



OCULO-VISUAL PROBLEMS AND VISION REQUIREMENT STANDARD AMONG INTERCITY COMMERCIAL BUS DRIVERS IN ABIA STATE AND IMO STATE, NIGERIA

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ABSTRACT

The study determined the burden of oculo-visual problems among intercity commercial bus drivers in Abia State and Imo State. A prospective field study, in which seven hundred commercial bus drivers were selected from major motor parks in the two states, through convenient sampling technique; three hundred and fifty from each state. A detailed case history, visual acuity test, external eye examination, visual field tests for detection of subjects with constricted visual field, color vision test for diagnosis of color blindness, ocular motility test, ophthalmoscopy, intra ocular pressure test for diagnosis of ocular hypertension, amsler grid test in subjects with macular problems, blood sugar test and sphygmomanometry were carried out to identify oculo-visual problems as well as identify drivers who met vision requirement standard for safe driving. Data were analyzed using descriptive and inferential statistics. Results from the study showed co-morbidity of cataract and refractive errors in 69 (18.65%) and refractive errors in 77 (20.75%) to be the most common oculo-visual problems among drivers in Abia and Imo States respectively. Results also showed a total oculo-visual burden of 289 (78.11%) and 261 (70.35%) among drivers in Abia and Imo States respectively. Only 166(47.4%) and 199(56.9%) of the drivers in Abia and Imo States respectively met vision requirement standard for safe driving. In conclusion, the burden of oculo-visual problems among intercity commercial bus drivers in Abia and Imo States is high as only about 50% of the study population met vision requirement standard for safe driving. The researchers educated the drivers on the public health importance of regular comprehensive vision/eye check, counseled and provided treatments where necessary as public health intervention strategies. The researchers recommend comprehensive oculo-visual examination before issuance and renewal of driver's license.

Keywords: Ocular, ophthalmoscopy, amsler, sphygmomanometry, co-morbidity, cataract



INTRODUCTION

The most essential component of safe driving is good vision. No person has ever seen a blind driver, nor any country/government that permits blind people to drive. This is because vision is the most important sense organ for driving, as about 95% of the sensory requirements for driving is vision oriented (Berna, Ahmad, El.Jawil & Al-Bakr, 2014).

Any significant loss in visual function such as visual activity or visual field will definitely diminish a driver's capability to drive safely.

Driving is visually tasking, requires several sets of abilities which include sensory ability (mainly visual), mental ability, motor ability and compensatory abilities (Kotacha, Sprat, Viswanathan, 2008). Good and comfortable vision is very crucial for driving for a number of reasons such as the driver's ability to judge distance of other vehicles and pedestrians, in reading road signs and traffic lights (Solagberu, Adekanye, Ofoegbu, Udoffa & Abdulrahman, 2003).

Recent studies have shown an increase in the rate of road traffic accident globally. Developing countries like Nigeria are bearing disproportionately high burden of morbidity and mortality as a result of road traffic accidents (Aderamo, 2010).

The developing countries of which Nigeria is prominently included account for more than 85% of all road traffic accidents in the world (Nantulya & Reich, 2002).

In terms of the standard for driving, the vision requirement standard for safe driving in Nigeria as set by the Nigerian Federal Road Safety Corps (FRSC) is 6/9 in the better eye and 6/12 in the poorer eye for commercial vehicle drivers. A continuous horizontal binocular visual field of 140 degrees or more. Any visual field less than 110 degrees horizontally is a contraindication for safe driving in Nigeria and should not condoned at all by all relevant agencies and authorities (Emem, Udechukwu, Umeh, Uwemedimbuk, 2010).

Drivers with visual acuity worse than the required standard for safe driving are more likely to have difficulty reading speed limit signs, stop signs and other road signs, at distances safe for making good vehicle control decisions, hence constitute public health threat to all road users (Aderamo, 2010).

Therefore, a commercial bus driver with marked oculo-visual problem will definitely fail to react appropriately due to the inability to perceive a potentially dangerous situation, thereby constituting a public health threat to himself, his passengers and other road users (John, 2020).

Road transportation is the most common mode of travelling in Nigeria today and commercial buses are the most frequently used vehicles by travelers in Nigeria. Therefore, since vision is the most important sensory factor for driving, accounting for about 95% of the sensory requirements for driving, it is of public health importance that a study such as this be carried out in Abia State and Imo State of the southeastern part of Nigeria, with a lot of commercial bus drivers; both young and old to ascertain the

epidemiology of the oculo-visual problems among these drivers and their level of awareness of inherent oculo-visual problems as well as to know the proportion of these intercity commercial bus drivers who actually met the vision requirement standard for safe driving in Nigeria

MATERIALS AND METHODS

Research Design

The researchers employed a prospective field study design to determine the burden of oculo-visual problems as well as the vision requirement standard for safe driving among intercity commercial bus drivers in Abia State and Imo State.

Study Population

The study population comprised of all intercity commercial bus drivers in Abia State and Imo State of Nigeria.

Inclusion and Exclusion Criteria

Inclusion Criteria

All intercity commercial bus drivers operating in Abia State and Imo State, from the major motor parks in these two states, who gave their consent

Exclusion Criteria

Intercity commercial bus drivers operating in Abia State and Imo State, who did not give their consent, intra-city commercial bus drivers in Imo State and Abia State, taxi drivers in Imo State and Abia State.

Area of Study



Figure1: Showing Map of Abia State (Latitude: 5°27'23"N, Longitude: 7°31'28"E) Source: <https://www.researchgate.net>

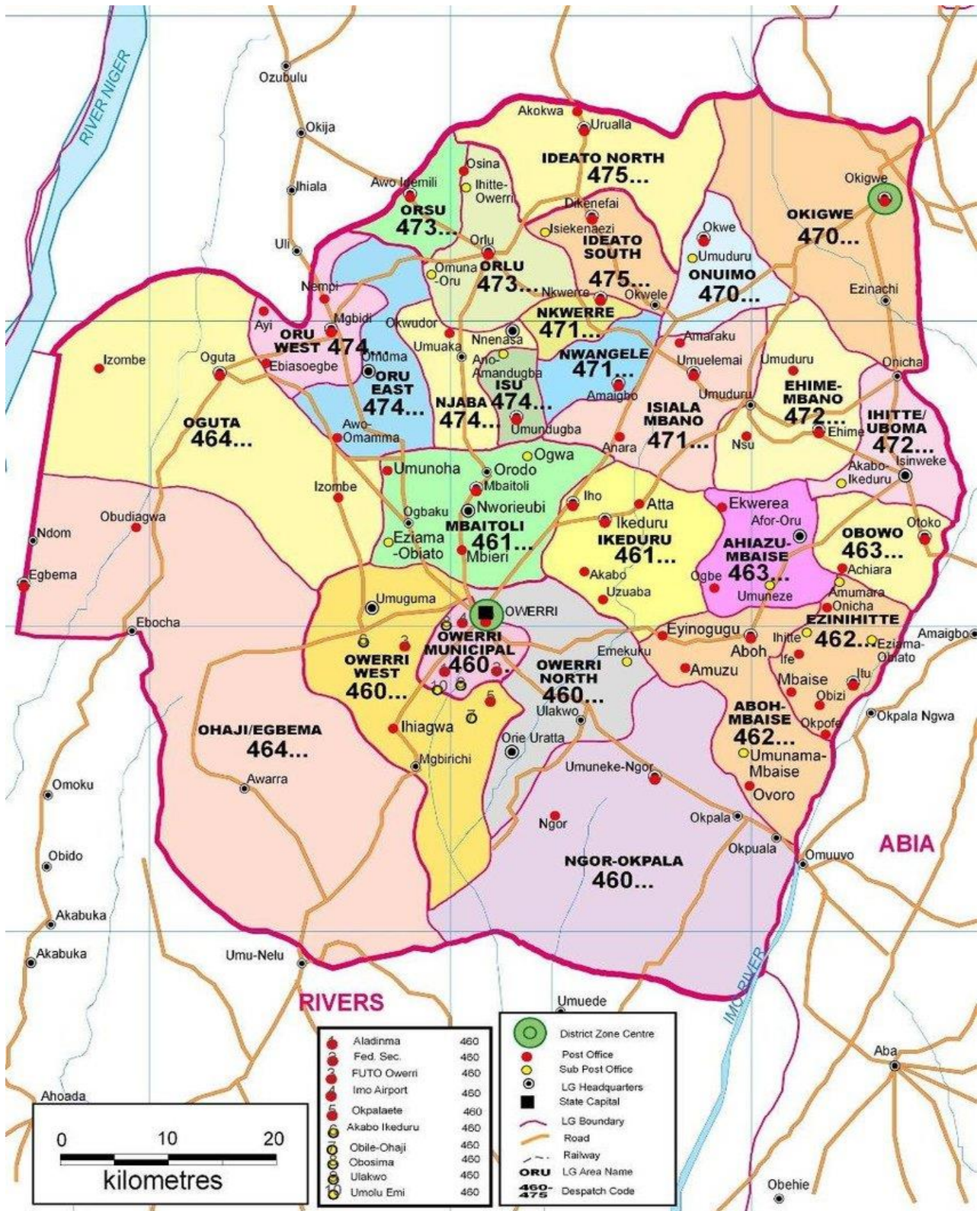


Figure2: Showing Map of Imo State (Latitude: 5.5720°N, Longitude: 7.0588°E) Source: <https://www.researchgate.net>

Abia State and Imo State are two States in the south-east geopolitical zone of Nigeria. The inhabitants are Igbos, with few non-Igbo residents. Igbo language and English language are the most commonly spoken languages in the two states. Imo state was created in 1976, it is bordered by Abia State Eastward, Anambra State on the north, Rivers State southward and Delta state on the west. The capital of Imo state is Owerri. Imo state has twenty-seven Local Government Areas namely: Aboh-Mbaise, Ahiazu Mbaise, Ehime mbano, Ezinihitte mbaise, Ideato north, Ideato south, Ihitte uboma, Ikeduru, Isiala mbano, Isu, Mbaitolu, Ngorokpala, Njaba, Nkwere, Nwangele, Obowo, Oguta, Ohajiegbema, Okigwe, Onuimo, Orlu, Orsu, Orueast, Oru west, Owerri municipal, Owerri north and Owerri west.

On the other hand, Abia State was created in 1991. The capital of Abia state is Umuahia, the popular commercial city of Aba is in Abia state. There are seventeen Local Government Areas in Abia state, they include: Aba North, Aba South, Arochukwu, Bende, Ikwuano, Isialangwa North, Isialangwa South, Isiukwuato, Obingwa, Ohafia, Osisioma Ngwa, Ugwunagbo, Ukwu East, Ukwu West, Umunneochi, Umuahia North and Umuahia South. The inhabitants of the two neighboring States are mostly business men and women; hence travel a lot with commercial buses as they do their business transactions.

Sample Size and Sampling Techniques

The sample size for this study was seven hundred intercity commercial bus drivers; three hundred and fifty participants from each of the two states which is twenty-five per cent of the study population, as the total number of intercity commercial bus drivers in both Abia State and Imo State is estimated to be two thousand eight hundred.

Convenient sampling technique was used because of constant movement of intercity commercial bus drivers.

Instruments for data collection

Instruments used for this study include the following: Snellen's visual acuity chart, Occluder, Trial lens box, Trial frame, Pseudoisochromatic test chart. Amslergrid chart, Pinhole, Direct ophthalmoscope, Retinoscope, Penlight, Glucometer, Sphygmomanometer, Structured clinic form, Pen.

Reliability and Validity

All the instruments used for this study are recognized and approved by the World Council of Optometry (WCO), Optometrists and Dispensing Opticians Registration Board of Nigeria (ODORBN), Ophthalmological Society of Nigeria (OSN) and the World Health Organization (WHO), for both external and internal comprehensive examination of the eyes.

More so, the researchers were responsible for oculo-visual examinations. The reason for this was to bring about consistency of test outcomes, also to reduce inter-examiner variability.

Procedures for Data Collection

A structured form that included questions on demographic profiles, case history, number of years in transport business was used.

Oculo-visual examinations such as, visual acuity test using the Snellen’s visual acuity chart at distance and at near, monocularly and binocularly, unaided and aided, if the participant had spectacle prescription were done on all participants.

Other examinations such as confrontation visual field test and ocular motility tests were done in all directions of gaze in all the participants.

The lids, the conjunctiva, the cornea, the sclera, the iris and the pupil were examined too, for any abnormality. Color vision test was done on the participants.

Finally, funduscopy was done on all participant intercity commercial bus drivers using Welch Allyn professional direct ophthalmoscope. Those whose fundus showed classical signs of hypertensive retinopathy, diabetic retinopathy and macular degenerations were all tested with sphygmomanometer, glucometer and amslergrid chart respectively for confirmation.

Commercial bus drivers who met vision requirement standard for safe driving, as well as those without vision requirement standard for safe driving were noted and recorded.

Method of Data Analysis

Data were analyzed using descriptive and inferential statistical packages

RESULTS

Research question 1

What are the types of oculo-visual problems among intercity commercial bus drivers in Abia State and Imo State?

Table 1: Distribution of Oculo-visual Problems among Drivers in Imo State

*Total is more than study population because some participants were diagnosed with two conditions.

Table 2: Distribution of Oculo-visual Problems among Drivers in Abia State

Oculo-visual Problems	Frequency	Percent
None	81	21.89
Cataract	69	18.65
Glaucoma	24	6.49
Refractive Errors	69	18.65
Pterygium	39	10.54
Pinguecula	42	11.35
Hypertensive Retinopathy	14	3.78
Diabetic Retinopathy	23	6.22
Color Blindness	4	1.08
Macular Degeneration	5	1.35
Total	370	100.0

*Total is more than study population because some participants were diagnosed with two conditions.

Findings from table two above shows 81 (21.89%) of the study participants had no oculo-visual problems. The most common oculo-visual problem found among drivers in Abia State were cataract and refractive errors each accounting for 69 (18.65%) of the study population, pinguecula was found to be the next accounting for 42 (11.35%) of the study population, the least common oculo-visual problems were color blindness and macular degeneration accounting for 4 (1.08%) and 5 (1.35%) respectively.

Findings from table 1 above also shows 110 (29.65%) of the study participants in Imo State had no oculo-visual problems, however the most common oculo-visual problem found among drivers in Imo State was refractive errors accounting for 77 (20.75%) of the study population, cataract was found to be the next oculo-visual problem accounting for 47(12.67%) of the study population, the least common oculo-visual problems were color blindness and hordeolum accounting for 3 (0.81%) and 5 (1.35%) respectively.

Comparing the findings from both states, oculo-visual problems were more prevalent in Abia State with a prevalence rate of 289(78.11%) than in Imo State which had a prevalence rate of 261(70.35%).

Research Question 2

What proportion of intercity commercial bus drivers in Abia State and Imo State met vision requirement standard for safe driving?

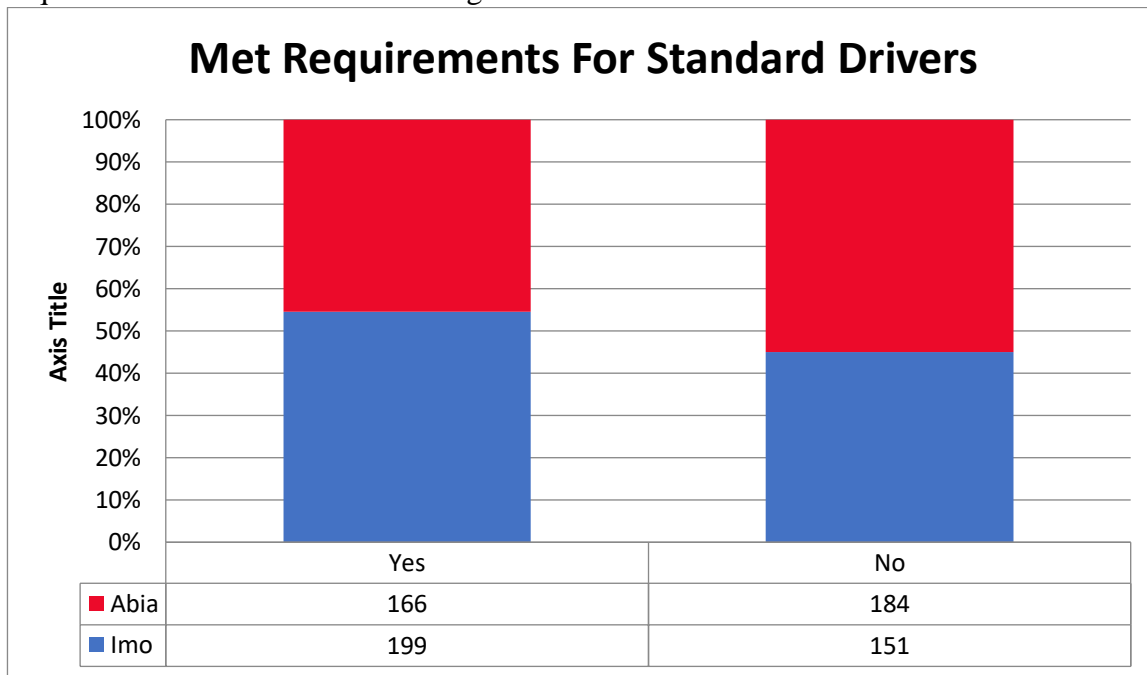


Figure 3: showing the proportion of intercity commercial bus drivers in Abia State and Imo State who met vision requirement standard for safe driving.

From figure 5 above, 199 (56.9%) of the intercity commercial bus drivers in Imo State met the vision requirement standard for safe driving while in Abia State only 166 (47.4%) of the intercity commercial bus drivers were certified to have met the vision requirement standard for safe driving.

Research Question 3: Is there a variation in terms of vision requirement standard among intercity commercial bus drivers in Abia State and Imo State?

Table 3: showing variation in terms of vision requirement standard among intercity commercial bus drivers in Abia State and Imo State.

Met Standard Driving Vision Requirement	Location			
	Abia		Imo	
	Frequency	Percentage	Frequency	Percentage
Yes	166	47.4	199	56.9
No	184	52.6	151	43.1
Total	350	100	350	100

From the table 3 above, 199 (56.9%) of intercity commercial bus drivers in Imo State met the vision requirement standard for safe driving as against 166 (47.4%) of the intercity commercial bus drivers in Abia State.

Ho1: The variation in terms of vision requirement standard for safe driving among intercity commercial bus drivers in Abia State and Imo State does not differ significantly ($P < 0.05$).

See chi square test table showing answers to research hypothesis 1 below.

Chi-Square Tests table showing answers to research hypothesis 1

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.546 ^a	1	.111		
Continuity Correction ^b	2.213	1	.137		
Likelihood Ratio	2.548	1	.110		
Fisher's Exact Test				.130	.068
Linear-by-Linear Association	2.539	1	.111		
N of Valid Cases ^b	350				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 71.62.

b. Computed only for a 2x2 table

Symmetric Measures

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Pearson's R				
Interval	-.085	.053	-1.597	.111 ^c
Ordinal by Spearman				
Ordinal	-.085	.053	-1.597	.111 ^c
N of Valid Cases	350			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b
Interval	by Pearson's R			
Interval		-.085	.053	-1.597
Ordinal	by Spearman			
Ordinal	Correlation	-.085	.053	-1.597
N of Valid Cases		350		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

A test for significance using the chi square and Pearson's correlation showed a negative correlation between intercity commercial bus drivers in Abia State and Imo State who met vision requirement standard for safe driving, thus the null hypothesis is supported and the alternate hypothesis is not accepted.

Discussion

The findings from this study showed cataract to be the most common oculo-visual problem among intercity commercial bus drivers in both Abia State and Imo State, with frequency of 47 {18.65% } and 69 (12.66%) respectively. This is not in agreement with the study done by Isawumi, Adeoti, Ubah (2011), who found refractive error (31.3%) to be the most common oculo-visual problem in commercial vehicle drivers in Osun State.

Refractive errors in this study were seen in 69 (18.65%) and 77 (20.75%) in intercity commercial bus drivers in Abia State and Imo State respectively. This is not in agreement with the study done by Mohammed, Auduallem, Woldenmichael, Yeshigeta (2013), who found 8.8% refractive error among drivers in Jimma town, South-West Ethiopia.

The findings from the study also differed from the study done by Oladehinde, Adeoye, Adegbehingbe, Onakoya (2007), in which refractive error was seen in 8.4% of the drivers in Osun State.

The study is also at variance with that of Isawumi, Adeoti, Ubah (2011), who found (31.3%) refractive error in commercial vehicle drivers in Osun State.

The results from the study showed 4 (1.08%) and 3 (0.8%) of intercity commercial bus drivers in Abia State and Imo State with color blindness respectively. This is similar to (1.6%) reported by Mohammed, Auduallem, Woldemichael, Yeshigeta (2013), in Jimma town, South-West Ethiopia.

The study is in disagreement with that of Omolase, Afolabi, Omolase, Ihemedu (2012) and that of Victor (2006), who reported none (0%) and 14 (6.31%) color blindness in Ondo State and Selangor respectively.

The result is also at variance with that of Adekoya, Owoeye, Adepoju, Ajaiyeoba (2009), who reported (4.3%) color blindness in intercity commercial drivers in Ilorin.

The findings from this study showed intercity commercial bus drivers in Abia State and Imo State who met vision requirement standard for safe driving to be 166 (47.4%) and 199 (56.9%) respectively. This is at variance with (88.5%) reported in Ilorin by Adekoya, Owoeye, Adepoju, Ajaiyeoba (2009) and (3.2%) reported in Jimma town, South-West Ethiopia by Mohammed, Auduallem, Woldenmichael, Yeshigeta (2013).



Conclusion

In conclusion, the burden of oculo-visual problems among intercity commercial bus drivers in Abia State and Imo State is high, as only about 50% of the study population met vision requirement standard for safe driving.

Recommendations of the study

1. The Federal Road Safety Corps (FRSC) must ensure that only commercial drivers who met vision requirement standard for safe driving are issued driver's license.
2. Commercial vehicle drivers with poor vision should as a matter of public health importance quit driving to save their lives, their passengers and that of other road users.

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