DETERMINANTS OF FOOD CHOICES OF ADOLESCENTS IN SOUTH-WESTERN NIGERIA

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ABSTRACT

Food choices of adolescents have become increasingly unhealthy, putting them at increased risk of malnutrition, as they grow older. The study investigated the determinants of food choices of adolescents in order to assess their nutritional knowledge and implication. World Health Organisation (WHO) describes children aged 10-19 years as adolescents. Four hundred and one adolescents who were in secondary schools were interviewed from six of the thirty local government areas of Osun State, which is a south-western state of Nigeria. Based on the population of secondary schools in the local government areas, thirty-two schools were sampled. Pre tested structured questionnaires using a set of high quality colour photographs of foods and drinks that would typically be offered to adolescents were used. The photographs, showing one item each, included foods such as biscuits, buns, meat pie that were classified as "snacks" and those, such as rice and beans garnished with vegetable and either fish/meat stew, stewed beans, pounded yam that formed part of a conventional meal. In the same manner, photographs showing a bottle of coke, milk, chocolate drink and home made non-alcoholic drinks were presented. This was used to elicit information from the respondents. Descriptive statistical techniques such as frequency counts, percentage, mean and standard deviation, likewise inferential tools, such as, correlation analysis and analysis of variance (ANOVA) were used in data analysis. The study showed positive and significant correlation between the preference and nutritional contents of foods ($r = 0.514$, $p<0.05$) and drinks ($r = 0.346$, $p<0.05$). There was no significant difference in the preference and perceived nutritional contents of the foods ($F = 3.072$), while there was a difference in the choice and perceived nutritional contents of drinks ($F = 0.217$) among the urban and rural adolescents. It is concluded that, the food choice of the adolescents in the study area was based more on taste preference than the nutritional contents. The nutritional knowledge of the adolescents in the study area is high but the knowledge on home made non alcoholic drinks is low. Nutrition education should be intensified especially on traditional foods and home made non-alcoholic drinks that are nutritious.

Keywords: Adolescents, Food choices, Nutritional knowledge.

INTRODUCTION

The nutritional quality of the diets of adolescent school children in Nigeria, have been a matter of concern for sometime. The problem of helping adolescents to choose foods, which make up a nutritionally sound meal, remains unsolved. A number of studies have identified the food habits and preferences of adolescents. Some studies have examined the food choices of school children of this age, at school meals [1, 2]. They reported that there was a strong preference for snack food such as cakes and biscuits, crisps and fizzy drinks. It was found in a number of studies that in most cases, the nutritional knowledge of the adolescents is fairly sound [1, 3] .

Another study found that the wholesomeness of the meals was not a very important factor in adolescents' food choice. Personal preferences for the taste, texture and appearance of the food had a much greater influence than the nutritional quality [4, 5]. A number of authors have pointed out the need for school-based initiatives to improve children's eating habits [3]. Others stress that such efforts should be based on an understanding of their beliefs concerning food [6]. Some authors found an inverse relationship between the perceived wholesomeness of food and adolescents' liking for the foods. Despite this, the difference in nutritional value between the healthy choices and the favourite choices was not as great as many nutritionists feared [4, 7]. The meals chosen based on preference were, in many respects, no less healthy than those chosen on the basis of the adolescents' perceptions of the healthiness of the meals, and in some respect the "preferred meals" were healthier [4].

While studies reviewed above have all explored child food preferences in general and at school, the factors that influence the adolescents' choice, their nutritional knowledge, and attitudes to food and health, few of these have looked at the preferences for and perceptions of the healthiness for the same set of foods.

This paper reports on the foods and drinks commonly served at home which are most frequently chosen for the meals and drinks to be consumed (preferred meals/drinks). The perceived healthiness of the meals and drinks were also investigated (healthy meals/drinks). The paper finally identified the foods and drinks that are the most and the least likely to be chosen and those perceived to be the most and the least healthy, in both cases based on a scoring system.

The main objective of this study was to investigate the factors responsible for the choice of foods and drinks among adolescents in south-western, Nigeria.
Two hypotheses were further investigated in the study:
(1) There is no significant relationship between the choice of foods and drinks and nutritional contents among the adolescents.
(2) There is no variation in the choice of foods and drinks between the urban and rural adolescents.

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METHODS

Osun State, with a land area of 925,100 hectares or 9,251_ km^2 and an estimated projected population of 2,184,569 in 1998 is divided into 30 local government areas (LGAs) with urban and rural districts. During the study period from September to November 2004, 239,829 adolescents aged 10 – 19 years [8] were attending government schools [9, 10, 11]

The adolescents were the subjects of the cross sectional study conducted in both urban and rural areas of the state with the use of a multistage stratified, random sampling technique. A list of names of government schools was obtained from the Department of Planning Research and Statistics, Ministry of Education, Oshogbo, Nigeria [10]. Thirty-two schools were selected randomly. Of these, 25 were proportionally selected from urban areas and 7 from rural areas.

The final sample size was determined by the following steps. First, the number of subjects living in urban and rural was estimated at 80% and 20%, respectively, since some of the subjects in rural area attend schools in urban area. The number of students selected from each school was determined according to the total number of students at each school. Finally, the classrooms were chosen by systematic sampling and each adolescent was selected randomly from a classroom. Available statistics shows that Osun State has the highest number of children attending school in the nation [9, 10, 11]. The survey instrument which is a structured questionnaire was administered on 450 adolescent students from various schools. Of these, 401 were included for analysis; 267 from urban and 134 from rural. Each interview lasted 20 minutes and was conducted on one on one basis during the lunch break in the schools, in order not to disrupt the lessons and for full participation of the adolescents.

A set of high quality colour photographs of foods and drinks that would typically be offered to adolescents at home were used [12]. The photographs showed one item each. The foods shown included biscuits, buns, meat pie that were classified as "snacks" and those, such as rice and beans garnished with vegetable and either fish/meat stew, stewed beans, pounded yam that formed part of a staple meal. In the same manner, photographs showing a bottle of coke, milk, chocolate drink and home made non-alcoholic drinks namely '*kunu' and 'sobo'* were presented. (*Kunu*' is made from millet and sometimes guinea corn which is rich in protein, while '*sobo*' drink is extracted from *Roselle Calyx* which has been found to be rich in iron and vitamin C) [13].

The adolescents, who were not aware of the purpose of the study, were presented with all the photographs and were asked to select the foods and drinks that would make up the meal and drink that they would most likely choose if they were offered that range of foods and drinks. In the second task, the children were asked to rate each of the foods or dishes on a five-point scale, marking the point that best reflects their likelihood to choose the item. The scales ranged from 'very likely to choose' scored at 5 to 'very unlikely to choose' scored at 1. The meal selection and the rating tasks were repeated, this time, with the adolescents being asked, first of all, to select the meal that they thought would be the most healthy (the 'healthy' meal), and secondly, to rate all the foods or dishes according to how healthy they perceived each one to be. In this case, the scale ranged from 'very healthy' (scored at 5) to 'very

unhealthy' (scored at 1). The selection and rating task was repeated for drinks. All responses were recorded on a questionnaire.

DATA ANALYSIS

For the meal selection task, the frequency with which items were selected for the "preferred meal" and the "healthy meal" was determined and comparison made between urban and rural respondents.

Mean values for the rating score on both the preferred meals and healthy meals scales were calculated, and correlation analysis was used to determine whether there was a relationship between the preferred meals/drinks and their healthiness. In all cases, statistical significance is quoted at the 5% level ($P<0.05$) [12, 14].
Further, analysis of variance (ANOVA) was used to differentiate between urban and rural adolescents.

RESULTS

FOOD AND DRINKS MOST LIKELY TO BE CHOSEN
The food item most frequently chosen was rice in form of boiled rice and stewed rice (*Jollof rice*). This was followed by fresh fruits, bread, pounded yam, yam flour (*amala*), stewed beans, bean pudding (*moinmoin*) and snacks, each of which were chosen as preferred meals by over 50.0% of both urban and rural adolescents [Table1].
The least popular choices were boiled yam, yam porridge, bean balls and cassava flour products (*Gari and Fufu).* Rural adolescents were significantly more likely than the urban counterparts to choose stewed beans, and urban adolescents were more likely to choose bean pudding *(moinmoin)*, bean cake (*akara*) and snacks [Table1].

Similarly, the drinks most frequently chosen were fruit juice, milk drink, water and soft drinks, which were chosen by over 70.0% of both urban and rural adolescents in that respective order. While the least popular choice of drinks, were chocolate drinks, '*sobo'* (made from Roselle Calyx) and '*kunu'* (made from millet or guinea corn) [Table 2]. The same trend was exhibited between both the urban and rural adolescents. The description of the local dishes and home made non-alcoholic drinks is shown in Table 3.

FOOD AND DRINKS PERCEIVED TO BE HEALTHY
The food items most frequently chosen for the healthy food were stewed beans, rice, fruits and bread, which were chosen by over 70.0% of the adolescents in both rural and urban areas [Table1]. Yam products and cassava products followed this set. The least choices for the healthy food were snacks. This trend was followed among both the urban and rural adolescents. Similarly, the drinks most frequently chosen as 'healthy' drinks as shown in Table 2 were fruit juice, milk and water followed by chocolate drink, while the drinks that were regarded as 'unhealthy' were '*Kunu', 'sobo'*, sweetened and soft drinks. About 76% and 47% of the adolescent preferred soft and sweetened drinks; respectively, even though, only 3.7% and 6.7% perceived them to be healthy. The adolescents preferred these two drinks

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despite the awareness of their unhealthiness probably because they are cheap, affordable and readily available, notwithstanding the health implication.

CORRELATION ANALYSIS AND ANALYSIS OF VARIANCE

Correlation analysis results shown in Table 4 revealed the relationships between 'preferences' and 'healthiness' (nutritional contents). Choice of food had positive and significant relationship with 'Healthiness' of food (r=0.514, p<0.05) while choice of drinks also had positive and significant relationship with 'healthiness' of drinks (r=0.346, p<0.05). The result of analysis of variance (ANOVA) shown in Table 5 indicated that there is a significant difference in the preference (F=3.072) and perceived healthiness (F=0.955) of foods among the urban and rural adolescents, while there is no significant difference in the preference (F=0.217) and healthiness (F=0.347) of drinks among both the urban and rural adolescents.

DISCUSSION

The study showed that there is a positive correlation between the preference and healthiness of foods among the adolescents in the study area. They have a fair knowledge of the nutritional contents of the foods they eat, and would rather go for healthy foods than unhealthy ones, if available. The consumption of snacks though is a worldwide issue among the adolescents regardless of where they live, whether urban or rural areas, developed or developing countries, they are usually exposed to almost the same lifestyle [15, 16, and 17]. However, Snacking is a key characteristic of an adolescent's diet and it is not a bad practice on its own, but the quality of the snacks should be a matter of concern. Snacks chosen by adolescents tend to be high-sugar or high fat foods. Snacks can contribute positively to nutrient intakes, if chosen rightly. Snacks provide one-fourth to one-third of the daily energy intake for adolescents [18, 19, 20]. In this study, about 51.4% would prefer to eat snacks, even though only 1.9% perceived them to be healthy. This could be because snacks are readily available regardless of the type and quality. When the adolescents are hungry, snacks are usually more easily available than wholesome meals despite the nutritional implication. Even the parents encouraged this probably due to time constraints [10]. Contrary to previous studies carried out [5, 7, 21, 22, 23], this study found that most of the items perceived to be more healthy were those that were more likely to be chosen.

Likewise, for the drink selection task, most of the drinks perceived to be healthy were more likely to be chosen with the exception of soft and sweetened drinks. The preference for '*sobo*' and '*kunu*', which are homemade non-alcoholic drinks, is low, probably because the adolescents did not know the nutritional contents of these drinks. '*Kunu*' is made from millet and sometimes guinea corn which is rich in protein, while '*sobo*' drink is extracted from *Roselle Calyx* which has been found to be rich in iron and vitamin C. These home made non-alcoholic drinks are always available and quite cheap in the study area, but the adolescents did not go for them probably due to peer pressure, status symbol and 'self-ego'. They prefer to take the 'popular' soft and sweetened drinks despite the awareness of the unhealthiness. A similar study revealed that soft drinks are one of the most common drink choices for adolescent females because of the sweet taste [7, 12, 24].

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A number of studies have established the fact that taste preference is the main influence of food selection among the adolescents [24, 25, 26]. Although dietary trends are affected by behavioural, socio-cultural, and economic variable, diet choices are most often guided by how food tastes [24, 26]. Adolescents, especially, prefer sweet and dislike bitter taste [27]. If preference is that important a determinant of food choice, health practitioners should focus their efforts on process of determining preference in order to improve food habits [28, 29, 30].

In conclusion, the adolescents in the study area should be further enlightened on the importance of consuming snacks that are rich in nutrients since they cannot be discouraged from taking snacks. In addition, they should be made to realize the benefits that could be derived by consuming some nutritious non-alcoholic home-made drinks.

Table1: The percentage of adolescents choosing each of the items for their 'preferred' meals and 'healthy' meals and the mean rating scores (±SDs) for the 'likelihood to choose' and 'perceived healthiness' of each item

Dishes	Percentage of Adolescents choosing each item						Mean Rating Scores (±Standard Deviation)	
	Preferred meals			Healthy meals				
	Total (n=401)	Urban (n=267)	Rural (n=134)	Total (n=401)	Urban (n=267)	Rural (n=134)	Preference	Healthiness
Snacks (biscuits, Puff Puff, Buns, Pie, cake, etc	51.4	55.8	47.0	3.9	4.1	3.7	4.39(±2.15)	2.01(±1.05)
Yam porridge with fish stew	37.4	36.0	38.8	36.3	34.5	38.1	3.88(±1.17)	4.14(±0.81)
Boiled yam with stew	39.9	44.6	35.1	39.1	40.8	37.3	3.99(±1.12)	4.15(±0.88)
Jollof rice, fish/meat	78.1	81.6	74.6	72.2	72.7	71.6	4.66(±0.81)	4.59(±0.79)
Rice, dodo and meat	80.4	82.4	78.4	76.5	76.0	76.9	4.69(±0.77)	4.66(±0.72)
Stewed beans	52.9	49.8	56.0	81.3	81.3	81.3	4.14(±1.14)	4.68(±0.83)
Beans pudding (Moinmoin)	51.3	54.7	47.8	58.7	64.0	53.0	4.22(±1.03)	4.41(±0.89)
Bean cakes (Akara)	47.0	50.0	44.0	49.1	53.9	44.0	4.12(±1.07)	4.29(±0.87)
Cassava flour (Gari) with meat stew and okro	32.6	36.0	29.1	31.0	32.6	29.1	3.63(±1.32)	3.85(±1.06)
Pounded yam with meat/fish & vegetable stew	59.4	59.9	58.9	57.4	59.6	55.2	4.40(±2.72)	4.39(±0.88)
Yam flour (Amala) & Ewedu soup & Meat/fish	50.1	56.2	44.0	48.3	48.7	47.8	4.17(±1.10)	4.22(±0.93)
Fufu & Okro & meat/fish stew	33.9	32.6	35.1	27.7	27.7	27.6	3.66(±1.29)	3.83(±1.03)
Lafun and Okro & meat /fish stew	24.1	27.3	20.9	30.7	30.0	31.3	3.27(±1.43)	3.73(±1.16)
Bread and Egg (boiled or fried)	65.1	65.9	64.2	70.3	70.4	70.1	4.43(±0.96)	4.54(±0.87)
Fresh fruits	71.2	72.3	70.1	76.8	79.0	74.6	4.50(±0.99)	4.64(±0.82)

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Table2: The percentage of adolescents choosing each of the items for their 'preferred' drinks and 'healthy' drinks and the mean rating scores (±SDs) for the 'likelihood to choose' and 'perceived healthiness' of each item

Drinks	Percentage of Adolescents choosing each item						Mean Rating Scores (±Standard Deviation)	
	Preferred drinks			Healthy drinks				
	Total (n=401)	Urban (n=267)	Rural (n=134)	Total (n=401)	Urban (n=267)	Rural (n=134)	Preference	Healthiness
Sweetened drinks	47.1	44.9	49.3	5.2	3.7	6.7	4.06(±1.14)	1.94(±1.10)
Sobo	22.2	21.3	23.1	27.3	22.5	32.1	3.59(±1.20)	3.78(±1.02)
Kunu	19.3	16.9	21.6	26.4	22.9	29.9	3.24(±1.32)	3.68(±1.07)
Soft drinks	75.9	74.2	77.6	3.7	3.7	3.7	4.66(±0.73)	1.71(±1.07)
Chocolate drink	58.2	56.6	59.7	59.6	54.3	64.9	4.40(±2.24)	4.35(±0.93)
Water	77.0	77.9	76.1	81.4	84.3	78.4	4.70(±0.65	4.74(±0.66)
Milk Drink	80.0	79.4	80.6	79.5	84.3	74.6	4.73(±0.62)	4.68(±0.70)
Fruit juice	81.7	83.5	79.9	82.1	80.5	83.6	4.76(±0.67)	4.81(±0.55)

Table3: Description of local dishes and home made non-alcoholic drinks

Local dishes	Description
Dodo	Ripe plantain, sliced and fried in oil
Moinmoin (Bean pudding)	Peeled beans, ground into paste, seasoned and steamed in modes or local leaves
Akara (Bean cake)	Peeled beans, ground into paste, seasoned and fried in oil into balls
Gari (Eba)	Fermented cassava, drained and roasted into grains. Later processed into dough using hot water usually eaten with any types of soups
Fufu	Fermented cassava, mashed and kept in paste form. Later processed into dough using hot water, usually eaten with any types of soups
Lafu	Fermented cassava, drained, dried and ground into flour. Later processed into dough using hot water, usually eaten with any types of soups
Amala (Yam flour)	Dried yam ground into flour and later processed into dough using hot water, usually eaten with any types of soups.
Sobo drink	Drink extracted from *Roselle Calyx* which has been found to be rich in iron and vitamin C
Kunu drink	Made from millet and sometimes guinea corn which is rich in protein

Table4: Correlation analysis showing the relationship between choices based on 'preference' and 'healthiness'

Variables	Correlation coefficient R	Coefficient of determination r^2	Percentage of contribution
Healthiness of Foods	0.514[-]	0.264	26.4
Healthiness of Drinks	0.346[-]	0.120	12.0

[-]Significant at $p < 0.05$ level

Table 5: Result of analysis of variance (ANOVA) between the urban and rural adolescents

		Sum of Squares	Mean Square	F	Significance.
Preferred food					
	Between Groups	183.453	183.453	3.072[-]	0.080
	Within Groups	23829.519	59.723		
	Total	24012.973			
Perceived healthiness of foods					
	Between Groups	43.525	43.525	0.955[-]	0.329
	Within Groups	18189.478	45.588		
	Total	18233.002			
Preferred drinks					
	Between Groups	3.250	3.250	0.217	0.642
	Within Groups	5983.035	14.995		
	Total	5986.284			
Perceived healthiness of drinks					
	Between Groups	3.194	3.194	0.347	0.556
	Within Groups	3667.096	9.191		
	Total	3670.289			

[-] Significant at $p < 0.05$ level

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