

Use of Mobile Phone by Intercity Commercial Motorist in Three Towns in Benue State, Nigeria - A Threat to Road Crash

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Abstract

Inappropriate use of mobile phone by motorist has become an emerging issue of concern, most especially in low- and middle-income countries where majority of road accidents occur annually. A cross sectional descriptive study was conducted among 360 intercity commercial motorist in three towns in Benue State, Nigeria between April and May, 2013 using multi-staged sampling technique to assess the practice of mobile phones and the associated prevalence of auto clash. The data were analysed using SPSS (version 17) with statistical significant set at p-value of 0.05. Ninety -five (26.4%) receive calls only, 7921.9%) receive and made calls, 18(5.0%) made calls only, 14(3.9%) read or send sms text messages, while 57(15.8 %) engaged in all forms of use of mobile phone (i.e calls and sms text messages). Majority (72.5 %) of the respondents who had experienced auto crash, had it while using phone and driving at the same time. The relationship between accident and use of mobile phones while driving was statistically significant (p value= 0.003). Nigerian Federal Road Safety Corps and other government agencies should discourage inappropriate use of mobile phones by motorist while driving through education and public orientation campaigns.

Keywords: Mobile Phone Use; Motorist; Accident; Nigeria.

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1. Introduction:

Every year the lives of about 1.24 million people are cut short globally as a result of fatal road traffic accidents [1], while 20 to 50 million people suffer non-fatal injuries, with many incurring several forms of disability as a result of their injury [2]. Majority of these accidents occurs in low and middle-income countries, particularly the African region¹⁻⁴ and close to half of the victims are car occupants between 15 – 44 years of age [1]. The mortality and morbidity associated with these injuries as a whole cause considerable economic loss to victims, their families, the communities and the nation. These losses arise from the cost of treatment (including rehabilitation and incident investigation) as well as reduced / lost productivity for those killed or disabled by their injuries, and for family members who need to take time off work (or school) to care for the injured [1-4]

Many factors have been documented to be responsible for most of the fatal injuries. Top on the list is increase in average speed, which is directly related both to the likelihood of road traffic accident occurring and to the severity of the consequences of the accident. Drink-driving, deplorable state of roads, poor motor maintenance, poor safety culture, and bad weather are amongst the additional risk factors [1-3]. In recent time, an emerging issue of concern to the road safety worldwide is the inappropriate and careless use of mobile phones by drivers while driving [5]. Growth in mobile phone subscriptions is fastest in low and middle-income countries where there are now twice as many mobile phone subscriptions as in high-income countries, reflecting the relative size of these markets [6]. Information from the World Health Organisation (WHO) has found that between 2008 to 2009 the use of mobile phones in developing countries exceeded 50% of the global population, reaching an estimated 57 per 100 inhabitants, while in high income countries, the use has largely exceeded 100% (i.e. there is more than one mobile phone subscription for every inhabitant [7]).

The likelihood of involving in road crash is four times higher among those who use mobile phone while driving compared to those who drive without using mobile phones [8]. Reasons are that, majority of them speak on hand-held phones while driving and some engaged in text messaging; these in turn reduced their driving performance on the road as it made the drivers to take their eyes off the road (visual distraction), minds off the road (cognitive distraction), and hands off the steering wheel (physical distraction). Mobile phones can also cause slow reaction in terms of braking reaction time and reaction to traffic signals [9-12].

Digital mobile technology was introduced into Nigeria in 2001, and since then, the country has experienced a high increase in teledensity. Between 2001 and 2006 alone, there was an increase of twenty five percent which implies that over 55 million mobile phones are already in use by Nigerians [13]. In 2008, the prevalence of 23.5% mobile phone usage amongst nonprofessional drivers was reported for Owo rural community in Nigeria [14].

it has become accepted that driving while talking on a cell phone can be hazardous, most jurisdictions are making hand-held phone use illegal while allowing hands-free phone use [15]. On that basis there are road safety laws on how to reduce mobile phone use while driving in most developed countries. However, in low and middle-income countries of the African and Eastern Mediterranean regions where majority of the deaths from the road traffic accidents occurs, comprehensive road safety laws on use of mobile phones while driving is lacking[15-17] In few African countries like Ghana and South Africa where the law is already in place, the enforcement of the law remains a problem [6]. In Nigeria, a strategy has newly been adopted by the Federal Road Safety Commission (FRSC) which ensures that any person caught using their mobile handsets while driving, will be immediately charged to court and jailed [4,18].

The overall goal of the decade is to stabilize and then reduce the forecast level of road traffic fatalities around the world by 2020 [19].In the light of this, this study assessed the use of mobile phones while driving and the associated prevalence of auto crash among commercial motorist in three towns in Benue State, Nigeria.

2. Methodology:

2.1 Study Area:

Benue State has twenty three local government areas with an estimated population of 5,287,129 [20]. The State shares boundaries with five States (Nasarawa to the north, Taraba to the east, Cross-River to the south, Enugu to the south-west and Kogi to the west) and a common boundary with the Republic of Cameroun on the south-east. The largest town in the state is Makurdi which serves as the state capital and also as the headquarters of Makurdi Local Government Area. Next to Makurdi are Gboko and Otukpo which are also local government headquarters; each with an estimated population of about 500,000 or above. Gboko and Otukpo are about an hour and 30 minutes drive by car from Makurdi. Transportation within and outside of the state is mainly by road. The major northern route by road to Makurdi is Makurdi – Lafia – Jos road. The southern routes are Makurdi – Otukpo – Enugu and Makurdi – Yandev – Adikpo – Calabar roads. Traffic from the west comes through Makurdi – Otukpo/ Ankpa – Okene roads and from the east through Makurdi – Yandev – Katsina Ala – Wukari roads. There are sixteen private and four public (Benue Link) motor packs with about 2,345 registered bus and taxi commercial drivers providing intercity commercial services within and outside the state. Communication is mainly via modern communication services which includes General System of global Mobile communication (GSM), digital telephone service, and interpersonal means [21]

2.2 Study Design:

A cross sectional descriptive study was conducted between April to May, 2013 investigating the use of mobile phones while driving and the prevalence of road accidents among 360 intercity commercial drivers in fifteen selected motor parks in three towns in Benue state (Makurdi, Gboko and Otukpo).

2.3 Study Population:

Participants were required to hold Benue State union of road transport workers identity card. Based on the data from the union of road workers union office, the drivers who had loaded at least once in a week from any of the parks in Benue state to another town in last six months before the survey were included. Town service drivers and commercial drivers who do not operated regularly from the selected motor parks were excluded from the study because they were generally unaffordable to the population under study.

2.4 Sample Estimation:

A minimum sample size of 377 was obtained using the single population formula ($n = z^2 pq/d^2$) [22] based on the assumption of 57.3% (p) drivers using mobile phone while driving from a previous study⁶, the desired width of 5% (d), and 95% confidence interval (CI). After adjusting for infinite factor for population less than 10,000 and 10% non response rate, a final minimum sample size of 361 was arrived at. The number was later rounded up to 360 for convenience.

2.5 Sampling Technique:

Multi-staged sampling technique was employed. A total of fifteen motor parks were selected for the study; one Benue links motor parks and four other parks from each town. The sampling frame was the list of drivers with Benue state union of road transport workers in the motor parks selected for the study. The drivers were stratified by long and short distance and twenty four (24) legible divers were finally selected from each of the motor parks using a stratified random sampling technique.

2.6 Data Collection Tools:

The participants were assessed using a structured, interviewer administered questionnaire. The questionnaire contained items on socio-demographic characteristics, use of mobile phone while driving, perceptions of the risk of phone use while driving; and adverse incidents relating to phone use, including crash involvement. A pre-testing of the questionnaire was carried on 36 (10% of sample size) commercial drivers in a motor park at Ugbokpo, Apa local government area, Benue state, about two hours drive from Makurdi.

2.7 Measurements:

The main outcome used in this study was use of phones while driving and involvement in auto accident. The independent variables were socio-demographic characteristics including age, education and years of driving experience. Phone use in this study was defined as making calls, answering calls and or reading/sending text messages while driving.

2.8 Data Analysis:

The data were analysed using SPSS statistical package (version 17). Descriptive statistics were used to present frequency distributions. Chi square was used for test for association between the outcome and the independent variables with statistically significant set at *p-value* of 0.05.

2.9 Ethical Consideration:

Informed consent was sought from the respondents and the Chairman of the union of road transport workers of each of the motor park after securing ethical clearance from the research and ethical committee of Benue State University Teaching Hospital (BSUTH), Makurdi.

3. Results:

3.1 Socio-demographic Characteristics:

The study populations were predominantly those between 32-38 years of age (36.7%). Their mean age was 36.84years (± 9.98). Slightly above one-third (38.8%) of them had completed secondary education, while less one third (26.9%), had primary, 13.9% were post secondary graduates and 23.3% had no formal education. Those who uses commercial buses (61.4%) predominates the study group and considerable number of the respondents had more than one year driving experience (Table 1).

3.2 Use of Mobile Phones While Driving:

Phone use as defined in this study is seen in Table 2. Ninety seven (26.9%) of the drivers reported not to have ever used, while 263(73.1%) had used at least once while driving a year before the survey. Ninety five (26.4%) reported receiving calls only, 79(21.9%) receive and make calls, 18(5.0%) make calls only, 14(3.9%) receive or send SMS text messages and 57(15.8 %) engaged in all forms of use of mobile phone (i.e calls and sms text messages).

3.3 Magnitude of Road Traffic Accident Had by Respondents One Year before the Survey:

The prevalence of road accident a year before the survey among the 360 respondents was 41.4%. The proportion of those who had the accident once in a year predominates (32.2%), followed by the respondents who had accidents twice and trice (24.2% and 20.1% respectively). The mean average of the accidents experienced by the respondents was 2.4 times. Majority (48.2%) of the total accidents experienced were damage to the vehicle only, while

34(29.8%) recorded vehicle damaged with minor injuries to passenger. Thirteen (11.4%) and 10.5% had accidents that necessitate hospital admission to the injured passengers and deaths respectively (Table 3)

3.4 Use of Mobile Phones and Accident:

As seen in table 4, majority (72.5 %) of the respondents who have experienced accident had it while using phone and driving at the same time. The predominant means of phone use in relation to the accidents was receiving calls only (25.5%), and the least was making calls. The occurrence of accident in relation to use of mobile phones while driving was statistically significant ($X^2=17.613$, $df= 5$; p value= 0.003).

3.5 Sociodemographic Characteristics and Use of Mobile Phones:

Table 5 shows the relationship between the socio-demographic characteristics of the respondents and use of mobile phones while driving. There was a statistically significant relationship between the respondent's age and use of mobile phones. Years of experience and the educational status of the respondents were also significantly related to use of mobile phones while driving ($p =0.000$).

4. Discussion:

The uses of mobile phones have come to stay as an important means of communication in every parts of Nigeria. This development has naturally led to high incidence of RTA, injuries and deaths among motorist, passengers and other road users. The Nigerian Federal Road Safety Commission (FRSC) in response put several efforts in place in order to discourage distracted driving [4,18] However, it was found in this study that a high percentage (73.1%) of drivers' still use mobile phones while driving and quite a significant proportion of them receive calls only. The findings are comparably higher than the 7.8% reported for South Africa and 59% seen in Australia and some European countries [23] But the increase is very much close to the results for Owo rural community in Nigeria [14]. Between 2001 and 2006 an increase of twenty five percent was reported and on that basis it was projected that as at 2008 over 55 million mobile phones were already in use by Nigerians [13]. Even though a general population survey for the entire country has not yet been conducted, from the prevalence of 23.5% mobile phone usage reported amongst nonprofessional drivers for Owo rural community in Nigeria [14] and the percentage in this study, it implies that the use of mobile phones by drivers have increased by 49.6% between 2008 to 2013. The high percentage may be due to the high increase in teledensity and increase in mobile phone subscriptions amongst the general population [5.6.13].

Findings in this study also revealed that reading or sending sms text messages constitutes the least means of mobile phone usage, even though majority of the drivers had formal education. The fact that a considerable number of times are required to read or type and send a sms text messages as compared to other forms of phone use may justify the reasons for the low percentage. The apparently anomalous findings in relation to the punitive measures by Nigerian FRSC [4,18] implies that majority of the drivers are aware of the dangers of use of phones while driving but in practice they never adhere to the instructions of FRSC.

The effects on driving behaviour of making/receiving calls; sending or receiving text messages are potentially hazardous. As documented in literature, use of mobile phones while driving could lead to visual distraction, cognitive distraction, physical distraction and slow reaction in terms of braking reaction time and reaction to traffic signals [9,12]. In this study, the prevalence of road accident among the commercial motorist was 41.4% and the likelihood of having accident among drivers who use mobile phone while driving is approximately three times higher as compared to those who do not use mobile phone while driving (Table 4). Of one hundred and forty nine drivers who had accidents, distraction with use of mobile phone while driving has been identified as a contributing factor in 72.5% of them and most of the drivers are young adults of 32-38 years of age with few years of driving

experience. This is consistent with 71.0% reported for truck crashes in naturalistic driving studies carried out in USA [23,24] but is slightly lower but consistent to likelihood of four times reported in other studies [8].

In this study the occurrence of accident was statistically related to use of mobile phones while driving ($p = 0.003$). This study also demonstrated a statistically significant relationship between the sociodemographic characteristics of drivers and use of mobile phones while driving ($p = 0.000$). This is perhaps a confirmation of likelihood of involving in road crash reported to be four times higher among those who use mobile phone while driving as compared to those who drive without using mobile phones [8].

5. Conclusion:

The use of mobile phones by drivers is on the increase and it has become a common threat to road crashes among commercial motorists, passengers and other road users in Benue state, Nigeria. Government (both Central and Local), FRSC, police and other agencies should continue to conduct education, orientation and public campaigns to discourage the inappropriate use of mobile phones while driving. Also, government needs to be proactive and make sure that the enforcements of law and order are put in place

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Authors' Contributions:

This work was carried out in collaboration between all authors.

Audu, O; and Ogboi, J. designed the study and wrote the protocol.

Audu, O. managed the literature searches with Abah ER, Igbabul, S. Joshua, IA and Ogboi J.

Audu O analyse the data with Ogboi J, Joshua IA, Abah ER and Igbabul, S.

Audu, O wrote the first draft of the manuscript with Ogboi J, Joshua IA, and Abah ER.

All authors read and approved the final manuscript

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ANNEX - Table

Table 1: Socio-demographic Characteristics of Respondents (n=360)

Socio-demographic characteristics	Frequency	Percent
Age group (years)		
18-24	40	11.1
25 – 31	46	12.8
32 – 38	132	36.7
39 – 45	70	19.4
46 – 52	39	10.8
53 – 59	25	6.9
60-66	8	2.2
Highest Educational level		
No formal education	84	23.3
Primary	97	26.9
Secondary	129	35.8
Post secondary	50	13.9
Years of experience (years)		
<1	100	27.8
1-2	86	23.9
3-4	86	23.9
≥5	88	24.4
Type of Vehicle used		
Car	89	24.7
Bus	221	61.4
Luxurious	50	13.9
Total	360	100

Mean age = 36.84 years (SD= 9.98)

Table 2: Use of Mobile Phone by Respondents One Year before the Survey (n=360)

Use of Phone	Frequency	Percent
Never used	97	26.9
Receiving calls only	95	26.4
Receiving and making calls	79	21.9
Making calls only	18	5.0
Receiving and or sending SMS text messages	14	3.9
Calls and SMS text messages	57	15.8

Table 3: Summary of Magnitude of Road Traffic Accident had by Respondents One Year before the Survey

Ever had	Frequency	Percent
Yes	149	41.4
No	211	58.6
Total	360	100.0
Frequency of accident		
Once	48	32.2
Twice	36	24.2
Thrice	30	20.1
Four	29	19.5
Five and above	6	4.0
Total	149	100.0
Severity of accident had		
Vehicle damage only	55	48.2
Vehicle damaged with minor injuries to passenger	34	29.8
Vehicle damaged with major injury to passenger necessitating hospital admission	13	11.4
Death involved	12	10.5
Total	149	100.0

Mean frequency of accident 2.4

Table 4: Use of Mobile Phone by Accidents (n=360)

Use of phone	Ever had accident while driving		Total
	Yes	No	
	Frequency (%)	Frequency (%)	Frequency (%)
Never used	41 (27.5)	56 (26.5)	97 (26.9)
Receive calls only	38(25.5)	57(27.0)	95(26.4)
Make calls only	7 (4.7)	11 (5.2)	18 (5.0)
Receive calls and make calls	21 (14.1)	58(27.5)	79 (21.9)
Read and send SMS text messages	10(6.7)	4 (1.9)	14 (3.9)
Calls and SMS text messages	32 (21.5)	25(11.8)	57 (15.8)
Total	149 (100.0)	211(100.0)	360 (100.0)

$\chi^2=17.613, df= 5; p \text{ value}= 0.003$

Table 5: Sociodemographic variables and Use of Mobile phone

Sociodemographic Variables	Use of mobile phone						Total
	No use	Received calls only	Make calls only	Received and make calls	Receive and send SMS text message	Both calls and SMS combined	
Age group (years)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
18-24	13 (13.4)	4 (4.2)	5(27.8)	10(12.7)	4(28.6)	4(7.0)	40(11.1)
25 – 31	6 (6.2)	31(32.6)	1(5.6)	7(8.9)	0(0.0)	1(1.8)	46 (12.8)
32 – 38	44 (45.4)	25(26.3)	2(11.1)	29(36.7)	1(7.1)	31(54.4)	132 (36.7)
39 – 45	22 (22.7)	26(27.4)	3(16.7)	2(2.5)	4(28.6)	13(22.8)	70 (19.4)
46 – 52	6 (6.2)	3(3.2)	2(11.1)	21(26.6)	2(14.3)	5(8.8)	39 (10.8)
53 – 59	4 (4.1)	4(4.2)	4(22.2)	9(11.4)	2(14.3)	2(3.5)	25 (6.9)
60-66	2 (2.1)	2(2.1)	1(5.6)	1(1.3)	1(7.1)	1(1.8)	8 (2.2)
N	97 (100.0)	95 (100.0)	18(100.0)	79 (100.0)	14(100.0)	57(100.0)	360 (100.0)
<i>Likelihood ratio= 127.646; df= 30; p= 0.000</i>							
Highest Educational level							
No formal education	23(23.7)	41(43.2)	1(5.6)	13(16.5)	4(28.6)	2(3.5)	84(23.3)
Primary	29(29.9)	48(50.5)	10(55.6)	4(5.1)	2(14.3)	4(7.0)	97(26.9)
Secondary	37(38.1)	4(4.2)	3(16.7)	47(59.5)	5(35.7)	33(57.9)	129(35.8)
Post secondary	8(8.2)	2(2.1)	4(22.2)	15(19.0)	3(21.4)	18(31.6)	50(13.9)
N	97(100.0)	95(100.0)	18(100.0)	79(100.0)	14(100.0)	57(100.0)	360(100.0)
<i>X² = 157.572; df= 15; p= 0.000</i>							
Years of experience (years)							
<1	18(18.6)	36(37.9)	12(66.7)	16(20.3)	2(14.3)	16(28.1)	100(27.8)
1-2	11(11.3)	29(30.5)	1(5.6)	37(46.8)	1(7.1)	7(12.3)	86(23.9)
3-4	36(37.1)	22(23.2)	2(11.1)	11(13.9)	7(50.0)	8(14.0)	86(23.9)
≥5	32(33.0)	8(8.4)	3(16.7)	15(19.0)	4(28.6)	26(45.6)	88(24.4)
N	97(100.0)	95(100.0)	18(100.0)	79(100.0)	14(100.0)	57(100.0)	360(100.0)
<i>X² = 94.529; df= 15; p-value = 0.000</i>							