

ROAD TRAFFIC INJURIES AND RISK FACTORS IN LAGOS STATE, NIGERIA

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Abstract

This study determines the characteristics of Road traffic injuries (RTIs) among Lagos drivers and examines the human behavioural and environmental risk factors associated in occurrence of RTIs. This cross-sectional survey was conducted in the primary health care centers during the period of May-November 2025. A random sample of 1700 Lagos drivers was approached and 1375 drivers responded and agreed to participate in the study (81%). Face-to-face interviews was conducted by trained research assistants based on questionnaire. This study revealed that of the studied Lagos drivers (1375), (19.7%) of them were injured. Young drivers in the age group (25-34) years were more involved in RTIs (42.2%). The RTIs occurred more among male drivers than females ($p < 0.002$). Among the injured drivers, those involved with traffic violations especially with over speeding (36.7%) and traffic light violations (13.3%). Lagos drivers were more injured from over speeding (22.6%) and overturn skid (16.1%). Head injuries were reported more from light vehicle crashes (50%) and next injuries from Hilux, Buses and SUVs crashes (36.4%). The study findings revealed the high risk of RTIs was among young male drivers in the age group (25-34) years. It showed that human behavioural factors represent one of the main causes of RTIs such as excessive speed and use of mobile phones. Also, some of the environmental factors associated in the occurrence of RTIs occurred mostly due to bad roads (75.6%), road traffic crashes at 't' junctions (54.2%) and during the rainy season (80%).

Keywords: traffic injuries, risk factors, road, traffic violations, road conditions, Lagos state

1. Introduction

Today, one of the highest challenges in the world, especially in developing countries is traffic accidents and their consequences. Numerous factors and circumstances contribute to traffic accidents. While some of the data are specific to particular region, others describe accidents (shahsavari et.al, 2022; Nantulya and Reich, 2002; Vinish et al., 2023; Ahmed et al., (2023) that are caused by environmental factors, road characteristics, and driver behaviour (Onate-Vega et.al, 2020; Wu & Xu, 2018; Ellison et al., 2013; Pakgothar et al., 2011; Atubi, 2012a, Atubi,2022a, Atubi,2022c).

The injuries caused by road traffic accidents (RTAs) become a major public health problems worldwide and a major cause of mobility and mortality with temporary or permanent disability (Atubi, 2020b, University of Oxford, 2022; Dataphyte, 2022; Wada et al., 2023; AbdRahman et al., 2023). Road traffic accidents have become one of the most important disadvantageous impacts of mans interrelationship with technology (WHO, 2022). There is an epidemic of road traffic accidents in Nigeria that is second only to infectious disease as a medical problem. Traffic accidents represents the leading cause of death and disability in the young (16-36 years old). It is an epidemic as serious as plague or small pox was to earlier generations.

Road traffic injuries were the second leading cause of death worldwide among adults aged 15-44 years (WHO, 2021). The worldwide data revealed that 1.2 million people are killed in road traffic crashes each year and 50 million are injured (WHO, 2018). The risk taking behaviour and socio-economic factors are involved in relation to road traffic accidents. Men are more often the victims of accidents than women. . In Lagos state, men are three times more likely as women to be involved in fatal car accidents (Atubi, 2023b, 2023c, 2023e). Men have higher exposure to risk of road traffic deaths/injuries because they are more employed as drivers and they are more likely to own cars than women.

The risk of crash involvement also appears to vary with environmental factors such as time of day. Crash risk is higher for early morning compared with other times of the day in Lagos state, with the difference being more pronounced for male drivers and at younger ages. Time of day has also appeared to be associated with crash severity as drivers are unlikely to sustain a fatal injury during early morning crashes compared to night time crashes, particularly among younger age groups (Atubi 2023e; Atubi 2012a; Atubi 2023a).

Driving behaviours are grouped into 3 categories: lapses, errors and violations. Driver aggression has been defined as any behaviour intended to physically, emotionally or psychologically harm another driver within the driving environment. Driver's aggression represents a potential danger to all road users due to traffic violations

and traffic collisions (Peden et al., 2005; Bener et al., 2013). Under conditions of stress, drivers are more likely to exhibit all forms of driver aggression at others. It was reported that the increase in evidence of aggressive driving is because of the steady increase in vehicles and road congestions that caused stress in drivers (Atubi, 2012b; 2013c; 2022b; 2022c). Few previous studies conducted in Nigeria by Atubi (2012j 2012m, 2012 n & 1013c) revealed that road traffic crashes and injuries(RTIs) were high in Nigeria/ Lagos state and human behavioural factors are one of the main causes of RITs.

Past studies reported that individual characteristics such as age and gender are related to driving behaviour (Atubi 2023b; 2023c & 2023e). Men and women exhibit different driving behaviour that affect their attitudes and safety; differences appear between male and female drivers in terms of crash rates and are evident in wide range of countries(Mesken et al., 2002; Bener et al., 2009; Atubi, 2023e; Olawole, et al.,2022).

In this study, the paper provides an overview of the characteristics of injuries sustained as a result road traffic crashes and examines the human behavioural and environmental risk factors in Lagos state, Nigeria.

Road remain the most favoured mode of transport for both private and public transportation in Nigeria. Our country Nigeria is a developing country and with its fast growing population coupled with the ever growing urbanization has made people more vulnerable to road accidents resulting in either injuries or disabilities or in worst case scenario death.

2. Subjects and Methods

A multi- stage stratified cluster sampling was applied by using the administrative divisions of Lagos state primarily health care facilities in six administrative districts (i.e. over 60 public primary health centers, PHCs) clinics of Lagos state government. The participants were carefully selected among patients registered and attending the six administrative PHC centers in both (urban and rural areas) of Lagos state. Research assistants were instructed to strictly interview and complete a questionnaire from four Randomly Selected eligible driving men and women during the period from May 2025 to November 2025, among Lagos drivers. Following informed consent, each participant was interviewed by a pre-trained Interviewer using a standard questionnaire covering socio-demographic information, driving history, type of vehicle, severity and type of injuries, nature of injuries and behavioural factors of injured drivers. With 2.5% Error bound and 99% (0.99) confidence limits the required sample size was estimated as 1,700 drivers. The participants were sampled from each district So that the sample size in both district was proportional to its share of the total population in Lagos state.

Research Assistants recorded data of each subject on a Standardized questionnaire. A representative sample of 1,700 drivers selected and approached for the data collection. The sample included males and females Aged 18 years and above. 1,375 drivers out of the total 1,700 participated in this survey, giving a response rate of 81%. All participants had driving licenses and were assured of confidentiality. The analyses were performed using the statistical Package for social Sciences (SPSS-version 21). Students't'- test was used to of ascertain the significance of differences between mean values of two varieties and Confirmed by non- Parametric Mann-Whitney 'U' test. Chi- Square and Fisher's tests (two-tailed) were performed. The alpha level $P < 0.05$ (95%) was considered as the cut-off value for significance.

3. Discussion of Results/Findings

Table 1: Socio-demographic characteristics of the Studied Lagos drivers according to the history of Road Traffic Injuries (N=1,375).

Variables	RTI N= 225 n (%)	NO. RTI N= 1150 n (%)	P value
Age group			
18-24	15 (6.7%)	160 (13.9%)	0.088
25-34	95 (42.2%)	400(34.8%)	
35-44	70 (31.1%)	325(28.3%)	
45-54	30 (13.3)	200(17.4%)	
≥55	15(6.7%)	65(5.7%)	
Gender			
Male	195(86.7)	910(79.1)	< 0.002
Female	30(13.3)	240(2.9)	

Marital status			
Single	45(20)	325(28.3)	0.094
Married	180(80)	825(71.7)	
Educational Level			
Illiterate	25(11.11)	50 (4.35)	< 0.002
Primary	50(22.2)	80 (6.96)	
Secondary	95(42.2)	400 (34.8)	
Tertiary	55(24.4)	620 (53.9)	
Driving experience			
< 1 year	20(8.98)	80(7.0)	0.421
1-3 years	60(26.7)	280(24.3)	
3-5 years	65(28.9)	220(19.1)	
5 years	80(35.6)	570(49.6)	
Are you an owner of a vehicle			
Yes	180(80)	855(74.3)	0.801
NO	45(20)	295(25.7)	

Table 1, reveals the socio-demographic characteristics of the Lagos drivers according to the history of road traffic injuries (RTIs). Of the studied Lagos drivers (1375), 19.7% of them were injured. The highest number of injured drivers was in the age group (25-34) years (42.2%). Males were commonly more involved with RTIs than female. A significant difference was observed in terms of gender (<0.002). Drivers with more than five years of driving experience were more involved with RTIs (35.6%).

Table 2: Evaluation of human behavioral risk factors of the studied drivers according to the history of road traffic injuries in Lagos state (n= 1,375)

Variables	RTI N=225 N (%)	NO. RTI N= 1150 N (%)	P Value
Do you use seatbelt while driving?			
Always	160(71.1)	850(73.9)	0.202
Sometimes/never	65(28.9)	300(26.1)	
Distractions habits while driving			
Smoking	30(13.3)	65 (5.7)	0.007
Eating/drinking	94(41.8)	638(55.6)	0.124
Use of Mobile Phone	102(45).3	706 (61.4)	0.345
Texting	85 (37.8)	315 (27.4)	
Do You Follow Traffic Speed Limit?			
Always	50(22.2)	350(30.4)	0.786
Never	175(77.8)	800(69.6)	
Violations			
Traffic light violation.	30 (13.3)	300(26.1)	0.614
Exceeding speed limit.	60(26.7)	700(60.9)	0.038
Parking violations.	20(8.9)	50(4.3)	0.814
Impatience with slow driver.	11(4.9)	100(8.7)	< 0.002

Table 2, evaluates human behavioural risk factors of the studied Lagos drivers according to the history of RTIs. Majority of the injured drivers were using Seat belt while driving (71.1%) but do not follow the traffic speed limit (77.8%), 45.8% of the Lagos Drivers injured during driving were distracted with the use of mobile phones, eating and drinking , followed by (41.8%) eating or drinking. The most common traffic violations of the injured drivers were exceeding speeding limit (36.7%) and traffic Light violating (13.3%). There was a significant difference found in terms of exceeding speed limit (P=0.038) and impatience with slow drivers (p< 0,002) between both the injured and non-injured groups.

Table 3: Evaluation of some environmental risk factors associated in occurrence of Road Traffic injuries (N=225).

Variables	Frequency (%)
Whether - temperature	
Hot	31(13.8%)
Moderate	194(86.2)
Weather- condition	
Dusty	20(8.9)
Sunny	25(11.1)
Rainy	180(80)
Accident location	
Main road	50(22.2)
Side road	44(19.8)
T-junction	122(54.2)
Roundabout	4(1.8)
Traffic light	5(2.2)
Road Condition	
Bad roads	170(75.6)
Broken down/abandoned vehicles	35(15.6)
Obstruction on the road	20(8.9)

Table 3. Shows some environmental risk factors associated in occurrence of RTIs. Most of the RTIs occurred due to bad roads (75.6%). Also road traffic Crashes at T' Junction led to higher injuries (54.2%) as well as during rainy season (80%).

Table 4: Distribution of Road Traffic Injuries among Victims according to type of vehicle (N=225)

Variables	Heavy vehicle N= 70 N (%)	Light vehicles N=100 N (%)	Hilux, buses, &SUVs N=100 N (%)	P value
Age group				
18-24	10(14.3)	4(4)	5(9.1)	<0.002
25-34	5(7.1)	50(50)	30(54.5)	
35-44	15(21.4)	30(30)	10(18.2)	
45-54	30(42.9)	15(15)	6(10.9)	
>= 55	10(14.3)	1(1)	4(7.3)	
Severity of injury				
Minor	3(4.3)	11(11)	7 (12.7)	
Moderate	50(71.4)	70(70)	40(72.7)	
Severe	17(24.3)	19(19)	8(14.5)	
Type of injury				
Head	4(5.7)	50(50)	10(18.2)	
Neck	19(27.1)	20(20)	20(36.4)	
Back	28(40)	0(0)	5(9.1)	
Arm	4(5.7)	1(1)	4(7.3)	
Leg	11(15.7)	10(10)	9(16.4)	
Chest	3(4.3)	11(11)	4(7.3)	
Abdomen	1(1.4)	8(8)	3(5.5)	
Others	0(0)	0(0)	0(0)	
Outcome of injury				
Minor case (went home)	6(8.6)	11(11)	5(9.1)	
Hospitalized	64(91.4)	89(89)	50(90.9)	

Table 4 shows the distribution of road traffic injuries (RTIs) among Victims according to the type of Vehicle (Transport). Higher occurrence of injuries was from Hilux and suvs crashes (72.7%). The highest number of victims who were injured from light Vehicle (50%) and Hilux and suvs (sports utility Vehicles) (54.5 %) were in the age group 25-34 years, whereas from heavy vehicle in the age

group 45-54 years (42.9%). Head injury (50%) was more common with light vehicle Crashes. Neck injuries were more common with Hilux, buses and Suvs (36.4%). Most of the injured drivers were hospitalized (91.4%) for their injuries.

Road traffic injuries (RTIs) stem from complex interactions between unsafe road users, vehicles, roads, and environments, with major risk factors including speeding, driving under the Influence of alcohol / drugs), distractions, fatigue and non-use of Safety devices, helmet, Seatbelts. Vulnerable users like Pedestrians, cyclists, and motorcyclists, along with young drivers, face higher risks, while factors like poor road design, inadequate lighting, and vehicle maintenance also significantly increase injury Severity and fatality rates. Hence, this study was conducted to investigate the determinants of the RTIs among Lagos drivers with an aim to highlight the importance of road safety and injury prevention. The study has also demonstrated how RTIs were caused, type of injuries by Vehicle type and outcome in these vulnerable road users.

RTI is especially damaging because economically active age group are the most vulnerable to such injuries. The data shows that the proportion of Victims was low in the age group (18-24) years (6.7%) and above the age of 55 years (6.7%) which is similar to the findings reported by Atubi(2025d, 2025e& 2025f), Arisabor & Atubi (2023).

The present study investigated the factors strongly associated with the risk of motor vehicle occupant injury, age, gender, environmental issues and human behavior. The predominance of males in road injury was common in the present study with the ratio 1.8. The over presentation of males is probably related to their higher exposure to road traffic due to economic opportunities and also higher risk taking behavior. Nantulya and Reich (2003) reported that the more involvement of men in RTIs is a common finding globally.

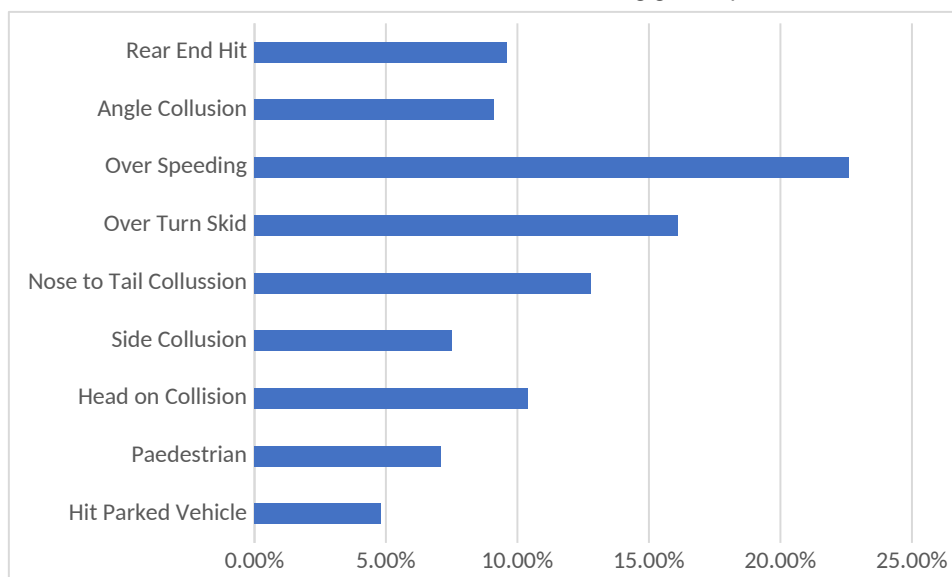


Fig 1: Distribution of Injuries Resulting from Road Traffic Crashes

Despite the fact that majority of the injured Lagos drivers obeyed the traffic rules like using seat belts (71.1%) and following not texting while driving (37.8%), more than half of them were involved in over speeding (77.8%) and traffic violations (53.8%). Although no significant difference was observed between the injured (71.1%) and non-injured drivers (73.9%) in their response that they were following the traffic rules on speed limit, exceeding speed limit was significantly more common among the injured drivers (26.7%, P=0.033). The possible explanation for this finding is that the injured drivers might not observe the traffic speed limit while they were driving. Eating and drinking (41.8%) and the use of mobile phones (45.3%) were the two most common distracting habits reported among the study group of injured Lagos drivers. These study findings reveal that human behavioral factors represent one of the main causes of RTIs

The data showed that RTIs are also related to vehicle and environmental issues. Most of the RTIs occurred during the rainy season (80%) and sunny day (11.1%). For the road safety planners, the study findings highlighted the types of road traffic crashes resulting to more number of injuries from over speeding (22.6%), overturn skid (16.1%), nose to tail (12.8%) and head-on - collision (10.4%). These causes of road injuries can be attributed to factors as rapid population growth (i.e. urbanization) and high motorization, which results in increased exposure levels to environmental risk factors of RITs.

Further analysis reveal an association between type of transport vehicle and the severity of road traffic injury. Injuries from light vehicle crashes gave largest proportion of moderate injuries (70%). Head injuries were reported more from light vehicle crashes (50%), whereas back Injuries from heavy vehicle crashes (40%). The explanation

for the high burden for RTIS in Lagos state is poor enforcement of traffic Safety regulations by the Federal Road Safety Corps and poor effective traffic awareness campaigns.

4. Conclusions

Road traffic injuries (RTIS) in Lagos State are high, driven primarily by human factors like over speeding, recklessness, fatigue and distraction (Phone use), alongside vehicle issues (bad brakes, tires and poor road conditions, with Commercial drivers, Motorcyclists (Okadas), and tricycles (keke) being high-risk groups, especially during peak hours and in congested areas.

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