academicJournals

Vol. 8(7), pp. 75-83, July 2016
DOI: 10.5897/IJMMS2016.1234
Article Number: C8CA31859282
ISSN 2006-9723

http://www.academicjournals.org/IJMMS

International Journal of Medicine and Medical Sciences

Full Length Research Paper

Prevalence of hypertension and associated risk factor among interstate commercial drivers in Jabi Park Abuja

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Received 25, February, 2016; Accepted 26 April 2016

Commercial drivers are a 'high-risk' population where fitness on duty is important in enabling them to adequately respond to their job responsibilities. This study was carried out to determine the prevalence of hypertension and its risk factors among the interstate commercial drivers in Jabi Park, Abuja. A cross-sectional study with 389 inter-state commercial drivers at Jabi Park in Abuja was conducted. A structured interviewer-administered questionnaire was used to collect information on socio-demographic characteristics, driving patterns, physical activity, dietary habit, tobacco-use, vision, alcohol consumption and practice of periodic health checks. Respondents' blood pressure (BP), waist circumference, hip circumference, body weight and height were measured. Fasting blood samples were collected for cholesterol and blood glucose estimation. Data was analyzed using descriptive statistics, Chi square and logistic regression at p<0.05. The prevalence of hypertension (BP>160/95 mmHg) was 9.0%. Hypertension was found among 19.9% of those obese. Ninety-nine percentage of the respondents had hyperglycaemia and of this 51.0% had hypertension. 2.3% of the respondents were smokers and 3.9% took alcohol. There was positive correlation between hypertension and body mass index (BMI; r = 0.8). Multivariate analysis, after controlling for age, revealed that obesity (BMI≥30 kg/m^2) (AOR=6.2; 95%CI=1.9-20.7), Waist-hip ratio > 0.95 (AOR=6.4; 95%CI=1.5-27.0), family history of hypertension (AOR=4.1, 95%CI=1.9-8.0) and hypercholesterolemia (AOR=4.0; 95%CI=1.2-13.2) significantly predicted occurrence of hypertension. There is high prevalence of hypertension among commercial drivers in Jabi Park and this is attributed to lifestyle factors. Thus, workplace interventions to address the risk factors identified in this study are crucial for preventing mortality and morbidity due to hypertension.

Key words: Prevalence, risk factors, hypertension, commercial drivers, Abuja.

INTRODUCTION

Hypertension is a leading risk factor and primary contributor to Cardiovascular Vascular Disease (CVD).

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In 2000, 972 million people were reported to have hypertension, a prevalence rate of 26.4% and this number is expected to increase to 1.54 billion by 2025 (Kearney et al., 2005). In sub-Saharan Africa, the overall prevalence of hypertension in 2008 was estimated at 16.2% (95% CI: 14.2 - 20.3) and in the Africa region, about 74.7 million (95% CI: 65.2 to 93.4 million) individuals were estimated hypertensive (Ogah, 2006, 2012).

In addition, a review undertaken in Nigeria in 2012 found the overall prevalence of hypertension ranged from 8 to 46.4% depending on the study target population, type of measurement and cut-off value used for defining hypertension (Ogah et al., 2012).

In developed countries such as the United States, hypertension has been found to be a largest contributor to cardiovascular mortality. Furthermore developing countries such as Nigeria face enormous challenge posed by the social and economic effects of increasing morbidity and mortality due to CVDs (Lopez et al., 2006; Gersh et al., 2010). NCDs affect populations that are still economically active such as truck drivers.

Statistics show that diseases that were initially prevalent in high income countries are increasingly becoming prevalent in middle and low income countries. This is attributed to globalization and industrialization which lead to lifestyle changes including consumption of highly refined food rich in fat and sugar (energy dense food), reduced physical activity and increased exposure to stress (Go et al., 2014). This transition has led to the emergence of NCDs including hypertension, diabetes, cancers and other related conditions.

Many studies conducted in developing countries especially in Africa have looked at truck drivers' sexual health in relation to HIV/AIDS. Lacking are studies that look at the prevalence on non-communicable diseases and their risk factors among this population especially in developing countries, (Lawoyin et al., 2002). Studies elsewhere have shown that truck drivers including other workers whose occupation is professional driving are at a higher risk of ischeamic heart conditions (Go et al., 2014; Lawoyin et al., 2002; Netterstrøm and Suadicani, 1993; Sangaleti et al., 2014). The higher risk of NCDs may be explained by the inherent prevalence of risk factors in this population. The conditions that truck drivers work under create a favorable environment for the development of NCDs such as hypertension. These include sedentary lifestyle, poor diets, poor access to health care and stress. In addition all these risk factors may contribute to obesity which is another important risk factor for hypertension.

Studies have looked extensively at the risk factors for hypertension. Meanwhile road accidents are also a major public health concern in Nigeria. As at 2001, Nigeria ranked second on the weighted scale of countries with very high road traffic crashes (Ghaffar, 2013). Over 7,000 Nigerians die every year from road traffic crashes (FRSC), over 26,000 injuries were recorded at same period and from 2000 to 2002, the annual death toll from road crashes in Nigeria recorded more than 8,400 from about 17,000 road crashes. This is an average of one death in every two crashes nationwide. A total of 208,361 cases of road traffic crashes were recorded by FRSC from 1990 to 2001, these resulted in 81,657 deaths and 238,573 people injured (Chidoka, 2013). Commercial drivers cause 40% of RTAs in Nigeria, (Chidoka, 2013). Commercial drivers undergo high stress, their diets are not controlled, smoke while on the wheel, drink alcohol before driving, may be drunk while driving and may not have time to do one medical checkup, (Chidoka, 2013). Some are already on treatment for hypertension but are not adherent to anti-hypertensive treatment while they still drive passengers and putting them at risk of losing lives. Hypertensive encephalopathy has led to many auto-crashes and many deaths among drivers and passengers (Akanbi et al., 2009).

However considering the importance of commercial drivers on the economy, it is therefore imperative to look at prevalence of hypertension as well as its risk factors in this population. The results would provide important information to be used at personal, community levels and workplace levels. Such information could be used to develop intervention strategies targeted at the prevention of hypertension and the promotion of the general health and well-being of these commercial drivers.

MATERIALS AND METHODS

A descriptive cross sectional study that was carried out in Jabi Motor Park, located in Utako area of Abuja municipality. It is the largest park in Federal Capital Territory (FCT) and services all routes to the various states of Nigeria from Abuja. There are about 2378 registered commercial drivers in Jabi Motor Park. The Jabi Motor Park has many food vendors, and there are other traders selling cigarette and alcoholic drinks.

The study population included interstate commercial drivers travelling from Abuja to and from the 36 states of the Federation. All interstate commercial drivers who were 18 years old and above, registered with the National Union of Road Transport Workers in the park at time of study were included in the study. Drivers below the age of 18 years, private motor drivers, drivers without licenses and non-consenting drivers were excluded from the study. Systematic sampling technique was used to select 414 subjects from the register in which 2738 commercial drivers were recorded. The study population (2378) was divided with the sample size (414) to get the sampling interval of 6.

Interviews using a pretested questionnaire collected data on socio-demographic characteristics, driving patterns, physical activity, dietary habit, tobacco-use, vision, alcohol consumption and practice of periodic health checks. It was reviewed by a senior colleague in the Department of Epidemiology and Medical Biostatistics, Faculty of Public Health, College of Medicine, University of Ibadan In addition, measurements such as blood pressure, weight, height, waist circumference, hip circumference were taken. Fasting venous blood samples were collected for cholesterol and blood glucose estimation. Data was collected between February and April, 2013. The individual interview took between 10 to 20 min to complete. Respondents that were found to be hypertensive and diabetic without prior knowledge of their health

status were provided with medications to reduce the blood pressure and blood sugar level and were eventually referred to health clinic and hospital of their choice.

Blood pressure measurements

Blood pressure was taken on the left upper arm using a sphygmomanometer cuff. The BP was taken only two times with intervals of two days instead of three times with interval of 3 to 4 days, (JNC, 2014). Blood pressure was measured using mercury Accoson sphygmomanometer. The measurements were taken in the sitting position with exposed outstretched right arm on a table after resting for at least 5 min, using appropriate cuff size, the cuff bladder completely encircling the arm covering 75% of the arm between the acromion and olecranon. The bell of the stethoscope was placed over the brachial pulse at the proximal medial part of the anti-cubital fossa. For each measurement, the cuff was rapidly inflated to occlude the brachial artery, and then deflated slowly allowing the mercury column of the sphygmomanometer to fall at a rate of approximately 2 to 5 mm Hg per second. The first Korotkoff sound was taken as systolic BP and the fifth Korotkoff sound as the diastolic BP. Blood pressure was measured twice for each person in the same sitting with at least two minutes interval between measurements. The average of the two measurements was then estimated as the blood pressure level of the subject. For those with a raised BP, two additional BP measurements were made at least a week apart. Hypertension (HTN) was defined as average of two measurements of systolic and/or diastolic BP that is ≥160/95 mmHg or self-reported treatment of hypertension with antihypertensive medication taken in the past 2 weeks (Whitworth, 2003).

Height was measured with respondents standing on bare feet on a height meter RCZ-120, with their backs against the calibrated stadiometer. The flat bar was moved downward till it touches the head and height recorded to the nearest 0.1 cm, (JNC, 2014).

Weight was measured using a **c**alibrated and standardized weighing scale (RCZ-120) put on a flat surface. The respondents were asked to remove additional clothing like hats, empty their pockets of coins and keys, remove wrist watch or heavy jewelry. The measurement was taken to the nearest 0.1 kg and recorded, (JNC, 2014).

Body mass index

The BMI was classified using height and weight according to the criteria of the World Health Organization (WHO) as: underweight (BMI: <18.5 kg/m^2), normal weight (BMI: 18 – 24.9 kg/m^2), overweight (25 to 29.9 kg/m^2) and obese (>30 kg/m^2) (Akanbi et al., 2009; WHO TRS, 2000; WHO Expert Consultation, 2004).

Waist circumference

Waist circumference was measured using a flexible, non-stretchable tape with the subject standing erect with relaxed abdominal muscles (expiration), arm at the side and feet together. The waist circumference was measured at the level of umbilicus to the nearest 0.5 cm. The measurement was taken at the end of a normal expiration (Al-Lawati and Jousilahti, 2008).

Hip circumference

Hip circumference was measured at the point of greatest circumference around hips and buttocks, level of the anterior iliac spine, to the nearest 0.5 cm. Measurements were taken with a flexible, non-stretchable tape in close contact with the skin, but without indenting the soft tissue (JNC, 2014).

Waist hip ratio

Waist hip ratio classification was as follows: normal (W/H: <0.90), overweight (W/H: >0.90- ≤0.95) and obese (W/H:>0.95) (Al-Lawati and Jousilahti, 2008).

Measurement of fasting blood sugar

Fasting blood sugar was measured using a glucometer. A fasting 2 drops of blood sample was taken after maintaining sterility. The middle finger was cleaned with alcohol spirit swab. A lancet was used to prick the finger and 2 drops of blood were made to fall on the test strip and the result was read within few minute after collection of blood sample (Al-Lawati and Jousilahti, 2008).

Measurement of fasting blood cholesterol

Two methods were used to measure blood cholesterol and this was to maintain quality and accuracy of result:

a. Spectrophotometer method: The procedure was carried out under aseptic condition. A 5 ml needle and syringe was used to carry out venepuncture on each respondent at the cubital veins. The samples were taken to the laboratory in an ice pack to avoid hemolysis (Allen et al., 2010).
b. Lipid pro-meter machine and method: Lipid profile meter test strips were inserted into the machine, the middle finger was cleaned with spirit swab. A lancet was used to do needle prick for 2 drops. The 2 drops fell on the test strip and the result was read within few minutes after collection of blood sample. The result showed the lipid profile high density lipoprotein, low density lipoprotein, triglycerides and total cholesterol, respectively (Lipidpro INFLOIA, 2013).

Data analysis

Data was entered into Epi info 7. All the data were cleaned before analysis was carried out. Descriptive statistics such as means, proportions, percentages and range were used to summarize the data and analytical statistical tests were carried out to test associations. Bivariate analysis (Chi square) and multivariate logistic regression were performed to identify significant predictors of hypertension and level of association was judged significant at $p<0.05$.

Ethical approval

Ethical approval was granted by the Health Research Ethics Committee of the Federal Capital Territory in Abuja. Written informed consent for the study was sought from the respondents after the purpose of the study was explained. Confidentiality of the information was ensured by not using names of the respondents on any of the study documents. There was no monetary compensation for this study. Each respondent was given a dustbin basket for his vehicle and the results of the investigations were provided to them.

RESULTS

Socio-demographic characteristic of respondents

A total of 398 drivers participated in the study and the response rate was 96.0%. About 33% of respondents

Table 1. Socio demographic characteristics of respondents (N=398).

Characteristic	Frequency	Percent
Age group		
16-25	34	8.6
26-35	132	33.2
36-45	128	32.2
46-55	81	20.4
56-65	20	5.0
66-75	2	0.5
Marital status		
Single	78	19.6
Married	319	80.2
Divorced	1	0.3
Numbers of children		
>4	275	69.1
≤4	123	30.9
Educational status		
None	21	5.3
Primary	140	35.2
Secondary	183	46.0
Years of driving		
<5	63	15.8
5-10	119	29.8
11-15	52	13
16-20	53	13.3
21-25	31	7.8
26-30	27	6.8
>30	53	13.3

were in the age group 26 to 45 years and their mean age was 39.0±10.0 years with a range of 18 to 68 years. All respondents were males. Out of 398 interviewed, the majority 323 (80.6%) were married, 66 (16.0%) had more than one wife and 274 (69.0%) had more than four children. Many of the respondents 183 (46%) had secondary school education and 140 (35.2%) primary school education (Table 1).

Health profile

A total of 191 (48.2%) respondents reported being in good health while 4(1.0%) reported poor health, 21 (5.2%) reported they were hypertensive, 30 (7.5%) had diabetes mellitus and 34 (8.5%) had eye problems. A total of 87 (18.75%) reported a family history of hypertension of which 18(4.5%) had hypertension themselves and 39 (9.1%) had family history of obesity. Most respondents 277 (69.5%) had never had a medical checkup in any health facility while only 121 (30.5%) drivers had ‘ever’ received a health screening.

Prevalence of hypertension among the respondents

The overall prevalence of hypertension among the interstate commercial drivers in Jabi park, Abuja was 37 (9.0%). This included 16 (4.0%) new cases detected during the study and 21(5.0%) already diagnosed and were on treatment. Hypertension was more prevalent among the 36 to 65 year age group as shown in Table 2. Co-morbidity of diabetic mellitus and hypertension occurred among 15 (3.7%) of the respondents.

Distribution of risk factors among the hypertensive and non hypertensive respondents

The number of respondents that smoked were 86

Table 2. Age distribution of the respondents by status of blood pressure (N=398).

Age group (years)	Hypertension [n (%)]	No hypertension [n (%)]
16-25	0	34 (9.5)
26-35	0	131 (36.7)
36-45	11 (2.8)	121 (33.9)
46-55	13 (3.1)	74 (20.7)
56 -65	13 (3.1)	19 (5.3)
66+	0	2 (0.56)
Total	37 (9.0)	361 (91)

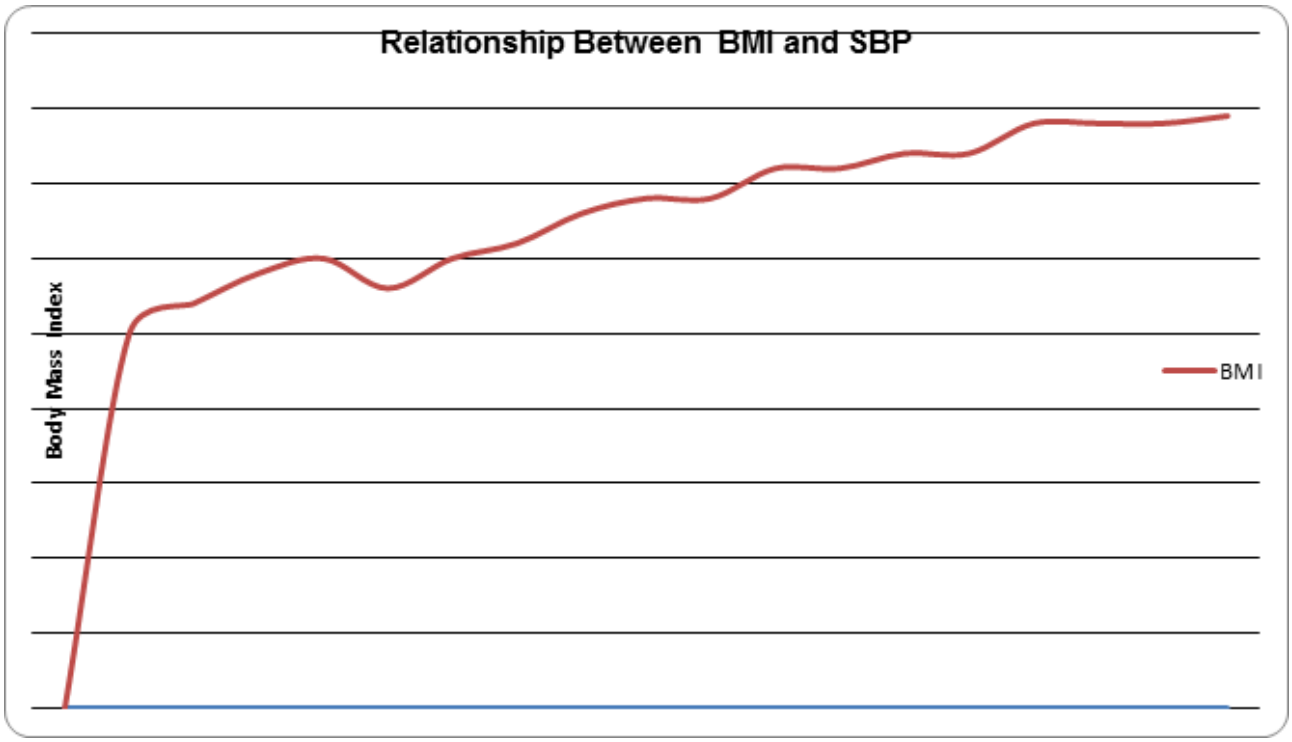

Figure 1. Relationship between Systolic Blood Pressure and Body Mass Index among the new cases during the study.(r=0.8).

(21.7%) of which 2 (2.3%) were hypertensive. There were 204 (51.3%) physically inactive respondents. Most of the respondents 322 (81.1%) ate more than three times per day. A total of 141 (35%) drank at least one bottle of alcohol per day and 5 (3.9%) of these respondents were hypertensives. Of the respondents who drank alcohol, 48 (34.3%) drank daily while 56 (40%) drank twice a week. Majority of alcohol users 104 (72.2%) reported taking 1 to 3 bottles of beer per day in the last 3 months. No respondents drank before driving but 109 (77.9%) reported being drunk in the past 30 days before the study.

Obesity was assessed using BMI and WHR. Eighty two (20.7%) of the respondents were underweight (WHR < 0.85) while 12 (3.0%) of the respondents were underweight using BMI <18 kg/m^2. There were 137(35.8%) overweight respondents (using BMI 25 to 29.5 kg/m^2), and 102 (25.7%) using a WHR 0.90 to <0.95. Seventy five (18.4%) of the respondents were obese using BMI ≥30 kg/m^2 while 99 (24.7%) were obese using WHR>0.95. Hypertension was found among 19.9% of those obese.

Thirty-nine (9.9%) of the respondents had hyperglycaemia and of this 51.0% had hypertension. The prevalence of hypercholesterolemia among the respondents was 129 (34.4%), hypertriglycerilemia 183 (46%), high density hyperlipoproteinemia 72(18%), and low density hyperlipoproteinemia 168 (42%). There was a linear correllation (r=0.8) between systolic blood pressure and body mass index as shown in Figure 1.

Risk factors associated with hypertension among respondents

Respondents who had a BMI of >30 kg/m^2 were 11 times more likely to develop hypertension, (OR=11, 95%CI: 3.8-34.6) compared with those non-obese. Similarly, a driver with abdominal obesity measured by waist-to- hip ratio had 13 times the odds of developing hypertension (OR=13, 95%CI: 3.7 - 49.6) compared to non-obese drivers. Both obesity by BMI and abdominal obesity (WHR) were significantly associated with hypertension. A significant association was found between age and hypertension. Respondents aged ≥40 years were 3.6 times more likely to develop hypertension (OR= 3.6, 95%CI: 1.2-11.6) compared with those in younger age group. While respondents with a family history of hypertension were 4 times more likely to develop hypertension (OR=4.1, 95% CI: 1.97-8.08). The respondents with hypercholesterolemia had 4.5 times the odds of being hypertensive (OR=4.5, 95% CI: 1.51-13.20) compared to those with normal cholesterol values, while those with high density hyper lipoprotein had 18 times the odds of developing hypertension (OR=18.2, 95% CI: 8.6-43.0) compared with those with normal values. In addition, respondents with low density hyper proteineamia had 2.8 times the odds of developing hypertension (OR=2.8, 95% CI: 1.4 – 58.0) (Table 3).

Predictors of hypertension among respondents

Logistic regression revealed that age was a predicting factor of hypertension among commercial drivers. Obese individuals with BMI≥30 kg/m^2 (Adjusted Odds Ratio (AOR) 6.23; 95%CI: 1.88-20.71) were 6.2 times more likely to develop hypertension than respondents with BMI<30 kg/m^2). Individulas with abdominal obesity with Waist to Hip ratio of > 0.95 (AOR= 6.4; 95%CI: 1.54-27.0) were 6.4 times more likely to develop hypertension than respondents with WR < 0.95. Respondents who reported positive family histroy of hypertension (AOR = 1.7; 95%CI: 0.48-6.49) were 1.7 times more likely to develop hypertension than those with no family history. Respondents with hypercholesteroleamia (AOR=4.0; 95%CI: 1.24-13.18) were 4 times more likely to develop hypertension than the respondents with normal cholesterol levels. A family history of hypertension, obesity and total cholesterolemia were predictors of hypertension among the commercial drivers in Abuja (Table 4).

DISCUSSION

The prevalence of hypertension among the respondents in this study was 9%. This is higher than the national prevalence for rural community in Nigeria (5 to 7%) but much less than the National Survey report for prevalence of hypertension in the urban areas in Nigeria (17 to 20%) (WHO Technical Report Series, 2000). When compared with prevalence from studies carried out in different settings, the prevalence among these commercial drivers is less than that found in southwestern rural community with prevalence of 21% (Erhun et al., 2005).

If active search for hypertension is not instituted among this group of people and hypertension is not adequately controlled, this may lead to hypertensive encephalopathy which if occurs during driving could lead to mass mortality from resulting auto-crash. Therefore hypertension among this important category of people is of public health significance which requires urgent attention.

Limitations

The study was done within one motor park which may not be a true representative of all the motor parks or commercial drivers in FCT, therefore the findings cannot be generalized. Secondly, there were a few blood samples that were not enough to analyze the blood cholesterol levels and needed to be repeated but the respondent had travelled out of Abuja and could not be reached (due to the nature of the job) before writing up the report. This study relied on self-report, and is, therefore, subject to reporting bias.

Conclusions

The prevalence of hypertension and associated risk factors among commercial drivers in Jabi is high and of public health importance.

Conflict of Interests

The authors have not declared any conflict of interests.

ACKNOWLEDGEMENTS

The authors acknowledge the support of Nigeria Field Epidemiology Training Program (NFELTP) for the support provided to OSO, while undergoing residency training in the programme and the opportunity to contribute to disease control in Nigeria. They are grateful to the Chairman, National Road Transport Workers Union of Nigeria Jabi Branch and other executive members who introduced us to other associations within the park and sought the cooperation of their members. The authors thank all the subjects who participated in this study. They also thank the staff of the Non Communicable Disease Program and the focal person on hypertension of the Federal Ministry of Health for their support and sharing their data collection instruments (which have been used

Table 3. Risk factors associated with hypertension among respondents.

Variable	Frequency (%)	OR	95%CI		P-value
			Lower	Upper	
Physical activity					
Yes	194 (49)	1.3	0.6	2.6	0.61
No (Ref)	204 (51)	1			
BMI categories					
BMI≥30 kg/m^2	66 (16.6)	11.4	3.8	34.6	0.002*
BMI<30 kg/m^2 (Ref)	332 (83.4)	1			
Overweight					
BMI 25-29.9	146 (36.8)	1.6	0.5	5.1	0.60
BMI ≤25 (Ref)	186 (46.3)	1			
WHR Categories					
Central obesity					
WHR > 0.95	98 (24.7)	13.6	3.7	49.3	0.001*
WHR < 0.95 (Ref)	300 (75.3)	1			
Overweight					
WHR 0.9-≤0.95	102 (25.7)	2.3	0.6	11.2	0.35
WHR <0.9 (Ref)	197 (49.7)	1			
Alcohol intake					
Yes	141 (35.0)	1.0	0.4	3.3	0.90
No (Ref)	257 (65.0)	1			
Smoking					
Yes	86 (21.7)	4.0	0.5	30.9	0.26
No (Ref)	311 (78.3)	1			
Age					
≥40 years	176 (44)	3.6	1.2	11.6	0.02*
<40 years (Ref)	221 (56)	1			
Hyperglycemia					
Yes	39 (9.9)	1.0	0.2	3.2	0.9
No (Ref)	359 (90.1)	1			
Number of meals per day					
≤ 3x/day (Ref)	76 (18.9)	1			
>3x/day	322 (81.1)	1.5	0.4	5.3	0.8
Family history of hypertension					
Yes	74 (18.6)	13.7	6.0	33.1	0.001*
No (Ref)	324 (81.3)	1			
Hypercholesterolemia					
Yes	129 (34.4)	4.1	1.5	13.2	0.001*
No (Ref)	269 (64.5)	1			

Table 3. Cont'd.

Hyper triglyceridemia					
Yes	183 (46.0)	1.0	0.6	2.4	0.9
No (Ref)	215 (54.0)	1			
High density hyper lipoproteinemia					
Yes	72 (18)	18.2	8.6	43.0	0.001*
No (Ref)	326 (82)	1			
Low density hyper lipoproteinemia					
Yes	168 (42)	2.8	1.4	58.0	0.006*
No (Ref)	230 (58)	1			

*Significant at 5% level.

Table 4. Logistic regression modeling risk factors significantly associated with hypertension.

Variable	Adjusted odds ratio	95% CI		Coefficient	SE	P-value
		Lower	Upper			
Age≥ 40 years	1.5631	0.4150	5.8874	0.4467	0.6766	0.5091
Age<40 years (Ref)	1	-				
Positive family history	1.6740	0.4823	6.1864	0.4998	0.6124	0.0101*
No family history (Ref)	1					
Obese WHR>0.95	6.4422	1.5371	26.9994	1.8629	0.7311	0.0108*
WHR <0.95 (Ref)	1					
TC Hyper	4.0433	1.2400	13.1837	1.3971	0.6030	0.0205*
Normal TC (Ref)	1					
HDHL	3.3416	0.5857	19.0653	1.2065	0.8885	0.1745
Normal HDL (Ref)	1					
LDHL	0.4918	0.1043	2.3201	-0.7096	0.7914	0.3699
Normal LDL (Ref)	1					
Obese BMI≥30 kg/m2	6.2313	1.8754	20.7046	1.8296	0.6127	0.0028*
BMI<30 kg/m2 (Ref)	1					

for related program by the division) which was adapted for this study.

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