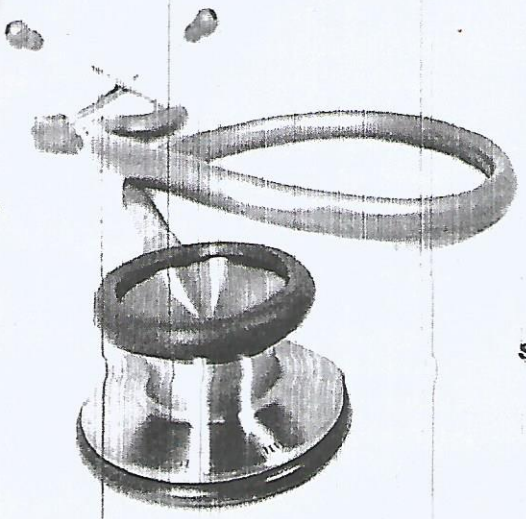
Caliphate Medical Journal

A Publication of Nigerian Medical Association Sokoto State Chapter.

Vol. 5 No. 1 & 2, January - June, 2017

ISSN: 2346-7193



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ISSN: 2346-7193 (Print)
ISSN 2346-7207(Online)

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ORIGINAL ARTICLE

PREVALENCE OF HYPERTENSION AND OBESITY AMONG INTERCITY COMMERCIAL BUS DRIVERS IN LAGOS STATE, NIGERIA

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Abstract

Background: There is a growing burden of hypertension and obesity in developing countries and commercial bus drivers are vulnerable occupational group due to environmental and lifestyle characteristics linked with their jobs.

Objective: The broad objective of this study was to assess the prevalence of hypertension and obesity among commercial bus drivers in Lagos state, Nigeria

Methods: Study design was a descriptive cross sectional study among 507 commercial bus drivers. Pretested interviewer administered questionnaire was used for collection of data on sociodemographic characteristics, hypertension history, lifestyle habits and biometric measurements. Data analysed with Epi-Info version 7.1.4.0 statistical software. Univariate and bivariate analyses were carried out. P value $\leq$ 0.05 was considered statistically significant.

Results: Response rate was 98% and mean age of respondents was 43.28±10.76 years. Prevalence of hypertension and obesity were 35.8% and 16.1% respectively. There was statistically significant relationship (P<0.05) between age, numbers of years of driving, tobacco smoking, drinking of coffee, alcohol consumption and prevalence of hypertension and obesity.

Conclusion: Prevalence of hypertension and obesity among the commercial bus drivers were similar to that of urban population. Health education programmes to modify lifestyle habits and thereby reduce the prevalence of hypertension and obesity are recommended.

Key words: Prevalence of hypertension and obesity, lifestyle habits, commercial bus drivers

Running Title: Hypertension and obesity among drivers

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INTRODUCTION

Hypertension (HTN) is a chronic condition of concern due to its role in the causation of coronary heart disease, stroke and other vascular complications.1 The prevalence and vulnerability to complications increase with age and, for unknown reasons, are high in African-Americans and blacks.2Worldwide, the number of people diagnosed with hypertension rose from 600 million in 1980 to 1 billion in 2008. In 2008, worldwide, approximately 40% of adults aged 25 and above had been diagnosed with hypertension.3The estimated prevalence of hypertension in 2008 among adults aged 25 years and above was 33.8% in USA, 43.5% in UK, 38.2% in China, and 42.8% in Nigeria.2In 2010, the prevalence of hypertension among adults aged 18 years and above was 18.7% in USA, 22.6% in UK, 20.2% in China and 22.2% in Nigeria while in 2014 it was 22% worldwide, 13.4% in USA, 15.2% in UK, 18.8% in China and 27.8% in Nigeria.4

Raised blood pressure is estimated to have caused 9.4 million deaths and 7% of disease burden – as measured in DALYs – in 2010.4 Hypertension is responsible for at least 45% of deaths due to heart disease and 51% of deaths due to stroke.3Risk factors for hypertension include stress, obesity, smoking, physical inactivity, and heavy consumption of salt.5

Obesity increases the likelihood of diabetes, hypertension, coronary heart disease, stroke and certain types of cancer.4Although obesity was thought to be a problem only in the developed countries, it is fast becoming a pandemic as the populations in developing countries are beginning to have sedentary lifestyles and eat processed, low cost, high-caloric diet.6Worldwide, the prevalence of obesity has nearly doubled since 1980. In 2010, the prevalence of obesity among adults aged 18 years and above was 32.4% in USA, 27.0% in UK, 5.4% in China and 7.8% in Nigeria while in 2014 it was 35.0% in USA, 29.8% in UK, 7.3% in China and 9.7% in Nigeria.4

Not much is known about the prevalence of hypertension and obesity among commercial bus drivers in Nigeria as shown by the paucity of data and limited number of research conducted amongst them. This study was therefore carried out to determine the prevalence of hypertension and obesity among commercial bus drivers in two motor parks in Lagos state, Nigeria.

Methodology

Study population: The study was conducted among intercity commercial bus drivers in two motor parks (Ojota New Garage and Yaba Motor Parks) in Lagos state, the commercial capital of Nigeria. The population of Lagos state and Nigeria were projected to be 21 million and 186 million respectively by the year 2016. Ojota New Garage and Yaba Motor Parks are in Kosofe and Lagos Mainland Local Government Areas of Lagos state respectively. The two Motor Parks are overseen by the National Union of Road Transport Workers (NURTW). There were 497 and 55 registered intercity commercial bus drivers at the Ojota New Garage and Yaba Motor Parks respectively.

Methods: The study design was a descriptive cross sectional study conducted among commercial bus drivers. With a prevalence of 21.4% of hypertension among inter-city drivers in an urban city in south-south Nigeria7, confidence

interval of 95%, degree of accuracy desired of 5% and assumed response rate of 90%; the minimum sample size of 196 was estimated using the formula for descriptive cross-sectional study when the sampled population is less than 10,000. However, all the 507 intercity commercial bus drivers in the two Motor Parks that were available, eligible and willing to participate in the study were enrolled.

A pre-tested, structured, interviewer-administered questionnaire which was derived from other similar published study,7and biometric measurement instruments were used for data collection. The questionnaire had three sections for recording the sociodemographic information, hypertension history/lifestyle habits and biometric (i.e. blood pressure, weight and height) measurements.

Sociodemographic information included age, educational status, marital status, ethnicity, religion, years spent in driving as commercial bus driver, and monthly income. Hypertension history and lifestyle habits included awareness of being hypertensive, tobacco cigarette use, alcohol intake and taking of stimulants to stay awake while driving.

Three blood pressure (BP) readings using a mercury sphygmomanometer (Accoson, London, UK) with appropriate cuff were obtained at $\geqslant$ 5 minutes intervals with the subject in a sitting position, after a rest of at least 30 minutes. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) readings were based on Korotkoff's first and fifth sounds respectively. Measurements were carried out by seven trained health professionals who had previous experience with BP measurement. The average of the last two of the three readings was used for the analyses.

Weight and height were measured in light clothing without shoes and body mass index (BMI) was calculated as weight in kilograms divided by square of height in meters.

Definitions of hypertension and obesity: Hypertension was defined based on the Seventh Report of the Joint National Committeeon Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC7) and/or awareness of being hypertensive and/or currently taking antihypertensive medication. Obesity was defined based on WHO International Classification of BMI for adults.9

Data analysis: Data was analysed using the Epi Info version 3.5.1, WinPepi and GraphPad Instat computer statistical software packages. Chi-square and Fisher Exact tests were used for comparing differences between proportions while t-test and Analysis of variance (ANOVA) were used for comparison of differences between means. P values $\leqslant$ 0.05 were considered statistically significant.

Ethical consideration: Ethical approval was obtained from the Health Research and Ethics Committee of Lagos University Teaching Hospital. Participants were informed about the nature, purpose and extent of the study and their verbal consent was obtained before data collection. The respondents were assured of confidentiality in handling their responses.

Results

Response rate: A total of 497 out of the 507 respondents that were enrolled for the study participated in all phases of the study giving a response rate of 98%.

The mean age and modal age group of the respondents were 43.28±10.76 years and 31-40 years respectively. Majority of the respondents were at least 40 years old (57.95%), had at least secondary school education (67.81%), were married (86.32%), were Yoruba by tribe (86.12%), were Christians (72.43%), and had been driving for less than 20 years (57.34%) (Table 1).

Among the respondents, 42(8.5%) were aware they were hypertensive while 18(3.6%) were taking antihypertensive medications. A total of 125(25.2%) of the drivers were currently smoking cigarette; 81(16.3%), 23(4.6%), 6(1.2%) and 15(3.0%) smoked 1-5, 6-10, 11-15, and 16-20 sticks of cigarettes per day respectively. Ninety eight (19.7%) and 27(5.5%) of the respondents have been smoking for less than 20 years and at least 20 years respectively. Among the respondents, 144 (29.0%) reported kolanut consumption; 93(18.7%) consume coffee; 9(1.8%) were taking aspirin; 9(1.8%) consume bitter kola; 9(1.8%) take Lipton tea; 6(1.2%) take alligator pepper; 6(1.2%) use chewing stick; 6(1.2%) take sweet; 5(1.0%) use chewing gum; 3(0.6%) drink water and 2(0.4%) consume coke to stay awake while driving. A total of 298 (60.0%) of the drivers reported current alcohol consumption; 256(51.5%) reported taking beer, 150(30.2%) reported consumption of dry gin, 106(21.3%) consume red wine and 5(1.0%) drink palm wine. A total of 194(39.0%) and 104 (20.9%) of the respondents have been taking alcohol for less than 20 years and at least 20 years respectively.

Biometric measurements: One hundred and seventy eight (35.8%) of the respondents were hypertensive; 142(28.6%) and 36(7.2%) were in stage 1 and stage 2 respectively. All the respondents that were aware of being hypertensive and/or currently taking antihypertensive medication had blood pressure readings of stage 1 HTN. As regards the BMI, 258(51.9%) of the respondents were overweight; 178(35.8%), 71(14.3%) and 9(1.8%) were pre-obese, obese class I and obese class II respectively (Table 2).

The prevalence of hypertension was shown to statistically significantly increase with increasing age ($p<0.00001$), increasing numbers of years of driving ($p<0.0007$), tobacco smoking ($p=0.0432$), drinking of coffee ($p=0.0002$), taking of alcohol ($p<0.0001$), and being overweight ($p<0.0001$) (Table 1).

The prevalence of obesity was statistically significantly shown to increase with increasing age ($p< 0.00001$), to be more among the married than the unmarried ($p=0.0004$), to be more among the Christians than the Muslims ($p=0.024$), to increase with numbers of years of driving ($p<0.0001$), to be more among the non-smokers than the smokers ($p=0.04$), to be less among those who eat kolanut to stay awake while driving than those who do not eat kolanut to stay awake while driving ($p=0.0001$), to be more among the non-coffee drinkers than the coffee drinkers ($p=0.0002$), and to be more

among those who take alcohol than those who do not take alcohol ($p<0.0001$) (Table 3).

Discussion

This study was carried out among commercial bus drivers all of whom were males; this is due to the fact that it is a male dominated profession as reported in other studies. Modal age group of the commercial bus drivers in this study was 31 to 40 years; this is similar to the finding of the study done in North Kerala, India.10Highest education level of majority of the study population was secondary level of education; this is similar to the findings of a study carried out in Benin, Nigeria.7 Majority of the respondents in this study were married, which is similar to the findings from the studies conducted in Brazil, and in North Kerala, India.10,11 Yoruba was the predominant ethnic group of the respondents; this is anticipated because the study location is in the South Western part of the country, where Yoruba tribe is the major ethnic group. There was high consumption of alcohol among the respondents; similar findings have been reported by Cavagioni et al from Brazil.11

Prevalence of hypertension among the respondents in this study was higher than the findings of other studies conducted in Nigeria7,12 and Turkey13but lower than the prevalence for bus drivers in Brazil5 and North Kerala, India.10 It is however similar to the reported 33.3% from a study done among adults in an urban community in Lagos, Nigeria.14 The near urban prevalence of hypertension in this study could be due to the drivers acquiring life style risk factors seen in urban population which may be due to the habits associated with the job like the sedentary nature of driving for very long hours. Being hypertensive in this study was found to be statistically significantly associated with increasing age; increasing years of driving; alcohol consumption; smoking; stimulant use (coffee consumption), and increasing BMI.

Regarding obesity, the prevalence of obesity (class I & II) among the respondents in this study was less than the prevalence rate of obesity among adults in a study carried out in Brazil (36%).5 but similar to the finding of the study conducted in Turkey (15.6%).13 Obesity in this study was significantly associated with age greater than or equal to 40 years and marital status. The effects of marriage on weight may be due to the influence of marriage on motivation to eat (e.g. shared meals).

Epidemiologic data and cross-sectional studies have suggested a fundamental relationship between obesity and hypertension. According to the WHO, up to 20% of the population in developed countries may suffer from obesity-associated hypertension, which may account for 78% and 65% of essential hypertension in men and women, respectively.15 A study done in Ogbomoso in Nigeria showed an overall prevalence of hypertension of 50.5% with a prevalence of 60% among the obese subset. In our study population, the prevalence of hypertension among the overweight (pre-obese, obese class I and Obese class II) subset was 49%.

In conclusion, prevalence of hypertension was high among the commercial bus drivers while prevalence of obesity was low. Increasing age, alcohol consumption, stimulant (coffee) use and obesity were significantly associated with hypertension. It is therefore recommended that health education programmes on HTN and obesity should be organized for commercial bus drivers by the Lagos State Ministry of Health in conjunction with Lagos State Ministry of Transportation and the National Union of Road Transport Workers (NURTW) to address modifiable risk factors for hypertension and obesity. In addition, compulsory HTN and obesity screening exercise should be a prerequisite for renewal of drivers' license of commercial bus drivers.

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Table 1: Relationships between prevalence of different blood pressure categories and studied variables among commercial drivers

Variables	Total	Blood Pressure Categories Frequency (%)				Statistics & P value
	Frequency (%) (n=497)	Normal	Pre-HTN	Stage 1 HTN	Stage 2 HTN	
Age (Years)						
<40	209(42.05)	43(20.6)	110(52.9)	56 (26.8)	0(0.0)	
≥40	288(57.95)	33(11.5)	133(46.2)	86(29.9)	36(12.5)	
Mean±SD	43.28±10.76	38.37±9.21	42.37±10.60	45.20±10.59	52.19±8.73	**p<0.00001 (ANOVA)**
Educational status						
	160(32.19)	26(16.3)	71(44.4)	45(28.1)	18(11.3)	**X^2=6.37; df=3; p=0.095**
	337(67.81)	50(14.8)	172(51.0)	97(28.8)	18(5.3)	
Marital status						
Married	429(86.32)	60(14.0)	214(49.9)	122(28.4)	33(7.7)	
Not married	68(13.68)	16(23.5)	29(42.6)	20(29.4)	3(4.4)	***p=0.20**
Ethnicity						
Yoruba	428(86.12)	62(14.5)	213(49.8)	119(27.8)	34(7.9)	
Others (Igbo+Hausa)	69(13.88)	14(20.3)	30(43.5)	23(33.3)	2(2.9)	***p=0213**
Religion						
Christianity	360(72.43)	38(10.6)	174(48.3)	115(31.9)	33(9.2)	**X^2=31.11; df=3; p<0.0000**
Islam	137(27.5)	38(27.7)	69(50.4)	27(19.7)	3(2.2)	
Duration of driving (years)						
<20	285(57.34)	63(22.1)	149(52.3)	62(21.8)	11(3.9)	
≥20	212(42.66)	13(6.1)	94(44.3)	80(37.7)	25(11.8)	
Mean±SD	18.81±12.14	15.14±9.10	18.12±11.85	20.75±13.62	23.53±10.98	**p=0.0007 (ANOVA)**
Tobacco smoking						
Yes	125(25.15)	10(8.0)	68(54.4)	35(28.0)	12(9.6)	
No	372(74.85)	66(17.7)	175(47.0)	107(28.8)	24(6.5)	***p=0.0432**
Kola nut consumption						
Yes	144(28.97)	18(12.5)	76(52.8)	39(27.1)	11(7.6)	
No	353(71.03)	58(16.4)	167(47.3)	103(29.2)	25(7.1)	***p=0.60**
Coffee consumption						
Yes	93(18.71)	9(9.7)	32(34.4)	42(45.2)	10(10.8)	
No	404(81.29)	67(16.6)	211(52.2)	100(24.8)	26(6.4)	***p=0.0002**
Alcohol intake						
Yes	298(59.96)	25(8.4)	159(53.4)	85(28.5)	29(9.7)	
No	199(40.04)	51(25.6)	84(42.2)	57(28.6)	7(3.5)	***p<0.0001**
Aware of being hypertensive						
Yes	42(8.45)	0(0.0)	0(0.0)	30(71.4)	12(28.6)	
No	455(91.55)	76(16.7)	228(50.1)	127(27.9)	24(5.3)	***p<0.00001**
BMI Category						
Non-overweight (BMI<25)	242(48.69)	43(17.8)	146(60.3)	45(18.6)	8(3.3)	
Overweight	255(51.31)	33(12.9)	97(38.0)	97(38.0)	28(11.0)	
Mean±SD	25.58±4.02	25.65±3.77	24.61±3.96	26.83±3.74	27.11±4.30	**p<0.0001 (ANOVA)**

*Fisher's exact

Table 2: Frequency distribution of Blood Pressure and Body Mass Index among commercial bus drivers

Blood Pressure and BMI	Frequency (%)
Blood pressure	
Normal (<120mmHg SBP and <80mmHg DBP)	76(15.3)
Prehypertension (120-139mmHg SBP or 80-89mmHg DBP)	243(48.9)
Stage 1 hypertension (140-159 mmHg SBP or 90-99mmHg DBP)	142(28.6)
	36(7.2)
Total	497(100)
Body Mass Index	
Underweight (BMI<18.50)	14(2.8)
Normal Range (BMI 18.50-24.99)	225(45.3)
Pre obese (BMI 25.00-29.99)	178(35.8)
Obese class I (BMI 30.00-34.99)	71(14.3)
Obese class II (BMI 35.00-39.99)	9(1.8)
Total	497(100)

Table 3: Relationships between Body Mass Index categories and studied variables among commercial bus drivers

Variables	Body Mass Index Categories Frequency (%)					
	Under-weight	Normal	Pre obese	Obese 1	Obese 2	Statistics &Pvalue
Age (Years)						
<40	11(5.3)	121(57.9)	59 (28.2)	18(8.6)	**0(0.0)**	
	3(1.0)	104(36.1)	119(41.3)	53(18.4)	**9(3.1)**	
Mean±SD	36.07±11.51	40.79±10.69	44.94±10.02	97.77±9.89	58.33±3.60	**p<0.00001 (ANOVA)**
Educational status						
	3(1.9)	64(40.0)	72(45.0)	18(11.3)	**3(1.9)**	
	11(3.3)	161(47.8)	106(31.5)	53(15.7)	**6(1.8)**	***p=0.056**
Marital status						
Married	8(1.9)	188(43.8)	159(37.1)	68(15.9)	**6(1.4)**	
Unmarried	6(8.8)	37(54.4)	19(27.9)	3(4.4)	**3(4.4)**	***p=0.0004**
Ethnicity						
Yoruba	14(3.3)	193(45.1)	152(35.5)	60(14.0)	**9(2.1)**	
Others (Igbo+Hausa)	0(0.0)	32(46.4)	26(37.7)	11(15.9)	**0(0.0)**	***p=0.536**
Religion						
Christianity	11(3.1)	148(41.1)	136(37.8)	59(16.4)	6(1.7)	
Islam	3(2.2)	77(56.2)	42(30.7)	12(8.8)	**3(2.2)**	***p=0.0237**
Duration of driving (years)						
<20	11(3.9)	151(53.0)	85(29.8)	38(13.3)	**0(0.0)**	
	3(1.4)	74(34.9)	93(43.9.7)	33(15.6)	**9(4.2)**	
Mean± SD	13.79±14.67	16.91± 11.63	19.94± 11.85	20.45±11.91	38.67±1.00	**p<0.0001 (ANOVA)**
Tobacco smoking						
Yes	6(4.8)	65(52.0)	42(33.6)	12(9.6)	**0(0.0)**	
No	8(2.2)	160(43.0)	136(36.6)	59(15.9)	**9(2.4)**	***p=0.0399**
Kola nut consumption						
Yes	0(0.0)	56(38.9)	71(49.3)	17(11.8)	0(0.0)	
No	14(4.0)	169(47.9)	107(30.3)	54(15.3)	9(2.5)	***p=0.0001**
Coffee consumption						
Yes	6(6.5)	24(25.8)	49(52.7)	11(11.8)	3(3.2)	
No	8(2.0)	201(49.8)	129(31.9)	60(14.9)	6(1.5)	***p=0.0002**
Alcohol intake						
Yes	11(3.7)	116(38.9)	124(41.6)	41(13.8)	6(2.0)	
No	3(1.5)	109(54.8)	54(27.1)	30(15.1)	3(1.5)	***p=0.0001**

***Fisher's exact**