

Epidemiological Study On the Prevalence of Road Traffic Accident and Associated Risk Factors Among Drivers in Bauchi State, Nigeria

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Keywords:

Bauchi; Drivers; Nigeria; Prevalence; Risk factors; Road traffic accident

1. Abstract

1.1. Background: Worldwide Road traffic accident (RTA) is a huge public health and development problems killing nearly 1.2 million people a year and injuring or disabling between 20-50 million people worldwide; thus making the loss of US 518 billion dollars globally. According to World Health Organization, every day more than 3000 people die from road traffic accidents. Developing countries account for 90% of global road traffic deaths. Road traffic accidents are being the critical public health problem that causes disabilities and death in Nigeria which could need due investigations. Therefore, the aim of this study was to determine the Prevalence of Road Traffic Accident and Associated Risk Factors among Drivers in Bauchi State, Nigeria.

1.2. Methods: cross-sectional study design was conducted among drivers in Bauchi State, Nigeria from December, 2020 to January, 2021. Data was collected using a pretested structured questionnaire. Descriptive analysis was performed to obtain the frequency distribution of the variables.

1.3. Results: The result shows that 300 participants responded to the questionnaire. The overall road traffic accident prevalence was 115 (38.3%).

1.4. Conclusion: The prevalence of road traffic accident revealed in this study is of public health significance. RTA-related causalities are extremely high in Nigeria. Male young adults and vulnerable road users are at increased risk of RTA. The most perceived cause of road traffic accidents mentioned was an overcrowded road which is shared by drivers, pedestrians, and animals. There-

fore, there is an urgent need for bringing road safety to the country's public health agenda.

2. Introduction

Road traffic accident (RTA) is an incident on a way or street open to public traffic, resulting in one or more persons being injured or killed and involving at least one moving vehicle. Road traffic accidents have become a huge global public health and development problem killing nearly 1.2 million people a year and injuring or disabling between 20-50 million people worldwide; thus making the loss of US 518 billion dollars globally [1, 2, 3]. RTA contributes to poverty by causing loss of productivity, material damage, injuries, disabilities, grief and deaths [4]. Deaths and injuries resulting from road traffic crashes remain a serious problem globally and current trends suggest that this will continue to be the case in the foreseeable future [5, 6]. RTA is the major cause of economic loss globally. The total costs to public services identified as follows: older drivers, £63 million (£10 000 per fatality); people driving for work, £702 million (£700 000 per fatality); motorcyclists, £1.1 billion (£800 000 per fatality) and young drivers, £1.3 billion (£1.1 million per fatality) [7].

Approximately 1.3 million people die each year in traffic-related accidents worldwide [8]. Road traffic injury is now the leading cause of death for children and young adults aged 5–29 years, signalling a need for a shift in the current child health agenda. It is the eighth-leading cause of death for all age groups exceeding HIV/AIDS, tuberculosis and diarrhoeal diseases [9] and the deaths due to RTAs are predicted to become the fifth-leading cause of death

by the year 2020 [8].

The burden of road traffic injuries and deaths is disproportionately borne by vulnerable road users and those living in low-income and middle-income countries, where the growing number of deaths is fuelled by transport that is increasingly motorized. Between 2013 and 2016, no reductions in the number of road traffic deaths were observed in any low-income country [4]. The causes of road traffic accidents are multi-factorial. These factors can be divided broadly into driver factors, vehicle factors and roadway factors. Accidents can be caused by a combination of these factors. Driver factors solely contribute to about 57 per cent of road traffic accidents and 93 per cent either alone or in combination with other factors [10, 11]. Driver factors in road traffic accidents are all factors related to drivers and other road users. This may include driver behavior, visual and auditory acuity, decision making ability and reaction speed. Drug and alcohol use while driving is an obvious predictor of road traffic accident, road traffic injury and death [11]. Speeding, travelling too fast for prevailing conditions or above the speed limit, is also a driver factor that contributes to road traffic accidents. The risk of being injured increases exponentially with speed much faster than the average speed. The severity of injury depends on the vehicle speed change at impact and transfer of kinetic energy. Though vehicles travelling slower than average speed are also at increased risk of road traffic accidents, most involve speed too fast for the conditions. Vehicle factors can be divided into vehicle design and vehicle maintenance. Some safety features of vehicles like seatbelts and airbags are likely to reduce the risk of death and serious injuries. A well-designed and maintained vehicle is less likely to be involved in accidents. If the brakes and tires are good and the suspension well-adjusted, the vehicle is more controllable in an emergency and thus, better equipped to avoid accidents. Road design and maintenance is also a factor that contributes to road traffic accidents. The causes of road traffic accidents are not just human error or driver negligence. Unfortunately, Nigerian highways are arguably one of the worst and most dangerous in the world [11]. Although road infrastructures have a significant role in the occurrence of RTA; the human factor is the most prevalent contributing factor of RTAs. This includes both driving behaviour (e.g. drinking and driving, speeding, traffic law violations) and impaired skills (e.g., lack of attention, exhaustion, physical disabilities and so on) [9,10]. A road traffic accident can be attributed to multiple factors: including human or driver errors, types of vehicles, traffic infrastructures like that of engineering design, road maintenance, and traffic regulation among others [10]. Factors contributing to the high incidence of RTAs in Nigeria include rampant reckless driving behaviors, poor road network, substandard road conditions, failure to enforce traffic laws and poor conditions of vehicles [11].

In Africa, about one-quarter of injury-related deaths are attributed to road traffic accidents (RTA). In 2008, road traffic accidents

caused approximately 158,000 deaths and were the 13th ranked cause of fatalities, accounting for 2.3% of all deaths in the continent. Nigeria and Ethiopia contributed to a high proportion (23%) of road accident-related deaths to the continent's [11]. The most widely accessible and affordable transportation in Africa is road transport as the air and rail transport are either costly or even in some part the region not available at all [12, 13].

Globally, pedestrians share the road with different types of vehicles like cars, trucks, buses and, motorcycles as well as also with the animals [14]. These days, transportation is the riskiest and intricate system that people deal with in their daily lives [15]. Unacceptable deaths and disabilities are happening as a result of road traffic injuries. The socio-economic and health burden it creates is challenging the sustainable development of the nation's [16]. The International Federation of Red Cross and Red Crescent Societies have described the situation as "a worsening global disaster destroying lives and livelihoods, hampering development and leaving millions in greater vulnerability" [17]. Globally, in 2013 around 1.25 million people had died as a result of a road traffic accident and 50 million peoples have encountered non-fatal injuries. About half of the victims are pedestrians, cyclists and Motorcyclists in the urban areas. Most of the road traffic accident deaths (90 %) occur in Low- and Middle-income countries (LMICs) where the death rates (21.5 and 19.5 per 100 000 populations respectively) are double of those for high-income countries [12].

Road traffic accident (RTA) is a major public health and development challenge. Every year nearly 1.3 million people lose their lives on the road and as many as 50 million others are injured [18]. Globally 17 road fatalities per 100,000 populations per annum are reported. RTA is the second leading cause of death in economically active population group of 15–44 years of age; further, more than 75% of RTA casualties occur in this age group [19–21]. In many countries the estimate economic loss due to RTAs is as high as 3% of their gross domestic products [22]. The burden of RTA is disproportionately high in low- and middle-income countries (LMIC) were over 85% fatalities and 90% of disability-adjusted life years lost are reported [20,23,24]. Fatalities secondary to RTAs is at least two-times common in LMIC than in high-income countries.

Globally RTA fatalities remain more or less constant since 2007; yet, in many developing countries the rates are increasing [25]. Especially Africa faces the highest annual rate of road fatalities in the world– 27 per 100,000 populations [25]. In the next few decades, the problem can even rise due to the ongoing rapid economic growth and increase in motorization in the continent [19, 23, 26]. Despite the growing burden of RTAs, road safety remains a neglected issue in many developing countries and the health sector has been slow to recognize it as a priority public health problem [25, 27]. A large body of evidence suggests that RTAs are easily preventable and many high income countries have successfully reduced the incidence through proven and cost-effective interven-

tions [19, 28]. The Sustainable Development Goals (SDGs) Goal-3 sets an ambitious target to halve the global number of fatalities and injuries from RTAs by 2020 [29].

The productive parts of population aged 15-44 years accounted for more than half of all road traffic deaths globally [30,31]. Half of the world's road traffic deaths occur among motorcyclists (23 %), pedestrians (22 %) and cyclists (5%), car occupants 31 % and the remaining 19 % among unspecified road users [32]. Generally, Road traffic accidents are an unintended, non-communicable and preventable and common risk every day to our life that can happen to almost everyone at any place [33, 34]. In many developing countries including Nigeria there is paucity of evidence regarding the incidence of RTA-related injuries and fatalities. Further, the available estimates based on official reports are likely to underestimate the extent of the problem [10].

However, the prevalence of Road traffic accidents, especially among drivers in Bauchi State, Nigeria is largely unknown and to the best of our knowledge, no study-based survey has been conducted on the prevalence of Road traffic accidents and its associated risk factors in Bauchi State, Nigeria. Therefore, the aim of this study was to determine the Prevalence of Road Traffic Accident and Associated Risk Factors among Drivers in Bauchi State, Nigeria.

3. Methodology

3.1. Study Area and Study design

Bauchi State takes its name from the historic town of Bauchi, which also serves as the capital city and is located in the North East of Nigeria. The state was formed in 1976 when the former North-Eastern State was broken up. According to tradition, it was named for a hunter known as Baushe, who settled in the region before the arrival of Yakubu, the first traditional ruler of Bauchi emirate (founded 1800–10). Bauchi State occupies a total land area of 49,119 km² (18,965 sq mi) representing about 5.3% of Nigeria's total land mass and is located between latitudes 9° 3' and 12° 3' north and longitudes 8° 50' and 11° easts. According to the 2006 census, Bauchi state has a population of 4,653,066. Bauchi State consists of twenty Local Government Areas (LGAs). They are: Alkaleri, Bauchi, Bogoro, Damban, Darazo, Dass, Gamawa, Ganjuwa, Giade, Itas/Gadau, Jama'are, Katagum, Kirfi, Misau, Ningi, Shira, Tafawa Balewa, Toro, Warji, Zaki. Bauchi state is bordered by seven states, Kano and Jigawa to the north, Taraba and Plateau to the south, Gombe and Yobe to the east and Kaduna to the west [35].

A cross-sectional study was conducted using interviewer-administered questionnaire from December, 2020 to January, 2021.

3.2. Sample Size Determination

In this study, manual calculation of the sample size using Morgan and Krejcie (1970) formula was used for sample size determination as stated below:

$$S = \frac{X^2NP}{1-P} \div d^2(N-1) + X^2P(1-P)$$

Where:

S = Required sample size

X² = The table value of the chi-square at desired confidence (3.841)

N = Study Population size (1367)

P = Population proportion assumed to be 0.50 since this would provide maximum sample size

d² = Degree of accuracy of the result expressed as proportion 0.050
3.841 × 1367 × 0.5 × 0.5

$$0.0025 \times 1366 + 3.841 \times 0.5 \times 0.5$$

$$1312.66175 = 300$$

$$4.37525$$

Hence 300 respondents

3.3. Inclusion and Exclusion Criteria

All drivers who were based in Bauchi city with a legal driving license and who were driving taxi, Bajaj (three-wheel taxi), private owned car and governmental car in Bauchi city were included in the study. Heavy truck drivers, drivers who were not working and sick during the study period, those who drive more than two vehicle types and those who came from other areas to Bauchi city were excluded from the study.

3.4. Data Collection

The study subjects (drivers) were traced and interviewed for data collection. The drivers were traced at their destination for taxi and Bajaj, house cars in their working area and governmental cars at their offices using the car plate number. A structured interviewer administered questionnaire, adapted from different literatures, was used.

3.5. Data Analysis

Data were analyzed using Statistical Package for Social Science (SPSS) software version 16.0 at that time with the help of the Statistician. The descriptive statistical method was used to analyze frequencies and percentages.

3.6. Ethical Considerations

A permission letter was obtained from Bauchi State transport agency. Informed written consent was obtained from all study participants. All the study participants were assured that the data collection process was anonymous. The objective of the study was explained for participants and they were given the chance to raise any concern they have as well as their right to refuse or withdraw at any moment during the study.

4. Results

4.1. Socio-Demographic Characteristics

A total of 300 respondents were interviewed, giving 100% response rate. Majority of respondents 285, (95%) were males. Among all,

125(41.7%) of respondents were 26-30 years of age. Of the study subjects, 180 (60%), were single, 120 (40%), were married. The socio-economic characteristics of the study showed that, among all respondents, 100 (33.3%) of respondents attended formal education, among this 40(13.3%) of respondents were primary school completed, 35(11.7%) of respondents were secondary school completed and 25 (8.3%) were tertiary completed, while 200(66.7%) of respondents reported that they were took informal education (were illiterate and only read and write) (Table 1).

Table 1: Socio demographic characteristics of respondents (n=300)

Characteristics	Frequencies	Percentages %
Gender		
Males	285	95
Females	15	5
Ages		
20-25	100	33.3
26-30	125	41.7
31-35	55	18.3
36+	20	6.7
Marital status		
Married	120	40
Single	180	60
Educational level		
Illiterate	90	30
Can read and write	110	36.7
Primary	40	13.3
Secondary	35	11.7
Tertiary	25	8.3

4.2. Prevalence of Road traffic accident among respondents

The overall prevalence of RTA among drivers was 115 (38.3%). Among all the drivers, 105 (35%) had encountered RTA in the past 2 years from the time of the current study. Most of the accidents happened on Tuesday, 85 (28.3%) and Saturday, 65 (21.7%) even though accidents were reported in all the 7 days. About 87 (29%), 85 (28.3%), 65 (21.7%) and 50 (16.7%) of the reported causes of RTA were due to Violation of traffic rules and regulations, Violation of speed limit, Lack of vehicle maintenance and Lack of general safety awareness of Pedestrians. A significant number of the accidents, 170 (56.7%) happened at day time. Passenger 85 (28.3%), Pedestrian 80 (26.7%), Driver 75 (25%) and Cyclist 60 (20%) constituted the major share of the RTA victims. RTA happened at either T-junction 155 (51.7%), Cross road 85 (28.3%) and Straight road 60 (20%), (Table 2).

Table 2: Prevalence of Road Traffic Accident Drivers in Bauchi State, Nigeria (n=300)

Characteristics	Frequencies	Percentages %
Vehicle ownership		
Private (driver is employee)	185	61.7
Driver (driver is the owner)	85	28.3
Governmental	30	10
Have you Ever drive a car beyond the limited speed		
Yes	105	35
No	195	65
Have you ever had Road traffic accident?		
Yes	115	38.3
No	185	61.7
No of accidents (life time experience)		
1	185	61.7
2	30	10
3	85	28.3
Accident experience in the previous 2 years		
Yes	105	35
No	195	65
Type of accident		
Injury	80	26.7
Injury and property damage	85	28.3
Property damage	75	25
Death	60	20
Accident site road		
T-junction	155	51.7
Cross road	85	28.3
Straight road	60	20
Day of accident		
Monday	35	11.7
Tuesday	85	28.3
Wednesday	55	18.3
Thursday	25	8.3
Friday	23	7.7
Saturday	65	21.7
Sunday	12	4
Reason for the accident		
Violation of traffic rules and regulations	87	29
Violation of speed limit	85	28.3
Lack of vehicle maintenance	65	21.7
Lack of general safety awareness of Pedestrians	50	16.7
Did not remember	13	4.3
Light condition		
At dawn	130	43.3
Day time	170	56.7
Victim		
Passenger	85	28.3
Pedestrian	80	26.7
Driver	75	25
Cyclist	60	20
Do you have Driving License		
Yes	86	28.7
No	214	71.3

4.3. Risky Driving Behaviours among Drivers in Bauchi State, Nigeria (n=300)

Concerning risky driving behaviours, 54 (18%) of the drivers drunk alcohol before driving. About 67 (22.3%) of the drivers were chat chewers and 179 (59.7%) were smokers. 214 (71.3%) of the drivers reported that they used cell phone for communication while driving. The prevalence of RTA among drivers was 71.3%, 18%, 22.3%, 59.7% and 62% among cell phone users, alcohol consumers, chat chewers, cigarette smokers and seat belt users while driving respectively. On the other hands, the prevalence of RTA among drivers was 166 (55.3%), 279 (93%), 156 (52%) and 129 (43%) among drivers who failed to check their mirrors before pulling out, listen radio while driving, side talking to a person in the car and aggressive driving behaviour. With regards to the road infrastructure, gravel 55 (18.3%), asphalt 160 (53.3%) and cobble stone 85 (28.3%) were the type of road they regularly drive on. However, 214 (71.3%) and 125 (41.7%) were reported concerning Service provision of the vehicle as per the manufacturer recommendation as well as ever received a ticket, citation or warning for any traffic violation (Table 3).

Table 3: Risky Driving Behaviours among Drivers in Bauchi State, Nigeria (n=300)

Characteristics	Frequencies	Percentages %
Do you Speak to mobile while driving		
Yes	214	71.3
No	86	28.7
Fail to check mirrors before pulling out		
Yes	166	55.3
No	134	44.7
Listen radio while driving		
Yes	279	93
No	21	7
Aggressive driving behavior		
Yes	129	43
No	171	57
Side talking to a person in the car		
Yes	156	52
No	144	48
Substance use		
Alcohol	54	18
Cigarette	179	59.7
Chat	67	22.3
Seat belt use		
Yes	186	62
No	114	38
Road infrastructure		
Gravel	55	18.3
Asphalt	160	53.3
Cobble stone	85	28.3
Service provision of the vehicle as per the manufacturer recommendation		
Yes	214	71.3
No	86	28.7
Ever received a ticket, citation or warning for any traffic violation		
Yes	125	41.7
No	175	58.3

5. Discussion

The present study aimed at determined the prevalence of Road Traffic Accident (RTA) and Associated Risk Factors among Drivers in Bauchi State, Nigeria. In the present study, the overall prevalence of RTA among drivers was 115 (38.3%). The result of the current study is much lower than the study conducted in Saudi Arabia (84.4%) [36], in Abu- Dhabi (49% of male and 39% of female) had a road traffic accident in the last twelve months [37], in Vellore district, southern India (73 %) [38], in Diredawa, Eastern Ethiopia (80%) [39], in Wolita Zone, southern Ethiopia (62.5%) [3]. This difference might be due to the difference in sample size and study period. This finding is in line with the study conducted at Tikur-Anbesa specialized hospital at Adult Emergency Department (36.23 %) [32], at Jima University Specialized hospital 30.3% [40], Emergency Departments of Amhara Regional State Referral Hospitals 33.9% [31]. On contrary, this prevalence of this study is higher than studies conducted in Mekele, Ethiopia (26.4%) [40], in Lusaka, Zambia, (25.6%) [41], in Nigeria at Kaduna state (27.7%) [42]. The differences may be due to the study period, the sample size, data reviewing technique and quality of the emergency department. The result also found that males were more victims by RTA than females, this result is consistent with the study conducted in Jimma specialized hospital Ethiopia, Tanzania, Saudi Arabia [40, 43, 44]. This is maybe due to the nature of the men's work (outfield), which increased the risk. Our study revealed that majority of RTA victims were Passenger 85 (28.3%), followed by pedestrians 80 (26.7%) which is similar to the study conducted in Wolita zone southern Ethiopia, Tanzania, two neighboring nation in Africa [3, 43, 45], it was found to be that pedestrians were majority of the victims followed by passengers in studies conducted in Tikur-Anbesa Ethiopia, Diredawa administrative zone Ethiopia and central Ethiopia [2, 39, 43, 46]. This difference may be due to low public awareness on road traffic accident, poor road design and poor road safety measures taken by the population.

The findings of this study indicate that the prevalence of road traffic accidents was associated with various factors. Nearly 95.7% of the risk factors were associated with human risk behavior which is a similar finding to a study conducted in Mekele Town, where 96% of the causes of road traffic accidents were related to human risk behavior [47]. Research findings indicate that in many countries, many of the road traffic accidents are not reported to the police and even some of the reported crashes are not recorded. Thus, in those countries hospital data on road casualties are used to supplement police data [48]. The situation of having recorded data on road traffic accidents is worst in Nigeria because hospitals do not record separately road injury and casualties information which could be used as an important research input in addition to the police data to clearly show the magnitude of the problem in the country. Human factor is the most potent contributor to road traffic accidents in Nigeria and India [49]. For example, a study conducted in India in-

icated that human characteristics, such as rushing and negligence make up 95.4% of the total road traffic accidents [50]. Speeding is another factor which accounted for 35% of the total crashes in Bauchi State, Nigeria. In Ghana, the speed factor alone accounted for more than 50% of the crash. Reducing vehicle speed was one of the most effective interventions employed to stem traffic crashes on Ghanaian roads. As a result, installed rumble strips and speed humps reduced crashes by about 35% and fatalities by about 55% [51]. Pilkington and Kinra (2005) reviewed fourteen studies and concluded that speed cameras are effective intervention in reducing road traffic collisions and related casualties. Reductions in outcomes across studies ranged from 5% to 69% for collisions, 12% to 65% for injuries, and 17% to 71% for deaths. [52].

The distribution of road traffic accident deaths also varies across low-income, middle-income and high-income countries. In high-income countries crashes involve primarily privately owned vehicles with the driver being the main car occupant injured or killed [53]. About 45% of road traffic fatalities in low-income countries are among pedestrians, whereas an estimated 29% in middle-income and 18% in high-income countries are among pedestrians [54].

This study revealed that driving after taking alcohol was found to be an aggravating factor for RTA. Drivers who drove after consuming alcohol were more likely to have RTA compared with those who do not consume alcohol. This finding is similar to a similar study which showed that individuals who drank alcohol were more likely to encounter RTA [55]. It was also supported by the Great Britain department for Transport provisional estimates for 2013 which showed that between 230 and 290 people were killed in accidents in Great Britain where at least one driver was over the drink drive limit [56]. Another study also showed that impairments from alcohol were associated with traffic accident of crashes and deaths [57, 58]. This might be due to the nature of alcohol that has a range of psychomotor and cognitive effects, including attitude, judgments, vigilance, perception, reaction and controlling [59]. This can increase accident risk by lowering cognitive processing, coordination, attention, vision and hearing.

The likelihood of RTA was higher among drivers who used cell phone while driving compared with these who do not use. This study is consistent with a previously done study in Mekelle city [60]. Other studies have also reported that drivers distracted by mobile devices such as smart phones and/or other in-vehicle devices are at risk for serious negative outcomes [61–63]. A similar study indicated that telephone use while driving increases the likelihood of RTA. [64]. In this study about 87 (29%), 85 (28.3%), 65 (21.7%) and 50 (16.7%) of the reported causes of RTAs were due to Violation of traffic rules and regulations, Violation of speed limit, Lack of vehicle maintenance and Lack of general safety awareness of Pedestrians. This finding is similar with the study on the comparative analysis of literature concerning road safety, which

showed that the causes include: lack of control and enforcement concerning implementation of traffic regulation (primarily driving at excessive speed, driving under the influence of alcohol and not respecting the rights of other road users (mainly pedestrians and cyclists), lack of appropriate infrastructure and unroad worthy vehicles [65]. This is because, obeying traffic laws are designed to protect the drivers and other people, animals or from destruction of properties around the road and itself the road. In other words, by knowing the rules of the road, practicing good driving skills and generally taking care as a road user can help a vital role in preventing a crash.

This study identified that ownership of the vehicles 185 (61.7%) Private (driver is employee), 85 (28.3%) Driver (driver is the owner) and 30 (10%) was found to be predictor of RTA. A study on Arab gulf countries as compared with other countries showed that vehicle ownership levels and safety parameters in both developed and low-income and middle-income countries is presented to highlight the relative seriousness of the road safety situation in different countries [66]. Vehicles that receive service in the last twelve months are 41% less likely to face RTA than those who didn't. This might be because those who received service might be in better condition than their counterpart.

6. Conclusion

The prevalence of road traffic accident revealed in this study is of public health significance. RTA-related causalities are extremely high in Nigeria. Male young adults and vulnerable road users are at increased risk of RTA. The most perceived cause of road traffic accidents mentioned was an overcrowded road which is shared by drivers, pedestrians, and animals. Therefore, there is an urgent need for bringing road safety to the country's public health agenda.

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References

1. Odero W GP, Zwi A. Road traffic injuries in developing countries: a comprehensive review of epidemiological studies. *Tropical Medicine & International Health. Trop Med Int Health.* 1997 May; 2(5): 445-60.
2. Tiruneh BT, Dachew BA, Bifftu BB. Incidence of road traffic injury and associated factors among patients visiting the emergency department of Tikur Anbessa specialized teaching hospital, Addis Ababa, Ethiopia. *Emerg med int.* 2014; 2014: 439818.
3. Hailemichael F, Suleiman M, Paulos W. Magnitude and outcomes of road traffic accidents at Hospitals in Wolaita Zone, SNNPR, Ethiopia. *BMC research notes.* 2015; 8: 135.
4. World Health Organization (WHO). *Global status report on road safety.* Geneva: WHO, 2018.

5. WHO. Projections of mortality and causes of death, 2015 and 2030. Geneva: WHO, 2013. <http://www.who.int/healthinfo/>
6. Foreman KJ, Marquez N, Dolgert A, et al. Forecasting life expectancy, years of life lost, and all-cause and cause-specific mortality for 250 causes of death: reference and alternative scenarios for 2016-40 for 195 countries and territories. *Lancet*. 2018; 392: 2052-90.
7. Clifford J, THEOBALD C, Atkinson S. Evaluating the costs of incidents from the public sector perspective: a road safety policy research paper. 2016.
8. WHO. Global plan: decade of action for road safety. 2011-2020. Geneva: WHO, 2010.
9. WHO. Global health expenditure database. Geneva: WHO, 2018. <http://apps.who.int/nha/database>
10. Nabi H, Consoli SM, Chastang J-F, Chiron M, Lafont S, Lagarde. Type A behavior pattern, risky driving behaviors, and serious road traffic accidents: a prospective study of the GAZEL cohort. *Am J Epidemiol*. 2005; 161: 864-70.
11. Adogu PO, Ilika AL, Asuzu AL. Predictors of road traffic accident, road traffic injury and death among commercial motorcyclist in an urban area of Nigeria. *Niger J Med*. 2009; 18(4): 393-397.
12. World Health Organization. Global status report on road safety 2015. WHO. 2015.
13. Juillard C, Labinjo M, Kobusingye O, Hyder AA. Socioeconomic impact of road traffic injuries in West Africa: exploratory data from Nigeria. *Inj Prev*. 2010; 16(6): 389-392.
14. World Health Organization. Road Traffic Injuries, Fact sheet. 2017.
15. World Health Organization. World report on road traffic injury prevention: prevention. WHO. 2004.
16. Federal ministry for economic cooperation & development. Urban road safety, sustainable transport: a sourcebook for policymaking in developing cities. Giz SUTP. 2017.
17. Cater N, Walker P. World Disasters Report. Oxford University Press. 1998.
18. Sleet D, Baldwin G, Dellinger A, Dinh-Zarr B. The decade of action for global road safety. *J Safety Res*. 2011; 42: 147-8.
19. Mohan D. Road safety in less motorized environments: Future concerns. *Int J Epidemiol*. 2002; 31: 527-32.
20. Nantulya V, Reich M. The neglected epidemic: Road traffic injuries in developing countries. *BMJ*. 2002; 324: 1139-41.
21. Odero W, Khayesi M, Heda P. Road traffic injuries in Kenya: Magnitude cause and status of intervention. *Inj Control Saf Promot*. 2003; 10: 53-61.
22. World Health Organization. Road traffic injuries: Key facts, 2018. Accessed from: <http://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries>. Cited 01 July 2018.
23. Peden M, Scurfield R, Sleet D, Mohan D, Hyder A, Jarawan E. World report on road traffic injury prevention. Geneva: World Health Organization. 2004.
24. Ameratunga S, Hajar M, Norton R. Road-traffic injuries: Confronting disparities to address a global health problem. *Lancet*. 2006; 367: 1533-40.
25. World Health Organization. Global status report on road safety 2015: Summary. Geneva: WHO; 2018.
26. Bishai D, Quresh A, James P, Ghaffar A. National road casualties and economic development. *Health Economics*. 2006; 15: 65-81.
27. Watkins K. Safe and sustainable roads: An agenda for Rio+20. 2012. Accessed from: http://www.youthforroadsafety.org/uploads/nieuws_bijlagen/rio_20_report_lr.pdf. Accessed on: July 01, 2018.
28. Elvik R. The stability of long-term trends in the number of traffic fatalities in a sample of highly motorized countries. *Accid Anal Prev*. 2010; 42: 245-60.
29. United Nations Development Program. Sustainable Development Goals, 2018. Accessed from: <http://www.undp.org/content/undp/en/home/sustainable-development-goals.html>. Cited 01 July, 2018.
30. Peden M, Scurfield R, Sleet D, Mohan D, Hyder AA, Jarawan E et al. World report on road traffic injury prevention. World Health Organization Geneva. 2004.
31. Bashah DT, Dachew BA, Tiruneh BT. Prevalence of injury and associated factors among patients visiting the Emergency Departments of Amhara Regional State Referral Hospitals, Ethiopia: a cross-sectional study. *BMC emergency medicine*. 2015; 15: 20.
32. Seid M, Azazh A, Enquselassie F, Yisma E. Injury characteristics and outcome of road traffic accident among victims at Adult Emergency Department of Tikur Anbessa Specialized hospital, Addis Ababa, Ethiopia: a prospective hospital based study. *BMC Emerg Med*. 2015; 15: 10.
33. Organization WH. Global status report on road safety: time for action. World Health Organization. 2009.
34. Shah Ta. Prevalence of Road Traffic Accidents; Admitted In One Surgical Ward At Allied Hospital Faisalabad During One Year. *Professional Medical Journal*. 2016; 23(4): 378- 382.
35. Bauchi State Government (BASG), Nigeria-OfficialWebsite". www.bauchistate.gov.ng. Archived from the original on 13 July 2018. Retrieved 13 July 2018.
36. Mansuri FA, Al-Zalabani AH, Zalat MM, Qabshawi RI. Road safety and road traffic accidents in Saudi Arabia. A systematic review of existing evidence. *Saudi Med J*. 2015; 36: 418-24.
37. Hammoudi A, George Karani, John Littlewoods. Road Traffic Accidents among Drivers in Abu Dhabi, United Arab Emirates *Journal of Traffic and Logistics Engineering*. 2014; 2: 7-12.
38. Mohan VR, Sarkar R, Abraham VJ, Balraj V, Naumova EN. Differential patterns, trends and hotspots of road traffic injuries on different road networks in Vellore district, southern India. *Trop Med Int Health*. 2015; 20: 293-303.
39. Belachew M, Zeleke D. Statistical analysis of road traffic car accident in Dire Dawa Administrative City, Eastern Ethiopia. *Science Journal of Applied Mathematics and Statistics*. 2015; 3: 250-6.

40. Woldemichael K, Berhanu N. Magnitude and pattern of injury in Jimma University specialized hospital, South West Ethiopia. *Ethiopian journal of health sciences*. 2011 Nov;2 Woldemichael K, Berhanu. Magnitude and pattern of injury in Jimma University specialized hospital, South West Ethiopia. *Ethiop J Health Sci*. 2011; 21: 155-65.
41. Seidenberg P, Cerwensky K, Brown RO, Hammond E, Mofu Y, Lungu J, et al. Epidemiology of injuries, outcomes, and hospital resource utilisation at a tertiary teaching hospital in Lusaka, Zambia. *African Journal of Emergency Medicine*. 2014; 4: 115- 22.
42. Jobin PD. Analysis of road traffic accident hotspots along Zaria-kaduna expressway, kaduna state. Nigeria. 2015.
43. Boniface R, Museru L, Kiloloma O, Munthali V. Factors associated with road traffic injuries in Tanzania. *Pan Afr Med J*. 2016; 23: 46.
44. Ghaffar U, Ahmed S. A review of road traffic accidents in Saudi Arabia: the neglected epidemic. *Indian journal of forensic and community medicine*. 2015; 2: 242.
45. Wiebe DJ, Ray S, Maswabi T, Kgathi C, Branas CC. Economic development and road traffic fatalities in two neighbouring African nations. *African journal of emergency medicine*. 2016; 6: 80-6.
46. Asefa F, Assefa D, Tesfaye G. Magnitude of, trends in, and associated factors of road traffic collision in central Ethiopia. *BMC public health*. 2014; 14: 1072.
47. Hassen A, Godesso A, Abebe L, Girma E. Risky driving behaviors for road traffic accident among drivers in Mekele City, Northern Ethiopia. *BMC Res Notes*. 2011; 4: 535.
48. International Transport Forum. Reporting on serious road traffic casualties, 2009 [Cited 30 April 2011]; Available at: URL:<http://www.internationaltransportforum.org/irtadpublic/pdf/Road-Casualties-Web.pdf>.
49. Atubi AO. Determinants of road traffic accident occurrences in Lagos State: Some lessons for Nigeria. *International Journal of Humanities and Social Science* 2012; 2.
50. Goswami A, Sonowal R. A statistical analysis of road traffic accidents in Dibrugarh City, Assam, India. Division of Epidemiology and Nutrition. Regional Medical Research Centre. 2009.
51. Nantulya VM, Reich MR. The neglected epidemic: Road traffic injuries in developing countries *BMJ*. 2002; 324: 1139-41.
52. Pilkington P, Kinra S. Systematic review of road traffic collisions and related casualties: Systematic review. *BMJ*. 2005 ;330: 331-4.
53. Persson A. Road traffic accidents in Ethiopia: Magnitude, causes and possible interventions. *Advances in Transportation Studies* 2008; 15; 1-9.
54. Zhu M, Cummings P, Chu H, Xiang H. Urban and rural variation in walking patterns and pedestrian crashes. *Inj Prev*. 2008; 14; 377-80.
55. Connor J, Norton R, Ameratunga S, Jackson R. The contribution of alcohol to serious CAR crash injuries. *Epidemiology*. 2004; 15: 337-44.
56. Great Britain Department for Transport. Estimates for reported road traffic accidents involving illegal alcohol levels: 2013 (second provisional) self-reported drink and drug driving for 2013/14. London: Great Britain Department for Transport, 2015. [https:// assets. publishing. service. gov. uk/ government/ uploads/ system/ uploads/ attachment_ data/ file/ 402698/ rccgb- drink- drive- 2013- prov.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/402698/rccgb-drink-drive-2013-prov.pdf).
57. Shinar D. *Traffic safety and human behavior*. 2nd edition. Beersheba, Israel: Ben Gurion University of the Negev, 2017.
58. Brown T, Milavetz G, Murry DJ. Alcohol, drugs and driving: implications for evaluating driver impairment. *Ann Adv Automot Med*. 2013; 57: 23-32.
59. Zhao X, Zhang X, Rong J. Study of the effects of alcohol on drivers and driving performance on straight road. *Math Probl Eng*. 2014; 1: 1-9.
60. Asefa NG, Ingale L, Shumey A, Yang H. Prevalence and factors associated with road traffic crash among TAXI drivers in Mekelle town, Northern Ethiopia, 2014: a cross sectional study. *PLoS One* 2015; 10: e0118675.
61. Lipovac K, Đerić M, Tešić M, Andrić Z, Marić B. Mobile phone use while driving-literary review. *Transp Res Part F: Traffic Psychol Behav*. 2017; 47: 132-42.
62. Caird JK, Willness CR, Steel P, Scialfa C. A meta-analysis of the effects of cell phones on driver performance. *Accid Anal Prev*. 2008; 40: 1282-93.
63. Horrey WJ, Wickens CD. Examining the impact of cell phone conversations on driving using meta-analytic techniques. *Hum Factors*. 2006; 48: 196-205.
64. Farmer CM, Braitman KA, Lund AK. Cell phone use while driving and attributable crash risk. *Traffic Inj Prev*. 2010; 11: 466-70.
65. Goniewicz K, Goniewicz M, Pawłowski W, Fiedor P. Road accident rates: strategies and programmes for improving road traffic safety. *Eur J Trauma Emerg Surg*. 2016; 42: 433-8.
66. Bener A, Abu-Zidan FM, Bensiali AK, Jadaan KS, Al-Mulla A. Strategy to improve road safety in developing countries. *Saudi Med J*. 2003; 24: 603-8.