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Road Use Regulations: Knowledge and Compliance Among Commercial Motorcycle Riders in Oluyole Local Government Area, Ibadan, Nigeria

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Abstract: The usage of motorbikes for commercial transportation has become increasingly popular, particularly when there are traffic jams in Nigeria. However, the number of injuries resulting from motorcycle accidents is rising, and there is insufficient data on how much commercial motorcyclists abide by traffic laws and regulations. This study, therefore, assessed the knowledge of road use regulations and compliance among commercial motorcycle riders in Oluyole Local Government Area (OLGA), Ibadan, Oyo state, Nigeria. A cross-sectional study was conducted 300 randomly selected commercial motorcyclists in OLGA. A validated semi-structured questionnaire was used to collect information. Data was analyzed using descriptive statistics and chi-square at p=0.05. Respondents' mean age was 31.9±7.0 years, 66.0% were married while 54% had a valid riding license. Sixty-eight percent of the participants stated that 50 km/hour is the speed limit for commercial motorcycle while 77.7% reported that the dotted white line on the road indicating a rider can overtake. The mean knowledge score was 7.8±1.8, 86.0% had good knowledge on road use rules and regulation. Most (99.7%) of the participants revealed that they always mindful of following road use rules while 37.0% said they always use helmet whenever they want to carry passengers. The mean level of compliance to road use rules and regulation was 6.3±0.6, only 31% were in full compliance with the road use rules and regulation. Significantly, commercial motorcycle riders who possess a valid drivers' license (36.6%) had full compliance to road use regulations compared to those without valid drivers' license (25.2%). Commercial motorcycle riders had good knowledge of traffic rules and regulations but full compliance was low. Compliance to road use rules and regulations should be enforced.

Keywords: Motorcycle Riders, Road Rules and Regulations, Helmet, Commercial Motocycle

1. Introduction

The use of motorcycle for commercial activities, where motorcycle riders carry passengers for hire has gained widespread acceptance in Nigeria. Motorcycles' ability to travel on roads where no car has gone before especially the urban slums and other narrow commercial areas have increased its acceptance in every part of Nigeria. For instance, studies have reported that the use of motorcycle is on the increase in African peri-urban and urban centers and is becoming the de facto means of transport [1-4]. This is because it is inexpensive, fuel-efficient, compact, agile, and easy to maneuver in congested areas [2, 5]. It is also an effective means of transportation with minimum delay as it requires just a passenger that is normally taken to their destination) [6].

Despite the many benefits of using motorcycles for business transportation, motorcycle accidents are among the most frequent causes of traffic injuries in Nigeria, according to a recent study [7]. This has caused a lot of concern among the general population, public health officials, and the many government bodies tasked with promoting road safety. In Nigeria, a significant fraction of traffic accidents are caused by motorcycles. For instance, Salako et al. [8] reported that a study they did in Sagamu, Ogun state, Nigeria, found that the

probability of injury or fatality for both riders and passengers in road traffic accidents and serious crash injuries involving commercial riders has increased dramatically in recent years.

A study in Calabar by Ngim *et al.* [9] attributed 52.8% of all limb injuries to motorcycle accidents with the riders and passengers as the victims. Similarly, Alti-Muazu and Aliyu [10] in a study in Zaria, Nigeria observed that a high prevalence of road traffic accidents were associated with the use of illegal drugs among the motorcyclists. Furthermore, Amoran *et al.* [11] reported in a study that only 23.3% could recognize more than half of the currently used road safety codes whileonly 15.7% obey these road safety codes most of the time they see it. Also, Özkan *et al.* [12] reported that traffic errors, control errors, speed violations, the performance of stunts, were common and non uses of safety equipment came out strongly as the principal factors causing motorbike accidents. Similarly, Moskal *et al.* [13], found motorcycle riders, being male, not wearing a helmet, consuming excess legal limit for alcohol, not following traffic rules, and taking more than one passenger at a time increased the risk of accidents.

Increasing use of motorcycles not only as a means of personal mobility but also for commercial transportation in both urban and rural areas of Nigeria has worsened the intra-urban road traffic accident records [14]. Most motorcyclists disobey traffic regulations and road signs and operate on the intra-city roads with abandonment and lack of due regard for their safety. The operators are usually indulge in drugs, ignorant of traffic codes, with no form of training on the use of motorcycles, and are majorly hirers of motorcycles for business [10, 11, 15]. Many motorcyclists have the habit of

scaring other road users from their rights-of-way and overtake the slow-moving vehicles on the right and the left without adequate warning. They claim the right-of-way where they have none [14].

However, Adherence to road traffic regulations and codes of conduct as enshrined in the Highway Code reduces the risk of occurrence, but road users often flout these crash prevention and impact mitigation rules. Nevertheless, there is a need to focus on improvements of motorcyclists' behaviors, reduction of risky riding behaviors, including efforts to improve their compliance to traffic rules and regulations. Therefore, this study was conducted to document the knowledge of road use regulations and compliance among commercial motorcycle riders in the Oluyole Local Government Area in Ibadan, a growing mega city in Oyo state.

2. Methodology

2.1. The Study Area

The study was carried out among commercial motorcycle riders in Oluyole Local Government Area in Ibadan, Oyo state, Nigeria. Oluyole Local Government is one of the oldest Local Government councils in Oyo State (Figure 1). The Local Government has its headquarters at Idi-Ayunre, Old Lagos/Ibadan road and has a population of 202,725 [16]. The Local Government shares boundaries with four Local Government Areas i.e. Ibadan South-West, Ibadan South-East, Ona-Ara and Ido, all within Ibadan Metropolis. While it shares boarders with Ogun State through Egbeda-Obafemi, Odeda and Ijebu North Local Government Areas.
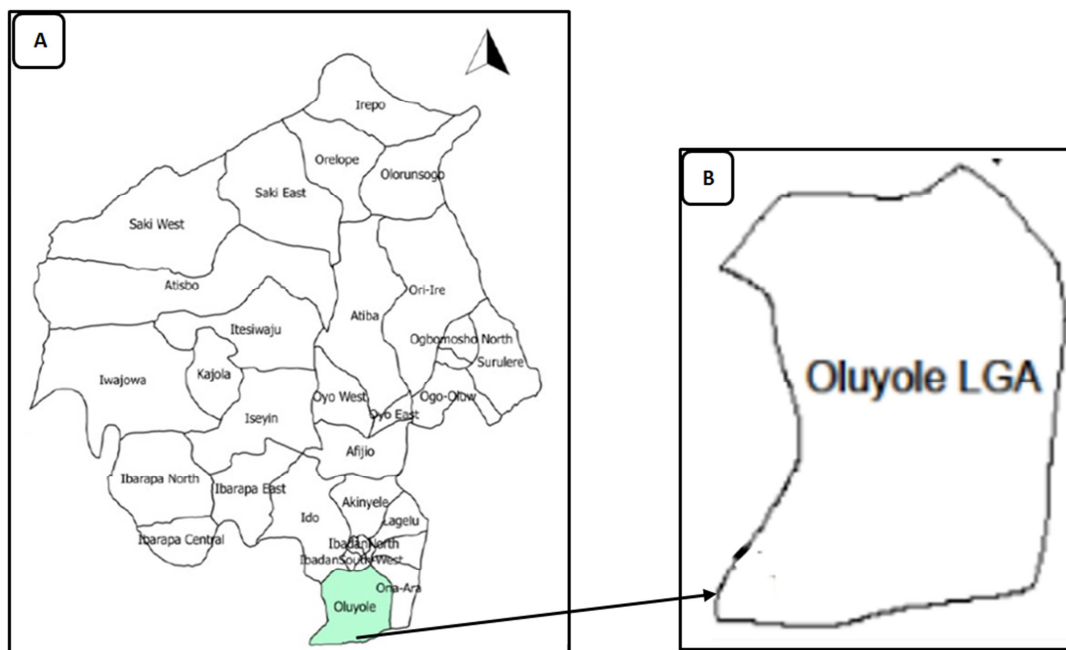

Figure 1. Map of study area [A=Map of Oyo state; B=Map of Oluyole local government area].

2.2. Study Design and Population

A cross-sectional study was carried out among 300

randomly selected commercial motorcycle riders. A validated semi-structured questionnaire was used to obtain information. Commercial motorcycle riders who were not

registered in all the parks within Oluyole Local Government Area were recruited to participate in the study.

2.3. Data Collection Instrument and Procedure

A validated, interviewer administered questionnaire containing 4 sections was used to collect data. The questionnaire captures the demographic information and motorcycle usage and traffic rules, a 12-point scale on knowledge of motorcycle riders on traffic rules and regulations, and 14-point scale on compliance to road rules and regulations. All the commercial motorcycle riders belong to a registered association. The executives of the association were met before the commencement of the data collection to discuss the purpose, objectives and benefits of the study. Also, their cooperation was solicited. This schedule was necessary to ensure that they understood all aspects of the study. The executive granted the permission and thereafter held a meeting with their members. During the meeting with their members, purpose and objectives of the study were discussed and their cooperation was secured. However, informed consent was obtained from motorcycle riders who accepted to be included in the study and the interview was conducted. The interview was conducted by four research assistants who had post secondary school education and were conversant with questionnaire research. They were further trained on how to use the instrument, and how they should introduce themselves and the research objectives modestly to the participants during the data collection.

2.4. Data Analysis

All the completed questionnaire were reviewed for completeness and the data entry and analysis was done using SPSS (Version 22) software. Descriptive statistics was conducted to obtain frequencies, percentage, mean and standard deviation. Knowledge of and compliance to road use regulations were measured on 12-point and 14-point scales, respectively. Scores of ≥6 and 14 were rated as good knowledge and full compliance respectively. Chi-square test was used to test for statistical association between sociodemography, knowledge and compliance to road traffic rules and regulations. Level of significance was set at p=0.05.

2.5. Ethical Consideration

Ethical approval was obtained from the Oyo State Ministry of Health Research Ethical Review Board. Written/verbal informed consent was obtained from participants after providing them with the information and benefits of the research. They were assured that information provided would be kept confidential and that they are free to withdraw from the research if the need arises. There was no any form of inducement before, during and after the data collection.

3. Results

3.1. Socio-Demographic Information and Motorcycle Usage

Table 1 presents the socio-demographic characteristics of the commercial motorcycle riders. Respondents'' mean age was 31.9±7.0 years, 66% were married while 87% were engaged in menial job as other income generating activities. More than half (52.0%) of the participants revealed that they had been riding a motorcycle for more than 3 years while 70% stated that they learnt motorcycle riding from friend. Majority (62.4%) reported that the training took less than 3 months while 53.7% had valid drivers' license. About a quarter (25.3%) of the participants said that they had ever been arrested for not having a valid license while 42.3% said they had ever been involved in road accidents.

Table 1. Socio-demographic information and motorcycle usage.

Socio-demographic characteristics	Frequency	Percentage
Age distribution in years		
<30 years	130	43.3
30 – 39 years	123	41.0
40 – 49 years	42	14.0
50 and above	5	1.7
Mean±SD=31.9±7.1		
Marital status		
Married	198	66.0
Single	91	30.3
Separated	6	2.0
Divorced	5	1.7
Other income generating source		
Menial job	260	86.7
Student	31	10.3
Government employee	9	3.0
The period since riding a motorcycle		
< 1 year	29	9.7
1 – 3 years	115	38.3
>3 years	156	52.0
Point where motorcycle riding was learnt		
Friends	210	70.0
From Relatives	78	26.0
From driving school	12	4.0
Duration of training on motorcycle riding		
< 3 months	187	62.4
3- 6 months	92	30.7
>6 months	21	7.0
Ownership of a valid driver's license	161	53.7
Ever been arrested by POLICE for not having a valid license	76	25.3
Ever been involved in road accidents	127	42.3

3.2. Traffic Rules Practices Among Motorcycle Riders

Most (98.7%) of the participants said they observe speed limit when riding as shown in Table 2. About Ninety-seven percent stated that they follow road signs, 38.7% revealed that they use of the helmet while 14.3% reported that they ensure the passengers wear a helmet. Majority (92.7%) of the participants stated that they take more than one passenger on a go, 88.0% said there are no distraction during riding while 32.0% revealed that they wear other personal protective equipment.

Table 2. *Traffic rule practices among motorcyclists.*

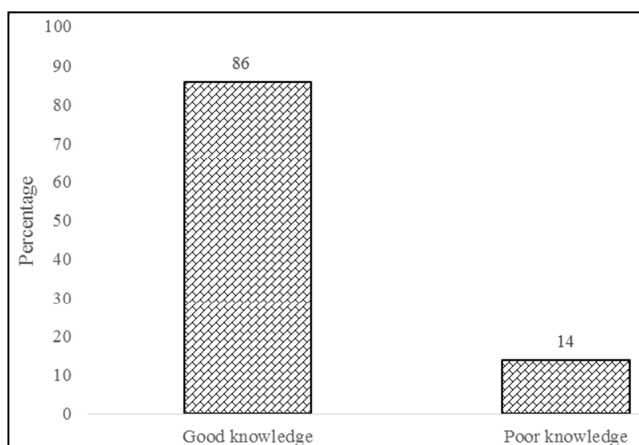| Traffic rule	Frequency	Percentage
Do you observe speed limits when riding	296	98.7
follow the road signs	290	96.7
wear a helmet while driving	116	38.7
Insist that passengers should wear a helmet	43	14.3
Take more than one passenger on a go	278	92.7
No distraction during riding	264	88.0
Wear other personal protective equipment	96	32.0

3.3. Knowledge of Motorcycle Riders on Road Use Rules and Regulations

Table 3 presents the knowledge of motorcycle riders on the road use rules and regulation. Majority (68.0%) of the participants stated that 50 km/hour is the speed limit for commercial motorcycle, 98.4% said that green traffic light signaling go/move/pass while 90.8% stated that red traffic light signaling stop/stop-over/wait. About forty percent (40.3%) stated that orange light signaling about to go/get ready to move/caution to proceed, 93.3% revealed that left-side being the safe side to overtake a vehicle while 77.7% reported that the dotted white line on the road indicates a rider can overtake. The mean knowledge score was 7.8±1.8 while 86.0% had good knowledge on road use rules and regulation as depicted in Figure 2.

Table 3. *Motorcycle riders' knowledge on road use rules and regulations.*

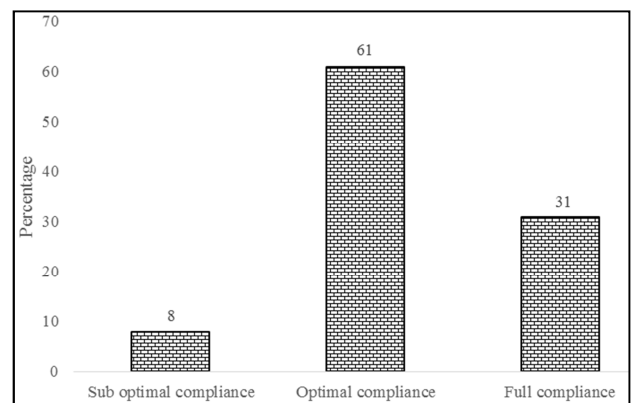| Knowledge variables	Frequency	Percentage
The speed limit for commercial motorcycle		
50 km/hr.*	204	68.0
70 km/hr.	50	16.7
100 km/hr.	28	9.3
150 km/hr.	18	6.0
What does the GREEN traffic light sign mean?		
Go/Move/Pass*	295	98.4
Don't know	5	1.6
What does the RED traffic light sign mean?		
Stop/Stop-over/Wait*	272	90.8
Danger	18	6.0
Don't know	10	3.2
What does the ORANGE traffic light sign mean?		
About to go/Caution to proceed/Get ready to move*	121	40.3
Slow down/ wait	167	55.7
Don't know	12	4.0
Safe side to overtake		
Left side*	280	93.3
Right side	20	6.7
The line on the road that signifies a rider can overtake		
Dotted white line*	233	77.7
Solid white line	64	21.3
Don't know	3	1.0

Note: * are the correct response

Knowledge score: Mean±SD=7.8±1.8

Figure 2. *Category of Knowledge on road use rules and regulation.*

3.4. Compliance to Road Use Rules and Regulations

Compliance score: Mean±SD = 6.3±0.6

Figure 3. *Level of Compliance to Traffic Rules and Regulations.*

Most (99.7%) of the participants revealed that they always mindful of following road use rule as shown in Table 4. Only

37.0% said they always use helmet whenever they want to carry passenger while 98.7% stated that they do not usually drive above the appropriate speed limit. About eleven percent (10.7%) said they easily overtake other vehicles by the right side of the road while 98.0% reported that they always avoid

the use of cell phone each time they are riding a motorcycle. The mean level of compliance to road use rules and regulations was 6.3±0.6, only 31% were in full compliance with the road use rules and regulation as seen in Figure 3.

Table 4. Compliance to road use rules and regulations.

Compliance statement	Frequency	Percentage
I am always mindful of following the road regulations, knowing fully that I am of the road users	299	99.7
I always use my helmet whenever I want to carry a passenger	111	37.0
I do not usually drive above the appropriate speed limit	296	98.7
I easily overtake other vehicles by the right side of the road	32	10.7
I always avoid the use of my cell phone each time I am riding a motorcycle	294	98.0
I always follow road traffic lights when I see one	296	98.7
I always keep a safe distance and avoid riding too close to moving vehicles	299	99.7
I always avoid taking alcoholic beverages or drugs before riding	298	99.3
I always check my motorcycle tyres, cables, chain, brake oil, fuel; before setting out	299	99.7

3.5. Comparison of Knowledge Category with the Sociodemographic Characteristics and Information on Motorcycle Usage

The result of comparison between knowledge category, sociodemographic characteristics and information on motorcycle usage is presented in Table 5. There is no significant association between knowledge category and age

distribution, the period since riding a motorcycle, point where motorcycle riding was learnt and having valid drivers' license. However, significantly, 92.4% of respondents who had been riding motorcycle for 3 – 6 months had good knowledge of road use regulations compared to 81.8% and 76.7% of those who had been riding motorcycle for less than 3 months and above 6 month respectively.

Table 5. Comparison of knowledge category with the sociodemographic characteristics and information on motorcycle usage.

Variables	Knowledge category		Chi-square/ Fishers	p-value
	Poor (%)	Good (%)		
Age distribution in years				
< 30	18 (13.8)	112 (86.2)	1.64*	0.907
30 – 39	16 (13.0)	107 (87.0)		
40 – 49	5 (16.7)	37 (83.3)		
50+	2 (11.8)	3 (88.2)		
The period since riding a motorcycle				
<1 year	4 (13.8)	25 (86.2)	5.05*	0.071
1 – 3 years	22 (19.1)	93 (80.9)		
>3 years	15 (9.6)	141 (90.4)		
Point where motorcycle riding was learnt				
From Friends	28 (13.7)	182 (86.3)	1.74*	0.672
From Relatives	10 (12.8)	68 (87.2)		
From driving school	3 (25.0)	9 (75.0)		
Duration of training on motorcycle riding				
< 3 month	34 (18.2)	153 (81.8)	9.91*	0.016
3 – 6 months	7 (7.6)	85 (92.4)		
>6 months	5 (23.8)	16 (76.2)		
Have a valid drivers' license				
Yes	19 (11.8)	142 (88.2)	1.03	0.311
No	22 (15.8)	117 (84.2)		

3.6. Comparison of Compliance to Road Use Regulations with Sociodemographic Characteristics, Information on Motorcycle Usage and Knowledge Category

The study revealed that there is no significant association between category of compliance to road use regulation, age distribution and duration of training of motorcycle riding as shown in Table 6. However, 34.8% of respondents who had been riding motorcycle for 1-2 years significantly had full compliance to road use and regulation than their counterparts

who had been riding for more than 3 years (33.3%) and less than a year (6.9%). Those who learnt motorcycle from driving school (50.0%) significantly had full compliance to road use regulations compared to their colleagues that learnt from friends (34.5%) and relatives (25.6%). Significantly, commercial motorcycle riders who possess a valid drivers' license (36.6%) had full compliance to road use regulations compared to those without valid drivers' license (25.2%). Furthermore, only 30.6% of respondents who had Good knowledge of road use regulation had full compliance to the

road use regulation, p<0.05.

Table 6. *Comparison of category of compliance to road use regulations with sociodemographic characteristics, information on motorcycle usage and knowledge category.*

Variables	Category of compliance			Chi-square/ Fishers	p-value
	Full (%)	Optimal (%)	Sub-Optimal (%)		
Age distribution in years					
< 30	33 (25.4)	82 (63.1)	15 (11.5)	18.18	0.052
30 – 39	48 (39.0)	66 (53.7)	9 (7.3)		
40 – 49	10 (33.3)	31 (63.3)	1 (3.3)		
50+	1 (20.0)	3 (60.0)	1 (20.0)		
The period since riding a motorcycle					
<1 year	2 (6.9)	20 (69.0)	7 (24.1)	17.47	0.002
1 – 3 years	40 (34.8)	65 (56.5)	10 (8.7)		
>3 years	52 (33.3)	96 (61.5)	8 (5.2)		
Point where motorcycle riding was learnt					
From Friends	68 (34.5)	125 (58.4)	17 (7.1)	15.67*	0.010
From Relatives	20 (25.6)	52 (66.7)	6 (7.7)		
From driving school	6 (50.0)	4 (33.3)	2 (16.7)		
Duration of training on motorcycle riding					
< 3 months	54 (28.9)	120 (64.2)	13 (6.9)	5.97	0.427
3 – 6 months	34 (37.0)	48 (52.2)	10 (10.8)		
> 6 months	6 (28.6)	13 (61.9)	2 (9.5)		
Have a valid drivers' license					
Yes	59 (36.6)	95 (59.0)	7 (4.3)	9.86	0.007
No	35 (25.2)	86 (61.9)	18 (12.9)		
Knowledge of road rules and regulations					
Poor knowledge	15 (36.6)	19 (46.3)	7 (17.1)	6.31	0.043
Good knowledge	79 (30.5)	162 (62.5)	18 (6.9)		

4. Discussion

The study documents the road use regulations knowledge and compliance among commercial motorcycle riders in Oluyole Local Government Area, Ibadan, Nigeria. It was found that large proportion of the participants in this study mentioned 50 km/hour as the speed limit for commercial motorcycle which they observed. Most of the motorcycle riders revealed that green traffic light signaling go/move/pass whereas red traffic light signaling stop/stop-over/wait. These findings are in consonance with the highway safety code which stipulated that the motorcyclists need to slow down at intersections, keep within speed limit and when the need to turn arises should make use of traffic indicator [17, 18]. Many motorcyclists have the habit of scaring other road users from their rights-of-way and overtake the slow-moving vehicles on the right and the left without adequate warning, claiming the right-of-way where they have none [14]. In this study however, most of the respondents mentioned left-side being the safe side to overtake a vehicle. This indicated that the commercial motorcycle riders who participated in this study were aware about the rules and regulation concerning vehicle overtake during the movement on the road. Moreover, the use of motorcycle helmets are a highly effective road safety intervention that reduces the frequency and severity of head injuries resulting from a traffic accident [19]. In this study however, 37% of the commercial motorcycle riders always wear helmet during riding whereas only 14.3% informed their passengers to wear helmet. Similar results had been reported that only negligible number of the participants

used helmet or supplied helmet to their passengers [20]. This indicated that most of the commercial motocycles riders in the study setting did not obliged with the safety code on the use of helmet during driving.

Furthermore, most of the motorcyclists in this study had good knowledge of traffic rules and regulations. The data also revealed that there is no significant association between knowledge of road use, and age distribution, the period since riding a motorcycle, point where motorcycle riding was learnt and having valid drivers' license. This is indicated that neither age distribution of the motorcycle riders nor the period since riding a motorcycle, point where motorcycle riding was learnt and having valid drivers' license has influence on the knowledge of road use among the study group. However, significant association existed between respondents' period of riding motorcycle and knowledge of road use regulations. These findings revealed that motorcycle riders who had been riding motorcycle for over a year had more knowledge about the road use law and regulations.

Disobedience to road signals among commercial motorcyclists and over speeding are some of the causes of motorcycle accidents [21]. The study revealed that majority of the motorcyclists were aware of some road rules and regulations including avoidance of the use of cellphones while riding, keeping a safe distance, and avoid riding too close to moving vehicles. Previous study has reported similar findings that most of the commercial motorcycle riders did not obey the road use law and regulations [22]. However, only 31% of the commercial motorcycle riders in this study had full compliance with road use rules and regulations. Deficiency in the compliance of the commercial motorcycle riders to road use

rule and regulation could be a risk factors for accidents occurrence. For example, previous studies have highlighted the importance of rider's license and permit with the awareness of road code, riding experience, and traffic signs as essential predictors of road traffic crashes [1, 23, 24, 25]. This study however, found that more commercial motorcycle riders who possess a valid drivers' license had full compliance to road use regulations compared to those without valid drivers' license. Furthermore, participants who had been riding motorcycle for 1-2 years significantly had full compliance to road use and regulation than their counterparts who had been riding for less than a year. Previous studies have reported similar findings [26, 27, 28]. The present findings might be attribute to the experiences they might have acquired during operation. Also, it was revealed that participants who learnt motorcycle from driving school significantly had full compliance to road use regulations compared to their colleagues that learnt from other avenue such as friends and relatives. Driving school is a formal avenue of learning motorcycle riding and the learner has to go through some procedure. Learners would be able to keep the procedure and find it easy to put into use. Only 30.6% of respondents who had good knowledge of road use rules and regulations were fully compliance. This proportion was low but the association was significant. This is an indication that having good knowledge of road use rules and regulations is necessary to improve the participants' compliance.

5. Conclusion

The study discovered that few individuals used helmets when driving, and even fewer made sure that their passengers did. The majority of participants had a strong understanding of traffic laws and regulations, although few of them had fully complied. Additionally, having a valid driver's licence and having ridden a motorbike for 1-2 years were some of the criteria that strongly influenced the participants' compliance with road use laws and regulations. Furthermore, improving participant compliance requires having solid awareness of the rules and regulations governing road use.

6. Recommendations

The following recommendations were made:

The use of safety helmets particularly for passengers should be promoted through voluntary and compulsory strategies by providing education on the device and accessibility on the market.

Compliance with road use regulations and rules should be enforced.

Proper training for a specified period and at a government certified driving school should be enforced.

Conflict of Interest

The authors declare that they have no competing interests.

Author's Contributions

All authors participated from the conception of the idea, collection of the data, analysis of the data, development of the manuscripts, editing and preparing for the publication.

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