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Investigating Vehicle (Fire) Accidents on Nigeria's Highway, A Case Study of the Lagos-Ibadan Expressway

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Abstract

This study examined the causes of fire accidents traceable to petrol engine along Lagos-Ibadan expressway, Nigeria. Road accidents had taken away so many lives in Nigeria that hardly can any disease match its mortality rate. A questionnaire was developed and distributed to passengers, commercial and private motorists that transit on Lagos- Ibadan expressway often. A survey research design was used and the population of the study comprised of 315 passengers, private and commercial motorists. The sample was made up of 78 passengers, 65 private motorists and 100 commercial motorists obtained through stratified random sampling technique. A Structured Questionnaire was used as instrument for data collection. Mean and standard deviation were used to answer the research questions, while the null hypotheses were analyzed using z-test at 0.05. The findings of the study revealed that most of the drivers are not formally trained to drive on the highway, 55.7% of the driver completed the training for driving on the highway while 44.3% did not. Even when the cause of vehicle (fire) accident is traceable to mechanical factor, carelessness of the driver in form of negligence, that is, ability to check and maintain the vehicle at the appropriate time increases the risk of vehicle (fire) accident exponentially, which could have been avoided. The enforcement agencies need to update their rules and regulation in a way to help reduce fire accidents traceable to petrol engine along Lagos-Ibadan Expressway

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1. Introduction

Road accidents occur all over the world. Based on US fire Administration's National Fire Incident Reporting System from 2014-2016, there were 171,500 highway vehicle fires in the United State with an annual death rate of 345 people, 1300 injured and 1.1 billion in financial losses[1]. Brushlinsky et al [2] reported that vehicle fires constituted about 6.4% of all the fires in Australia, 6.2% in Belarus, 4.6% in Romania, 13.5% in Russia, 10.3% in Slovenia, 23.5% in Sweden, 4.4% in Ukraine, 15.5% in USA, 7.5% in Bulgaria, 5.9% in Croatia, 10.4% in Liechtenstein, 9.1% in Lithuania, 13.3% in Moldova, 31.4% in New Zealand, and 13.1% of all fires around the world. When road fire accident happens, lives can be lost or people get injured. Road accident is an event that happens unexpectedly, which could result into minor, major or fatal injury. Phrases used to describe road accident include auto accident, car crash, car smash, car wreck, tyre burst, fender

bender, motor vehicle accident (MVA) and so on. Many studies had been carried out on causes and preventive measures of road accidents. World Health Organisation [3] revealed that about 1.24 million people die annually on the roads, with 20–50 million sustaining non-fatal injuries. A report by [4] also stated that in the United States, vehicle miles of travel (VMT) increased from 2423 billion in the year 1995 to 2747 billion in 2000, and to 2990 billion in 2005. The number of traffic fatalities also increased from 41,817 in 1995, 41,945 in 2000 and to 43,443 in 2005. The incidence of fire accidents in Nigeria is phenomenal. Bun [5] also reported that Nigerian highways are arguably one of the worst and most dangerous in the world. In Nigeria, particularly on Lagos-Ibadan expressway, the issue of road accident has become a constant occurrence every day [6]. Sometimes, it could be caused by armed robbers, bad road, police men, or road safety corps trying to stop a vehicle on speed [7]. Causes of vehicle accident among others include: Distracted driving, Speeding, Drunk Driving, Reckless Driving, Running Stop Signs, Running Red Lights, Teenage Driving, Night Driving, Design Defect, Unsafe Lane Change, Wrong Way Driving, Improper Turns, Tailgating, Driving under the influence of drugs, Ice/floods, Snow, Road Rage, Pot Holes, Drowsing Driving, Tyre Blowout, Fog, Deadly Curves, Animal Crossing, Street Racing [8]. Three quarter of vehicle accidents which result to fire incidents are caused by mechanical or electrical failures during normal operation such as leakage of fuel, naked wire which can cause spark, wrong connection and so on [9]. Less than 10% of vehicle accidents leading to fire are caused by collisions [10, 11]. Works on incidents of fire outbreak among fuel truck accidents in Oyo State, Nigeria concluded that immature drivers, designs defects and carelessness were the major causes of road accidents [12, 13]. There is need to view vehicle (fire) accidents in Nigeria as an issue that requires urgent attention aimed at reducing the health, social and economic effects.

2. Methodology

A questionnaire was developed and distributed to passengers, commercial and private motorists that transit on Lagos- Ibadan expressway often at the motor park using simple random technique. A convenience sample was utilized due to the fact that there are over 1500 drivers on Lagos-Ibadan expressway. The questionnaire was distributed equally among the heavy and light duties drivers. The distribution was selected to provide a complete section of drivers that frequent the route. The population of the study comprised of 315 private motorists, commercial motorists and passengers. The sample of the study consisted of 65 private motorists, 100 commercial motorists and 78 passengers which were obtained through stratified random sampling technique. The questionnaire is designed to solicit background information and input concerning the research questions. Each individual was given maximum time of twenty five minute to return the questionnaire. The Instruments used for data collection was a structured Questionnaire. The following research questions are used for this study:

1. Can natural disaster, driver's carelessness, lack of proper maintenance, collision of two vehicles or sudden stop of vehicle be the source of vehicle fire accidents?
2. Can inadequate training of drivers lead to road fire accidents?
3. What do you think was the main contributing factor to the road accidents that lead to fire outbreak?

3. Results

From the interview conducted and questionnaire distributed, various observations were recorded during these activities which gave clear understanding to the causes of road accident on Lagos-Ibadan expressway. Also from the information obtained from commercial drivers through the use of interview and questionnaire, it can be deduced that most of the drivers are not formally trained

to drive on highway. Many drivers do not know the necessary signs and requirements needed in driving. The results obtained from the distributed questionnaires are shown in table 1 below

Research Question One

Can natural disaster, driver's carelessness, lack of proper maintenance, collision of two vehicles or sudden stop of vehicle be the source of vehicle fire accidents?

Table 1: Result obtained from the distributed questionnaires for research question one

S/N	***Questions***	***Drivers,Nd=165***			***Passenger, Np=68***		
		Percentages (%)					
		A	NA	NS	A	NA	NS
1	*Car accident is a natural disaster meant to happen*	10.9	*78.5*	*10.6*	*8.6*	*77.4*	*14 .0*
2	*Driver 's carelessness contribute to accident*	79.8	*12.3*	*7.9*	62.4	*18.6*	*19.0*
3	*Lack of proper maintenance can result to fire outbreak*	69.6	*16.3*	*14.1*	*79.2*	*13.3*	*7.5*
4	*Collision of two vehicles may result to fire outbreak*	*48.8*	*32.2*	*19.0*	*57.6*	*32.3*	*10.1*
5	*Sudden stop of vehicle could result to fire incident*	*58.3*	*25.4*	*16.3*	*49.6*	*27.6*	*22.8*
	TM%	53.4	32.9	13.5	51.4	33.8	14.6

Key: A= agree, NA=not agree, NS=not sure, ND=Number of drivers, NP=Number of passengers, TM%= total mean percentage

Research Question Two

Can inadequate training of drivers lead to road fire accidents?

Table 2: Result obtained from the distributed questionnaires for research question two

S/N	***Questions***	***Drivers Nd=165***			***Passengers Np=68***		
		Percentages (%)					
		A	**NA**	**NS**	**A**	**NA**	**NS**
6	*Commercial drivers are responsible for majority of road accidents that lead to fire outbreak*	67.5	20.4	12.1	77.7	12.1	10.2
7	*Drivers that did not attend driving schools are responsible for road that lead to fire outbreak*	60.9	*28.5*	*10.6*	*78.4*	*17.2*	*4.4*
8	*Driving without current driving license may contribute to road accidents*	59.8	*32.3*	*7.9*	52.4	*29.3*	*18.3*
9	*Driving without appropriate fire extinguisher may contribute to road fire accidents*	69.6	*16.3*	*14.1*	*49.2*	*33.3*	*17.5*
10	*Adequate knowledge of road/ highway codes may help to reduce road accidents that lead to fire outbreak*	*58.8*	*22.2*	*19.0*	*57.6*	*23.3*	*19.1*
11	*Lack of driver's training for driving heavy and light vehicles may contribute to road fire accidents*	*58.3*	*25.4*	*16.3*	*47.6*	*28.6*	*23.8*
12	*Annual driver recertification may help to reduce road fire accidents*	55.48	30.94	13.58	35.96	30.48	33.02
13	*TM%*	61.48	25.15	13.37	56.98	24.89	18.05

Key: A= agree, NA=not agree, NS=not sure, Nd=Number of drivers, Np=Number of passengers.TM%= total mean percentage

Research Question Three

What do you think was the main contributing factor to the road accidents that lead to fire outbreak?

Table 3: Result obtained from the distributed questionnaires for research question three

S/N	Questions	Drivers Np=165			Passengers Np=68		
		Percentages (%)					
		A	NA	NS	A	NA	NS
1	*Mechanical failure*	69.9	*28.1*	*2.0*	*78.6*	*17.0*	*4.4*
2	*Commercial drivers/vehicles*	79.8	*12.3*	*7.9*	52.4	*28.6*	*19.0*
3	*Road/weather condition*	69.6	*16.3*	*14.1*	*59.2*	*23.3*	*17.5*
4	*Lack of driving training*	*78.8*	*18.2*	*3.0*	*87.6*	*10.1*	*2.3*
5	*Road blockage by Police/ Armed robbers*	*48.3*	*35.4*	*16.3*	*57.6*	*18.6*	*23.8*
	TM%	69.28	22.06	8.66%	67.08	19.52	13.

Key: A**=** agree, NA=not agree, NS=not sure, N_d=Number of drivers, Np=Number of passengers, TM%= total mean percentage

The study found out based on the response of passengers, private and commercial motorists that the percentage of drivers that completed the formal training for driving heavy and light duties vehicles are 55.7% while 44.2% did not. Thirty-five percent of the drivers interviewed had been involved in road accident while sixty-five percent of the drivers have not. The study also revealed that 17.1% of the people that had been involved in road accidents agreed that mechanical failure is a main contributing factor to road accident that led to fire outbreak, 41.4% agreed that both commercial and private motorists are the main contributing factor to road fire accident, 32.9% agreed on lack of driving technique as the main factor and 8.6% agreed on road blockage by police or armed robbers as the main contributing factor to road fire accident.The study also discovered that 68.6% of drivers are driving with current driving license while 31.4% of the drivers are driving without current driving license. This study also found out that 89.3% of the drivers are with current high way signal code while 10.7% of the drivers are without current high way signal code.

4. Conclusion

The findings of the study revealed that most of the drivers are not well trained to drive on the highway, 55.7% of the driver completed the training for driving on the highway while 44.3% did not. Even when the cause of vehicle (fire) accident is traceable to mechanical factor, carelessness of the driver in form of negligence, that is, ability to check and maintain the vehicle at the appropriate time increases the risk of vehicle (fire) accident exponentially, which could have been avoided. From this study it is concluded that with better trainings of the learner drivers and testing techniques for issuing the licence, number of vehicle (fire) accidents can be reduced.

5. Recommendation

The following recommendations are suggested in order to minimize vehicle (fire) accidents on Lagos Ibadan road:

- Improvement in driver training field necessitates new concepts and training procedures, including a high and uniform level of training for driving instructors.
- There is need for a regular assessment of vehicle (fire) accident trends in relation to a critical evaluation and innovation of vehicle (fire) accident counter measures in Nigeria.

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