DETERMINANTS OF ROAD TRAFFIC ACCIDENTS AMONG CLIENTS OF AUTOMOBILE REPAIR WORKSHOPS IN FEDERAL CAPITAL TERRITORY, ABUJA

BY

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DECLARATION

It is hereby declared that this dissertation is my original work and has not been presented for a degree or any other award in any institution, nor has it been submitted elsewhere for publication. All sources of information where applicable have been duly acknowledged in form of references.

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CERTIFICATION

This is to certify that the work presented in this thesis was carried out by Abimbola Folakemi Aman-Oloniyo under our supervision.

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DEDICATION

This work is dedicated to the Almighty God, and to my late parents, especially my Mum who passed on in year 2015, during the conduct of this research.

My husband's understanding and support through my many academic pursuits are highly appreciated.

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ACRONYMS

AMAC	Abuja Municipal Area Council
DALY	Disability Adjusted Life Years
FCT	Federal Capital Territory
FRSC	Federal Road Safety Commission
GDP	Gross Domestic Product
GNP	Gross National Product
ICD	International Classification of Diseases
LMICs	Low and Middle Income Countries
NATA	National Automobile Technicians Association
RTAs	Road Traffic Accidents
SCT	Social Cognitive Theory
VIO	Vehicle Inspection Officer
VRUs	Vulnerable Road Users
WHO	World Health Organization
YLL	Years of Life Lost

SUMMARY

According to the World Health Organization, about 1.24 million people die every year as a result of road traffic accidents. Nigeria, like other developing countries, has a high rate of road traffic accidents, one of the highest accident rates in Africa. The aim of the study was to identify the determinants of road traffic accidents among clients of automobile repair workshops within the Federal Capital Territory, Abuja, Nigeria.

A cross-sectional (retrospective) descriptive study was conducted among those who patronize randomly selected automobile repair workshops registered under the National Association of Automobile Technicians, Abuja Chapter with focus on vehicle owners and/or drivers who met the inclusion criteria for the study. Semi-structured interviewer administered questionnaire was used to collect socio-demographic data as well as information on driving characteristics, involvement in accidents and circumstances around such accidents. The data was analyzed using Epi info version 7. Univariate analysis of human, environmental and vehicular factors responsible for accidents was done; bivariate analyses were done to determine the odds of involvement in accidents with respect to modifiable human factors. A p-value of ≤ 0.05 was considered statistically significant.

A total of 298 respondents were vehicle drivers. Males made up 225 (85.6%) of these. One hundred and twenty one (40.6%) of the respondents fell within the age group of 30 – 39 years. The mean age was 35.9 ± 8.6 years. One hundred and twenty two (40.9%) picked phone calls without hands free device; 188 (63.1%) tuned their radio when driving. A total of 194 (65.1%) had been involved in an accident in the past, the average age among this group was 37.4 ± 8 years and 166 (85.4%) were males. About 31 (16%) accidents occurred on Mondays and 29 (14.9%)

on Fridays. Seventeen (8.8%) accidents occurred on Saturdays. Fifty-seven (29.4%), of the accidents happened in Abuja Municipal Area Council (AMAC). Forty-nine (23.3%) of the accidents were head on collisions, 43 (22.8%) occurred at night and 38 (19.6%) occurred at T-junctions. Twenty-five (12.9%) of the respondents said their brakes failed at the time of the accident. Age, duration of driving and area council of respondents were significantly associated with involvement in accidents. Those that read text messages while driving were about 3 times as likely to be involved in accidents as those that did not; this association was higher among female drivers. About half (49.5%) of the accidents were severe. Of those involved in accidents, 145 (74.7%) of the drivers had a seatbelt on at the time of the accident. There was no statistically significant relationship between use of seatbelt and severity of accident.

The study recommends continuous advocacy and sensitization on safe driving including use of seatbelts and avoidance of phone use. Also, traffic lights or traffic wardens should be deployed to T- junctions and U-turns.

CHAPTER ONE

INTRODUCTION

1.1. Background

About 20 and 50 million people are injured (some with permanent disabilities) and about 1.24 million people die every year as a result of road traffic accidents (also called motor vehicle accident, collision, crash);[2] most of these deaths occur in young people between the ages of 15–29 years with 91% of the world's fatalities occurring in low-income and middle-income countries. Road Traffic Accidents (RTAs) affect mostly those termed vulnerable road users (VRUs) such as pedestrians, cyclists and motorcyclists. Road traffic accidents cost an estimated US$ 518 billion globally and about 1-1.5% of Gross National Product (GNP) of many low- and middle-income countries.[4] Year 2020 global forecasts suggest that traffic accidents will be sixth as a cause of death, second in terms of years of life lost (YLL) and third with respect to 'disability-adjusted life years' (DALYs).[3]

The 2004 World Health Day was dedicated to the theme "Road Safety is No Accident".[5] Globally the highest fatality rates (deaths per 10,000 motor vehicles) worldwide occur in African countries, particularly Ethiopia, Uganda and Malawi whilst fatality risk (deaths/100,000 population) is highest in a disparate group of countries including Thailand, Malaysia, South Africa and Saudi Arabia.[3] Nigeria has a high rate of road traffic accidents. The proportion of deaths from road traffic accidents in Nigeria is said to have increased from 38.2 percent to 60.2 percent in the ten years from 1991 to 2001.[3]

1.2. Problem Statement

According to the World Health Organization, as at 2004, RTAs was ranked as the 9th leading cause of death worldwide and is projected to rank 5th by 2030. WHO noted that even though

RTAs affect all age groups, its impact is mostly among the young being one of the top three causes of death among this group.[6] RTAs are responsible not only for deaths but injuries causing an estimated 20 -50 million injuries annually globally. The injuries resulting from RTAs have economic consequences resulting in as estimated loss of about $518 billion globally being about 1% to 3% of the gross national product. It is estimated that economic cost of road crashes is 1% of Gross National Product (GNP) in low-income countries, 1.5% in middle-income countries and 2% in high-income countries. In terms of costs of RTAs to low-income and middle-income countries, it is estimated that these countries account for about US$ 65 billion of the estimated loss of US$ 518 billion per year.[4]

The direct costs of RTAs on individuals and families include the costs of medical care and rehabilitation that goes with caring for the injured, costs of vehicle repairs and funeral costs incase of death. The indirect costs include the loss of earnings while caring for the injured and the loss of a breadwinner.[6]

In Nigeria (RTAs) are a leading cause of death and disabilities and cause high economic and financial loses such as disabilities, loss of jobs, and reduction in earnings.[8] A number of studies have been conducted to determine the burden of RTAs in Nigeria.[9-11] Hospital data have also been used to estimate burden of RTAs and have shown that RTAs are the most common causes of traumatic deaths in this area.[12]

According to the WHO, RTAs are mostly preventable and predictable and amenable to rational analysis being a human-made problem.[6] The Human factors related to road traffic accidents include drivers and other road users such as driver behaviour, visual and auditory acuity, ability to make quick decision and to react, the speed (driving above the speed limit), drug or alcohol

use before or while driving. The risk of being injured is said to increase exponentially with speed and the injury severity dependent on the vehicle speed change at impact and transfer of kinetic energy. Even in Nigeria where RTAs are a leading cause of death and disabilities, there is a strategy in place for road safety with a fatality reduction target from 48.4 deaths/10 000 vehicles to 3.2 deaths/10 000 vehicles between year 2010 and 2020.[13] This strategic framework needs to be followed.

1.3. Justification

Road Traffic Accidents remain a big problem globally, nationally regionally and locally/peripherally. RTAs are responsible for a high number of deaths and injuries annually worldwide. It is however often neglected. RTAs are largely preventable as they are mostly man-influenced. Availability of relevant data will help to identify interventions to address and prevent these RTAs. The WHO noted that in Low and Middle Income Counries (LMICs), there are no systematic efforts to collect data on RTAs and that there is gross underreporting of deaths and injuries resulting from RTAs[6]. A survey on road safety by WHO showed that most data sources from RTAs are from the police. Only about 7% were from the health sector and another 7% were linked to the health sector.[6] A report on global road accidents noted that road accident data was available in only half of African countries and even less data was available, with respect to vehicle data, and motorisation (except in South Africa).[3]

The WHO noted that data on incidence, types of crashes, number and types of injuries caused and detailed understanding of the circumstances leading to crashes can help guide safety policies, identify, implement and monitor interventions.[6] The WHO emphasized the need for the health sector to take up the role of establishing data systems on injuries recommending, among others that the heath sector could intervene in RTAs in terms of injury surveillance and surveys,

researches on the causes of traffic accidents and injuries, exploration of ways to prevent and reduce the severity of injuries in road crashes by appropriate interventions.[6] Hence the need for a study like this.

According to the Federal Road Safety Commission in 2006, Nigeria had the highest rate of death from motor accidents in Africa with respect to the number of deaths per 10,000 vehicles accidents[9] and there is a strategy in place for road safety with a fatality reduction target from 48.4 deaths/10 000 vehicles to 3.2 deaths/10 000 vehicles between year 2010 and 2020.[14] There is a need to determine the factors responsible for these RTAs in order to address these factors appropriately and channel resources adequately with a view to reducing the burden (saving lives and properties) bearing in mind the scarce resources available to address the burden of RTAs.

Despite the high burden of RTAs in Nigeria however, there is a dearth of data on the factors responsible for these accidents. It has been established that RTA are caused by a number of factors ranging from vehicular to human to environmental but these have not been characterized in studies on RTAs in Nigeria.[15] Therefore, the problem that this study will address is the prevalence of accidents in Nigeria by identifying and characterizing factors that are responsible for RTAs in Nigeria.

1.4. Research Questions

1. What is the prevalence of involvement in RTAs among people that patronize automobile technician workshops in Abuja?
2. What are the demographic profiles of those involved in these road accidents?
3. What proportion of these accidents result in injuries, hospitalization or death?
4. What are the human factors associated with road accidents?

5. What are the environmental characteristics associated with road accidents?
6. What are the vehicular characteristics associated with road accidents?

1.5. General and Specific Objectives

1.5.1. General Objective

To determine the prevalence and factors associated with occurrence of RTAs in the Federal Capital Territory, Abuja.

1.5.2. Specific Objectives

1. To determine the prevalence of RTAs among people that patronize automobile technician workshops in Abuja
2. To determine the socio-demographic characteristics of drivers involved in RTAs in Abuja
3. To determine the proportions of RTAs that resulted in injury, hospitalization or death
4. To determine the vehicular and environmental characteristics amongst RTA victims in Abuja
5. To determine the modifiable human factors associated with RTAs in Abuja

1.6. Scope of the Study

Road Traffic accidents could involve pedestrians, (motor) cyclists, and vehicles , the focus of this study is however limited to accidents involving collision of vehicles (irrespective of what the vehicle collided with). Particular attention is paid to the drivers of these vehicles.

1.7. Definition of terms

Traffic Accident: A vehicle accident occurring on the public highway, originating on, terminating on, or involving a vehicle partially on the highway, (unless another place is specified); accidents involving only off-road motor vehicles are classified as non-traffic accidents.[1] For the purpose of the study, a Road Traffic Accident was defined as accident, which

took place on the road between two or more objects, one of which must be any kind of a moving vehicle.

A road traffic injury: A fatal or non-fatal injury that occurs as a result of an accident on a public road involving at least one moving vehicle.[2]

A road death: The Convention of Road Traffic accidents in Vienna, deems a road death to have occurred when a person injured dies within 30 days of a crash (and as a result of the crash) and an injury road crash to involve a collision of a moving vehicle on a public road in which a road user (human or animal) is injured.[3]

Severity of accident: For the purpose of this study, a road accident that affects the occupants of the affected vehicle either by injury (minor or major), hospitalization or death is classified as severe but where the vehicle alone is affected (property damage only), it is considered not severe.

CHAPTER TWO

LITERATURE REVIEW

2.1. Epidemiology of Road Traffic Accidents

According to the World Health Organization, the total number of road traffic deaths is about 1.25 million per year globally; currently ranked as 9th leading cause of death RTAs are projected to rank 7th leading cause of death worldwide by 2030.[6] The WHO advocates that attention be paid to reduction of road traffic accidents so as to save lives and in addition, reap the economic benefits that accrue from such reduction.[16] It is estimated that countries worldwide spend about 1–3% of their Gross Domestic Products (GDP) on road traffic injury prevention.[16] A study on RTA reduction measures in Catalonia over a 10-year period showed a 57% reduction in deaths from RTAs and about US$ 24 000 million saved in economic terms.[16]

Being a developing country, Nigeria falls among the countries with high burden of road accidents. The trend in road traffic deaths in Nigeria has ranged from about 10,000 in 2001 to about 4065 in 2010 and 4% GDP is estimated to be lost due to RTAs annually.[14] The road traffic injury rate is estimated at 41 per 1000 population and mortality from road traffic injuries, 1.6 per 1000 population.[8]

2.2. Prevalence of Road Traffic Accident

According to the World Health Organization, over 1.2 million deaths and between 20 to 50 million non-fatal injuries occur on the roads globally each year. Inspite of the fact that low and middle income countries (LMICs) have just 48% of the total number of registered vehicles worldwide, the WHO estimates that 90% of the fatalities from RTAs occur in LMICs; the case fatality rates in LMICs is about 21.5 per 100,000 and 19.5 per 100,000 respectively but for high income countries, it is about 10.3 per 100,000 population.[6]

Mortality due to accidents resulting in injuries in Africa is among the highest in the world, at 28.3 deaths per 100 000 population.[8] When analysed globally, the share of Africa's road fatality is three times as large (11%) as it's motor vehicle share.[3] In 1999 a report on world traffic accidents noted ten countries accounted for almost 90 per cent of all the road fatalities reported in the Africa region; two countries, South Africa and Nigeria, accounted for more than half of the Africa region's road fatalities. [3]

The Nigeria FRSC Annual Report of 2013 noted that 11,385 road accidents with 6052 deaths were reported in the Country in year 2010; 13,196 road accidents with 6054 deaths were reported in year 2011 and 13,262 RTAs resulting in 6092 deaths were reported in 2012.[17] The report also noted that 13,583 accidents occurred in year 2013 with 6544 deaths. Of these numbers, the FCT has consistently carried the highest burden with 1193 of the total RTAs in 2010 (10.5% of total) with 396 deaths (6.5% of total). In year 2011, the FCT had 1364 RTAs (10.3% of the total) with 465 deaths;). In year 2012, the FCT had 1522 RTAs (11.5% of the total) with 347deaths. While in year 2013, the FCT had 1766 RTAs (13% of the total) with 446 deaths.[17]

2.3. Determinants related to Road Traffic Accidents

Road Traffic Accidents are not usually the result of a single causal factor (i.e. not having a single cause) but each would usually have several causative factors.[18] The causes of road accidents classified into three: the road (including climate), the vehicle and the road user. This study attempts to describe how different factors (human, vehicular and environmental) contribute to accidents [18]. The table below shows a Systematic analyses of the factors associated with Road Traffic Accidents through the use of Haddon Matrix.

Table 1: The Haddon Matrix of road accidents/ crashes

	Factors			
Phase		Human	Vehicles and equipment	Environment
Pre-crash	Crash Prevention	Information, Attitudes, Impairment, laws Police enforcement	Roadworthiness, Lighting, Braking Handling Speed management	Road design and road layout Speed limits Pedestrian facilities
Crash	Injury prevention during the crash	Use of restraints, Impairment	Occupant restraints, Other safety devices, Crash-protective design	Crash-protective roadside objects
Post-Crash	Life sustaining	First-aid skill, Access to medics	Ease of access Fire risk	Rescue facilities, Congestion

*adapted from Sumaila, 2013

2.3.1. Human factors

The human factors responsible for RTAs include demographic characteristics like age, sex, occupation, marital status, driving skills, speed, alcohol use, defective eyesight, distractions, fatigue, and disease condition. A review summarized studies on the epidemiology of motor vehicle accidents in developing countries showed that male casualties in RTAs were consistently more than females. [19] Another study conducted in Zagreb Croatia found that the risk of involvement in fatal rather than injured outcomes was higher among males than among females.[19] Another study conducted in Nigeria reported that an increased risk of injury was

associated with male gender among those aged 18–44 years, with a relative risk of 2.96 when compared with women in the same age range [8] Accident rates were 4.9 times higher in males than females.[21]

In Ontario Canada, accident involvement rates of 16–19 year old drivers were higher than those of 20–24 and 25–59 year olds. Age group 16-19 year olds accounted for only 4.9% of the total yearly travel by 16-59 year olds but were involved in more serious accidents (13.7% of the drivers involved in fatal accidents were in this age group).[22]

A case-control study designed to assess the presence or absence of risk factors among persons who had accidents and those who had not had accidents found that the major factors independently associated with an increased risk of traffic accidents were; years of driving experience, motor and cognitive activities, and cellular phone use time. The study also noted that talking more than 50 minutes per month on cellular phones in a vehicle was associated with a 5.59 fold increased risk in a traffic accident.[23] Assessment of the combinations of cellular phone use time and other driver inattention factors found that the combination of cellular phone use time and drinking a non-alcoholic beverage, or with drinking an alcoholic beverage, with driving without a hand on the steering wheel, and with lighting a cigarette or cigar all resulted in a significant increase in the odds of having an accident.[23]

A number of studies showed that driver negligence (reckless driving, improper overtaking, and disregarding traffic lights) was judged by the police as the main causal factor for RTAs.[19, 22, 23] Age group 16-19 year olds were found to account for only 4.9% of the total yearly travel by 16-59 year olds but were involved in more serious accidents (13.7% of the drivers involved in fatal accidents were in this age group).[22] These accident involvement rates of 16–19 year olds were

disproportionately high on weekends, at nighttime and where there were other passengers; the negative effect of passengers on overall accident rates was obvious in 16–19 year old drivers and pronounced for both sexes, (accident involvement rates being approximately twice as high with passengers as without) .[22] The study noted that for 16–19 year olds, accident rates were significantly higher for two or more passengers versus one passenger, with the highest rates occurring with passengers at nighttime.[22]

2.3.2 Environmental factors

The environmental factors are sometimes known as road factors. These factors responsible for RTAs include road design, construction and surfacing, number of lanes, separation of pedestrians and cyclists from road traffic, availability of lighting, climatic conditions (cloudy, rain, fog).[20] Secondary data was used to examine the influence of passengers, time of day and day of week on accident rates using accident data made available by the Ontario Ministry of transportation derived from police reports for all accidents.[22]Accident rates were found to be similar from Monday to Thursday and higher on Fridays and Saturdays; also accident rates for all driver groups were found to gradually increase towards the evening, peaking between the late night hours of midnight and early hours of dawn[22]; this was similar to the findings that more fatal accidents occurred during night hours and that more deaths than injuries occurred during weekend.[20] It however differed from another set of findings, in a study that interviewed 494 victims of whom about a quarter mentioned that the road was wet at the time of RTA (representing 107 vehicles) involved in accident during wet road conditions, that the highest number of RTAs took place on Sundays followed by Tuesdays and Thursdays with the least number of RTAs occurring on Mondays ; the peak time for RTAs were highest number of RTAs occurring from 4 PM to 5 PM and from 6 PM to 7PM.[21] Most of the studies in a review showed

that between 60% and 80% of RTA casualties occurred during the day and one-third of traffic injuries occurred during the night with the highest incidence being between 6pm and midnight and the highest incidence of traffic injury occurring during weekends. [19]With respect to the presence of other passengers they found that fatal accidents were significantly higher when passengers were present; involvement rates varied between sexes, however, the accident involvement rates of 16-19 year old drivers were higher with passengers than without.[19]

2.3.3. Vehicular factors

The Vehicular factors responsible for RTAs include mechanical defects (of brakes, tyres, steering, exhaust system and lights), type and design[23]. Accident reports, found that tyres and brakes were the main contributors to mechanical failures resulting in accidents in the Pretoria.[23] Few studies, however, address vehicular factors which is one of the factors this study considered.

2.4. Prevention of Road Traffic Accidents

The World Health Organization[7] provides a few recommendations for preventing road accidents and improving safety on the roads. These include incorporating safety features into land-use and transport planning (provision of shorter and safer pedestrian and bicycle routes, convenient, safe and affordable public transport and designing roads to include controlled crossings for pedestrians, and street lighting), setting and enforcing speed limits appropriate to specific roads, setting and enforcing laws requiring seat-belts and child restraints for all motor vehicle occupants, setting and enforcing laws requiring riders of bicycles and motorized two-wheelers to wear helmets, setting and enforcing blood alcohol concentration limits for drivers including random breath testing, making daytime running lights a requirement for two-wheeled vehicles, and maybe four-wheeled vehicles, design of motor vehicles so as to protect the occupants, subjection of new road projects to road safety audits, making existing road infrastructure to

promote safety, through the provision of safer routes for pedestrians and cyclists, incorporating traffic calming measures, low-cost remedial measures and crash-protective roadsides, provision of immediate access to care for road accident victims, from the accident scene to health facility, enhancing programmes of law enforcement with public information and education campaigns on safe driving.

2.5. Conceptual Framework

A conceptual framework of how factors work together to determine safety on the roads is as shown in figure 1. This conceptual framework is applicable in a cross-sectional study on RTAs.

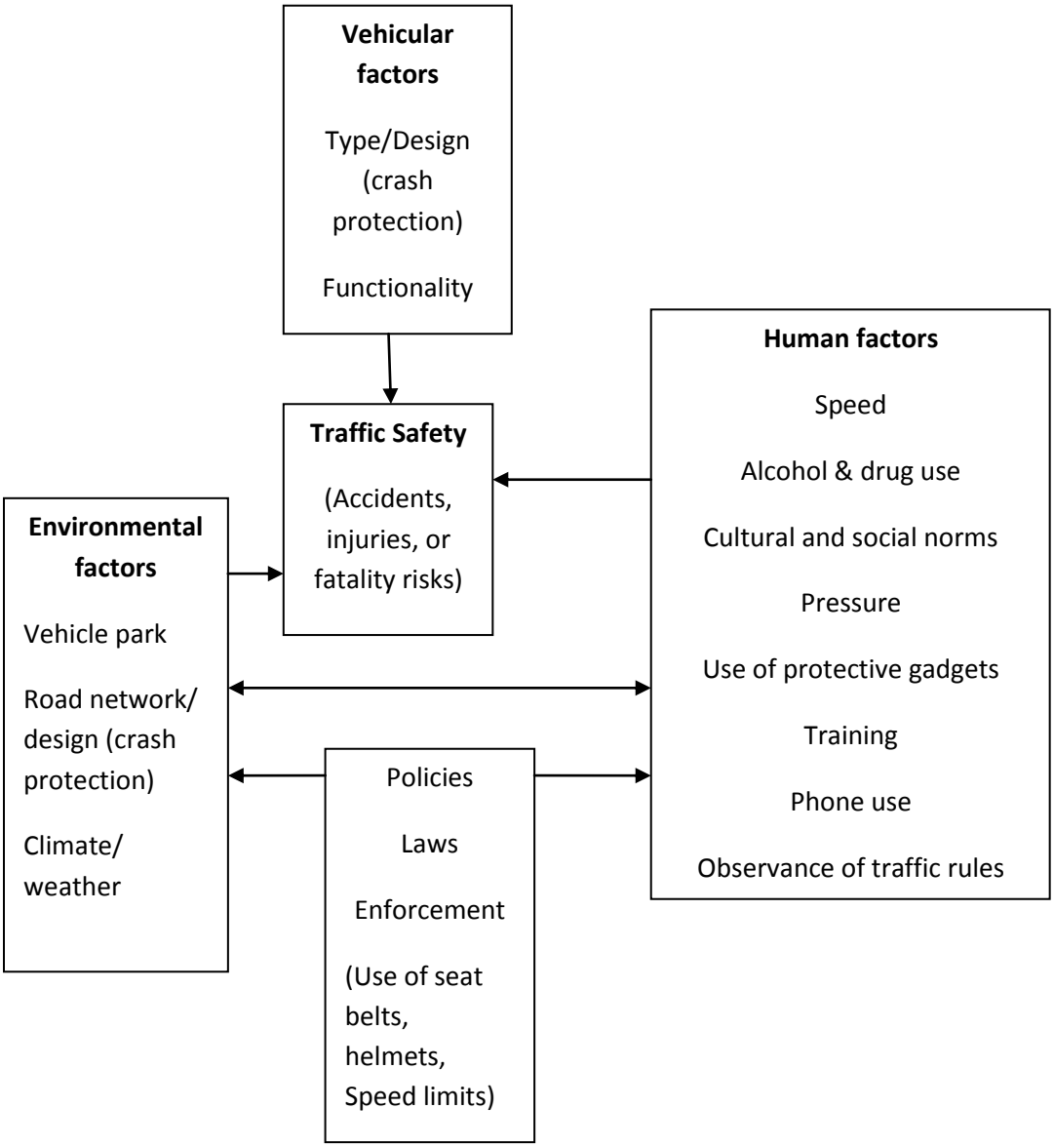


Figure 1: Conceptual framework for risk of road traffic accidents, injuries or fatalities

The conceptual framework looks at how safety in road traffic is influenced by prevention of road accidents. A number of authors have developed frameworks that describe road safety and road traffic accidents.[25-32] The conceptual framework adapted (figure 1), shows how vehicular factors, environmental/road and human factors influence road safety and by extension prevention of road traffic accidents.[24] The vehicular factors were divided into active (which relate to the human controlling the vehicle) and active safety which have to do with the vehicle itself. The human factors noted that driving behaviour is influenced by many other factors including driving ability (knowledge, skill, experience), driving environment (including the physical and the social environment; night or darkness, weather, road conditions, vehicle ability, type and interior and passenger influence), perceived environment (family norms and expectations), developmental factors (physiological and psychological), behavioural, personality and demographic factors (age, gender, employment status and education).[24] Government policies and laws governing road and vehicle use affect the environmental factors hence affecting the traffic safety; however, the Online Transportation Demand Management (OTDM) encyclopedia[25] considered the concept of traffic safety in terms of engineering and behaviour.

CHAPTER THREE

METHODOLOGY

3.1. Study Area

The study was carried out in the Federal Capital Territory (FCT), Abuja. The FCT was conceived in 1976 and carved out of three States (Niger, Nassarawa and Kogi) and by 1991, the seat of Government was moved there making it the capital of Nigeria. [33, 34] Geographically, the FCT, Abuja is located at the center of Nigeria above Niger-Benue and shares boundaries with Kaduna State in the North, Niger in the West, Kogi in the South-West and Nassarawa State in the South-East. [33] The capital city, Abuja covers a landmass of about 250 sq. Km. The FCT covers an area of about 8000 sq. Km and has a population of 1,406,239 [12, 13] which accounts for 1.3% of Nigeria's total population and population density of 192 people/ Sq. km. There are six area councils for local administration and provision of basic social services namely Abuja Municipal, Gwagwalada, Abaji, Kuje, Bwari and Kwali. These area councils are mostly urban. The city has a population put at about 1.4 million (according to the 2006 National census)[13]with an exponential growth rate of 9.3%. The city is rapidly growing with a high influx of people from all geopolitical zones in the country into the territory, this could make the population to be well over 8 million people. [33] Being the Federal capital, the FCT is home to people from different tribes and cultures within Nigeria.

The FCT is well planned and developed with a good network of roads. According to the Annual report by the FRSC in the last three years, the FCT has consistently had the highest number of road accidents.[17] The road network, adjudged as some of the best in Africa encourages over speeding. However, some current challenges that have been identified with regards to the transportation system within the FCT include widespread use of low-occupancy vehicles for

public transport, non-development of transit ways to major activity centres, city-wide traffic congestion, emergence of illegal bus stations, poor parking facilities, absence of pedestrian walkways, growth of squatter and shanty settlements along with safety and administrative challenges.[33] The Federal Road Safety Commission is the traffic authority established by the Federal Government to handle traffic-related matters in Nigeria, including issuance of drivers' licences. In addition Vehicle Inspection Officers (VIOs) are responsible for ensuring the worthiness of vehicles operating on the roads including issuance of road worthiness certificates; also, training and testing of drivers for drivers licence and riders (motorbikes) for riders licence. In addition, VIOs are responsible for inspection of accident vehicles and certification of driving schools. Both bodies operate within the FCT.

Table 2: The Area Councils in Abuja, their Headquarters and 2006 Census population `

Area Council	Headquarters	2006 Census population
Abaji	Abaji	58,642
Abuja Municipal	Abuja	776,298
Bwari	Bwari	229,274
Gwagwalada	Gwagwalada	158,618
Kuje	Kuje	97,233
Kwali	Kwali	86,174
Total Population		1,406,239

*source: National Population Commission (Census, 2006).

3.2. Study Design

This was a cross-sectional (retrospective) descriptive study.

3.3. Study Population

The study population were all persons that took their vehicles for repairs (patrons) at registered automobile mechanic workshops within the FCT.

3.3.1. Inclusion Criteria

Residents of the Federal Capital Territory, Abuja who are vehicle owners and/or drivers, who are clients of or who patronize automobile mechanics during the study period, irrespective of age.

3.3.2. Exclusion Criteria

Any accident, injury or deaths on the road without involvement of a vehicle (e.g. a person slipping and falling on the road and sustaining injury) or injury involving a stationary vehicle (e.g. persons getting injured while washing or loading a vehicle) were excluded from the study.

3.4. Community entry and sampling method

Respondents were patrons/clients of automobile mechanic workshops. The National Automobile Technicians Association (NATA) executive members were sensitized on the proposed study. Automobile mechanics were reached through the NATA which provided a list of registered automobile repair workshops in all area councils in Abuja. The chairmen of all the units were sensitized at a monthly meeting of the association. In addition, one-on-one meeting was held with each chairman of the selected units; at the meeting, they were requested to nominate an educated member of their units to serve as data collectors. The nominated individuals were given a one-day training and served as data collectors. Each data collector interviewed and collected the information from the consenting respondents between January and July 2015.

3.5. Sample Size Determination

The sample size was determined using the following sample size calculation formula.[36]

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

where n = minimum sample size

Zα = the standard normal deviate corresponding to level of significance of 5%

p = proportion of outcome of interest from previous study or report

q = 1-p

d is the desired level of precision (5% for single proportions)

With a road traffic injury prevalence rate of 54%[8], therefore,

$$n = \frac{1.96^2 0.54 \text{ x } 0.46}{0.05 \text{ x } 0.05^2}$$

n = 382

Since we are dealing with a finite population (<10,000),

$$\text{nf} = \frac{\text{n}}{1 + (\text{n} - 1)/\text{N}}$$

n_f = 382 / (1+ 382-1/700) = 247

Where n_f = Sample size after finite correction

Assuming a non-response rate of 17%[37],

$$\text{final n} = \frac{\text{n}}{1 - \text{NR}}$$

where NR = Non Response (NR) proportion

$$\text{final n} = \frac{247}{1 - \frac{17}{100}}$$

n =297.5

Two hundred and ninety eight respondents that indicated that they drive were included in the analysis.

3.6. Sampling Technique

A cluster sampling technique was used. The clusters were units of registered automobile workshops. The sampling frame was all registered automobile workshops within the FCT. A list of all registered automobile workshops was obtained from the Abuja Chapter of NATA. The NATA has a list of 29 registered units covering the six area councils in the FCT. Some area councils have one unit and some have many. Eleven units were initially randomly selected from each council through balloting proportionate to the number of units per council. The area councils with only one unit were all purposely selected. Consecutive consenting clients visiting the automobile workshops were interviewed; where there were more than one eligible respondents per visit, the respondent was randomly selected by ballot. The table below shows the units selected.

Table 3: Selected NATA units by area council

AREA COUNCIL	UNIT	SELECTED (YES/NO)
AMAC	Area 1	No
AMAC	Apo nepa	No
AMAC	Utako	Yes
AMAC	Zone 3	No
AMAC	Tipper garage	No
AMAC	Stadium	Yes
AMAC	Kugbo	Yes
AMAC	Ap durumi	Yes
AMAC	Apo dutse	No
BWARI	Mpape	No
BWARI	Bwari	Yes
AMAC	Garki	No
GWAGWALADA	Zuba	Yes
AMAC	Mabushi	No
AMAC	Pp grand	No
AMAC	Jabi	No
GWAGWALADA	Gwagwalada	Yes
AMAC	Kurudemo	No
AMAC	Deidei	No
AMAC	Gudu	Yes*
AMAC	Apo	Yes
AMAC	Lugbe	No
AMAC	Durumi II	No
AMAC	Games village	No
AMAC	Kabusa	No
KWALI	Kwali	Yes
KUJE	Kuje	Yes
ABAJI	Abaji	Yes

3.6. Study Instrument

Based on variables from previous studies, the questionnaire was designed by the researcher and pre-tested among a few friends and drivers (students) from outside Abuja. The semi structured interviewer-administered questionnaire was used to elicit demographics, human, environmental and vehicular factors related to occurrence of RTAs. The questionnaire was divided into three sections .The first section had questions on socio-demographic characteristics including age, sex, educational level, occupation and ethnicity. The second section was general questions on driving habits, the third section was on accident circumstances for those that had been involved in accidents, the fourth section asked about environmental factors that could have been responsible for the accident, the fifth section was about human risk factors while the sixth was about vehicular risk factors.

3.7. Data Collection Methods

Educated ('volunteer') automobile technicians were nominated by the chairmen of the chosen NATA units; where competent technicians were not available, the chairman represented his unit. The recruited automobile technicians were invited to the State NATA office and a one-day training on the data collection tools and interview method including obtaining informed consent. The training included a role play by all data collectors on conducting the interviews. Three different batches of trainings had to be conducted because of unavailability of all data collectors at the same time. The data was collected between January and July 2015. A supervisor was employed to monitor and follow up on completeness of questionnaires and to retrieve.

3.7.1. Data Management

The variables collected are as shown in table 4.

Table 4: List of Variables

Independent Variables	Dependent Variables
Sex, age , religion, education level, occupation, ethnicity, years of driving experience, day of week of accident, time of accident, local government where accident occurred , type of vehicle, point of accident, environmental factors, human factors	Involvement in Road traffic Accidents categorized by type and Severity based on injuries sustained, hospitalization, or death

3.8. Measurement of Variables

Severity of accidents was assessed by whether or not the accidents affected humans in any way. Respondents were asked whether there was injury, hospitalization or death in the accident. An accident was regarded as severe where a respondent answered yes to any of the three scenarios (injury, hospitalization or death).

The table below details the variables measured and the statistical analyses

Table 5: Objectives, variables measured and analyses

Objective	**Exposure Variables**	**Outcome Variables**	**Analysis/ Statistical analyses**
To determine the socio-demographic characteristics of vehicle drivers in Abuja	Age, Sex, educational Status, occupation, ethnicity, religion	Involvement in accident	Frequencies, Proportion / bivariate
To determine the human, vehicular, road and environmental factors associated with vehicular RTAs in Abuja	Ringing mobile phone Phonecall without handsfree Phonecall with handsfree Reading text message Tuning radio or CD player Loud radio or CD player Typing text message or dialing mobile phone Adjusting car controls Car GPS Talking to (other) passenger (s) Eating Drinking (non alcoholic) Drinking (alcoholic) Smoking Combing hair Applying makeup Counting money Use of laptop or other device(e.g. ipods, ipads) Moving an object within the vehicle Moving people or object on road Billboard / signage Counting money	Involvement in accident	Frequencies, Proportion, bivariate, multivariate
To determine the severity of vehicular RTAs in Abuja	Accident involvement	Severity (injury, hospitalization, death)	Proportion

3.9. Ethical Considerations

The approval of the ethical committee/ Institutional review board (IRB) of the Federal Capital Territory Administration was obtained before the commencement of the study**.** Written informed consent was obtained, from each respondent before recruitment into the study. The respondents did not bear any cost for the research. Confidentiality was maintained. Participation was voluntary and participants were allowed to withdraw at any point during the interview if they so wished. The study did not constitute any risk to the participants. The consent form is shown in Appendix 3.

3.10. Limitations

The higher number of males than females in the study may reflect that males are more likely to visit automobile workshops than females. The involvement in and circumstances surrounding accidents were self-reported hence authenticity of claims could not be verified. In view of the nature of the study which asked about the engagement in unlawful driving behaviours of drivers, some participants might have made wilful misstatements in order to look good or to avoid being sanctioned. This was however considered at the proposal stage and may have been reduced in view of the fact that the automobile technicians conducted the interviews (rather than unfamiliar interviewers) hence the drivers may not have considered the study to be for the purposes of sanction. Also, the fact that the survey did not collect personal information such as names, addresses or phone numbers. In view of the fact that the exact length of time since accident was not specified, there may have been recall bias with respect to the circumstances of the accident such as the date and time of the accident; for example a number of participants that mentioned the dates of the accident selected days of the week that did not match those dates after being cross checked during analyses. Injuries could not be classified using the International

Classification of Diseases (ICD) because of the cross-sectional nature of the study. Some respondents had been in accidents more than once; in such cases, the respondents were asked to respond based on their most recent accidents. The environmental (road) and vehicular factors could not be analyzed/determined as only those involved in accidents could provide information on the circumstances in the environment and with the vehicle at the time of the accident.

CHAPTER FOUR

RESULTS

A total of 332 respondents who were clients of automobile repair workshops, consented to participate in the study; however, only 298(89.8%) of these indicated that they drive and were included in the analyses. The mean age of those that drive was 35.9 ±8.6 years. Of those that drive, 255 (85.6%) were males, 194 (65.1%) had been involved in accidents; 57 (29.4%) of these accidents occurred at AMAC. The average age of those involved in RTAs was 37.4±8.7years. Of those that responded to the demographic characteristics, 166(85.4%) were males, 136 (71.6%) were Christians, and 72 (37.7%) Yorubas. About 68 (37.6%) of those involved in RTAs had secondary education while 69 (38%) had tertiary education. With regards to occupation, about 55 (32%) were drivers and 29 (16.9%) were civil servants. The mean duration of driving amongst those that had been involved in accidents was 10.9 years ± 7.4years. About 96 (49.5%) of the accidents were severe resulting in injuries 84 (48.5%), hospitalization (41.2%) and 9.8% were fatal. The major human factor identified was use of mobile phones; talking to other passengers seemed to be protective. The vehicular characteristics during accidents were failed brakes and/or clutch 27 (14.1%) and burst and /or worn tyres 17 (8.9%). The major environmental /road characteristics during accidents were night time, rainfall, speedbreakers and cross roads (T-junction, U-junctions). The rest of the result is shown below in tables and charts.

Table 6: Distribution of clients of automobile workshops by Area Council (N = 332)

Area Council	**Frequency n (%)**
Abaji	20 (6.0)
AMAC	176 (53.0)
Bwari	59 (17.8)
Gwagwalada	16 (4.8)
Kuje	41 (12.3)
Kwali	20 (6.0)

Most (53%) of the respondents were from Abuja Municipal Area Council (AMAC).

Table 7: Socio-demographics of respondents (N = 332)

Variable	Frequency n (%)
Sex	
Female	58(17.5)
Male	255 (85.6)
Age-group (years)	
<30	86 (25.9)
30-39	134 (40.4)
40-49	86 (25.9)
>/= 50	26 (7.8)
Ethnicity	
Yoruba	119 (35.8)
Ibo	67 (20.2)
Hausa	64 (19.3)
*Others	82 (24.7)
Religion	
Christian	226 (68.1)
Muslim	104 (31.3)
**Others	2 (0.6)

*Other ethnic groups in Nigeria ** Traditional religious beliefs

Of the 332 respondents, there were more 274 (82.5%) men than women in this study; 134 (40.4%) of the respondents fell in the age group 30 -39; with respect to ethnicity, 119 (35.8%) were Yorubas, 67 (20.2%) were Ibos while 64 (19.3%) were Hausas; other tribes were 82 (24.7%), in terms of religion, 226 (68.1%) were of the Christian faith.

Table 8: Age and Sex of respondents that drive (N=298)

Variable	Frequency n (%)
Sex	
Female	43(14.4)
Male	255 (85.6)
Age-group (years)	
<30	68 (22.8)
30-39	121 (40.6)
40-49	84 (28.2)
>/= 50	25 (8.4)

Among the 298 (89.8%) respondents that drive, there were more males 255 (85.6%) than females. Most 121 (40.6%) of the respondents that drive fall within the age group 30-39. The mean age was 35.9 $\pm$8.6.

Table 9: Duration of driving among respondents (N=298)

Duration of driving (year)	**Frequency** **n (%)**
< 5	81 (27.2)
5 – 9	72 (24.2)
10 – 14	66 (22.1)
15 – 19	35 (11.7)
≥ 20	44 (14.4)

Eighty-one (27.2%) of the respondents had driving experience of less than 5 years; the least number 35(11.7%) fell in the driving duration of 15-19 years. The mean duration of driving was 10.3 (± 7.5).

Table 10: Respondents' usual speed and what they do when driving (N=298)

Usual speed when driving	**Frequency** **n (%)**
Less than 50 km/hour	44 (14.8)
50 -99 km/hour	142 (47.7)
100- 149km//hour	97 (32.6)
More than 150 Km/hour	9 (3.0)
Don't know	6 (2.0)
***Modifiable human factors for Accidents**	
Pick phone call without hands free	122 (40.9)
Pick phone call with hands free	86 (28.9)
Type text message	23 (7.7)
Read text message	51 (17.1)
Tune radio or CD player	188 (63.1)
Adjust other car controls (A/C or car GPS)	133 (44.6)
Talk to other passengers	159 (53.4)
Eat	62 (20.8)
Drink non alcoholic	68 (22.8)
Drink alcoholic	11 (3.7)
Smoke	19 (6.8)
Comb hair	7 (2.3)
Apply makeup	10 (3.4)
Count money	28 (9.4)
Use laptop or other devices (e.g. ipods, ipads)	5 (1.7)

* Multiple responses

Most 142 (47.7%) usually drive at a speed of between 50 and 99 Km/hour. A high number indulge in dangerous use of phones while driving such as picking call without handsfree, 122(40.9%), reading text messages 51 (17.1%) and typing text messages 23(7.7%). Only about 86 (28.9%)say they pick phonecalls with handsfree. One hundred and eighty-eight (63.1%) tune their radio or CD player when driving, or talk to other passengers in the vehicle 159 (53.4%)

while 133 (44.6%) adjust their other car controls. When asked whether they had ever been involved in an accident, of 298 respondents,194 (65.1%) of respondents said they had been involved in an accident.

Table 11: Circumstances around accidents (N = 194)

Variable	Frequency n (%)
Day of week of the accident	
Monday	31 (16.0)
Tuesday	28 (14.4)
Wednesday	26 (13.4)
Thursday	18 (9.3)
Friday	29 (14.9)
Saturday	17 (8.8)
Sunday	21(10.8)
Not sure	24 (12.4)
Place of accident	
Abaji	20 (10.)
Abuja Municipal Area Council (AMAC)	57 (29.4)
Bwari	12 (6.2)
Gwagwalada	22 (11.3)
Kuje	18 (9.3)
Kwali	9 (4.6)
Outside Abuja	38(19.6)
Don't know	18 (9.3)
Type of vehicle	
Private	133 (68.6)
Commercial	52 (26.8)
Company	7 (3.4)
Yes	126 (42.3)

No	63 (21.1)
No response	109 (36.6)
Presence of children less than 18 years in the vehicle	
Yes	34 (17.5)
No	152 (78.4)
Don’t know	8 (4.1)

There was not much difference with regards to days of the week that the accidents occurred. The least accidents among respondents occurred on Saturdays 17 (8.8%) and Thursdays 18 (9.3%). Most of the vehicles involved in accidents (68.6%) were private, 126 (66.7%) of the vehicles involved in accidents had other passengers in the vehicle and 34 (17.5%) had children less than 18 years in the vehicle.

Table 12: Types and number of vehicles and type of accidents (N = 194)

Variable	Frequency n (%)
Type of vehicle	
Articulated vehicle (trailer)	3 (1.5)
Big Red buses (commercial)	4 (2.1)
Mini bus	31 (16.0)
Other Bus	8 (4.1)
Saloon car	123 (63.4)
Sports Utility Vehicle (SUV)/ Jeep	16 (8.2)
Tricycle	2 (1.0)
Others	7 (3.6)
Type of accident	
Angle or side impact accident (side)	41(21.1)
Accidents involving pedestrians or cyclists	14 (7.2)
Accidents with animals	7 (3.6)
Head-on accident (front)	49 (23.3)
Rear-end accident (back)	31 (16.0)
Single vehicle /run-off-road accident	34 (17.5)
Don't Know	18 (9.3)
Number of vehicles involved in the accident	
1	50 (25.8)
2	89 (45.9)
3	17 (8.8)
4	1 (0.5)
5	1(0.5)
No response	36 (18.6)

Most of the accidents (63.4%) involved salon cars followed by mini buses (16.0%). All commercial buses were 43(22.2%) of the cars that had been involved in accidents. Accidents were mostly 49 (23.3%), head on accident, single vehicle/run off 34 (17.5%) and rear end accidents 31 (16.0%). The number of vehicles involved were mostly 2 (45.9%) or one (25.8%).

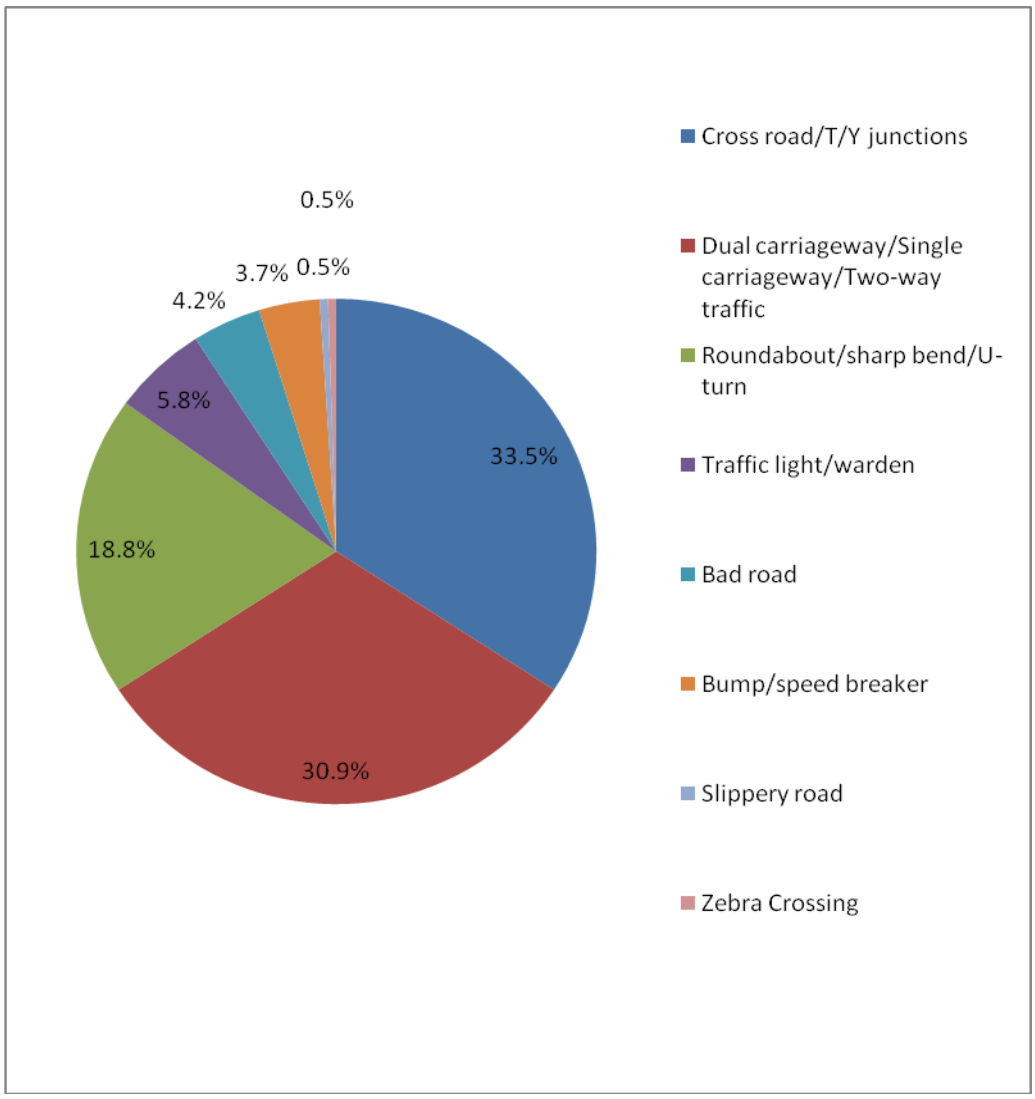


Figure 2: Representation of the parts of roads where accidents occurred

As shown in Figure. 2, of 194 respondents involved in accidents, a number of the accidents 64 (33.5%) occurred at cross roads (including T- and Y-junctions); 59 (30.9%) occurred on 2-way traffic, dual and single carriageways; 36 (18.8%) occurred at roundabouts, /sharp bends or U-turns 11 (5.8%) occurred where there were either traffic lights or traffic wardens.

Table 13: Level of severity of accidents (N = 194)

Variable	Frequency n (%)
Injuries sustained	
Yes	94 (48.5)
No	93 (47.9)
Don't know	7(3.6)
Hospitalization	
Yes	80 (41.2)
No	108 (55.7)
Don't know	6 (3.1)
Death occurred	
Yes	19 (9.8)
No	167 (86.1)
Don't know	8 (4.1)
Severity of accident	
Severe	96 (49.5)
Not severe	98 (50.5)

In terms of how much the accidents affected the occupants of the vehicles (severity), of 194 accidents, 94 (48.5%) resulted in injuries being sustained, 80 (41.2%) resulted in hospitalization and 19 (9.8%) resulted in deaths. About half (96, 49.5%) of the accidents were severe (there were injuries, hospitalization or death).

Table 14: Frequency of Environmental factors at time of accident (N = 194)

Present at the time of the accident	**Frequency n (%)**
Night	43 (22.8)
Obstruction of vision by harmattan/fog	5 (2.6)
Obstruction of vision by other items	17 (8.8)
Obstruction of vision by trees	3 (1.5)
Potholes	18 (9.3)
Rainfall	31(16.0)
Speed breaker (bumps)	27 (13.9)
No response	50 (25.8)

Of 194 accidents, most occurred at night 43 (22.8%), a large number 31 (16.0%) happened at during rainfalls; 27 (13.9%) occurred where there were speed bumps and 18 (9.3%) occurred where there were potholes. About 25 (12.9%) said they had their visions obstructed, 5 (2.6%) by harmattan/fog, 3 (1.5%) by trees and 17 (8.8%) said by other items.

Table 15: Frequency of modifiable Human factors for accidents (N = 194)

Variable	Frequency n (%)
Had seat belt on at the time of accident	
Yes	145 (74.7)
No	43(22.2)
Could not remember	6 (3.1)
Have valid license	
Yes	114 (58.8)
No	53 (27.3)
Could not remember	27 (13.9)
Have a known eye problem	
Yes	23 (11.9)
No	146 (75.3)
Don't know	30 (12.8)
Used eye glasses to drive normally	
Yes	26(13.4)
No	168 (86.6)
Used eye glasses at the time of accident	
Yes	19 (9.8)
No	142 (73.2)
Could not remember	33 (17.0)
Distracted at the time of the accident	
Yes	68 (35.1)
No	102 (52.6)
Could not remember	24 (12.3)
Over-speeding at the time of the accident	
Yes	32 (16.5)
No	127 (65.5)
Could not remember	35 (18.0)

Only 145 (74.7%), had seat belt on at the time of accident, about 22.2% did not have seatbelts on at the time of the accident. Just about half of those involved in accidents 114 (58.8%), had a valid driving license at the time of the accident. Twenty-six (13.4%) of these drivers use glasses to drive normally but 19 (11.2%) used glasses at the time of the accident. Some of the drivers 68 (35.1%) acknowledged that they were distracted at the time of the accident and 32 (16.5%) of the respondents admitted to over speeding at the time of the accident.

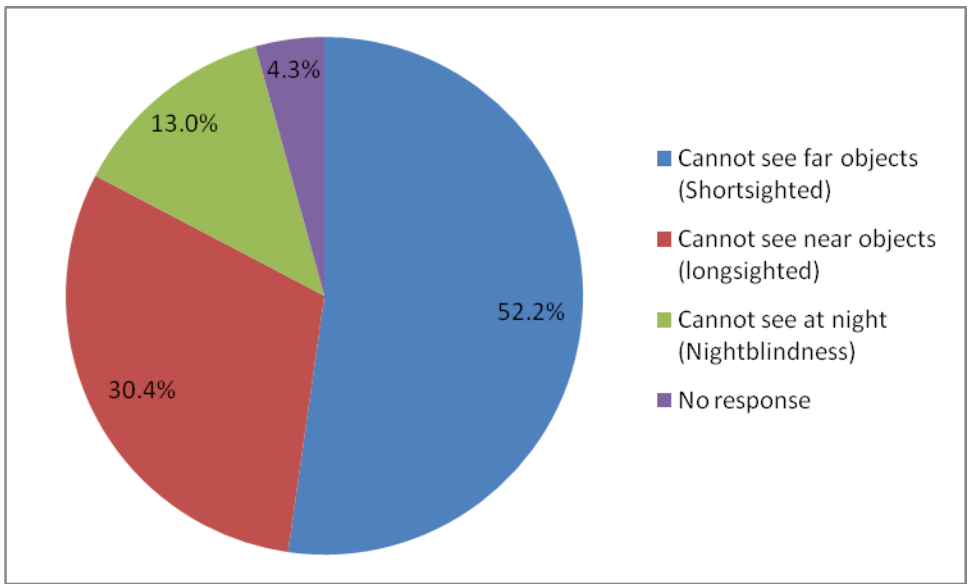


Figure 3: Type of eye problems reported by respondents (N = 23)

About 23 (11.9%) had known eye problem of whom 12 (52.2%) were shortsighted. Three (13%) reported nightblindness.

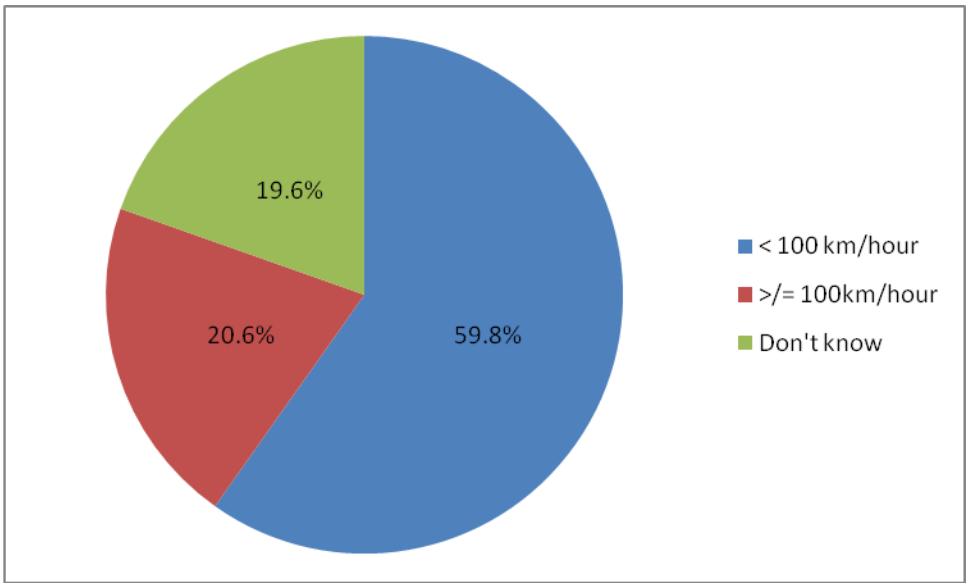


Figure 4: Respondents' speed at the time of the accident (N = 194)

When asked about their exact speed at the time of the accident of 194 respondents, 38 (19.6%) could not state their exact speed. However, when given a range, 116 (59.8%) said they were driving at less than 100km/hour. Only 40 (20.6%) said they were driving at more than 100km/hr.

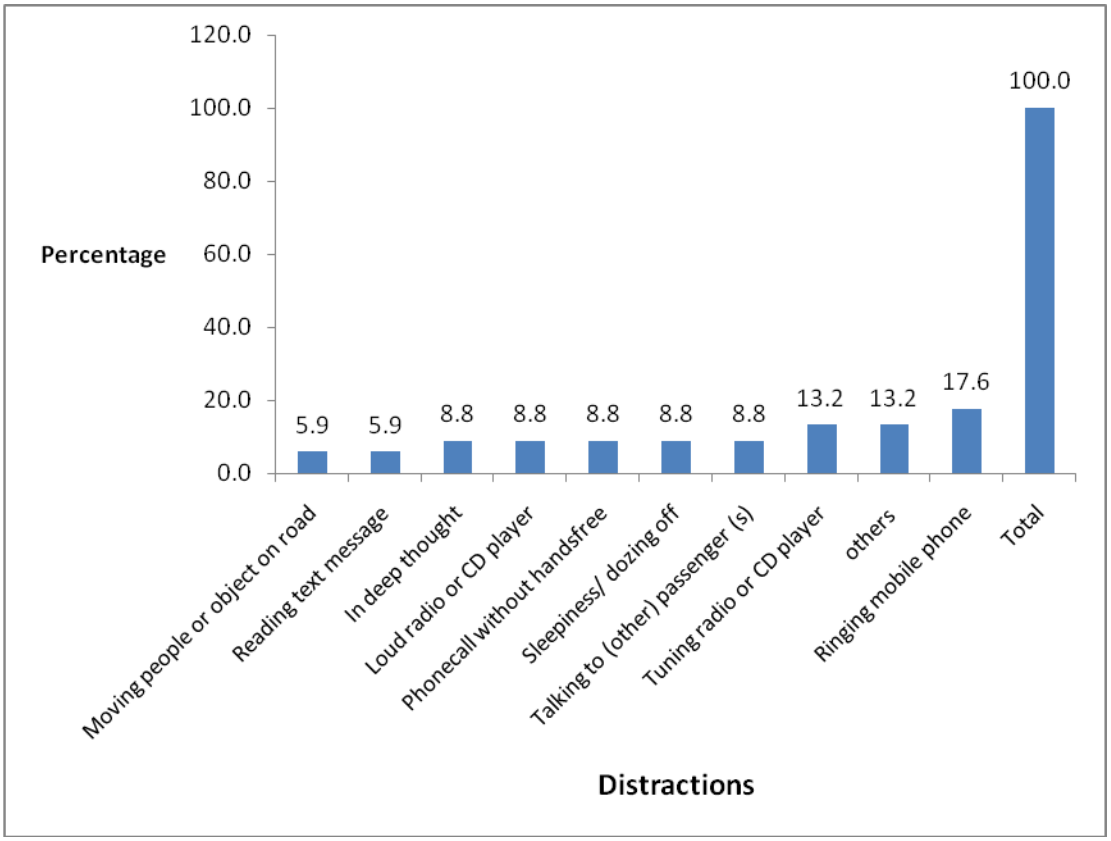


Figure 5: Types of distractions expressed by drivers at the time of accident (N= 68)

Of 68 respondents that said they were distracted, 12(17.6%) said they were distracted by their ringing mobile phones, 9 (13.2%) said they were tuning their radio/CD players and 6 (8.8%) each said they were talking to other passengers, sleepy/dozing off, picking their phonecalls without handsfree and in deep thought.

Table 16: Vehicular characteristics among those involved in accidents at time of accident (N = 169)

Variable	Frequency n (%)
The vehicle had valid unexpired road worthiness	
Yes	120 (61.9)
No	26 (13.4)
Could not remember	48 (24.7)
Vehicle developed the following before/at time of accident*	
Failed brake	25 (12.9)
Failed clutch	2 (1.0)
No headlights	1(0.5)
No trafficator	4 (2.1)
Burst tyres	13 (6.7)
Worn tyres	4 (2.1)
Faulty steering	2 (1.0)

*Multiple responses

About 146 respondents could remember whether or not their vehicles had road worthiness certificates; only 120 (61.9%) of the respondent vehicles had road worthiness certificates. Most of the vehicular factors were either failed brakes with 25 (12.9%) of the respondents or burst tyres with 13 (6.7%) of the respondents.

Table 17: Association between involvement in an accident and age, sex, ethnicity, religion, education and area council

Socio-demographic characteristics	Involved in an accident (%)			χ^2	df	p-value	Fisher exact p
	Yes	No	Total				
	n = 194	n = 104	n = 298				
Area Council							
Abaji	11 (61.1)	7 (38.9)	18	30.1	5	< 0.001*	
AMAC	105 (62.9)	62 (37.1)	167				
Bwari	33 (78.6)	9 (21.4)	42				
Gwagwalada	12 (75.0)	4 (25.0)	16				
Kuje	30 (83.3)	6 (16.7)	36				
Kwali	3 (15.8)	16 (84.2)	19				
Age (year)							
< 30	33 (48.5)	35 (51.5)	68	13.5	3	0.004*	
30 – 39	89 (73.6)	32 (26.4)	121				
40 – 49	53 (63.1)	31 (36.9)	84				
≥ 50	19 (76.0)	6 (24.0)	25				
Sex							
Male	166 (65.1)	89 (34.9)	255	0.0	1	0.998	
Female	28 (65.1)	15 (34.9)	43				
Ethnicity							
Hausa	34 (58.6)	24 (41.4)	58	2.7	3	0.435	
Ibo	42 (66.7)	21 (33.3)	63				
Yoruba	75 (70.1)	32 (29.9)	107				
Others	43 (61.4)	27 (38.6)	70				

* Statistically significant

Area council of respondents (χ^2=30.1. p<0.001) and age of respondents (χ^2=13.5, p=0.004) had statistically significant association with involvement in accidents. Ethnicity and sex were not statistically significantly associated with involvement in accidents.

Table 18: Association between involvement in an accident and religion, education

Socio-demographic characteristics	Involved in an accident (%)			χ^2	df	p-value	Fisher exact p
	Yes	No	Total				
	n = 194	n = 104	n = 298				
Religion							
Christian	138 (66.0)	71 (34.0)	209	0.4	2	0.812	0.769
Islam	55 (63.2)	32 (36.9)	87				
Traditional	1 (50.0)	1 (50.0)	2				
Education							
No formal education	13 (92.9)	1 (7.1)	14	6.9	4	0.140	
Primary	26 (56.5)	20 (43.5)	46				
Secondary	79 (64.2)	44 (35.8)	123				
Tertiary	69 (65.1)	37 (34.9)	106				
**Others	7 (77.8)	2 (22.2)	9				

* Statistically significant ** Other education such as technical schools

Other demographics such as education, religion, were not statistically significantly associated with involvement in accidents.

Table 19: Vehicular characteristics among those involved in accidents at time of accident (N = 169)

Variable	Frequency n (%)
The vehicle had valid unexpired road worthiness	
Yes	120 (61.9)
No	26 (13.4)
Could not remember	48 (24.7)
Vehicle developed the following before/at time of accident*	
Failed brake	25 (12.9)
Failed clutch	2 (1.0)
No headlights	1(0.5)
No trafficator	4 (2.1)
Burst tyres	13 (6.7)
Worn tyres	4 (2.1)
Faulty steering	2 (1.0)

*Multiple responses

About 146 respondents could remember whether or not their vehicles had road worthiness certificates; only 120 (61.9%) of the respondent vehicles had road worthiness certificates. Most of the vehicular factors were either failed brakes with 25 (12.9%) of the respondents or burst tyres with 13 (6.7%) of the respondents.

Table 20: Involvement in an accident and duration of driving and respondent's usual speed

Variable	Involved in an accident n (%)			χ^2	df	p-value
	Yes	No	Total			
	n = 194	n = 104	n = 298			
Duration of driving (year)						
< 5	39 (48.1)	42 (51.9)	81	14.6	4	0.006*
5 – 9	53 (73.6)	19 (26.4)	72			
10 – 14	46 (69.7)	20 (30.3)	66			
15 – 19	26 (74.3)	9 (25.7)	35			
≥ 20	30 (68.2)	14 (31.8)	44			
Respondents' usual speed						
Less than 50 km/hour	24 (54.5)	20 (45.5)	44	8.5	4	0.075
50 -99 km/hour	86 (60.6)	56 (39.4)	142			
100- 149km//hour	73 (75.3)	24 (24.7)	97			
More than 150 Km/hour	7 (77.8)	2 (22.2)	9			
Don't know	4 (66.7)	2 (33.3)	6			

* Statistically significant

Duration of driving was statistically significantly associated with involvement in accidents (χ^2=14.6, p=0.006). There was however no statistically significant association between usual speed of driving and involvement in accident.

Table 21: Association between modifiable human risk factors and involvement in accidents

Modifiable Human risk factors	Involvement in an accident			
	Yes N (Col %)	No N (Col %)	OR (95%CI)	P-value
Pick Phone call without hands free				
Yes	79 (41.4)	41 (39.8)	1.1 (0.7- 1.7)	0.89
No	112 (58.6)	62 (60.2)		
Phone call with hands free				
Yes	53 (27.7)	33 (32.0)	0.8 (0.5-1.4)	0.52
No	138 (72.3)	70 (68.0)		
Type text message				
Yes	19 (10.0)	4 (3.9)	2.7 (0.9 – 8.3)	0.072 (Fisher's)
No	175 (90.0)	99 (96.1)		
Read text message				
Yes	42 (22.0)	9 (8.7)	2.9 (1.3-6.3)	0.0069*
No	149 (78.0)	94 (91.3)		
Tune radio or CD player				
Yes	116 (60.7)	71 (68.9)	0.7 (0.4-1.2)	0.205
No	75 (39.3)	32 (31.1)		
Adjust other car controls (A/C, Car GPS)				
Yes	84 (44.0)	49 (47.6)	0.9 (0.5-1.4)	0.639
No	107 (56.0)	54 (52.4)		
Talk to (other) passenger (s)				
Yes	94 (49.2)	64 (62.1)	0.59 (0.4-1.0)	0.045*
No	97(50.8)	39 (37.9)		
Eat				
Yes	36 (18.9)	26 (25.2)	0.68 (0.4 – 1.2)	0.25
No	115(81.1)	77 (74.8)		
Count money				
Yes	20 (10.5)	8 (7.8)	1.39 (0.6-3.3)	0.585
No	171 (89.5)	95 (92.2)		
Among Females				
Read text message				
Yes	13 (46.4)	1 (6.7)	12.13(1.4 – 105.3)	0.014*
No	15(53.6)	14 (93.3)		
Among Males				
Read text message				
Yes	29 (17.8)	8 (9.1)	2.16(0.9 – 5.0)	0.09
No	134(82.2)	80 (90.9)		

* Statistically significant

Those that read text messages while driving were about 3 times as likely to be involved in accidents as those that did not (OR=2.9, p=0.0069); this association was higher among female drivers (OR=12.1, p=0.014). Talking to other passengers seems to be protective as those that talk to other passengers seemed to be less likely to be involved in accident (OR= 0.6, p=0.045).

Table 22: Associations between severity accident and use of seat belt

Used seat belt	**Had Injury (%)**			χ^2	**p-value**
	Yes	No	Total		
	n = 94	n = 100	n = 194		
Yes	67 (46.2)	78 (53.8)	145	1.16	0.28
No	27(55.1)	22 (44.9)	49		
Used seat belt	**Hospitalized (%)**				
	Yes	No	Total		
	n = 80	n = 114	n = 194		
Yes	55 (37.9)	90 (62.1)	145	2.59	0.11
No	25 (51.0)	24 (49.0)	49		
Used seat belt	**Death (%)**				
	Yes	No	Total		
	n = 19	n = 175	n = 194		
Yes	16 (11.0)	129 (89.0)	145	1.00	0.32
No	3 (6.1)	46 (93.9)	49		
Used seat belt	**Severe accident (%)**				
	Yes	No	Total		
	n = 96	n = 98	n = 194		
Yes	69 (47.6)	76 (52.4)	145	0.83	0.36
No	27 (55.1)	22 (44.9)	49		

df = 1

The association between each of the measures of severity individually and collectively, with the use of seatbelt was assessed; there was no statistically significant association between severity of accidents and seatbelt use.

Table 23: Simple logistic regressions of occurrence of accident on the associated factors

Independent variable	Crude Odds ratio			p-value	Adjusted Odds ratio			p-value
	Odds ratio	95% CI			Odds ratio	95% CI		
		Lower	Upper			Lower	Upper	
Demographics								
Age (year)	1.0	0.9	1.1	0.06				
Risk factors								
Duration of driving (year)	1.0	0.9	1.1	0.06				
Type or read text message	2.8	1.4	5.5	0.00*	3.3	1.6	7.0	0.00*
Talk to passenger (s)	0.6	0.4	0.9	0.02*	0.5	0.3	0.8	0.00*

* Statistically significant

A multivariate analysis was done; simple and multiple logistic regressions of occurrence of road accidents and the associated factors showed that use of phones (typing or reading text messages) and talking to passenger (s) were still statistically significant.

Table 24: Multiple logistic regressions of occurrence of accident on the associated factors

Variable	Crude Odds ratio			p-value	Adjusted Odds ratio			p-value
	Odds ratio	95% CI			Odds ratio	95% CI		
		Lower	Upper			Lower	Upper	
Area council (Kwali, referent)								
Area council (Abaji/Kwali)	8.4	1.8	39.7	0.01*	7.6	1.5	38.3	0.01*
Area council (AMAC/Kwali)	9.0	2.5	32.2	0.00*	8.2	2.2	30.4	0.00*
Area council (Bwari/Kwali)	19.6	4.7	82.3	< 0.01*	20.2	4.6	89.4	< 0.001*
Area council (Gwagwalada/Kwali)	16.0	3.0	85.3	0.00*	20.9	3.7	117.4	0.001*
Area council (Kuje/Kwali)	26.7	5.9	121.1	< 0.00*	22.0	4.6	105.0	< 0.001*

* Statistically significant

Multiple logistic regressions of occurrence of road accidents and the associated factors with Kwali as the referent population, showed that area council of respondents were still statistically significant.

CHAPTER FIVE

DISCUSSION

This study was carried out to determine prevalence and the factors that contribute to the occurrence of RTAs in the FCT, Abuja. In this study, 298 of the respondents drive. Most of the respondents that drive were within the productive age group with the mean age of 35.9 years±8.6years, more than three quarters were males the prevalence of RTA among this group was 194 (65.1%). Majority of those involved in RTA were male; males constituted the highest proportion of respondents and this may be due to the fact that the study was carried out in automobile workshops which are mostly patronized by males. Another factor that may be responsible is that vehicle drivers in Nigeria are mostly males. The report on road crashes by the FRSC in 2013[17] showed that out of 79744 persons involved in road crashes, 71.3% were adult males and 22.7% were adult females. Also, a study using secondary data from a tertiary hospital in Hapur found that there were more males involved in accidents than females[38]; a report indicated that in Ethiopia five per cent of the drivers killed in road crashes were women and that females accounted for one out of every four road traffic casualties.[33] A study in Ile-Ife Nigeria showed that males are twice as prone to RTAs as females[34]. In Zimbabwe only one out of every six road casualties were female[33]. This may be an indication of the proportion of men and women who drive in these areas, the greater male exposure on streets or a reflection of the higher level of involvement in (high-risk) activities including reckless driving/riding, over-speeding and drunken driving, and non use of protective gears. [39-40]

Most of those involved in accidents in this study were middle-aged, this was similar to the findings of the Hapur study which showed that patients involved in a accidents from a tertiary hospital records had a mean age of 30.91 years and the highest numbers of victims were in the

20-30 years age group[38]; this age group is the most active and productive age group hence more likely to be involved in accidents. Over one third each of those involved in RTAs had secondary and tertiary education; just over two-thirds were Christians. About one-third were drivers and one-sixth were civil servants by occupation; those involved in RTAS were mostly Yoruba. The mean duration of driving amongst those that had been involved in accidents was an average of 10 years.

Most of the RTAs happened in the AMAC which is the commercial nerve centre of the FCT. There was more involvement of private vehicles this may be a reflection of the proportion of private vehicles compared to other vehicles that ply the roads in FCT. This finding is similar to the report by the FRSC in 2013 that there were more private vehicles (1655 out of 2670 accidents) involved in accidents followed by commercial vehicles (982 out of 2670).[16] The findings of this study that mostly saloon cars and less than a fifth were minibuses is similar to the FRSC 2013 report that noted that the highest categories of vehicles involved in accidents were cars followed by minibuses with the FCT having 1562 cars out of 2670 accidents and 204 minibuses out of 2670 accidents). [16] In this study, the least number of accidents happened on Saturdays; compared with other days of the week, there are usually less traffic/ movement on Saturdays (weekdays are mostly rush hours for workers) this may explain the low accident rate on Saturdays. This finding was different from those in a study in India which reported that the least number of RTAs occurred on Mondays.[20] About one-sixth of the accidents occurred when it was raining; this is comparable to a study in India that found that 24.5% of the accidents occurred on wet roads.[20]

The major modifiable human factor identified as being associated with RTAs was use of mobile phones; talking to other passengers seemed to be protective. The major vehicular characteristics

during accidents were failed brakes and burst tyres and major environmental /road characteristics during accidents were night time, rainfall, speed breakers and cross roads (including T-junctions and U-junctions). The outcomes of accidents were rarely fatal.

In this study, drinking before/ during driving was not common amongst drivers involved in accidents as less than a tenth of them said they drank alcohol within 1 hour before accident A study among commercial drivers in Ile-Ife reported that 1.9% of respondents said they drink during the days work; others claimed they drink before starting the day (13.5%) or when they are off duty (10.1%).[29] In terms of fatality, about a tenth of the accidents resulted in deaths; this was slightly lower than the 29490 fatal accidents out of 225891accidents (13%) reported by the Nigeria Police Force between 2003 and 2007[8] and much lower than the estimated one death in 2.65 accidents in Nigeria.[8]According to the FRSC in 2013, there were 4394 accident casualties within the FCT in 2013 (representing 9.4% of the total 46601 casualties in the Country that year); of these 446 (10.2%) were fatalities and 3948 (89.8%) were injuries.[16] In this study, about half of the accidents resulted in injuries but 41.1% required hospitalization; a study on patterns of RTAs in Ile-Ife showed that 13.2% of RTAs resulted in hospitalization. [33]The higher rate of hospitalization in the accidents occurring in Abuja suggests that these accidents are more severe and more impact perhaps because of the wider network of roads that encourage over speeding and the metropolitan nature of the capital compared to Ile-Ife.

In this study, about a third of those involved in RTAs did not have driving licenses. This proportion is two times higher than the findings of a study in India that reported that 15.3% of drivers involved in accidents did not have driver's license. [20] This may mean there are less stringent measures to ensure ownership of driver's licenses in Abuja. About a quarter of those involved in accidents said they had no seatbelt on at the time of the accident. A study in Zagreb

Croatia noted that majority of the people who died at the scene of an accident or during transportation had not used their seat belts, therefore the risk of fatal accident was high and that car occupants who were not using seat belts had more fatal and severe injuries than mild injuries.[19] Children are also victims in RTAs. Even though the use of restraints and severity of these RTAs in children was not specifically addressed, it is important to consider involvement of this vulnerable group when formulating road safety policies.

In this study, those drivers that read text messages being about three times more likely to be involved in accidents than those that do not. A study among drivers involved in motor accidents in Toronto showed that the risk of a vehicle accident when using a cellular telephone was four times higher than the risk when a cellular telephone was not being used. [34] A study in USA noted that drivers with phones had a significantly higher rate (than drivers who did not have phones) for unsafe speed, driver inattention, and driving on wrong side of road.[35] The study also noted that increased availability and use of phones between 1992 and 1995 led to an increased percentage of accidents. [35] A secondary data analysis of the Oklahoma State Department of Public Safety database (325, 757 police accident reports) in Oklahoma USA found a nine-fold increased risk of fatality with the use of a cellular phone while driving and a two-fold increased risk for a fatality with the presence of a cellular phone in the vehicle.[43] This study also found talking to passengers to be protective; this is similar to the findings of various studies that reported that having passengers had an overall protective effect on driving in various human, environmental and vehicular conditions (driving alone as compared to driving with passengers leads to an increased risk of an accident.[41-45]

CHAPTER SIX
CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

More than half of the clients of automobile repair workshops had been involved in accidents and most of these were men and in the productive age group (30 -39 years). Half of the accidents were severe. Majority of accidents occurred at T-junctions and U-turns; also about a fifth of the accidents were single vehicle and/or run off accidents while a large proportion occurred on single carriageway. More accidents occurred on Mondays and Fridays than other days of the week. A number of accidents involved two vehicles at the time of the accident and more than half of the vehicles involved in accidents were salon cars. About half of the accidents resulted in injury and less than this resulted in hospitalization; a few resulted in death. The use of mobile phones constituted a modifiable human risk factor for accidents within Abuja and this was higher among women. Drivers were not totally compliant with the use of seat belts as required by the law. About a quarter of the drivers who were involved in accidents did not have driver's licences.

6.2. Recommendations

1. There is a need for road safety education and campaigns, by the FRSC and VIO, directed at vehicle owners and/or drivers especially women. Such road safety education should be focused on safe driving and avoidance of risky behaviors such as use of mobile phones.

2. There is a need for traffic control and restriction of speeds at as T-junctions and U-turns; such traffic controls include the use of traffic lights or manning by traffic wardens.

3. To reduce single/run off vehicle accidents, motorists should be advised to drive within speed limits and at speeds consistent with road and vehicle conditions.

4. The FRSC needs to continually sensitize drivers and passengers on the need and benefits of use of seat belts. Regulations on compulsory use of seat belts should be enforced.

5. The FRSC and other law enforcement authorities need to put measures in place to ensure that vehicle drivers' are licensed to drive. There should be strict procedures for obtaining these drivers' licenses; periodic spot checks of ownership of drivers licenses should be intensified on the roads.

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APPENDIX

Appendix 1: Study Instrument

Questionnaire for Study on Determinants of Road Traffic Accidents in Abuja

Introduction

Good day dear respondent. We are conducting a project on road traffic accidents in Abuja as part of the requirements for graduation of the Requirements for the award of Masters degree (Ahmadu Bello University, Zaria). We seek your permission to administer this questionnaire which was designed to assist us to determine the causes of road traffic accidents in Abuja and to prevent future occurrences.

We are hopeful that your sincere response to these questions will go a long way in enabling us to achieve our objective. We appreciate the few minutes you will spend in responding to these questions and sincerely assure you that all your response will be treated with utmost confidentiality; please note that the questionnaires will not be linked to you in any way.

Consent form

Title of the research: Determinants of Vehicular Road Traffic Accidents among vehicle drivers in FCT, Abuja.

Names and affiliations of researchers: This study is a thesis to be submitted to Ahmadu Bello University, Zaria, for the award of MPH-field epidemiology.

Sponsors of research: This study is self-sponsored.

Purposes of research: The purpose of this research is to determine the factors associated with Road Traffic Accidents in the FCT, Abuja.

Procedure of the research, what shall be required of each participant and approximate total number of participants that would be involved in the research: Participants will be chosen from vehicle drivers, users or owners visiting automobile workshop for the purpose of repair of their vehicles. Each participant will be interviewed with regards to involvement in and risk factors associated with Road Traffic Accidents. In total we expect to recruit about least 426 participants in this study.

Expected duration of research and of participants' involvement: In total, we expect you to be involved in this research for less than 1 hour.

Risk(s): There is no anticipated risk from the study.

Costs to the participants, if any, of joining the research: Your participation in this research will not cost you anything.

Benefit(s): The findings from this study will help us proffer methods to avoid Road Traffic Accidents and recommend appropriate control measures in the FCT.

Confidentiality: Your name(s) will not be collected in this study. All information collected in this study will be strictly confidential; no identifier that can be linked to you will be used in any publication or reports from this study.

Voluntariness: Your participation in this research is entirely voluntary.

Consequences of participants' decision to withdraw from research and procedure for orderly termination of participation: You can also choose to withdraw from the interview at any time. However the researchers promise to make good faith effort to comply with your wishes as much as is practicable.

Statement of person obtaining informed consent:

I have fully explained this research to _____ and have

given sufficient information, including about risks and benefits, to make an informed decision.

Date: _____ Signature: _____

Name: _____

Statement of person giving consent:

I have read the description of the research or have had it translated into language I understand. I understand that my participation is voluntary. I know enough about the purpose, methods, risks and benefits of the research study to judge that I want to take part in it. I understand that I may freely stop being part of this study at any time. I have received a copy of this consent form to keep for myself.

Date: _____ Signature: _____

Name: _____

Witness' signature (if applicable): _____

Witness' name (if applicable): _____

This research has been approved by the Federal Capital Territory Health Research Ethics Committe. Protocol approval number FHREC/2014/01/75/16-12-14 (approval date 16/12/2014, expiration date 15/12/2014).

You can contact the principal investigator, Mrs Aman-Oloniyo on phone number 08023228573 or email – bimboaman@gmail.com or a member of the Federal Capital Territory Health Research Ethics Committee at the FCTA.

Area council _____ NATA Unit ----------

Serial No. _____ Interviewer Code ----------

Instruction: Please tick (✔) the correct response.

Section 1: Socio demographics

1.	Age (in years)	……
2.	Sex of respondent	1. Male □ 2. Female □
3.	Highest educational level attained	1. No formal education □ 2. Primary □ 3. Secondary □ 4. Tertiary □ 5. Others ……. (Please specify)
4.	Occupation	……..……
5.	Ethnicity	1. Hausa □ 2. Ibo □ 3. Yoruba □ 4. Others (Please specify) ……
6.	Religion	1. Christian □ 2. Islam □ 3. Traditional □ 4. Others (Please specify) ……

Section 2: General

S/N		Coding categories
7.	Do you drive?	1. Yes …….. □ 2. . No ……..,. □
	If No to Question7, go to Question 11, if yes to question 7, go to question 8	
8.	How long have you been driving?	…….. Years ……. Months (if less than a year)
9.	Do you do any of the following when driving?	a. Pick Phonecall without handsfree □ b. Phonecall with handsfree □ c. Type text message □ d. Read text message □ e. Tune radio or CD player □ f. Adjust other car controls (A/C, Car GPS) □ g. Talk to (other) passenger (s) □ a. Eat □ b. Drink (non alcoholic) □ c. Drink (alcoholic) □ h. Smoke □ i. Comb hair □ j. Apply makeup □ k. Count money □ l. Use laptop or other devices(e.g. ipods, ipads) □

10.	What is your usual speed when driving?	a. Less than 50 km/hour □ b. 50 -99 km/hour □ c. 100- 149km//hour □ d. More than 150 Km/hour □

Section 3: Accident circumstances

S/N		**Coding categories**
11.	Have you ever been involved in an accident?	1. Yes ……. . □ 2. No ……..□
If No to question 11, end interview, if yes, continue to question 12		
12.	Date of accident	……. Don't know □
13.	Time of accident	…….. am □ …….pm □ Not sure
14.	Day of week of accident	a. Monday □ b. Tuesday □ c. Wednesday □ d. Thursday □

		e. Friday □ f. Saturday □ g. Sunday □ h. Not sure □
15.	Exact place of accident	Road /Street …… Area……. Area council/ Local Government a. Abuja Municipal Area Council (AMAC) □ b. Abaji □ c. Gwagwalada □ d. Kuje □ e. Bwari □ f. Kwali □ g. Others (e.g. outside Abuja) …….. h. Don't know □
16.	Type of vehicle	a. Private □ b. Commercial □ c. Company □ d. Others……
17.	Were you in the vehicle involved in the accident?	1. Yes ……..□ 2. No ……..□
If no to Question 17, end interview, if yes, go to question 18		

18.	If yes to Q17, what was your role in vehicle?	a. Driver □ b. Conductor □ c. Passenger □ d. Others (pls specify)……
19.	Were there other passengers (people) in the vehicle at the time of the accident?	1. Yes …….□ 2. No …….□
20.	If yes to Q19, how many passengers were in the vehicle (apart from the driver)	……
21.	Were there any children (less than 18 years) in the vehicle at the time of the accident?	1. Yes …….□ 2. No …….□ 3. Don't know…….□
22.	If yes to question 21, how many children?	……
23.	Type of vehicle	a. Tricycle □ b. Saloon car □ c. Sports Utility Vehicle (SUV)/ Jeep □ d. Articulated vehicle (trailer) □ e. Mini bus □ f. Big Red buses (commercial) □ g. Other Bus □ h. Others (specify)……
24.	What type of accident or accident was the vehicle involved in?	a. Head-on accident (front) □ b. Rear-end accident (back) □ c. Angle or side impact accident (side) □

		d. Accidents involving pedestrians or cyclists □ e. Accidents with animals □ f. Single vehicle /run-off-road accident □ g. Don't Know □
25.	How many vehicles were involved in the accident?	……
26.	Part of road where accident occurred	a. T-junction ╥ ╢ □ b. Y- junction **Y** □ c. Cross road ╬ □ d. Single carriageway ı□ **e.** Dual carriageway ı□ı f. Roundabout ρ□ g. U-turn ∩ □ h. Traffic light □ i. Zebra crossing  □ j. Sharp bend κ ϡ □ k. Slippery road □ l. Two-way traffic □ m. Bumb / speed breaker □ n. Bad road □ o. Traffic warden □ p. Others (pls specify)…… q. Don't Know

27.	Was there any injuries sustained as a result of the accident?	1. Yes …….□ 2. No …….□ 3. Don't know…….□
28.	Was there any hospitalization as a result of the accident?	1. Yes …….□ 2. No …….□ 3. Don't know
29.	Was there any death in the accident?	1. Yes …….□ 2. No …….□ 3. Don't know…..□

Section 4: Environmental factors

S/N		**Coding categories**
30.	Which of the following was true at the time of accident	a. Rainfall □ b. Night □ c. Obstruction of vision by harmattan/fog □ d. Obstruction of vision by trees □ e. Obstruction of vision by other items □ f. Potholes □ g. Speed breaker (bumps) □

Section 5: Human risk factors

31.	Did you have seatbelt on at time of accident?	1. Yes …….. □ 2. No …….. □ 3. Don't know…….. □
32.	Were you the driver at time of accident?	1. Yes …….. □ 2. No …….. □ 3. Don't know…. □
If no to question 32, end interview, if yes to Q32, go to Q33		
33.	At the time of accident, did you have a valid (unexpired) driver's license?	1. Yes …….. □ 2. No …….. □ 3. Don't know…. □
34.	Do you have a known eye problem or defect?	1. Yes …….. □ 2. No …….. □ 3. Don't know…. □
35.	If yes what is the eye problem or defect?	a. Cannot see near objects (longsighted) b. Cannot see far objects (Shortsighted) c. Blurred vision (Astigmatism) d. Cloudiness on eye lens (cataracts) e. Cannot quickly focus on near objects (Presbyopia) f. Cannot see at night (Nightblindness) g. Others (specify)……

36.	Do you use eye glasses to drive normally?	1. Yes …….□ 2. No …….□ 3. Don't know…..□
37.	Did you use eye glasses at time of accident?	1. Yes …….□ 2. No …….□ 3. Don't know…..□
38.	Were you distracted at the time of accident?	1. Yes …….□ 2. No ……..□ 3. Don't know…..□
39.	If yes to Q38, type of distraction	a. Ringing mobile phone b. Phonecall without handsfree c. Phonecall with handsfree d. Reading text message e. Tuning radio or CD player f. Loud radio or CD player g. Typing text message or dialing mobile phone h. Adjusting car controls i. Car GPS j. Talking to (other) passenger (s) k. Eating l. Drinking (non alcoholic) m. Smoking n. Combing hair o. Applying makeup

		p. Counting money q. Use of laptop or other device(e.g. ipods, ipads) r. Moving an object within the vehicle s. Moving people or object on road t. Billboard / signage u. Counting money v. Sleepiness/ dozing off w. Day dreaming x. In deep thought y. Others (pls specify)…….
40.	Do you think you were overspeeding at the time of accident?	1. Yes ……..□ 2. No ……..,.□ 3. Don't know…… □
41.	What was your speed at the time of accident?	a. Less than 50 km/hour □ b. 50 -99 km/hour □ c. 100- 149km//hour □ d. More than 150 Km/hour □ e. Don't know □
42.	Were you inattentive at the time of the accident for any of the following reasons?	a. Sleepiness/ dozing off □ b. Day dreaming □ c. In deep thought □ d. Others (specify)…….

43.	Did you do any of the following before the accident	a. Drink alcohol (within 1 hour before accident) □ b. Have a quarrel with someone □ c. Get into a fight □ d. Receive bad/sad news □ e. Use illegal drug □ which drug……. f. Use of non prescription (over the counter) drug □ which drug……. g. Use of prescription drug □ which drug……. h. Others (specify) ……
44.	Did any of the following happen at the time of the accident?	a. Mis-step on accelerator instead of break □ b. Beat traffic light □ c. Inability to see due to headlights of oncoming vehicles □ d. Pool of water □ e. Blurred vision (could not see well) □ f. Alcohol consumption during driving □

Section 6: Vehicular factors

S/N		Coding categories
45.	Did the vehicle have a valid (unexpired) road worthiness certificate?	1. Yes ……..□ 2. No ……..…..□ 3. Don't know…… □
46.	Did the vehicle develop any of the following before or at the time of the accident?	a. Failed brake b. Failed clutch c. No headlights d. No trafficator e. Burst tyres f. Worn tyres g. Faulty steering h. No / Faulty seatbelt

Thank you for your cooperation

Appendix 2: Work Plan

GANTT CHART OF ACTIVITY TIMELINE

Activity								
Proposal Development								
Develop survey tools								
Ethical approval								
Recruitment of Subjects								
Data Entry								
Data Analysis								
Dissemination meeting								
	Dec-14	JAn-15	Feb-15	Mar-15	April-15	May-15	June-15	July-15

Appendix 3: Ethical approval

Name of Principal Investigator	Abimbola F. Aman-Oloniyo
Address of Principal Investigator:	E13, Igbaraoke Link, Army Estate, Kubwa - Abuja
Date of receipt of valid application:	26/11/2014

NOTICE OF RESEARCH APPROVAL

Protocol Approval Number: FHREC/2014/01/75/16-12-14

Study Title: Determinants of Vehicular Road Traffic Accidents among Vehicle Drivers in FCT, Abuja.

This is to certify that the FCT Health Research Ethics Committee (FCT HREC) has fully approved the research described in the above stated protocol.

Approval Date: - **16/12/2014**
Expiration Date: - **15/12/2015**

Note that no activity related to this research may be conducted outside of these dates. Only the FCT HREC approved informed consent forms may be used when written informed consent is required. They must carry FCT HREC assigned protocol approval number and duration of approval of the study.

The National Code of Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the code. The FCT HREC reserves the right to conduct compliance visit to your research site without previous notification.

Modifications: Subsequent changes are not permitted in this research without prior approval by the FCT HREC.

Problems: All adverse events or unexpected side effects arising from this project must be reported promptly to FCT HREC.

Renewal: This approval is valid until the expiration date. If you are continuing your project beyond the expiration date, endeavor to submit your annual report to FCT HREC early, and request for renewal of your approval to avoid disruption of your project.

Closure of Study: At the end of the project, a copy of the final report of the research should be forwarded to FCT HREC for record purposes, and to enable us close the project.

Ikwubiela S. Adem
Secretary, FCT HREC
December 16. 2014