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ASSESSMENT OF BODY COMPOSITION, SMOKING AND ALCOHOL AS RISK FACTORS TO HYPERTENSION AMONG ADULTS IN ABEOKUTA, OGUN STATE, NIGERIA

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ABSTRACT
Background: Cardiovascular disease is a group of disorders/diseases of the heart and blood vessels, including heart attack and stroke that is responsible for many deaths around the world.
Objective*:* The general objective of this study was to assess body composition, smoking and alcohol as risk factors to hypertension among adults in Abeokuta, Ogun state, Nigeria.
Methods*:* Four wards were randomly selected from each of the three local government areas in the city of Abeokuta, Ogun State. Convenient sampling method was used to recruit 300 voluntary respondents into the study. A semi structured questionnaire was used to obtain information on socio-demographic, socio-economic characteristics, modifiable and non-modifiable risk factors of non-communicable chronic diseases and the dietary habits of the respondents. Blood pressure and anthropometric measurement of respondents were taken using standard procedures.
Results*:* The results indicated that majority of the respondents were within the age ranges of 41-50 years (32%). Using the American Heart Association (AHA) blood pressure classification, 40.3% had normal blood pressure, 30.7% were pre-hypertensive while 29.0% had hypertension. More than half of the respondents (55.3%) were overweight while 17.0% were obese, 6.1 % were current smokers and 21% were current alcohol drinkers. Blood pressure had a positive correlation with tobacco smoking, alcohol drinking, body mass index and waist-hip-ratio, these associations were significant at $p<0.05$. Tobacco smoking contributed significantly to hypertension in this study ($R^2=0.114$, $F=38.342$, $p= 0.000$).
Conclusion*:* Findings of the study showed a high prevalence of hypertension, overweight and obesity, alcohol intake and smoking were significantly associated with hypertension.

Key words: *Dietary Habit, Risk Factors, Cardiovascular Diseases, Adults*

INTRODUCTION
Lifestyle dispositions have been well related to cardiovascular and other chronic diseases among adults. Smoking, drinking of alcohol and inadequate physical inactivity have been the subject of various studies resulting in abundance of literatures (1–3). One of the most consistent findings in research is that tobacco smoking, excessive alcohol intake and a sedentary lifestyle are significant risk factors of cardiovascular diseases (CVD) (4–6).

Globally, the rising prevalence of CVDs have strongly been linked with obesity, lifestyle factors and their direct impact on novel pathways of clinical cardiovascular risk have been established (1). Studies have confirmed the link between CVDs and lifestyle factors such as diet, alcohol intake, inadequate physical activity, smoking, and excessive weight (3,7). Generally, individuals usually present with multiple risk factors of hypertension rather than just having one risk factor. Consequently, the product of the interactions of these risks can be responsible for an overall effect that will be synergistic on presentation. It has been established that habitual alcohol consumption of three or more drinks per day will clearly raise blood pressure which may open the door to a spectrum of cardiovascular diseases (8,9). However, alcohol in moderation (one drink for women and men older than 65 years or two drinks for men age 65 and younger) have been suggested to be beneficial in preventing CVD. This can be through effects on serum lipids and clotting factors while heavy consumption can be harmful (8,10).

Also, smoking has been clearly linked to a higher risk of nearly all forms of cardiovascular diseases, including high blood pressure, myocardial infarction among others. Cigarette smoking also increases triglyceride levels which will in turn increase the risk of CVDs. Individuals who are exposed to tobacco use and second-hand smoke (passive smokers) have an increased susceptibility to developing coronary artery diseases and they are also at an increased risk of stroke (11,12). Studies have further shown that being a current smoker triples the risk of acute myocardial infarction compared with a non-smoker, the risk increases as more cigarettes are smoked per day (7,13,14).

Additionally, overweight and obesity have been identified as an epidemic which contributes to an increased risk of premature death (5). Interestingly, individuals with abdominal obesity have been observed to have an increased risk of cardiovascular morbidity and mortality such as stroke, congestive

heart failure, myocardial infarction and cardiovascular related deaths (15). This abdominal obesity association are usually independent of obesity and other cardiovascular risk factors (7). Assessment of body mass index (BMI) and waist circumference is therefore important for the maintenance of a health and nutritional status. Overweight and obesity have also been implicated in high blood pressure, abnormal blood lipid profile and poor sugar metabolism (16). Hence, this study assessed body composition, smoking and alcohol as risk factors to hypertension among adults in Abeokuta, Ogun State, Nigeria.

METHODS

Study design: Cross sectional descriptive survey.
Study area: The study was conducted in the city of Abeokuta North Local Government, Ogun state, Nigeria.

Eligibility: Eligible respondents were adults who were apparently healthy and not pregnant at the time of the study.

Ethical approval: Prior to the survey, approval to embark on the study was obtained from Nutrition and Dietetics Department, Federal University of Agriculture, Abeokuta and Ogun State Ministry of Health. Respondents who were willing to be part of the study were recruited after giving informed consent. Confidentiality of the information and identity of the respondents was assured and maintained throughout the study.

Sampling method: Four wards were randomly selected from each of the three local government areas in the city of Abeokuta, Ogun State. Convenient sampling method was used to recruit voluntary respondents into the study after the objectives of the study had been explained to them.

Data collection:
A pretested semi-structured questionnaire was used to obtain data on socio-demographics, alcohol consumption and smoking status of the respondents. Respondents' anthropometric measurements such as height, weight, waist and hip circumferences were taken using standard procedures. The blood pressure (mmHg) was measured with the respondents seated after a five minutes rest. Measurements were taken in the left upper limb in sitting position to using a digital blood pressure monitor. The average of two readings was taken for each respondent. Blood pressure levels were classified using the America Heart Association guidelines (17). Systolic pressure less than 120 and diastolic pressure less than 80 was classified as normal, systolic pressure between 120-129 and diastolic pressure of 80-89 as elevated risk, while mild hypertension was systolic pressure of 130-139 and diastolic pressure of 80-99 and morbid hypertension as systolic pressure of 140 or higher and diastolic pressure of 100 or higher.

Statistical analysis: Data collation and sorting was done manually. Computer data processing was done using the Statistical Package for Social Sciences (SPSS) version 20. All statistical analysis was set at 5% level of significance (that is, $p < 0.05$). Data was analysed using descriptive statistics such as frequency and percentages while regression analysis was carried out to determine the strongest predictor of hypertension.

RESULTS

The characteristics of the respondents are shown in table 1. Majority (32.0%) of the respondents were within the range of 41 – 50 years and mostly (89.3%) Yoruba. More than half of the population had their monthly allowance above 40,000 naira.

Table 1: Bio-data of the Respondents (n=300)

VARIABLES	N	%
Sex		
Male	151	50.3
Female	149	49.7
Age		
18 – 30	35	11.7
31 – 40	66	22.0
41 – 50	96	32.0
51 – 60	76	25.3
61 – 70	25	8.3
70 above	2	0.7
Education status		
No formal schooling	22	7.3
Primary school	33	11.0
Secondary school	67	22.3
Polytechnic	96	32.0
University	55	18.3
Post graduate degree	27	9.0
Ethnicity		
Yoruba	268	89.3
Igbo	30	10.0
Hausa	2	0.7
Marital status		
Never married	44	14.7
Currently married	234	78.0
Divorced	11	3.7
Widowed	11	3.7
Employment status		
Government employee	111	37.0
Non-government employee	48	16.0
Self employed	116	38.7
Non-paid	2	0.7
Student	11	3.7
Retired	10	3.3
Unemployed	2	0.7
Income per month (Naira)		
Less than 10,000	22	7.3
Between 10,000 and 19,999	35	11.7
Between 20,000 and 40,000	48	16.0
Above 40,000	195	65.0

The smoking of cigarette/tobacco use and alcohol consumption pattern of the respondents is shown in table 2 which indicates that 6.3% and 21% were current smokers and current drinkers respectively. From the findings, 40% of the respondents were passive smokers while 5.3% were daily smokers. The table also shows the alcohol drinking frequency, 2.7% were daily drinkers while 20.7% were occasional drinkers.

Table 2: Smoking and alcohol consumption of the respondents (n=300)

VARIABLES	N	%
Current smoker		
Yes	19	6.3
No	281	93.1
Daily smoker		
Yes	16	5.3
No	284	94.7
Passive smoker		
Yes	120	40
No	180	60
Past smoker		
Yes	41	13.7
No	259	86.3
Alcohol consumption		
Yes	123	41
No	177	59
Not-current drinker		
Yes	87	29
No	213	71
Current drinker		
Yes	63	21
No	237	79
Alcohol Drinking frequency		
Daily	8	2.7
5-6 days per week	14	4.7
1-4 days per week	5	1.7
1-3 days per month	42	14.0
Occasionally	18	6.0
None	213	71.2

Table 3 shows the nutritional status of the respondents. About 2.3% were underweight, 25.3% had normal weight, 55.3% were overweight, and 17.0% were obese. Also, the distribution of waist hip ratio among the respondents showed that 17% of the males and 19.3% of females had normal waist hip ratio while 33.3% of males and 30.3% of females had abdominal obesity. Overall, 63.6% of the respondents had abdominal obesity while 36.3% were normal. Gender was not significantly associated with BMI but was significantly associated with abdominal obesity.

Table 3: Nutritional Status of participants (n=300)

Nutritional status	Males		Females		Total		Sig.
BMI	N	%	N	%	N	%	
Underweight	5	1.7	2	0.7	7	2.4	0.085
Normal	46	15.3	30	10	76	25.3	
Overweight	79	26.3	87	29	166	55.3	
Obese	21	7.0	30	10	51	17.0	
Abdominal obesity							0.001
Normal	51	17	58	19.3	109	36.3	
Abdominal obesity	100	33.4	91	30.3	191	63.7	

Table 4 shows the blood pressure classification among respondents. About 40.3% of the population had normal blood, 30.7% had elevated blood pressure. About 27.3% were moderately hypertensive, 1.7% were morbidly hypertensive. However, no association was found between blood pressure levels and gender.

Table 4: Blood Pressure Classification (n=300)

Blood pressure	Males		Females		Total		Sig.
	N	%	N	%	N	%	
Normal	54	18.0	67	22.3	121	40.3	0.178
Pre hypertension	46	15.3	46	15.3	92	30.7	
Moderately hypertensive	47	15.7	35	11.6	82	27.3	
Morbidly hypertensive	4	1.3	1	0.3	5	1.7	

Table 5 shows the regression analysis of lifestyle factors and hypertension. Having smoked tobacco in the past was found to contribute about 11.4% to the prevalence of hypertension in this study and this contribution was found to be significant. Also, having drank alcohol for the past 1 month, daily smoking, BMI and WHR slightly contributed to hypertension, however, this contributions though small were significant.

Table 5: Regression analysis of lifestyle factors and hypertension

Variables	R	R^2	F	Sig.
Alcohol intake pattern	0.151	0.023	1.973	0.164
Drank in the past 12 months	0.168	0.028	8.696	0.003
Smoked in the past	0.338	0.114	38.342	0.000
Daily smoking	0.183	0.030	10.290	0.001
Body mass index (BMI)	0.160	0.026	7.828	0.005
Waist-hip-ratio	0.127	0.016	4.888	0.028

DISCUSSION

Hypertension in this study was lower than the prevalence found in a systematic review of hypertension among Nigerians where a prevalence of 2% to 42% was reported (18). Also, the prevalence of high blood pressure in this study was higher that what Oyeniyi and Ajayi, (19) reported in 2016 among road transport workers in Abuja where the prevalence of 9% was recorded. The number of respondents with elevated blood pressure found in this study show that about a third of the study population may eventually have hypertension if care is not taken. This will increase the burden of diseases and consequent increased mortality. This negative trend in the Nigeria population calls for urgent intervention and actions.

It was also found that more than half of the respondents were overweight and close to one fifth were obese. The rising prevalence of overweight and obesity among Nigeria population is very alarming. Similar studies across the country have shown a high prevalence of overweight and obesity (2,7,15). However, obesity in this study was lower than the findings by Oladoyinbo *et al* (2015) (20) among traders in Ijebu ode, Nigeria. In their study, the prevalence of obesity was 26.7%. This study further found that abdominal obesity was present in two third of the respondents. This agrees with findings from similar studies among the Nigeria population (21,22), The high level of overweight and obesity coupled with high prevalence of behavioural risk factors may have serious health impact on individuals, because obesity comes with extra health consequences such as musculoskeletal disorders, cancers, leading to substantial disability thereby complicating morbidity from Cardiovascular diseases.

This study documented that 6.3% of respondents smoked cigarette. This finding was lower than that of the study by Agaba *et al* (2017) who found cigarette smoking of 2.9% among university workers (23). Increased prevalence in this study might be due to the fact that the study was a community survey while Agaba *et al* (2017) study was facility based. Similarly, study in Sokoto showed a slightly lower prevalence of 5.2% (24). An estimated 34.7% of all deaths resulting from cigarette smoking are related to CVD because cigarette smoking significantly increases the risk for developing atherosclerosis, hypertension, and stroke (Centres for Disease Control and Prevention, 2005). It was also found in the Nigeria 2008 report that tobacco smoking prevalence was 4.6%, while in a research conducted by Raji *et al*, (2013)(25) among adolescents in north-western Nigeria, it was found that 8.3% smoked tobacco which was higher than what was observed in this study. Smoking contributed significantly to the prevalence of hypertension in this study. This agrees with global reports that smoking increases the risk of cardiovascular diseases (3,6,7)

Furthermore, alcohol consumption had a slightly positive correlation with hypertension and this association was significant. Earlier studies have however shown that consumption of alcohol has a dose response effects. This means the association of alcohol intake with chronic diseases increases with the number and frequency of drinks (2,26) There are similar relationships between alcohol and tobacco use and biomarkers of chronic diseases such as levels of triglycerides and other indices of metabolic syndrome which have been linked with increased risk of CVDs in some studies (22,27,28).

CONCLUSION

The prevalence of overweight, obesity, abdominal obesity and high blood pressure in this study was high, Cigarette smoking and alcohol consumption were found to be significantly associated with hypertension and smoking contributed the most to hypertension in this study.

Recommendation

The health sector and other stakeholders should create awareness of cardiovascular disease risk prevention and management with a particular focus on behavioural risk factors tailored to the need of this population.

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