Full Length Research Paper

Helmet use among motorcycle riders Insemi-Urban communities in Southwestern Nigeria

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Abstract

The use of helmet by motorcyclists is important in preventing both fatal and non-fatal injuries sustained during crashes. The study was designed to determine the prevalence of use of crash helmets among the motorcycle riders in Ogbomoso and Osogbo in the South- Western part of Nigeria. It also considered various factors that influenced the use of crash helmet by motorcyclists and their passengers/pillion riders. A cross-sectional survey using a direct observation of motorcycle riders was used in this study. A total of two thousand and seventy two (2072) motorcycles were observed during the period of study. 2069 (99.9%) of the participants were male, while the remaining 3 (0.1%) were female. Results revealed the overall prevalence of helmet use to be 89 (4.3%) among the riders and 17 (1.4%) among the pillion rider. There were significant associations between the use of helmet and the age, sex and the motorcycle engine size. We concluded that poor compliance with the use of helmets among motorcyclists exists, hence, the need to enforce law on use of helmet and educational programs such as media enlightenment should be intensified in order to enhance the use of helmet.

Keywords: Motorcycle, Road safety, Helmet and Law enforcement.

INTRODUCTION

Motorized two–wheeled vehicles popularly called 'Okada' is a major mode of transportation in Nigeria. In the last ten years, there has been an increase in the use of motorcycles for commercial public transportation in rural and urban areas in Nigeria (Johnson O.E, et al., 2011). This is because it is easier for the motorcyclists to navigate in between vehicles in numerous traffic hold-ups in the urban regions, easy navigation on the bad roads and also a means of livelihood for the teaming population of unemployed youths in Nigeria.

It is known to be associated with higher risk of fatal and non-fatal traffic injuries than other modes of transport. Motorcycle riders in the United States of America are 34 times more likely than car occupants to die in a traffic crash and eight times more likely to be injured. (NHTSA, 2007.)

Globally, road traffic injuries are responsible for significant proportion of overall injury morbidity and mortality, 90% of these mortalities are seen in the developing countries. (Peden M., 2002). Percentage share of motorcycles' involvement in road crashes based on Federal Road Safety Commission (FRSC) of Nigeria data is 26.38% and 22.70% in 2008 and 2009 respectively(Federal Road Safety Commission of Nigeria.,2010).

One major way to decrease morbidity and mortality from motorcycle riding is the use of helmet. Wearing helmet results in 70% reduction in the risk of head injury and 40% decrease in risk of mortality (Liu, B.C., 2009) and reduces the length of hospital stay and medical costs of injured riders, (Chesham.,1993). A motorcycle rider without a helmet is 40% more likely to suffer a fatal head injury and 15% more likely to suffer a non-fatal injury than a rider that uses helmet when involved in a crash. (NHTSA, 2008). Even with national legislation, usage rates and pattern may vary widely from one region to the

next depending on educational level, penalty charge and enforcement activities (World Health Organization, 2006). In Nigeria, the guidelines for the use of motorcycles for passenger transport are spelt out in the National Road Traffic regulations of 2004(Federal Republic of Nigeria) which includes the use of helmet for riders and pillions among other things (Federal Republic of Nigeria., 2004). Despite these rules and roles of Police and FRSC in enforcing the use of helmet, the rate of helmet use remained low in Nigeria. A survey of the knowledge, attitude and practice of the commercial motorcyclists in Ile Ife South West of Nigerian, 20% of the motorcyclists suggested use of a crash helmet as one of the safety devices and 23.8% had a helmet on at the time of study. (Oginni F.O et al., 2007). These findings inform our decision to carry out this study to determine the prevalence of helmet use in the selected communities and various factors that could influence the use of helmet as a major safety device among motorcycle riders.

METHODOLOGY

Setting

The study was conducted among the motorcyclists in two major cities; Osogbo and Ogbomoso both in Southwestern part of Nigeria between January 2014 and April 2014. Selected suitable sites were chosen for cross-sectional on-site observations. We used the local maps of the two towns obtained from the local government Town planning departments to identify the roads in the two towns. The roads were classified into Trunk A (Federal roads or major highways), Trunk B (State roads or feeder roads to the highways) and Trunk C (Local Government roads). Three intersections were randomly selected to represent each of the road types. A stationary, well positioned, high resolution Nikon D 7000 Cam coder model supplied and operated by the Audio visual unit of Biomedics Department of College of Heath Sciences LAUTECH Ogbomoso was used to record all the motorcycles that passed through the pre-selected intersections for one hour at a session. The total recording hour per a spot was 6 hours spanning week days that is Monday to Friday and Saturday and Sunday. In each of the randomly selected site, data were collected for 3 separate hours of day time (7:30am to 7:00pm).

The Video recordings were slowly played on the computer systems, with play back from time to time for clarity purpose and the data from it recorded on spread sheets by two different authors at different times. The inter observer reliability for each pair of observers was at least 90%.

Participants

Two thousand and seventy two (2072) motorcycle riders constituted the participants of the present study. Data for this study were collected through a systematic observational method. The gender, estimated age, the motorcycle engine size, number of riders, use of helmet by primary rider and or 2nd rider as the case may be, type of road and the day and the time during the day.

Helmet use was further classified as correct use (chinstrap fastened firmly), incorrect use (chinstrap not fastened firmly or not fastened at all) and no helmet use. Road types were classified as Trunk A, Trunk B and Trunk C. Ethical approval was obtained from the Ethical committee of LAUTECH Teaching Hospital, Ogbomoso and no identifying information of riders was collected.

Statistical analysis

Statistical package for social science (SPSS) version 17 was used in the analysis of the data. Frequencies, proportions and their associated 95% confidence intervals (CI) for helmet use by variables including the gender, age, engine size, time of the day, number of riders on the motorcycle, day of the week and type of the road were calculated. P-values less than 0.05 were defined as statistically significant.

RESULTS

Two thousand and sixty nine (2069) 99.9% of the participants were male, while the remaining three (3) 0.1% were female. Three hundred and fifty nine (359) 17.3% of the participants were estimated to be below the age of 25 years, one thousand three hundred and seventy six (1376) 66.4% were in the estimated age range of 25 and 50 years, while three hundred and thirty seven (337) 16.3% were estimated to be more than 50 years.

Results presented in Table 1 revealed the demographic attributes of the riders observed as well as the helmet use prevalence rate. It was observed that only 89 (4.3%) of the riders observed used helmet, while the majority (1983) of the riders constituting 95.7% of the total riders observed did not use helmet at the time of observation. Further, 17 (1.4%) of second riders used helmet, while 1175 (98.6%) did not use. Finally, the prevalence rate of group users was shown to be 89 (4.3%) helmet user, and 1983 (95.7%) both rider and second rider did not use.

Table 2 showed that there was no significant association between time of day and helmet use among bike riders (X^2 (2, 2072) = 2.33, P > .05).

It was also found that there was no significant relationship between day of the week and helmet use among bike riders (X^2 (1, 2072) = 1.17, P > .05). The results revealed a significant association between sex of rider and helmet use (X^2 (1, 2072) = 28.43, P < .01).

Table 1: Socio-demographic characteristics of respondents

VARIABLES	FREQUENCY (N=2072)	PERCENTAGE
Estimated Age of Rider		
< 25	359	17.3
25 – 50	1376	66.4
>50	337	16.3
Gender		
Male	2069	99.9
Female	3	.1
Helmet used by Riders		
Correct use	70	3.4
Incorrect use	19	.9
Not used	1983	95.7
Helmet use by second rider		
Correct use	16	1.3
Incorrect use	1	.1
Not used	1175	98.6
Group Helmet use		
Used	89	4.3
Not used	1983	95.7
Engine Size		
100M3	2061	99.5
>100M3	11	.5
Type of road		
Trunk A	1044	50.4
Trunk B	620	29.9
Trunk C	408	19.7
Number of passengers/pillion riders on Bike		
1	880	42.5
2	1104	53.3
3	81	3.9
4	7	.3

A significant association also existed between the estimated age of rider and the use of helmet (X^2 (2, 2072) = 91.81, P < .01). Further, it was shown from the results that engine size was significantly related with helmet use (X^2 (1, 2072) = 14.20, P < .01).The results also showed that there was no significant association between type of road and the use of helmet (X^2 (2, 2072) = .91, P > .05).

Finally, a non-significant relationship was found between number of riders on bike and helmet use (X^2 (3, 2072) = 4.68, P > .05).

DISCUSSION

Motorcycle as a means of transport is increasing in popularity globally especially among the young and low income groups (Kraus JF et al., 1975). Motorcycles are also considered to be the most dangerous form of motorized transport, with injury rates eight times, and fatality rates 35 times that of automobile occupants [per vehicle mile travelled](NHTSA.,2007). A well tested and proven strategy to decrease morbidity and mortality from motorcycle riding is helmet use (Bledsoe et al., 2002; Ferrando et al., 2002). Wearing a crash helmet by motorcyclists results in a 72% reduction in the risk of head injury, and a 37% decrease in the risk of mortality (Liu et al., 2004). The importance of proper wearing of crash helmet by motorcycle rider cannot be over emphasized.

The overall 4.3% prevalence of helmet use found in this study although slightly better than 0.00% reported in a studies that were carried out in Zaria in Northern

Table 2: The relationship between helmet use and the socio-demographic characteristics of the respondents

Variables N=2072	Helmet use (%)		Chi-square	Df	p-value
	Used	Not used			
Time of the Day			2.33	2	0.31
7.30 – 8.30am	35 (5.2)	632 (94.8)			
11.30am – 12.30pm	36 (4.0)	863(96.0)			
6 – 7pm	18 (3.6)	488 (96.4)			
Day of the Week			1.17	1	0.28
Monday – Friday	56 (4.7)	1133 (95.3)			
Saturday	33 (3.7)	850 (96.3)			
Sex of Rider			28.43	1	<0.001
Male	87 (4.2)	1982 (95.8)			
Female	2 (66.7)	1 (33.3)			
Estimated Age of Rider			91.81	2	<0.001
< 25	6 (1.7)	353 (98.3)			
25 – 50	36 (2.6)	1340 (97.4)			
>50	47 (13.9)	290 (86.1)			
Engine Size			14.20	1	<0.001
100m3	86 (4.2)	1975 (95.8)			
>100m3	3 (27.3)	8 (72.7)			
Type of Road			0.91	2	0.63
Trunk A	46 (4.4)	998 (95.6)			
Trunk B	23 (3.7)	597 (96.3)			
Trunk C	20 (4.9)	388 (95.1)			

Nigeria and Benin city in Southern Nigeria (Alti-Muazu et al., 2008; Nnzegwu et al., 2008), it was still a far cry from more than 95% prevalence rate of helmet use reported from Spain and Italy (Guillen et al., 1995; Servadei et a ., 2003).

The poor rate of helmet use found in this study may not be unconnected with laxity in enforcing the law guiding the use of helmet while riding motorcycle. Helmet laws had the least cost per year of lives saved among all major traffic safety programs (Graham, 1993) and their benefit-cost ratios range from 2.3 to 5.07 (Hyder et al., 2007). In Nigeria, the crash helmet law which was introduced in 1975 and became effective in most states in 1976 (Asogwa, 1980.,Oginni et al.,2007) had either been repealed in some states or ignored in others, hence very low compliance.

A study done in Zhongshan, a southern city in China in (Yu Xuequn et al., 2009) showed a prevalence of helmet use of 72.6% among the riders and 34.1% among the second riders. One of the factors attributed to better compliance in the study done in Malayasia is the implementation and enforcement of law of helmet use (Kulanthanyan et al., 2000), which is not the case in most parts of Nigeria.

We found a better compliance in older age group; 23% (47) in age group above 50years better than 0.3% (6) in under 25years and 1.7% (36) in 25-50 year group. This was in agreement with finding in a similar study in Australia (Dang Viet Hung et al., 2008) where helmet use was found to be associated with older age.

We found significant association between the gender of the riders and the use of helmet, this finding in a study done in China (Yu Xuequn., 2011). Female motorcyclists in our study were just 3 (0.1%), out of which 2 wore helmets at the time of observation (66.7%), as opposed to 4.2% of the male gender. We are of the opinion that the number of the females captured in this study was too small for us to draw a strong conclusion.

Likewise, an association was found with the motorcycle engine size; of 4.3%, majority, 4.2% that use the helmet had engine size of 100m^3 and only 0.1% of them with engine size of > 100m^3 used helmet. All the male gender group that used helmet in this study were actually Police dispatch riders that were properly kitted for their duties.

The type of the road, time of the day, day of the week, numbers of riders on the bike had no significant association with use of helmet according to our findings.

These were at variance with other studies (Dang Viet Hung et al., 2008; Kulanthayan et al.,2000), which showed that the prevalence rate of helmet use was, better on highways than rural roads, better during the week (Monday –Friday) than the week ends (Saturday and Sunday), (Corad et al.,1996;Skalkidou et al .,1997). Law enforcement agents' presence are more visible during those periods. In a situation that nobody enforces any law, like in our areas of study, all these factors are of no consequence to the motorcyclists.

CONCLUSION AND RECOMMENDATION

Based on the findings of this study, it can concluded that compliance with the use of helmet by motorcyclists is very poor in this part of the world, as evident by prevalence of 4.3% in our study which is not the case in the developed world where the use of helmet is seen as a major safety measure and efforts are made towards ensuring compliance by the riders.

We hereby recommend that extensive and regular public awareness should be raised to educate people about the correct use and safety benefits of the use of helmet.

In addition, we also recommend that high level of enforcement activities should be implemented as obtainable in other countries where compliance with use is better.

Conflicts of Interest

The authors declare no conflict of interest concerning this article. The authors are solely responsible for financing the research work

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