A COMPARATIVE STUDY OF FOOD CONSUMPTION PATTERN AMONG PUBLIC AND PRIVATE PRIMARY SCHOOL CHILDREN IN OJODU LOCAL GOVERNMENT AREA, LAGOS STATE, NIGERIA.

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Authors contributions.

The work was carried out in collaboration of all authors. The first author contributed in the write up and some of the analysis, while the second author developed the topic as well as data collection and contributed in the write up as well, the third author wrote the article with relevant literature back ups

ABSTRACT

Introduction: Adequate nutrition in school age children is of paramount importance to their health and plays a significant role in their growth and development. The pattern of food consumption is a reflection of their nutrition.

Objective: The study assessed the food consumption pattern among primary school children in Ojodu Local Government Area, Lagos Nigeria.

Methodology: The study employed a cross-sectional descriptive design. A pre-tested, interviewer-administered, structured questionnaire was used to elicit information from 206 pupils who were recruited by multi-stage sampling method from a public and two private primary schools in Ojodu Local Government Area (LGA), Lagos State, Nigeria. The data were analyzed using descriptive statistics.

Results: Majority of respondents consumed rice in both the public (63.1%) and private (71.8%) schools. Those from the private schools significantly consumed more meat, fish, beans, bread, noodles and snacks; than those of their public school counterparts ($p < 0.05$). Majority of respondents in both public 50(48.5%) and private 46(44.7%) schools only consumed milk occasionally ($p > 0.05$).Majority of respondents in both public 78(75.7%) and private 75(72.8%) schools ate fruits either once a week or occasionally ($p > 0.05$). Majority of respondents in the public 78(75.7%) and private 81(78.6%) schools ate vegetables either once a week or occasionally ($p > 0.05$).

Conclusion: Pupils in private primary schools consumed more protein foods than those in the public schools. However pupils in both category of schools do not consume enough milk, fruits and vegetables.

INTRODUCTION

Diet plays a big role in our health and well-being and ensuring that children eat well is one of the best ways we can take care of them.[1]A healthy diet gives us energy to get through our busy day, supports growth, boost immunity and protect us from infections and diseases.[2]An unhealthy diet results in malnutrition which is deleterious to the well-being of children; affecting physical growth and mental development.[2-3]

Malnutrition refers to disorders resulting from an inadequate (under-nutrition) or excessive (over-nutrition) nutrient intake in relation to the body requirements.[4]Malnutrition in its severe form remains a significant cause and determinant of mortality, short-term morbidity, permanent lossof productivity and intellectual capacity in societies, which cannot afford such losses and costs.[5]In children, malnutrition of whatever form increases the likelihood of mortality from a number of complications and disease entities. It is estimated that more than 800million persons are affected worldwide by malnutrition and ten children die every minute as a result of malnutrition.[6]

Under-nutrition, usually caused by inadequate intake in relation to body requirements or failure to absorb or assimilate dietary elements, is an important public health problem in Sub-Saharan Africa. [6]and the prevalence of child stunting is 34.5% while that of underweight is 24.5%.[7] High percentages of the children are underweight and suffer disease because of their poor diet and in some areas almost half of all under-fives are malnourished. Similarly in Nigeria, over 38% of children are stunted, 9% are wasted and 29% are underweight.[8]Poverty and low standard of living with inability to afford proper nutrition and health care are reported to be responsible.[8]Under-nutrition has negative consequences for children's long term overall development, constitutes an economic burden and poses a serious threat to their education; particularly where majority of school children lack the food they need.[8-9]

Over-nutrition is an unhealthy condition which results from an excessive intake of calories or particular nutrients beyond what the body requires.[10]It results in obesity which is responsible for a number of non-communicable chronic diseases and various types of cancers, the prevalence of which is rapidly increasing in developing countries.[9 21] About 16% of children age 6-11years are overweight and an additional 14.3% are also at high risk.[10]Since the long-term adverse effects of child and adult obesity

are very difficult to treat; prevention of poor eating habits and childhood obesity is now a public health priority.[9-10]

The increasing prevalence of malnutrition in school children shows an urgent need for intervention which can easily be achieved through preventive approaches. This study therefore determined the food consumption pattern of school children in Ojodu, Lagos. It is envisaged that the findings will be useful to policy makers in planning appropriate intervention programs targeting school aged children; and thereby improve their quality of life and productivity.

MATERIALS AND METHODS

The study was conducted in Ojodu, one of the 18 Local Government Areas (LGAs) of Lagos State, South-Western Nigeria. Lagos, the commercial and industrial nerve centre of Nigeria is populated by ethnic groups from various parts of the country.

Study Design

The study was a community based comparative cross-sectional survey, conducted among 8-10 year old pupils, who were in primary three to six in the selected schools.

Sample Size Determination

Assuming a 95% level of confidence, an estimated underweight of 47% among pupils in public schools and 21% among those in private schools, a statistical power of 90% and a level of significance of 5%, the formula for comparing independent proportions was used to obtain the minimum estimated sample size of 64 per study group[11]In order to compensate for improperly completed questionnaires, the calculated sample size was increased by 20%. The adjusted sample size became 80 per study group and a total of 160 respondents in all but a total of 206 pupils were eventually interviewed.

Sampling Technique

Respondents were recruited into the study by using multistage sampling technique. A complete list of all the approved primary schools in Ojodu LGA was obtained from the Ministry of Education. This was then stratified into public and private schools. Using simple random sampling method, 2 out of the 15 private and one out of the 5 public schools were chosen. Since the population of pupils in the private schools was much smaller than that of the public school, all pupils in primary 3 to 6 were selected for inclusion in the study in the private schools. The total number was one hundred and three (103). In the public school, simple random sampling (balloting) was used to select an arm from each of the class levels (3-6). This sample size (103) was shared among these chosen classes by proportionate allocation using the formula:

$$\text{Class sample size} = \frac{\text{total class size} \times 103}{\text{total no of pupils in classes 3-6}}$$

This yielded the number to be drawn from each class. Systematic random sampling was then used to draw out the number from each class

Data Collection Methods

A pre-tested, structured, interviewer administered questionnaire was applied to each respondent by previously recruited and trained research assistants. The questionnaire elicited information on respondents' socio-demographic characteristics and 24- hour dietary pattern.

Ethical Issues

Approval for the research was obtained from the Ethics and Research Committee of the Lagos University Teaching Hospital. Permission was taken from the school authorities with responsibility for the pupils. Informed consent was obtained from the parents and children. Information about participants was treated confidentially.

Data Analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 17. Continuous data such as age were summarized as means. Discrete data were summarized as proportions and presented as frequency tables. Chi-square test (or Fisher's exact test where appropriate) was used to compare proportions and a p value of < 0.05 was considered statistically significant.

RESULTS:

Table 1: Socio-demographic characteristics of respondents

Socio-demographic Characteristics	Private (n=103) Freq (%)	Public (n=103) Freq (%)	P-value
Age (years)			
8	37 (35.9)	23 (22.3)	0.04
9	35 (34.0)	34 (33.0)	
10	31 (30.1)	46 (44.7)	
MeanSD	8.9 0.81	9.2± 0.79	
Sex			
Male	45 (43.7)	62 (60.2)	0.02
Female	58 (56.3)	41(39.8)	
Ethnicity			
Yoruba	63 (61.2)	78 (75.7)	0.03
Igbo	39 (37.9)	23 (22.3)	
Hausa	1 (1.0)	2 (1.9)	
Religion			0.67
Christianity	60 (58.3)	57 (55.3)	
Islam	43 (41.7)	46 (44.7)	

Table 1: The respondents were between the ages of 8-10 years. Seventy-two (69.9%) of these from the private schools were <10 years old while 57(55.3%) of these from the public school were < 10 years (p=0.004).There were more females 58(56.3%) in the private schools, whereas there were more males 62(60.2%) in the public school (P=0.02). There were more Yorubas in the public 78(75.7%) than the private schools 63(61.2%); but more Ibos in the private 39(37.9%) than the public 23(22.3%)schools (p=0.03). Majority of respondents from both the private 60(58.3%) and public 57(55.3%) schools were Christians.

Table 2: Daily food consumption pattern of the respondents

Food items	Public *Freq (%)	Private *Freq (%)	X^2	P-value
Meat	13 (12.6)	46 (44.7)	25.87	0.001
Fish	11(10.7)	43(41.7)	25.70	0.001
Beans	10 (9.7)	23 (22.3)	6.10	0.014
Rice	65(63.1)	74 (71.8)	1.79	0.181
Bread	26 (25.2)	58 (56.3)	20.58	0.001
Eba	38 (36.9)	22 (21.4)	6.02	0.014
Egg	8 (7.8)	29 (28.1)	14.53	0.001
Noodles	13 (12.6)	43 (41.7)	22.07	0.001
Snacks	20(19.4)	45(43.7)	14.05	0.001

*There were multiple responses

Table 2: The dietary pattern of the respondents shows that majority consumed rice in both public (63.1%) and private (71.8%) schools. Respondents from private schools significantly consumed more meat 46(44.7%) vs 13(12.6%), fish 43(41.7%) vs 11(10.7%), beans 23 (22.3%) vs 10 (9.7%) and eggs 29(28.1%) vs 8 (7.8%) compared to those in the public schools. They also consumed more bread, noodles and snacks (p=0.05).

Table 3: Daily feeding frequency among respondents.

Frequency of meals	Public Freq (%)	Private Freq (%)	
Once	2 (1.9)	1 (1.0)	Fisher's p = 0.001
Twice	15 (14.6)	9 (8.7)	
Thrice	83 (80.6)	66 (64.1)	
≥Four times	3 (2.9)	27 (26.2)	
Total	103 (100.0)	103 (100.0)	

Table 3 shows the eating frequency per day among the respondents. Twenty-seven (26.2%) respondents from the private and 3 (2.9%) respondents from the public schools ate four or more times per day (p = 0.001).

Table 4: Frequency of milk consumption among the respondents

Frequency	Public Freq (%)	Private Freq (%)	Fisher's Exact P -value
Everyday	7 (6.8)	13 (12.6)	0.2576
Twice a week	28 (27.2)	33 (32.0)	
Once a week	18 (17.5)	11 (10.7)	
Occasionally	50 (48.5)	46 (44.7)	
Total	103 (103%)	103 (100.0%)	

Table 4 shows the milk consumption pattern among the respondents. Majority of the respondents in both public 50(48.5%) and private 46(44.7%) schools only consumed milk occasionally. There is no statistically significant difference in the frequency of milk consumption between respondents in both schools (p > 0.05).

Table 5: **Frequency of fruit consumption among the respondents**

Frequency	Public Freq (%)	Private Freq (%)	Fisher's Exact P - value
Fruits			
Everyday	13 (12.6)	16 (15.5)	0.1631
Twice a week	12 (11.7)	12 (11.7)	
Once a week	31 (30.1)	43 (41.7)	
Occasionally	47 (45.6)	32 (31.1)	
Total	103 (100.0%)	103 (100.0%)	

Table 5 shows the fruit consumption pattern among the respondents. Only 13(12.6%) in the public and 16(15.5%) in the private schools, ate fruits every day. Majority of respondents in the public 78(75.7%) and private 75(72.8%) schools ate fruits either once a week or occasionally (p> 0.05)

TABLE 6: Frequency of vegetable consumption among the respondents

Frequency	Public Freq (%)	Private Freq (%)	Fisher's Exact P - value
Everyday	-	- -	- 0.5693
Twice a week	25 (24.3)	22 (21.3)	
Once a week	29 (28.2)	24 (23.3)	
Occasionally	49 (47.6)	57 (55.3)	
Total	103 (100.0)	103 (100.0)	

Table 6 shows the vegetable consumption pattern among the respondents. Majority of respondents in the public 78(75.7%) and private 81(78.6%)schools ate vegetables either once a week or occasionally ($p > 0.05$).

DISCUSSION

The study set to assess the food consumption pattern among primary schools in the public and private schools in an urban city of Nigeria. The health of the children in any society is crucial to the future economic survival of that community. Children's nutritional status is an integral component and reflection of their overall health. When children have access to an adequate food supply, are not exposed to repeated illness and are well cared for, they reach their growth potential and are considered well nourished.[12] The dietary intake of the children obtained through 24 hours dietary recall were cereals (rice), legume (beans), cassava (eba), poultry product (egg), animal product (meat, fish), indomie and snacks (biscuit, sweet, gala, cake). Previous study however reported that the dietary intakes of children in the western part of Nigeria were mainly traditional foods, such as cassava products (gari, fufu and lafun), yam products (pounded yam and amala), legume products (cooked beans, akara and moimoi) and cereal (rice, eko and bread); while others were fruits/vegetables and animal based food.[13]In both private and public schools, rice seems to be the most preferred (71.8% and 63.), which was higher compared to (23.8%) reported in a study carried out in Uyo,[14] this was followed by bread (56.3%).

Among children in the public school, Rice consumption also has the highest percentage (63.1%) which was closer to (60.4%) reported in past study, Food rich in proteins such as Beans, eggs, fish, meat were reported almost thrice consumed in private schools compared to public school.

Most of the pupils in well-established private schools are from families with good socioeconomic status in most parts of Nigeria. The parents of such pupils can easily afford the cost of protein rich diets which are higher than most carbohydrate rich diets.

It is possible that in view of the low socio-economic status of the children's parents, many cannot afford to buy meat as the public school is assumed to be patronized by the urban poor, such scenario could impact on the children's nutritional status. Indomie, a luxurious nodule food was reported to have been consumed about thrice more in private schools compared to public schools which is inconsonance with previous studies. [14] Previous studies have also reported high consumption carbohydrate diet devoid of proteins, vitamins, minerals by school pupils especially in public schools who are always in the majority.[15]

According to a study carried out by Lin et al, snacks provided a total of 32% of the total daily energy, higher in fat, saturated fat, and sodium and lower in fiber, iron, and calcium.[33] In this study, the proportion of children in private school that mentioned snack was 43.7% , though not as high as 80% of children that reported eating snacks during the National nutrition survey 2005.[11] This is corroborated with the observation of Nielson et al, of an increase in the consumption of salty snacks, candy, and soft drink in the past three decade, which has led to an increase in the prevalence of Overweight in children, especially in the private school as seen in this study. [16]

As reported by the children, majority of the pupils in both groups of schools ate thrice daily which is in agreement with a study conducted among the Sudanese where most pupils were fed thrice daily.[17] However about a quarter of pupils were reported eating four times per day as against less than 2% in public schools.

Consistent with a study carried out to determine the food consumption pattern among household in Oyo-State, Nigeria where it was reported that the children consumed very low fruits and vegetables,[14] the children in this study also consumed low fruits and vegetables. A higher proportion of children in public school reported consuming fruit (45.6%) and vegetable (47.6%) occasionally. Among children in private, 31.1% and 55.3% respectively consumed fruits and vegetable occasionally.

The immunity of children is further boosted through increased consumption of fruits and vegetables prompting higher levels of circulatory antibodies. This enhances the defence mechanisms of such children against common infectious diseases prevalent in the communities. Less than half of respond nets from both groups of schools reported consumption of fruits and vegetables. This could be due to ignorance about the importance of the roles these food items by play in the human bodies both by the parents/care givers of the pupils as well as the respondents themselves.

It is interesting to observe that 55.3% of children in private school take beverage everyday in a week while less children (19.4%) reported taking beverage occasionally.

This study had far higher percentage of children from

private school consuming beverage compare to the study carried out in Uyo where 6.4% was reported.[14] However in the public school, 22.3% reported taking beverage everyday with a higher percentage (43.7%) taking it occasionally. Consumption of highly processed food such as beverage, noodles, among children enrolled in public schools, but more especially among children in private schools sometimes constituting the three main meal in the 24 hour dietary recall has also been reported in past study.[14]

CONCLUSION AND RECOMMENDATION

This study showed that the dietary intake of the respondents was mainly carbohydrate based food, constituting the three main meals in the 24 hour dietary recall of the majority of the respondents in public schools.. There was a lower consumption of protein-based foods such as egg, meat, milk and fish especially among respondents in public school. Fruits and vegetable consumption was low in both the public and private primary schools.

Implication of the study for clinical practice and policy makers

The study has addressed an area of clinical practice that bothers on the nutrition of children. Poor nutrition exposes children to various opportunistic infections because of low body immunity. The respondents need to improve on their feeding pattern to build up strong immunity against some diseases prevalent in most developing countries like kwashiorkor, anaemia etc. From this study, policy makers are encouraged to adopt quality school feeding programmes that will enhance the nutritional status of children in their respective schools.

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