Assessment of Pattern of Road Traffic Crashes among the Nigerian States and Federal Capital Territory (Abuja)

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ABSTRACT

Mobility between one location and another is characterized not only by efficiency and convenience as well as safety within space and time but also severe externalities of pollution, congestion, and crashes. The crash aspect is the focus of the study as it examined the pattern of crashes among the 36 States in Nigeria and Federal Capitol Territory (FCT with the specific)objectives of identifying road traffic causative factors, vehicles involvement, variation in the severities, and difference in recorded death and injured casualty.

The descriptive tools of mean, standard deviation, frequency, percentage, and tables were used in data presentation and inferential statistical tools of Pearson Product Moment Correlation was used to determine the relationship between pairs of road traffic crash factors, Analysis of Variance for the variation in the severities of crashes and Student T test for the difference in recorded death and injured person in the States and FCT.

The findings of the study revealed that there are a total of 11,151 road traffic crashes recorded caused by various factors in where speed violation (SPV) is the most common crash factor with 5342 (47.91%) cases while usage of phone while driving (UPD) is the least with 42 (0.38%) cases. There seems to be a strong positive, moderately positive, weak positive, and weak negative relationship between pairs of factors, and no relationship in some instance. The study therefore recommended that government at various tiers should intensify efforts in promulgating local laws and also keep abreast with the international laws relating to driving hour standard limits, fixing of speed limit devices on vehicles, task traffic law enforcement agent at all levels in discharging their duty accordingly.

(Keywords: traffic accidents, crash factors, crash injuries, traffic deaths, Nigerian states, Federal Capitol Territory, FCT).

INTRODUCTION

Transport is the movement of people, goods, information, and ideas from one point of origin to another point of destination by a mechanical means or others which cut across land (roads and rail), water (inland waterways and maritime) as well as air. According to Munby (1968), there is no escape from transport and Owen (1968) asserted that immobility perpetuate poverty.

Transportation is unquestionably one of the most important industries in the world as it creates place and time utility. When goods are moved to places where they have higher value than where they originated, they have place utility; while time utility means that this service occurs when it is needed. Time and place utility are provided to passengers when they are moved from where they don't want to be to places where they want to be and at the demanded time (John, Edward, and Robert, 1994).

Transport industries fulfill one of the most important functions and are one of the most pervasive activities in any society or economy (Hoyle, *et al*., 2000). However, the role played by transport and its importance in social integration of society and the economic development of a nation have been seen to overwhelm its merits. Negative aspects of transportation include air and water pollution, noise pollution, as well as traffic crashes. Road traffic accidents are an

unexpected phenomenon that occur as a result of the operation of vehicles including bicycles and handcarts on the public highways and roads. These may be fatal, resulting in deaths of the road users (passengers, drivers, or pedestrians), or minor when it is not severe enough as to cause substantial hardship.

WHO (2013), observed that road traffic crashes occur worldwide but the incidence is higher in developing countries and it observed that about 1.24 million people die each year as a result of road traffic crashes and road traffic injuries are the leading cause of death among young people, aged 15–29 years. 91% of the world's fatalities on the roads occur in low-income and middle-income countries, even though these countries have approximately half of the world's vehicles while half of those dying on the world's roads are "vulnerable road users": pedestrians, cyclists, and motorcyclists.

Without action, road traffic crashes are predicted to result in the deaths of around 1.9 million people annually by 2020. Only 28 countries, representing 416 million people (7% of the world's population) have adequate laws that address all five risk factors (speed, drink-driving, helmets, seat-belts, and child restraints).

Road traffic crashes have been recognized as the most deleterious and noxious negative extremity associated with the operation of transport despite its undisputed role on the effective functioning of modern societies (Gbadamosi, 2003; Ogunsanya, 2004). Sheriff, (2009) opined that hardly a day goes by, in Nigeria that road traffic crashes will not surface leading to increased incidences of morbidity and mortality rates as well as financial cost to both society and the individuals involved. Information on some of these traffic crashes gets to the newsrooms of media houses and are aired while a majority go unreported. Nigeria has the highest road crash rate as well as the largest number of deaths per 10,000 vehicles. One may be tempted to believe that the level of awareness on the causes of road traffic crashes is very low among Nigerians while Nigerian roads have become killing fields without protection for their users (Eze, 2012).

The integrated efforts towards reducing the menace of road traffic crashes, Nigeria still remains one of the worst hit countries despite her low vehicular population of over 7.6 million and total road length of about 194,000 kilometres (comprising 34,120 km of federal, 30,500 km of state, and 129,580 km of local roads). The country has suffered severe losses to fatal car crashes and four road crashes deaths in Africa occurs in Nigeria and the WHO survey and FRSC report of 5,693 fatal road crashes in 2009 leave no doubt about the dangerous situation on Nigerian roads (WHO, 2013). The importance of this study is to examine and evaluate the submission and observations of the existing and current literature on road traffic crashes and analyzed the causative factors of road traffic crashes in term of human, environmental and mechanical within the 36 states of the country and federal capital territory (Abuja).

LITERATURE REVIEW

Literature review on road traffic crashes has received adequate and diverse attention among scholars, some of whom include Giummarra, Beck, and Gabbe (2021) who based their studies on classification of road traffic injury collision characteristics using text mining analysis in Victoria, Australia and it was discovered that people with intentional injury, serious head injury, no compensation claim/missing injury event description, or who died ≤ 12-months post-injury were excluded, resulting in a sample of 2,486. Crashes in which no other was at fault included circumstances involving lost control or avoiding a hazard, mechanical failure, or medical conditions while collisions in which another was predominantly at fault occurred at intersections with another vehicle entering from an adjacent direction, and head-on collisions. More importantly, crashes with common unknown fault included multi-vehicle collisions, pedal cyclists injured in rear-end collisions, and pedestrians hit while crossing the road or navigating slow traffic areas.

Hangoma and Moonga-Mukale (2021) evaluated the impact of night travel bans on road traffic crashes and fatalities in Zambia and they concluded that night travel bans were associated with a reduction in the level of road traffic crashes (RTCs) by 4131.3 (annual average RTCs before the policy = 17 668) and a reduction in the annual trend in RTCs by 2485.5, these thus show effect of 0.01 significant level and they amount to an overall reduction in RTCs by 24%. It was equally claimed that the night ban policy was reflected a 57.5% reduction in road traffic fatalities (RTFs) with a reduction in trend with 477.5 (Annual

average RTFs before the policy = 1124.7) and significant at below 0.01 alpha level.

Muthusamy, Rajendran, Ramesh, and Sivaprakash (2015) opined from literature that road traffic crashes occurrences are the effect of multiple human, vehicle and environmental elements often interacting in a complicated manner to generate the initiation of the event but not just human error or driver negligence and there is need for urgent attention to reduce the health, social, and economic impacts of road traffic crashes.

Yasin, Michal, and Fikri (2021) examined the impact of global COVID-19 pandemic on road traffic crashes and it was claimed that traffic volume dropped significantly during the COVID-19 pandemic and with adequate reduction in road traffic crashes globally and consequently in reduction of road deaths in 32 out of 36 countries in April 2020 compared with April 2019, with a decrease of 50% or more in 12 countries, 25 to 49% in 14 countries, and by less than 25% in six countries. It was further indicated that there was a decrease in annual road deaths in 33 out of 42 countries in 2020 compared with 2019, with a reduction of 25% or more in 5 countries, 15–24% in 13 countries, and by less than 15% in 15 countries while there was increase in 4 and 9 countries during the periods, respectively. More importantly, there was also a reduction in the number of injured persons in trauma centers related to road traffic crashes during both periods which was associated to an increase in speeding, emptier traffic lanes, reduced law enforcement, non-adherence to seat belts usage, and alcohol and drug abuse.

The first ten years of the 21st century saw record numbers of road safety performance in most countries of the International Transport Forum (ITF) and based on three consecutive years of record improvements in 2008, 2009, and 2010, the number of people killed in road accidents continued to fall in 2014 recording a drop of 1.2% in OECD countries (excluding Chile and Israel). However, in 2014 one third of ITF countries reported an increase in road fatalities when compared to 2013, Russia (10.9%), the United Kingdom (4.7%), France (3.5%), and Germany (1.1%). Countries used to good road safety performance might report an increase in road fatalities; this could be explained by the difficulty in improving further an already good level of safety performance. These overall positive developments should not hide the economic costs and human tragedies behind the data.

While high-income countries look back on a record decade in reducing road fatalities, 90% of global road deaths occur in low- and middle-income countries and estimates put annual world road fatalities above 1.3 million, with 50 million serious injuries (OECD, 2016).

Kidane (2021) modeled Road Traffic Crashes (RTC) in the Amhara Region using time-series analysis of Auto-regressive Integrated Moving Averages (ARIMA) and deduced that the average number RTC injured person, RTC fatal cases, and RTC total were 27.2, 14, and 78.2 per month, respectively. It was further observed that a relatively large number of RTC's are reported on Tuesday, Thursday, and Saturday relative to other days of the week while the information collected equally revealed that more than 60% of crashes involve drivers between the ages of 18–30 years. ARIMA (2,0,0) (1,0,0) ARIMA (2,0,0) and ARIMA (2,0,0) (1,1,0) were fitted as the best model for total RTC injured persons, RTC fatal cases and total RTC data, respectively. He consequently shows that road traffic crash cases would continue at the non-decreasing rate in the Amhara region for the predicted periods based on a 48-month forecast fitted models.

Aderson (1999) in his study of causes of road traffic crash was of the opinion that many young men take to commercial passenger vehicle driving as a last resort. The conditions under which they work are also challenging and sometimes practically unimaginable. It is in light of this that, driver behavior comes into question. Driver behavior that causes road crashes is dangerous overtaking usually involves speeding, and of course driving in the lane of oncoming cars, both activities found to increase crashes risk.

Adewale (2012) reflected his view of crash causation as over speeding which suggested as an important factor in one third of all fatal crashes on our roads. Over speeding has been researched to a deliberate and calculated behavior where the driver knows the risk but ignores the danger that might be involved. Some drivers have been used to the habit of over speeding due to effect of taking alcohol, drugs, and other prohibited substances. Over speeding has contributed to major fatal road crashes in developing countries as most of the roads are

bad and unmarked or signed which also applicable in Oyo State. The Road Safety Authority (RSA) of Nigeria asserts speeding travelling too fast for the prevailing conditions or above the posted speed limit is a factor in about 40% of road deaths (NSW Roads and Traffic Authority, 2008).

Driver distractions has been seen as the leading causes of most auto crashes and has also been identified as an emerging road safety issue in Towards Zero Western Australian's road safety for 2008-2020 (Road Safety Council, 2009). It is also being increasingly ranked by road safety authorities around the world as significant contributing factors to road traffic crashes (Kristle, Young & Regan, 2009). There are four type of driver distraction: physical, visual, auditory, and cognitive distraction (Kristle, Young and Regan, 2009). A distracting activity involves one or more of these. The act of operating a hand-held mobile phone, for example, may involve all four types of distraction; (dialing) visual distraction; (looking at the display); auditory distraction (holding of conversation with the other person); and cognitive distraction.

Bad overtaking/passing has been ranked the most annoying driver behavior by American Association members, so there is a clear used for more driver education on how to use passing lanes and overtake correctly. American Associations ranked bad overtaking, slow drivers and tailgating as the three most annoying driver behaviors in March 2006 survey. Dangerous overtaking is thought to increase crash risk (Mohit, Dhananjay, Ashutosh, Salyl, and Aditya, 2018). It is, however, difficult to estimate how large the increase in risk on dangerous overtaking will give. In-depth road traffic crash studies carried out by Swedish, Israeli, and UK police force have estimated that dangerous overtaking is the most probable cause of 2-5% of all traffic crashes investigated by the police (Anderson, 1999).

Samuel and Amini (2021), were of the opinion that, Nigeria losses $6.2 billion yearly to road crashes. The amount translates to about twelve per cent of Gross Domestic Product and about seventeen per cent of the current foreign reserve. He also lamented that many of the people who died as a result of road crashes were men in their active years between 25 years and 45 years. "There are a lot of social problems arising from road crashes including economic and health issues. The number of people in hospital having broken legs and arms from road crashes are major losses in our society".

Atubi, (2009) observed that Nigeria road traffic crash situation over the last three decades has been particularly disturbing. In 1976, there were 53,897 road traffic crashes resulting in 7,717 deaths while in 1981, the magnitude reduced to 5,114 crashes, but the fatality increased to 10,236 which mean that there was an average of 96 crashes and situation in subsequent years has not been any better. The number of people killed in road crashes between 1990 and 2005 rose from 28,253 and the fatality rate remains consistently high. More importantly, the analysis of the number and type of vehicles involved in road traffic crashes revealed that private cars, buses and taxis were more prone to crashes in Lagos State and also that more than 90% of road traffic crash in Lagos State could be attributed to recklessness on the part of drivers, ignorance of highway codes, over speeding etc. (Atubi, 2010).

METHODOLOGY, RESULTS, AND DISCUSSION

Hypothesis One of the Study

The hypothesis one of the study states that *there is no significant correlation between factors that causes road traffic crashes in Nigerian States and FCT.* The output Table 1 provides Pearson Product Moment Correlations between each pair of factors and associated significance tests. The road traffic crash factors are as follow: Speed Violation **(SPV)**, Use of Phone While Driving **(UPD)** Tyre Burst **(TBT)**, Mechanically Deficient Vehicle **(MDV)**, Brake Failure **(BFL)**, Overloading **(OVL)**, Dangerous Overtaking **(DOT)**, Wrongful Overtaking **(WOT)**, Dangerous Driving **(DGD)**, Bad Road **(BRD)**, Route Violation **(RTV)**, Road Obstruction Violation **(OBS)**, Sleeping on Steering **(SOS)**, Driving Under Alcohol/Drug Influence **(DAD)**, Poor Weather **(PWR)**, Fatigue **(FTQ)**, Sign Light Violation **(SLV)** and Others **(OTS)**. The correlations among the road traffic crash factor variables discovered that there is strong positive relationship between pair of factors, some are moderately positive correlated while some others are weak positive relationship. More importantly, there is some pair of road traffic crash factors which have strong negative, moderate negative and weak negative relationship.

Table 1: Pearson Product Moment Correlation of Pair of Crash Factors.

	SPV	UPD	TBT	MDV	BEL	OVL	DOT	WOT	DGD	BRD	RTV	OBS	SOS	DAD	PWR	FTQ	SLV	OTS
SPV	1	.399*	.753**	.680**	.477**	0.238	0.284	.636**	.704**	.626**	.778**	.656**	-0.048	.514**	.522**	.782**	0.223	0.313
		0.014	0	0	0.003	0.156	0.088	0	0	0	0	0	0.779	0.001	0.001	0	0.184	0.059
UPD	.399*	1	.695**	.331*	0.054	0.282	0.148	.554**	.341*	.386*	0.175	0.24	-0.045	0.02	0.023	0.229	0.13	-0.038
	0.014		0	0.045	0.75	0.091	0.382	0	0.039	0.018	0.302	0.153	0.792	0.908	0.894	0.174	0.444	0.822
TBT	.753**	.695**	1	.547**	0.242	.388*	0.226	.755**	.670**	.630**	.514**	.605**	0.082	0.229	.340*	.620**	0.269	0.13
	0	0		0	0.149	0.018	0.179	0	0	0	0.001	0	0.631	0.174	0.04	0	0.108	0.444
MDV	.680**	.331*	.547**	1	.807**	0.245	.409*	.650**	.639**	.675**	.654**	.367*	-0.037	.728**	0.273	.390*	0.039	0.325
	0	0.045	0		0	0.144	0.012	0	0	0	0	0.026	0.829	0	0.103	0.017	0.82	0.05
BEL	.477**	0.054	0.242	.807**	1	0.022	0.117	.381*	.452**	.538**	.541**	0.216	-0.042	.665**	0.276	0.227	-0.023	0.251
	0.003	0.75	0.149	0		0.897	0.49	0.02	0.005	0.001	0.001	0.2	0.805	0	0.098	0.176	0.891	0.134
OVL	0.238	0.282	.388*	0.245	0.022	1	.396*	0.297	0.125	0.223	0.315	.382*	-0.229	0.211	-0.015	0.006	-0.013	0.231
	0.156	0.091	0.018	0.144	0.897		0.015	0.074	0.461	0.185	0.058	0.019	0.172	0.211	0.929	0.971	0.939	0.169
DOT	0.284	0.148	0.226	.409*	0.117	.396*	1	.399*	0.205	.398*	0.319	0.089	0.002	.434**	0	0.054	-0.039	.472**
	0.088	0.382	0.179	0.012	0.49	0.015		0.014	0.224	0.015	0.054	0.602	0.991	0.007	0.998	0.752	0.82	0.003
	.636**	.554**	.755**	.650**	.381*	0.297	.399*	1	.608**	.533**	.492**	.384*	0.081	.415*	0.309	0.284	0.234	0.226
	0	0	0	0	0.02	0.074	0.014		0	0.001	0.002	0.019	0.635	0.011	0.063	0.089	0.163	0.179
DGD	.704**	.341*	.670**	.639**	.452**	0.125	0.205	.608**	1	.643**	.615**	.451**	0.185	.448**	.479**	.623**	.335*	0.262
	0	0.039	0	0	0.005	0.461	0.224	0		0	0	0.005	0.273	0.005	0.003	0	0.043	0.118
BRD	.626**	.386*	.630**	.675**	.538**	0.223	.398*	.533**	.643**	1	.574**	.411*	0.097	.474**	.413*	.491**	0.122	0.267
	0	0.018	0	0	0.001	0.185	0.015	0.001	0		0	0.012	0.567	0.003	0.011	0.002	0.471	0.11
RTV	.778**	0.175	.514**	.654**	.541**	0.315	0.319	.492**	.615**	.574**	1	.574**	-0.017	.492**	.464**	.706**	0.229	.337*
	0	0.302	0.001	0	0.001	0.058	0.054	0.002	0	0		0	0.92	0.002	0.004	0	0.173	0.042
OBS	.656**	0.24	.605**	.367*	0.216	.382*	0.089	.384*	.451**	.411*	.574**	1	-0.008	0.223	.391*	.615**	0.221	0.123
	0	0.153	0	0.026	0.2	0.019	0.602	0.019	0.005	0.012	0		0.962	0.185	0.017	0	0.188	0.467
SOS	-0.048	-0.045	0.082	-0.037	-0.042	-0.229	0.002	0.081	0.185	0.097	-0.017	-0.008	1	-0.112	0.01	0.033	-0.105	-0.176
	0.779	0.792	0.631	0.829	0.805	0.172	0.991	0.635	0.273	0.567	0.92	0.962		0.508	0.953	0.844	0.535	0.298
DAD	.514**	0.02	0.229	.728**	.665**	0.211	.434**	.415*	.448**	.474**	.492**	0.223	-0.112	1	0.177	0.227	-0.003	.700**
	0.001	0.908	0.174	0	0	0.211	0.007	0.011	0.005	0.003	0.002	0.185	0.508		0.294	0.177	0.986	0
PWR	.522**	0.023	.340*	0.273	0.276	-0.015	0	0.309	.479**	.413*	.464**	.391*	0.01	0.177	1	.580**	-0.005	0.012
	0.001	0.894	0.04	0.103	0.098	0.929	0.998	0.063	0.003	0.011	0.004	0.017	0.953	0.294		0	0.976	0.945
FTQ	.782**	0.229	.620**	.390*	0.227	0.006	0.054	0.284	.623**	.491**	.706**	.615**	0.033	0.227	.580**	1	0.278	0.209
	0	0.174	0	0.017	0.176	0.971	0.752	0.089	0	0.002	0	0	0.844	0.177	0		0.095	0.215
SLV	0.223	0.13	0.269	0.039	-0.023	-0.013	-0.039	0.234	.335*	0.122	0.229	0.221	-0.105	-0.003	-0.005	0.278	1	0.156
	0.184	0.444	0.108	0.82	0.891	0.939	0.82	0.163	0.043	0.471	0.173	0.188	0.535	0.986	0.976	0.095		0.358
OTS	0.313	-0.038	0.13	0.325	0.251	0.231	.472**	0.226	0.262	0.267	.337*	0.123	-0.176	.700**	0.012	0.209	0.156	1
	0.059	0.822	0.444	0.05	0.134	0.169	0.003	0.179	0.118	0.11	0.042	0.467	0.298	0	0.945	0.215	0.358	

The study therefore observed that there are strong positive relationships between the following pairs of crash factors:

SPV and TBT - (r = 0.753, p< 0.05);
SPV and MDV - (r = 0.68, p< 0.05);
SPV and WOT - (r = 0.636, p< 0.05);
SPV and BRD - (r = 0.626, p< 0.05);
SPV and RTV - (r = 0.778, p< 0.05);
SPV and OBS - (r = 0.656, p< 0.05);
SPV and DGD - (r = 0.704, p< 0.05);
SPV and FTQ - (r = 0.782, p< 0.05);
UPD and TBT - (r = 0.695, p< 0.05);
TBT and WOT - (r = 0.755, p< 0.05);
TBT and DGD - (r = 0.670, p< 0.05);
TBT and BRD - (r = 0.630, p< 0.05);
TBT and OBS - (r = 0.605, p< 0.05);
TBT and FTQ - (r = 0.620, p< 0.05);
MDV and BEL - (r = 0.807, p< 0.05);
MDV and WOT - (r = 0.650, p< 0.05);
MDV and DGD - (r = 0.639, p< 0.05);
MDV and BRD - (r = 0.675, p< 0.05);
MDV and RTV - (r = 0.654, p< 0.05);
MDV and DAD - (r = 0.728, p< 0.05);
BEL and DAD - (r = 0.665, p< 0.05);
WOT and DGD - (r = 0.608, p< 0.05);
DGD and BRD - (r = 0.643, p< 0.05);
DGD and RTV - (r = 0.615, p< 0.05);
DGD and FTQ - (r = 0.623, p< 0.05);
RTV and FTQ - (r = 0.706, p< 0.05);
OBS and FTQ - (r = 0.615, p< 0.05);
and DAD and OTS - (r = 0.700, p< 0.05) as indicated in Table 1.

The study among other things equally showed that moderate positive relationship exists between the following pairs of crash factors with the following r and p-values some of which include:

SPV and DAD - (r = 0.514, p< 0.05);
SPV and PWR - (r = 0.522, p< 0.05);
UPD and WOT - (r = 0.554, p< 0.05);
TBT and MDV - (r = 0.547, p< 0.05);
TBT and RTV - (r = 0.514, p< 0.05);
BEL and BRD - (r = 0.538, p< 0.05);
BEL and RTV - (r = 0.541, p< 0.05);
WOT and BRD - (r = 0.533, p< 0.05);
BRD and RTV - (r = 0.574, p< 0.05);
RTV and OBS - (r = 0.574, p< 0.05);
and PWR and FTQ - (r = 0.580, p< 0.05) as shown in Table 1.

The weakly positive relationship between pairs of crashed factors as indicated in the Table 1 revealed that the following:

SPV and UPD - (r = 0.399, p< 0.05);
SPV and BEL - (r = 0.477, p< 0.05);
SPV and OVL - (r = 0.238, p< 0.05);
SPV and DOT - (r = 0.284, p< 0.05);
SPV and SLV - (r = 0.223, p< 0.05);
SPV and OTS - (r = 0.313, p< 0.05);
UPD and MDV - (r = 0.331, p< 0.05);
UPD and BEL - (r = 0.054, p> 0.05);
UPD and OVL - (r = 0.282, p< 0.05);
UPD and DGD - (r = 0.341, p< 0.05);
UPD and DOT - (r = 0.148, p> 0.05);
UPD and RTV - (r = 0.175, p> 0.05);
UPD and OBS - (r = 0.24, p> 0.05);
UPD and DAD - (r = 0.02, p> 0.05);
UPD and PWR - (r = 0.023, p> 0.05);
UPD and FTQ - (r = 0.229, p> 0.05);
UPD and SLV - (r = 0.13, p> 0.05);
TBT and BEL - (r = 0.242, p> 0.05);
TBT and OVL - (r = 0.388, p< 0.05);
TBT and DOT - (r = 0.226, p> 0.05);
TBT and SOS - (r = 0.082, p> 0.05);
TBT and PWR - (r = 0.340, p< 0.05);
TBT and SLV - (r = 0.269, p> 0.05);
and TBT and OTS - (r = 0.13, p> 0.05) as revealed in Table 1.

This weak correlation also includes:

MDV and OVL - (r = 0.245, p> 0.05);
MDV and DOT - (r = 0.409, p< 0.05);
MDV and OBS - (r = 0.367, p< 0.05);
MDV and PWR - (r = 0.273, p> 0.05);
MDV and FTQ - (r = 0.390, p< 0.05);
MDV and SLV - (r = 0.039, p> 0.05);
MDV and OTS - (r = 0.0325, p< 0.05);
BEL and OVL - (r = 0.022, p> 0.05);
BEL and DOT - (r = 0.117, p> 0.05);
BEL and WOT - (r = 0.381, p< 0.05);
BEL and DGD - (r = 0.452, p< 0.05);
BEL and OBS - (r = 0.216, p> 0.05);
BEL and PWR - (r = 0.276, p> 0.05);
BEL and FTQ - (r = 0.227, p> 0.05);
BEL and OTS - (r = 0.251, p> 0.05);
OVL and DOT - (r = 0.396, p< 0.05);
OVL and WOT - (r = 0.297, p> 0.05);
OVL and DGD - (r = 0.125, p> 0.05);
OVL and BRD - (r = 0.223, p> 0.05);
OVL and RTV - (r = 0.315, p> 0.05);
OVL and OBS - (r = 0.382, p< 0.05);
OVL and DAD - (r = 0.211, p> 0.05);
OVL and FTQ - (r = 0.006, p> 0.05);
OVL and OTS - (r = 0.231, p> 0.05);
DOT and WOT - (r = 0.399, p< 0.05);
DOT and DGD - (r = 0.205, p> 0.05);
DOT and BRD - (r = 0.398, p< 0.05);
DOT and RTV - (r = 0.319, p> 0.05);
DOT and OBS - (r = 0.089, p> 0.05);
DOT and SOS - (r = 0.002, p> 0.05);
DOT and DAD - (r = 0.434, p< 0.05);
DOT and FTQ - (r = 0.054, p> 0.05);
DOT and OTS - (r = 0.472, p< 0.05);
WOT and RTV - (r = 0.492, p< 0.05);
WOT and OBS - (r = 0.384, p< 0.05);
WOT and SOS - (r = 0.081, p> 0.05);
WOT and DAD - (r = 0.415, p< 0.05);
WOT and PWR - (r = 0.309, p> 0.05);
WOT and FTQ - (r = 0.284, p> 0.05);
WOT and SLV - (r = 0.234, p> 0.05);
and WOT and OTS - (r = 0.226, p> 0.05) as indicated in Table 1.

Hypothesis Two of the Study

The second hypothesis of the study implies that *there is no significant variation in the categories of crash severity among the Nigerian 36 States and Federal Capital Territory (FCT).* The mean and standard deviation of the fatality, serious and minor severities of the road traffic crashes were deduced from the Table 2; it was shown that serious case has the highest variation as the maximum number of cases are 767 and minimum of 13 cases during the year 2019 with an estimated mean of 186.7838 and standard deviation of 155.06524 when compared to other categories of crash in the nation.

More importantly, fatality severity has maximum of 276 cases and minimum of 5 cases across the state but with mean and standard deviation of 78.2703 and 57.68817 respectively while minor cases of crash has the least maximum and minimum of 236 and 1 cases accordingly and mean and standard deviation of 34.1892 and

51.94593 when compare to other categories as shown in Table 2.

The ANOVA result from the table 2 showed that F – Ratio is 22.765 which is significant as $p < 0.05$. Given that F – calculated value is 22.765, and F – table value at 0.05 level of significant is 3.07, then, F – calculated is greater than F – table value. It therefore implies that there is significant variation in the categories of crash severity among the Nigerian 36 States and Federal Capital Territory (FCT). Therefore, the null hypothesis is rejected, and alternative hypothesis accepted for the severity of crash in the country.

Hypothesis Three of the Study

The hypothesis three of the study state that *there is no significance difference in the number of death and injured casualty of the crashes occurred across the Nigerian States and FCT.* The mean difference, standard deviation, t-value and significant level of the individual Injury and Death casualty as well as their combined differences as shown in Table 3.

It was however, observed that injury casualty as the highest mean difference and standard deviation with ($\bar{x}$ = 972.46) and (SD = 738.50) while death casualty has mean difference and standard deviation of ($\bar{x}$ = 148.19) and (SD = 108.95). The respective T-values show that there is significant difference in the number of both Injury and Death recorded across the states and the FCT with the following values: {Injury – t-value = 8.010 p-value < 0.05 and Death – t-value = 8.273 p-value < 0.05.

The paired sample T-test equally showed that there is significant difference in the number of combined Injury and Death recorded across the states and the FCT as t-value = 7.868, p-value < 0.05 as shown in Table 3.

All these are significant at 0.05 confidence level, therefore we can accept alternative hypothesis and reject null hypothesis which implies that there is significance difference in the number of death and injured casualty of the crashes occurred across the Nigerian States and FCT.

Table 2: Mean, Std. Deviation, and ANOVA Result of Variations in Crash Severities of the Study Area.

Crash Type	N	Minimum	Maximum	Mean	Std. Deviation
Fatality Crash	37	5	276	78.2703	57.68817
Serious Crash	37	13	767	186.7838	155.06524
Minor Crash	37	1	236	34.1892	51.94593
Valid N (listwise)	37				

Groups	Sum of Squares	Df	Means Square	F	Sig
Between Groups	456375.694	2	228187.847	22.765	0.00
Within Groups	1082575.243	108	10023.845		
Total	1538950.937	110			

Table 3: One and Two Sample Student T-test Results on Difference in the Number of Injuries and Death Recorded across the State and FCT in 2019.

Casualty of Road Traffic Crash	T-value	Df	Sig. (2-tailed)	Mean Diff	S. Deviation
Injury	8.010	36	0.000	972.4595	738.50121
Death	8.273	36	0.000	148.1891950	108.95382
Pair (Injury & Death)	7.868	36	0.000	824.27027	637.26772

CONCLUSION

The empirical findings indicate that some factors are more threatening than the others while some states are more affected than the others, even at the geopolitical zone level. The study further concluded that:

i.) Speed violation as form of human error is the most threatening of all factors followed by wrong overtaking and dangerous overtaking.

ii.) There are mixed relationship between pair of causative factors some of which are strong positive relationship between pair of factors, moderately positive relationship, weak positive relationship, weak negative relationship as well as zero relationship.

iii.) Sedan vehicles both private and commercial dominated the types of vehicles involved in road traffic crashes, followed by motorcycles and various minibuses used for commercial purposes.

iv.) Federal Capital Territory (FCT), Kaduna and Ogun states were more affected than any other states in the country and North Central geopolitical zone is more affected with the crashes followed by Southwest geopolitical zone and Southeast geopolitical zone.

v.) The volume of serious crashes is on the high side which consequential resulted into already high fatality crash rate.

vi.) There is significant variation in the categories of crash severity among the Nigerian 36 states and FCT.

vii.) There are more injured persons than persons killed.

viii.) There is significant difference in the number of both injured and dead persons are all significant at 0.05 confidence level.

RECOMMENDATIONS

The provision and position of the literature relating to road traffic crash factors have contributed vehemently in the examination and investigation of the topic and equally proffer lasting solution. However, this study aims to contribute to the body of knowledge by recommending among other things that government at various tiers should intensify efforts in promulgating local laws and also keep abreast with the international laws in form of:

(i) Set a driving hour standard limit for both commercial and private vehicles in other to reduce crashes associated to human errors in terms of fatigue.

(ii) Fixing speed limit devices on vehicles to reduce and curb excessive speeding by road users.

(iii) Task traffic law enforcement agent at state and federal levels in discharging their duty accordingly and to the world standards.

(iv) Intensifying rescue efforts on our roads to reduce situation of serious casualties resulting in fatality casualties.

(v) Warning and campaign against driving on bad roads and during bad weather conditions.

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SUGGESTED CITATION

Olorode, K.P., M.E. Ogunbiyi, O.O. Elufisan, and A.O. Bello. 2023. “Assessment of Pattern of Road Traffic Crashes among the Nigerian States and Federal Capital Territory (Abuja)”. *Pacific Journal of Science and Technology*. 24(1): 49-57.