



Knowledge, Attitude and Compliance with Safety Protective Measures and Devices among Commercial Motorcyclists in Sokoto Metropolis, Northwestern Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author NL design the study, performed the statistical analysis, write the protocol and write the first draft of the manuscript. Authors MOO, BAI and AY managed the analyses of the study. Author MOR managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: Motorcycle accidents occur frequently in this part of the world as a result of interface among the agent, the host and its environment resulting in fatal consequences. The objective of this study was to assess the Knowledge of, attitude and compliance with road safety protective devices among commercial motorcyclists in Sokoto metropolis, Sokoto.

Methods: A cross-sectional descriptive study was carried out among 307 commercial motorcyclists randomly selected from 40,000 commercial motorcyclists in Sokoto metropolis who are registered with Amalgamated Commercial Motorcycle Riders Association of Nigeria using a multistage

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sampling technique. A pre-tested 99 item, structured interviewer-administered questionnaire was used as the tool for data collection. The Data were analyzed using SPSS version 20.

Results: Majority of respondents (67%) had poor overall knowledge of road safety measures, while 60.9% could not identify earplugs. Equally, 77.9% could not correctly identify zebra crossing, and 87.9% were unable to correctly identify the overtake do not overtake road sign. On the other hand, less than one third (30.6%) of respondents had positive attitude towards use of road safety protective devices; with 47.2% of respondents perceiving the use of safety devices as unimportant and 19.5% do not regard adherence to safety protective devices as measure that can prevent injuries from RTA. Majority (99.7%) of the respondents had inappropriate safety measure practice, as most of the respondents reported they had never worn a reflective jacket. In terms speed, 93% of the respondents confessed that they usually ride fast to beat traffic light while 79% confirmed that they observe regulated speed limit, as 32% revealed that they rarely use traficator before turning to a junction.

Conclusion: Most of the respondents had poor overall knowledge of road safety measures, less than one third had positive attitude towards use of road safety measures while majority had inappropriate safety measure practice.

Recommendation: Ensuring formal training, vigorous enlightenment campaigns and enforcement on the use of safety protective devices by the relevant key authorities will greatly help improve the Knowledge, attitude and practices of commercial motorcyclist.

Keywords: Attitude; commercial motorcyclists; compliance; knowledge; safety protective device.

1. INTRODUCTION

Road traffic accidents occur when a vehicle collides with another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole [1]. It is an accident which takes place on the road between two or more object, one of which must be any kind of moving vehicle, [2] Global experience shows that, road traffic accidents lead to several deaths, disability as well as financial cost to both societies and the individuals involved. Unfortunately, there is generally increasing incidences, of morbidity and mortality rates through road traffic accidents. It is quite disturbing that people are injured in road accidents almost on daily basis particularly in developing countries like Nigeria. Accordingly, one major challenge is the fact that, despite its enormity, this dangerous phenomenon of road traffic accident does not seem to be appreciated by certain critical stakeholders in road use since clear evidences show that enough preventive measures are not taken [1]. Available records indicate that about 1.24 million people die each year globally as a result of road traffic crashes [3]. The same factor has been regarded \ second leading cause of death globally among young people 5-29 years [4]. And third among 30-44 years [4]. Most recent safety data in Nigeria shows that, in 2012, there were 13 262 reported road crashes, which caused the deaths of 6 092 persons, 1% more than in 2011. Also in 2013, there was a 2% increase in road traffic crashes, a 2% increase in injuries and a 6% increase in

fatalities when compared with the 2012 [5]. Specifically, in Sokoto state about 1,468 cases of road traffic accidents were registered by FRSC Sokoto command between 2011- 2013, [5] with 95 cases of fatality at the accident spot. An okada (also: *Kabu kabu, Achaba, Going, Inaga*) is a commercial motorcycle used as a means of especially township transportation in Nigeria. it constitutes a significant proportion of modal choice of commuters in many cities since the late 80's [6]. It was reported that in 1995, an estimated 45,000 motorcycles were in use for public transportation in Lagos metropolis alone [6]. In 2004 and 2005, 52% of all motor vehicle license plates were for motorcycles, and about 2% of the 2004 motorcycle license plates were produced for commercial purposes [7]. In Sokoto metropolis, motorcycle accidents constituted 40% of road traffic accidents in 2009 [8].

It should be noted that road traffic deaths and injuries can be prevented [4]. However, the only key to successful prevention lies in the commitment of all relevant stakeholder representing various sectors: public and private-health, transport, education, finance, police, legislator, manufacturers, foundation and the media. This study is carried out aims to determine Knowledge, attitude and compliance with road safety measures among commercial motorcyclists in Sokoto metropolis, Sokoto, North-Western Nigeria. Motorcycle injuries have not received the attention they deserve partly

due to insufficient local data, and the public policy responses to this epidemic seem to have been neglected at regional and national level.

2. MATERIALS AND METHODS

Sokoto is situated in the North- Western part of Nigeria. The State was created from Old North-western in 1976; it assumed its present form after the creation of Kebbi State (in 1991) and Zamfara State (in 1996) It is bounded by Zamfara State to the South, Kebbi state to the west, Katsina State to the east and Niger Republic to the North. The State has 23 Local Government with Sokoto Metropolis being the capital, and it comprises the Sokoto North, Sokoto South and some part of Dange shuni, kware and Wamako Local Government Area. The metropolis is the seat of Government and popularly called the seat of caliphate. It lies between longitudes 05 11 to 13 03 east, latitude 13 00 North and covers area of 60, 33 square km. The average projected population of the state for 2015 is 4,886.888 (UNFPA, 2015) with the metropolitan having (2,425,969) Sokoto covers a total Land area of 26,595,000m² thus constituting about 59% of the country total land mass. The state has an average annual temperature of 28.3° C (82.9° F), it is one of the hottest cities in the country. The annual rainfall ranges between 500mm – 1,300mm and occurs between May and September with a peak in August, the dry season usually spans from November to March during which there is harmattan period that is characterized by the cold dusty wind between the months of November to February. The hot periods starts from March and ends around May during which the recorded environmental temperatures are in the range of 38°C – 42°C with an average humidity of less than 20%. The people are mainly Hausa/Fulani; others are Zabarmawa, and other various tribes from different part of the country. Islam is the predominant religion. The vegetation is that of Savannah zone with grassland suitable for the cultivation of grains and animal husbandry. The people are mainly farmers. However some engage in art work like shoe making, tanning, Black- Smiting and other various kind of trade. There are four motorparks within Sokoto metropolis with Central motor Park being the largest others are Kara Motor park, Illela garage Motor park and Kalambaina Motor Park, Kwannawa, Round mai ruwa, Hubbare and Dandima garage. The commonest mode of transportation in Sokoto metropolis is commercial motorcycle. The people engaged in such

transportation services have an Association called (ACOMORAN) which is an acronym of "Amalgamated Commercial Motorcycle Riders Association of Nigeria" headed by a Chairman and the secretary, with different units headed by the unit chairmen. The association has a total number of about 60,000 commercial motorcycle riders in the state (Acomoran 2014) And those in the metropolis constitutes about 40,000 and about 15,000 are registered with the association which maintains a daily register in their unit in order to carry out their services, The units are categorized below:

For Sokoto North there are 12 units and had 2556 registered riders as at the time of this study.

For Sokoto south there are 24 units these constitutes about 8000 riders but only about 3048 had registered with the association as at the time of this study.

In Dange Shuni there are 18 units with 2,548 Riders registered with the association while Wamako LGA has 36 units which constitute about 6000 Riders with about 4,233 registered one, and kware has about 1200 registered members as at the time of this study.

A cross sectional descriptive study design was employed to determine the knowledge, attitude and compliance with road safety measures among commercial motorcyclists. The population of the study consists of registered commercial motorcyclists that operate mainly in metropolis and have spent at least 6 months in commercial motorcycling business. All persons that have not met these criteria were therefore excluded from participating in the study.

A multistage sampling technique was adopted for the study.

Stage I: This involved the selection of units by simple random sampling technique using the balloting method to select 25% of the units in each of the metropolitan local government areas. (Sokoto North 12, Sokoto South 24, Wamako 36, Dange Shuni 18, and Kware 4) that is Three, Six, Nine, Five, and one units respectively, were enrolled into the study (sample frame).

Stage II: Therefore proportional allocation was used to select the respondents (sample unit) from the sample frame. Thereafter, Systematic sampling was used to select the subjects of the study.

A pre-tested structured interviewer-administered questionnaire was used to collect the data from 307 commercial motorcyclists who consented, the questionnaire was pretested in a different commercial motorcycle station located in another Local Government Area away from that of the study after translation and back translation to ensure standardization. The data collection took place from the 30th November to 30th of December 2014 and was carried out by the six trained research assistants. The questionnaire consisted of six sections that sought information on: socio-demographic profile of the commercial motorcyclists, knowledge, attitude and compliance with road safety measures, cause and pattern of accident and injuries. Data collected was entered, validated, and analyzed using SPSS software version 20.0. For the descriptive aspect of the analysis, frequency distributions were generated for all categorical variables.

2.1 Ethical Consideration

Before embarking on the study, permission was sought from the Sokoto state ministry of health ethical review committee. Permission was also obtained from the chairman of Amalgamated Commercial Motorcycle Riders Association of Nigeria (ACOMARAN) Accordingly, each respondent was briefed and adequately informed on the purpose of the study, after which their consent was sought for. The respondents were all assured of their privacy and confidentiality on whatever information they would give.

2.2 Limitation of the Study

None response and excessive demand for incentives made some targeted riders non accessible for the study.

3. RESULTS

3.1 Socio-demographic Characteristics

A total of 307 respondents were studied and majority of them (72.4%) were within the age range of 20-29 years. All the respondents interviewed were males with 77.2% of them reported Hausa as their ethnic group and 93.0% of them indicated Islam as their religion. In terms of educational background, 41.0% of the respondents attended secondary school while 24.1% and 18.6% attended Quranic and primary schools. Over half (54.1%) of the respondents

are married. Majority (79.8%) of the respondents did not receive any form of formal training before the eventual commencement of their business. Detail of the socio-demographic characteristics of the respondents is summarized in Table 1.

Table 1. Socio-demographic profile of respondents

Variables	n (%)
Age (years)	
10-19	22 (7.1)
20-29	153 (49.0)
30-39	102 (32.7)
40-49	27 (8.7)
≥50	3 (1.0)
Mean Age= 28.6, ±7.03	
Sex	
Male	307 (100)
Female	0 (0)
Marital status	
Single	118 (38.4)
Married	166 (54.1)
Separated	13 (4.2)
Divorced	10 (3.3)
Religion	
Islam	293 (95.4)
Christianity	14 (4.6)
Ethnicity	
Hausa	237 (77.2)
Fulani	46 (15)
Yoruba	9 (2.9)
Igbo	6 (2.0)
Others	9 (2.9)
Education	
Primary	57 (18.6)
Secondary	126 (41.0)
Tertiary	47 (15.3)
Qur'an	74 (24.1)
Others	3 (0.9)
Motorcycle riding training school attendance	
Yes	62 (20.2)
No	245 (79.8)

3.2 Knowledge on Safety Protective Devices

A significant proportion of the respondents (59.0%) are aware of safety protective devices, however, majority of them (67.0%) seem to have poor knowledge of what a safety protective device is. The only safety protective devices known by the respondents were; Crash helmet, eye goggles, and boots constituting 81.4%, 80.1% and 70.0% respectively.

Table 2.

Variable	n (%)
Good Knowledge ($\geq 50\%$)	101 (33.0)
Poor Knowledge ($< 50\%$)	206 (67.0)
<i>Mean Knowledge score 44.13 \pm 13.97</i>	

3.3 Attitude toward Safety Protective Devices

In terms of willingness to wear safety protective devices, 79.2% of the respondents are willing to do so, and agreed that adhering to safety measures can prevent injuries from RTA. But 52.8% of the respondents perceived that using safety protective devices is not important and can only be observed in case of meeting authorities on the road. However, overall attitude of the respondents towards safety protective device was poor 69.4%.

3.4 Compliance with Use of Safety Protective Devices

Majority of the respondents owned eye goggles (41.7%), boots (29.6%) and hand gloves (28.7%). However, almost all of them do not use the items while riding motorcycles. Therefore, in terms of their compliance score it was poor as 99.7%. Compliance with safety protective device was measured during the interview through one-off observation and asking respondents to show the type of safety protective device presently with them.

3.5 Association of Socio-demographic Characteristics with Knowledge of Road Safety Measures

Majority 58 (57.4%) of the respondents that with good knowledge are within the age of less than 30 years, and 117 (56.8%) of those with poor knowledge are also within this age range. About

55 (54.5%) of respondents with good knowledge are married, 78 (96.0%) Hausa by tribe and 114 (55.3%) married had poor knowledge. Among those who had formal education 75 (74.3%) had good knowledge of road safety measures however there was no statistically significant association between socio-demographic characteristic and knowledge.

3.6 Association of Socio-demographic Characteristics with Attitude towards Use of Road Safety Measures

Majority of the respondents that have positive attitude are less than 30 years of age and 74 (78.7%) of those with formal education showed positive attitude but there was no statistically significant association between socio demographic profile and attitude toward the use of safety measures.

3.7 Association of Socio-demographic Characteristics with Practice of Road Safety Measures

Majority of respondents 233 (76.1%) with formal education engage in inappropriate practice of road safety measures, 174 (56.9%) of the respondents who are less than 30 years of age manifest inappropriate practice. Thus, there was no statistically significant association between socio demographic profile and practice of road safety measures.

4. DISCUSSION

This study investigated the Knowledge, attitude and practice of road safety measures and pattern of accident and injuries among commercial motorcyclist in Sokoto metropolis. All the respondents in this study were males, which was already envisaged as this is a male dominated occupation. This is similar to the finding

Table 3.

Variable	Correct n (%)	In correct n (%)
Use of helmet is a protective measure	250 (81.4)	57 (18.6)
Use of eye goggles is a protective measure	246 (80.1)	61 (19.9)
Use of boots is a protective measure	215 (70.0)	92 (30)
Use of gloves is a protective measure	173 (56.4)	134 (43.6)
Use of reflective jacket is a protective measure	145 (47.2)	162 (52.3)
Use of ear plugs is a protective measure	122 (39.7)	185 (60.3)
Use of long pant is a protective measure	120 (39)	187 (60.9)

of, [9,10,11] the numerous risks associated with motorcycling might explain why there is male preponderance in such business in addition to the fact that it such is culturally acceptable in the study environment for females to engage in commercial motorcycling although there are no laws forbidding women from using motorcycles in the country.

Table 4.

Variable	Knowledge		df	x ²	P
	Good n (%)	Poor n (%)			
Age					
< 30	58 (57.4)	117 (56.8)	1	0.011	0.917
≥ 30	43 (42.6)	89 (43.2)			
Marital status					
Single	44 (43.6)	75 (36.4)	3	5.216	0.157
Married	55 (54.5)	114 (55.3)			
Separated	1 (1.0)	8 (3.9)			
Divorced	1 (1.0)	9 (4.4)			
Level of education					
Formal	75 (74.3)	158 (76.7)	1	0.221	0.638
Non formal	26 (25.7)	48 (23.3)			
Religion					
Islam	97 (96.0)	196 (95.1)	2	0.610	0.737
Christian	3 (3.0)	9 (4.4)			
Ethnicity					
Hausa	78 (77.2)	160 (77.7)	4	2.669	0.615
Fulani	16 (15.8)	30 (14.6)			
Yoruba	1 (1.0)	8 (3.9)			
Igbo	2 (2.0)	3 (1.5)			
Others	4 (4.0)	5 (2.4)			

Table 5.

Variable	Attitude		df	x ²	p
	Positive n (%)	Negative n (%)			
Age					
< 30	57 (60.6)	118 (55.4)	1	0.730	0.393
≥ 30	37 (39.4)	95 (44.6)			
Marital status					
Single	33 (35.1)	86 (40.4)	3	2.850	0.415
Married	57 (60.6)	112 (52.6)			
Separated	1 (1.1)	8 (3.8)			
Divorced	3 (3.2)	7 (3.3)			
Level of education					
Formal	74 (78.7)	159 (74.6)	1	0.592	0.442
Non formal	20 (21.3)	54 (25.4)			
Religion					
Islam	93 (98.9)	200 (93.9)	2	5.823	0.054
Christian	1 (0.3)	13 (4.2)			
Ethnicity					
Hausa	80 (85.1)	158 (74.2)	4	6.514	0.164
Fulani	11 (11.7)	35 (16.4)			
Yoruba	0 (0)	9 (4.2)			
Igbo	1 (1.1)	4 (1.9)			
Others	2 (2.1)	5 (3.3)			

Table 6.

Variable	Practice		df	x ²	p
	Appropriate n (%)	Inappropriate n (%)			
Age					
< 30	1 (100)	174 (56.9)	1	0.75	0.384
≥ 30	0(0)	132 (43.1)			
Marital status					
Single	0 (35.1)	119 (38.9)	3	0.819	0.845
Married	1(100)	168 (54.9)			
Separated	0 (0)	9 (2.9)			
Divorced	0 (0)	10 (3.3)			
Level of education					
Formal	0 (0)	233 (76.1)	1	0.592	0.442
Non formal	1 (100)	73 (23.4)			
Religion					
Islam	1 (99.3)	292 (95.4)	2	0.048	0.926
Christian	2 (0.7)	12(3.9)			
Ethnicity					
Hausa	0 (0)	238 (77.8)	4	5.692	0.223
Fulani	1 (100)	45(14.7)			
Yoruba	0 (0)	9 (2.9)			
Igbo	0 (0)	5 (1.6)			
Others	0 (0)	9 (2.9)			

This study showed that nearly half (49.0%) of the respondents were within the age range of 20-29 years, and a mean age of 28.6 years this is in consonance with findings obtained by, [9,12,13] in Ibadan, who found the age range of their respondents to be 20-29years, the Similarity in the age range for the respondents in the two centers (Zaria and Ibadan) may not be unconnected to the high level of unemployment among the youths in the country which has forced the youths to take to motorcycles riding as business to earn a living. Majority (74.9%) of the commercial motorcyclist had formal education which is similar to the findings of, [9] conducted in Zaria where (70%) of their subjects had formal education, however the figure obtained from this study is lower than the one obtained by, [12,14] in Lagos, and in Ibadan where (91.6%), and (94.2%) had formal education respectively. These differences may be due to higher number of unemployed graduate in the south west region more than North West region of Nigeria. The significance of this finding is that it could enhance better awareness and knowledge of safety practice amongst the motorcyclist. Majority of respondents did not receive any formal training before commencement of the business, similar to the findings obtained by [14,13]. However the findings obtained from this study was higher than the one obtained by [12] in Ibadan, (38%). Generally, lack of formal training is a major risk factor for road traffic accidents by

motorcyclist. . This goes to show that both the passengers and commercial motorcyclists subject themselves to a great risk of motorcycle injury while riding their motorcycle. This underscores the need for enforcement of regulations for people to qualify to drive or ride especially commercial vehicles or motorcycles respectively in Nigeria.

This study also revealed that about Fifty Nine percent of the respondents are aware of road safety measures, which is lower than the figures obtained by, [9,13] who observed that (88.0%) and (77.0%) of their respondents are aware of road safety measures respectively, The study also showed that while majority of the commercial motorcyclists who were aware of safety protective devices knew that adhering to safety measures can prevent injuries from road traffic accident (79.2%), their understanding of safety protective devices is only crash helmet, eye goggle, and boots as a protective device, which is similar to findings obtained by, [13] in Lagos where (80%) of the respondents mentioned helmet as a protective devices but the figure obtained from this study is lower than the one obtained by, [9], Zaria where (92.7%) mentioned helmet as a protective devices. The high figure obtained in the Zaria study might be attributed to the fact that there was a rule in Ahmadu Belloh university Zaria during the period of this study, that no motorcycles will be allowed

to enter the university without helmet and this must have contributed to the increased awareness amongst the riders in terms of regular usage of helmet. However (80.1%) of the respondents can correctly identify eye goggles as road safety protective devices and also in another study shows helmets were used by less than one third of motorcycle drivers [15]. In terms of knowledge therefore, majority (67.1%) of the commercial motorcyclists had poor knowledge of road safety protective devices however the figure obtained from this study is lower than the one obtained by [9,16]. This gives an indication that, most motorcyclists do not undergo any form of formal training where they should have been given the basics or fundamental principles underlying the road and safety measures. And this might be the main reason why prevalence of RTA was high among the commercial motorcyclist. In some countries like India there is good legislation that control licenses issuance to commercial motorcycle riders before they plunge into the business unlike in Nigeria where people may decide to buy motorcycle at any time and start business without going through the driving school to acquire basic knowledge and skills.

One's attitude towards another, Object, or idea can be positive or negative or both. According to, [17] attitude can be seen to be an evaluative reaction to a concept such as road safety measures. They also noted that, attitudes towards a concept may be mixed and not necessarily be consistent within the individual. Riding safely is held in high regards among dedicated motorcyclists. However, the enjoyment of taking risks and the enjoyment of speed, in particular, are higher for motorcyclists than for car drivers. That notwithstanding, although speed violation is a significant predictor of road accidents, the biggest predictor of crash among motorcyclists cannot be blamed on non-deliberate errors but on violations of the safety measures, [18].

In this study findings on attitude of respondents revealed that about (69.4%) of the respondent had negative attitude to the use of protective devices. The figure obtained from this study is high when compared to the one obtained by [14,19] who found that (32.7%) and (18.7%) had negative attitude respectively. However; the findings are lower than the one obtained by [9,18] in Ghana, who found (95.2%) and (80%) respectively. Almost all (99.7%) of the respondents in this study had inappropriate compliance to protective devices, However the

figure obtained from this study is higher than the one obtained by, [9,19,20,21] who found (56.4%), (86.4%), (84.2%), and (67.6%) respectively. The high proportion of respondents with inappropriate practice is comparable to the high figure obtained in similar studies from Ibadan and Ogun State of Nigeria.

5. CONCLUSION AND RECOMMENDATION

It is evident from the findings of this study that although majority of the commercial motorcyclists defined safety protective devices as items worn for protection most of them do not know other safety protective devices aside helmet, eye goggle and boots. Most of the respondents think using safety wears make rider feels uncomfortable, therefore they can only wear in case of meeting authorities on the roads. In terms of accidents by the commercial motorcyclists, the commonly injured and affected parts were the lower limbs.

Ensuring formal training and vigorous enlightenment campaigns on road traffic regulations should be instituted by the relevant stakeholders in order to reduce the prevalence of accidents. While strict enforcement on using safety protective devices amongst the commercial motorcyclists by the relevant key authorities is necessary in order to reduce the prevalence of and severity of injuries during accidents.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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