

Analysis of Road Traffic Accidents in Port Harcourt Rivers State, Nigeria

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ABSTRACT

This study is meant to analyse the rate of road traffic accidents in Port Harcourt, Rivers State, Nigeria. The study covers a period of fifteen years beginning from 2005 to 2019. Both primary and secondary sources of data were utilized. Data on road traffic crashes were collected from the Federal Road Safety Office, Port Harcourt. The results of the first and second hypotheses formulated show that the rate of road traffic casualties vary significantly between 2005 and 2019 and that there was no significant relationship between the extent of road traffic crashes and non-compliance of road traffic rules and regulations by motorists in the study area respectively. From the study, though non-compliance of road traffic rules and regulations by motorists was one of the factors contributing to road traffic accidents in the study area, statistically it was not significant. This shows that other factors combined together in the rate of accidents in Port Harcourt. The study also revealed that the rate of accident occurred more during the period commercial motorcycle operators were not banned. Based on the findings of the study, it was suggested that stringent measures and proper monitoring with effective enforcement be put in place by traffic regulatory agencies to curb accident rate in the city. Also, roads should be rehabilitated periodically since bad road condition also contributes to accident occurrence.

KEY WORDS: *Road traffic, Motorists, Accident, Traffic regulations, Port Harcourt, Transportation.*

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I. INTRODUCTION

The importance of transportation to human wellbeing and economic development cannot be over emphasized. The invention of automobile has increased the mobility of man all over the world (World Bank, 2013). In Nigeria and other countries, the industry is generally regarded as an engine room of development because of the crucial role it plays in linking all segments of the economy (FRSC, 2012). Despite the importance and contributions of road transportation to economic development and social well-being of man and society, its unregulated and improper use has adverse effects on man, the environment and the society it serves. The adverse impact of automobile traffic on human health can be categorised into three namely; air pollution, noise pollution and traffic accidents. An estimated 1.3 million people are killed through road accident annually around the world and as many as 50 million suffer from injuries (Murtala, Raji and Udokang, 2015). In some developing countries of the world like Nigeria, traffic crashes constitute the greatest problem that requires urgent attention. The issue has not received the attention it deserves likely due to the nation's state of under-development (Atubi, 2012).

However, the situation in Nigeria is worse than many nations of the world considering the number of road crashes which is obvious despite the good network of roads (Atubi, 2010). The fact remains that crash proportion in Nigeria is ranked ahead of other countries in Africa. The Federal Road Safety Commission Report (2008) shows that from the period of 1970 to 2005, Nigeria witnessed 726,383 road traffic crashes, killing up to 208,655 people with injuries amounting to 596,425. In the same vein, Lagos State alone witnessed up to 39,141 road traffic crashes in the period 2011 to 2015 killing 10,132 people while those injured were 18,972 (Atubi, 2017). He added that every progressive year within the study period witnessed an increment in accidents, deaths, and injuries. This therefore shows that the Nigeria accidents' rate and occurrences tend to show that better roads result in more casualties and more proportion in the intensity and number of deaths due to driver's non-compliance to road traffic rules (Onakomaiya, 2000; Gbadamosi, 2004; Filani and Gbadamosi, 2007).

The rate of road accident situation in Port Harcourt urban roads is almost similar to other parts of the country. Report of the Federal Office of Statistics (2016), shows that Port Harcourt has a steady accident rate since its creation in 1990. In the year 1996, 60 deaths were recorded, in 1997, 29 deaths, in 1998 it rose to 135 deaths and in 2013, 2014, and 2015 the figures were 190, 254 and 242 respectively (Arosanyin, 2017). Although many works incorporated different aspects of road traffic accidents in their studies at different times and places, they are still scanty in Port Harcourt. It is on this basis, that this study seeks to add to the existing knowledge.

II. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

The System Theory: The system theory views the performance of humans as the workings of different interacting systems. In terms of road accidents causation and human error, for instance, errors are widely accepted as a resultant effect of system failure instead of mere unusual psychological factors in individuals (Levinson, 2004). The system theory is relevant to this study as it contributes to identifying the system of traffic regulations, laws and enforcement put in place in maintaining safety on the roads. The theory also helps to identify and understand three factors which contribute to road traffic accidents which are humans, vehicular and roadway environment. The essence of using systems approach is to consider not only the underlying factors for road traffic accidents, but also the role of different agencies and actors on causes, impacts, and intervention measures for prevention.

The Risk Theory: The application of risk theory is useful in the description of accident causation in modern times. Risk can be seen in terms of probability and the seriousness of the adverse effects (McCarthy, 2011). Risk resulting in accident is widely applied in the field of safety analysis in transportation sector. Road traffic accidents risk is seen to function in four components: first, the exposure on the level of movement in the system in a given population, concentration and users; second is the underlying probability of crash, given a particular exposure; third is the probability of injury given a crash and fourth is the outcome of injury (Dejoy, 1991).

Perhaps, as put forward by McCarthy (2011), the most important consideration of this theory to road traffic crashes is in the effort of looking at risk factors in their overall interaction in consideration of road traffic accidents and the likely mitigation or safety measures to be adopted in the control or reduction of accidents casualties. It also enables a closer attention along the network to be detected as well as provides a better insight into the overall inter-relationship of risk, safety intervention and driver behaviours.

The Three E's Concept: The three E's concept of traffic safety was originated by Harvey et al (2018), who suggested that the solution to the traffic safety problem was directly related to the development of a comprehensive programme of traffic safety involving education, engineering and enforcement. The first "E" which is education refers to formalized programme in the school or a public education endeavour which contributes significantly in preparing elementary and secondary school students and the general public alike to live safely in a traffic environment. The second "E" which is enforcement refers to the traffic laws through the appropriate law enforcement agencies of a nation. While the third 'E' which is engineering deals with the movement of motor vehicles on streets and high ways and the method, procedures and devices used to direct them to their destination and to maintain a space cushion between another moveable or fixed objects including pedestrians.

The Rate of Road Traffic Accidents over Time: It is estimated by the World Health Organization that about 1.7million deaths were recorded per annum globally, as a result of automobile crashes. The breakdown of this figure shows that almost 70 percent of death cases occur in less developed countries. The global rise in the rate of automobile crashes is due to increase in population and rising number of motor vehicles. This rise in motor vehicles is a characteristic of the "automotive revolution", brought about by the rising number in urban motor vehicle population in most countries of the developing world (Atubi, 2012). Available statistics shows that more than 90 percent of crashes that occur in Nigeria are due to errors of the drivers (FRSC, 2008) and Aworemi, Lupton, Hubbard and Moen (2009).

Also Onakomaiya (1991) compared the situation between Nigeria and the industrialized nations of the world and found that the rate of traffic crashes in Nigeria is as high as twenty times those of Europe and North America. He went on to say in the eighties, Nigeria experienced the worse in road traffic accidents situation than Europe and North America in 1930; Botswana, Niger, Kenya and Srilanka in 1980. In Lagos State, for instance, fatal cases of road crashes are reported almost every day on the major roads. Different types of traffic vehicles are involved in crucial crashes in the state (Atubi, 2012). Automobile accidents happen to be the major attribute of deaths in young adults and adolescence out of the estimated 856,000 of deaths from road crashed that occur yearly in the world; 74 percent of the figure occurs in developing world (Atubi and Onokala, 2009). Atubi (2000) added that there have been dramatic decline of over 26 percent of road crashes in developed countries, while the proportion has maintained a steady rise in the developing countries (Rose, Ogunaya and Larson, 2001).

For instance, Atubi (2010), Ezenwa (2011), Kulmala (2012), all observed that Nigeria and Kenya experienced fivefold rise in crash related fatalities in the last 30 years. The countries in Africa and Asia with the lowest number in automobiles, are witnessing more fatality rate for every 10,000 vehicles than the developed North American and European nations (Jacobs and Sayer, 2004; WHO, 2004). The measures required to reduce traffic crashes require conscious planning, design and operations of the road system.

Road Traffic Accidents and its Associated Casualties: Road traffic crashes according to (Mohan and Romer, 2001) happen to be a major contributory factor of deaths in adolescents and young adults worldwide. Out of the 865,000 accidents death estimated by World Bank (2003) that occur yearly in the world (conservative estimate), 74 percent is said to occur in under developing countries. Moreover, while road accident figures are in the decline in most developed countries, they are on the rapid rise in most developing countries. Road traffic accidents however, constitute a serious economic burden on less developed countries.

Models have also been used to study injuries and deaths due to road traffic accidents. For instance, structural time series was applied by Harvey and Durbin (2018) on monthly data series for people that died and those that sustained injuries in United Kingdom between January 1996 and December 1999. The study revealed an impressive measure in the introduction of legislation on the use of seat belts. Jacobs (1996) carried out an analysis of road traffic accidents for different years in 20 developing nations applying linear regression and established that there was a significant relationship between fatality rate and level of automobile ownership (Valli, 2006). Ismaila, Abbassi, and Bum (2009); Van, Pratap, Jaranit, Paibul and Lap (2006) attempted to model road traffic accidents' death and injuries on Nigeria in Thain Nguyen roads using data collected from 1969 to 2006. It is pertinent to note that road traffic accident casualties numbered about twenty times higher in the under developed world, especially in Nigeria and Kenya than in western Europe and North American countries. Road accidents create a negative effect on the economy of developing nations and this is put to morbidity, mortality and property – related costs (Downing, 1991; Jadaan, 2009; WHO 2009).

The causes of road traffic accidents can be multi-factorial in nature. They occur due to a number of pre-crash attributes such as human, vehicular and the highway environment (Wu, 2002). The Nigerian assessment is indeed very complex considering the gross under-estimation of road traffic injuries and fatalities for lack of adequate collection of data by agencies of the government, in view of the fact that road traffic accident forms cardinal health problems. In Nigeria, socio-economic cost of road traffic accidents is vital. The best way to understand direct cost of accident casualties is in the aspect of workforce lost to the country's economy.

Road users' Perception of Road Traffic Accidents

Most of the factors contributing to accident occurrence and rates may be grouped and labelled as "economical" factors. The World Bank (2004) relates much of the accident problems in developing countries to a shortage of funds, for both owners of vehicles and the governments. The study revealed that over loading, over speeding among others are major factors that contribute to higher accident risks or to more serious accidents. In developing countries the resource constraints, especially of hard currency may produce the following consequences. Moreover, road user behaviour in reckless studies showed that drivers routinely ignore traffic laws (Odero, Zwi, Soderlund and Kual, 2003; WHO, 2004) and pedestrians routinely walk in the middle of streets and cross without checking for in-coming traffic.

In general, drivers' errors, often accompanied by law violations are some of the causes leading to more than 90 percent of all highway accidents. However, the nature of behaviour differs between individual drivers, while alcohol for example is found to be the most common causes of accidents in many developed countries. Investigations into some aspects of drivers' behaviour in some rich developing countries indicated that drivers acquire many dangerous and harmful driving habits and that drivers observation of traffic regulations is poor (Quinn, Zealley and Huxford, 2004).

In recent years, many countries have launched integrated road safety programmes which are attempts to incorporate all the diverse elements related to accidents and casualties aimed at increasing the efficiency of road safety, work and generate new solutions to the accident problem (WHO, 2004). The study revealed that vulnerable road users include pedestrians, cyclists and motorcyclists. They account for a much greater proportion of road traffic collisions and road traffic injuries causing emotional, physical and economic harm. Beside loss of lives, road crashes consume massive financial resources that society can ill afford to lose.

The factors affecting accidents may be conveniently divided into two (2) groups: direct and indirect factors. Direct factors contribute directly to the occurrence of individual accidents. They include; road users behaviour, drivers ability and attitude, traffic engineering, roads and environment and medical services. Indirect factors contribute to the total population and rate of accidents in the country. They include; demographic (population structure and distribution) and vehicle population and characteristics (number, type, usage and occupancy).

III. MATERIALS AND METHODS

Port Harcourt city, the study area is the administrative capital of Rivers State of Nigeria. The city lies along the Bonny River and is located in the Niger Delta. Port Harcourt is located between latitudes 6° 58'N and 7° 6'N of the Equator, and between longitude 4° 40'E and 4° 55'E of the Greenwich Meridian. It falls almost entirely within the low-land swamp forest ecological zone and is flanked in the east, west, north and southern limits by mangrove swamp forest (Akpogomeh, 2010). Port Harcourt grew from an area of 15.54km² in 1914, to an uncontrolled area of 360km² in the 1980s (Ayotamuno and Gobo, 2004). As the capital of Rivers State, the city has become an important administrative centre with regular road, water and air transport services to other parts of Nigeria. Port Harcourt has a population of 1,865,000 people and a population density of 15.54 person/square kilometres (NPC, 2006). The city is highly heterogeneous in nature with different groups speaking different languages. The main socio-economic activities of the people of Port Harcourt city include fishing, industrial and commercial activities.

The study adopted the survey research approach. This involved the collection of data with a representative sample of which inferences about the population were made. In the light of this, data were collected from both primary and secondary sources. The primary sources of data include questionnaire administration, interview and personal observation. The secondary sources of data were both published and unpublished sources like population bulletin, records of accident cases in the study area from Federal Office of Statistics and Federal Road Safety Commission, Port Harcourt.

The total population of Port Harcourt in 2016 according to the National Population Commission was 1,865,000. This figure was projected to 2019 using 3% growth rate, resulting to 2,037,936. The sample frame for the study was therefore 2,037,936, from where the sample size of 400 was determined using Yaro Yamani's formula as stated below:

$$n = \frac{N}{1 + N(e)^2}$$

Where n = sample size, N = population of the area

e = Level of significance (0.05), I = constant

Stratified random sampling was adopted. In applying the technique, the entire city was stratified using the sixteen (16) identified study points/locations in the study area as shown in Table 1.0

Table 1.0: Stratification of Study Area

S/N	Study Points/Locations
1.	Aba Road
2.	Market Road
3.	Woji Road
4.	Rumuodara Road
5.	Wilson Street
6.	Azikiwe Road
7.	Peter Odili Avenue
8.	Ikwere Road
9.	Agip Road
10.	Trans Amadi Avenue
11.	Rumukopkw Road
12.	East West Road
13.	Abuloma Road
14.	OluObasanjo Road
15.	Choba Road
16.	Rumuokoro Road

Source: Field Survey, 2020.

Thereafter, the names of the study locations were written on pieces of papers and put into a container and shuffled. Applying random sampling, eight (8) study locations were selected without replacement for sampling during the study. Systematic sampling was then used to determine the actual respondents administered with questionnaires. Every four (4) motorists that park along the selected roads/locations (including passengers where applicable) and pedestrians were administered with questionnaires.

Since there was no existing statistics indicating the number of vehicles using these arterial roads, the sample size of 400 was divided equally to all the study points in the study area as shown in Table 2.0.

Table 2.0: Distribution of Questionnaires

Study Points/Locations	No. of Questionnaires
Aba Road	50
Woji Road	50
Wilson Street	50
Ikwere Road	50
Rumuokoro Road	50
Peter Odili Avenue	50
Trans Amadi Avenue	50
Choba Road	50
Total	400

Source: Field Survey, 2020

In the course of the study, two hypotheses were formulated. They are; ‘the rate of road traffic casualties in Port Harcourt does not vary significantly from 2005 to 2019’. The second hypothesis states that ‘there is no significant relationship between the extent of road traffic crashes and the level of non-compliance of road traffic rules and regulations in Port Harcourt’. Analysis of variance (ANOVA) was used in testing the first hypothesis while regression analysis was used for the second. ANOVA was used to determine whether the number of road traffic accidents differ significantly from 2005 to 2019. The dependent variable (y) was the number of road traffic accidents in Port Harcourt while the independent variables (x, x₁, x₂, ...,x_n) matches with the period in years as factors. The general formula for ANOVA is shown below:

$$SST = \sum X^2 - \frac{(\sum X)^2}{N} \text{----- (i)}$$

$$SSB = \frac{(\sum X_1)^2}{N} + \frac{(\sum X_2)^2}{N} + \frac{(\sum X_3)^2}{N} + \dots + \frac{(\sum X_n)^2}{N} \text{----- (ii)}$$

$$SSW = SST - SSB \text{----- (iii)}$$

Where:

SST = total variation (total sum of squares)

SSW= variation within groups (sum of squares within).

Regression Analysis was used to test the cause and effect relationship between the extent of road traffic crashes and the level of non-compliance of road traffic rules and regulations in the study area. The dependent variable (y) was the extent of road traffic crashes for the past years (2005-2019) in Port Harcourt, while the independent variable (x) was the level of compliance of traffic rules and regulations. Simple linear regression was used and the general formula as shown below:

$$y = a + bx + e$$

where: y = the dependent variable

x = the independent variable

a = the intercept

b = regression coefficient

e = residual error in prediction of the relationship

Also, $a = \bar{y} - b\bar{x}$, while $b = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sum(x-\bar{x})^2}$

IV. RESULTS AND DISCUSSION

Road Traffic Accidents in the Study Area

Table 3 shows the yearly number of road traffic accidents in Port Harcourt from 2005 to 2019 as recorded by Federal Road Safety Commission. From the table, a total of 1,190 accident cases were recorded in the study area within the period under study. During this period, 2006 and 2010 had the highest number of accidents with 123 cases constituting 10.3 percent. This was followed by the year 2005 with 122 cases representing 10.2 percent. Furthermore, the year 2007, 2009 and 2008 recorded 115, 109 and 104 accident cases with percentages of 9.3, 9.2 and 8.7 respectively. The number of road traffic accidents in the years 2006 and 2010 were high because of the high rate of commercial motorcycles ownership then, in Port Harcourt.

However, the table shows a decline in road traffic accidents from 2007 to 2008; with marginal increase in 2009 with 109 cases. After 2010 the figure dropped to 48 and rose again in 2012 with 61 accident cases. Thereafter, there was a rise and fall in the figures. This could be attributed to the ban on motorcycle mode of public transportation in the city. The year 2013 had the lowest accident cases of 31 constituting 2.6 percent. This could be due to neglect in recording or reporting of accident cases in the state (FRSC 2013). Generally, this could be as a result of rapid rate of motorization and urbanization in the state capital. The table also

shows variation in the nature of accidents; whether fatal or minor within the same period, including the number of vehicles involved and the major causes of accidents

Table 3.0: Yearly Number of Road Traffic Accidents in Port Harcourt

S/N	Year	Number of Accident cases	%	Nature of Accident				Number of Vehicles Involved	%
				Fatal	%	Minor	%		
1	2005	122	10.2	31	8.9	91	10.8	256	9.13
2	2006	123	10.3	35	10.2	88	10.5	251	8.95
3	2007	115	9.3	29	8.30	86	10.2	230	8.20
4	2008	104	8.7	31	8.9	73	8.7	220	7.9
5	2009	109	9.2	33	9.5	76	9.03	225	8.02
6	2010	123	10.3	31	8.9	92	10.9	251	8.95
7	2011	48	4.0	14	4.01	34	4.04	101	3.60
8	2012	61	5.1	24	6.9	37	4.4	130	4.63
9	2013	31	2.6	12	3.43	19	2.3	81	4.9
10	2014	69	5.8	19	5.44	50	5.94	206	7.4
11	2015	48	4.0	18	5.15	30	3.6	162	5.8
12	2016	56	4.7	7	2.00	49	5.82	202	7.20
13	2017	51	4.3	22	6.30	29	3.44	125	4.5
14	2018	67	5.6	23	6.6	44	5.23	222	7.92
15	2019	63	5.3	20	5.73	43	5.11	140	4.99
Total		1,190	100	349	100	841	100	2,802	100

Source: Federal Road Safety Commission, Port Harcourt, Rivers State (2020)

For easy computation, particularly during the test of hypothesis two, table 3 was further grouped into four categories as seen in table 4.

Table 4: Grouping of Accident Cases from 2005-2020

Years	No. of Accident Cases	Percentage
2005-2008	464	39.0
2009-2012	341	28.7
2013-2016	204	17.1
2017-2019	181	15.2
Total	1190	100

Source: FRSC, Port Harcourt, 2020.

Category of Vehicles Involved in Accidents

Consideration was also given to the category of vehicles involved in accident cases in the study area as shown in table 5. Commercial vehicles were those mostly involved in the auto crash cases with a total of 1743 cases with a percentage of 62.2. On the other hand, government vehicles followed with 558 cases representing 19.9 percent. However, privately owned vehicles were the least with 501 cases representing 17.9 percent.

Table 5.0: Category of Vehicles Involved in Accidents (2005-2019)

Category	Frequency	%
Private	501	17.9
Commercial	1743	62.2
Government	558	19.9
Total	2,802	100

Source: FRSC, Port Harcourt, Rivers State (2020)

Causes of Road Accidents from the FRSC Perspective

In line with one of the study objectives which seeks to identify the major causes of automobile crashes in the study area, two different perspectives were considered; from the Federal Road Safety Commission and the road users (particularly, drivers).

The records from the Federal Road Safety Commission (FRSC) as presented in Table 6, ten (10) different causes of road traffic accidents were identified. The table shows that out of the total figure of 1,288

cases, dangerous driving ranked highest with 641 constituting 48.8 percent. This was followed by speed violation with a figure of 463 representing 35.2 percent, tyre burst with score of 45 constituting 3.4 percent, and mechanically deficient vehicle with score of 41 constituting 3.1 percent. However, obstruction, road sign, bad road, driving under alcohol/drug influence, over loading and traffic light violation as causative factors for road accidents in the study area as put together accounted for only 7.4 percent. This is an indication that other causative factors are negligible in Port Harcourt.

In all, the causative factors by the FRSC as causes of accidents, over 60 percent are human related causes, while vehicular and environmental (road way conditions), shared the remaining 40 percent. When subjected to further analysis, it was observed that over 90 percent of road accidents in the study area in the period (2005-2019) were caused by the human related factors. The vehicular and environmental (road way conditions) causes from FRSC records are negligible factors in road traffic accidents in the study area.

Table 6.0: Causes of Road Accidents

Option	Frequency	%
Dangerous driving	641	48.8
Speed violation	463	35.2
Tyre burst	45	3.4
Mechanically deficient vehicle	41	3.1
Road obstruction	25	1.9
No road sign	24	1.8
Bad road	20	1.5
Driving under alcohol/drug influence	17	1.3
Over loading	08	0.6
Traffic light violation	04	0.3
TOTAL	1,288	100

Source: Federal Road Safety Commission, Port Harcourt, Rivers State (2005-2019)

Causes of Accidents as Perceived by Road Users (Drivers)

In order to understand the possible causes of road traffic accidents in the study area on the side of the road users (particularly the drivers), interviews were held and distribution of questionnaires. Table 7 shows that brake failure ranked the highest with 126 respondents constituting 36.4 percent. This was followed by over-speeding with 84 respondents representing 24.3 percent, while wrong overtaking followed with a frequency of 48 representing 13.9 percent among others.

Table 7.0: Perceived Causes of Road Accident by Respondents

Option	Frequency	%
Bad road	28	8.1
Tyre burst	15	4.3
State of the vehicle	8	2.3
Over speeding	84	24.3
Wrong overtaking	48	13.9
No road sign	9	2.6
Poor visibility	12	3.5
Brake failure	126	36.4
Not wearing seat belt	16	4.6
TOTAL	346	100

Source: Field Survey, 2020

Non Compliance to Road Traffic Rules and Regulations

Table 8.0 shows the level of non-compliance to road traffic rules and regulations by motorists in the study area. General, the responses from the field revealed that 94 respondents representing 27.1 percent were of the opinion that the level of non-compliance to road traffic rules and regulations by motorists was very high, 186 representing 53.8 percent of the respondents stood for high level of non-compliance. Those who stood for Low level and very low were 48 and 18, representing 13.9 and 5.2 percent respectively. From the table the level of non-compliance to road traffic rules and regulations was generally high.

Table 8.0: Non Compliance to Road Traffic Rules and Regulations

S/N	Level of Non-compliance	No. of Responses	Percentage
1	Very High	94	27.1
2	High	186	53.8
3	Low	48	13.9
4	Very Low	18	5.2

Total	346	100
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Source: Field Survey, 2020

Test of Hypotheses

The analysis employed the one-way analysis of variance (ANOVA) and Statistical Package for Social Sciences (SPSS) was used in the computation. The hypothesis states that ‘the rate of road traffic casualties in Port Harcourt does not vary significantly from 2005 to 2019’. Data for the test were obtained from table 1.0. The result of the analysis is presented in table 9.0.

Table 9.0: ANOVA Result

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	586535.083	13	45118.083	394.619	.003
Within Groups	228.667	2	114.333		
Total	586763.750	15			

Source: Statistical Computations, 2020

The result shows that the rate of road traffic casualties vary significantly between 2005 and 2019. As seen in table 9.0. The calculated significant value was 0.003. This implies that the calculated significant value is less than 0.005 hence, the null hypothesis was rejected while accepting the alternative hypothesis.

Hypothesis Two

Hypothesis two states that ‘there is no significant relationship between the extent of road traffic crashes and non-compliance of road traffic rules and regulation by motorists in the study area for the period of 2005 to 2019’. The hypothesis was tested with the use of simple linear regression. In order to test the hypothesis, data were obtained from table 4 and table 8. Data in table 4 was used as the independent variable while data in table 8 was used as the dependent variable. The result of the hypothesis is presented in table 10.

Table 10: Regression Table. ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30222.688	1	30222.688	2.785	.237 ^a
	Residual	21706.312	2	10853.156		
	Total	51929.000	3			

a. Predictors: (Constant), Level of non-compliance

b. Dependent Variable: Rate of Accident

Source: Statistical Computation, 2020

The result from the regression analysis as presented in table 10 shows that there is no significant relationship between the extent of road traffic crashes and non-compliance of road traffic rules and regulation by motorists in the area for the period of 2005 to 2019. The result showed that the calculated significant value was 0.237 which is greater than 0.05. From the result, the null hypothesis was accepted and the alternative hypothesis was rejected. This implies that there was no significant relationship between the extent of road traffic crashes and non-compliance of road traffic rules and regulations by motorists in the area for the period of 2005 to 2019. To this end, it may be assumed that other factors determined road traffic crashes other than non-compliance with traffic rules and regulations.

V. Discussions

i. The study examined the rate of road traffic accident over time. The study showed that road traffic accidents have been occurring in Port Harcourt within the period in review. As empirically analysed using ANOVA, the study showed that there was a significant difference in the rate of road traffic accidents. While the number increased in some years, the figure dropped in other years. For instance, in 2010 when motorcycles were officially banned in Port Harcourt, traffic accidents dropped (see table 3). However, accidents in the study area occurred in different types. For instance, both minor and fatal accidents have occurred in the study area within the same period. In the same vein, the high rate of accident in the study area which showed the rise and fall from 2005-2010 alongside the level of minor and fatal injuries due to accident corroborates. This goes with the findings of Mohan and Romer (2001), that automobile crashes formed the major contributing factor in adolescents and young adults’ deaths.

ii. The study also pointed the extent of casualties arising from road traffic crashes in the study area. Obviously, there have been degrees of injuries sustained from crashes along the roads resulting from accidents. Table 3 specifically pointed out that road crashes among commuters in the study area have been on steady

occurrence over the years. An interview with staff of the Federal Road Safety Corps (FRSC) in Port Harcourt revealed that accidents have claimed lives of people during this period. Earlier, Harvey and Durbin (1986), Valli (2006) have shown that traffic accidents are inevitable in cities due to socio-economic activities and so on. Aderamo (2012), Jacobs (1996) discussions on road accident and its consequences; the study clearly showed that the high casualty rate associated with road accidents are not tied to high vehicle ownership rate but other associated factors. Thus, as revealed by this study especially on fatal tolls and the level of minor injuries; it corroborates with the findings of the aforementioned authors.

iii. The perception of road users on road traffic accident was equally assessed. The study revealed that road users are divided on the causes of road traffic accidents. Notably, the study showed that users believe that road traffic accidents are caused by bad roads, tyre burst, and state of vehicles, over-speeding, wrong overtaking, lack of functional road signs, inadequate road viability and break failure. The result of hypothesis two revealed that the rate of road traffic accident was not significantly tied to non-compliance of drivers' rules and regulations by traffic enforcement agencies. Therefore, it may be deduced that while traffic accidents are unavoidable, it is not completely due to the fact that the drivers are reckless. This agrees with the findings of Black, Paez and Suthanaya (1991) who observed that bad roads can bring about road accident. Aderamo (2012) also shows that bad road conditions has resulted in massive rise of traffic accidents leading to deaths.

iv. In relation to the causative factors of road traffic accidents in the area which were mainly dangerous driving speed violation and loss of control was a confirmation of the earlier studies carried out by Cherington (2002), Evans (1991), Bob-Manuel (2002), Osterom and Erickson (2002). Consequently, these findings corroborated with the works of Onakomaiya (1991), Umeano (1991) and Atubi (2017). However, the studies carried out by Aworemiet *al.*, (2009) and FRSC (2008) reaffirmed the findings of this study on the main contributing factors of traffic crashes. Nevertheless, variations in automobile crashes globally have been stated to have variable rate of occurrence, fatality, minor as posited by Wu and Malison, (1990), Ogunsanya (1991), Bener and El-Sayyad (1990), Ofosuet *al.*, (2008) and Atubi (2010).

VI. Recommendations

Based on the findings of the study, the following recommendations were made;

i. Since road traffic accidents have been occurring in the study area, there is need for stringent measures and enforcement by traffic control agencies to reduce the rate of traffic accidents in Port Harcourt

ii. With the observation that road traffic accidents declined after the ban on motorcycles, there is need to ensure that the illegal re-surfacing of commercial motorcycle operation, as noted in some cities, should be seriously looked into and be discouraged.

iii. Casualties arise from accidents therefore; measures such as seat belts should be properly enforced.

iv. Traffic accidents are caused by varied measures including bad roads therefore, roads should be rehabilitated frequently by the state government through her agency(s)

v. More qualified staff concerned with road traffic management should be recruited. This increase in man power will encourage effective traffic control and monitoring to reduce road traffic crashes in the study area.

VII. Conclusion

In line with the study objectives, the study has examined the rate of road traffic accident in Port Harcourt over time (2005-2015). The study pointed out that road traffic crashes were occurring more during the period motorcycles were used for commercial purposes in the study area. However, it was deduced that after the ban on commercial motorcycle as a public mode of transport, accident rate dropped gradually.

In the same vein, the perception of the people regarding road traffic accidents was appraised. The people revealed that accidents are caused by bad roads, tyre burst, and state of vehicles, over-speeding, wrong overtaking, road sign, viability and break failure. In addition, the result of the second hypothesis revealed that road accident in the study area was not significantly dependent on non-compliance of drivers to the rules and regulations of road traffic. The causes of road traffic accidents in the area therefore include bad road alignments and lack of regular maintenance and expansion of the existing roads to accommodate the ever increasing number of vehicles on the streets

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