The prevalence and predictors of undiagnosed hypertension among commercial long-distance bus drivers (CLDBs) in cape coast, ghana.

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Abstract

Introduction: Hypertension is a public health issue globally and contributes substantially to mortality. The risk factors are numerous and can be modifiable and non-modifiable. This study assessed the occupational, lifestyle, and anthropometric determinants of hypertension among Commercial Long-Distance Bus Drivers (CLDBDs) in Cape Coast, Ghana.

Methods: The study was cross-sectional in design and involved 170 CLDBDs from five Ghana Private Road Transport Union bus stations in Cape Coast. The socio-demographic, occupational, lifestyle, and anthropometric data were collected. We calculated the years of driving a commercial vehicle for occupational factors while we computed alcohol intake and physical activity levels for lifestyle factors. Percent body fat (% BF) and Body Mass Index (BMI) in kg/m2 were used to evaluate adiposity. Blood pressure (mmHg) was measured to determine hypertension levels.

Results: The mean age of the respondents was 48.78 ± 8.26 years. Mean % BF was 20.5 ± 7.7% and mean BMI of 25.4 ± 4.2 Kg/m2. Hypertension prevalence was 21.2%. The prevalence of overweight and obesity were 36.5% and 14.2%, respectively. About 51.8% had been driving commercial vehicles for over 18 years, 45.9% took alcohol, 35.9% had high % BF and 19.2% very high % BF. There is a significant difference in systolic blood pressure (P<0.001) and diastolic blood pressure (P<0.001) between the age groups. The years of driving a commercial vehicle showed a significant difference in high systolic pressure (P<0.001) and high diastolic pressure (P<0.001). Those who used alcohol had a statistical significant difference (P=0.02) in systolic blood pressure. Age of drivers, BMI, %BF and alcohol intake predicted hypertension development.

Conclusions: There was a high prevalence of hypertension among the study participants since one-in-five had hypertension. Lifestyle, occupational, and body composition factors predicted the likelihood of hypertension.

Keywords: Lifestyle factors, Anthropometric, Hypertension, Cape Coast, Commercial long-distance bus drivers.

Accepted on November 10, 2020

Introduction

Hypertension is a common risk factor for CVDs and is a major health problem around the world and is responsible for at least 45% of deaths because of cardiovascular diseases (CVDs) [1,2] and an important contributor to mortality in the world [3,4]. It is a major public health issue in sub-Saharan Africa [5] over 40% of adults are hypertensive [5]. According to Roger et al. [6], and Virdis et al. [7], blood pressure can be triggered by work-related psychological stress, job strain, and long irregular working hours. Although stress may not directly cause hypertension, it can lead to repeated blood pressure elevations, then irregular heartbeats, which eventually may lead to hypertension through exposure to mechanical vibrations [8,9]. Evidence suggests a strong correlation between BMI and hypertension [10]; at least 75% of the incidence of hypertension is related directly to obesity [11]. Body mass index (BMI), reflects adiposity in individuals, is one of the key independent factors that predispose one to hypertension. Data on global hypertension prevalence between 1990 and 2015, showed an increase in global incidence and prevalence [12]. Similarly, there has been a steady increase in the prevalence of hypertension and associated morbidities in Ghana over the past forty years [13-15]. The prevalence is higher in the urban sector compared to the rural. Hypertension is the second leading cause of morbidity among adults [16], with prevalence ranging from 19% to 48% [17,18]. The high morbidity has been associated with inadequate prevention and poor management efforts [16,18]. In a study where hypertension prevalence was 58.9%, 19.0% of hypertensives were aware of their status; 67.6% of those who were aware of their condition were receiving treatment. In the same study, age, place of residence,

and employment status were associated with hypertension awareness and treatment [19]. Notwithstanding this trend, hypertension awareness, treatment, and control remained poor in a study in Accra, a coastal town just like Cape Coast, 19% of hypertensives were not aware of their condition and therefore not on treatment [19,20]. Commercial long-distance bus driving is one of those economic areas where earnings are based on the number of trips made and distance travelled. Occupation and life style have been found to be associated with hypertension development among adults in Ghana [13,14]. According to the Ghana Demographic Health Survey, Hypertension prevalence among adults in urban Cape Coast is higher than the national average. To mitigate hypertension mortality, the National Health Insurance Scheme (NHIS) was instituted to make health care, including hypertension treatment and management affordable to all [19]. Despite this intervention, hypertension prevalence remains high, and this has been associated with an increase in life expectancy and lifestyle factors [21]. It has become important to consider employment status in efforts to reduce morbidities among population groups since evidence as of now indicates that there is a higher risk of mortality among individuals who have co-morbidities and are infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. We therefore assessed the prevalence of hypertension among Commercial Long-Distance Bus Drivers in Cape Coast. It also determined the predictors of hypertension because of occupation, lifestyle, and body composition.

Materials and Methods

Study design

This was a quantitative cross-sectional study that comprised Commercial Long-Distance Bus Drivers.

Study area and setting

The study took place in five transport unions' bus stations (Tantri number 1, Tantri number 2, Francol Transport Services Ltd, Metro Mass Transit Services and Co-operative Transport Union) in Cape Coast, the Central Regional capital of Ghana. These organizations have buses that transport passengers to destinations that are 140km or more outside Cape Coast that were considered to be a long distance [22]. Cape Coast covers a total land mass of 9,826 square kilometers with an estimated population of 1,805,488 [23]. The Metropolis covers an area of 122 square kilometers and is the smallest metropolis in the country. The area is located on longitude 1° 15'W and latitude 5°06'N. The main occupation of the inhabitants is fishing since the southern section of the town is bordered by the Gulf of Guinea. Majority of the people are Christians and belong to the Akan ethnic group [23].

Study participants

The study participants comprised 170 Commercial Long-Distance Bus Drivers (CLDBDs), in the Cape Coast municipality.

Study period

We conducted the study from October 2012 to November 2012, between the hours of 4.30 am and 9.00 am.

Sample size determination

We determined the sample size using the prevalence of hypertension among West African workforce which was 34.4% [16] and computed using the formula: $n=Z^2 pq/d^2$. Where n =estimated sample size, Z =confidence level (95% level of confidence-1.96), p =the probability of having hypertension, (Prevalence = 34.4%) =0.344, q=1–p, which is the probability of not having hypertension, in this case: 1-p=0.656, d= 0.05 as the acceptable margin of error. The population of long-distance drivers was=325. Therefore, n= (1.96) 2 (0.344) (0.656) (0.05) 2=347. Correction for finite population n/{1+ (n 1/population)}=165. We rounded this up to 170 to increase the precision of the estimates.

Sampling Method

The managers at the various transport unions gave a list of Long-Distance Bus Drivers based on Metro Mass categorization of 140km.Weighting was used to calculate the number of potential respondents needed from each list from the unions based on the calculated sample size. We then met the drivers at pre-agreed dawns at the Unions (bus stations). Simple random sampling was then used to recruit respondents from each union. We gave identification tags to those sampled, and these were used to collect data on agreed dates at dawn. We sampled 170 respondents from the five transport Unions.

Inclusion and exclusion criteria

We included in the study registered drivers at the unions have a valid driver's license and classified as a long-distance driver based on Metro Mass Classification of driving not less than 140km per day. Those who did not have the License C, which qualifies them to drive a bus and those who operated at the stations but are not registered members of the unions were excluded. We excluded those with known hypertension from the study.

Height measurement

Each participant stood on the footboard of the stadiometer (model: HM200P, Charder USA) bare footed with the heel, head, and buttocks touching the body of the stadiometer and took in a deep breath. They then recorded the height to the nearest 0.1cm in duplicates.

BMI and percent body fat measurements

The height measurement, age, and gender were keyed into the Omron Fat Loss Monitor with scale (HBF 400; Omron China), which was mounted on a hard level ground. Each participant mounted the equipment (Omron fat loss monitor with scale) with cleaned and dried feet, wearing minimal clothing [24]. The weight measurement, BMI, and the percent body fat readings were recorded. We measured weight to the nearest 0.1kilograms and the percent body fat in 0.1% increments. We performed all measurements in duplicates.

Measurement of blood pressure

A standardized digital Omron automatic blood pressure monitor (HEM–172CN2; Omron, China) was used for measuring the blood pressure of the participants at the lorry stations of the road transport unions. The participants were asked to sit for 15 minutes, after which the cuff was wrapped around their left arm and arterial blood pressure readings recorded. Three readings

(mmHg) were taken at five minutes intervals.

Study tools

Pretesting of questionnaire: We pretested every aspect of the questionnaire at Madina Lorry Park among CLBDs who ply Madina-to-Aflao, Madina-to-Kpando, Madina-to-Ho, and Madina-to-Hohoe. Based on the responses, we made modifications to the questionnaire concerning the items in the questionnaire and decided on the best times to conduct the study.

Data collection tools and procedure: The data were collected on the CLDBDs using different instruments. A structured questionnaire developed by the study team was used to collect information on socio-demographic, occupation, and lifestyle variables. The stress level of the drivers was determined using the adapted stress management scale for dummies [25]. Standardized procedures [26] were used to collect data on weight and height measures of participants in duplicates and means recorded. BMI was categorized based on using WHO standards [26] While % BF was categorized based on recommended cut-offs [24]. We measured arterial systolic and diastolic blood pressure readings in triplicate using (HEM–172CN2; Omron, China) according to standard procedures [27]. The means of the readings were recorded. Participants were asked to rest for at least five minutes between measurements. We considered systolic blood pressure of ≥140mmHg and diastolic blood pressure of ≥ 90mmHg as hypertension or current pharmacological treatment for hypertension [28].

Lifestyle practices*:* The variables collected were: alcohol intake; the types of alcohol consumed; the frequency of intake; quantity of alcohol taken at a time and whether respondents use tobacco.

Occupational variables*:* Data were collected on; years of commercial driving, vehicle sitting capacity (seats), hours driven to destination, the number of round trips in a day, eat on your trips, the number of meals per day, and whether they eat fruit or eat any snack (any meal apart from their main meals).

Variables classification

BMI: We converted The body weight and height measurements taken from participants into BMI values by dividing the weight (kg) by the height in meters squared. The values were then categorized as follows; Underweight: < 18.50; Normal weight: 18.5–24.99; Overweight: ≥ 25.00; Obese class I: 30.00to –34.99; Obese class II: 35.00to –39.99 and Obese class III: ≥ 40.00 [25].

Hypertension*:* This was done by categorizing the mean of the three readings of the systolic and diastolic values recorded based on the classification of [28]. These are Normal: Systolic BP <120 and Diastolic BP <80 mmHg; Pre-hypertension: Systolic BP -139 and/or Diastolic BP = 80-89 mmHg, Hypertension - Stage I hypertension: Systolic BP = 140-159 and/ or Diastolic BP = 90-99 mmHg and Hypertension - Stage II hypertension: Systolic BP > 160 and/or Diastolic BP > 100 mmHg.

Physical activity variables*:* The variables were asked: what do you do when you are not driving; If they exercise, they should describe the activity; show how often do you exercise; show frequency of exercise in a day; frequency of exercise in a week; frequency of exercise in a month; time do you spend on an exercise in a day; time do you spend on an exercise in a in a week and time spend on an exercise in a in a month. The physical activities were classified into low, moderate, and high according to the method of [29]. Physical activity less than 150 mins per week is considered low; 150-300 mins per week considered was considered medium while physical activity >300 mins per week was considered high.

Stress level*:* For stress level determination among the drivers, ten questions were asked for which respondents were to answer never, sometimes, often and very often. The variables were: Experience irritation, tiredness, easily get annoyed, have anxiety, worry, lack of focus, experience, profuse sweating, not eat well, not hungry but keep on eating and experience sleeplessness or had a problem sleeping. Scores between 0-9 were classified as lower than average; 20–39 as average; 40–49 as moderately higher than average; and 50 and above much higher than average.

Percent body fat: The % BF that was measured by the Omron fat analyzer was categorized based on [24]. This procedure assumes that normal % BF depends on age (years). We classified the percent body fat based on age categories from low, normal, high, and very high. For those aged between 20-39 years, % BF<8.0, 8.0 -19.9, 20.0–24.9 and ≥ 25were classified as low, normal, high and very high respectively. For those aged between 40 to 59 years, the classifications were: <11.0, 11.0–21.9, 22.0-27.9, and ≥ 28 as low, normal, high and very high respectively. We categorized the age category from 60 to 79 years as:<13.0, 13.0to –24.9, 25.0–29.9 and ≥ 30 as low, normal, high and very high respectively.

Training and pretesting: We trained the data collectors for two days on how to conduct the interview in the English and the local dialects. During the training, they translated the questionnaire into Akan language and back into English language again to ensure that meanings of words were not lost. And for participants who consented, but did not have a formal education, they did the interviews in the local language. We pretested the questionnaire on 5% of the CLDBDs at Madina bus station, in the Greater Accra Region and modifications made to the study questionnaire. We tested every aspect of the study protocol during pretesting.

Data analysis

Data were doubly entered, into IBM SPSS version 16 and inaccurate entries were identified and removed from the data set before analysis began. Frequencies and percentages were used to summarize the socio-demographic characteristics, BMI, stress, blood pressure, lifestyle, and occupational categorical variables. Chi-square test of association was performed for the socio-demographic characteristics, occupational factors, lifestyle factors, BMI and % BF against blood pressure and statistical significance determined at P<0.05. Binary logistic regression was used to predict the odds of developing high systolic pressure (BP ≥140mmHg) and high diastolic pressure (≥ 90mmHG) among CLDBDs. The explanatory variables used in both models for high systolic and high diastolic blood pressures are: age of drivers,% BF, years of commercial driving, number of trips made in a day, seat capacity of vehicles, turnaround time, stress level, hours of sleep in a day, physical activity level,

alcohol intake, smoking and snacking frequency. The reference independent variables in the logistic model for the categories are; age 46, years of commercial driving >21, the number of round trips in a day 2, seat capacity >20, hours of sleep in a day ≥8, alcohol use no, snack intake no, physical activity level very high and percentage body fat very high. The adjusted and unadjusted odds ratio, confidence interval, and the P values were reported for the model. We set the significant levels at P< 0.05 and P< 0.01.

Ethical issues

The participants gave informed consent after the purpose of the study was explained to them. They were told their participation was voluntary, they can withdraw from the study and refuse to answer any question, if they so wish. Confidentiality was assured. We referred participants who were found to have hypertension based on our categorization to Cape Coast Teaching Hospital for treatment. Ethical approval (protocol #004/12-13) for the study was given by the Institutional Review Board of Noguchi Memorial Institute for Medical Research, University of Ghana, Legon.

Results

The socio-demographic and occupational characteristics of CLDBDs

All the Commercial Long-Distance Bus Drivers (CLDBDs) in this study were males with the mean age of 40.78 ± 8.26 years (Table 1). They have been driving commercial vehicles for 18.46 ± 8.48 years. About three-fourths (76.5%) of these drivers completed either Junior High School or Middle school, is about nine years of formal education (Table 1). While driving to their destinations 98.8% ate food (s); at least half of them had three meals daily. Besides the main meals, 91.2% consumes fruits frequently while 72.4% took snacks (Table 1).

Lifestyle practices

We present the results of stress and lifestyle practices in Table 2. About 98.2% of the participants had lower stress levels (scored 0-19) While 1.8% of them were averagely stressed (scored 20-29). Regarding lifestyle practices, forty-six percent drank alcohol and of this proportion, 53.8% drank spirits. Only 1.8% of them were current smokers. Their mean sleeping hours per day was 5.81± 1.49, and 87.1% sleeps seven hours a day. Majority (64.7%) were categorized to engage in low physical activity.

Blood pressure profile

A proportion of 21.2% of respondents who met the study definition of hypertension had systolic blood pressure of 140mmHg or higher. Twenty-two percent have a diastolic blood pressure of 90 mmHg or more. The mean pulse rate was 72.6 ± 9.9 beats per minute (Table 3).

Anthropometric indices

The mean Body Mass Index of the participants was 25.4 ± 4.2 kg/m2. The prevalence of overweight and obesity were 36.5% and 14.2%. For those aged 20-39 years, percent body fat for was very high among 19.2% with a mean of 20.5 ± 7.7. About 37.8% had normal percent body fat among those aged 40-59 years with a mean of 23.6 ± 6.7 (Table 4).

Predictors of hypertension

In this study, age of participants, years of commercial driving, alcohol use, body mass index (BMI), and percentage body fat (% BF) were factors associated with blood pressure measurements (Tables 5 and 6). The significant predictors of high systolic blood pressure (HSBP) (≥ 140 mmHg) and high diastolic blood pressure (HDBP) (≥ 90 mmHg) were age in years, years of commercial driving and % BF (Tables 5 and 6). There was a significant statistical association between age and systolic and diastolic blood pressure measurements (p<0.0001; Tables 5 and 6). Drivers aged less than 35 years and those aged 35-40 years were 90% and 80% less likely to develop HSBP as compared to those who were at least 46 years (OR=0.1; 95% CI=0.02-0.82) and (OR=0.2; 95% CI=0.04-0.61) respectively. Drivers less than 35 years and those aged 35−0 years were 90% and 80% less likely to develop HDBP compared with those 46 years and above (OR 0.1; 95% CI= 0.03-0.39) and (OR=0.2; 95% CI=0.05–0.55) respectively. Years of commercial driving was significantly associated with systolic and diastolic blood

Table 1. *The socio-demographic and occupational characteristics of CLDBDs (N=170).*

Characteristics	n (%)
Age (years)	
< 35	45 (26.5)
35-40	39 (22.9)
41-45	42 (24.7)
≥46	44 (25.9)
Educational Level	
None/ Primary	13 (7.6)
1JHS/MSLC/	130 (76.5)
2SHS/GCE (OL)/Tech/Voc	26 (15.3)
Tertiary	1 (0.6)
Years of commercial driving	
≤ 18	88 (51.8)
>18	82 (48.2)
Vehicle sitting capacity (seats)	
≤ 20	101 (59.4)
> 20	69 (40.6)
Hours driven to destination	
2-3	126 (74.1)
>3	44 (25.9)
Number of round trips in a day	
1	94 (55.3)
2	76 (44.7)
Eat on your trips	
Yes	168 (98.8)
No	2 (1.2)
Number of meals per day	
1-2	81 (47.6)
3-4	89 (52.4)
Do you take fruit	
Yes	155 (91.2)
No	15 (8.8)
Snack intake	
Yes	123 (72.4)
No	47 (27.6)
1=JHS/MSLC=Nine years of schooling; 2=SHS/GCE (OL)/Tech/ Voc=Twelve years of schooling.	

Table 2. *Descriptive statistics of lifestyle practices among the CLDBDs (N=170).*

Characteristics	n (%)
Stress level	
Lower than average (0-19)	167 (98.2)
Average (20-39)	3 (1.8)
Lifestyle Practices	
Alcohol intake	
Yes	78 (45.9)
No	92 (54.1)
Type of alcohol	
Spirit	42 (53.8)
Beer	35 (44.9)
Wine	1 (1.3)
Tobacco use	
Yes	3 (1.8)
No	167 (98.2)
Sleeping hours in a day	
3-5	76 (44.7)
6-7	72 (42.4)
≥8	22 (12.9)
Physical activity level	
Low	110 (64.7)
Moderately	43 (25.3)
High	17 (10.0)

Table 3*. Descriptive statistics of body composition and blood pressure variables of CLDBDs in Cape Coast (N=170).*

Measurement Body mass index (kg/m2)	n (%)
Underweight (<18.5)	5 (2.9)
Normal weight (18.5–24.9)	79 (46.5)
Overweight (25–29.9)	62 (36.5)
Obese (≥ 30)	24 (14.2)
Percent body fat (%BF)	
(20-39 years)	
Low (< 8.0)	5 (6.4)
Normal (8.0–19.9)	30 (38.5)
High (20.0–24.9)	28 (35.9)
Very High (≥ 25)	15 (19.2)
40 -59 years (%)	
Low (<11.0)	2 (2.2)
Normal (11.0–21.9)	34 (37.8)
High (22.0–27.9)	26 (28.9)
Very High (≥ 28)	28 (31.1)
60- 79 years (%)	
High (25.0–29.9)	1 (50.0)
Very High (≥30.0)	1 (50.0)
Blood pressure (mmHg)	
Systolic	
<140	134 (78.8)
≥ 140	36 (21.2)
Diastolic	
<90	132 (77.7)
≥ 90	38 (22.4)
Pulse rate (/min)	
60-100	169 (99.4)
>100	1 (0.6)

pressure measurements (P<0.0001). Drivers who have been driving for less than 14 years and between 14 and 21 years were 90% and 60% less likely to develop HSBP compare to those who had been driving for over 21 years (OR=0.1; 95% CI=0.04-0.39) and (OR=0.4; 95% CI= 0.18-0.96; Table 5) respectively. Driving for less than 14 years places a driver at a decreased risk (10%) for developing HDBP than those who have been driving for over 21 years (OR=0.1; 95% CI=0.04-0.39; Table 6). There was a significant association between alcohol intake and systolic blood pressure (p=0.020) but not with diastolic blood pressure (P=0.230; Table 6). The drivers who consumed alcohol increased their risk of developing HSBP by threefold (OR=2.54; CI=1.19-5.45), compared with those who did not take alcohol (Table 5).

Body mass index (BMI) and percent body fat (%BF) were both associated with systolic and diastolic blood pressure measurements. Participants with normal % BF were 80% less likely to develop HSBP as compared to their counterparts with very high % BF (≥ 25), (OR=0.2; 95% CI=0.06-0.60), (Table 5). The likelihood of a driver with normal % BF developing HDBP was 0% compared with a driver with very high % BF (OR=0.2; 95% CI=0.07–0.53), (Table 6).

Discussion

To our knowledge, this is the first study in Cape Coast and Ghana that assessed the occupational, lifestyle, and anthropometric predictors of hypertension among Commercial Long-Distance Bus Drivers (CLDBDs). Hypertension status can be directly or otherwise associated with lots of factors. Our study found that the prevalence of hypertension, determined by the systolic and diastolic blood pressure values averaged 21%. This result is lesser than 40% prevalence reported in Ashanti Region by [5], to 33.8% reported by [30] among traders at Hohoe in the Volta Region and 27.3% at Keta also in the Volta Region. Commercial driving is a shift work, and this was found to be associated with the risk of developing hypertension [31]. The differences in prevalence seen may be due to the different populations involved and the geographical location [32]. The decreased odds of developing hypertension among drivers with fewer years and hours of commercial driving as compared to those who have been driving commercially for longer periods is consistent with a finding in the United States of America [33]. We have found long working hours to increase tension resulting in an increased activity of the sympathetic nerve increasing the mean daily blood pressure in both normotensive and hypertension individuals [34]. This observed differences may be due to less rest, which is known to increase one's chances of developing hypertension and heart related diseases by 40-80% [34]. It has been shown that sleep deprivation can contribute to the development of hypertension in truck drivers. The observed obese proportion (14.2%) among the drivers was higher compared to the national prevalence of obesity (2.8%) for males 18 years and older [35] and among drivers in Accra reported by [36]. The proportion of overweight and obesity observed in this population may be because of low physical inactivity, alcohol intake, and the high percentage of body fat. This is consistent with the findings of [37]. Prolonged long-distance driving for long hours may contribute to the development of overweight and obesity observed elsewhere [16,38]. Physical

Table 4: Chi-Square statistics of demographic characteristics, BMI by blood pressure among CLDBDs in Cape Coast, Ghana (N=170).

Background characteristics	Systolic blood pressure	P-value	Diastolic blood pressure	P-value
	<140mmHg	≥140mmHg	<90mmHg	≥90mmHg
<35	42 (24.7)	3 (1.8)**	42 (24.8)	3 (1.8)**
35-40	35 (20.6)	4 (2.4)	35 (20.6)	4 (2.4)
41-45	33 (19.4)	9 (5.3)	29 (17.1)	13 (7.6)
>45	24 (14.1)	20 (11.8)	26 (15.3)	18 (10.6)
≤3	102 (60.0)	22 (12.9)	99 (58.3)	25 (14.7)
>3	32 (18.8)	14 (8.2)	33 (19.4)	13 (7.6)
<14	53 (31.2)	4 (2.4)**	53 (31.2)	4 (2.4)**
14-21	48 (28.2)	12 (7.1)	46 (27.1)	14 (8.2)
>21	33 (19.4)	20 (11.8)	33 (19.4)	20 (11.8)
≤20	87 (51.2)	20 (11.8)	83 (48.9)	24 (14.1)
>20	47 (27.6)	16 (9.4)	49 (28.8)	14 (8.2)
Yes	73 (42.9)	21 (12.4)	72 (42.4)	22 (12.9)
No	61 (35.9)	15 (8.8)	60 (35.3)	16 (9.4)
5-Apr	54 (31.8)	14 (8.2)	51 (30.0)	17 (10.0)
7-Jun	57 (33.5)	14 (8.2)	57 (33.6)	14 (8.2)
9-Aug	23 (13.5)	8 (4.7)	24 (14.1)	7 (4.1)
Yes	55 (32.4)	23 (13.5)*	56 (33.0)	22 (12.9)
No	79 (46.5)	13 (7.6)	76 (44.7)	16 (9.4)
Underweight	5 (2.9)	0 (0.0)**	5 (2.9)	0 (0.0)*
Normal	70 (41.2)	9 (5.3)	69 (40.6)	10 (5.9)
Overweight	45 (26.5)	17 (10.0)	44 (25.9)	18 (10.6)
Obese	14 (8.2)	10 (5.9)	14 (8.2)	10 (5.9)
Low	7 (4.1)	1 (0.6)*	7 (4.1)	1 (0.6)*
Normal	57 (33.5)	7 (4.1)	57 (33.5)	7 (4.1)
High	44 (25.9)	10 (5.9)	41 (24.1)	13 (7.6)
Very high	26 (15.3)	18 (10.6)	27 (15.9)	17 (10.0)
Total	134 (78.8)	36 (21.2)	132 (77.7)	38 (22.4)
*: Signifies association at P<0.05; **: association at P< 0.001.				

Table 5. *Logistics regression of predictors of high systolic blood pressure among CLDBDs in Cape Coast, Ghana (N=170).*

Variable	OR	P-Value	OR	P-Value
	Adjusted (95% CI)		Unadjusted(95% CI)	
Age category (years)				
< 35	0.14 (0.02 − 0.82)	0.03*	0.09 (0.02–0.32)	< 0.01*
35-40	0.15 (0.04 − 0.60)	0.01*	0.14 (0.04–0.45)	< 0.01*
41-45	0.34 (0.10 − 1.09)	0.07	0.33 (0.13–1.57)	0.07
≥ 46	1		1	
Years of commercial driving				
< 14	0.37 (0.07–1.96)	0.24	0.13 (0.04−0.39)	< 0.01*
14-21	0.59 (0.19–1.91)	0.39	0.41 (0.18–0.96)	0.04*
> 21	1		1	
Number of round trips make in a day				
1	0.83 (0.27–2.53)	0.75	1.17 (0.56–2.46)	0.68
2	1		1	
Seat capacity				
≤ 20	1.24 (0.38–4.02)	0.72	0.68 (0.32–1.43)	0.3
> 20	1		1	
Hours of sleep in a day				
5-Mar	0.73 (0.15–0.34)	0.69	1.55 (0.45–4.99)	0.51
7-Jun	0.79 (0.17–0.35)	0.75	0.99 (0.29–3.42)	0.99
≥ 8	1		1	
Alcohol use				
Yes	1.95 (0.76 − 5.02)	0.17	2.54 (1.19–5.45)	0.02*
No	1		1	
Snack intake				
Yes	0.99 (0.36–2.71)	0.99	0.95 (0.42–2.18)	0.91
No	1		1	

Physical activity level				
Low	0.62 (0.13–2.94)	0.55	0.91 (0.27–3.04)	0.87
Moderate	0.39 (0.07–2.26)	0.29	0.74 (0.19–2.89)	0.67
High	1		1	
Percentage body fat (%)				
Low	0.33 (0.03–4.19)	0.39	0.21 (0.02–1.83)	0.16
Normal	0.19 (0.06–0.60)	0.01*	0.18 (0.07–0.48)	< 0.01*
High	0.34 (0.11–1.04)	0.06	0.33 (0.13–0.82)	0.02*
Very high	1		1	
Hosmer-Lemeshow Statistic: P=0. 873; Nagelkerke R2=0.365.				

Table 6. *Predictors of high diastolic blood pressure among CLDBDs in Cape Coast, Ghana (N=170).*

Variable	OR	P-Value	OR	P-Value
	Adjusted (95% CI)		Unadjusted (95% CI)	
Age category (years)				
< 35	0.19 (0.03 − 1.11)	0.07	0.10 (0.03–0.39)	< 0.01*
35-40	0.18 (0.04 − 0.76)	0.02*	0.17 (0.05–0.55)	< 0.01*
41-45	0.78 (0.26 − 2.36)	0.66	0.65 (0.27–1.57)	0.34
≥ 46	1		1	
Years of commercial driving				
< 14	0.37 (0.08 −1.82)	0.22	0.13 (0.04 − 0.39)	<0.01*
14-21	0.96 (0.32 − 2.94)	0.95	0.50 (0.22–1.14)	0.09
> 21	1		1	
Number of round trips make in a day				
1	0.94 (0.32 −2.75)	0.91	1.15 (0.55–2.38)	0.72
2	1		1	
Seat capacity				
≤ 20	3.58 (1.09–11.75)	0.04*	1.01 (0.48–2.14)	0.98
> 20	1		1	
Hours of sleep in a day				
5-Mar	3.12 (0.57–15.15)	0.19	2.58 (0.69–9.61)	0.16
7-Jun	1.67 (0.32–8.58)	0.54	1.39 (0.36–5.42)	0.63
≥ 8	1		1	
Alcohol use				
Yes	1.56 (0.62–3.89)	0.34	1.87 (0.89–3.88)	0.09
No	1		1	
Snack intake				
Yes	0.99 (0.36 − 2.71)	0.99	0.75 (0.34– 1.65)	0.48
No	1		1	
Physical activity levels				
Low	0.62 (0.14−2.82)	0.54	0.86 (0.26–2.89)	0.81
Moderate	0.73 (0.14–3.74)	0.71	1.11 (0.30–4.16)	0.87
High	1		1	
Percentage body fat				
Low	0.47 (0.04−5.49)	0.55	0.23 (0.03–2.01)	0.18
Normal	0.20 (0.06−0.65)	0.01*	0.19 (0.07–0.53)	< 0.01*
High	0.70 (0.24−2.06)	0.52	0.50 (0.11–1.20)	0.12
Very high	1		1	
Hosmer-Lemeshow Statistic: P=0. 439; Nagelkerke R2=0.348.				

inactivity, overweight, obesity, and alcohol consumption are established risk factors for hypertension development [39]. The low physical inactivity observed is consistent with the findings of [40]. This is because drivers spent long hours driving and are too tired to do any physical activity when they get home and the Unions do not have designated areas at the bus stations for drivers to perform any physical activity. The high % BF found is also consistent with findings from elsewhere [41]. This occurs because the snacks they reportedly took were maybe high in calories, and they also drank alcoholic beverages that are known to supply empty calories. In fact, in some lorry stations at Cape Coast, alcohol vending points are located within the bus stations and this makes it easily available to the drivers. In a study in Nigeria, religious obligations prevented drivers from taking alcohol [42]. In that instance, alcohol intake among the drivers was low compared with this study. Higher body percent fat is an independent predictor of hypertension and cardiovascular diseases [39]. Studies have shown that age is a non-modifiable risk of hypertension and this was observed in this study that as one ages the risk of developing hypertension increases. This finding is consistent with that found by [43] and cited by [44]. The significance of the study was that it generated data

on the determinants of systolic and diastolic blood pressure separately. This study had some weaknesses. Among these was the fact that the design was cross-sectional and the sample size was small. Not using the WHO stepwise approach for non-communicable disease surveillance (hypertension) was also a weakness of the study. Additionally, we did not collect data on hypertension awareness, treatment, and control. Data on alcohol consumption such as units of alcohol and frequency were not gathered. These may affect the generalization of the study results, but the identified deficiencies provide avenues for further research in the area.

Conclusion

The study revealed that hypertension exists among this category of Commercial Long-Distance Bus Drivers. This was attributable to factors like lifestyle and body composition and occupational factors. The implication of the findings is that advocacy on performance of physical activity, healthy eating is done through the various driver union, so drivers can be healthier and transport passengers safely to and from their destinations, especially here in Ghana where rail transport is virtually absent and, at least in Cape Coast road transport is the only means of getting around.

Acknowledgement

We, the authors thank the drivers for taking part in this study. We are grateful to the executives of the Ghana Private Road Transport Union (GPRTU) Cape Coast branch and the local drivers' union in Cape Coast for their support. Our acknowledgement goes to the late Professor Ebenezer Asibey–Berko of the Department of Nutrition and Food Science, University of Ghana, Legon, for providing comments on the manuscript.

Funding

All activities that led to the writing of this manuscript were self-financed. They also declare no conflict of interest.

Availability of data

All data supporting the conclusions of this article are in the manuscript.

Authors' contributions

JS was engaged in data collection, analysis and interpretation of data, drafting, and reviewing of manuscript. HAA was involved in sample and data collection, data analysis and interpretation of data, drafting, and reviewing of the manuscript. PNG was involved in data curation and interpretation and reviewing of manuscript. GE was involved in manuscript review. CNA was involved in data interpretation, drafting, and review of manuscript. MSA was involved in concept and design of study, sample and data collection, data interpretation, and reviewing of manuscript. All authors approved of the final version of the manuscript.

Ethical approval and consent to participate

Ethical approval (protocol, #004/12-13) was given by the Institutional Review Board of Noguchi Memorial Institute for Medical Research, University of Ghana, Legon. The study participants gave their written consent or thumb impressions to participate. Permission was granted by the authorities of various Transport unions for the study to be carried out.

Consent for publication

Not applicable.

Competing interest

The authors have no conflict of interest.

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