Junk Food Consumption and Obesity Status of Tertiary Institution Students In Southwest Nigeria

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ABSTRACT

Background: *Consumption of junk foods has increased worldwide and in Nigeria, particularly in the last few decades. Frequent junk food consumption increases the risk of obesity among teens which is a major health problem.*

Objective: *This study examines the relationship between junk food consumption and the obesity status of tertiary institution students in Southwest, Nigeria.*

Methods: *A total of 300 students were assessed from six tertiary institutions in Southwest, Nigeria through a cross-sectional study design between August and December 2022. Junk food consumption expenditure was estimated using descriptive statistics. Descriptive statistics was used to describe the socioeconomic characteristics, and the junk food consumption expenditure using the 7 days memory recall. The Body Mass index (BMI) was used to assess the obesity status of the respondents. Logit regression model was used to determine the effects of junk food consumption on the obesity status of the respondents.*

Results: *It was found that snacks accounted for 43.5% of the junk food consumed. This was followed by the consumption of carbonated soft drinks (36.6%). Package cookies/chocolates were the least consumed accounting for 10.9% of the total junk food expenditure share. Also, 14.0% of the respondents were underweight, 25.3% had a normal weight of 18.5≤ 24.9 kg/m2, 32.7% was overweight with 25 ≤ 30kg/m2 BMI, and 28.0% was obese with BMI ≥ 30 kg/m2. An average student in the study area was overweight with a mean BMI of 29.6kg/m2. The mean junk food consumption pattern share was highest (33.6%) among obese and lowest for underweight (17.7%).*

Conclusion: *The findings suggest that junk food consumption expenditure exerts a significant positive effects on the obesity status of the respondents. Hence, Junk food consumption is a major driver of the obesity status of students in tertiary institutions in Southwest, Nigeria. This study established that a health danger of junk food consumption. Hence, reduction of junk food consumption should be encouraged as the convenience and easy availability of the junk food may have negative contributions in the students' health status.*

Keywords: Unhealthy foods, Young Adult, Schools, Nutritional status

Doi: https://dx.doi.org/10.4314/njns.v45i2.14

INTRODUCTION

Available statistics show that obesity-related non-communicable diseases are increasing in many developing countries with cross-sectional and secular trends of childhood obesity globally and more prevalent to developing countries [1, 2].

Increase intake of junk food due to their availability and cheapness is a global phenomenon having a prevalence of around 70% world over [3]. Junk food contains low nutrients and is widely consumed as an alternative to conventional food. This is considered as an emerging major public health challenge among all age groups especially in young adults [3, 4]. The increased high energy food consumption with low nutritional value (junk food) represents an important proportion (15-40%) of total daily calorie intake of children and this has been attributed to overweight and obesity that is observed among children and adolescents nowadays [5]. These days, nutritious foods have been largely substituted by junk foods such as chips, biscuit, doughnuts, candies, noodles and aerated drinks such as coke, fanta, sprite, and other aerated drinks. This change in pattern of food preferences among children and adolescents in the developed and developing

countries of the world have been reported as the leading cause of obesity, and its associated complications around the world [5].

The prevalence of overweight and obesity is on the increase worldwide, with serious public health implications. In the last three and half decades, the prevalence of obesity has increased steadily, according to the standard established by the World Health Organization (WHO) body mass index (BMI) categorization of obesity [6]. The steady increase in the prevalence of overweight and obesity is global and the rate of increase in an African country like Nigeria is not lower than that observed in developed countries of the world [6, 7]. According to the World Health organization (WHO), Africa is facing an emerging public health problem of obesity, with the prevalence among children and adolescents ranging from 5 to 16.5% [8]. Obese adolescents are more likely to become obese adults hence, have higher odds of developing type-2 diabetes and cardiovascular disease. Adolescent overweight/obesity can result in bullying, discrimination and stigmatization with consequent poor school performance and quality of life [9].

The Global Burden of Disease study in 2017 evaluated 84 risk factors and obesity was reported as one of five leading environmental, behavioral, and metabolic risks that drive injury and disease worldwide [10]. Obesity was also observed to have the greatest relative increase in exposure since 1990 [10]. Obesity and overweight are associated with a greater risk of non-communicable diseases such as cardiovascular diseases, diabetes mellitus, metabolic syndrome, chronic kidney disease, cancer, and musculoskeletal disorders [11]. In 2015, diabetes was the second largest cause of death from obesity-related causes [11]. In Nigeria, some of the co-morbidities reported included type 2 diabetes mellitus, hypertension, and dyslipidemia [12].

In Nigeria, some risk factors for obesity have been reported to be gender, age, locality (urban community), decreased physical activity, educational status, high income, and diet [13-16]. Increased dietary consumption of energy-dense foods, high levels of refined sugar and saturated fats (fast food) and sedentary lifestyles are recognized as some of the major causes of the increased prevalence of obesity in Nigeria [17]. There has also been a rapid increase in the number of restaurants that sell fast food in most urban communities in the country within the last three decades with associated increased patronage by the upper and middle class that can afford junk foods [18].

Junk foods are defined as foods that are readily available, usually inexpensive, and having less nutrient value. These foods contain more calories, more salt, have a higher content of saturated fat, and contain less iron, calcium, and dietary fiber [19]. Common junk foods include fast food, carbonated drinks, chips, desserts, chocolate [19]. Globally, junk foods are popular stuff, and consumption is increasing constantly. Traditional foods have been nearly replaced by food items that can be found in a state of ready to eat, in canned form, and preserved for a longtime [20]. The consumption of such foods has peaked in developed countries; however, there is an increasing trend in the developing countries of the world [21]. Despite established evidence of the negative impacts of junk foods on the human body, the consumption of junk foods is popular among young adults. Such consumption may lead to a high prevalence of obesity, diabetes mellitus, hypertension, and coronary heart disease [22]. In Nigeria, particularly among adolescents, the rising junk food consumption is due to globalisation, lifestyle, the ready availability, taste, low cost, peer pressure and marketing strategies which makes it popular among children and adolescents [23]. Globalisation has caused changes in people's lifestyles, both in developing and developed countries as such diet has now turned into eating foods that are instant and unhealthy [24].

Despite the socioeconomic condition of the family, junk food consumption has been emerging worldwide due to quick consumption, ready to eat, inexpensive, and of good taste. Such foods have been found prepared using low-quality ingredients such as refined grains, added sugar, and fats, despite nutritious ingredients [25]. Fast foods are more flavorful and satisfying and such foods attract more people especially children and adolescents [26]. Studies have identified a strong positive relationship between the availability of junk food and its consumption as well as junk food consumption and obesity outcomes [27, 28, 29]. However, Park [30] assessed the just food consumption on the general obesity based on Body Mass Index (BMI). In Nigeria, there are few empirical works on the relationship beyween junk food consumption and obesity status of adolescents of government owned institutions in southwest, Nigeria.

Nigeria has strategic direction documents on promoting physical activities, nutrition counseling,

adhering to dietary guidelines, and implementing mandatory nutritional labeling [31]. All these are captured in the country's health and nutritional policies [31]. One of the challenges of these policy summersaults is the lack of empirical work on obesity, its junk food associated determinant, and more attention is currently being paid to undernutrition [32]. In order to convince policy-makers to pay more attention to overweight and obesity, reliable statistics highlighting obesity as a serious public health problem in Nigeria are needed. Therefore, this study examined the effects of junk food consumption on obesity status of students in tertiary institutions in Southwest, Nigeria.

METHODOLOGY

Study Design

Primary data was used for this study to assess the effects of junk food consumption on the obesity status of the respondents.

Study Area and Population

This study used primary data to carried out this study in Southwest, Nigeria. This was obtained from 300 students drawn across the three types of tertiary institutions in Southwest, Nigeria specifically Abeokuta in Ogun and Ibadan in Oyo State. In Ogun state, Federal University of Agriculture, Federal College of Education, and Mashood Abiola Polytechnic, Abeokuta were selected. In Oyo state, University of Ibadan, the polytechnic, Ibadan, and Federal college of Agriculture, Moor Plantation, Ibadan.

Sampling Techniques

Multi-stage sampling techniques was used to recruit 300 students. Stage one (1) involved a random selection of two (2) out of six (6) states in Southwest, Nigeria. Stage two (2) was the purposive selection of the six (6) tertiary institutions comprising two (2) federal university, two (2) polytechnics, and two (2) college making a total of 6 institutions. The third (3) stage involved a random sampling of 50 students from each of the selected institutions making a total of 300 students. This altogether made up a total of 300 respondents used for this study.

Data Collection

The research data was collected using an interviewer administered questionnaire and was conducted in classrooms, polytechnic hostels, polytechnic library, canteens and various departmental blocks. The questionnaire form consisted of three sections i.e. socioeconomic information, anthropometric measurement and junk food consumption expenditure.

Data Analysis

Both descriptive and inferential statistics were used to analysed the data. Descriptive statistics was used to describe the socioeconomic characteristics of the respondents. The definition of overweight and obesity in studies, with both broadly identified as abnormal or excessive fat accumulation presenting a risk to health [28]. For this study analysis, obesity was measured using Anthropometric measurement (Body Mass Index), equivalent to a person's weight (in kilograms, kg) divided by the square of his or her height (in meters, m). Each respondent's height and weight were measured and BMI was calculated. BMI was categorized as follows: underweight (BMI $<$ 18.5 kg/m2), normal (BMI 18.5$\leq$ 24.9 kg/m2), overweight (BMI 25 $\leq$ 30 kg/m2), and obesity (BMI $\geq$ 30 kg/m2).

Descriptive statistics including mean, standard deviation and frequencies were used to describe the junk food consumption pattern of the respondents. The consumption expenditure share of the junk food categories was assessed as the ratio of each of the consumption expenditure of junk food category to the total junk food consumption expenditure. The analysis further established the respondents junk food consumption expenditure based on their body mass index.

The Logit regression model was used to determine the effects of junk food consumption on obesity status of students in tertiary institutions in Southwest, Nigeria. The model is specified as:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + \ldots + B_8X_8 + U_i$$

Where Y = Obesity status (1 = obese, 0 = Not obese)

X_1 = Age (Years)

X_2 = Sex (Male = 1, Female-0)

X_3 = Monthly stipend (N/month)

X_4 = Residency (1 = Live in outside university hostels, 0 = others)

X_5 = Sleeping habits (1 = More than 8 hours sleeping/night, 0 = otherwise)

X_6 = Years of Education

X_7 = Awareness of obesity as a disease (1 = Yes, 0 = No)

X_8 = Junk Food Consumption Expenditure (N/week)

RESULTS

Socioeconomic characteristics of the respondents

A total of 300 students participated in this study. Most participants (56.0%) are female and 44.3% were less than 20 years of age. The mean age was

21±2.2 years. Most the student (44.0%) were first year in the tertiary institution. 29% were in final year, and 27% were in other year. Most students (58.7%) reported living outside the institution hostels, 31.3% live outside the institution hostels, and 10.00% live with both parents. There were 50.7% of the students who reported optimal sleeping of less than 6 hours per night. About 49.3% reported more than 8 hours sleeping/night. Additionally, 48.00% reported using electronic devices on a daily basis. There were 42.7% who ate breakfast daily, and 42.7% reported that they ate breakfast. About 65.3% and 34.7% ate lunch within and outside the institution. Additionally, 52.0% reported a sedentary life style. There were

Table 1. Socioeconomic characteristics of the respondents

Characteristic	Frequency	Percentage
Sex		
Male	168	56.0
Female	132	44.0
Age (years)		
<20	133	44.3
20-30	167	55.7
Mean age (Standard deviation)	21±2.2	
Level of education		
First year	132	44.0
Final year	86	28.7
Others	82	27.3
Monthly stipend (₦)		
1000-5000	46	15.3
6000-10000	112	37.3
11000 and above	142	47.4
Mean (Standard deviation)	12000±4.5	
Residency place at night		
Live with both parents at home	30	10.0
Live in university hostels	176	58.7
Live in outside university hostels	94	31.3
Sleeping habits		
Less than 6 hours sleeping/night	152	50.7
More than 8 hours sleeping/night	148	49.3
Lifestyle habits		
Use electronic device daily	128	42.7
TV in the bed room	52	17.3
Eating and watch TV	102	34.0
Play video game on a daily basis	36	12.0
Daily breakfast eating	204	68.0
Breakfast at home	178	59.3
Lunch within the institution	248	82.7
Lunch outside the institution	52	17.3
Eating fruit at least daily	88	29.3
Eating fast food on a daily basis	288	96.0
Soft drinks at least once daily	276	92.0
Sedentary life style (%)	138	46.0
Practicing sports more than 300 min/week	64	26.7
Walking to and from the school daily	104	34.7
Awareness of obesity as a disease		
Yes	176	73.3

Source: Field survey, 2022

34.7% of the students who walked to and from school most days.

Body Mass index, and obesity status of the respondents

Table 2 presents the Body Mass Index (BMI) of the respondents. From the study, 58.7% had a height of above 1.51m. The mean height was 1.6m±0.8. The mean weight was 53±3.7kg. 14.0% of the respondents have a body mass index of less than 18.5 kg/m^2 indicating that they are underweight, 25.3% have healthy weight of 18.5≤ 24.9 kg/m^2, 32.7% are overweight (25 ≤ 30kg/m^2), and 28.0% are obese with BMI ≥ 30 kg/m^2. The mean BMI in the study area was 29.6kg/m^2 implying that an average student in the study area is obese.

Junk food consumption expenditure

Table 2 presents the result of the consumption expenditure of junk food. The most commonly consumed junk foods consumed in the study area were soft drinks, packaged cookies/chocolates, sweetened beverages, and snacks. Snacks were the most (43.5%) consumed junk food by the respondents on a weekly basis. This was followed by consumption of carbonated soft drinks (36.6%). Sweetened Beverages accounts for 13.0% of the total junk food expenditure. However, Package cookies/ chocolates were the least consumed accounting for 10.8% of the total junk food expenditure share. In this study, snacks often consist of whole foods, such as fruits, vegetables, or nuts, while junk food is typically processed and contains

Table 2. Body Mass Index and Obesity Status of the respondents

Measures	Frequency	Percentage
Height (m)		
1.10-1.50	124	41.3
1.51 and above	176	58.7
Mean height (Standard deviation)	1.6±0.8	
Weight (kg)		
<50	94	31.3
51-60	144	48.0
61 and above	62	20.7
Mean weight/Standard deviation	53±3.7	
Categories (kg/m^2)		
Underweight (BMI < 18.5 kg/m^2)	42	14.0
Normal/Healthy weight (BMI 18.5≤ 24.9 kg/m^2)	76	25.3
Overweight (BMI 25 ≤ 30 kg/m^2)	98	32.7
Obese (BMI ≥ 30 kg/m^2)	84	28.0
Mean/Standard deviation BMI	29.6±4.1	

Source: Field survey, 2022

Table 3: Distribution of junk food consumption expenditure

Categories	Expenditure value (₦/week)	Expenditure share
Soft drinks	3600	36.6
Package cookies/ chocolates	1440	13.0
Sweetened Beverages	1200	10.9
Snacks	4800	43.5
Total	11040	100

Source: Field survey, 2022

artificial additives. Additionally, snacks are generally portion-controlled, while junk food often comes in larger, indulgent servings.

Description of respondents BMI based on their junk food consumption expenditure share

The junk food consumption pattern share was highest (33.6%) among obese students as shown in Table 4. However, it was lowest with underweight (17.7%). The junk food consumption share of normal weight students was 20.8%, while overweight was 27.9%.

Effects of junk food consumption on obesity status of students in tertiary institution

Table 5 shows the factors influencing the obesity status of Tertiary students in Ogun state, Nigeria. It was found that six (6) out of the eight (8) variables were significant at various levels. Sex (5%) and the student's awareness of obesity as a disease (1%) have negative effects on obesity status of Tertiary students in Oyo state, Nigeria. Hence, female students with low level of awareness of obesity as a disease were more vulnerable to obesity when compare to their male and students with high level of awareness level.

The Age (5%), monthly stipend (5%), Residency (Live outside university hostels at 1%), and junk food consumption expenditure (1%) have a positive effect on student's obesity status.

DISCUSSION

The roles of diets in healthy living and its associated numerous pathologies have been reported over the years [33]. Studies have shown that junk foods consumption as substitutes to nutritious healthy diets are the leading cause of overweight and obesity [27, 34]. Overweight and obesity are risk factors for many diseases and the increase in its incidence among the young adults' population is worrisome [35]. In Nigeria, junk food is commonly consumed

Table 4. Junk food consumption expenditure share and BMI Categorization

Categories	Junk food consumption expenditure share
Underweight	17.7
Normal weight	20.8
Overweight	27.9
Obese	33.6
Total	100

Source: Field survey, 2022

Variables	Coefficients	t-value
Constant	1.294**	6.183
Age (Years)	1.038**	2.292
Sex (Male=1, Female-0)	-0.834***	-2.143
Monthly stipend (₦/month)	0.462**	2.376
Residency (1= Live outside university hostels, 0 = Others)	0.064***	2.568
Sleeping habits (1= More than 8 hours sleeping/night, 0 = otherwise)	0.832	0.874
Years of Education	0.622	0.336
Awareness of obesity as a disease (1=Yes, 0=No)	-0.431*	-1.987
Junk Food Consumption Expenditure (₦/week)	1.937***	3.099
Number of observations = 300		
LR *Chi*2 (12) = 144.381		
Prob>*Chi*^{2} = 0.000		
Pseudo R^2 = 0.126		
Log likelihood = -4121.276		

Source: Field Survey, 2022. ***, **, * implies significant at 1%, 5% and 10% respectively.

among students because of its ready to eat attribute. The results of this study (Table 1) showed that most the student (44.0%) were in 100 Level. This confirms majority of the students were Beginners. However, 58.7% reported living inside the institution hostels, and 31.3% live outside the institution hostels. Based on feeding lifestyle, 96.0% consumed fast food on a daily basis, while 92.0% consumed soft drinks at least once daily, and 34.7% walked to and from the school daily. Besides, 73.3% considered obesity as a disease. This result shows the level of obesity perception of tertiary institution as a disease.

In this study, majority of the students in the study population (25.3%) had normal/healthy BMI (Table 2). This is in contrast to the majority (50.5%) having BMI less than normal as reported for school adolescents by Poudel [36] and Saudi Arabia study that reported a normal BMI of the majority i.e. 57.2% of the population [25]. In this study, obesity and overweight is 28.0% and 32.7%, respectively (Table 2). This result is similar to that reported by Al-Otaibi [27]. The mean BMI in the study area was 29.6kg/m^2 implying that an average student in the study area is obese. This result can be attributed to the majority being in their 100 Level.

The junk food consumption expenditure share was highest (33.6%) among obese students as shown in Table 4. However, it was lowest with underweight (17.7%). The junk food consumption share of healthy weight students was 20.8%, while overweight was 27.9%. This results implies that junk food is associated with higher body mass index. According to Khalaf [37] high consumption of junk foods contributes to the overweight among School-aged children in India from 9.7% to 13.9% over a decade. The potential adverse effects on weight status in younger population include Physical inactivity and unhealthy dietary habits and, consequently, the future health of adults [38; 39]. High intake of fried foods and artificially sweetened drinks are found to be directly linked with high body mass index and obesity in children [40].

The junk food consumption share of obese, normal weight students was 33.6% and 20.8% respectively, while overweight was 27.9% implies that junk food is associated with higher body mass index. According to Ranjani [41] high consumption of junk foods contributes to the overweight among School-aged children in India from 9.7% to 13.9% over a decade. The potential adverse effects on weight status in younger population include physical inactivity and unhealthy dietary habits and, consequently, the future health of adults [42; 43]. High intake of fried foods and artificially sweetened drinks are found to be directly linked with high body mass index and obesity in children [44].

The determinants of the obesity status of the respondent were age, sex, monthly stipend, residency, obesity awareness, and junk food consumption expenditure. This confirms that older and female students were more likely to be obese when compare with their counterparts. Also, students who lives outside the institution were less likely to be obese. However, Residency of students has been linked to Obesity. Gupta [45] posited that children who walk to or from school are classified into a higher physical activity category than those who use transport to travel to school, and hence are less likely to be obese compare to their counterparts. Besides, junk food consumption expenditure exerts a positive influence on the obesity status of the respondents. Junk food consumption is positively related to overweight and obesity due to extremely high energy density of these foods [46, 47]. Moreover, a study a significant association was observed between BMI and fast food consumption [48]. Moreover, obesity/overweight was significantly associated with frequency of fast food consumption [27]. This established that a health danger based on the results of this study, the junk food eating pattern of the students should be discouraged as the convenience and easy availability of the junk food may have negative contributions in the students' health status. However, this recommendation based on the junk food studied and may not apply to other junk foods with different nutritional composition.

CONCLUSION

The findings of this study revealed that there is a significant effects of consumption of junk foods on the obesity status of the respondents. The study discovered that the frequency and consumption expenditure of junk food consumption among the students was high and mostly daily and that the reason was mainly due to the fact that junk food consumption is convenient for them. It was found that 28.0% was obesity and 28.0% was overweight. With the attendant mean BMI of 29.6kg/m^2, an average student in the study area is either overweight or obese partly due to widespread lifestyles, and proliferation of processed food outlets. This study established that a health danger of junk food consumption. Hence, junk food eating pattern of the students should be discouraged as the convenience and easy availability of the junk food

may have negative contributions in the students' health status. However, this recommendation based on the junk food studied and may not apply to other junk foods with different nutritional composition.

Conflict of Interest

Authors declare no conflict of interest

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