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DIETARY DIVERSITY AND NUTRITIONAL STATUS OF STREET FOOD CONSUMERS IN OYO, SOUTH WESTERN NIGERIA

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ABSTRACT

Street food is an affordable and acceptable source of dietary intake remarkable for its high consumption in developing countries. The aim of this study was to assess the dietary diversity and nutritional status of street food consumers in Oyo, a Nigerian urban town. The study was cross-sectional in design. A semi-structured questionnaire was used to elicit information on the socio-economic characteristics, consumption of street food and a single 24hr dietary recall from 385 street food consumers in Oyo town of Oyo State. The nutritional status of the respondents was assessed with the use of anthropometric indices-weight (kg) and height (m) to estimate the Body Mass Index (BMI) which was classified as Underweight (<18.5kg/m^2), Normal (18.5-24.9 kg/m^2), Overweight (25.0-29.9 kg/m^2) and Obese (≥30.0kg/m^2. Dietary Diversity was based on the number of food groups consumed in the previous 24hours and a Dietary Diversity Score (DDS) ranging from 0 to 9 was constructed from a 9-food group model. The mean age of the respondents was 38.8±12years, majority (87%) were male and 59.7% were self-employed. About 40% spent half of their income on food while 10% spent more than three-quarters on food. More than 60% consumed street food daily, 82.1% indicated street meal as the most preferred street food whilst snacks and beverages were preferred by only 13%. Majority (74.0%) consumed street foods in the afternoon and about 20% in the morning. Four out of 10 respondents had low DDS, about half had medium DDS and 10% had high DDS. The nutritional status indicated 25.2% to be overweight while 3.1% and 6.2% were found to be underweight and obese, respectively. A significant association was found between the dietary diversity and nutritional status of the respondents. This study revealed that street food consumers in the ancient town of Oyo, Nigeria were either overweight or obese and their dietary diversity was low.

Key words: Street food, Consumers, Dietary Diversity, Nutritional status, South Western, Nigeria

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INTRODUCTION

Street foods are ready-to-eat foods and beverages prepared and/or sold by vendors and hawkers on the street from pushcarts or baskets or balance pole, or from stalls or shops having fewer than four permanent walls [1, 2]. It includes commercially produced snacks that are retailed by street food vendors, as well as food items made by vendors on-site or in nearby kitchens [3]. Street foods have become an indispensable component of food distribution systems and mainly contribute to the daily dietary intake of urban consumers in the developing world [3-5].

Today's society is known for its rapid urbanization and civilization where people have less time to select, prepare and eat food than ever before. Street foods, however, are now considered to be more appealing because they provide quick, reasonable priced and readily available alternatives to home cooking [6]. Street food vending have become common and important features of urban towns in many of these countries including Nigeria. In Africa, street foods are popular and are on an ever increasing demand [1, 7, 8]. Most of the street foods are prepared daily from a variety of ingredients to suit local taste and demand [9]. Their intake, however, is usually influenced by characteristic taste, distinguished flavour as well as cultural acceptability and demand.

The diversity of street foods is extensive, as they vary widely not only from country to country but also by culture [8, 10]. Street food in some countries maintains part of traditional diet and also serves as a way of conserving traditional food habits [11]. However, increase in its consumption in most countries has now become part of broader patterns of dietary change associated with urbanization [10].

Urban dwellers in Bamako, Mali were reported to spend as much as half of their food budgets on street foods [12] while street foods accounted for about 40% of the food purchases of low-income families and 25% in high-income brackets in Accra, Ghana [13]. A study which investigated the contribution of street foods to daily nutritional requirement in Nairobi found that non-home prepared foods contributed to 13-36% of dietary energy; 11-20% of vitamin A intake and 7-20% of iron intake of urban residents [14]. The fact that street food trade proliferates and expands in developing countries and cities indicates that it responds to urban consumer food needs and wants and thus is vital [15]. According to a study in Mali, street food was found to be contributing to the food intake of families of different socio-economic status especially those with low income [12]. A study on urban food consumption in developing countries reported that people with limited income rely almost exclusively on food supplied by vendors [15].

Dietary diversity is a useful indicator of nutrient adequacy and it is usually assessed by the use of a tool known as diversity scores where the number of food groups consumed over a reference period is scored [16-18]. These scores have been validated as a good proxy for indicating dietary quality [19, 20]. Studies on street foods in Nigeria have focused more on street food vendors and less on the consumers [8, 21, 22]. There is also paucity of information on the diversity of diet of street food consumers as well as their nutritional status. The objectives of this study were, therefore, to assess the nutritional status and dietary diversity, and also to determine the relationship between dietary

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diversity and nutritional status of street food consumers in Oyo town, South western Nigeria.

METHODOLOGY

The cross-sectional designed study was carried out in Oyo town. Oyo is an ancient town is located in Oyo State, South western Nigeria and it comprises Atiba, Oyo East and Oyo West Local Government Areas. Oyo East Local Government was randomly selected for the study. The residents of Oyo town are predominantly of Yoruba ethnic group and their occupation are mainly farming but a sizeable number are civil servants, artisans, traders, and others work in private organizations.

A semi-structured interviewer administered questionnaire was used to obtain information on socioeconomic characteristics and consumption of street food from 385 consumers of street food. The respondents were randomly selected from 5 major street food outlets in the selected region of Oyo town. The anthropometric indices (height and weight) were measured and then used to obtain the Body Mass Index (BMI=weight (kg)/height (m^2)) of the respondents. Body Mass Index was classified as Underweight (<18.5kg/m^2), Normal (18.5-24.9 kg/m^2), Overweight (25.0-29.9 kg/m^2) and Obese (≥30 kg/m^2).

The dietary diversity of the respondents was obtained from the dietary diversity score (DDS) which is defined as the number of different food groups consumed in the 24 hours preceding the interview [17]. The information collected from the 24h dietary recall was used to calculate for the DDS of each respondent. In this study, a 9 food-group aggregation was created from the list of food groups created from the 24hr recall. The aggregated 9 food groups (starchy staples, dark green leafy vegetables, other Vitamin A rich fruits and vegetables, other fruits and vegetables, organ meat, meat and fish, eggs, legumes and seeds/nuts, milk and milk products) was then used to create the diversity scores with each group carrying a score. Respondents with a score less than 3 were regarded as low dietary diversity; those with scores of 4 and 5 had medium dietary diversity while those with a score of 6 and above had high dietary diversity. This scoring categorization has been used in previous studies [17, 23].

Data Analysis

Data were entered, organized and analysed using Statistical Package for Social Scientists (SPSS Inc., Chicago, Illinois, USA) Version 15.0. Descriptive statistics was used for the frequency count while Chi square test was used to test for the association between the categories of dietary diversity and nutritional status of the respondents with the level of significance set at $P<0.05$.

RESULTS

The main characteristics of the consumers of street food that participated in the study are shown in Table 1. The vast majority (87.0%) were male and about 60% of them were married. The largest proportion of the sample by age (34.3%) was found among respondents between 20-29 years, closely followed by those between 30-39 years (25.5%) while those below 20 years of age had the lowest proportion (6.5%). The mean

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age of the street food consumers in the current study was 38.8±12.4 years. Seven out of 10 respondents were Muslim. Only 2.1% had no formal education, 16.6% had primary education while about half (47.3%) and 34% had secondary and tertiary education, respectively. The employment status of the respondents revealed that about 60% were self-employed, 17.4% were employed by the government, 8.1% were employed by private organisations and 14.8% were unemployed. One-third reported a monthly income below N20,000 (100 dollars), about half earned N20,000-N50,000 (100-250 dollars) while 18% earned more than N50,000 (250 dollars) monthly.

Table 2 presents the pattern of street food consumption of the respondents. More than 60% of the respondents consumed street food daily, one out of five consumed street food 3-5 times per week while only 1% consumed street food occasionally. Ten percent of the street food consumers spent more than three-quarters of their income on food, 37.4% spent about half of their income and 17.7% spent one-quarter of their income on food. Majority (82.1%) of the respondents preferred to consume meal as their street food, 13.3% preferred only snacks and beverages while 4.6% preferred to consume both snacks and meal. Afternoon was indicated as the preferred time of street food consumption by 74% of the respondents, 19% preferred morning while 7% preferred evening.

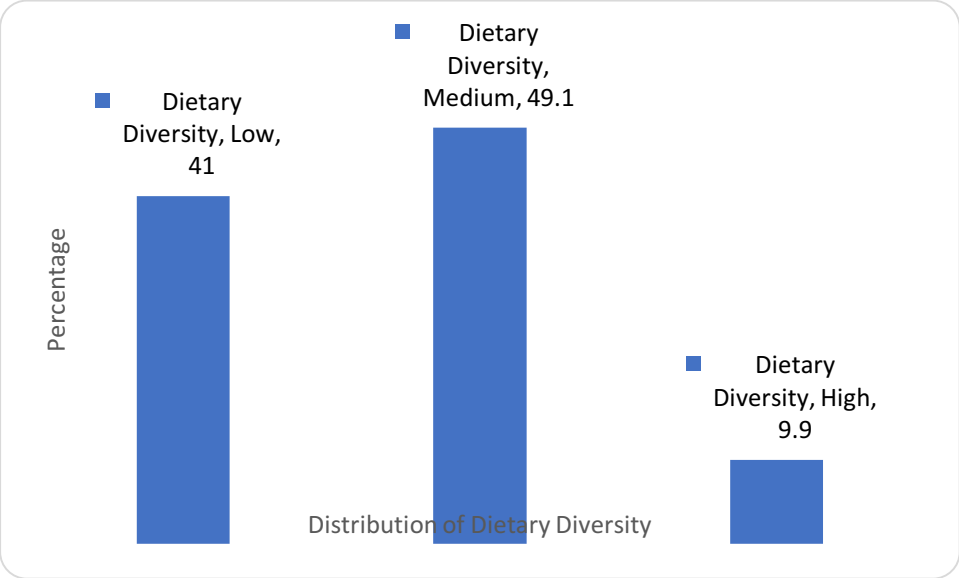

Figure 1: Distribution of dietary diversity of street food consumers

The distribution of the dietary diversity of the respondents as shown in Figure 1 indicated that 41% of the respondents had low dietary diversity, about half (49.1%) had medium dietary diversity while only one out of 10 had high dietary diversity. The nutritional status of the respondents revealed that 3.1% were underweight and 65.5% had their BMI within the normal range. About 25% and 6.2% were overweight and obese, respectively. Most of the respondents with low and medium dietary diversity had their nutritional status within the normal range (77.8% and 64%, respectively) while a good number with high dietary diversity (60.5%) were found to be overweight. Less than 20% of the respondents

with high dietary diversity were found to be obese. However, a significant association was found between dietary diversity and nutritional status of the respondents.

DISCUSSION

Street foods have become an indispensable component of food distribution systems in many urban settings of developing countries [5]. The rise in consumption of street foods in most countries has been identified to be part of broader patterns of change associated with urbanization [10]. Studies have shown that the main consumers of street foods in most countries are members of the informal sector, such as artisans and street hawkers as well as casual wage labourers [24-26]. However, a study by Ohiokpehai *et al.* [27] revealed that the consumers of street foods comprise mainly of the working class and professionals. Most of the street food consumers in this study were found to belong to the informal sector comprising largely of self-employed artisans. Most artisans locate their outlets and offices along major roads for easy access by customers hence the likelihood of exposure and easy access to street food.

Regular purchase and consumption of street food can be attributed to the level of income. Street food has been reported to be less expensive when compared with the cost of home prepared food and its regular consumption is common among people with low income [5]. Mensah and co-authors further revealed that the consumption of street food is common in many countries with high unemployment, low salaries and work opportunities [28]. In another review on street food vending, it was reported that the poorer the family, the larger the percentage of their budget spent eating on street foods [29]. An earlier study in Nigeria showed that economic recession led to an increased consumption of street foods because of the scarcity and high cost of obtaining ingredients [30]. The finding from this study is in contrast to that from a previous study as most of the street food consumers were found within the category of those with higher monthly income.

High purchasing power and inadequate cooking time for home-made food could be the reason for the increase in the consumption of street food especially in the cities. Neumark-Sztainer *et al.* [31] reported that the preparation of food at home is on the decline and also that most parents have been reported to be too busy to cook. Majority of the respondents in a study in United States were reported to be eating outside their homes [32].

Street food either in the form of meal, snacks or beverages has significantly become a vital part of daily food consumption in Nigeria. In the early 80s, street foods which were only regarded to be supplementary to daily intake had risen to becoming an integral part of daily dietary intake by mid 90s especially in urban food supply [10, 33]. With increase in demand for work time and growing fast food outlets, the implication of this trend in the nearest future indicates that food cooked outside the home especially street food will eventually become the main source of food intake. The frequency and regularity of street food consumption was further affirmed in the current study to be on the increase as more than half of the respondents were daily consumers of street foods and spent 50-75% of their income on street food. The proportion of income spent on food from this study is

significantly higher than what was reported in an earlier study where the proportion of the daily household food budget spent on street foods only ranged between 25 to 47% [2].

In a study on the contribution of street food to daily dietary intake, meals were identified as the most important type of street food consumed, followed by snacks [34]. This conforms to a Ghanaian study where snacks, complete meals, and refreshments were all identified as part of the street food consumed in Ghana [28]. Snacking has been observed as a habit that has displaced nutritious diet however, snacking in this study was found to be an uncommon habit while consumption of complete meal was found to be the most preferred form of street food. Food has been considered a major part of culture, and culture has a great influence on food choice [35]. The influence of traditional diets on choice of street foods may have been the reason for preference of street meal over street snacks in the current study. In some countries, street foods still form part of the traditional diet hence serve as a way of conserving traditional food habits [11]; the commonly consumed street meals and snacks in a community may reflect the indigenous foods of such community. An earlier ethnographic study of the food habits among children in West Java, however, reported that snacks did not replace meals [36]. There is, therefore, the need to extensively explore the role played by indigenous diets on choice of street foods.

The pattern and consumption of street foods vary from country to country. The finding on afternoon as the preferred time for street food consumption in the current study can be compared to a similar study in Philippines whereas another related study in Senegal reported breakfast as the common meal consumed as street food [37, 38]. According to Rheinländer *et al*. [4], the street food industry in urban areas of low- and middle-income countries has experienced a rapid expansion especially in terms of providing access to a diversity of inexpensive foods for low- income households [4]. It should, however, be of note that their nutrient quality in terms of diversification is in doubt. Although street foods are easily accessible and affordable, their quality in terms of nutrient adequacy to the consumers cannot been ascertained due to paucity of information on diversity of its consumption.

Dietary diversity ensures improvement in the diet quality and nutritional status of both the young and old. Dietary diversity scores obtained in this study is in consistent with the findings from six Nigerian states [39]. Dietary diversity is associated with adequate intake of macro and micronutrients [20, 40] hence highlighting its importance in establishing the contribution of each food to overall diet quality [39]. Studies have implicated a positive association between dietary diversity and nutritional status in Africa [41, 42]. The significant association that was found between dietary diversity and nutritional status of street food consumers in this study is in line with previous findings [39, 43] which further established direct relationship between dietary diversity and nutritional status but in contrast to the findings obtained from the population of mothers in Nigeria [39]. Although about half of the street food consumers in the current study had medium dietary diversity, participants with low dietary diversity were significantly higher than those with high dietary diversity.

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CONCLUSION

This study has established that street food is commonly consumed among inhabitants of Oyo town and further provided an insight on the dietary diversity as well as the nutritional status of the street food consumers in Oyo, a south western city of Nigeria.

It is recommended that further studies should explore the consumption pattern of street food among urban population in other Nigeria's cities. In order to establish the nutrient adequacy and quality of street food, it is necessary to document the nutrient composition as well as the safety of street foods. Due to variation in socio-cultural definition of street foods, there is the need for a clear distinction between street meals, street snacks and street beverages in Nigeria.

Limitation

The respondents included only street food consumers patronising street food outlets in Oyo during the period of data collection hence may not be representative of all street food consumers in Nigeria. Nevertheless, this paper has revealed the dietary diversity and nutritional status of street food consumers in the ancient city of Oyo, South western Nigeria.

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Table 1: Socio-economic characteristics consumption of the respondents

Variable	Frequency	Percentage
Sex		
Male	335	87.0
Female	50	13.0
Marital status		
Single	152	39.5
Married	233	60.5
Age (years)		
Below 20	25	6.5
20-29	132	34.3
30-39	98	25.5
40-49	74	19.2
50 and above	56	14.5
Mean age= 38.8±12.4years		
Religion		
Christianity	123	31.9
Islam	262	68.1
Level of Education		
No formal education	8	2.1
Primary	64	16.6
Secondary	182	47.3
Tertiary	131	34.0
Employment status		
Self employed	230	59.7
Civil Servant	67	17.4
Privately employed	31	8.1
Unemployed	57	14.8
Monthly income (naira) (n=122)		
Below 20,000	41	33.7
20,000-50,000	59	48.3
Above 50,000	22	18.0
Total	**385**	**100.0**

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Table 2: Pattern of street food consumption of the respondents

Variable	Frequency	Percentage
Proportion of income spent on food		
25%	68	17.7
50%	144	37.4
75%	132	34.3
>75%	41	10.6
Frequency of street food consumption		
Daily	244	63.4
3-5 times per week	82	21.3
1-2 times per week	55	14.3
Occasionally	4	1.0
Preferred street food		
Snacks and Beverages	51	13.3
Meal	316	82.1
Both Snacks and Meal	18	4.6
Preferred time of street food consumption		
Morning	73	19.0
Afternoon	285	74.0
Evening	27	7.0
Total	**385**	**100.0**

Table 3: Nutritional status of the street food consumers

Nutritional status	Frequency	Percentage
Underweight	12	3.1
Normal	252	65.5
Overweight	97	25.2
Obese	24	6.2
Total	385	100.0

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Table 4: Association between Dietary Diversity and Nutritional Status of the Respondents

	Dietary Diversity			
BMI	Low	Medium	High	P-value
Underweight	9 (5.7)	3 (1.7)	0 (0.0)	
Normal	123 (77.8)	121 (64.0)	8(21.1)	
Overweight	21 (13.3)	53 (28.0)	23(60.5)	0.000
Obese	5(3.2)	12(6.3)	7(18.4)	
Total	158 (100.0)	189 (100.0)	38 (100.0)	

Chi square was used to test the association

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