Prevalence of Road Accident by Commercial Motorcycle Operators in Benue State, Nigeria


1Research Scholar, Department of Mechanical Engineering, University of Agriculture, Makurdi, Nigeria

2Research Scholar, Department of Science Policy and Innovation Studies (SPIS), National Centre for Technology Management (NACETEM), North Central Zonal Office-Abuja, Nigeria

EMAIL: kz4tawa@gmail.com

Abstract

Four thousand eight hundred (4800) questionnaires targeted at establishing the frequency, causes and nature of injuries sustained in road accidents by commercial motorcycle operators within a period of five (5) years (2006 - 2010) were administered on operators, Motorcycle Hire Association (MOHA), Federal Road Safety Corps (FRSC) and the Transport Unit of the Nigerian Police Force in four major commercial towns of Benue State, Nigeria. Victims were also interviewed on nature of injuries sustained. Analysis of results revealed that, over speeding accounted for 22.9 % of accidents. Brake failure and non-compliant to traffic rules had 17.8 % respectively, followed by sudden stoppage by the law enforcement agent 15.4 %, recklessness 14.2 % and poor state of the road 11.8 %. Similarly, 38 %, 35 %, and 26 % of injuries recorded in Makurdi were fractures, bruises, and head injuries respectively. Oturkpo recorded 31 % bruises, 30 % fractures and 38 % head injuries. While Gboko recorded 24 % bruises, 22 % fractures and 53.8 % head injuries. Zaki-Biam had 25 % bruises, 27 % fractures, and 46.9 % head injuries. Conclusively Makurdi had 646 accidents, followed by Oturkpo with 582, Gboko with 520 and Zaki-Biam with 330. These ranking can be justified by the population of the commercial towns. There is an urgent need to enforce the use safety helmets and speed limits to reduce the number of accidents and the resulting injuries sustained by the users of this mode of transport. This paper also proposed a synergy of stakeholders aimed at manpower development of riders in line with the contemporary Science, Technology and Innovations (STI) policy on Nigeria.

Key Words:
Prevalence, Accidents, Commercial, Motorcycles, Operators

Introduction

Until about two decades ago, commercial motorcycling, popularly known as Okada was alien to Nigeria. Taxicabs and minibuses were the common means of commercial transportation. However, individuals owned motorcycles and governments at the three tiers gave motorcycle loans to civil/public servants for ease of mobility, but they were not used for commercial purposes. The need to correct the structural imbalances in the Nigerian economic led to the introduction of the World Bank mediated structural adjustment
programme (SAP) in the mid-1980s. The many negative fallouts of SAP in developing countries that adopted the programme are well documented in the literature. Negatives of SAP includes the disappearance of the middle income class, rapidly falling naira exchange rate, government inability to undertake new infrastructural projects and to effectively maintain existing aging public facilities. Consequently, middle-income-level vehicle owners could not replace them, intra and intercity road networks became rapidly degraded, and rural communities gradually became inaccessible. Thus, commercial motorcycling became a necessity.

Commercial motorcycling has since been accepted by most Nigerians and gradually integrated into the urban life of the country with tacit approval of government, as they become new income generating avenues to government, especially at the local level. This mode of transportation has continued to enjoy increasing acceptance relative to the other modes (Ogunsanya and Galtima, 1993; Adesanya, 1998; Layode, 1998; Fasakin, 1999). Commercial motorcycling (Owolabi, 1999) represents an estimated 25% of total traffic in major roads within Southwestern Nigeria. One thing that enhances the sustainable operations of the commercial motorcyclist is the relatively high level of daily profits usually posted by operators compared to daily operational cost (Layode, 1998).

Motorcycle, a two-wheeled light-weighted vehicle comprises a central frame fabricated from tabular sectioned steel, to which two pairs of cylindrical folks housing hydraulically damped springs are attached to bear the front and rear wheel, Olusanya and William, (2003). The springs enhance smooth riding and road holding qualities of the motorcycles. The front pairing folks are connected to a vertical rod, which bears pivoted handle bars that are used to control the direction and balance of the motorcycle. In Section 2, we discussed relevant literature that forms the foundation for the survey. The methodology adopted is covered in Section 3. The choice of Makurdi, Gkoko, Otukpo and Zaki-biam of Benue State for this study was based on the population density and commercial activities in the towns warranting the use of commercial motorcycle for transportation. It is not as if accidents involving motorcycles are particular to Nigeria alone, but the prevalence and severity differs from place to place, which is an issue of concern and calls for an evidence-based road safety policy measures deserving holistic approach. Section 4 contains the discussion of the outcome, followed by conclusions as we recommended in Section 5.

**CONCEPTUAL OUTLINE**

**Acceptability of the Motorcycle as a Means of Transportation**

The use of motorcycles for commercial activities, with riders carrying passengers for money has been on the increase in different parts of Nigeria thus, becoming a major mode of transportation Solagberu, et al., (2006), despite the fact its users are 20 times more venerable to crashes than motor vehicles (Murgatroyd 2004, WHO 2006). According to the World Health Organization (WHO, 2006) motorcycle users make up a high proportion of overall traffic injuries and deaths, particularly in low-income and middle-income countries where motorcycle ownership is high. The acceptance of this mode of transportation is due to the absence of a convenient, inexpensive, and reliable alternative. Coupled with their maneuverability during traffic congestions, fuel efficiency, and door step delivery for both passenger and cargo. Owners of this business generate income,
which sustains their families. The motorcycles used for commercial activity are often branded with names like “Hire” in Benue, “Okada”, in the mid-west, “Achaba” in the North, and “Going” in the East, and “Akauke” in the South- South parts of Nigeria. According to Olusanya, et al.,(2003) commercial motorcycling has gained wide spread acceptance, due in large part to the economic down turn, which has placed the purchase and maintenance of new cars and mini buses beyond the grasp of most Nigerians, other factors are its ability to travel on roads which are unmotorable footpaths in villages and urban slums. It is inexpensive to maintain, environment friendly, with minimum delay, as it requires just a passenger or two in some situations.

Prevalence of Road Accident in Nigeria from Motorcycles

Despite the numerous advantages associated with the use of motorcycle for commercial applications, the absence of any substantial protective barriers between the motorcycle rider and the road makes user prone to serious injuries in the event of an accident (Kadiyali, 1982). In most urban centers in Nigeria, the high rate of motorcycle accident is a source of worry to both the society and government agencies charged with the responsibility of promoting safety on Nigeria roads. Emejulu, et al., (2009) reported in a survey that of 1055 neurosurgical cases attended to in a center in the period under study about 748 had trauma, road traffic accidents accounted for 537 (71.8 %), while 367 (68.3 %) were from motorcycles. The effect of most of the accidents range from incapacitation of victims, damage to property to loss of lives. Ngim, et al., (2008) in another study discovered that in Calabar, motorcycle riders caused about 52.8 % of accidents.

In the United States, the death rate per registered motorcycle is every 59 per 100, 000 that is approximately three times the death rate per registered passenger car of 17 per 100, 000 (Preusser, et al., 1995). Besides the higher death rate, motorcyclists are likely to be injured when involved in an accident. Horswill and Helman (2001) considered about 399 injury accidents in the UK in which either a motorcycle or a car was involved in a head-on-collision with the same type of object in the same way. About 97 % of motorcyclists were injured or killed in these collisions compared with 50.5 % of car drivers. This makes it clear that motorcyclists are more susceptible to injury and death than car drivers in support of the need for safety dressing to cushion the effect in the case of an accident.

Bolade (1991), and O’flaherty (1999), identified and grouped the causes of road accidents into human, vehicular and roads/environmental factors. Accidents may be classified as fatal or serious. An accident involving loss of human life within 30 days of occurrence or from injuries sustained directly from the accidents is termed fatal. On another hand, an accident is termed serious if someone is wounded and hospitalized, but with higher chances of survival. In a case there is no injury to someone but there is damage to vehicles or property, such accident is termed minor. Olusanya, et al., (2003) attributed commercial motorcycle accidents in Nigeria to speed, failure to stop at junctions entering major roads, refusal to wear protective clothing like helmets, gloves and boots, overloading and failure to obey appropriate road signals. The commercial motorcycle riders are usually involved in all aforementioned accidents.

MATERIALS AND METHODS

Two thousand and seventy eight (2078) questionnaires of the four thousand eight
hundred (4800) administered were retrieved from registered motorcycle operators in the study area. The questionnaire targeted causes and nature of injuries sustained by accident victims of commercial motorcycle passengers and operators in the four (4) commercial hubs of Benue state; Makurdi, Gboko, Otukpo and Zaki-Biam. Oral interviews were also granted by concerned respondents this was supported by available data for duration of five years (2005 – 2010) from the Federal Road Safety Corp (FRSC) and Government hospitals in the areas of study.

This methodology employed is in line with the narrative-textual case study (NTCS) method, which is preferred because of the absence of sequential data related to the prevalence of road accident by commercial motorcycle operators in Benue State, Nigeria. NTCS is a social science research method that employs intensively, the information, data and academic materials made available and easily accessible by information and communication technology facilities such as intranet, internet, World Wide Web, online databases, e-libraries et cetera (Abouzeedan and Leijon, 2007).

Equation 1 was used to determine the number of questionnaire to be administered per town,

\[ X = \frac{30}{100} \times A \]  \hspace{1cm} (1)

Where \( X \) = no of questionnaires distributed in each town.

\( A \) = total no of registered commercial motorcycle operators in each of the town

Equation 2 was used to determine the number of accidents per city between 2005 -2010

\[ C = \frac{x}{100} \times B \]  \hspace{1cm} (2)

Where \( C \) = Total no of accident in each year

\( X \) = percentage of the accident recorded in each year

\( B \) = total no of accident recorded in each town for 5years.

Equation 3 was used in computing the percentages of the causes of accident,

\[ E = \frac{x}{100} \times D \]  \hspace{1cm} (3)

Where \( E \) = total no of the causes of accident

\( D \) = total no of accident,

\( X \) = percentage of the causes of accident

Equation 4 was used in computing the percentage of injuries sustained from the accident from 2005 – 2010,

\[ G = \frac{x}{100} \times F \]  \hspace{1cm} (4)

Where \( G \) = total no of injuries sustained in 5 years,

\( X \) = percentage of injuries sustained

\( F \) = total no of accident in 5 years,

RESULTS AND DISCUSSION

Causes and Degrees of Commercial Motorcycle Accidents in Benue State

Figure 1 shows the summary of the causes and occurrences of commercial motorcycle accidents as recorded and extracted in the four major towns of Makurdi, Oturkpo, Gboko, and Zaki-Biam between 2005-2010. It could be observed that over speeding was the highest cause of accidents, contributing 148 or 22.9% of the 646 cases reported. Particularly in Oturkpo that tops the list of recorded over speed cases. Gboko, Zaki-Biam then Makurdi respectively all recorded similar cases but with less severity. The implication of this result may be knotted to the nature of the road network and traffic intensity, since less vehicles ply Oturkpo
roads and traffic is relatively higher in Makurdi compared to the three (3) other towns. Another advantage motorcycle operators may have is the levelness of the Oturkpo road network with fewer potholes that may constitute obstructions to commuters and motorcycles alike. Again, there is need for concerned governmental and non-governmental bodies to concentrate on mechanisms geared towards speed limit control in Benue state by implication. The new Science Technology and Innovations (STI) policy made a provision for the implementation of the triple helix model proposing the Government-Industries-Academics (GIA) synergy and manpower development. In another development, violation of traffic rules, and brake failure accounted 115 or 17.8% each. Both Makurdi and Oturkpo almost tied in traffic rule violation, Gboko recorded about 97 of such cases. It implies commercial motorcycle operators are poor at adherence to constituted traffic rules and therefore may either beat the traffic light or the traffic officer most often than not. This may be because of the level of literacy and exposure given to the operators. It may be insinuated that less accident may be recorded in Zaki-Biam on the basis of compliance to traffic rules. Been compliance means respecting the rules, regulations and officers saddled with the responsibility of implementing the rules. The benefits accrued to compliance far outweigh the non-compliance since lives will be saved. This result is a pointer to a wake-up call on the FRSC on adopting a technology enabled traffic control and management measures rather than been paradigm paralyzed to the traditional road traffic management practices.

Law enforcement officers in Benue state are expected to improve the safety on roads and encourage users to use the road for the benefit of all users. This paper revealed a deviant from expectations as sudden stoppage by law enforcement agents had 100 or 15.5%. In Makurdi, more cases of accident as a result of abrupt stoppage were recorded as Oturkpo and Gboko tied.

![Figure 1. Causes of accidents and their percentage occurrences](image-url)

By consequence, road traffic officers and law enforcement agents in Zaki-Biam are better at polite approach to stopping motorcycle operators and therefore causes less accidents as compared to agents in Makurdi and Oturkpo. To achieve the zero tolerance to road crashes and reduction of accidents by 75% as visualized by the FRSC, the law enforcement agents and offers alike must be more friendly and polite while dealing with road users, even to the method used in stopping motorcycle operators in the absence of power-controlled traffic lights. Recklessness in riding motorcycles and poor state of road accounted for 92 (14.2%), and 76 (11.8%) of accidents respectively. This result supports the fact that some operators are usually under the control of one form of toxic substances or another and termed it ‘energy booster’. Makurdi and Gboko top the list on prevalent of accident due to recklessness. The implication is that the agents concerned must intensify efforts on
Recklessness has caused about 245 or 37.9% of these accidents in Makurdi. This has resulted to one form of fracture or the other as 173 or 26.8% had head injuries, while 228 or 35.3% escaped with bruises and other forms of injuries as in Figure 2.

This survey also has a grasp of poor state of road as a factor responsible for accident in the area of study. In Gboko, of the 520 cases reported, poor state of roads was responsible for 145 or 27.9 % of accidents. Inferentially, there may be over 1000 cases of accidents caused by poor road network in Gboko alone if the result was projected to cover ten years; double the study period of this survey. The implication also on agencies responsible for road management is that emphasis be placed on remedial operations of all roads to facilitate smooth running of motorcycle operators. On another hand, operators should wear protective clothing and obey traffic rules knowing that not all roads are pothole free. Like other machines, the break system of the motorcycles are not 100 % effective. Issues like environment, types and quality of tires and nature/topography of roads may constitute reasons why breaks fail. To this end, brake failure had caused 120 or 23.1 % of accidents recorded in five (5) years. Although, break failure does not occur without prior indicators, except if the operator neglected such signs.

Nature of Injuries Sustained

Injuries are almost inevitable when a motorcycle is involved in an accident, especially when it is a head-on-collision. Invariably, there is usually a direct inelastic collision with the motorcycle operator of the passenger. This is so because riders are used to reckless riding and do not obey traffic rules. To worsen the situation, is the reckless riding and over speeding on the part of the riders. Figure 2 is the report of the nature of injuries sustained over the same period in the understudied state as a result of unscrupulous riding practices of the motorcycle operators. Against this backdrop, 280 or 53.8% of injuries in Gboko were head injuries, 115 or 22.1% were fractures, while the remaining 125 or 24.1% end with bruises and other injuries. The implication of this outcome is that most of the accidents may result in serious injury and in some cases loss of lives. This is because the bulk of accidents are head injuries aligned and that makes it more fatal-like. These further strengthen the abolished nationwide helmet campaign initiated by the FRSC in the year 2005 and early 2006.

Operators of commercial motorcycles in an interview claimed helmets are additional burden and may transmit communicable diseases. The contemporary STI policy preaches adoption and adaption of Science, Technology and Innovation culture by all Nigerians and therefore does not renege in factoring in all and sundry. To this end, as the nation approaches the implementation in phases, there is need for training of motorcycle operators on best practices in the use of helmets and other protective accessories as practiced and found relevant in reduction of death rates in the USA and UK (Preusser, et al., 1995).

In addition, Oturkpo reported 582 cases of accident. Causes of these accidents ranges from poor state of roads (175 or 30.1%), non-observance of traffic rules (110 or 18.9%), sudden stoppage by law enforcement and over speed both had 80 or 13.7% occurrence. Recklessness trailed with 67 or 11.5%. In all, about 223 or 38.3% of injuries in Oturkpo were head injuries, 177 or 30.4% were fractures, while the remaining 182 or 31.3% end up with bruises and other injuries. This result is not in any way far from that obtained at Gboko and even Zaki-Biam. The common feature is the prevalence of head injuries, which is a pointer to the importance of helmets. In the cases of fractures and bruises...
sustained by operators, protective boots and kneel caps may be an option worth considering. Proposal of technical and vocational education and training (TVET) in technological capability building may also be an option to minimizing the prevalence of accidents.

Figure 2 Nature of injuries sustained

In affirmation to TVET capability building as an option to reducing the prevalence of accident, operators in Zaki-Biam, had 330 cases reported, poor state of roads were responsible for 115 or 34.8% of accidents. Brake failure with 67 or 20.3% and non-observance of traffic rules had 55 or 16.6%. Over speed had 47 or 14.1% occurrence while sudden stoppage by law enforcement recorded 26 or 7.8% and recklessness trailed with 20 or 6.1%. In the four (4) towns surveyed, bruises and fracture almost tied, with the exception of Makurdi, head injuries remain the highest recorded case in accidents involving commercial motorcycle operators. The pattern of injuries sustained was maintained as 155 or 46.9% of injuries in Zaki-Biam were head injuries, 90 or 27.3% were fractures, while the remaining 85 or 25.8% ending with bruises and other injuries. The situation in Makurdi town diverged slightly from what obtained in aforementioned towns. Fractures are the major concern of operators in Makurdi, this is followed immediately by bruises and other injuries as head injuries recorded about 170 of cases reported. It may be insinuated that operators in Makurdi are likely to be aware of the dangers of sustaining head injuries and often settle for less dangerous injuries than exposing their heads to danger. However, this left orthopedics with more fractured bones to handle since fractures and bruises top the chart of cases recorded between 2005-2010.

CONCLUSION

This paper observed the prevalence of accidents involving the commercial motorcycle operators in Benue state, Nigeria within five (5) years, 2005-2010. Likening the causes of accidents in the four (4) towns, it is clear that over speeding, noncompliance with traffic regulations and recklessness remain prominent among other reasons. Brake failure and sudden stoppage by law enforcement agents are the least suspected reasons why a motorcycle operator should be involved in an accident. Injuries sustained as a fallout of these causes range from head injuries to fractures and bruises, with more head injuries recorded than any other type of wounds. From the causes of accidents and the nature of injuries sustained by commercial motorcycle operators in the four commercial towns of Makurdi, Oturkpo, Gboko and Zaki-Biam in Benue State, Nigeria, it is clear that there is an urgent need to enforce the use of safety helmets and speed limits to reduce the number of accidents and the resulting injuries sustained the users of this mode of transport. Again, this paper propose capacity development and a synergy among stakeholders (GIA) as proposed by the STI policy to reform the commercial motorcycle operators and the FRSC on best practices as obtainable in the USA and UK to minimize
to the barest minimum the number of injuries and casualties.

References: