

Epidemiology of road traffic crashes among long distance drivers in Ibadan, Nigeria

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Abstract

Background: Road Traffic Crashes (RTCs) are major causes of morbidity and mortality in Nigeria. Few studies in Ibadan have focused on the distribution and determinants of RTC among long distance drivers.

Objective: To describe the distribution of crashes by place, times of occurrence, characteristics of persons involved and identify associated factors.

Methods: A cross-sectional study was carried out among consenting long distance drivers within selected parks in Ibadan.

Results: Respondents (592) were males, with median age of 42.0 years (range 22.0-73.0 years). Secondary education was the highest level of education attained by 38.0%. About 34.0% reported current use of alcohol. The life-time prevalence of crashes was 35.3% (95% CI= 31.5-39.2%) and 15.9% (95% CI=13.1-19.0%) reported having had at least one episode of crash in the last one year preceding the study. The crash occurred mainly on narrow roads [32/94 (34.0%,)] and bad portions of tarred roads [35/94 (37.2%,)] with peak of occurrence on Saturdays 18/94 (19.1%,). Significantly higher proportions of drivers aged ≤39years (23.4%) versus >39years (11.7%), those with no education (29.9%) versus the educated (13.8%) and those who reported alcohol use (21.9%) versus non users (12.8%) were involved in crashes in the year preceding the study. Significant predictor of the last episode of crashes in the last one year were age (OR=2.2, 95% CI=1.4-3.5), education (OR=2.7, 95% CI=1.5-4.6) and alcohol use (OR=1.8, 95% CI=1.2-3.0).

Conclusion: Road traffic crashes occurred commonly on bad roads, in the afternoon and during weekends, among young and uneducated long-distance drivers studied. Reconstruction of bad roads and implementation of road safety education programmes aimed at discouraging the use of alcohol and targeting the identified groups at risk are recommended.

Keywords: Road traffic crashes, long distance drivers, mortality

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Introduction

Road traffic crashes (RTCs) have emerged as a major global public health problem of this century and are now recognized as a neglected pandemic¹. They accounted for 2.1% of total deaths and 21.0% of total injury globally², and developing and underdeveloped countries accounted for 80% of these deaths³.

A RTC is defined as an event that produces injury and/or property damage, that involves a motor vehicle in transport and occur on a traffic way or while the vehicle is still in motion after running off the traffic way. Human, vehicular and environmental factors play roles before, during and after a crash event, therefore, RTCs have to be studied in terms of an epidemiological model of agent (person), host (vehicle) and environmental factors (infrastructure and climatic conditions), and analyzed in relation to time, place and person distribution⁴. Human behavior and incapacitation account for over 85% of the contributing factors reported by a previous study in Africa³. Epidemiological research has tended to focus on human risk factors because they are relevant to the search for preventive measures, and because they have been identified as the most frequent cause of crashes⁵.

It has been reported that commercial vehicle drivers, in particular, young commercial drivers engaged in long

distance journeys are a major contributor to RTCs incidents in Nigeria, and their impact on RTCs and economic losses are high⁶. Previous studies in Ibadan, south western Nigeria, had shown increase in RTC involvement among commercial intra-city and private drivers and had associated it with their behaviour^{7,8}, but few have focused on the distribution and determinants of RTCs among long distance drivers in this part of the country. This gap, the study intends to fill by exploring the conditions that made the long-distance drivers prone to RTCs. This information could be used to design, implement and evaluate interventions to reduce the risk of RTCs among them. Hence, the study was conducted to determine the prevalence of RTCs and describe the distribution of RTCs by place, time of occurrence, characteristics of persons involved, as well as identify factors associated with involvement in RTCs among long-distance drivers in Ibadan metropolis.

Methodology

This was a cross-sectional study conducted in Ibadan, the capital of Oyo State and the third largest metropolitan area by population in Nigeria after Lagos and Kano. Participants included in the study were the long-distance commercial intercity vehicle drivers covering a distance of no less than 400 km per journey and in the twelve major motor parks in Ibadan. Those that did not consent or were not available during the interview days were excluded. The parks are located in each of the eleven local government areas in Ibadan, except Akinyele local government area, which has two parks. The other parks at each local government included; Ibadan North, Ibadan North-East, Ibadan North-West, Ibadan South-

East, Ibadan South-West, Lagelu, Egbeda, Oluyole, Ona-Ara and Ido park. A cluster sampling technique was used to select 594 consenting commercial long-distance drivers from the motor parks in Ibadan in May, 2013. Each of the motor parks represented a cluster. A total of 5 clusters were selected from the 12 clusters in Ibadan metropolis using simple random sampling technique. In the selected clusters, all long distance drivers who met the eligibility criteria were approached and included in the study. A pretested interviewer-administered semi-structured questionnaire was used to collect data from the respondents on their characteristics, psychoactive substance use in their life time, life time and one-year history of RTCs including place and time of occurrence of the last crash in the previous one year before the study, and analysed using SPSS version 16 with the level of significance set at 0.05.

Ethical approval to conduct the study was obtained from the ethical review committee of the Oyo State Ministry of Health and the National Union of Road Transport Workers (NURTW) Ibadan before the commencement of the study.

Results

Characteristics of long distance drivers in Ibadan in May 2013

Among the 594 long-distance motor vehicle drivers approached, 592 responded. The respondents were males with the median age of 42.0 years (range 22.0 -73.0years) (Table 1). Secondary education was the highest level of education attained by 38.0%. Most (88.2%) were married and 51.5% were Moslems. About 39.2% of them had been driving for more than 20 years.

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Table 1. Characteristics of long distance drivers in Ibadan in May 2013.

	Number of Divers (n=592)	Percentage (%)	Median	Mean ± SD
Gender				
Male	592	100.0		
Female	0	0.0		
Age			42.0	
20-29	33	5.6		
30-39	185	31.2		
40-49	204	34.5		
50-59	110	18.6		
≥60	60	10.1		
Educational status				
Non- formal	77	13.0		
Primary	290	49.0		
Secondary	225	38.0		
Marital Status				
Single	30	5.1		
Married	522	88.2		
Divorced/separated	23	3.9		
Widowed	17	2.9		
Religion				
Christian	281	47.3		
Islam	304	51.5		
Tradition	7	1.2		
Tribe				
Yoruba	475	80.2		
Igbo	63	10.6		
Hausa/Fulani	49	8.3		
Others	5	0.8		
Driving Experience				
<5	22	3.7	17.00	18.1±9.0
5-9	68	11.5		
10-14	129	21.8		
15-19	141	23.8		
>20	232	39.2		

Psychoactive substance use among long distance drivers in Ibadan in May, 2013

The substances most commonly used by the respond-

ents in descending order were kolanut (38.5%, 95% CI= 34.7 – 42.5%) alcohol (34.0%, 30.2 – 37.8%) and cigarettes (26.0%, 22.6 – 29.7%) (Table 2).

Table 2: Psychoactive substance used among long distance drivers in Ibadan in May, 2013

Psychoactive substance used	Number of Divers (n=592)	Percentage (%)	95% CI Lower	Upper
Kolanut use				
Yes	228	38.5	34.7	42.5
No	364	61.5		
Cigarette smoking				
Yes	154	26.0	22.6	29.7
No	438	74.0		
Alcohol use				
Yes	201	34.0	30.2	37.8
No	391	66.0		

Experiences of RTCs among long distance drivers in Ibadan in May 2013

The lifetime prevalence of RTCs was 35.3% (95% CI= 31.5-39.2%) and 15.9% (95% CI=13.1-19.0%) reported having had at least one crash in the last one year preceding the study (Table 3). High proportion [44/94

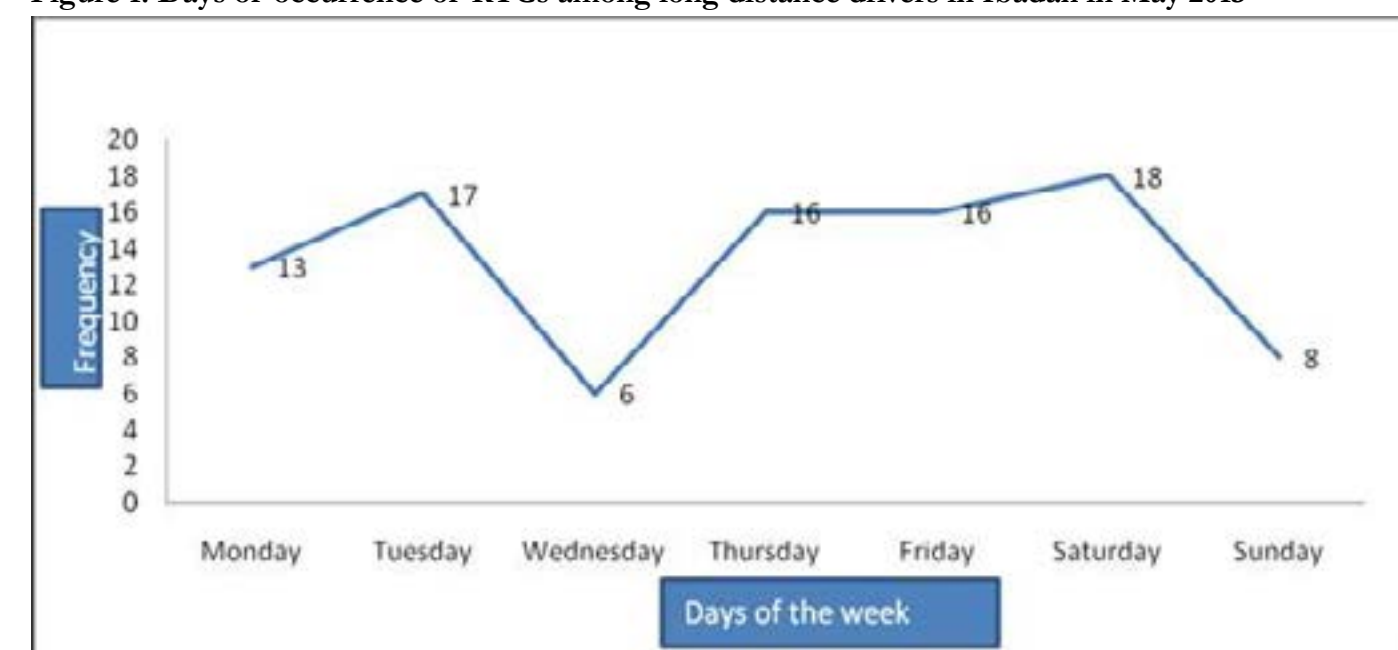
(46.8%), 95% CI= 37.0 – 57.0%)] of respondents who reported RTC in one year were of the age group 35-44 years and 44/94 (46.8%, 95% CI= 37.0 – 57.0%) reported that the crash occurred in the afternoon. More than a quarter [40/94 (42.6%), 95% CI= 33.0% - 52.7%] of RTCs reported occurred during the rainy period.

Table 3: Experiences of RTCs among long distance drivers in Ibadan in May 2013.

	Number of Divers (n=592)	Percentage (%)	95% CI Lower	Higher
RTC in life time				
Yes	209	35.3	31.5	39.2
No	383	64.7		
RTC in 1 year				
Yes	94	15.9	13.1	19.0
No	498	84.1		
Age at last crash	N=94			
<15	1	1.1	0.0	5.1
15-24	9	9.6	4.8	16.8
25-34	33	35.1	26.0	45.2
35-44	44	46.8	37.0	57.0
>45	7	7.4	3.3	14.2
Time of last crash	N=94			
Morning	11	11.7	6.3	19.4
Afternoon	44	46.8	37.0	57.0
Evening	19	20.2	13.0	29.2
Night	19	20.2	13.0	29.2
Not specific	1	1.1	0.1	5.1
Climatic conditions at last crash	N=94			
Raining	40	42.6	33.0	52.7
Sunny	37	39.4	30.0	48.5
Windy	5	5.3	2.0	11.4
Others	12	12.8	7.1	20.7

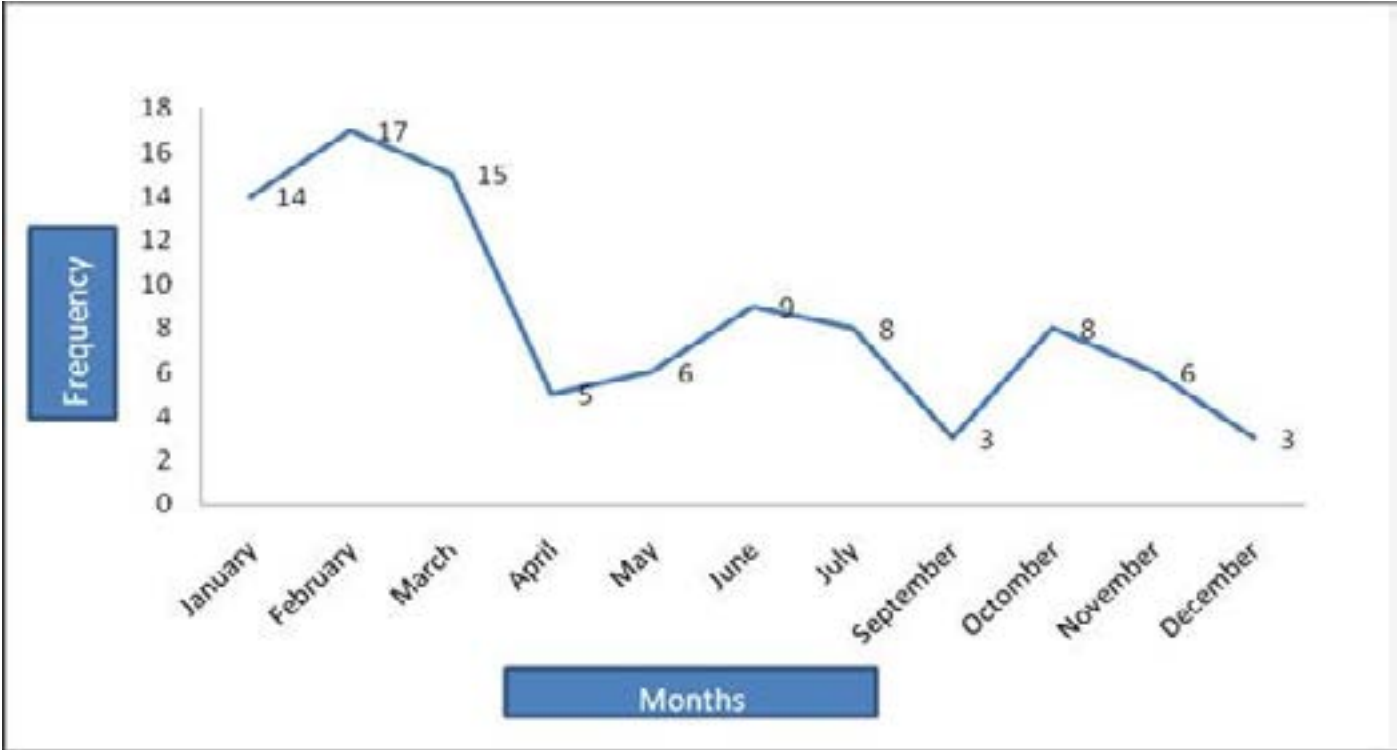
The peak-day of occurrence of RTCs was on Saturdays [18/94 (19.1%)] (Figure 1)

Figure 1: Days of occurrence of RTCs among long distance drivers in Ibadan in May 2013



The peak-months of occurrence of RTCs was on February [17/94 (18.1%)] followed by March [15/94 (16.0%)] (Figure 2).

Figure 2: Months of occurrence of RTCs among long distance drivers in Ibadan in May 2013



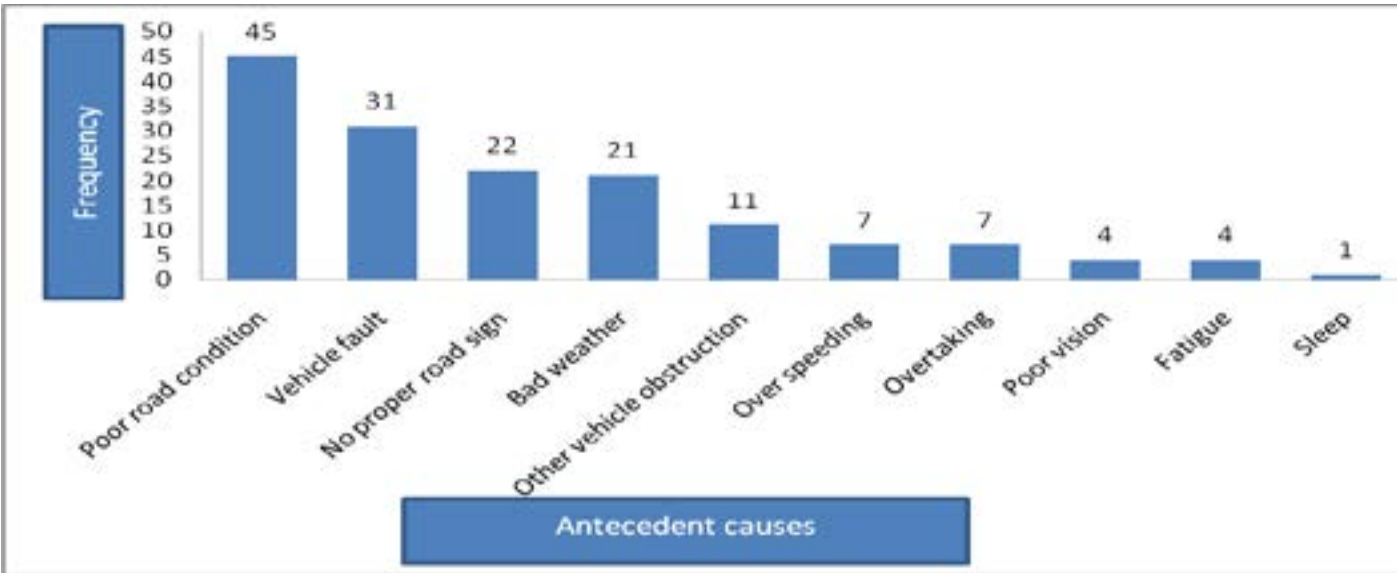
The RTCs occurred mainly on narrow roads [32/94 (34.0%)] and bad portions of tarred roads [35/94 (37.2%)] (Figure 3).

Figure 3: Nature of the road during the last RTC among long distance drivers in Ibadan in May 2013



Poor road condition [45/94 (47.9%)] was the highest followed by mechanical fault [31/94 (33.0%)] as shown in Figure 4.

Figure 4: Antecedent causes of the last crash among long distance drivers in Ibadan in May 2013



***Multiple responses allowed**

Relationship between drivers’ characteristics and occurrence of RTCs in the last one year among long distance drivers in Ibadan in May 2013

In the exploration of the relationship between occurrence of RTCs in the last one year and drivers’ characteristics, age-groups and educational status were statis-

tically significant (Table 4). About 23.4% of those ≤39 reported they had RTCs in the last one year compared to those >39 years (11.7%) p=0.00. More than a quarter (29.9%) of those with no formal education reported RTCs in the last one year compared to those that were educated (13.8%), p=0.00.

Table 4: Associations between drivers’ characteristics and occurrence of RTCs in the last one year in May, 2013

Demographic Variables	RTCs in the last 1 year		Row Total	χ ²	P-Value
	No n (%)	Yes n (%)			
Age groups in years					
≤39	167 (70.0)	50 (23.4)	217	13.2	0.00
>39	331 (88.3)	44 (11.7)	375		
Education					
No education	54 (70.1)	23 (29.9)	77	13.0	0.00
Educated	444 (86.2)	71 (13.8)	515		
Marital Status					
Single	20 (66.7)	10 (33.3)	30	8.0	0.05
Married	443 (84.9)	79 (15.1)	522		
Divorced/Separated	21 (91.3)	2 (8.7)	23		
Widowed	14 (82.4)	3 (17.6)	17		
Tribe					
Yoruba	396 (83.4)	79 (16.6)	475	2.7	0.54
Igbo	57 (90.5)	6 (9.5)	63		
Hausa/Fulani	41 (83.7)	8 (16.3)	49		
Others	4 (80.0)	1 (20.0)	5		
Religion					
Christianity	239 (85.1)	42 (14.9)	281	1.8	0.40
Islam	252 (82.9)	52 (17.1)	304		
Traditional	7 (100.0)	0 (0.0)	7		
Driving experience					
<10	107 (81.1)	25 (18.9)	132	2.1	0.34
10-19	190 (83.3)	38 (16.7)	228		
≥20	201 (86.6)	31 (13.4)	232		

Relationship between psychoactive substance use and occurrence of RTCs in the last one year among long distance drivers in Ibadan in May 2013
A significant proportion (21.9%) of respondents who use alcohol were involved in RTCs in the last one year compared to those that does not use (12.8%), p=0.00 (Table 5).

Table 5: Relationship between psychoactive substance use and occurrence of RTCs in the last one year among long distance drivers in Ibadan in May 2013

Psychoactive substances	RTCs in the last 1 year		Total	X ²	P-Value
	No n (%)	Yes n (%)			
Cigarette smoking					
No	372 (84.9)	66 (15.1)	438	0.8	0.36
Yes	126 (81.8)	28 (18.2)	154		
Alcohol use					
No	341 (87.2)	50 (12.8)	391	8.2	0.00
Yes	157 (78.1)	44 (21.9)	201		
Kolanut use					
No	313 (86.0)	51 (14.0)	364	3.2	0.12
Yes	185 (81.1)	43 (18.9)	228		

Logistic regression association between drivers' characteristics and occurrence of RTCs in the last one year among long distance drivers in Ibadan in May, 2013
Significant predictors of the last episode of RTCs were alcohol use (OR=1.8, 95% CI=1.2 - 3.0), age ≤39 years (OR=2.2, 95% CI=1.4 - 3.5) and educational status (OR=2.7, 95% CI=1.5 - 4.6) (Table 6).

Table 6: Logistic regression association between drivers' characteristics and occurrence of RTCs in the last one year in May, 2013

Variables	P- value	Odds ratio	95% Confidence interval	
			Lower	Upper
Age in years				
≤39	0.00	2.2	1.4	3.5
>39				
Educational status				
Non educated	0.00	2.7	1.5	4.6
Educated				
Marital status				
Single	0.26	2.3	0.5	10.0
Divorced	0.78	0.8	0.2	3.0
Widowed	0.41	2.5	0.1	3.0
Married	0.06			
Alcohol use				
Yes	0.01	1.8	1.2	3.0
No				
Kolanut use				
Yes	0.25	1.3	1.0	2.1
No				

Discussion
We found that majority of the respondents were between 30 and 49 years of age. This age bracket is characterised by highly risky driving behaviours as reported by other authors^{4,9}. Secondary school education was the highest level of education attained by 38.0% of the respondents in this study. This differs from findings by authors that have carried out similar work^{8,10}. Similar to our study, Bamisoa et al. reported high prevalence (35.7%) of alcohol use among long distance drivers in Ilorin, Nigeria⁹.

The one year prevalence of RTCs (15.9%) in this study was higher when compared to the five year prevalence reported among drivers of a tertiary institution (11.1%) and a teaching hospital (4.0%) in a previous study in Ibadan⁸. This marked disparity can be attributed to the differences in study population. The present study was on commercial drivers while the study in reference was on government drivers, who may be generally more careful and spend less time on the road. Significant high prevalence of RTCs was found among drivers that were <40 years of age even though they formed the minority group of the study participants. This can be attributed to the high risky behaviours among this category of drivers compared to the older ones. Previous authors have reported common risky behaviours such as over speeding, non-adherence to safety measures and high intake of psychoactive substances such as alcohol among this group of drivers¹¹. Similar report has also been made in a previous study¹².

However, this is contrary to a report made by some other authors¹³. These differences may be related to driver's risk exposure, and this mainly has to do with a driver's annual mileage. Similar to our study, previous authors in Nigeria had reported significant proportion of RTCs among non-formally educated drivers compared to the educated ones,¹⁴ Significant proportion of those that used alcohol were involved in RTCs in the last one year and alcohol use was found to be a predictor of RTCs, its impairment has been identified as an important factor influencing both the risk of RTCs and the severity of injuries¹⁴.

In this study, highest prevalence of RTCs was reported in February and March, while the least was reported in August. Eke et al. reported that majority of the crashes occurred during the rainy season period (June, July

and August) in Port Harcourt¹⁵. Considering the fact that heavy road traffic leads to more RTCs, our findings may be explained by this association between RTCs and heavy traffics which occurs on the Nigerian roads during Christmas and new year festivities which span through the first (January, February and March) and last quarter (October, November and December) of the year. The highest prevalence of RTC reported occurred on Saturdays. This peak is probably due to the commune culture of travelling to attend social functions in villages during weekends, therefore, increasing traffic on the roads. Other reports indicated highest prevalence during the week days¹⁶. RTC had been found to occur regularly on narrow and bad roads⁷. The narrow roads represent single lane roads that could only be plied by one moving vehicle at a time, while bad roads include those with sharp bends, potholes and at bad sections of the highways. In our study, we found that RTCs reported occurred on narrow roads and bad portions of tarred roads, similar to previous reports^{7,16}.

Various causes have been reported as contributory to RTCs. Mechanical factors such as brake failure do occur, but human factors are by far the most important in the causation of crashes. Atubi reported human factors as the most potent contributor to motor vehicular crashes in Nigeria¹⁷, however, we found poor road condition as the highest perceived cause of crashes reported in the last one year.

Limitations
The findings from this study could have been limited by the study design. For instance, RTCs were reported among survivors and those who were not severely disabled by the RTCs. Therefore, information may not have been obtained on many fatal and severe crashes, thereby providing an underestimation of the burden of the crashes. In addition, association found may have been influenced by survival bias. The survey relied on the reports of respondents which could not be independently validated. There was a tendency to underreport crashes due to poor recall, thus the findings of the study may be influenced by recall bias. The study, however, provided an insight into the burden as well as risk factors of RTCs in the studied area, upon which some specific interventions could be suggested and subsequently evaluated, if they are implemented.

Conclusion
We found that RTCs occurred commonly on bad roads,

in the afternoon and weekends; and among young and uneducated long distance drivers. There is a need for repair and reconstruction of bad roads, including proper design of road networks and implementation of road safety education programmes aimed at discouraging the use of alcohol and targeting the identified groups at risk.

Authors' contributions

All the authors were involved throughout the course of the study. Adejugbagbe A. and Fatiregun A. conceived the study. Initial draft was done by Adejugbagbe A. and approved by all authors.

Conflict of interest: None

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