ANALYSIS OF CAUSES AND TREND OF ROAD TRAFFIC ACCIDENTS IN URBAN ZARIA, KADUNA STATE, NIGERIA

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Abstract:
Transportation is the inevitable movement of people from one place to another. In the process of the movement, road accident might occur. With the increasing number of people and vehicles, the rate this road accidents will definite increase if proper measures are not put in place. This paper investigated the trend of Road Traffic Accidents (RTA) in Zaria urban area, Kaduna state. Both qualitative and quantitative data were collected for the study. The quantitative data were obtained from the administration of 352 copies of a structured questionnaire to purposively selected respondents in the study area. While the qualitative data were obtained through a session of Focus Group Discussion (FGD) with each of Kaduna State Traffic and Environmental Law Enforcement Agency (KASTELEA), Federal Road Safety Corp (FRSC) and National Union of Road Transport Workers (NURTW; and Key Informant Interview (KII) were conducted to the leaders of the unions. The results indicated low level of literacy from respondents in which (11%) had no formal education while (43%) attended only primary school; this may affects ability to interpret road signs and symbols. Teen drivers accounted a large number of (8%) which is very bad for any society. A significant number of the respondents (48%) do not have valid driver's license. Even the 52% that alleged having a valid driver's license, only 44% claimed to have attended driving school. The following recommendations were offered, public enlightenment for the drivers should be strengthen, transport infrastructures should be enhance and traffic laws should be enforced.

Key words:
Road Traffic Accidents, Road Safety, Enforcement, Urban Zaria

1 INTRODUCTION

Movement is one of the general characteristics of living things, as well as extremely vital part of the socio-economic development of societies (Evwiekpaefe and Umar, 2021). Road transportation is the movement of goods and personnel from areas of supply to areas of demand and from residence to places of activities. Road is a link between two destinations, which has been either paved or not to enable transportation by way of motorized and non-motorized carriages (Rodrique, 2020). Road transportation is a catalyst for the movement of people and agricultural produce and sustained the other components of life by making them interact. The capacity and connectivity of a network is very important in regional and national development (World Health Organization, WHO, 2014).

Accident is an unexpected happening with a potential to cause injury or damage (Mohammed 2005). Accident is anything which occurs by chance or taken place unexpectedly. Road traffic accidents occur when a vehicle collides with either another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole. Traffic crash may result in fatal, serious and vehicle damage as well as financial burden (Mohammed, Ambak, Mosa, and Syamsunur, 2019).Road traffic injuries are the 10th leading cause of death and the 9th leading cause of the burden of disease in the world. In Nigeria, injuries and deaths resulting from Road Traffic Accidents are on the rise (Asogwa, 1978) and account for the highest proportion of deaths on the Africa continent. Road accidents are Nigeria's third-leading cause of overall deaths, the leading cause of trauma-related deaths and the most common cause of disability (Akinpeluet al, 2007), depleting the workforce of the nation and rendering victims and their relatives to suffer severe psychological trauma (Oyeyemi, 2003; Heidi, 2015).

According to FRSC (2010), the major cause of premature deaths in Nigeria is attributed to Road Traffic Crashes. It is also responsible for maiming and incapacitating many activities and productive lives. These have the consequences of low productivity and poverty among other negative effects. Three major causes of roads traffic crashes, namely: Human factors, Mechanical factors and Environmental factors, Out of the 3 major factors that causes road traffic crashes, human factors constitute about 90% of the causes of road traffic accidents recorded in the country. This includes over speeding, overconfidence, lack of concentration, dangerous overtaking at bends, crest of a hill, driving under the influence of alcohol/drugs, the use of mobile phone while driving, and nonchalant attitude among others (FRSC 2008).
Yakasai, (1998) in Gana & Emmanuel, (2014) divulge that improper driving habits, poor mental and physical condition of the driver are directly or indirectly causes of most accidents. He also sees ignorance and disregard for traffic regulations as well as lack of consideration for other road users as causes of accidents. He identifies lack of knowledge and attention to the vehicle behavior as causes. Agbeboh and Osarumwense (2013) assert that training will help driver to cultivate the ability to make decision in traffic which is both quick and accurate. A decision may be worse than useless if it is unduly delayed. To entail large margins of safety on the road, a driver should see other drivers as fools and he/she is the only sensible driver on the road since there is no way of knowing who is a foolish driver.

A good control of the vehicles on the road depends very much on the behaviors (which is very complex) and skill of the driver (Odero, 1995). Driving is a complex system in which a large number of variables are interacting with each other but also with varying degree of dependence. Accident may be due to judgment errors, ignorance, incompetence, rule violation, lapses or carelessness, all of which are human errors. The human factor contributes to the majority of road traffic accidents (Odero (1995; Royal Society for the Prevention of

Accidents, 2001; 2017). The rate of road traffic accidents in Kaduna State is very high and alarming as reported by Federal Road Safety Corps [FRSC] (2015) in Yahaya et al, (2021) that Kaduna State had the highest road traffic accident in Nigeria and Nigeria had the highest in Africa. Aside the current insecurity bedeviling the country, accidents are currently by far the main cause of violent death in Nigeria (Ukoji, 2014). Hence, this paper investigated the causes and trend of road traffic accident in Urban Zaria being the second largest and growing city in Kaduna state with the aim of providing recommendations to the concerned stakeholders towards safer roads.

2   METHODS AND METHODOLOGY

Road traffic crashes are believed to have varying causes. Hence, the ultimate aim of all road traffic research and intervention is, to some extent, identify and reduce these causes as much as possible. These causes may be complex in nature and are often perceived to be impacted by science and politics (Elvik and Vaa, 2004). Though no single theory or models has gained universal acceptance among the traffic research community, they nonetheless have shape our understanding of the road crashes problem in significant ways. This research has adopted the system theory also known as the systems approach; Dekker, 2002). It is the most predominant framework employed in safety research in recent decades. The system theory which is based on man-environment adjustments (Muhlrad and Lassarre, 2005), and the components of the theory are the environment, the means of transport (Vehicles) and the behavior of man (Krug, 2002) (Sharma, 2002). The environment component comprises of the natural and built environments and transport networks. The means of transport component comprises of the volume and quality of vehicles on the modes of transport. The behavior of man component comprises of demographic characteristic of road users (age, sex, education, socio-economic status, stage in life cycle), people's perceptions of risk and people's general behavior on the streets. Integrated in the system theory is a system of highway codes and enforcement mechanisms designed to ensure that road users adhere to the controls and regulations of traffic flow for maintaining road traffic safety.

2.1 Effects of road transport crashes on the society

Families also suffer from the involvement of family members in road traffic crashes. They are considered 'hidden' victims of road traffic crashes, and need care and support just like other road traffic crashes victims or survivors. Families can be affected psychologically and socially. High levels of anxiety, depression, irritability and mood disturbances are the most common psychological symptoms among victims' relatives. This is related to the shock of losing their close relatives or loved ones.

One of the most serious effects of road traffic accidents worldwide is physical injuries. Death is considered the major consequence of physical injury. According to the WHO, "Deaths from road traffic injuries account for around 25% of all deaths from injury". This data shows that a full quarter of fatal cases are related to road traffic crashes, death is the end of human function and production, after that, physical disability varies in harshness. Families can experience several interpersonal difficulties such as family friction or poor tolerance (WHO, 2002)

A study suggests that the reason for this is related to the sudden change in family life which can threaten living or working conditions that there is a significant difference between the way nuclear families and extended families deal with these situations. Overall, a family's

ability to cope varies from culture to culture and every community has different family behaviors and interaction strategies (Adamu, 2013).

The consequential effect of the negative externalities of transport is accident with its attendant injuries and fatalities capable of neutralizing its social and economic benefits if not well managed. The effects of injuries sustained from Road Traffic Crashes (Road Traffic Crashes) go beyond fatalities alone; after all, not every injury results in death. Both temporary and permanent disability can have equally significant consequences on individuals, families, and their communities, loss of income due to disability can extend beyond the victim when family members have to leave work to stay at home and provide care for the victim, as well as subsequent losses in productivity within the local work force. Injuries can also have significant financial impacts on the local health care system (Masahiro, Mikio and Oguri 2008).

2.2 The study area

The study area is Zaria Urban Area comprised of Sabon Gari and Zaria Local Government Areas. Located between Latitudes $10^0 58^1$ and $11^0 12^1$ north of the Equator and Longitudes $7^0 39^1$ and $7^0 49^1$ East of the Greenwich Meridian. Zaria Urban Area is nodal settlement located along Kaduna Kano expressway, and Funtua-Jos major road. The area is surrounded by settlements like Shika, Giwa, Hunkuyi Makarfi, Soba, Pambegua and Saminaka who serve as immediate source of food and other vegetal resources for the area (Mortimore, 1970 and Ogbaji, 2006). The area exhibits tropical continental climate with distinct wet (rainy) season from April to October and cool dry (Harmattan) season from November to March which characterized by low temperature windy and dusty weather controlled by the movement of the Inter Tropical Discontinuity (ITD). The population of the study area according to 2006 population census was 801,498, predominantly composed of Hausa/Fulani who engaged in various economic activities such as trading, farming and other administrative activities.
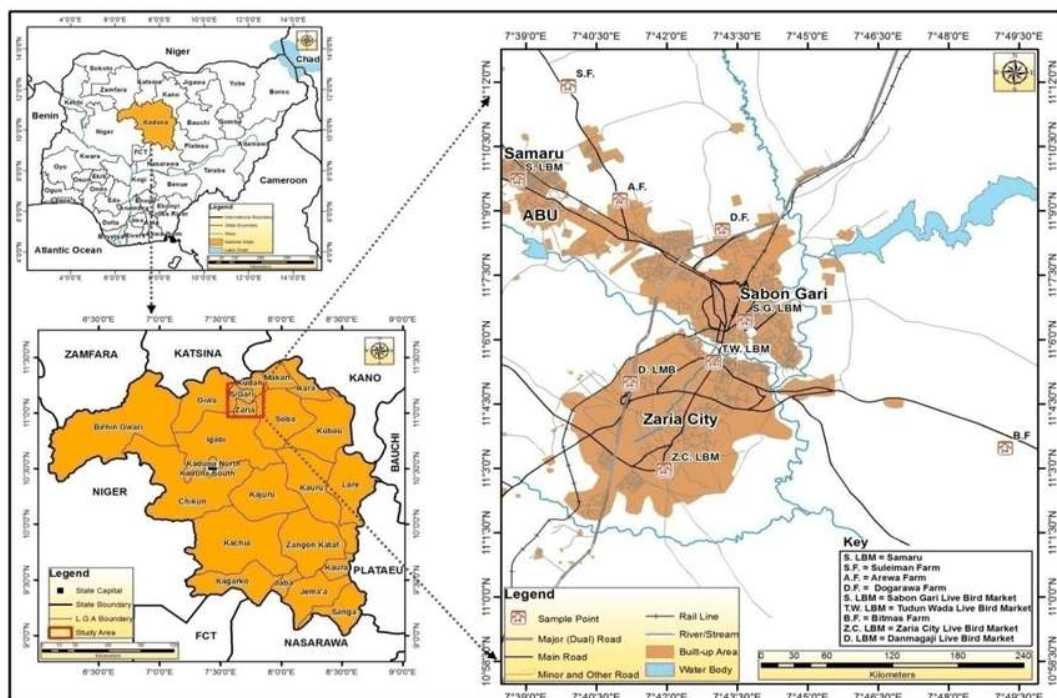

Fig.1 *The study area – Adapted and midfied map of Zaria Urban Area*
Source: (Olajide A. O., 2017)

Other minority tribes include Yoruba, Igbo, Tivs, Idoma, Igala, Ibira and Nupe and foreigners from America, Europe, India, Lebanon, Pakistan, Sudan, Niger and many other Africans (NPC, 2016).

2.3 Sample Size and Sampling Technique

The data for this work was source through both primary and secondary source. Primary data was collected through administration of structured questionnaire and interview guide from the sample respondents of drivers and passengers, Focus Group Discussion (FGD) with the FRSC, KASTELEA, and NURTW. The secondary source data include recorded number of death, injured and number of cases obtained from the Federal Road Safety Corps (FRSC) and Text books, journals, researches conducted in the area and relevant document from libraries and internet. Random Sampling technique was adopted in data collection for this study. The data obtained was analyzed using descriptive statistics and time series analysis was used in analyzing the trend of accidents in the study area from 2011 to 2020, while the qualitative data was analyzed using content analysis technique. The Time Series Analysis is a **specific way of analyzing a sequence of data points collected over an interval of time**. It one of the main objectives of statistics is to forecast the future levels of economic activities by studying the behavior of the data in the past. The most important techniques of making references about the future on the basis of what has happened in the past is the analysis of time series.

The additive model in time series was used which is generally accepted as good approximations to the time relationship among the components of the observed data (Muritala Raji and Udokang, 2015). Additive model assumes that the value of composite series is the sum of the four components, that is:

$$Y_t = Tt + St + C_t + I \qquad (1)$$

where:
Y_t *- original,*
T_t *- values of secular trend,*
St *- value of seasonal component,*
C_t *- value of irregular component,*
I *- value of irregular component.*

3   RESULTS AND DISCUSSION

Table 1 shows that the highest numbers of respondents of drivers (74%) were male; this should not be unconnected to the fact that Zaria Urban Area is part of the northern Islamic culture where almost all outdoor activities such as commercial driving, socio economics activities are carryout by male. Culture and religion play significant role in determining who do what and why in the northern Nigeria. For instance, no woman would want to participate in commercial driving which is considered to be a menial job. Even the 26%, whom were females, were private drivers, not commercial drivers.

The age structure of the respondents indicated a serious problem that underage (<18yrs) and elderly (>60yrs) is large, amounting 31% put together. This significant number has the following implications. Firstly, older drivers present a unique challenge to the transportation field. Older drivers may experience a decline in physical and mental facilities that cause unsafe driving behaviors leading to increased likelihood of injury and higher crash causing

propensity (Stamatiadis, 2016). This is in line with study of Bekibele et al, (2007) that the rate of RTA increased with increasing age which may be related to increasing visual impairment with old age. Secondly, underage drivers are more likely than older drivers to speed, run red lights, make illegal turns, ride with an intoxicated driver, and drive after using alcohol or drugs. It was found that underage drivers are four times more likely than older drivers to crash (ArriveAlive, nd.).

Tab. 1: *Socio Economics Characteristics of Respondents in Zaria Urban Area*

Table 1. Socio Economics Characteristics of the Respondents in Zaria Urban Area

Sex		Frequency	Percentage
	Male	261	74
	Female	91	26
		352	100
Age			
	Below – 18	29	8
	18 – 29	48	14
	30 – 39	85	24
	40 – 49	55	16
	50 – 59	53	15
	60 – 69	50	14
	above 69	32	9
		352	100
Level of Education			
	No Formal School	39	11
	Primary	152	43
	Secondary	95	27
	Tertiary	66	19
		352	100
Ownership of Driver's License			
	Yes	183	52
	No	169	48
	Total	352	100
Driving School Attendance			
	Yes	155	44
	No	197	56
	Total	352	100
Drivers' Status			
	Private	147	42
	Commercial	205	58
	Total	352	100

Field Survey (2021)

The educational background of the respondents indicated that more than 43% of them had no more than primary education, out of which 11% of them had no formal education. A substantial number of drivers with no formal education are found mostly in commercial drivers. This may has implications for traffic safety in the study area. It means that many of them may not be able to interpret road signs correctly thereby increasing Road Traffic Crashes on the roads.

Similarly, a significant number of the respondents (48%) do not have valid driver's license. Even the 52% that alleged having a valid driver's license, only 44% claimed to have

attended driving school. This is having serious implication on the safety of our roads because many drivers do not have the basic requirements for driving yet they ply our roads. Once one is able to buy a car, especially with the advent of automatic car, would just start using the highways. For the commercial drivers (more common to bus drivers), most at time the drivers do allow their assistants (conductors), who are usually underage and undertrained, to be driving the bus.

3.1 Trend of RTA in Zaria Urban Area

The data obtained from the Federal Road Safety Corps (FRSC) from 2011 to 2020 on road traffic accidents was presented in Fig.2. For this period of ten years, Zaria has been consistently been ranked as having the highest incidents of road traffic accidents within the state. This might not be unconnected to the unprecedented increase in population, second to the capital city of the state, coupled with factors discussed earlier from Table 1. The trend of the RTA is fluctuation from 2011 to 2020. There was sudden drop in the rate of RTA in 2015, this coincide with the period that the Kaduna State Government established Traffic and Environmental Law Enforcement Agency (KASTELEA), which is charged with the responsibility of directing, controlling and decongesting traffic on public roads and highways in township in the state (Kaduna State Traffic and Environmental Law Enforcement Agency, 2014), at the same time the commercial motor cycle operation (which according to Fig 2, account for 39% of all the accidents in the study area) was banned in the second quarter in 2014 (NewsRescue, 2014). This is in line with the study of Oluwafunbi, (2021) that ranked Motorcycles are the third most common vehicle type involved in RTC in Nigeria. These two government policies could be part of the reasons that contributed to the drastic fall in the rate of RTA in the study area.
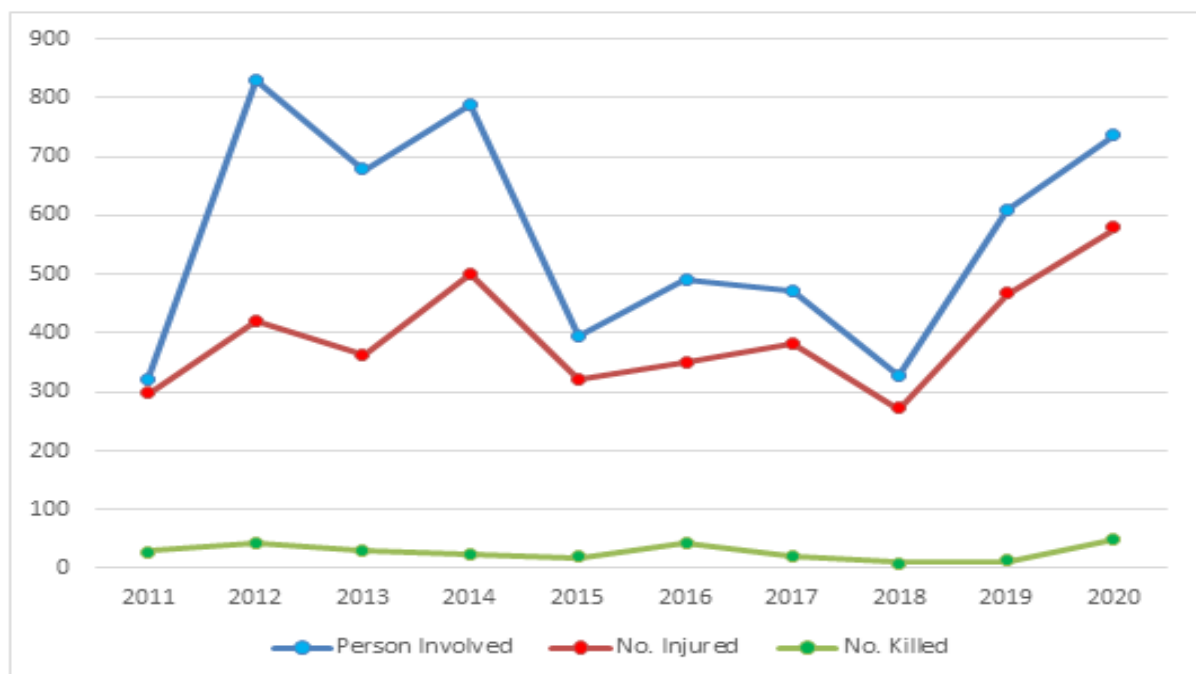

Fig.2 *Categories of Vehicles involved in Road Traffic Crashes in Zaria in 2020*
Source: (Federal Road Safety Corps, 2021)

3 CONCLUSION

Transportation is a process that involves movement of commuters, good and services from a given point of origin to specific destination. Transportation is an essential part of human activity and in many ways and from the basis of all socio-economic interactions of human being in the course of his daily activities and it is difficult to conceive a situation where transportation does not play significant role in the life of any individual.

Driver behavior can be influenced by so many factors which include age, education, experience among others. However, the results of this study have indicated that people are abiding by the rules and regulations governing road traffic safety. Unless and until the public is educated on the importance of obeying traffic laws for the safety of all road users, the menace would hardly be curtail. Therefore, so much is expected from the various stakeholders in ensuring the safety of the public.

The following recommendations were made:

1. Public enlightenment in form of seminars, workshops, public lectures should be organized for general public and commercial drivers on importance of obtaining driver license in an recognized institutions and obeying traffic rules and regulations. The process of attending drivers training and obtaining license for drivers should be made easy and accessible by the common man

2. Transport infrastructures such as motor parks/parking spaces, roads should be constructed to avert the loading and offloading of passengers and street hawking by the construction of mini markets.

3. Government at various levels should encourage and support the road traffic law enforcement agencies such as FRSC, KASTLEA and alike, with all the logistics and training to be able enforce the road safety laws to reduce road traffic accidents to the barest minimal level.

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