

Access this article online	
Quick Response Code:	Website: www.annalsafrmed.org
	DOI: 10.4103/1596-3519.108248

Knowledge of commercial bus drivers about road safety measures in Lagos, Nigeria

I. P. Okafor, K. A. Odeyemi, D. C. Dolapo¹

Department of Community Health and Primary Care, College of Medicine, University of Lagos, Lagos,
¹Leverage Consulting Ltd, Road 425, Zone 6, Abuja, Nigeria

Correspondence to: Dr. Okafor Ifeoma P, Department of Community Health and Primary Care, College of Medicine, University of Lagos, Lagos, Nigeria. E-mail: iphooma@yahoo.com

Abstract

Background/Objective: Road traffic injuries have persisted as a serious public health problem and much of the health burden is in developing countries. Over-speeding, poor enforcement of traffic regulations and commuter buses have been highly implicated in road traffic injuries in developing countries. The aim of this study was to determine drivers' knowledge of selected road safety measures, i.e. the pre-requisites for driver's license, road signs and speed limits.

Materials and Methods: This was a cross-sectional study carried out in Lagos, Nigeria. Simple random sampling was used to select the two motor parks used for the study and all the consenting commercial minibus drivers operating within the parks (407) were included in the study. Data was collected with a pre-tested, structured, interviewer-administered questionnaire and analyzed with epi-info statistical software.

Results: Two hundred and sixty-one (64.1%) of them knew that Visual Acuity test should be done before obtaining driver's license and 53.8% knew the correct minimum age for obtaining driver's license. Only 1% of the drivers had correct knowledge of the driver's license authorities in Nigeria. The drivers had poor knowledge of road signs (59.0%) and poor knowledge of maximum speed limits (100%). The oldest, least educated and least experienced drivers had the poorest level of knowledge.

Conclusion: The drivers demonstrated poor knowledge of road safety measures. There is need for driver education to improve their knowledge.

Keywords: Driver's license, road safety, road signs, speed limits

Résumé

Contexte/Objectif: Circulation routière blessures ont persisté comme un problème grave de santé publique et une grande partie de la charge de la santé est dans les pays en développement. Vitesse, une mauvaise application de la Loi de réglementation de la circulation unnd autobus de banlieue ont été très impliqués dans les accidents de la circulation dans les pays en développement. Le but de cette étude était de déterminer les connaissances des conducteurs des mesures de sécurité routière sélectionnés, c'est à dire les composants requis pour les permis de conduire, la signalisation routière et les limites de vitesse.

Méthodes: C'est une étude transversale menée à Lagos, au Nigeria. Échantillonnage aléatoire simple a été utilisé pour sélectionner les deux parcs moteurs utilisés pour l'étude et tous les chauffeurs de minibus commercial consentants dans les parcs (407) ont été inclus dans l'étude. Données ont été recueillies avec un questionnaire pré-testé, structuré, intervieweur et analysées avec le logiciel epi-info.

Résultats: Deux cent soixante et un (64,1%) d'entre eux savaient que le test d'acuité visuelle doit être fait avant l'obtention de permis de conduire et de 53,8% connaissait l'âge minimum approprié pour l'obtention de permis de conduire. Seulement 1% des conducteurs avaient une connaissance correcte d'agréer les autorités du conduire au Nigeria. Les pilotes ont mauvaise connaissance de la signalisation routière (59,0%) et la mauvaise connaissance des limitations de vitesse maximales (100%). Le plus ancien, moins instruits et moins expérimentés pilotes avaient le niveau les plus pauvres de la connaissance.

Conclusion: Mesures les pilotes que les pauvres connaissances de la sécurité routière. Il n'est nécessaire pour la formation des conducteurs afin d'améliorer leurs connaissances.

Mots clés: Permis de conduire, la sécurité routière, la signalisation routière, les limites de vitesse

Introduction

Road traffic injuries (RTIs) are a global public health epidemic. Worldwide, an estimated 1.2 million people are killed in road crashes each year and as many as 50 million are injured.^[1] Globally, RTIs account for 41.2 million (2.7%) DALYs and 7.2 million (1.9%) DALYs, in the African Region.^[2] They are projected to rise from the global ninth leading cause of health burden (as % of total DALYs) in 2004 to the third in 2030.^[2] This burden will continue to rise unless there is a new commitment to prevention. A large proportion of the burden is in Low and Middle Income Countries, (LMIC). More than half of the people killed in road traffic accidents, (RTAs) are young adults aged between 15-44 years.^[1] In developing countries, the problem of limited research on causes and risk factors, as regards road safety has been recognized.^[3]

Results from a recent population-based survey on RTIs in Nigeria showed that the overall road traffic injury rate was 41 per 1,000 population (95% CI 34 to 49), and mortality from road traffic injuries was 1.6 per 1,000 population (95% CI 0.5 to 3.8).^[4] According to the Federal Road Safety Command (FRSC) Lagos State Sector command, in 2007, 4291 RTAs occurred in Lagos State, 33% of which involved buses/minibuses and a fatality of 212/1000.^[5]

A valid driver's license should be possessed by all drivers as a proof of their proficiency. All over the world, it is also recognized as a valid means of identification. In Nigeria, the authorities involved in procurement of driver's license are the Motor Licensing Authority (MLA), the Vehicle Inspection Office (VIO) and Federal Road Safety Commission (FRSC). Application forms are obtained from the MLA, driving tests are conducted by the VIO, and the licenses are issued by the FRSC. National Road Traffic Regulations demand that every applicant for driver's license goes through training in an approved driving school and passes the driving test. The applicant also provides a certificate of medical fitness and Visual Acuity (VA) testing from any government hospital.^[6] Most countries set maximum speed limits permissible for specific types of vehicles, and on specified roads. In Nigeria, the road signs in use and specified speed limits are

published in the National Road Traffic Regulations and the Highway Code.^[6,7] The road signs are classified as regulatory, informative and warning signs. Roads are classified as those in built-up areas, highways and expressways. For taxis and buses, the maximum speed limit in built-up areas is 50 km/hr, on highways, 80 km/h and 90 km/h on express ways.

Over-speeding and poor enforcement of traffic regulations are some of the major reasons for the high burden of RTIs.^[8] Buses and minibuses have also been highly implicated in road traffic injuries in developing countries. Road traffic deaths among motorized four-wheeler occupants in low-income and middle-income countries are mainly due to fatalities that occur in public buses and trucks.^[9] Commercial motorcycle riders lack good knowledge of traffic codes and even in the United Kingdom, commercial drivers do not know their speed limits.^[10,11] Good knowledge of road signs and speed limits by drivers is imperative for safer roads, therefore, assessing commercial drivers' knowledge of safety measures is an indicator of their proficiency, especially as passengers entrust their lives to them throughout the journey. Arguments have also been presented for the public health perspective of road safety, which is multidisciplinary to come to the fore in road safety research in Africa.^[12] This study was carried out in Lagos State to determine commercial drivers' knowledge of road signs, speed limits and the pre-requisites for driver's license including the licensing authorities in Nigeria. The findings have implications for more targeted interventions.

Materials and Methods

This cross-sectional study was conducted in May 2009 in two of the urban Local Government Areas (LGAs) in Lagos State, which was the capital and is still the commercial nerve center of Nigeria. Although, Lagos state is the smallest state in Nigeria, with an area of 3,577 km², yet it is one of the most populated (about 10 million). Lagos State has a total of 20 LGAs (16 urban and 4 rural). The state attracts a lot of travelers, majority of who travel by road. The two LGAs used were Kosofe and Mainland LGAs with a combined population of 1,564,083. Kosofe LGA shares boundary with neighboring Ogun State and is a major gateway into Lagos State for travelers from all over the country. The two LGAs of study

were purposely selected because they both have a high concentration of motor parks. Both LGAs also have big markets which attract a lot of travelers.

Sampling

By simple random sampling, one major motor park out of the motor parks registered with the Lagos State Ministry of Transportation, was selected from each of the LGAs. All minibus drivers registered in both parks (numbering about 500) were eligible for inclusion but subsequently, 407 of them gave their consent to participate in the study. Smaller cars and unregistered drivers were excluded.

Data collection

Data collection was done with a pre-tested, structured, interviewer-administered questionnaire. The questionnaire was divided into sections and elicited information on the drivers' socio-demography, professional driving experience, distance being travelled daily and their knowledge of pre-requisites for obtaining drivers license such as minimum age for driving, Visual Acuity (VA) test, driving test and also the various authorities involved in obtaining drivers license. The questionnaire also tested their knowledge of various road signs and knowledge of maximum speed limits for minibuses on designated roads as provided by law. The section on the road signs was obtained from the Vehicle Inspection Office (VIO) of the Lagos State Ministry of transportation.

Data analysis

Data was analyzed electronically with Epi Info V.3.5.1 statistical software. Frequency distribution of variables and cross-tabulation of variables were recorded. Chi-square test was done to test for association between variables and the level of significance was set at 5%. To further describe the association between selected variables, odds ratios with confidence intervals were calculated. Level of knowledge was computed by assigning scores to correct answers on knowledge of road safety measures. The respondent scores one point for each correct answer. The sum of the scores was equated to 100%. A score of <50% was considered poor level, 50 to 75% was fair level, and >75% was high level of knowledge. A total level of knowledge was obtained from the summation of all knowledge scores on the various aspects of safety measures and also expressed as percentages.

Ethics approval was obtained from the Ethics and Research Committee of the Lagos University Teaching Hospital, LUTH. Permission was obtained from the National Union of Road Transport Workers (NURTW) before commencement of the

study. Free and informed consent was obtained from the drivers prior to interview.

Results

A total of 407 drivers out of approximately 500 gave their consent and subsequently participated in the study. A majority of the drivers were between 30 and 49 years, 257 (63.1%) with a mean age of 43.4 ± 10.8 years. Most, (90.2%) of them were married and had some form of formal education, (89.9%). The largest proportion of drivers had been driving professionally for 11 to 20 years (37.8%). Two-thirds of them, (32.9%) travel a distance of at least 400 km daily. Only 10% of them travel more than 600 km daily. The proportion of drivers who owned their vehicles (49.4%) was almost equal to that of those who were not owners of their vehicles (50.6%).

Two hundred and sixty-one (64.1%) of them knew that VA test should be done before obtaining driver's license. A little above half (53.8%) of the respondents knew the correct minimum age for obtaining driver's license. Worse still, only (4)1% of the drivers had correct knowledge of the drivers license authorities in Nigeria [Table 1]. Less than one-fifth (17.9%) of the drivers could interpret the road sign 'carriage way narrows' and only 18 (3.2%) of them knew their maximum speed limits on expressways [Table 1].

On the other hand, 238 (59.0%) and all the drivers (100%) respectively, had poor knowledge of road signs and maximum speed limits. The mean score for road sign test was $32.3\% \pm 12.4$ while for maximum speed limits it was $9.9\% \pm 16.7$ [Table 2].

Drivers between 40-59 years had better knowledge than the rest of their counterparts. The highest proportion of drivers who had poor knowledge scores were among the oldest (97.1%), least educated, (91.9%) and least experienced (89.5%) drivers. Using age group 20-29 years as a reference category, drivers between 40 and 49 years old have the odds of a better knowledge 3 times as high as those between 20-29 years (OR 2.95, 95% CI 0.80-12.91) [Table 3].

Discussion

The drivers' knowledge of the minimum age for driving was poor. Over one-third of them also did not know VA test as a requirement for drivers' license despite the fact that many of them have been professional drivers for a long time. For professional drivers, a better performance is expected. This poor performance leaves doubt as to the driver's age and

Table 1: Respondent's knowledge of pre-requisites and authorities for driver's license in Nigeria

Variable	N=407	
	n	%
Pre-requisites for drivers license (minimum age, VA test and driving test)		
Minimum age for obtaining driver's license	219	53.8
VA test should be done before driver's license	261	64.1
VA test should be done every 6 months	243	59.7
Driving test should be done before driver's license	394	96.8
Driver's license authorities (multiple responses allowed)		
Vehicle inspection unit (VIO)	254	62.4
Federal road safety commission (FRSC)	253	62.2
Motor licensing authority (MLA)	26	6.4
Correct answer (mentioned all three authorities)	4	1.0
Road signs		
Narrow bridge	324	48.4
Dangerous bend right	165	26.3
Double dangerous bend first to right	301	48.4
Railway crossing without gate	179	32.4
Long grade dangerous hill	213	32.9
Carriage way narrows	92	17.9
Speed limit 80 km/h	322	80.8
Stop at intersection	154	77.6
Hospital	332	82.6
Advance direction	157	25.1
Speed limits		
Maximum speed limit in built-up areas	27	4.4
Maximum speed limit on highways	137	20.4
Maximum speed limit on expressways	18	3.2

vision status at the time of their driver's license procurement. Awareness of teen driving risks and knowledge of current driver license laws, have been presented by authors and proffered as methods to guide driver license laws.^[13]

In Nigeria, officials of the FRSC and VIO, in addition to their roles in the procurement of driver's license, are usually seen carrying out spot checks on the roads unlike the MLA officials who basically perform all their duties in their offices. This may explain why majority of the drivers did not know MLA as a driver's license authority. One can then postulate that many unqualified individuals may have procured drivers license through unauthorized means otherwise, they should have known the licensing authorities. This highlights the importance of enforcement of traffic regulations, especially in developing countries.

Poor knowledge of the road signs and speed limits shows their poor knowledge of the Highway Code or non familiarity. Road sign design should be guided by established ergonomics principles namely sign-content compatibility, familiarity and standardization to enhance comprehension.^[14] Over-estimation of speed limits by the drivers

Table 2: Respondents' level of knowledge

Knowledge	N=407	
	n	%
Pre-requisites for drivers' license in Nigeria		
Poor	84	20.6
Fair	175	43.0
Good	148	36.4
Mean±SD	66.9±21.2	
Road signs		
Poor	240	59.0
Fair	167	41.0
Good	32.3±12.4	
Mean±SD		
Maximum speed limits		
Poor	407	100
Fair	9.3±16.7	
Mean±SD	352	
Overall knowledge	55	13.5
Poor	35.2±9.7	
Fair	84	20.6
Mean±SD	175	

Page | 37

implies that they may be over-speeding most of the time. Commercial drivers in Ghana and Osun State, Southwest Nigeria, were better at interpreting road signs.^[15,16] Poor knowledge of speed limits by drivers was also observed in the UK where a large proportion (80%) of commercial drivers studied showed a lack of speed limit knowledge.^[10] In the absence of speed limit monitors which is a means of enforcement, it becomes mandatory for drivers to know their speed limits and adhere to them. Certainly, poor knowledge of these safety measures has negative implications for good traffic regulatory practices, hence, the persistence of RTIs as a growing public health problem.

Poor knowledge of road safety measures by commercial motorcyclists have been reported by various authors in western Nigeria.^[17,18] Several factors such as age, education and driving experience, influence drivers' knowledge of road safety measures.^[11,19,20] For Americans, the older the driver, the higher the test scores for a written drivers' test examination.^[19] In this study, drivers 60 years or older and the youngest ones had the poorest scores. For the elderly group, it is possible their memory is failing them and the younger drivers may not be well grounded in their knowledge of the Highway Code. The presence of possible confounders could also be considered and thus opens up areas for further research. In Anambra State (Southeast Nigeria), a third of the commercial motorcyclists studied had good knowledge scores and the younger riders performed significantly better than the older ones.^[11] Looking at the overall level of knowledge, respondents with formal education performed better. This is similar to observations in Southeast

Table 3: Association between respondents' age, educational level, professional driving experience and level of knowledge

Variable	Level of knowledge			P	Odds ratio	95% CI	
	Fair	Poor	Total			Lower	Upper
Age (years)							
20-29	3 (6.8)	41 (93.2)	44	0.010	1.00		
30-39	12 (11.9)	89 (88.1)	101		1.84	0.45	8.73
40-49	27 (17.8)	125 (82.2)	152		2.95	0.80	12.91
50-59	12 (15.8)	64 (84.2)	76		2.56	0.62	12.24
≥60	1 (2.9)	33 (97.1)	34		0.41	0.02	4.83
Total	55 (13.5)	352 (86.5)	407				
Educational level							
No formal	3 (8.1)	34 (91.9)	37	0.560	1.00		
Primary	18 (12.2)	129 (87.8)	147		1.58	0.41	7.19
Secondary	30 (15.7)	161 (84.3)	191		2.11	0.57	9.23
Post secondary	4 (12.5)	28 (87.5)	32		1.62	0.27	10.14
Total	55 (13.5)	352 (86.5)	407				
Professional driving experience (years)							
≤10	14 (10.5)	119 (89.5)	133	0.444	1.00		
11-20	24 (15.6)	130 (84.4)	154		1.57	0.74	3.37
>20	17 (14.2)	103 (85.8)	120		1.40	0.62	3.18
Total	55 (13.5)	352 (86.5)	407				

Nigeria.^[11] The positive influence of high years of driving experience on the comprehension of posted signs documented in the middle-east (Bahrain, Qatar and United Arab Emirate) was not reflected in this study.^[20] On the other hand, the most experienced drivers had the best total knowledge scores compared to their less experienced counterparts. The dearth of data on this important aspect of road safety (knowledge of safety measures by commuter bus drivers) is an indication that possible areas for intervention are being over-looked, especially in developing countries.

Conclusion

Good knowledge of road safety measures by drivers, no doubt is necessary for good practice of these safety measures and subsequent reduction of RTIs. These commercial drivers have demonstrated poor knowledge of road safety measures. A combination of age, education and experience may be considered to influence knowledge of safety measures. These factors should be considered in the design and execution of interventional programs, especially for younger and less experienced drivers and those who have no formal education to improve their knowledge of safety measures. However, larger scale studies should be undertaken.

Strengths and limitations

The study definitely adds to the body of knowledge as this aspect of road safety has not been sufficiently studied in Nigeria, especially among commercial bus drivers. It was however done in only one state in Nigeria and may not represent the rest of the country.

References

1. Peden M, Scurfield R, Sleet D, Mohan D, Hyder AA, Jarawan E, *et al.* 2004. World Report on Road Traffic Injury Prevention. Geneva: World Health Organization; 2004. Available from: <http://whqlibdoc.who.int/publications/2004/9241562609.pdf> [Last accessed on 2011 Mar 28].
2. WHO, 2008. The global burden of disease 2004 update. Geneva: World Health Organization; 2004. Available from: http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf [Last accessed on 2011 April 5].
3. Odero W, Garner P, Zwi A. Road traffic injuries in developing countries: A comprehensive review of epidemiological studies. *Trop Med Int Health* 1997;2:445-60.
4. Labinjo M, Juillard C, Kobusingye OC, Hyder AA. The burden of road traffic injuries in Nigeria: Results of a population-based survey. *Inj Prev* 2009;15:157-62.
5. FRSC, 2007. Federal Road Safety Commission (FRSC), Lagos State Sector Command. Lagos State road traffic accident data, 2007.
6. Federal Government of Nigeria (FGN), 2004. Federal Republic of Nigeria, Official Gazette 79 (91). Federal Road Safety Commission Act (CAP 141 LFN): National Road Traffic Regulations, 2004. FGN; 2004.
7. FRSC, 2008. The Federal Road Safety Commission, Federal Republic of Nigeria. Nigeria Highway code, 2008. FGN; 2008.
8. Nantulya MV, Reich MR. The neglected epidemic: Road traffic injuries in developing countries. *Br Med J* 2002;324:1139-41.
9. Naci H, Chisholm D, Baker TD. Distribution of road traffic deaths by road user group: A global comparison. *Inj Prev* 2009;15:55-9.
10. Adogu OU, Ilika AL. Knowledge of and attitude towards road traffic codes among commercial motorcycle riders in Anambra State. *Niger Postgrad Med J* 2006;13:297-300.
11. Fleet News, 2008. Survey shows a lack of speed limit knowledge. Fleet Available from: <http://www.news.co.uk> [Last accessed on 2009 April 6].
12. Seedat M. Extending the boundaries of injury prevention

- theory, research and practice in Africa. *Afr Saf Promot* 2002;1:5-15.
13. Campbell BT, Chaudhary NK, Saleheen H, Borrup K, Lapidus G. Does knowledge of teen driving risks and awareness of current law translate into support for stronger GDL provisions? Lessons learned from one state. *Traffic Inj Prev* 2009;10:320-4.
 14. Ben-Bassat T, Shinar D. Ergonomic guidelines for traffic sign increase sign comprehension. *Hum factors* 2006;48:182-95.
 15. Mock C, Amegashie J, Darteh K. Role of commercial drivers in motor vehicle related injuries in Ghana. *Inj Prev* 1999;5:268-71.
 16. Oladehinde MK, Adeoye AO, Adegbehingbe BO, Onakoya BO. Visual functions of commercial drivers in relation to road accidents in Nigeria. *Indian J Occup Environ Med* 2007;11:71-5.
 17. Oginni FO, Ugboko VI, Adewole RA. Knowledge, attitude, and practice of Nigerian commercial motorcyclists in the use of crash helmet and other safety measures. *Traffic Inj Prev* 2007;8:137-41.
 18. Amoran OE, Eme O, Giwa OA, Gbolahan OB. Road safety practices among commercial motorcyclists in a rural town in Nigeria: Implications for health education. *Int Q Community Health Educ* 2005-2006;24:55-64.
 19. St Louis MO. 33 million licensed Americans may be unfit for roads, according to fourth annual GMAC insurance national driving test. GMAC insurance. 2008.
 20. Al-Madani H. Influence of drivers' comprehension of posted signs on their safety related characteristics. *Accid Anal Prev* 2000;32:575-81.

Cite this article as: Okafor IP, Odeyemi KA, Dolapo DC. Knowledge of commercial bus drivers about road safety measures in Lagos, Nigeria. *Ann Afr Med* 2013;12:34-9.
Source of Support: Nil, **Conflict of Interest:** None declared.