Food Consumption Pattern and Prevalence of Obesity among Street Food Vendors in Abeokuta South Local Government Area, Ogun State

Oyeyemi Oseyemi O[1]., Olojede Iskilu A[1]., Lano-Maduagu Atinuke T[2]., Olalusi Oluwaseun M[1]., Olajide Bolanle R[1]., Adebowale Agboola A[1]., Oladosu Gbenga S[1],[3]., Afolabi Wasiu O[1].

[1]*Department of Nutrition and Dietetics, College of Food Science and Human Ecology, Federal University of Agriculture, P.M.B 2240, Abeokuta, Ogun State.*
[2]*Department of Science and Technology Education, University of Lagos, Lagos state.*
[3]*Home Economics Education Unit, Department of Vocational Education, Faculty of Education, Delta State University, P.M.B 1., Abraka, Delta State.*

Corresponding Author: olojedeadeolu@gmail.com

ABSTRACT

Background: *Obesity has emerged as a significant global challenge, affecting developed and developing countries. Traders including street food vendors often consume street food which is often laden with processed foods, sugar, or calories, as well as higher energy and fat intake which increases the risk of overweight and obesity.*

Objective: *This study assessed the food consumption pattern and prevalence of obesity among street food vendors in Abeokuta South Local Government Area, Ogun State.*

Methods: *The study was descriptive and cross-sectional in nature. A multi-stage sampling technique was used to select one hundred respondents in Abeokuta South Local Government Area. Data was elicited through a semi-structured questionnaire with different sections on socio-demographic and socio-economic characteristics, dietary habits, food frequency questionnaire, and anthropometric characteristics. Data were analyzed using the statistical package for social science (SPSS, v20.0).*

Results: *More respondents (32%) fell between the ages of 26-34 years and were predominantly female (84%). A higher percentage of the respondents (73%) consume sugar-sweetened beverages, 30% mostly consume rice and 13% mostly consume bread. Many (42%) of the respondents are overweight, 18% have obesity grade 1, and 6% have obesity grade 2. There was a strong association between socio-demographic characteristics and nutritional status at $p<0.05$ level of significance.*

Conclusion: *This study established obesity prevalence among street food vendors with risk factors considered to be high intake of energy-dense meals and sugar-sweetened soft drinks as well as most respondents consuming three or more meals daily. It is recommended that street food vendors control their consumption patterns of energy-dense foods, meal consumption frequency, and sugar-sweetened soft drinks intake to reduce the high prevalence of obesity among them.*

Keywords: Food Intake, Obesity, Street Food, Abeokuta.
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INTRODUCTION

The Food and Agriculture Organization (FAO) and the World Health Organization (WHO) define street foods as "ready-to-eat foods and beverages prepared and/or sold by vendors or hawkers, especially in the streets and other similar places" [1]. Street foods are a source of culturally accepted, inexpensive, appealing, and convenient foods for both urban and rural populations worldwide [2]. Most urban cities and towns in Nigeria have witnessed an upsurge in the establishment of street food outlets in the last decade to cater for the increasing demand for street foods as more people and families eat more outside the home [3The main challenges in the public health area have been

associated with the prevalence of diseases caused by eating foods high in fat (particularly, saturated fat) and sugar added, contributing to the higher energy density of foods, these characteristics are commonly present in the nutritional composition of street foods [4]. Street foods are associated with the development of chronic non-communicable diseases, including obesity since street foods usually have high quantities of carbohydrates and fats and the emergence of food-borne diseases, due to the ease of contamination by pathogenic and non-pathogenic microorganisms [5]. Globally, overweight and obesity cost an estimated US$2 trillion per year, and 68 percent of all deaths are caused by non-communicable diseases (NCDs), of which three of the four most common are diet-related [6]. Moreover, two-thirds of deaths from NCDs take place in developing countries, where two-thirds of overweight or obese people live, casting obesity no longer as only a developed country challenge [7]

To the best of our knowledge, no study has considered food intake patterns and the prevalence of obesity among street food vendors who have first-hand access to street food in Nigeria, especially in Ogun State, hence this study aims to provide data on which reliable inferences can be made and predict potential risks of developing NCDs, especially among street food vendors.

METHODOLOGY

Study Design

The study was cross-sectional and descriptive in design

Study Area and Location

The study was conducted in Abeokuta South Local Government Area of Abeokuta, an urban area and the capital of Ogun state in the South Western Region of Nigeria. It occupies an area of about 5735km with an estimated population of about 250,278 people [8]

Study Population

The participants were 100 full-time Street Food Vendors within Abeokuta South Local Government Area.

The Street Food Vendors in the study area that gave consent to participate. Street food vendors in this study are those who are stationary or mobile street food vendors selling ready-to-consume staple foods like rice, amala, and eba which are generally consumed in that area.

Sampling Procedure

The street food vendors were selected using multi-stage sampling techniques. Abeokuta South Local Government was selected using a purposive sampling, four wards from the Local Government were selected using random sampling. Street food vendors were selected for these wards using simple random sampling techniques.

Data Collection:

Administration of a semi-structured interviewer-administered questionnaire divided into four sections was used to obtain data on the socio-demographic and socio-economic characteristics of the respondents, dietary habits, dietary patterns, and anthropometric characteristics. A total of 100 questionnaires were administered to 100 street food vendors. The dietary pattern was assessed using the food frequency questionnaire and the nutritional status was also assessed using anthropometry characteristics questionnaire.

Socio-demographic and socio-economic data consisted of questions on personal details such as age, gender, ethnic group, marital status, type of street food vending and vending site, estimated daily income, and other income-generating activities. The dietary habit questions were used to test respondent's habitual decisions regarding how and what foods they eat which included 10 structured and 6 semi-structured questions. A food frequency questionnaire was adopted from that used in the study of dietary habits and portion sizes associated with overweight and obesity in the same state [9]. Other commonly consumed foods within the study area were added and non-typical foods were omitted. Anthropometric characteristics such as height were measured with a height meter to the nearest 0.5cm, weight was measured with a bathroom scale to the nearest 0.5kg, and waist and hip circumference was measured with a tape rule to the nearest 0.5cm [10].

Data Analysis

Data generated from questionnaires were coded and analyzed using SPSS V20.0 for Windows. Frequency distribution, mean and percentages were computed, cross cross-tabulation was used to compare two variables. Body Mass Index was calculated using the formula weight/(height)2. Underweight was marked by body mass index less than 18.5, normal weight by 18.5 to 24.9, overweight by 25.0 to 29.9 and Obesity was

determined by Body Mass Index greater than or equal to 30. A waist-to-hip ratio of 0.95 or lower, 0.96 to 1.0, and above 1.0 was classified low, moderate, and high for men, and 0.80 or lower, 0.81-0.85, and above 0.85 was classified low medium, and high for women. Chi-square (2) was used to test for statistical significance between variables and P<0.05 was considered significant. The result was presented using tables, text, and charts.

Informed Consent

Oral informed consent was sought from the respondent before questionnaire administration. The study objectives were communicated. Street food vendors who did not give consent were excluded and data from the study was kept confidential and used strictly for research purposes.

RESULTS

Table 1 reveals that the majority of the respondents

Table 1: Socio-Demographic and Economic Characteristics of Respondents

Variable	Options	Frequency	Percentage	Mean±S.D
Age range	17-25years	17	17.0	37.38±16.84
	26-34years	32	32.0	
	35-43years	22	22.0	
	44-52years	14	14.0	
	53-61years	11	11.0	
	62-70years	4	4.0	
Gender	Male	16	16.0	
	Female	84	84.0	
Religion	Islamic	36	36.0	
	Christianity	63	63.0	
	Traditional	1	1.0	
Ethnicity	Yoruba	91	91.0	
	Non- Yoruba	9	9.0	
Education	No formal	12	12.0	
	Primary	30	30.0	
	Secondary	38	38.0	
	Tertiary	18	18.0	
	Others	2	2.0	
Marital status	Single	33	33.0	
	Married	64	64.0	
	Divorced	3	3.0	
Daily income	< 5000	10	10.0	
	5000-9999	33	33.0	
	10000-19999	41	41.0	
	20000-29999	15	15.0	
	>30000	1	1.0	
Other income generating activities	Yes	11	11.0	
	No	89	89.0	

were in the age range of 26 to 43 years. 32% were between the age brackets 26 to 34 years while 22% were between 35 to 43 years. A significant proportion (84%) were female and 91% were Yoruba. Christians were 63%, 30% and 38% had primary and secondary levels of education respectively. 63% of the respondents were married. 33% and 41% of the respondents have a daily income of 5000-9999 naira and 10000-19999 naira respectively. 88% of the street food vendors have permanent stalls and 61% of them have their stalls made of either concrete or wood. Also, 89% of the respondents do not have other income-generating activities aside from street food vending.

Figure 1a and 1b provides information on the dietary habits of the respondents. Mostly consumed breakfast delicacies include rice, pap, and bread consumed by 30%, 13%, and 13% of the respondents respectively. 48% of the respondents have either rice, bread, or beans mostly for lunch while dinner meals were mostly rice, amala, eba, and semo major consumed by 14%, 11%, 14%, and 10% of the respondents respectively. 87%, 84%, and 94% usually do not skip breakfast, lunch, and dinner respectively. 37% and 35% consume meals three times and more than three times daily respectively.

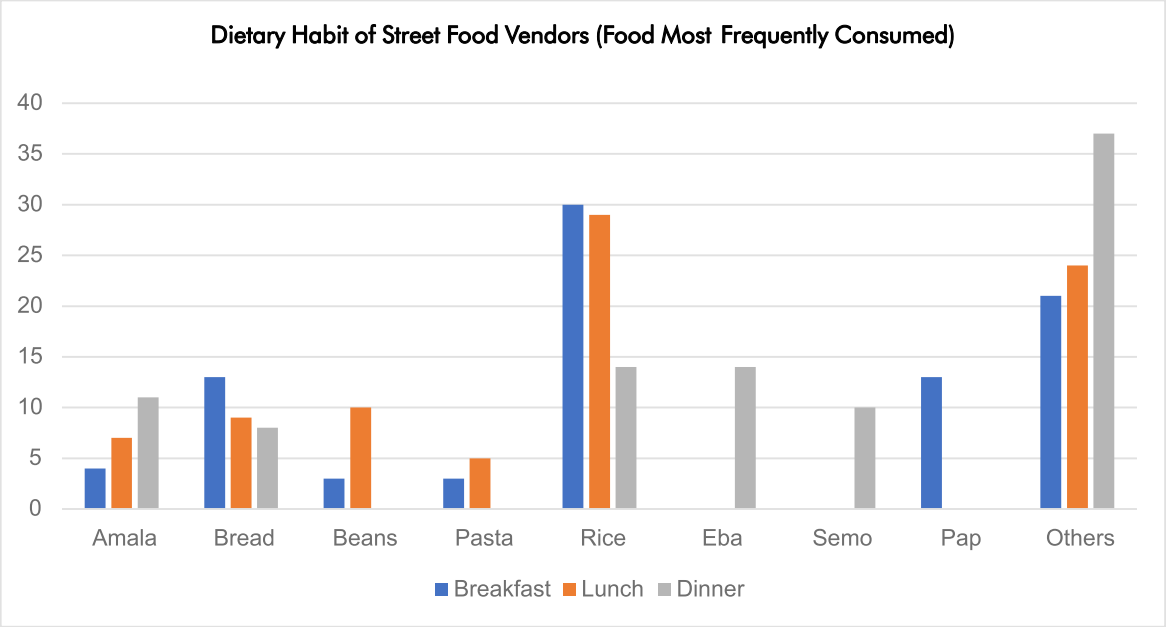

Figure 1a: Dietary Habit of Street Food Vendors (Food Most Frequently Consumed)

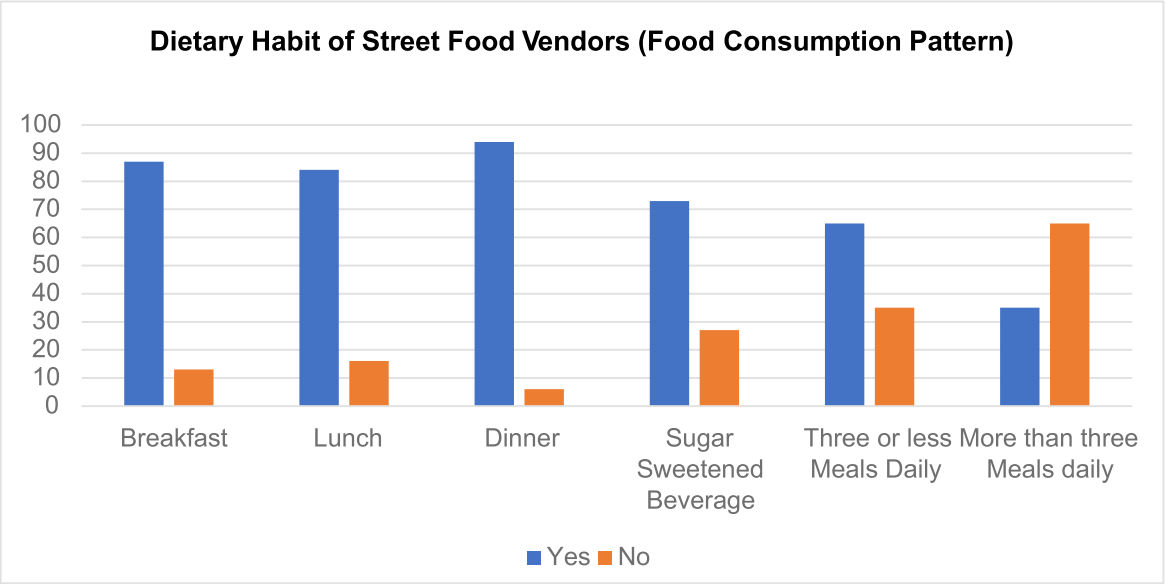

Figure 1b: Dietary Habit of Street Food Vendors (Food Consumption Pattern)

Table 2 shows the anthropometric characteristics of the respondents revealing that 31% are of normal weight, 42% are overweight, 18% have obesity grade I and 6% have obesity grade II.
Furthermore, 14%, 20%, and 66% of the respondents have a low, moderate, and high waist-to-hip ratio values respectively all relative to the normal waist-to-hip ratio value for gender and age.

Table 3 discloses the frequency of food consumption of each food group by the respondents. The table shows how many respondents consumed each food in different food groups as well as their frequency (never, 1-3 times, 4-7 times) of consuming the food. The table also shows the total respondents that consumed each food as well as their percentage relative to the total number of respondents.

Table 2: Anthropometric Characteristics of the Respondents

Background Information	Variable	Frequency (n)	Percentages (%)
Body mass index (kg/m^2)	Underweight	3	3.0
	Normal	31	31.0
	Overweight	42	42.0
	Obesity grade 1	18	24.0
	Obesity grade 2	6	6.0
Waist to Hip ratio	Low	14	14.0
	Moderate	20	20.0
	High	66	66.0

Table 3: Frequency of food consumption of each food group by Respondents

Food group N=300	Proportion that consumed food per frequency				
	Never	1 – 3 Times weekly	4 – 7 times weekly	Total respondent that consumed	Percent %
Cereals					
Spaghetti	3	60	37	97	97%
Bread	2	38	60	98	98%
Jollof rice	3	37	60	97	97%
Fried rice	10	52	38	90	90%
Semolina	7	62	31	93	93%
Root and Tubers					
Cassava Flakes	2	52	46	98	98%
Eba	3	74	23	97	97%
Amala	5	48	47	95	95%
Plantain	1	52	47	99	99%
Lafu	10	53	37	90	90%
Porridge	5	69	26	95	95%
Legumes and pulses					
Beans	1	54	45	99	99%
Groundnut	18	55	27	82	82%
Moi-moi	4	81	15	96	96%
Akara	5	88	7	95	95%
Cowpea	5	51	44	95	95%
Soya-bean	70	28	2	30	30%
Dairy Product					
Boiled egg	3	39	58	97	97%
Milk	2	29	69	98	98%
Chicken	4	67	29	96	96%
Fried egg	7	57	36	93	93%
Yogurt	9	80	11	91	91%

Table 3: Frequency of food consumption of each food group by Respondents

Food group N=300	Proportion that consumed food per frequency				
	Never	1 – 3 times weekly	4 – 7 times weekly	Total respondent that consumed	Percent %
Fruits					
Watermelon	1	47	52	99	99%
Orange	3	65	32	97	97%
Pawpaw	20	72	8	80	80%
Banana	4	58	38	96	96%
Beverages and Drinks					
Soft drink	4	48	48	96	96%
Malt drink	9	78	13	91	91%
Tea	3	43	54	97	97%
Energy drink	40	47	13	60	60%
Vegetables					
Lettuce	4	56	40	96	96%
Spinach	7	69	24	93	93%
Onions	3	7	90	97	97%
Pumpkin	10	62	28	90	90%
Fish & fish product					
Fried fish	5	13	82	95	95%
Smoked fish	11	24	65	89	89%
Boiled fish	11	24	65	89	89%
Fresh fish	11	58	31	89	89%
Meat & and meat product					
Beef	2	8	90	98	98%
Goat meat	2	65	33	98	98%
Poultry	1	69	30	99	99%
Fat and oil					
Vegetable oil	1	2	97	99	99%
Palm oil	1	5	94	99	99%
Mayonnaise	6	33	61	94	94%

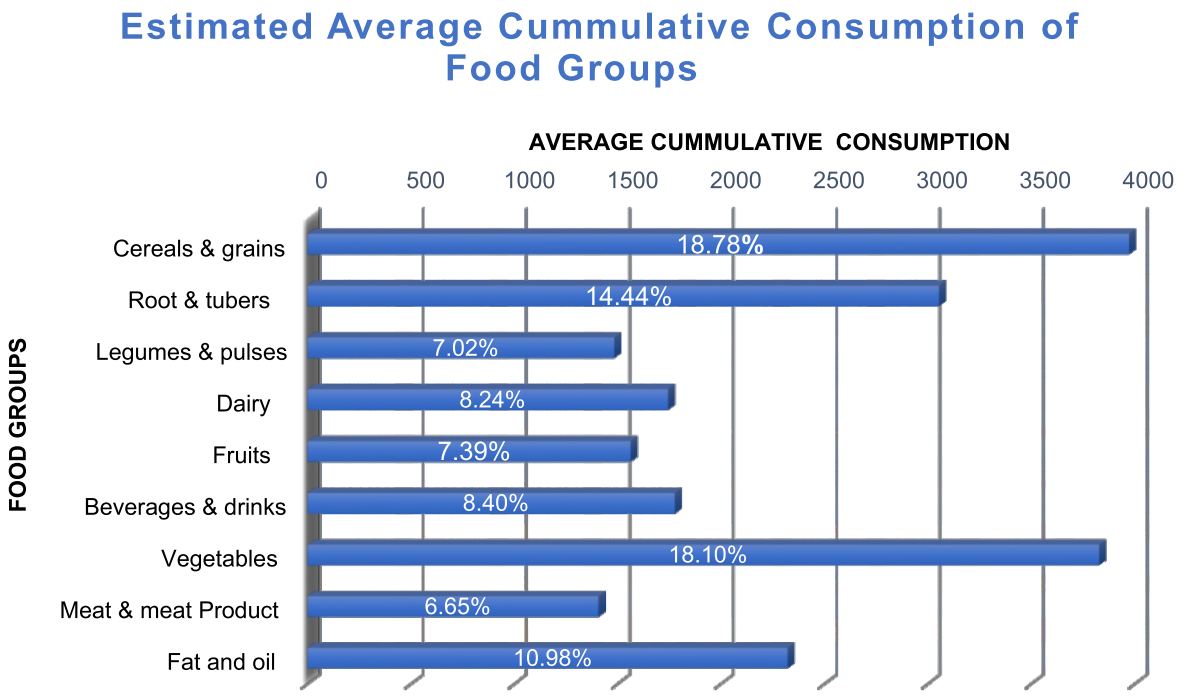

Figure 2: Estimated Cumulative Consumption of Food groups by Respondents

Table 4: Association between Socio-Demographic and Socio-Economic Characteristics and Nutritional status of the respondent (Waist to Hip Ratio)

	Waist to Hip Ratio (WHR)				
Variable	Low	Medium	High	X^2	p-value
Gender					
Male	13(81.3%)	3(18.7%)	0(0%)	46.63	0.00*
Female	1(1.2%)	17(20.2%)	66(78.6%)		

DISCUSSION

This study assessed the Food Consumption Pattern and Prevalence of Obesity among Street Food Vendors in Abeokuta South Local Government Area, Ogun State. The study revealed that a higher percentage of the respondents were between age of 26-34 years and the majority were female (84%). This can be explained by the fact that street food vending in Nigeria and Africa at large, is considered more as women-related jobs due to the cooking activities involved. Also, street food vending has low capital startups making it easier for more women including housewives to embark on. This corroborates with the study by [11] and [12] both conducted in Abeokuta as well as the study by [13], [14] in Nigeria and [2] in Uganda which reported that most street food vendors were female young adult but this was contrary to the study of [15] in Oyo State Nigeria. 91% were Yorubas with 68% having either primary or secondary level of education. This was similar to the findings of [13] and [16] who recorded 56.1% and 53.3% of respondents respectively with a primary or secondary level of education but contradictory to the result of [11]. The majority (93% of respondents) were stationary street food vendors and 88% had permanent food stalls. This was also recorded by [11] and [14] in Abeokuta and Kaduna North Central respectively. 41% had a

daily income of 10,000 to 19,999 naira daily which was also very similar to what was reported by [11]. This showed that a considerable amount of the respondents had reasonable income.

This study shows that the respondents rarely skip meals which can be attributed to the situation of their job as a food vendor who is always accessible to food throughout the day. Most of these foods the respondents consume are carbohydrates dense which contributes to excess weight gain and evidently high prevalence of overweight and obesity among the respondents. Most food vendors in this study also consume their breakfast early enough because they start vending as early as possible to meet the needs of street food consumers who take street foods as breakfast. On the other hand, dinner is usually consumed late in the evening till after the last sales or at bedtime. It has been discovered that the timing of food intake is an emerging factor that may predict the success of weight loss therapies. Not only "what" but also "when" food is eaten may have a significant role in obesity treatment [17]. The common prevalence of overweight and obesity among the respondents can also be attributed to this eating pattern. A study has investigated how late eating inverts the daily rhythm of salivary microbiota diversity as compared to early eating which may have deleterious effects on the metabolism of the host [18]. Soft drink consumption which is high among the study population has been associated with increased energy intake and is referred to as a major contributor to obesity and related health problems [19-21]. More so, the Negative health effects of sugar-sweetened beverages have not only been linked with obesity but also with diabetes and metabolic syndrome [22].

Analysis of the anthropometric characteristics of the respondents showed that 42%, 18%, and 6% of the respondents are overweight, and have obesity grade 1 and grade 2 respectively similar to the study of [23] where the prevalence of overweight and obesity among street food vendors was recorded to be 52.5% and 10.5% respectively. This high prevalence may be attributed to the respondents' dietary habits and patterns as well as to the fact that the majority of the respondents were adult females who were more likely to be obese than their male counterparts. It also revealed that 66% had waist-to-hip ratios which were higher relative to the normal set standard of waist-to-hip ratio for genders and age groups. A study has also revealed that participants who ate away from home greater or equal to 3 times per week were 2.13 times more likely to be obese than those who ate away from home less than once/week [24].

According to Nelia Steyn, May 2013, selling generally takes place at a fixed location. However, many vendors move around with their equipment and wares, frequenting places where consumers are concentrated such as bus terminals, stations, and garages, but in this present study, 88% of the respondents have a permanent stall where they prepare and sell their foods. From this study, the prevalence of obesity among the respondents is 24%, of which 66% have a high risk of cardiovascular health. 73% of the respondent consume sugar-sweetened beverages which has a negative effect on their health.

CONCLUSION

The food consumption pattern of the street food vendors showed high consumption of fat and energy-dense foods including carbohydrates and sugar-sweetened beverages with most of them having three or more meals daily. In addition, there was a high prevalence of overweight and obesity among the respondents which can be attributed to their dietary pattern and accessibility to energy-dense street foods. There is consequently a need for an intervention program that will target the consumption pattern of street food vendors to alleviate and further prevent an increase in obesity prevalence.

Conflict of Interest

We confirm that this manuscript is an original work of the authors and has not been submitted for publication elsewhere. Therefore, there is no conflict of interest.

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