HYPERTENSION STATUS AND BEVERAGE INTAKE OF POLYTECHNIC STUDENTS IN SELECTED TERTIARY INSTITUTION IN OGUN STATE SOUTH WEST NIGERIA.

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ABSTRACT

Hypertension may lead to irreversible damages in vital organs, such as heart, brain, and kidney, and may cause death in students if treatments are not given despite early diagnosis. Beverage intake has been a contributing factor to the increase of hypertension due to the high sugar and energy contents of the drink. This cross-sectional epidemiological study was conducted between May 2021 to May 2023 to investigate the prevalence of hypertension and hot beverage intake among the Polytechnic Students in Moshood Abiola Polytechnic Ojere, Federal Polytechnic Ilaro and Ogun state college of Technology Southwest Nigeria. Two thousand respondents were randomly selected and examined to determine their hypertension status. Digital Sphygmomanometer was used to determine the blood pressure and classify according to World Health Organization Standard. Nigeria Beverage Consumption Survey questionnaires were used to determine the beverage intake of the respondents. Data were analyzed using Statistical Package for Social Science version 21 and Pearson Correlation was used to determine the P values of the variables. Blood pressure measurement showed that 53 % had normal hypertension status, 10 % had hypertensive stage 1 while 5 % had hypertensive stage 2 for Systolic blood pressure. Diastolic blood pressure showed that 72 % had normal hypertensive status while 5 % had hypertensive stage 1. Beverage consumption result showed that 5.4 % took 250 ml of tea, 4 % took 300 ml of tea, 4 % took 1000 ml of chocolate, 3 % took 500 ml of chocolate, 4 % took 1000 ml of chocolate, the emergence of hypertension among the students has been identified. This can have a detrimental impact on the academic performance and general productivity of these future leaders. Therefore, there is a critical need for urgent intervention by all stakeholders

INTRODUCTION

Cardiovascular diseases (CVDs, including coronary heart disease, heart failure, stroke, myocardial infarction, and atrial fibrillation, among others) are the most prevalent non-communicable diseases in the world and are thought to be the cause of 17.9 million fatalities annually (Roth *et al*., 2017;), placing a growing burden on society and families. Although CVDs are typically seen in elderly people, the disease's development phase that cannot be seen clearly may occur at a younger age, and there is a rising trend of mortality among the young (Hong, 2010),

Hypertension is the most common attributed preventable risk factor for CVDs and leading single contributor to all-cause death and disability worldwide (Raitakari *et al*., 2003). Increasing studies have provided significant evidence that some adult hypertension develops in early childhood, that children and adolescents diagnosed with elevated blood pressure tend to end up as adults with recognizable hypertension (Bao *et al.*,1995; Chen and Wang 2008). It therefore becomes imperative that the prevention and control of hypertension are essential to maintain and promote human health, particularly in students of the highest Citadel of learning to cub the potential menace this might pose in the future.

The present study was aimed at detecting the quantity of beverage intake and the prevalence of hypertension status of among polytechnic Students in South west Nigeria.

SUBJECTS AND METHODS

Study Location

This study was carried out in three selected institutions in Ogun state namely: MoshoodAbiola Polytechnic, Federal Polytechnic Ilaro and Ogun state college of Health Technology Ilese.

Study Population and Sampling

The study was descriptive and cross-sectional study was carried out in three selected institutions of the states in Nigeria between May to September 2021 when the project commenced and was consummated between January to May 2023 when the final writes up was collated. The study population consisted of students in tertiary institutions in Ogun state.

Selection Criteria

- Participants was a registered student in any of the selected institution.
- Those who had been clinically ill 24 hours previous to the day of the interview were excluded.
- Participants must not be on any medication

Sample Size Selection

Since part of the objectives of this study is to estimate the hypertensive proportion of subjects, a prevalence value of 40±2.5% was used. The choice of this value was based on the results of the pilot survey and an earlier study on beverage consumption patterns of civil servants (Nupo 2016). The margin of error was put at 5 % and anticipated non-response rate at 10 % to obtain a minimum sample size of 2000.

Sampling Procedures

A multistage sampling procedure was be used to select the three Thousand students. For the second stage, students sampled were selected randomly. In the third stage, respondents were randomly selected from the sample institution.

Ethical Approval

Ethical approval for this survey was obtained from the Nutrition and Dietetic Moshood Abiola Polytechnic, Ethical committee with approval number NUD/ MAP/ETHIC/ BEV ST:0185/2021 and individual consent was sought and obtained from the participants. A full description of the aim and Objectives of the study was provided to the students and every participant, with a clear indication of the nature of questions. Firm assurances were given to them about the commitment of the research team to preserve the confidentiality of all the information provided. In line with the principles of informed consent, they were given the option to participate voluntarily or not in the survey. Subsequently those who consented participated in the study.

24- Hour Dietary Recall

The 24-hr intake recall has been recommended as a method for determining fluid intake especially where the 7-day diary method is unsuitable. Indeed, many countries like Belgium, Hungary and Iceland as well as USA (Kant *et al.*2019) have used data from 24-hr dietary recall for establishing their National beverage intake recommendations. This present study employed the Multiple pass 24-hr intake recall procedure to capture fluid intake during and outside meal events, at home and outside home. The probes that were used in this study were published earlier. Estimation of fluid volume consumed was aided by the use of local cups, mugs and bottles.
The fluids of consign in this study were recorded and classified into the following categories: Hot beverages (including hot tea and coffees as well as chocolates), Sport and energy drinks
Pilot testing of the questionnaire was conducted earlier in the survey area to ensure clarity of the questions. The recalls were administered on two days; one weekday and one weekend day and the average of the two was calculated and used for final analyses.

Measurement of Blood Pressure

Blood pressure using the method of Daniels (2018) with little modification. Blood Pressure (BP) was recorded after subjects had relaxed for at least 5 min. Measurements were taken with the subject being in the seated position using a mercury sphygmomanometer and by an automated BP monitor (Omron HEM-5001, Kyoto, Japan) placed on the subject's right arm. Measurement was done two times, and the average reading was recorded. Repeated measurements were obtained on two successive times, 6 hours apart in students with persistently elevated blood pressure.

RESULT AND DISCUSSION

Socio demographic characteristics

The results of the socio demographic characteristics showed that 33 % of respondents were between the age range of 18-26 years, majority of the respondents were 67 % were between the age range of 26-36 years. The result showed that 37.0 % were male, while 63% were female, about 97.2 % were single while 3 % were married, 79 % had ND certificate, and 21 % had HND certificate. Table 1 shows the hypertension status of the respondents, from the results it was observed that 53 % had normal hypertension status, 31 % had pre hypertensive status, 10 % had hypertensive stage 1 while 5 % had hypertensive stage 2 for systolic blood pressure. Determination of hypertension using diastolic blood pressure shows that 72 % had normal hypertensive status, 23 % had pre hypertensive while 5 % had hypertensive stage 1.

Hypertension also known as high blood pressure (HBP) is a non-communicable disease which is associated with high morbidity and mortality. The disease is a silent threat to the health of people all over the world, with up to one third of world population affected (Daniel *et al.*, 2018). Worldwide, hypertension has posed a serious concern to public health professionals as it is widely implicated in causing of cardiovascular disease (CVD) that could result in premature mortality as a result of multiple factors, the younger group of people are known to have a higher risk of developing cardiovascular complications from hypertension compared with those older. Those that develop hypertension earlier in life have greater reduction in lifespan, if the condition is not treated (Shokunbi and Ukangwa, 2021). The prevalence of hypertension in this study group is 15 % for both stage 1 and stage 2. This is consistent with similar studies carried out in other parts of the

world. Recent suggestions indicate the rise of non-communicable diseases (hypertension) among old adults in Africa countries (Shokunbi and Ukangwa, 2021; Tenkorang and Kuuire 2016; Farhangi *et al*., 2020) which has necessitated the need to screen the young adult population for early diagnosis and proper management/treatment of the conditions. In this study it was observed that 53 % had normal hypertension status, 31 % had pre hypertensive status, 10 % had hypertensive stage 1 while 5 % had hypertensive stage 2 for systolic blood pressure. Determination of hypertension using diastolic blood pressure showed that 72 % had normal hypertensive status, 23 % had pre hypertensive while 5 % had hypertensive stage 1**,** this finding was lower than the result of some researchers in a similar study carried out in Ghana which reported 26.1 % of the participants had pre-hypertension; similar to the 27.1% prevalence, found in a university in Palestine (Tayem, et al., 2012). However, other studies have found rather higher prevalence of prehypertension among undergraduate students such as the 42.9 % in Malaysian university (Lee, *et al.*, 2010) 40.0 % in Columbia (Ramos, 2011) and 39.5 % in Kuwait (Al-Majed *et al.*, 2012) This probably could be due to the lower beverage consumption reported in this study. Contextual lifestyle has been shown to be associated with the incidence of pre-hypertension and hypertension. Therefore, differences in context were a probable reason for the differences in prevalence.

Table 2 showed that 5.4 % took 250 ml of tea, 4 % took 300ml of tea, 2 % took 70 ml of chocolate, 2.2 % took 145 ml of chocolate, 4.2 % took 250 ml of chocolate, 4 % took 1000 ml of chocolate, 2 % took 300 ml of chocolate, 3 % took 500 ml of chocolate, 4 % took 1000 ml of chocolate. This study solely concentrated on quantity of beverage consumed by the students. Table 3. shows that 2 % took 250 ml of energy drinks, 2.4 % took 440 ml of energy drinks, 2 % took 800 ml of energy drinks. Table 4. shows that 16.4 % took 500 ml of zobo drinks, 8 % took 1000 ml of zobo drinks, 1 % took malt drinks.Table 4. shows that there is a significant positive relationship systolic and diastolic ($p>0.05$). It also shows that there is a significant positive relationship between beverage intake, systolic and diastolic ($p>0.05$). In the study, it has been observed that the participants were not high consumer of sweetened beverage as sugar-sweetened beverages (SSBs) or sugary drinks are leading sources of added sugars in the American diet. Frequently drinking sugar-sweetened beverages is associated with weight gain, obesity, type 2 diabetes, heart disease, kidney diseases, non-alcoholic liver disease, tooth decay and cavities, and gout, a type of arthritis (Bomback *et al*., 2010; Lee *et al*., 2019) Limiting sugary drink intake can help individuals maintain a healthy weight and have healthy dietary patterns. The study showed a significant relationship ($p<0.05$) between energy, Zobo drink and systolic blood pressure. This confirms other studies conducted by researches in developed countries In Australia and Mexico, in Australia, the average amount of 217 mL of SSB per day is consumed by youth contributing to 5.5 % of their total energy intake (Perng et al., 2019). In Mexico, SSB intake as one of the main sources of added sugar intake contributes to 8.3% of the total energy intake among children and adolescents (Abbasalizad, 2018).

Conclusion and Recommendation

The study showed that few students had hypertension stage 1 and stage 2. Also, there is a significant correlation ($p<0.005$) between the Energy drink, Zobo intake and the systolic blood pressure of the respondents. This can have detrimental impact on the academic performance and general productivity of the future leaders. Therefore, there is a critical need for urgent intervention by all stakeholders. Also, the study population are not regular consumers of beverage.

Tables

Table1: Hypertension Status of the Respondents

Systolic	Frequency	Percentage (%)
Normal(<120)	1058	53
Pre-Hypertension (120-<140)	635	31
Hypertension stage 1 (140-<160)	207	10
Hypertension stage 2 (>160)	91	5
Diastolic		
Normal(<80)	1434	72
Pre-Hypertension (80-90)	459	23
Hypertension stage 1 (90-100)	107	5
TOTAL		

Table :2. Hot Beverages Intake of the Respondents

Hot Beverages (ml)	Percentage
Tea	
250	5.4
300	4
Total	**5.8**
CHOCOLATE (cocoa) ml	
70	2
145	2.2
250	4.2
300	2
500	2.8
1000	4
Total	**10.0**

Table 3: Energy Drink Intake of the Respondents

Energy Drinks (ml)	Percentage
250	2.0
400	22.8
440	2.4
800	2
Total	27.4

Table 4: Zobo & Malt intake of the respondents

Zobo Drinks (ml)	Percentage
500	16.4

1000	8
Total	17.2
Malt Drinks	
330	1.0
Total	1.0

Table 5: Correlation Between Hot Beverage Intake and Hypertension

	Systolic	**Diastolic**
Soft drink	-0.021	-0.118*
Tea	-0.083	-0.406
Chocolate	0.217	0.063
Energy drinks	0.010	-0.070
Zobo drinks	0.048	-0.120

ACKNOWLEGEMENT

This is to specially appreciate the TetFund Nigeria via Institution-Based Research (IBR) for releasing fund to carry out this research. Also my deepest gratitude goes to the Management of our great Citadel of learning Moshood Abiola Polytechnic Management, most especially the Rector Dr David Adeoye Odedeji, and the Registrar Mrs Olubunmi Olubukola Elewodalu. I want to use this medium to also salute the director of the Centre for Research and Development Dr Adio Olufemi Abatan and director of School of Science and Technology Dr Mrs Abidemi Taiwo with their Noble team. The contributions of my noble colleagues and students are highly appreciated, few among them are Miss Lam Fadekemi Joy, Mrs Ogunkunle Temitope, Mrs Bola, Miss Hannah Aweda etc. To those I'm not able to mention their names I say thank you. Shalom

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