 Weight measurement

Weight measurement was taken using a bathroom weighing scale (HANA) placed on a flat hard surface. Participants were instructed to remove any heavy clothing (such as coats), car keys, coins and shoes and stand still on the weighing scale, with hands by their sides looking straight. The weighing scales were calibrated daily according to manufacturer's instructions. Measurement was taken to 0.1kg (WHO Guideline, 2012).

3.7.3 Height measurement

Height was measured using a stadio-meter. Participants were 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 stadio-meter by placing a flat ruler over the head to meet the stadio-meter's calibration. Measurement was to 0.1cm (WHO Guideline, 2012).

3.7.4 Body Mass Index (BMI)

The BMI was determined as weight (in Kilograms) divided by height (in meters) squared (m^2). The BMI results were categorized as: obesity if the BMI was ≥ 30 kg/m^2; Overweight if the BMI was > 25 but < 30 kg/m^2, and normal if the BMI is between 18-25 kg/m^2 and underweight if < 18 kg/m^2 (WHO Guideline, 2012).

3.7.5 Waist-Hip Ratio (WHR)

WHR was estimated as waist circumference (in cm) divided by the hip circumference (in cm). Central obesity was defined as WHR >0.85 for females and >0.90 for males (WHO, 2012).

3.8 Laboratory Test

In addition to the questionnaires and anthropometric measurements, consenting participants had their blood sample taken with the help of a trained phlebotomist. Fasting blood glucose test was performed on their samples as dictated by WHO Step risk factor surveillance guidelines. Blood samples were collected from respondents by pricking their fingers with new Acucheck lancet for two drops on the Acucheck strip which was

analysed on the Acucheck glucometer machine to give a reading in mg/dl. Diabetes was defined as fasting blood sugar ≥126mg/dl (WHO, 2012).

3.9 Study Variables

3.9.1 Dependent Variables

Prevalence of hypertension and diabetes

3.9.2 Independent Variables

Risk factors of hypertension and diabetes (smoking, alcohol consumption, physical inactivity and diet)

Socio-demographic characteristics

3.10 Operational Definition

3.10.1 Physical inactivity (sedentary living): Physical activity was computed using the following criteria:

For sedentary activity (e.g walking) = 3.3 {time of activity x number of days of activity} per week. For moderate activity (washing, climbing) = 4.0 {time of activity x number of days of activity} per week. Vigorous activity (playing football, jogging) = 8.0 {time of activity x number of days of activities} per week. Physical inactivity was calculated as < 600 mets-mins/per week. Moderate activity was calculated as 600 – 1,499 mets-mins/per week Vigorous activity was calculated as ≥ 1,500 mets-mins/ per week (IPAQ, 2004)

3.10.2 Excessive alcohol intake: Respondents who reported an average daily alcohol consumption of >1 drink(for females respondents) and >2 drinks (for male respondents). One drink was defined as one shot of spirits (gin or local gin), one glass of wine or half a bottle of beer. Current drinker was measured as taking at least one shot of spirit/ one glass of wine/half bottle of beer everyday or some days in the last 30 days (WHO Guideline, 2012).

3.10.3 Smoking status: Smoking status was determined using current smoking measured as smoking cigarettes every day or some days in the last 30 days.

3.11 Data Analysis

All analysis was performed using Statistical Package for the Social Sciences (SPSS) version 16. Descriptive statistics such as frequency distribution, proportions and percentages were used to summarise the data and inferential statistics such as Chi square test was used to test for associations between categorical and continuous variable. Multiple regression analysis was carried out to determine predictors of hypertension and diabetes among commercial drivers. Results were interpreted as statistically significant at 5% level or less ($p<0.05$). Questions on knowledge were scored to give an aggregate score of 13. Respondents with score less than 10 were categorized as having poor knowledge while those with scores between 10 and 13 were said to have good knowledge. Results were presented in tables and charts.

3.12Ethical Considerations

Ethical approval for the study was obtained from the Ethical Review Committee, Ministry of Health, Oyo State (see Appendix 3). Permission for study was obtained from theNURTW branch chairman of the parks selected for the study

Informed consent:Written informed consent was obtained from all participants. The informed consent form (see appendix 1) was translated into Yoruba, and back-translated to English to ensure correct translation.

Confidentiality of data: Confidentiality of participants' information was ensured by adopting a de-identified approach to data handling, with the use of unique identifiers for study participants.

Beneficence to participants: All participants received counselling on the importance of maintaining a healthy weight and engaging in a healthy lifestyle. Each consenting participant was able to know their sugar level and blood pressure and those requiring attention were advised to see a doctor accordingly.

Non-maleficence to participants: The risk of harm to study participants was estimated as low. Participants with obesity and/or high blood pressure were advised and where possible referred to a specialist for care. Password protected computerized systems were used for data management.

Voluntariness: Participation in this research is entirely voluntary. Eligible individuals were assured of their choice to participate in the study or not and were informed that they can withdraw at any stage of the interview.

CHAPTER FOUR

4.0 RESULTS

4.1Socio-Demographic Information of Respondents

A total number of 305 male respondents were recruited for this study. Table 4.1.1 shows the socio-demographic characteristics of the respondents. Results showed that majority of the respondents were married (92.1%) with 32.1% belonging to the age group 36-45 years. The age range of respondents was between 20-76 years with a mean age of 45.3±10.5 years. More than half of the respondents (64.9%) practiced the Islamic religion while 33.8% and 1.0% belong to the Christian and traditional religion respectively and are predominantly of the Yoruba ethnicity (94.4%). Almost half of the respondents (42.6%) had a secondary level of education, 31.8% of the respondents earned ₦30,000 and below every month and 52.8% of them had an average of three adults, including themselves in their household.

Table 4.1.1 Distribution of Socio Demographic of Respondents

Characteristics	Frequency	Percentage (%)
Age group (years)*		
< 35	63	20.7
36-45	98	32.1
46-55	79	25.9
>55	54	17.7
Missing	11	3.6
Marital Status		
Married	281	92.1
Others	17	5.5
Missing	7	2.4
Educational Status		
No formal Education	23	7.5
Primary	129	42.3
Secondary	130	42.6
Tertiary	19	6.2
Missing	4	1.2
Ethnicity		
Yoruba	288	94.4
Others	17	5.6
Religion		
Christianity	103	33.8
Islam	198	64.9
Traditional	3	1.0
Missing	1	0.3
Income*		
≤ 30000	97	31.8
31000 – 60000	86	28.2
>60000	93	30.5
Missing	29	9.5

*Age range: 20-76 years.

* Income range: ₦5,000-₦750,000.

4.2 Work-related Characteristics of Respondents

Tables 4.2.1 and 4.2.2 show the distribution of work related characteristics among respondents. Among the 305 respondents, more than half (66.6%) were intercity commercial drivers while the others plied routes within Ibadan metropolis (33.4%). The commercial drivers, both intercity and intra-city drivers, drove a median distance of 210 (IQR: 140-400) km for about 6 (IQR: 4-8) hours per day (by using median distance driven). The use of stimulants was high among the intercity drivers (71.7%) compared to intra-city drivers (28.3%) and more than half of the intercity drivers have been involved in road traffic accidents (71.4%). The average distance driven by the intercity drivers was 481.7km for about an average of 6.1 ± 2.8 hours per day compared to the intra-city drivers who drove an average distance of 131± 74.8 km for 6.5±1.5 hours per day. The mean number of hours spent driving without stop per day by both the intra-city and intercity drivers was 0.7±1.1 hours per day and 2.4±1.8 hours per day respectively.

Table 4.2.1: Frequency of distribution of work related characteristics among Respondents

Characteristics	Frequency	Percentage (%)
Route of Travel (N= 305)		
Intercity	203	66.6
Intra-city	102	33.4
Ever had traffic accidents (N= 256)		
Yes	91	29.8
No	165	54.1
Missing	49	16.1
Use of Stimulants (N= 292)		
Yes	53	17.4
No	239	78.4
Missing	13	4.3

Table 4.2.2: Frequency distribution of Respondents' work related characteristics by route of travel

	Intercity (%)	Intra-city (%)	Total (%)	Chi Square	P-value
Use of stimulants					
Yes	38 (71.7)	15 (28.3)	53 (100)	0.614	0.519
No	158 (66.1)	81 (33.9)	239 (100)		
Traffic Accidents					
Yes	65 (71.4)	26 (28.6)	91 (100)	0.240	0.672
No	113 (68.5)	52 (31.5)	165 (100)		
No of hours driven/day (hrs)	6.09 ±2.98	6.47 ± 4.17			
Hours driven without stop/day	2.37± 1.78	0.75±1.05			

4.3a Knowledge of Respondents on Hypertension and the Risk Factors

In this study, a predominant number of the respondents (95.7%) have heard of hypertension and diabetes. Of this proportion, 88.9% said that both hypertension and diabetes can cause body impairment. More than half of the respondents reported that smoking (51.1%), alcohol consumption (55.4%), unhealthy diet (51.8%), physical inactivity (51.5%), high salt intake (57.7%) and obesity (54.4%) can make one to develop hypertension. Among the respondents, 18.7% said that hypertension cannot be cured but rather managed. Majority of the respondents reported that hypertension (86.9%) can be prevented while more than half of the respondents said hypertension (63.0%) cannot be transmitted (Table 4.3.1). Generally, less than half of the respondents (40.0%) hada good knowledge of hypertension as well as its risk factors (Figure 4.3.1).

4.3b Knowledge of Respondents on Diabetes and the Risk Factors

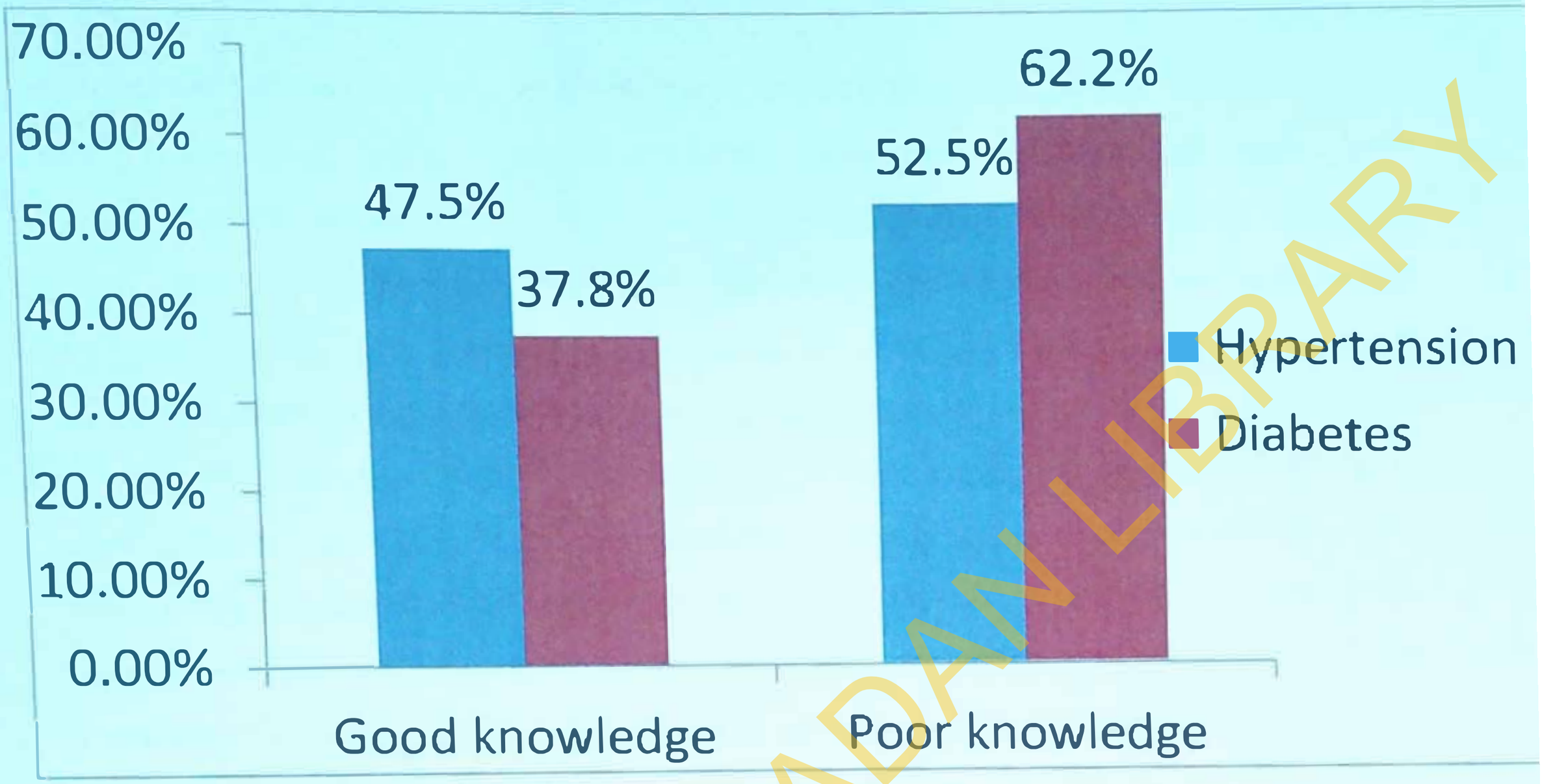
Also, majority (95.7%) of respondents have heard of diabetes and 88.9% reported that diabetes can cause body impaiment. Of the total respondents, 67.9%, 58.4% and 54.8% said that alcohol consumption, unhealthy diet and high salt intake respectively can make one to develop diabetes while 21.0% said that diabetes cannot be cured. A predominant number of respondents (86.2%) said that diabetes can be prevented while 60.7% reported that it cannot be transmitted (Table 4.3.1). Less than half of the respondents, 35.4%, had a good knowledge of diabetes (Figure 4.3.1).

Table 4.3.1: Knowledge of respondents about hypertension and diabetes in relation to their risk factors

	Yes (%)	No (%)	MVs	Total (%)
Ever heard of				
Hypertension	292 (95.7)	13 (4.3)	-	305 (100)
Diabetes	292 (95.7)	13 (4.3)	-	305 (100)
Disease can cause body impairment				
Hypertension	271(88.9)	21(6.9)	13 (4.3)	305 (100)
Diabetes	271 (88.9)	21(6.9)	13 (4.3)	305 (100)
Can make one to have				
Hypertension*				
Smoking	156 (51.1)	135 (44.3)	14 (4.6)	305 (100)
Alcohol consumption	169 (55.4)	122 (40.0)	14 (4.6)	305 (100)
Unhealthy diet	158 (51.8)	133 (43.6)	14 (4.6)	305 (100)
Physical inactivity	157 (51.5)	134 (43.9)	14 (4.6)	305 (100)
High salt intake	176 (57.7)	115 (37.7)	14 (4.6)	305 (100)
Old age	136 (44.6)	156 (51.1)	13 (4.3)	305 (100)
Family history	133 (43.6)	158 (51.8)	14 (4.6)	305 (100)
Obesity	166 (54.4)	125 (41.0)	14 (4.6)	305 (100)
Diabetes*				
Smoking	134 (43.9)	157 (51.5)	14 (4.6)	305 (100)
Alcohol consumption	207 (67.9)	84 (27.5)	14 (4.6)	305 (100)
Unhealthy diet	178 (58.4)	113 (37.0)	14 (4.6)	305 (100)
Physical inactivity	130 (42.6)	161 (52.8)	14 (4.6)	305 (100)
High salt intake	167 (54.8)	125 (41.0)	13 (4.3)	305 (100)
Old age	119 (39.0)	172 (56.4)	14 (4.6)	305 (100)
Family history	125 (41.0)	165 (54.1)	15 (4.9)	305 (100)
Obesity	144 (47.2)	145 (47.5)	16 (5.3)	305 (100)
Disease can be cured				
Hypertension	202 (66.2)	57 (18.7)	46 (15.1)	305 (100)
Diabetes	225 (73.8)	64 (21.0)	16 (5.2)	305 (100)
Diseases can be transmitted				
Hypertension	99 (32.5)	192 (63.0)	14 (4.6)	305 (100)
Diabetes	106 (34.8)	185 (60.7)	14 (4.6)	305 (100)
Diseases can be prevented				
Hypertension	265 (86.9)	26 (8.5)	14 (4.6)	305 (100)
Diabetes	263 (86.2)	28 (9.2)	14 (4.6)	305 (100)

*variable with multiple responses MVs = missing values

Figure 4.3.1: Level of knowledge of respondents on hypertension and diabetes



4.4 Frequency Distribution of Risk Factors of Hypertension and Diabetes among respondents

Among the 305 respondents, 49.2% reported to have ever smoked any form of tobacco products (cigarettes, snuff, hemp), 46.0% of the respondents who have ever smoked were current smokers of tobacco products, 58.7% of the current smokers do it frequently (smoking for at least five days in a week) while 15.3% and 4.7% smoked occasionally and rarely respectively. The average age of smoking debut was 20 ± 8.0 years; but majority of the current smokers (40.0%) started smoking between ages 18 and 30 years. Of the 305 respondents, more than half (77.7%) reported to have consumed alcoholic products at some point in their life, 71.8% of who were currently using alcohol or its products. Among the current alcohol consumers, 35.0%, 19.4%, 4.7% and 14.3% were daily, weekly, monthly and occasional alcohol consumers respectively. About 12.1% of the respondents reported addition of extra salt to already cooked meal while more than half uses vegetable oil (56.1%) and 41% uses palm oil. Barely 30% of the respondents consume fruits frequently (four or more times per week) while 39% reported occasional consumption and others reported rare consumption. The respondents who reported occasional vegetable consumption were 53.8% while 22.0% and 23.0% reported frequent and rare consumption of vegetable. About 43.0% of the respondents eat out frequently while 34.7% and 21.2% eat out occasionally and rarely respectively (Tables 4.4.1 and 4.4.2).

Table4.4.3shows the frequency distribution of other risk factors for hypertension and diabetes among respondents. Using the body mass index, more than half, 56.1% of the respondents had normal weight while 1.0%, 30.5% and 11.8% were underweight, overweight and obese respectively. Using the waist-hip ratio, it was found that 55.7% of the respondents had abdominal obesity (≥0.90). The study reported that 44.6% of the respondents were inactive (<600mets-mins/week) while 16.4% and 35.1% were moderately active (≥600mets-min/week) and very active (≥1500mets-mins/week) respectively. Of the total participants in this study, only 51 (16.7%) and 47 (15.4%) reported a family history of hypertension and diabetes respectively.

Table 4.4.1: Frequency Distribution of Respondents according to the Risk Factors of Hypertension and Diabetes

Risk Factors	Frequency	Percentage (%)
Use of Tobacco Product(s)		
Ever smoked any Tobacco Product		
Yes	150	49.2
No	155	50.8
Currently smoking Tobacco Product		
Yes	69	46.0
No	78	52.0
Missing	3	2.0
Age (years) when started smoking		
<18	39	26.0
18-30	60	40.0
>30	12	8.0
Missing	39	26.0
Frequency of smoking		
Frequently	88	58.7
Occasionally	23	15.3
Rarely	7	4.7
Missing	32	21.3
Alcohol Consumption		
Ever consumed alcohol		
Yes	237	77.7
No	67	22.0
Missing	1	0.3
Currently taking Alcohol		
Yes	170	71.8
No	32	13.5
Missing	35	14.7
Frequency of alcohol consumption		
Daily	83	35.0
Weekly	46	19.4
Monthly	11	4.7
Occasionally	34	14.3
Missing	63	26.6

Table 4.4.2: Frequency Distribution of Respondents according to the Risk Factors of Hypertension and Diabetes (continued)

Risk Factors	Frequency	Percentage (%)
Diet		
Add extra salt to already cooked meal		
Yes	37	12.1
No	268	87.9
Oil/fat used for cooking		
Vegetable oil	171	56.1
Palm oil	125	41.0
Others	8	2.6
Missing	1	0.3
Consumption of fruits/week		
Frequently (≥4 days)	84	27.5
Occasionally (2-3 days)	119	39.0
Rarely (≤1 day)	99	22.5
Missing	3	1.0
Consumption of vegetables/week		
Frequently (≥4 days)	67	22.0
Occasionally (2-3 days)	164	53.8
Rarely (≤1 day)	70	23.0
Missing	4	1.3
No of times ate out/week		
Frequently (≥4 days)	131	43.0
Occasionally (2-3 days)	103	33.8
Rarely (≤ 1 day)	63	20.7
Missing	8	2.6

Table 4.4.3 Other Risk Factors of hypertension and diabetes

Characteristics	Frequency	Percentage (%)
Body Mass Index		
Underweight	3	1.0
Normal weight	171	56.1
Overweight	93	30.5
Obese	36	11.8
Missing	2	0.7
Physical Activities		
Inactive	136	44.6
Moderately active	50	16.4
Very Active	107	35.1
Missing	12	3.9
Waist Hip Ratio		
Underweight (<0.80)	17	5.6
Normal weight (0.80-0.84)	35	11.5
Overweight (0.85-0.89)	50	16.4
Obese (≥0.90)	170	55.7
Missing	33	10.8
Family history of hypertension		
Yes	51	16.7
No	239	78.4
Missing	15	4.9
Family history of diabetes		
Yes	47	15.4
No	243	79.7
Missing	15	4.9

4.5: Prevalence of Hypertension and Diabetes among Respondent

Tables 4.5.1 below, shows the prevalence of hypertension and diabetes among the respondents. The study found that 27.7% and 3.4% of the respondents had hypertension and diabetes, respectively.

Table 4.5.1: Prevalence of Hypertension and Diabetes among Respondents

Characteristics	Hypertension	Diabetes
Present (%)	84 (27.7)	7 (3.4)
Absent (%)	219 (72.3)	196 (96.6)
Total (%)	303 (100.0)	203 (100.0)

4.6: Association of socio-demographic characteristics of respondents and other factors with the prevalence of hypertension and Diabetes

Table 4.6.1 shows the association of the socio-demographic characteristics of the respondents of this study and other risk factors with the prevalence of hypertension and diabetes. Among all the socio-demographic characteristics, age of respondents and marital status showed a significant association (p=0.00, p=0.03, respectively) with the prevalence of hypertension. Among the risk factors for hypertension, waist-hip ratio, body mass index and history of hypertension of respondents showed a significant association with the prevalence of hypertension (p= 0.00, 0.00 and 0.00 respectively). Addition of extra salt to already cooked meal, the consumption of fruits, the type of oil used in cooking waist-hip ratio and history of diabetes of respondents had a significant association (p=0.00, p=0.02, p=0.04, p=0.01 and p=0.01 respectively) with the prevalence of diabetes among the respondents (Table 4.6.3). The prevalence of obesity among the respondents found to have hypertension and diabetes in this study was 47.2% and 9.1% respectively (Tables 4.6.2 and 4.6.4). There is a significant statistical association between obesity and hypertension (p= 0.000) unlike diabetes (p=0.478).

Figure 4.6.1 shows that among the respondents with diabetes, 42.9% of them also had hypertension, an association that is not statistically significant (p=0.380).

Table 4.6.1: Association between characteristic of respondents and Hypertension

Characteristics	HTN (%)	No HTN (%)	Total (%)	Chi square	p-value
Route of travel					
Intercity	60 (29.6)	143 (70.4)	203 (100.0)	1.032	0.310
Intra-city	24 (24.0)	76 (76.0)	100 (100.0)		
Ethnicity					
Yoruba	78 (27.3)	208 (72.7)	286 (100.0)	0.515	0.473
Others	6 (35.3)	11 (64.7)	17 (100.0)		
Religion					
Christianity	36 (35.3)	66 (64.7)	102 (100.0)		
Islam	46 (23.4)	151 (76.6)	197 (100.0)	4.862	0.880
Traditional	1 (33.3)	2 (66.7)	3 (100.0)		
Marital Status					
Married	82 (29.3)	198 (70.7)	280 (100.0)	4.359	**0.037***
Others	1 (5.9)	16 (94.1)	17 (100.0)		
Age					
≤ 35	6 (9.8)	55 (90.2)	61 (100.0)		
36-45	24 (24.5)	74 (75.5)	98 (100.0)	18.675	**0.000***
46-55	31 (39.2)	48 (60.8)	79 (100.0)		
>55	21 (38.9)	33 (61.1)	45 (100.0)		
Level of Education					
No formal Education	7 (30.4)	16 (69.6)	23 (100.0)		
Primary	37 (28.9)	91 (71.1)	128 (100.0)	3.035	0.386
Secondary	37 (28.7)	92 (71.3)	129 (100.0)		
Tertiary	2 (10.5)	17 (89.5)	19 (100.0)		
Income					
≤ 30000	20 (20.6)	77 (79.4)	97 (100.0)		
31000-60000	25 (29.1)	61 (70.9)	86 (100.0)	1.760	0.415
>60000	23 (25.3)	68 (74.7)	91 (100.0)		

***p-value < 0.05**

Table 4.6.2: Distribution of Risk factors in relation with Hypertension

Risk Factors	HTN (%)	No HTN (%)	Total (%)	Chi square	P-value
Tobacco use (Ever smoked)					
Yes	39 (26.2)	110 (73.8)	149 (100.0)	0.351	0.554
No	45 (29.2)	109 (70.8)	154 (100.0)		
Alcohol use (Ever consumed)					
Yes	66 (28.1)	169 (71.9)	235 (100.0)	0.192	0.661
No	17 (25.4)	50 (74.6)	67 (100.0)		
Add extra salt to cooked meal					
Yes	5 (14.3)	30 (85.7)	35 (100.0)	3.566	0.059
No	79 (29.5)	189 (70.5)	268 (100.0)		
Fruits Intake					
Frequently	17 (20.5)	66 (79.5)	95 (100.0)		
Occasionally	37 (31.4)	81 (68.6)	118 (100.0)	3.247	0.197
Rarely	30 (30.3)	69 (69.7)	83 (100.0)		
Vegetable Intake					
Frequently	24 (35.8)	43 (64.2)	67 (100.0)		
Occasionally	40 (24.4)	124 (75.6)	164 (100.0)	3.152	0.207
Rarely	20 (29.4)	48 (70.6)	68 (100.0)		
Oil Intake					
Vegetable oil	50 (29.4)	120 (70.6)	170 (100.0)		
Palm oil	31 (25.0)	93 (75.0)	124 (100.0)	0.726	0.696
Others	2 (25.0)	6 (75.0)	8 (100.0)		
Eating out					
Frequently	35 (26.9)	95 (73.1)	130 (100.0)		
Occassionally	31 (30.4)	71 (69.6)	102 (100.0)	0.573	0.751
Rarely	16 (25.4)	47 (74.6)	63 (100.0)		
Physical Activities					
Inactive	37 (27.2)	99 (72.8)	136 (100.0)		
Moderately active	16 (32.0)	34 (68.0)	50 (100.0)	0.604	0.739
Very active	28 (26.2)	79 (73.8)	107 (100.0)		
Waist Hip Ratio					
No obesity	16 (14.3)	96 (85.7)	122 (100.0)	17.364	**0.000***
Obesity	63 (37.1)	107 (62.9)	170 (100.0)		
Body mass index					
Underweight (<18)	0 (0.0)	3 (100.0)	3 (100.0)		
Normal weight (18-24.5)	31(18.2)	139 (81.8)	170 (100.0)	20.278	**0.000***
Overweight (25-29.9)	35 (37.6)	58 (62.4)	93 (100.0)		
Obese (≥30)	17 (47.2)	19 (52.8)	36 (100.0)		
Knowledge of Hypertension					
Good knowledge	30 (25.0)	90 (75.0)	120 (100.0)	1.171	0.279
Poor knowledge	42 (31.1)	93 (68.9)	135 (100.0)		
Family history of Hypertension					
Yes	13 (25.5)	38 (74.5)	52 (100.0)	0.080	0.778
No	65 (27.4)	172 (72.6)	237 (100.0)		
Ever been told to have HTN					
Yes	24 (55.8)	19 (44.2)	43 (100.0)	18.065	**0.000***
No	36 (22.5)	124 (77.5)	160 (100.0)		

*p-value < 0.05

Table 4.6.3: Association between characteristics of Respondents and Diabetes

Characteristics	DM (%)	No DM (%)	Total (%)	Chi square	p-value
Route of travel					
Intercity	6 (4.6)	125 (95.4)	131 (100.0)	1.421	0.233
Intra-city	1 (1.4)	71 (98.6)	71 (100.0)		
Ethnicity					
Yoruba	6 (3.1)	190 (96.9)	196 (100.0)	2.558	0.110
Others	1 (14.3)	1 (85.7)	2 (100.0)		
Religion					
Christianity	4 (6.1)	62 (93.9)	66 (100.0)		
Islam	3 (2.3)	130 (97.7)	133 (100.0)	2.018	0.365
Traditional	0 (0.0)	3 (100.0)	3 (100.0)		
Marital Status					
Married	7 (3.8)	179 (96.2)	186 (100.0)	0.468	0.494
Others	0 (0.0)	12 (100.0)	12 (100.0)		
Age					
≤ 35	0 (0.0)	43 (100.0)	43 (100.0)		
36-45	1 (1.6)	60 (98.4)	61 (100.0)	4.686	0.196
46-55	4 (7.0)	53 (93.0)	57 (100.0)		
>55	2 (5.7)	33 (94.3)	35 (100.0)		
Level of Education					
No formal Education	1 (6.7)	14 (93.3)	15 (100.0)		
Primary	3 (3.4)	86 (96.6)	89 (100.0)	0.923	0.820
Secondary	3 (3.7)	79 (96.3)	82 (100.0)		
Tertiary	0 (0.0)	13 (100.0)	13 (100.0)		
Income					
≤ 30000	3 (4.5)	64 (95.5)	67 (100.0)		
31000-60000	3 (6.3)	54 (94.7)	57 (100.0)	1.164	0.559
>60000	1 (1.7)	59 (98.3)	60 (100.0)		

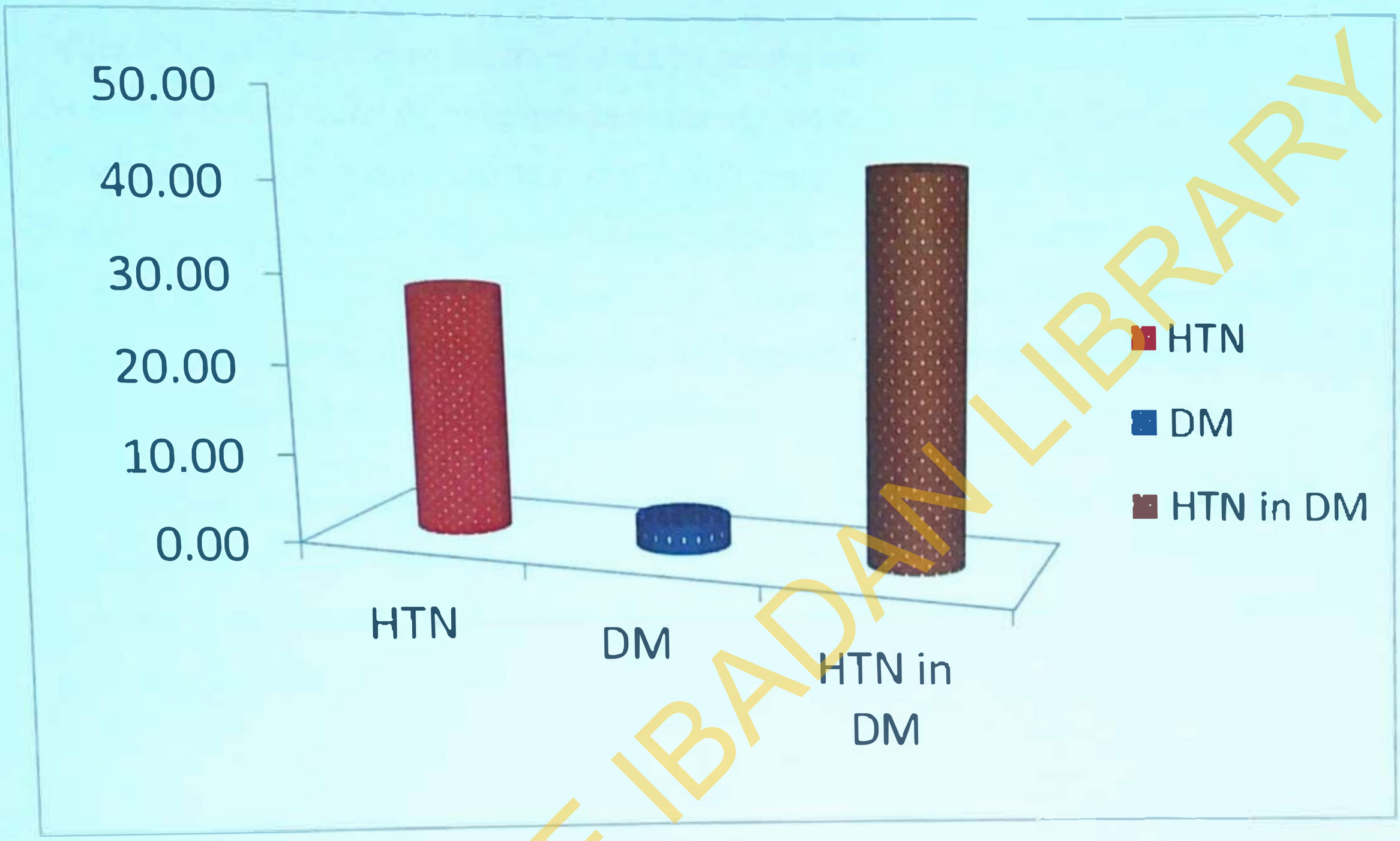
*p-value <0.05

Table 4.6.4: Distribution of Risk factors in relation with Diabetes.

Risk factors	DM (%)	No DM (%)	Total (%)	Chi square	p-value
Tobacco use (Ever smoked)					
Yes	2 (2.0)	97 (98.0)	99 (100.0)	1.184	0.277
No	5 (4.8)	99 (95.2)	104 (100.0)		
Alcohol use (Ever consumed)					
Yes	6 (3.9)	147 (96.1)	153 (100.0)	0.418	0.518
No	1 (2.0)	49 (98.0)	50 (100.0)		
Extra salt to cooked meal					
Yes	3 (14.3)	18 (85.7)	21 (100.0)	8.263	**0.004***
No	4 (2.2)	178 (97.8)	182 (100.0)		
Fruits Intake					
Frequently	1 (1.7)	59 (98.3)	60 (100.0)		
Occasionally	6 (8.0)	69 (92.0)	75 (100.0)	7.379	**0.025***
Rarely	0 (0.0)	64 (100.0)	64 (100.0)		
Vegetable Intake					
Frequently	2 (4.3)	45 (95.7)	47 (100.0)		
Occasionally	3 (2.6)	111 (97.4)	114 (100.0)	0.680	0.712
Rarely	2 (5.3)	36 (94.7)	38 (100.0)		
Oil Intake					
Vegetable oil	4 (3.8)	101 (96.2)	105 (100.0)		
Palm oil	2 (2.2)	91 (97.8)	93 (100.0)	6.063	**0.048***
Others	1 (25.0)	3 (75.0)	4 (100.0)		
Eating out					
Frequently	2 (2.2)	87 (97.8)	89 (100.0)		
Occasionally	5 (7.4)	63 (92.6)	68 (100.0)	4.661	0.097
Rarely	0 (0.0)	38 (100.0)	38 (100.0)		
Physical Activities					
Inactive	5 (5.5)	86 (94.5)	91 (100.0)		
Moderately active	0 (0.0)	36 (100.0)	36 (100.0)	2.477	0.290
Very active	2 (2.8)	70 (97.2)	72 (100.0)		
Waist Hip Ratio					
No abdominal obesity (≤0.89)	0 (0.0)	90 (100.0)	90 (100.0)	6.105	**0.013***
Abdominal Obesity (≥0.90)	7 (6.5)	100 (93.5)	207 (100.0)		
Body mass index					
Underweight (<18)	0 (0.0)	2 (100.0)	2 (100.0)		
Normal weight (18-24.5)	3 (2.7)	111(97.3)	114 (100.0)	2.487	0.478
Overweight (25-29.9)	2 (3.4)	56 (96.6)	58 (100.0)		
Obese (≥30)	2 (9.1)	20 (90.9)	22 (100.0)		
Knowledge of Diabetes					
Good knowledge	2 (2.8)	70 (97.2)	72 (100.0)	0.268	0.604
Poor knowledge	5 (4.2)	113 (95.8)	118 (100.0)		
Family history of Diabetes					
Yes	2 (6.7)	28 (93.3)	30 (100.0)	0.954	0.329
No	5 (3.0)	159 (97.0)	164 (100.0)		
Ever been told to have DM					
Yes	2 (25.0)	6 (75.0)	8 (100.0)	5.502	**0.018***
No	1 (2.6)	38 (97.4)	39 (100.0)		

*p-value < 0.05

Figure 4.6.1: Co-morbidity of Hypertension and Diabetes among Commercial Drivers



4.7 Travel Distance between Inter-city and Intra-city drivers

Tables 4.7.1 and 4.7.2 show the travel distance among respondents in this study as well as the distribution of travel distance between intercity and intra-city drivers respectively. The drivers travelled an average distance of 371 ±662 km/day. Among the respondents, 58.4% travelled a distance of ≤300km/day while 30.8% and only 3% travelled between 301-1000km/day and ≥1001km/day respectively. There is an association between travel distance and travel routes; 99.1% and 51.1% of intercity drivers drove a distance between ≥301-10000km/day and ≤300km/day respectively.

The association between travel distance and the risk factors found in this study revealed that 61.2% of the respondents who smoked travelled between 301-10,000km/day (p=0.005), about half, 50.5% of the respondents that eat out frequently drove longer distance (p=0.070).

4.7.1: Travel distance among respondents

Travel distance (km/day)	Frequency (%)
≤300	178 (58.4)
301-1000	94 (30.8)
≥1001	9 (3.0)
Missing	24 (7.9)

4.7.2 Association between travel distance of respondents and the risk factors for hypertension and diabetes

Risk factors	Travel Distance		Chi square	p-value
	≤300km/day	≥301km/day		
Tobacco use (Ever smoked)				
Yes	78 (43.8)	63 (61.2)	7.852	0.005*
No	100 (56.2)	40 (38.8)		
Total (%)	178 (100.0)	103 (100.0)		
Alcohol use (Ever consumed)				
Yes	139(78.5)	84 (81.6)	0.367	0.545
No	38 (21.5)	19 (18.4)		
Total (%)	177 (100.0)	103 (100.0)		
Extra salt to cooked meal				
Yes	158 (88.8)	92 (89.3)	0.021	0.886
No	20 (11.2)	11 (10.7)		
Total (%)	178 (100.0)	103 (100.0)		
Fruits Intake				
Frequently	116 (67.1)	71 (70.3)	0.310	0.578
Occasionally	57 (32.9)	30 (29.7)		
Total (%)	173 (100.0)	101 (100.0)		
Vegetable Intake				
Frequently	39 (22.4)	26 (25.2)	3.866	0.145
Occasionally	135 (77.6)	77 (74.8)		
Total (%)	174 (100.0)	103 (100.0)		
Oil Intake				
Vegetable oil	104 (58.4)	58 (56.8)		
Palm oil	71 (39.9)	43 (42.2)	0.335	0.846
Others	3 (1.7)	1 (1.0)		
Total (%)	178 (100.0)	102 (100.0)		
Eating out				
Frequently	71 (41.0)	51 (50.5)	5.327	0.070
Occasionally	102 (59.0)	50 (49.5)		
Total (%)	173 (100.0)	101 (100.0)		
Physical Activities				
Moderately active	113 (65.7)	63 (35.8)	0.788	0.674
Very active	59 (34.3)	37 (38.5)		
Total (%)	172 (100.0)	100 (100.0)		
Body mass index				
No obesity	155 (87.6)	89 (86.4)	0.079	0.779
Obesity	22 (12.4)	14 (13.6)		
Total (%)	177 (100.0)	103 (100.0)		

*p-value <0.05

4.8 Predictors of Hypertension among Respondents

Logistic regression showed that age ≥41years was likely to predict hypertension among commercial drivers which is not statistically significant (p=0.050). Respondents who were married were about 3 times more likely to develop hypertension than others (single, divorced or widowed) with p=0.334. Respondents who had BMI ≥30kg/m^2 were one and a half times more likely to develop hypertension than those with BMI ≤30kg/m^2 (p=0.364) while those with abdominal obesity were about 2.4 times more likely to have hypertension than those with no abdominal obesity and this is not statistically significant (p=0.051). Respondents who had ever been told to have hypertension were five and a half times less likely to develop hypertension than those who were not aware, this association is statistically significant (p=0.000).

Frequent fruit consumption is a predictor for diabetes (OR=2.714, 95% CI: 0.225-32.706; p=0.432). Consumption of vegetable oil showed that consumers were 29.4 times less likely to develop diabetes than those who consume others (margarine, butter etc) (p=0.043) while consumption of palm oil showed that consumers are 100 times less likely to develop diabetes than those who consume either vegetable oil or other types of oil (OR= 0.017,p=0.02). Addition of extra salt to already cooked meal showed that people who do add extra salt to their meal are almost 17 times less likely to develop diabetes (p=0.004).

Table 4.8.1: Predictors of Hypertension among respondents

Risk Factors	Odds Ratio	C.I (95%)		P-value
		Lower	Upper	
Age (years)				
≤ 40 (ref)	1	0.999	5.879	0.050
≥ 41	2.424			
Marital status				
Others(ref)	1	0.308	32.042	0.334
Married	3.143			
BMI				
No obesity (ref)	1	0.611	3.826	0.364
Obesity	1.529			
Waist-hip ratio				
No abdominal obesity (ref)	1	0.996	5.826	0.051
Obesity	2.409			
Ever been told to have HTN				
Yes (ref)	1	0.080	0.413	**0.000***
No	0.182			

*p-value <0.05; ref = reference category

Table 4.8.2: Predictors of Diabetes among respondents

Risk Factors	Odds Ratio	C.I (95%)		P-value
		Lower	Upper	
Fruits intake				
Frequently	2.714	0.225	32.706	0.432
Occasionally (ref)	1			
Oil intake				
Vegetable oil	0.034	0.001	0.894	**0.043***
Palm oil	0.017	0.004	0.524	**0.020***
Others (ref)	1			
Extra salt to meal				
Yes	0.061	0.026	0.758	**0.004***
No (ref)	1			

***p-value <0.05; ref = reference category**

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

In this study, more than half of the respondents were between 36 and 55 years. All respondents were male, majority of who were married. Out of all the respondents, about two-fifth of them had secondary level of education which is explainable for why less than 30% earn between 31,000 and 60,000; and about 53% had between one and three adults dependent on them. This is in correlation with the socio-economic situation of Nigeria, where a higher number of dependants increase the financial and psychological stress of respondents and these have been reported to be associated with higher blood pressure and overwhelming cardiovascular profile (Fauvel *et al.*, 2001).

More than half of the respondents were intercity drivers who drove an average distance of 481km/day (median distance travelled) for an average of six hours, about three-quarter of who use stimulants while driving which could lead to stress and thus complications of hypertension thereby leading to road traffic accidents while driving if not controlled (Makanjuola *et al.*, 2014). The self-reported prevalence of road traffic accidents among the respondents was more among intercity drivers (71.4%) compared to intra-city which was more than the 35% prevalence reported by Cavagioni and Pierin (2010). This could be as a result of increase in the use of stimulants (Makanjuola *et al.*, 2014)

Overall, only two-fifth, 40%, of the respondents had a good knowledge about hypertension which is low compared to 90% reported by Abah *et al* (2014) in a study conducted among pharmacists in Jos. Although studies have revealed that there is poor knowledge of hypertension among health workers (Mitwalli *et al.*, 2013) but there is still a huge knowledge gap about hypertension between healthcare professionals and other members of the community. Of the 40% respondents with good knowledge, 75% of them did not have hypertension which showed that good knowledge aid prevention of the disease (Kjellgren *et al.*, 1997).

This study showed that 35.4% of respondents had a good knowledge about diabetes. Among the respondents, only 47.2% agreed that obesity is a risk factor for diabetes which is low compare to 73% reported by Unadike and Chinenye (2009) after health education in a secondary school in Uyo indicating that there is need for health education on diabetes and its risk factors among commercial drivers.

This study revealed that commercial drivers drove a median distance of 210 (IQR: 140-400) km for about 6 (IQR: 4-8) hours per day. Among the intercity drivers, 99.1% drove a distance ≥301km/day at an average time of 6.1±2.85hours. This result, compared to Cavagioni and Pierin study among freight truck drivers who drove 800km/day at an average time of 10hours, showed that the inter-city drivers in this study (who drove between 301 and 10,000km/day) could actually be freight drivers. There is a significant association between routes of travel and distance driven (p=0.000). There is no association between use of stimulants, frequency of road traffic accidents and routes of travel.

Also, this study revealed a significant association between travel distance and tobacco use (p=0.005) which showed a higher prevalence (44.7%) of tobacco use among intercity drivers compared to the study by Makanjuola *et al.*, 2007 on the use of psychoactive substances among long distant drivers in Ilorin which revealed that tobacco use was 30.4%. Therefore, the intercity drivers in this study can be said to be long distant drivers.

The prevalence of hypertension in this study was 27.7% which correlates with the review on hypertension prevalence and its complications among Nigerian Africans by Ogah *et al* (2012) where the prevalence of hypertension was reported to be (8.1%-42.0%) in the urban setting. The site of study can be said to be urban.

In this study, there was an association between hypertension and body mass index indicating that those who were obese are one and a half times more likely to develop hypertension than those who are not indicating that BMI <30kg/m^2 is protective of hypertension which is in agreement with the report of Wofford, *et al* (2002) that obesity is a singular risk for developing cardiovascular diseases, one of which is hypertension (Doll, *et al.*, 2002) but was not statistically significant (p=0.149).

Also, there was an association between age and hypertension where respondents age ≥41 years are almost more than two times more like to develop hypertension than those aged ≤40 years which correlates with the report from the association between age and hypertension in the study among drivers in Abuja where more than half 56%, of those who had hypertension were ages >40 years (Oyeniyi, 2014 unpublished) but the result was not statistically significant. The result showed that respondents older than 40 years are more likely to develop hypertension. The association between hypertension and waist-hip ratio also showed a non-statistical relationship (p=0.051) where 37.1% of the respondents who had abdominal obesity (WHR≥0.90) had hypertension showing an odd of more than two times likelihood of developing hypertension among those with abdominal obesity.

In this study, the prevalence of diabetes was 3.4% which is in contrast with the study in Abuja (Oyeniyi, 2014) where diabetes had a prevalence of 10%. The reduced prevalence of diabetes in this study could be due to the fact that the adoption of western lifestyle in Abuja, being the Federal Capital Territory of Nigeria, is more prevalent than it is in Ibadan despite that the two cities are urban. However, 42.9% of the respondents with diabetes also had hypertension.

The kind of oil used in cooking in the respondents' household had a significant association with the development of diabetes. Respondents who consumed vegetable oil are 33 times less likely to develop diabetes compared to those who consumed other kinds of oil (margarine, butter etc) while those who used palm oil were 100 times less likely to develop diabetes than those who consumed other kinds of oil, including vegetable oil (p=0.04 and 0.02 respectively). The respondents who add extra salt to already cooked meal are almost 17 times less likely to have diabetes, a statistically significant association (p=0.004).

5.2 Limitations

Due to the nature of their job, it was difficult to get some of the commercial drivers as they are usually on turn waiting to load passengers. Reliance on self-reported data on age, smoking, alcohol consumption, salt intake and physical activities may have affected the findings by social desirability bias. Also, some of them did not allow the phlebotomist to

prick them as they were been superstitious about blood. Some of the respondents could not carry out the fasting blood sugar test as most of them do not return from travel every day. The post prandial test could not be carried out due to financial constraints therefore the prevalence of diabetes from this study may not be representative of the diagnosis.

5.3 Conclusions

The prevalence of hypertension (27.7%) among commercial drivers in Ibadan metropolis is relatively high compared to the nine percent prevalence among commercial drivers in Jabi (Oyeniyi, 2014) and the national figure of five to seven percent (Whitworth and WHO, 2003), suggesting an increasing trend which has implication on the health of the drivers and safety of the passengers.

Similarly the prevalence of diabetes, 3.4% among commercial drivers in Ibadan is higher than the 2.2% national prevalence reported by Nyenwe *et al.*,2003,although lower than the 10% prevalence of diabetes recorded among commercial drivers in Abuja. This relatively high prevalence of hypertension and diabetes in this study could relate to the poor knowledge of the disease by the drivers, although thte association was not significant.

The risk factors for hypertension prevalent such as obesity and abdominal obeity among the respondents corroborates findings of past studies in this environment. Addition of extra salt to already cooked meal, fruits intake, oil intake and waist-hip ratio were associated with diabetes but only addition of extra salt to already cooked meal was statistically significant (p=0.022).

About 43% of the respondent with diabetes in this study also had hypertension which showed that the risk of having either or both of diseases is intertwined. Therefore, avoidance from any of the risks for either hypertension or diabetes iskey to prevention of the diseases.

5.4 Recommendations

Based on the results from this study, the public health arm of the Oyo State should collaborate with the state NURTW to:

1. Organize public health education and awareness on the hypertension and diabetes as well as their risk factors among commercial drivers which will increase their knowledge on these diseases and thus aid prevention, management and control.
2. Carry out regular health screening services on hypertension and diabetes at different parks in order to help some commercial drivers and transport workers to know their status.
3. Put in place work-place intervention that will enable commercial drivers carry out effective and efficient physical activities as this will curb physical inactivity as a risk factor for non-communicable diseases (NCDs).
4. Stop the activities of alcohol, cigarette, herbal drinks sellers different parks as this will reduce the exposure of commercial drivers to some of the risk factors for NCDs

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APPENDICES

APPENDIX 1

Prevalence of Hypertension and Diabetes among Commercial Drivers in Ibadan Metropolis, South-west Nigeria.

My name is Odeyinka Oluwaseun Temitope, a postgraduate student of Epidemiology and Medical Statistics Department, University of Ibadan. I am currently carrying out a study on the 'Prevalence and Determinants of Hypertension and Diabetes among Commercial drivers", a requirement for the award of Masters of Science in Epidemiology. Below are the details of the study and what I need from you. Your participation in the study will be deeply appreciated.

Respondent consent form

- **In this study you are being asked to answer questions about your lifestyle (diet, smoking, alcohol consumption and physical activity - exercise).**
- **None of your colleagues or family member will see your answers.**
- **A research assistant will ask you some questions, weigh you, measure your height, blood pressure and prick you to collect blood sample for relevant biochemical tests. Your test results will be provided to you.**
- **Taking part in this study is absolutely your choice, as non-participation does not attract any penalty.**
- **If you do not want to answer a question, you can skip it.**
- **You may stop taking part in this study at any time.**
- **Your name will not be used before, during and after this study for confidentiality reasons rather coded identifiers will be used all through.**
- **By signing below, you agree to take part in this study.**

Signature/Thumbprint of Participant

Interview Date

Prevalence of Hypertension and Diabetes among Commercial Drivers in Ibadan Metropolis, South-west Nigeria.

Serial No_____

Interviewer's Name

Intercity Driver_____ Intra-city Driver

This is not a test, and there is no right or wrong answers. Remember, your answers will be kept private.

QUESTIONNAIRE

SECTION ONE: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Sex (1) Male ☐ (2) Female ☐
2. How old are you (at last birthday) _____
3. Your ethnicity is (a) Hausa ☐ (b) Igbo ☐ (c) Yoruba ☐ (d) Others

   _____
4. Your religion ? (a) Christianity ☐ (b) Islam ☐ (c) Traditional ☐ (d) Others

   (Specify)_____
5. Highest level of education (a) No formal education ☐ (b) Primary School ☐

   (c) Junior Secondary ☐ (d) Senior Secondary ☐ (e) Tertiary/University ☐
6. Marital status (a) Married ☐ (b) Single ☐ (c) Divorced ☐ (d) Widowed ☐
7. How many people older than 18 years, including yourself live in your household?

   _____
8. What is your average income in a month? _____

SECTION TWO: KNOWLEDGE ABOUT NCDs AND THEIR RISK FACTORS/FAMILY HISTORY		Yes	No	D/K
9.	Have you heard of any of these diseases? a) Hypertension			
	b) Diabetes			
	c) Cancer			
	d) Asthma			
10.	Can any of these diseases make any other part of the body not to work very well apart from where it starts from? a) Hypertension			
	b) Diabetes			
	c) Cancer			
	d) Asthma			
11.	Which of these can make an individual to have	a) Smoking		

	hypertension? **(you can pick more than one).**	b)Alcohol consumption			
		c) Unhealthy diet			
		d)Physical inactivity			
		e) High salt intake			
		f) Old age			
		g) Family history			
		h) Obesity			
12.	Which of these can make an individual have diabetes?**(you can pick more than one)**	a) smoking			
		b)alcohol consumption			
		c) unhealthy diet			
		d) physical inactivity			
		e) high salt intake			
		f) old age			
		g) family history			
		h) obesity			
13.	Which of these diseases can be cured?	a) Hypertension			
		b) Diabetes			
		c) Cancer			
		d) Asthma			
14.	Which of these diseases can be transmitted from one person to another?	a) hypertension			
		b) Diabetes			
		c) Cancer			
		d) Asthma			
15.	Which of these diseases can be prevented?	a) hypertension			
		b) Diabetes			
		c) Cancer			
		d) Asthma			
16.	Has any member of your family been diagnosed with any of these diseases	a) hypertension			
		b) Diabetes			
		c) Cancer			
		d) Asthma			
17.	Have you ever lost any family member to any of these diseases?	a) hypertension			
		b) Diabetes			
		c) Cancer			
		d) Respiratory Diseases			
18.	If yes to Q17. what is the relationship of this person to you?	a) Father ☐ b) Mother ☐ c) Sister/brother ☐ d) Cousin ☐ e) Grand parents ☐ f) Others specify _____			

D/K: Don't know

SECTION THREE: BEHAVIOURAL ASSESSMENT. A. TOBACCO USE

19	Have you ever smoked any form of tobacco products (cigarettes, cigars, pipes, snuff) in any way at any point in time? (*If no, go to question 24*)	(a) Yes ☐ (b) No ☐
20	Do you currently smoke any tobacco product (cigarettes, cigars, pipes)?	(a) Yes ☐ (b) No ☐
21	How old were you when you started smoking?	
22	How often do you smoke? (now or if stopped smoking)	(a) once daily ☐ (b) 5-6 times weekly ☐ (c) 1-4 times weekly ☐ (d) 1-3 times monthly ☐
23a	On the average, how many cigarettes do you smoke in a typical day? (now, or if stopped smoking)	
23b	How old were you when you stopped smoking?	
24	In the last 7 days, how many times did someone smoke around you?	(a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) more than 3 times ☐

B. ALCOHOL CONSUMPTION

25	Have you ever taken any alcoholic drink like beer, spirit, palmwine, burukutu? (*If no, go to question 33*)	(a) Yes ☐ (b) No ☐
26	Have you taken any alcoholic drink in the past 12 months? (*If no, go to Q 33*)	(a) Yes ☐ (b) No ☐
27	Have you ever taken local concoctions (e.g jedi-jedi, opa-eyin, iba) made with alcohol?	(a) Yes ☐ (b) No ☐
28	Have you consumed any alcoholic drink in the past 30 days? (*If no, go to Q33*)	(a) Yes ☐ (b) No ☐
29	In the past 30 days, how many times have you taken any alcoholic drink?	(a) once daily ☐ (b) 5-6 times weekly ☐ (c) 1-4 times weekly ☐ (d) 1-3 times monthly ☐
30	In the last 30 days, on how many occasions did you take at least one alcoholic drink?	(a) 0 ☐ (b) 1 ☐ (c) 2 ☐ (d) 3 ☐
31	During the last 30 days whenever you take alcoholic drink, how many times did you take it with meal (snacks not included)?	(a) usually with meals ☐ (b) sometimes ☐ (c) rarely with meals ☐ (d) never with meals ☐
32	Which of the following describes your drinking pattern?	(a) Daily ☐ (b) Weekly ☐ (c) Monthly ☐ (d) Occasionally ☐

B. DIET

33	In a typical week, on how many days do you eat fruit? *USE SHOWCARD*	(a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) ≥4 ☐
34	On such days, how many serving of fruits do you eat?*{1 serving= ½ cup of fruit juice or canned juice OR 1 medium size(80g) of fruit} USE SHOWCARD*	(a) 1☐ (b) 2☐ (c) 3☐
35	On such days, how often do you eat the serving of fruits?	(a) Morning only (b) Afternoon only (c) Evening only (d) Anytime of the day
36	In a typical week, on how many days do you eat vegetables? *USE SHOW CARD*	(a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) >4 ☐
37	On such days, how many serving of vegetable do you eat? *{1 serving= ½ cup of cooked chopped or raw vegetable juice OR 1 cup of green leafy vegetable/salad}*	(a) 1 ☐ (b) 2☐ (c) 3☐
38	What kind of oil/fat do you use to cook in your household?	(a) margarine ☐ (b) vegetable oil ☐ (c) butter ☐ (d) epo pupa
39	How many meals (breakfast, lunch and/or dinner) per week do you eat outside your home?	(a) 0 ☐ (b)1 ☐ (c) 2 ☐ (d) 3 or more times ☐
40	Do you add extra salt to your already cooked meal?	a. Yes b. No
41	If yes to 40 above, in what quantity?	a. Pinch b. Teaspoon c. Tablespoon d. Others

B. PHYSICAL ACTIVITY

42	Does your work involve very hard physical activity that causes large increases in breathing or heart rate like *[carrying bucket of water, playing football]* for at least 10 minutes continuously? *(If no, go to question 45)*	(a) Yes ☐ (b) No ☐
43	In a typical week, on how many days do you do very hard physical activities as part of your work?	_____ days/week No vigorous physical activity ☐

44	How much time do you spend doing very hard physical activities at work on one of those days?	_____hours per day _____ minutes per day ☐ Don't know/Not sure
45	Does your work involve hard physical activity *[such as weeding or planting seeds]* that causes small increases in breathing or heart rate for at least 10 minutes continuously? ***(If no, go to question 48)***	(a) Yes ☐ (b) No ☐
46	In a typical week, on how many days do you do hard physical activities as part of your work?	_____ days/week No moderate physical activity ☐
47	How much time do you spend doing hard physical activities at work on one of those days?	_____ hours/day _____ minutes/day ☐ Don't know/Not sure

C. RECREATIONAL ACTIVITIES/ SEDENTARY BEHAVIOUR

48	During the last 7 days, on how many days did you walk for at least 10 minutes at a time? ***(if no walking, go to question 50)***	_____ days/week ☐ No walking
49	How much time do you spend walking on one of those days?	---------- Hours/day_____ Minutes/day ☐ Don't know/Not sure
50	During the last 7 days, how much time did you spend sitting a week day?	---------- Hours/day _____ Minutes/day ☐ Don't know/Not sure
51	How long do you spend driving on a typical day?	_____
52	Can long hours of driving be termed as physical exercise?	(a) Yes ☐ (b) No ☐
53	On a typical day, how many hours do you spend sleeping?	_____

D. WORKRELATED ISSUES (Use a work day that is most typical of your work days to answer the following questions)

54	What is the average distance driven in a day?	Km/day
55	What is your driving route?	
56	What is the number of hours you drive in a day?	
57	What is the average number of hours you drive without stops in a day?	

58	Do you use sleep- inhibiting drugs or stimulants to prevent you from sleeping during driving?	
59	If yes; which drug or/and stimulants do you use?	
60	Have you ever had traffic accidents as a commercial driver?	

SECTION FOUR: PHYSIOLOGICAL CHARACTERISTICS A. HISTORY OF HIGH BLOOD PRESSURE

	Question	Yes	No
61	Have you ever had your blood pressure measured by a doctor or other health worker in the past 12 months? (*if no, go to 66*)		
62	In the past 12 months, have you ever been told by a doctor or other health worker that you have raised blood pressure or hypertension?(*if no, go to 66*)		
63	Are you currently receiving any of the following treatments/advice for high blood pressure prescribed by a doctor or other health worker?		
	a. Drugs (medication) that you have taken in the past two weeks		
	b. Advice to reduce salt intake		
	c. Advice or treatment to lose weight		
	d. Advice or treatment to stop smoking		
	e. Advice to start or do more exercise		
64	Have you ever seen a traditional healer for raised blood pressure or hypertension?		
65	Are you currently taking any herbal or traditional remedy for your raised blood pressure?		

B. HISTORY OF DIABETES

	Question	Yes	No
66	Have you ever had your blood sugar measured by a doctor or other health worker in the past 12 months? (*if no, go to 71*)		
67	Have you ever been told by a doctor or other health worker, in the past 12 months, that you have raised blood sugar or diabetes? *(if no, go to71)*		
68	Are you currently receiving any of the following treatments/advice for diabetes prescribed by a doctor or other health worker?		
	a. Insulin and other drugs		
	b. Special prescribed diet		
	c. Advice or treatment to lose weight		
	d. Advice or treatment to stop smoking		
	e. Advice to start or do more exercise		
69	Have you ever seen a traditional healer for raised blood sugar/ diabetes?		
70	Are you currently taking any herbal or traditional remedy for your raised blood sugar/ diabetes?		

C. Physical Measurements

Parameters			Measurements		
71	Height (in cm)				
72	Weight (in kg)				
73	Waist circumference (in cm)				
74	Hip circumference (in cm)				
75	Blood pressure (mmHg)	Parameters	1st Reading	2nd Reading	Average
		Systolic			
		Diastolic			

SECTION FIVE: BIOCHEMICAL CHARACTERISTICS

76	Blood glucose (Fasting Blood Sugar)	
77	Random blood sugar	

WIWA ATI AWON OUN TI O SE OKUNFA AISAN EJE RIRU ATI ITO SUGA LAARIN AWON AWAKO ERO NI ILU IBADAN, GUUSU-IWO OORUN NAIJIRIA.

Oruko mi ni Odeyinka Oluwaseun Temitope, akeko siwaju si ni eka Epidemiology ati Medical Statistics, Unifasiti ti Ibadan. Lowolowo, mo nse iwadi lori 'Awon oun ti o nse okunfa aisan Eje riru ati Ito suga laarin awon awako ero ati bi won se po to", eleyi ti o je ohun ti mo nilo lati gba ami eye Masters of Science ni Epidemiology. Awon alaye nipa iwadi yi ati oun ti mo ni lo lati odo re wa ni isale. Kiko pa re ninu iwadi yi o je eyi to dun mo mi ninu jojo.

IWE E MOGBA LATI KOPA

- **Ninu iwadi yi, a o bere fun idahun nipa igbe aye re (ounje, siga mimu, oti mimu, ise agbara – ere idaraya).**
- **Ko si okankan ninu awon alajosise tabi ebi re ti yoo ni anfanni lati ri awon idahun re**
- **Alabasise oniwadi yio bere awon ibeere, yi o won bi o ti sanra to lori iwon, yio won bi o ti ga si, ifunpa re ati wipe yi o gun o ni ika lati gba eje toro fun awom ayewo ti o ye. A o fun o ni esi awon ayewo wonyi.**
- **Kikopa ninu iwadi ko pon dandan, bi o ko ba kopa ko si ijiya kankan fun.**
- **Bi o ko ba fe dahun awon ibeere kan, o le lo si ibere omiran.**
- **O le pinu lati ma ko pa ninu iwadi yi mo nigba ti o ba wu o**
- **A ko ni lo oruko re fun ninu ibeere yi, laarin tabi leyin iwadi yi fun eto abo ti o peye lori I awon idahun ti olukopa ba fi sile, onka ni o fi ma pe olukopa.**
- **Bi o ba fi owo si iwe yi, o ti pinu lati kopa ninu iwadi yi.**

Mo fi owo si/Tite ka atanpako

Ojo iwadi

WIWA ATI AWON OUN TI O SE OKUNFA AISAN EJE RIRU ATI ITO SUGA LAARIN AWON AWAKO ERO NI ILU IBADAN, GUUSU-IWO OORUN NAIJIRIA.

Oruko Olubeere

Nomba olukopa_____

Awako lati ilu kan si omiran_____ .

Awako laarin igboro ilu kan_____

Eyi kii se idanwo, nitorina ko si idahun tio yege tabi kuna, ao si pa awon idahun re mo daadaa.

APA KINNI: AWON OUN TI O JE MO BI O TI SE JE

S/N	Awon Ibeere	Idahun
1	Nje okunrin ni o tabi obirin?	(1) Okunrin ☐ (2) Obirin ☐
2	Omo odun melo ni o (ojo ibi re ti o koja)	_____
3	Eya re ni	(a) Hausa (b) Igbo (c) Yoruba (d) Omiran _____
4	Esin re?	(a) Igbagbo (b) Musulumi (c) Ibile (d) Omiran (so ni pato) _____
5	Iwe melo ni o ka?	(a) Nko kawe (b) Alakobere (c) Girama kekere (d) Girama agba (e)Iwe giga/Unifasiti
6	Ipo re lori igbeyawo?	(a) Mo ti se igbeyawo (b) Apon/Omidan (c) Pinya (d) Oko/iyawo ti se alaisi
7	Eniyan melo.pelu iwo naa. ni o ti le ni omo odun mejidinlogun ninu ile re?	_____
8	Elo ni o ma n pa ninu osu kan	_____

APA KEJI: IMO NIPA AWON ARUN TI A KO LE KO LATI ARA ELOMIRAN, AWON OKUNFA WON/ILERA EBI

S/N	Ibeere		Beeni	Beeko	Nko mo
9	Nje o ti gbo nipa eyikeyi ninu awon aisan yi?	(a) Eje riru (b) Ito suga (c) Jejere (d) Asthma			
10	Nje okankan ninu awon aisan yi le mu ki awon eya ara kan ma sise daradara yato si ibi ti aisan yi ti bere?	(a) Eje riru (b) Ito suga (c) Jejere (d) Asthma			
11	Ewo ninu awon nkan wonyi ni o le je ki eniyan	(a) Siga mimu (b) Mimu oti lile			

	ni eje riru? (o le mu ju eyokan lo)	(c) Ounje ti ko sara lore (d) Aise ise agbara (e) Jije opo iyo (f) Ojo ori ti o dagba (g) Ilera ebi (h) Sisanra ju			
12	Ewo ninu awon nkan wonyi ni o le je ki eniyan ni ito suga? (o le mu ju eyokan lo)	(a) Siga mimu (b) Mimu oti lile (c) Ounje ti ko sara lore (d) Aise ise agbara (e) Jije opo iyo (f) Ojo ori ti o dagba (g) Ilera ebi (h) Sisanra ju			
13	Ewo ninu awon aisan yi o se wosan tan patapata?	(a) Eje riru (b) Ito Suga (c) Jejere (d) Asthma			
14	Nje okankan ninu awon aisan yi le ti ara enikan bo si ara elomiran??	(a) Eje riru (b) Ito suga (c) Jejere (d) Asthma			
15	Nje a le dena okankan ninu awon aisan yi?	(a) Eje riru (b) Ito suga (c) Jejere (d) Asthma			
16	Nje enikeni ninu ebi re ti ni okankan ninu awon aisan yi?	(a) Eje riru (b) Ito suga (c) Jejere (d) Asthma			
17	Nje o ti padanu enikeni ninu ebi re latari okankan ninu awon aisan yi?	(a) Eje riru (b) Ito suga (c) Jejere (d) Asthma			
18	Bi beeni si ibeere 17, kini ibasepo re pelu iru eni be?	(a) Eje riru (b) Ito suga (c) Jejere (d) Asthma			

APA KETA: AYEWO IGBE-AYE

A. SIGA MIMU

19	Nje o ti mu eyikeyi ninu awon nkan ti a fi taba se (siga kekere, siga nla, ikoko, taba) ni ona kona nigbakugba nigba kan ri? ***(bi beeko, lo si ibeere 26)***	(a) Beeni ☐ (b) Beeko ☐
20	Nje o si n mu eyikeyi ninu awon nkan ti a fi taba se (siga kekere, siga nla, ikoko, taba) ***(bi beeko, lo si ibeere 26)***	(a) Beeni ☐ (b) Beeko ☐
21	Omo odun melo ni o nigbati o bere si mu eyikeyi ninu awon ohun ti afi taba se?	_____
22	Bawo ni o se ma n mu awon nkan ti a fi taba se yi si? (lowolowo tabi ki o to fi siga mimu sile)	(a) Eekan lojumo☐ (b) eemarun si eemefa lose kan ☐ (c) eekan si eemerin lose kan ☐ (d) eekan si eemeta losu kan ☐
23a	Igi siga melon i o ma n mu lojumo kan (lowolowo tabi ki o to fi siga mimu sile)	
23b	Omo odu melon i nigbati o fi siag mimu sole?	
24	Ni ojo meje seyin, igba melo ni enikeni mu siga ni ibi ti o wa?	(a)1 ☐ (b) 2 ☐ (c) 3 ☐ (d) >3 ☐

B. MIMU OTI LILE

25	Nje o ti mu oti lile bi nia, ogogoro, emu, burukutu ri? ***(bi beeko, lo si ibeere 33)***	(a) Beeni ☐ (b) Beeko ☐
26	Nje o ti mu oti lile Kankan ninu osu mejila ti o koja? ***(bi beeko, lo si ibeere 33)***	(a) Beeni ☐ (b) Beeko ☐
27	Nje o ti mu agbo (bi I jedi-jedi, opa-eyin, iba) ti a fi oti se ri?	(a) Beeni ☐ (b) Beeko ☐
28	Nje o ti mu oti lile kankan ni ogbon ojo seyin? ***(bi beeko, lo si ibeere 33)***	(a) Beeni ☐ (b) Beeko ☐
29	Ninu ogbon ojo ti o koja, igba melo ni o mu oti lile?	(a) Eekan lojumo ☐ (b) eemarun si eemefa lose kan ☐ (c) eekan si eemerin lose kan ☐

		(d) eekan si eemeta losu kan ☐
30	Ninu ogbon ojo ti o koja, igba melo ni o mu, okere ju, oti lile eyokan?	(a) 0 ☐ (b) 1 ☐ (c) 2 ☐ (d) 3 ☐
31	Ninu ogbon ojo ti o koja, nigbkugba ti o ba mu oti lile, igba melo ni o mu pelu ounje (ki I se ipapanu)?	(a) Nigbogbo igba pelu ounje ☐ (b) Eekookan pelu ounje ☐ (c) O sowon pelu ounje ☐ (d) Lailai pelu ounje ☐
32	Ewo ninu awon nkan wonyi ni o juwe bi o se n mu oti?	(a) Ojoojumo ☐ (b) Osoose ☐ (c) Osoosu ☐ (d) Ekookan ☐

C. OUNJE

33	Ninu ose kan, ojo melo ni o fi ma n je eso? ***LO IWE AFIHAN***	(a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) ≥ 4 ☐
34	Ni iru ojo be, ipin eso melo ni o ma n je? ***(ipin kan = idaji koopu elerindodo ti a fi eso se tabi ti a se sinu agolo TABI eso ti o tobi to 80g) LO IWE AFIHAN***	(a) 1 ☐ (b)2 ☐ (c)3 ☐
35	Ni iru ojo be, bawo ni o se ma n je ipin eso yi?	(a) Aaro nikan (b) Osan nikan (c) Ale nikan (d) Nigbakugba ninu ojo kan
36	Ninu ose kan, igba melo ni o ma n je efo? LO IWE AFIHAN	(a) 1 ☐ (b) 2 ☐ (c) 3 (d) ≥ 4 ☐
37	Ni iru ojo be, ipin efo melo ni o ma n je? ***{ipin kan = idaji koopu efo ti a se, ge tabi omi ara efo TABI koopu orisirisi efo kan}***	(a) 1 ☐ (b)2 ☐ (c)3 ☐
38	Iru epo/ororo wo ni o fi ma n dana ninu ile re?	(a) Margarine ☐ (b) Ororo ti se lati ara efo ☐ (c) bota ☐ (d) omiran ***(so ni pato)*** _____
39	Ounje melo (ounje aaro, osan ati/tabi ale) ninu ose kan ni o ma n je nita?	(a) 0 ☐ (b) 1 ☐ (c) 2 ☐ (d) ≥ 3 ☐
40	Nje o ma n fi iyo si ounje ti a ti fi iyo si tele?	a. beeni b. beeko
41	O ma n to sibi iyo melo ti o fi ma n dana ninu ile re ninu ojo kan?	_____

D. ISE AGBARA

42	Nje ise oojo re ni I se pelu awon ise to lagbara gan an *(bi I sise ere idara bi boolu gbigba, ere sisa)* ti o m an fa ki eemi re lo soke daadaa fun bii iseju mewa leralera? ***(bi beeko, losi ibeere 45)***	(a) Beeni ☐ (b) Beeko ☐
43	Ninu ose kan, ojo melo ni o fi ma n se ise ti o lagbara gan gege bi ara ise oojo re?	_____ ojo/ose ☐ ko si ise ti o lagbara gan
44	Wakati tabi iseju melo ni o ma n lo lati se ise ti o lagbara gan ni iru awon ojo bayi?	_____ wakati/ojo _____ iseju/ojo ☐ Nko mo/ko daju
45	Nje ise oojo re jo mo ise to lagbara die (*bii gbigbe awon eru ti ko wuwo bii apo, awon oun ti a fi igi se, jijo ni ile isin, sisan oko tabi gbingbin irugbin, gbigbe ike omi*) ti o ma n fa ki eemi lo so ke die fun bii iscju mewa leralera? ***(bi beeko, lo si ibeere 48)***	(a) Beeni ☐ (b) Beeko ☐
46	Ninu ose kan, ojo melo ni o fi ma n se ise ti o lagabara die gege bi a ise oojo re?	_____ ojo/ose ☐ Ko si ise ti o lagabara die
47	Wakati tabi iseju melo ni o ma n lo lati se ise ti o lagabara die ninu awon ojo bayi?	_____ wakati/ojo _____ iseju/ojo ☐ Nko mo/ko daju

D. AWON OUN IDARAYA/IJOKO

48	Ninu ojo meje ti o koja, ojo melo ni e fi rin fun, o kere ju, iseju mewa lekannaa?	_____ ojo/ose ☐ Nko rin rara ***(bi o ko ba rin rara, lo si ibeere 50)***
49	Iseju melo ni o fi ma n rin ni iru awon ojo be?	_____ wakati/ojo _____ iseju/ojo ☐ Nko mo/ko daju
50	Ninu ojo meje ti o koja, wakati/tabi iseju melo ni o fi joko ninu ojo kan?	_____ wakati/ojo _____ iseju/ojo ☐ Nko mo/ko daju
51	Wakati/iseju melo ni o fi ma n wa oko ninu ojo kan?	
52	Nje a le so wipe wiwa oko fun wakati pipe je ere idaraya?	(a) Beeni ☐ (b) Beeko ☐
53	Ninu ojo kan, wakati melo ni e fi ma n sun?	

E. AWON OUN TI O JO MO ISE TI O N SE

54	Kini gbedeke ona ti o ma n rin ni ojumo kan?	
55	Nibo ni o man wa oko lo?	

56	Wakati melon i o fi ma n wa oko lojo kan?	
57	Wakati melon i o fi maa n wa oko lai duro	
58	Nje o ma n lo oogun tabi ounkohun ti o ki n je ki o sun tio ba n wa oko?	
59	Bi beeni, kini oun naa?	
60	Nje o tin i ijamba moto ri gege bi I awako ero?	

APA KERIN: NIPA AGO ARA

A. IBEERE NIPA IFUNPA GIGA

S/N	Awon Ibeere	Beeni	Beeko
61	Nje dokita tabi osise eleto ilera miran ti ye ifunpa re wo ri ninu osu mejila ti o koja? ***(bi beeko, lo si ibeere 59)***		
62	Ninu osu mejila ti o koja, nje dokita tabi osise eleto ilera miran so fun o wipe o ni ifunpa giga tabi eje riru? ***(bi beeko, lo si ibeere 59)***		
63	Nje o n gba eyikeyi ninu awon itoju/imoran ti o wa ni isale yi fun ifunpa giga lati odo dokita tabi eleto ilera miran?		
	(a) Oogun ti o nlo lati ose meji ti o koja		
	(b) Imoran lati din iyo jije kun		
	(c) Imoran tabi itoju lati din sisanra ku		
	(d) Imoran tabi itoju lati dekun siga mimu		
	(e) Imoran lati bere tabi tesiwaju ninu ere idaraya sise		
64	Nje o ti lo fun itoju fun ifunpa giga tabi eje riru lodo elegbo igi ibile?		
65	Nje o n lo agbo tabi egbo igi ibile Kankan lowolowo fun ifunpa giga?		

B. IBEERE NIPA ITO SUGA

S/N	Questions	Beeni	Beeko
66	Nje dokita tabi osise eleto ilera miran ti se ayewo fun o lori suga inu eje ri ninu osu mejila ti o koja? ***(bi beeko, lo si ibeere 64)***		
67	Ninu osu mejila ti o koja, nje dokita tabi osise eleto ilera miran ti so fun o wipe o ni suag ti o po ninu eje re tabi ito suga? ***(bi beeko, lo si ibeere 64)***		
68	Nje o n gba eyikeyi ninu awon itoju/imoran ti o wa ni isale yi fun ito suga lati odo dokita tabi eleto ilera miran?		
	(a) Insulin ati awon oogun miran		
	(b) Asayan ounje		
	(c) Imoran tabi itoju lati din sisanra ku		
	(d) Imoran tabi itoju lati dekun siga mimu		

	(e) Imoran lati bere tabi tesiwaju ninu ere idaraya sise		
69	Nje o ti lo fun itoju fun suga ti o po ninu eje tabi ito suga lodo elegbo igi ibile?		
70	Nje o n lo agbo tabi egbo igi ibile kankan lowolowo fun ito suga/ suga ti o po ninu eje?		

C. AWON IWON/AYEWO

S/N	Oun ti a fe won		Onka iwon		
71	Giga (ni cm)				
72	Sisanra (ni kg)				
73	Egbe/ikun (ni cm)				
74	Ibadi (ni cm)				
75	Ifunpa (mmHg)	Iwon	Akoko	Ekeji	Idaji
		Systolic			
		diastolic			

APA KAARUN: AYEWO EJE

76	Suga inu eje (Laiti jeun)	
77	Suga leyin igba ti a bat i jeun	

TELEGRAMS.....

TELEPHONE.....

OYO STATE: THE PACESETTER

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/ 993

January, 2016

The Principal Investigator,
Department of Epidemiology and Medical Statistic,
Faculty of Public Health,
University of Ibadan,
Ibadan.

Attention: Odeyinka Oluwaseun

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

This is to acknowledge that your Research Proposal titled: "Prevalence of Hypertension and Diabetes among Commercial Drivers in Ibadan Metropolis, South West Nigeria" 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.

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