Prevalence And Risk Factors for Hypertension Among Adolescents Attending A Family Medicine Clinic In North Central Nigeria

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Abstract

Background: Hypertension poses a substantial burden on the healthcare system. Hypertension in adolescents is becoming one of the most common health conditions globally.

Objectives: This study aimed to estimate the prevalence and identify associated factors with hypertension among adolescents residing in Ilorin, North central Nigeria in a bid to provide a theoretical basis for the prevention and control of hypertension in this group.

Methodology: The study was a cross-sectional descriptive study among 10-19 years of age attending adolescent clinic of family medicine department of UITH over a period of 3 months. A semi-structured questionnaire was used to obtain information. Blood pressure was measured using age-appropriate cuffs. Analysis was done using Statistical Package for Social Sciences (SPSS 20). Descriptive statistics, bivariate and multivariate logistic regression analysis was done to determine associated risk factors.

Results: The overall prevalence of hypertension was 13.0%. Of the behavioral risk factors, the prevalence of tobacco use, harmful alcohol use was 3.2% and 1.3% respectively, while low consumption of fruits and vegetables were found among 89.0% and 98.7% respondents respectively. High consumption of diet was found in 24.7%, while 31.2% low physical activity (using moderate activity) was reported. Risk factors for development of hypertension were family history of hypertension (p=0.017, OR=4.536, CI= 1.195-17.218) and high salt diet (P<0.001, OR=1.177, CI=1.096-1.264).

Conclusion: There is a high prevalence of hypertension among the adolescents in this study. Family history and high salt diet can be used as reference indicators for the prevalence of hypertension in this age group.

Keywords: Hypertension, Risk Factors, Prevalence, Adolescent, Family Medicine Clinic.

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Introduction

Hypertension is a global public health challenge.[1] It is the most common non-communicable disease, the most prevalent cardiovascular disease (CVD) risk factor worldwide and the most important modifiable risk factor for cardiovascular disease.[2,3] Data from World Health Organization's (WHO) 2004 Global Burden of Disease study showed that the total number of incident DALYs in those aged 10–24 years, which include adolescent age group, was about 236 million, representing 15·5% of total DALYs for all age groups.

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Africa had the highest rate of DALYs for this age group, which was 2·5 times greater than in high-income countries. Although there is no internationally accepted definition of adolescence, the United Nations defines adolescence as the onset of physiologically normal puberty and ends when an adult identity and behavior are accepted. This period of development corresponds roughly to the period between the ages of 10 and 19 years.[4,5]

Recent data have shown that the incidence of hypertension among adolescents and youths is increasing and that it has reached epidemic proportions worldwide, which is largely associated with the rising prevalence of childhood obesity.[2,6,7] Hypertension is the most common comorbidity identified in overweight adolescents and the leading risk for mortality in adulthood, attributable to approximately 12.8% of deaths worldwide.[8] Studies have shown that hypertension in children and adolescents can progress into adulthood, thus, contributing to the increase in the cardiovascular morbidity and mortality in adulthood.[9, 10]

Hypertension in children/adolescents is diagnosed if the systolic blood pressure (SBP) or diastolic blood pressure (DBP) readings is in the 95th percentile or greater for the gender, age, and height based on three or more readings according to the recommendation by the 2004 National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents.[11,12,13]

Adolescents aged 18 and 19 years are considered as adults and hypertension among them is classified as average SBP ≥ 140 mmHg and average DBP ≥ 90 mmHg according to the seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.[14]

In Nigeria, the prevalence of hypertension in adolescents ranges between 3.0% and 10% according to serial studies.[2,15,16,17,18,19] Despite the numerous studies done on childhood hypertension in Nigeria, only a few have explored the risk factors. In Ilorin, the only previous study on adolescents and its risk factors revealed prevalence of 3.0%.[20] Hence, due to the paucity of research, significant gaps still exist in the literature regarding the burden of hypertension among adolescents and the associated risk factors in Nigeria.

The rationale for screening adolescents and youths for elevated blood pressure is that if the risk factors for hypertension can be identified at an early stage, interventions could be initiated to prevent hypertension in affected individuals, thereby decreasing the rate of progression of hypertension from children to adults. This will also reduce the personal and public health burden of hypertension and the resulting cardiovascular outcomes. In addition, treatment may be beneficial to children during childhood.[12]

Knowledge of the predisposing risk factors is vital in the modification of lifestyle behaviors conducive to optimal cardiovascular health.[21] Moreover, identification of risk factors present in adolescents is important because correction of modifiable risk factors has been found to be more effective in this age group than in older patients.[22]

The few local studies that evaluated risk factors for hypertension were limited to either the history of hypertension in the family and or the role of obesity/overweight.[17,19] Hence, this study aim to determine the prevalence and assess

the risk factors for hypertension among adolescents attending family medicine clinic of University of Ilorin Teaching Hospital, Ilorin, Nigeria. The outcome of the study would provide baseline data and greater insight into the risk factors of hypertension among the adolescents in Ilorin, Kwara state.

Methodology

Study area: The study was conducted at the adolescent clinic of the Family Medicine Department of the University of Ilorin Teaching Hospital (UITH), Ilorin. The Department of Family Medicine represents the primary care unit of the hospital. All patients, except in emergencies are expected to pass through it for assessment, most of whom are managed, and the rest being referred to other specialized units of the hospital, based on need.

Study design: The study was a cross-sectional hospital based descriptive study carried out between February and April 2019.

Study population: This consisted of adolescents attending adolescent clinic of Family Medicine Department of UITH who satisfied the inclusion criteria.

Selection Criteria

Inclusion criteria: Consenting males and females who were 10 – 19 years of age attending adolescent clinic of Family Medicine department, UITH.

Exclusion criteria: Patients who were too sick to participate in the study and those with impaired cognitive function who were unable to comprehend and respond appropriately to the questionnaire.

Sample Size Determination

The required sample size was determined using Statistical Formula (Leslie Kish's formula) that was employed by Fisher and his colleagues for estimating minimum sample size in health studies.[23,24] by using the prevalence of 10.7% for hypertension among adolescents as in a previous study done in Nigeria.[2]

The sample size was subsequently adjusted for population less than 10,000, using the formula nf= n/1 +(n/N) and also for assumed 90% response rate using the formula[23,24] , $n_s = n/_r$, leading to arriving at the final sample size of 154 nf= desired sample size for population less than 10,000; n = estimated sample size = 147; N = the estimated population size= 2,568 nf = 147/1 + (147/2568) = 139.0

n_s = adjusted sample size of the response rate; n = calculated sample size =139; r was response ratio= 0.9

n_s= 139/0.9 = 154.4

The final sample size was approximated to 154.

Sampling Method

The systematic random sampling technique was used in recruiting the study sample from the study population who met the inclusion criteria.

Data Collection and Instruments

Data was collected by the researcher and a trained research assistant using a semi-structured questionnaire. The questionnaire consisted of five sections: sociodemographic characteristics, past medical history, family and social history, physical examination findings, and laboratory results. Behavioral risk factors were measured using the World Health Organization (WHO) Stepwise approach to chronic disease risk factor surveillance (STEPS 1 & 2) and Activity Questionnaire for Adults and Adolescents

(AQuAA).

Clinical Measurements: Body Mass Index was calculated by using weight in kilogram divided by the square of the height in meters. Body mass index (BMI) was classified based on its distribution by sex and age according to the growth chart developed by the Centre for Disease Control and Prevention into underweight (less than the 5th percentile), normal (greater than or equal to the 5th percentile and less than the 85th percentile), overweight (greater than or equal to the 85th percentile and less than the 95th percentile), and obese (≥ the 95th percentile).[25]

The blood pressure reading was to the nearest 2mmHg. Blood pressure was measured using a digital blood pressure (BP) apparatus (OMRON digital BP monitor, three readings) with age-appropriate cuffs, and hypertension was defined using the Centre for Disease Control prevention criteria. The averages of the systolic and diastolic readings of the two measurements were taken as the mean systolic and diastolic BP.[2] BP measured was compared with standard age for BP chart. Identified participants with raised blood pressure were re-screened and the second measurements were taken and recorded for those found to be hypertensive at the first measurement to determine the prevalence of hypertension and associated risk factors, and cases of hypertension were referred to Pediatric Cardiology Clinic of University of Ilorin Teaching Hospital (UITH) for further evaluation and management.

Laboratory Measurements: For those who had fasted for at least 8-10 hours, blood sample was taken for both lipid profile and fasting blood glucose measurements (in mmol/l) using standardized Accu-Chek glucometer. For those who did not fast, they were asked to fast 8-10 hours against their next appointment (within one week) when blood sample was taken for fasting blood glucose and lipid profile measurements.[26] The blood glucose result was usually displayed in mmol/L. For participants who have been previously diagnosed as diabetic, FBS levels < 7.0mmol/l was categorized as good glycemic control while levels ≥7.0mmol/l was categorized as poor glycemic control. For participants without previous diabetes diagnosis, FBS levels of <6.0 mmol/l was categorized as normal fasting glucose, while levels ≥ 6.0 - <6.9 mmol/l was categorized as impaired fasting glucose and ≥7mmol/l as diabetes mellitus.[27]

About 4ml of fasting venous blood sample was taken with a 5ml syringe and 21G hypodermic needle, under aseptic conditions with gloved hands. It was transferred into a serum plain bottle. Samples were analyzed at the UITH chemical pathology laboratory by the chemical pathologist where Cadiocheck® Professional analyzer was used to measure lipid profile according to the manufacturer's instructions.[28] Normal Total blood cholesterol ≤ 5.0mmol/l. Other serum lipid values are as follows: Normal Triglycerides was ≤1.7mmol and Normal LDL ≤3mmol/l. Normal HDL cholesterol ≥1.0mmol/l for boys, ≥ 1.2mmol/l for girls. Abnormal values were above normal except for HDL, which was below normal values.[29]

Operational Definition of Behavioral Risk Factors

To determine the prevalence of those at risk, cut-off points were set up to distinguish between those at risk or not at risk. STEPS used these cut-off points that were evidence based, widely used and recommended by the WHO.

Tobacco Use: The cut-offs used for tobacco use-

Any amount of cigarettes/tobacco in the last 30 days.[30]

Excessive Alcohol Consumption: The cut-offs used for excessive alcohol consumption

i. 3 or more standard drinks in a day[31, 32] OR
ii. Binge drinking is defined as pattern of drinking that brings blood alcohol concentration (BAC) levels to 0.08g/dl. This typically occurred after 5 or more standard drinks on the same occasion (i.e. at the same time or within a couple of hours of each other, on at least one day in the past month). [31, 32]

A standard drink is defined as one which contains 14grams of pure alcohol, which is found in:

i. 35cl of regular beer (5% alcohol by volume). OR
ii. 15cl of regular wine (12% alcohol by volume). OR
iii. 4.4cl of distilled spirits-so called shot (40% alcohol by volume alcohol) [31,32]

Low Fruit and Vegetable Diet: The cut-offs used for low fruit and vegetable diet -
Eating <5 servings/portion of fruits and vegetables daily. They could be fresh, frozen, canned, dried or juiced.[33] A serving is equivalent to: 80g of fresh, canned /frozen fruits and vegetables; OR 30g of dried fruit; OR 150ml glass of fruit juice or smoothie; OR Just 1 medium size piece of apple, banana, orange or similar sized fruit; OR a slice of pineapple or melon; OR 3 heaped tablespoons of vegetables; OR ½ cup tomatoes, onion, corn, etc.[33]

High Salt Diet: Adding more than one teaspoon of salt to food (cooking process, prepared) daily (equivalent to 2.3grams or more, of sodium).[34]

Physical Inactivity: The cut-offs used for low physical activity is values less than-

i. Five or more days of moderate intensity activities of at least 30minutes per day. Example walking, light lifting.[35] OR
ii. Three or more days of vigorous intensity activities of at least 20 minutes per day. Example- running, heavy lifting.[35]

Data Analysis

The collected data were sorted, coded and entered into the computer for analysis, using the Version 20 software packages of the Statistical Package for Social Sciences (SPSS 20). Results were presented using frequency tables and charts. For qualitative variables, values were expressed as proportions while means and standard deviations were used to summarize quantitative variables. The Chi-square test was used to find out the level of significance of association between two categorical variables. The level of significance of this study was set at 5% ($p<0.05$).

ETHICAL CONSIDERATION: An ethical approval for the study with the number UITH/CAT/189/19^{B}/519, was obtained from the ethical review committee of the hospital.

Results

Table 1: Socio-Demographic Characteristics of Respondents N=154

Variables	Frequency	Percentage
Age Groups		
10 – 12	44	28.6
13 – 15	51	33.1
16 – 19	59	38.3

Mean ± SD	**14.71 ± 2.91**	
Gender		
Male	58	37.7
Female	96	62.3
Ethnicity		
Igbo	5	3.2
Yoruba	142	92.2
Others	7	4.6
Level of Education		
No formal education	15	9.7
Primary	79	51.3
Secondary	46	29.9
Tertiary	14	9.1
Occupation of Caregiver		
Unemployed	17	11.0
Self employed	63	40.9
Artisan	21	13.6
Civil servant	50	32.5
Others	3	2.0
Household Size		
≤ 6	88	57.1
>6	66	42.9
Mean ± SD	**6.49 ± 2.37**	
Dwelling / Location		
Urban	122	79.2
Rural	32	20.8

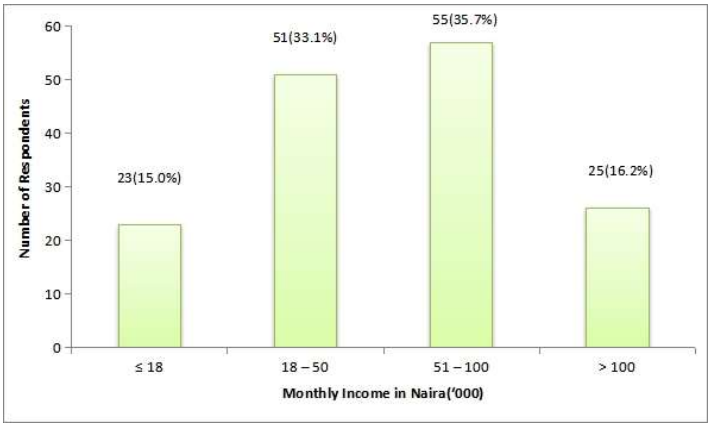

Figure 1: Monthly Income of Respondents' Caregivers

Table 2: Prevalence of Hypertension among Study Participants N=154

Variables	Frequency	Percentage
Systolic BP(mmHg)		
Normotensive	134	87.0
Hypertensive	20	13.0
Mean ± SD	**100.73 ± 13.65**	
Diastolic BP(mmHg)		
Normotensive	135	87.7

Hypertensive	19	12.3
Mean ± SD	**65.14 ± 9.81**	

Table 3: Gender as a Risk Factors of Hypertension

Gender	Hypertension		χ^2	ρ	Odd ratio	95 % C I
	Normotensive	**Hypertensive**				
Male	49 (84.5)	9 (15.5)	0.527	0.468	0.954	0.273 – 1.819
Female	85 (88.5)	11 (11.5)			1.354	0.597 – 3.070

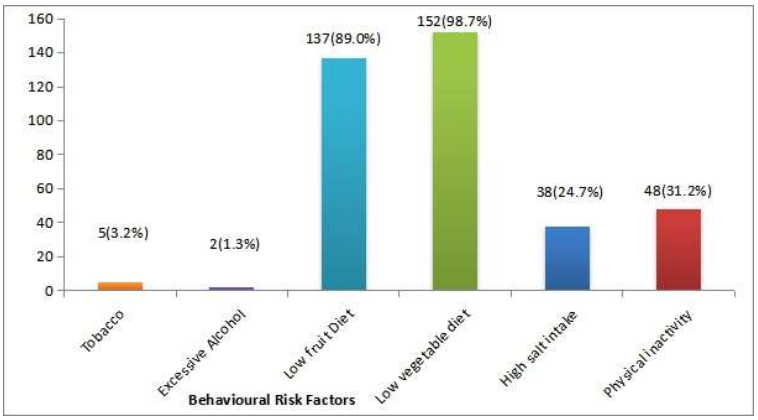

Figure 2. Prevalence of Behavioral Risk Factors in the Study Participants

Table 4: Risk Factors of Hypertension Among Study Participants N=154

Risk factors	Hypertension		χ^2	ρ	Odd ratio	95 % C I
	Normotensive (%)	**Hypertensive (%)**				
Family history of HTN	7 (63.6)	4 (36.4)	5.729	**0.017**	4.536	1.195 – 17.218
Family history of Diabetes	3 (100.0)	0 (0.0)	0.457	0.499	1.153	1.153 – 1.227
Obesity	79 (88.8)	10 (11.2)	0.572	0.449	1.436	0.560 – 3.683
Physical inactivity	133 (86.9)	20 (13.1)	0.150	0.698	0.869	0.817 – 0.924
Excessive alcohol	1 (50.0)	1 (50.0)	0.001	0.998	0.123	0.028 – 0.541
Tobacco	0 (0.0)	5 (100.0)	0.771	0.380	1.155	1.084 – 1.230
Low vegetable diet	132 (86.8)	20 (13.2)	0.302	0.582	0.868	0.816 – 0.924
Low fruit diet	119 (86.9)	18 (13.1)	0.025	0.874	0.881	0.186 – 4.180
High salt diet	0 (0.0)	20 (100.0)	145.72	**<0.001**	1.177	1.096 – 1.264
Total cholesterol	8 (88.9)	1 (11.1)	0.030	0.863	1.206	0.143 – 10.193
HDL	33 (84.6)	6 (15.4)	0.266	0.606	0.762	0.271 – 2.144
LDL	9 (81.80	2 (18.2)	0.283	0.595	0.648	0.130 – 3.241
Triglyceride	2 (100.0)	0 (0.0)	0.302	0.582	1.152	1.082 – 1.225

Table 1 shows the socio-demographic characteristics of the respondents. A greater percentage of the respondents 59 (38.3%) were between 16-19 years of age, with the mean age of **14.71 ± 2.91**. The gender distribution revealed a preponderance of female respondents of 96 (62.3%) with a female to male ratio of 1.65:1. In terms of educational qualification, 14 (9.1%) respondents were in tertiary institutions, 46 (29.9%) were in secondary schools, 79 (51.3%) were in primary schools, while 15 (9.7%) did not have formal education.

The occupation of the caregivers showed that sixty-three (40.9%) were self-employed, fifty (32.5%) were civil servants, twenty-one (13.6%) were artisans while 17 (11.0%) were unemployed. In relation to household size, 88 (58.0%), had not more than 6 household size. The majority of participants 122 (79.2%) lived in the urban area.

Fifty-five (35.7%) respondents were earning between N51,000 -N100,000 while twenty-three (15.0%) were earning below N18,000 minimum wage. (figure 1) Of the study participants, 20 met the criteria for hypertension, thus giving the prevalence of 13.0% for hypertension in the study, with nine (15.5%) males and 11(11.5%) females. (table 2&3) The bar chart (figure 2) shows the prevalence of the behavioral risk factors in the study population. The prevalence of tobacco use was 3.2%, harmful alcohol use was 1.3%, low fruit diet was 89.0%, low vegetable diet was 98.7%, high salt diet 24.7%, while low physical activity (using moderate activity) was 31.2%.

On multivariate analysis of risk factors for development of hypertension among respondent, family history of hypertension (p=0.017, OR=4.536, CI= 1.195-17.218) and high salt diet (P<0.001, OR=1.177, CI=1.096-1.264) were significantly associated with blood pressure status of the participants (Table 4).

Discussion

Majority of the respondents were female (62.3%), with a female to male ratio of 1.65:1. This is comparable to the study done in Nigeria, Brazil and India, where most of the participants were females.[15,36,37] This is in contrast with the findings by Oyeyemi et al and Uwaezuoke et al both in Nigeria, in which most participants were male [2,38] The reason for this female gender preponderance in this present study population may be related to better health seeking behavior of female compared to male.[39-41] This phenomenon has been demonstrated severally in the adult population by several studies.[39-41]

In this study, 90.3% of the respondents were students. This is in conformity with several other studies in adolescent population, which often capture student respondents as participants.[42] It would be unhealthy to find people in this age not to be in school.

It was found in this study that 79.2% of the respondents were residing in the city, which may be accounted for by the location of the hospital being in the urban area as well as being a tertiary health centre for attending to most of the referrals in the region. There are, however, similar studies on the adolescents in rural centers like that by Okagua et al in River State, South-South Nigeria, Patil et al in Wardha, India and Narayanappa in Mysore, India. [42-44]

Majority of the caregivers earned above the national minimum wage of N18,000 per month, and this may be responsible for why most of the respondents are in school and have nutritional risk factors. It depicts the caregiver has the means to care for the feeding and school needs of their wards.

Prevalence Of Hypertension

The prevalence of hypertension in the present study is 13.0% (male 15.5% and female 11.5%). This is considered high when compared to a global rate that is put at between 1-5%.[12] Also, the prevalence in the current study is higher than the 9.5% reported in an earlier study in Ilorin, by Obika al[45] and 3.0% by Ibrahim et al.[20] However, Owoeye et al, Oyeyemi et al and Uwaezuoke 13.9%, 13.2% and 10.7% respectively in other parts of Nigeria. [2, 38, 46] Also, it is comparable to a study done by Khan, et al, in Ahmedabad City, India, where 9.78 % were found to be hypertensive.[47]

Lower prevalences ranging from 0.6% to 6.0% was reported by other reasearchers in similar studies in Nigeria and India.[15-17,19,36,48] The variation in prevalence rates between studies may be due to methodological differences, geographical location, socio-demographic, clinical and racial factors.

Relationship Between The Risk Factors And Hypertension

Family History: Six children had father who had hypertension and five had mothers who had hypertension and of the 11 children with parental /family history of hypertension, four children (36.4%) had hypertension. These numbers were too small to properly assess the relationship between children hypertension and their parent's hypertension in order to provide evidence of genetic predisposition. However, Sundar et al. showed a similarity in a prevalence rate of hypertension of 41.86% among adolescents with hypertensive parents.[49] Also, Silva et al. found out that adolescents with family history of hypertension doubled the prevalence rate of hypertension.[50]

Tobacco Smoking: Smoking prevalence has varied from 8.8% to 13.1% in different studies.[16,43,51] The prevalence of tobacco use among the study participants was 3.2%. This was similar in findings by Odey et al in Calabar of 6.4% among 10-18 years[52] and very much lower compared to study by Salawu et al in Northern Nigeria with overall prevalence of 33.4% among 10 to 17-year age group.[53] The low prevalence of cigarette smoking in this study could be explained by the study area as being hospital-based compared to the other two mentioned studies in Nigeria, which were community-based. The important point to note here is that adolescent smoking is still a problem in Nigeria and there is a need to pay more attention to it. The fact that our study population recorded low prevalence is however encouraging and all effort should be made to keep it lower.

Excessive Alcohol Consumption: Risky alcohol consumption is one of the common major risk factors known to predispose individuals to the development of hypertension. In this study, the prevalence of alcohol consumption was 1.3%. This prevalence rate is low compared to a study carried out by Atilola et al in Ibadan, South-West of Nigeria who reported prevalence of 21%.[54] Another study by Tsering et al in 2010 in India reported 7.4%.[55] Low prevalence of alcohol consumption in this study may be due to the recent ban on the sales of alcohol in Ilorin Municipal, coupled with punitive measures to those arrested in connection to alcohol consumption.[56,57] More so, the participants might feel reluctant to open up especially before their parents. In addition, and on religion grounds, alcohol is regarded as a taboo and a form of social decadence among the people of Ilorin based.

Low Fruit/Vegetable Diet: The prevalence of adolescents who did not take enough fruits and/or vegetables were 89.0% and 98.7% respectively. This high prevalence is common to many other studies in Nigeria. For example, Ogah in his study in Abia state got a prevalence of 84.1%.[58] Also Ani in the Eastern Mediterranean Region and Peltzer in Southeast Asian Countries had prevalence of 80.6% and 76.3% respectively.[59,60] This result is associated with developing countries where food supply is not adequate or available and children and adolescents are particularly affected in this kind of situation.

High Salt Diet: In the present study, 13.6% of the adolescents reported adding extra salt to their food signifying over consumption of sodium chloride which is a risk factor for hypertension. This is comparable to the results obtained by Ogah in Abia state where 4.5% of respondents had high salt diet.[58] There are however, studies that reported high prevalence of excess sodium consumption such as Uwaezuoke et al in Enugu, Nigeria with 31.7%,[2] and Gandhari Basu in India with 50% prevalence.[61] The reason for the difference in prevalence is largely due to

methodological and geographical variations. More importantly however, is the implication of the result, which is due to increased risk of hypertension and CVD in adult life. There is therefore, need for parental health education and periodic checkup of adolescents to ascertain their consumption of sodium and parents should endeavor to control their wards from consuming too much sodium.

Low Physical Activity / Physical Inactivity: Physical inactivity (PIA) is a major risk factor for hypertension. The prevalence of physical inactivity was 68.8% in the study participants. While majority of the respondents, 50.6%, involved in physical education practice in school, only 31.2% involved in moderate exercise. Several Nigerian studies indicated that between 30.3% and 74.6% of children and adolescents do some kind of physical activity (PA) daily.[62-65] However, other studies suggest that the levels of PA among Nigerian children and adolescents may not be sufficient for health benefits. For example, Adeniyi et al in Ibadan, Nigeria recorded 53.8% of low physical activity[66] and Sebanjo et al reported only 47.3% of Nigerian children and adolescents participated in moderate-to-vigorous physical activity (MVPA) on 3 or more days per week.[67]

Brazilian studies showed similar prevalence rates. For example Bergmann et al and Rivera et al reported 68% and 93.5%,[68, 69] respectively, a rate of inactivity higher than that found in our study. Meanwhile, international guidelines recommend the accumulation of at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily.[70]

Diverse instruments for measurement and methods are used in quoted studies, and in addition, the disparate seasonal, environmental, and cultural characteristics may be a setback in making comparison, however, the low prevalence of active individuals in different studies is recurrent, regardless of the method. These results indicate that physical inactivity can be considered a global phenomenon and emphasizes the need for studies on the determinants of physical activity in children and adolescents in order to provide information for the elaboration of programs to encourage physical exercise.

With the high prevalence of physical inactivity among the study population, there is a need for the promotion of increased physical activity among adolescents. It is necessary to modify this risk factor through encouraging the children to participate in physical education practice session, less time spend on computer games, video, etc.

Conclusion

Hypertension in adolescents is a growing health problem that is often overlooked by physicians. Blood pressure screening is one of the strategies to help in curbing its progression. There is a high prevalence of hypertension among the adolescents in this study. Family history and high salt diet were found to be significant predictors of hypertension among the adolescents. There is a need to screen and identify adolescents who have high BP and initiate interventions to control the burden of hypertension and its consequences.

Limitations Of the Study

This study was a hospital-based cross-sectional descriptive study and the results may not be generalised for the entire population.There are tendencies of reporting bias because of self-reporting instruments used in obtaining data of behavioural attributes such as physical activity, alcohol intake, smoking.

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