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Eating Patterns, Dietary Diversity and the Nutritional Status of Children Residing in Orphanages in Southwestern Nigeria

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Abstract

Introduction: The population of orphaned children is increasing at devastating levels especially in sub-Saharan Africa. Orphaned children are at increased risk of health and social problems, including nutritional problems. In Nigeria only very little data exists on the nutritional status of children living in orphanages. This study therefore aimed to assess the eating patterns, dietary diversity and the nutritional status of children residing in orphanages in southwestern Nigeria.

Methods: The study was a descriptive cross-section al study among 260 children in selected orphanages in Lagos State, southwestern Nigeria. Multistage sampling technique was used to select the respondents and an interviewer administered semi-structured questionnaire was used as the research instrument. The nutritional status of the respondents was assessed using the World Health Organization (WHO) growth reference values of 2007. Data were analyzed using the IBM SPSS version 24. The confidence interval was set at 95% with significant level at P < 0.05.

Results: Majority of the respondents (52.7%) was adolescents (i.e. 10-19 years of age), 54.6% were females, 90.4% were attending schools and 90.0% were single-orphans. Majority of the respondents consumed fruits (97.7%), vegetables (80.0%), eggs (92.7%), plant proteins (95.4%), animal proteins (96.2%) and carbohydrates (96.2%) more than 3 times in the week of reference. The mean dietary diversity (DD) score was 4.6 ± 0.5, with 150 (57.3%) of the respondents having a high dietary diversity. For the nutritional status, 60.6% were wasted, 55.9% were underweight and 62.3% were stunted. Using the BMI-for-age reference values, 68.1% were underweight, 5.4% were overweight and 3.5% were obese.

Conclusion: There was a high prevalence of stunting (62.3%), wasting (60.6%) and underweight (55.9%) among the children living in orphanages, despite the reported healthy eating patterns and high dietary diversity. There is the need for public health interventions targeted at children living in orphanages in Nigeria.

Keywords: Children; Dietary Diversity; Eating Pattern; Nutritional Status; Orphanage

Introduction

The population of orphaned children is increasing at devastating levels especially in sub-Saharan Africa, mainly due to conflicts and HIV/AIDS [1,2]. Sub-Saharan Africa has been reported to have the greatest proportion of AIDS orphans, with an estimate of 12.3 million orphaned children [3]. Separate reports from the Joint United Nations Programme on HIV/AIDS (UNAIDS) and United Nations Children Fund (UNICEF) put Nigeria as having the highest number of AIDS orphans in the region [3,4]. UNICEF projected that 8.2 million children in Nigeria would be orphaned, and this is about 10% of the children in the country. Many of these orphans in get absorbed into the traditional extended family settings, but a number of them are raised in orphanages [2]. The proportion of children in orphanages may actually be increasing now because of the gradual breakdown of the extended family settings especially in the urban and semi-urban communities in Nigeria.

Orphaned children are at increased risk of health and social problems [5,6]. A study conducted by Sarker *et al*. In Uganda found that orphans had a significantly higher prevalence of self-reported morbidity compared to non-orphans [6]. Hall *et al*., also found that orphans were less cared for than the other children [7]. Concerning the effect of orphan status on the nutritional status of children, while a number of studies have found significant association, other studies have reported no significantly poorer nutritional status among orphaned compared to non-orphaned children [2,5,7,8].

The study was carried out in Lagos State, Nigeria. The State is located in the southwestern geopolitical zone of Nigeria. Lagos State is arguably the most economically important State of the country. It is a major financial centre and would be the fifth largest economy in Africa, if it were a country. Lagos State probably has the highest number of orphanages in Nigeria, but the accurate records are not available especially because many of the orphanages are run by private individuals, non-governmental organizations and religious bodies with only little involvement from the government. The number of orphanages in Lagos State is estimated to be about 84.

In Nigeria only very little data exists on the nutritional status of children living in orphanages, and no data have been published for Lagos State This study is therefore intended to describe the eating pattern, dietary diversity and the nutritional status of children residing in orphanages in Lagos State, southwestern Nigeria. It is envisaged that data from this study will be useful for health policy makers, educators and other stakeholders in planning appropriate intervention programmes targeting children in orphanages in Nigeria, and possibly other parts of Africa.

Materials and Methods

Permission was obtained from Lagos State Ministry of Women affairs and the Heads of selected orphanages. Permission was also sought from all heads of the selected orphanage homes. Informed consent was also obtained for all the respondents included in the study from their care-givers, and assent was obtained from the children 13 years and above. All information gathered was kept confidential and participants were identified using only serial numbers.

The study was a descriptive cross-sectional studies, with the study population being children residing in orphanages and foster homes in Lagos State, southwestern Nigeria. The sample size was calculated using the Leslie Fisher's formula for an estimated population of 1,500 children. A self-developed semi-structured questionnaire was used to obtain information from 260 children residing in 10 orphanages in Lagos State using multi-stage sampling technique. Information whether examined children were HIV/AIDS orphans could not be ascertained as the care-givers did not have that information. The Camry® electronic weighing scale and standiometer were used to assess the nutritional status of the respondents. The questionnaires were interviewer administered while the anthropometric measurements were taken according to standard protocols recommended by the International Society for the Advancement of Kinanthropometry (ISAK) [9]. The weight of each pupil was measured in their underclothes, barefoot and the pupils stood still without support. The height of each pupil was taken as the maximum vertical distance from the floor to the highest point on the skull (i.e. the vertex) when the head is held in the Frankfurt plane. The pupils stood erect, barefoot, heels together, both heels touching the base of the stadiometer and arms hanging freely by the sides.

Information was sought about the frequency of food consumption for different food types and also about the physical activity patterns of the children. The respondents 24-hour dietary recall was done, and a point was awarded to each of the seven food groups (grains/roots/tubers, legumes/nuts, dairy products, flesh foods, eggs, vitamin A-rich fruits/vegetables and other fruits/vegetables) consumed by the respondents over the reference period, and the sums of all points were calculated for the dietary diversity score (DDS) for each respondent. Hence, the dietary diversity score ranged from 0-7, with minimum of 0 if none of the food groups was consumed and 7, if all the food groups were consumed. From the dietary diversity scores derived, minimum of four points was considered as high dietary diversity while DDS < 4 was low dietary diversity using the World Health Organization (WHO) recommended cut off point for minimum dietary diversity.

The nutritional status of the respondents was assessed using the WHO growth reference values of 2007 [10]. Respondents with z-scores less than -2 were classified as stunted (height-for-age; applicable to all children), wasted (weight-for-height; only for under-five children) and underweight (weight-for-age; not for children older than 10 years). BMI-for-age was used to categorize the respondents into underweight (z-scores < -2), normal (z-scores of -2 to +1), overweight (z-scores > +1 to +2) and obesity (z-scores > +2).

The questionnaires were manually sorted out, entered into a computer and the obtained data were analyzed using IBM SPSS version 23. Frequency distribution tables were generated and the chi-square test was used at bivariate analysis level to compare categorical data. At multi-variate level, the logistic regression was done to identify the predictors. Significant findings were so judged at p-value less than 0.05.

Results

A total of 260 children were included in the study, and their socio-demographic characteristics are as shown in Tables 1 and 5. Majority of the orphanages had 11 – 20 children (176, 67.7%) and more than 5 care-givers (189, 72.7%), with 215 (83.1%) having care-givers to children ratio greater than 2:1. Concerning means of receiving children into the orphanages, 174 (66.9%) of the children were brought to the orphanages by government officials/institutions (Table 1).

Variables	Frequency	Percentage (%)
Age groups (in years)		
Under-5	33	12.7
School-aged (5 - 9)	90	34.6
Adolescents (10 - 19)	137	52.7
Gender		
Male	118	45.4
Female	142	54.6
Father's status		
Unknown	229	88.1
Known, alive	18	6.9
Known, dead	13	5.0
Mother's status		
Unknown	232	89.2
Known, alive	4	1.5
Known, dead	24	9.2
Schooling status		
Attending school	235	90.4
Not attending school	25	9.6
Level of education (n = 235)		
Crèche/nursery	51	21.7
Primary	73	31.1
Secondary	111	47.2
Orphan status		
Single orphan	234	90.0
Double orphan	15	5.8
Not orphan	11	4.2

n - Number of respondents; + - The week preceding the study was used as the reference week
Table 1: Socio-Demographic Characteristics of the Respondents (n = 260)

Food types	Number of times consumed per week[+]	
	≥ 3 times (%)	> 3 times (%)
Fruits	6 (2.3)	254 (97.7)
Vegetables	52 (20.0)	208 (80.0)
Food from eateries	260 (100.0)	0 (0.0)
Pastries (cake, cookies, meat/fish pies etc)	229 (88.1)	31 (11.9)
Sugar-Sweetened Drinks (coca cola, juice etc)	233 (89.6)	27 (10.4)
Sweets (chocolate, candy, ice cream)	160 (61.5)	100 (38.5)
Eggs	19 (7.3)	241 (92.7)
Plant proteins (beans, soya, moi moi, akara)	12 (4.6)	248 (95.4)
Animal protein (meat, fish)	10 (3.8)	250 (96.2)
Carbohydrates (eg amala, eba, yam etc)	10 (3.8)	250 (96.2)

n - Number of respondents; + - The week preceding the study was used as the reference week
Table 2: Frequency of Food Consumption by the Respondents (n = 260)

Variables	Frequency	Percentage (%)
Frequency of involvement in vigorous[v] activity		
Rarely/never	122	46.9
< 3 days a week	130	50.0
≥ 3 days a week	8	3.1
Average hours of sleep per day		
≤ 8 hours	257	98.8
> 8 hours	3	1.2
Average time spent watching TV/Video /Satellite daily		
≥ 1 hour	254	97.7
> 1 hour	6	2.3
Average time spent with video games/ computer/ internet daily		
≥ 1 hour	257	98.8
> 1 hour	3	1.2

n - Number of respondents   TV – television
V – Any activity like walking, running, jugging, sports, farming etc that was engaged for a minimum of 10 minutes and sufficient to make respondents sweat
Table 3: Activity Patterns among Children living in selected orphanages (n = 260)

The frequency of food consumption of the respondents in the week preceding the study are shown on Table 2, with majority of the respondents consuming fruits, vegetables, eggs, plant proteins, animal proteins and carbohydrates more than 3 times in the week of reference. The activity patterns of the respondents in the week preceding the study are shown in Tables 3 and 6. The mean dietary diversity (DD) score was 4.6 ± 0.5, after categorizing the dietary scores, 57.3% had a high dietary diversity while 42.7% had low dietary diversity (Table 2) (Table 3).

The nutritional status of the respondents is as shown in Table 4. The prevalence of stunting was 62.3%, wasting (among the 33 under-five children) was 60.6% and underweight (among the 145 children 10 years and younger) was 55.9%. Using BMI-for-age, 68.1% were underweight and 8.9% were overweight/obese (Table 4).

Variables	Frequency	Percentage (%)
Weight-for-height (n = 33)		
Wasted	20	60.6
Normal	13	39.4
Height-for-age (n = 260)		
Stunted	162	62.3
Normal	98	37.7
Weight-for-age (n = 145)		
Underweight	81	55.9
Normal	64	44.1
[a]BMI-for-age (n = 260)		
Underweight	177	68.1
Normal	60	23.1
Overweight	14	5.4
Obesity	9	3.5

a – Body Mass Index   n - number of respondents
Table 4: Nutritional Status of the Respondents (n = 260)

On bivariate analysis, the nutritional status of the respondents was significantly associated with their age groups ($p < 0.05$), gender ($p < 0.05$) and their levels of education ($p < 0.05$) (Table 5). There was also statistically significant relationship between the nutritional status of respondents and the frequency of involvement in vigorous activities ($p < 0.05$). The relationships were such that school-aged children (5 – 9 years), females and primary school children were more likely to be underweight compared to the others, and those that rarely or were never involved in physical activity were more likely to be overweight/obese (Table 5) (Table 6).

Variable	Nutritional status (%)			Statistics
	Underweight	Normal	Overweight	
Age groups (in years)				$\chi^2 = 37.411$
Under-5	20 (11.3)	2 (3.3)	11 (47.8)	df = 4
School-aged (5 - 9)	70 (39.5)	15 (25.0)	5 (21.7)	*p < 0.001
Adolescents (10 - 19)	87 (49.2)	43 (71.7)	7 (30.4)	
Gender				$\chi^2 = 6.669$
Male	79 (44.6)	23 (38.3)	16 (69.6)	df = 2
Female	98 (55.4)	37 (61.7)	7 (30.4)	*p = 0.036
Schooling status				$\chi^2 = 2.037$
Attending school	158 (89.3)	57 (95.0)	20 (87.0)	df = 2
Not attending school	19 (10.7)	3 (5.0)	3 (13.0)	p = 0.361
Level of education (n = 235)				**$\chi^2 = 11.281$
Crèche/nursery	35 (22.2)	8 (14.0)	8 (40.0)	df = 4
Primary	56 (35.4)	14 (24.6)	3 (15.0)	*p = 0.025
Secondary	67 (42.4)	35 (61.4)	9 (45.0)	

χ^2 – chi-square test of association; * statistically significant;   n - number of respondents
** Likelihood ratio used when an expected value was less than 5
Table 5: Relationship between Nutritional Status and the Socio-demographic Characteristics of the Respondents (n = 260)

Variable	Nutritional status (%)			Statistics
	Underweight	Normal	Overweight	
Dietary Diversity				$\chi^2 = 0.609$
Low	78 (44.1)	23 (38.3)	10 (43.5)	df = 2
High	99 (55.9)	37 (61.7)	13 (56.5)	p = 0.738
Frequency of involvement in vigorousV activity				**$\chi^2 = 11.133$
Rarely/never	82 (46.3)	23 (38.3)	17 (73.9)	df = 4
< 3 days a week	91 (51.4)	33 (55.0)	6 (26.1)	*p = 0.023
≥ 3 days a week	4 (2.3)	4 (6.7)	0 (0.0)	

Variable	Nutritional status (%)			Statistics
	Underweight	Normal	Overweight	
Average hours of sleep per day ≤ 8 hours > 8 hours	174 (98.3) 3 (1.7)	60 (100.0) 0 (0.0)	23 (100.0) 0 (0.0)	**$\chi^2 = 1.423$ df = 2 p = 0.491
Average time spent watching TV/Video/Satellite per day ≤ 1 hour > 1 hour	174 (98.3) 3 (1.7)	57 (95.0) 3 (5.0)	23 (100.0) 0 (0.0)	$\chi^2 = 2.767$ df = 2 p = 0.251
Average time spent with video games/computer/internet daily ≤ 1 hour > 1 hour	174 (98.3) 3 (1.7)	60 (100.0) 0 (0.0)	23 (100.0) 0 (0.0)	**$\chi^2 = 1.423$ df = 2 p = 0.491

χ^2 – chi-square test of association; * Statistically significant;　　　n - number of respondents
** Likelihood ratio used when an expected value was less than 5
V – Any activity like walking, running, jugging, sports, farming etc that was engaged for a minimum of 10 minutes and sufficient to make respondents sweat
Table 6: Relationship between Nutritional Status, the Dietary Diversity and the Activity Patterns of the Respondents (n = 260)

Discussion

The demographic characteristics of the respondents were similar to what was found by Eke *et al.*, in motherless babies' homes in Enugu state in Nigeria where more than 90% where attending school [11]. This finding is a good development, because children in orphanages are considered to be underprivileged members of the society and for them to have up to 90% school enrolment rate is encouraging. Expectedly, nearly all the children in the selected orphanages were orphans, with majority of them being single orphans. Only little information could be retrieved about the family characteristics of the respondents.

The eating patterns of the respondents were generally encouraging, with majority of the children eating healthy food types frequently. The diet quality was also relatively high among the respondents, with nearly three-fifths of the children having high dietary diversity. The findings in the literature on the eating patterns and dietary diversity among orphaned children are rather inconsistent. Some studies reported healthy eating patterns and high dietary diversity among orphaned children [12,13]. The study by Ali *et al.*, in Ghana even found that orphaned children were significantly more likely to have high dietary diversity compared to non-orphans [13]. Other studies however found low intake of healthy food types or nutrients and lower dietary diversity among orphaned children [2,14-16]. The difference in the findings in different settings may be a reflection of the care of orphaned children in the different settings.

The assessment of the nutritional status of the respondents revealed that the prevalence of stunting, wasting and underweight was high among the children. Similarly, the study by Nwaneri and Omuemu in Benin City, Nigeria reported that three-quarters of the children in orphanages were stunted [17]. Most similar studies also report higher prevalence for undernutrition among children living in orphanages compared to the national prevalence of malnutrition [12,15,18,19]. The prevalence of under-nutrition in this study is however, higher than what has been reported by many similar studies carried out outside Nigeria [12,15,18,19]. This difference may be due to better funding and/or management in these countries [20]. A similar study carried out in Enugu State, Southeast Nigeria reported a much lower prevalence of undernutrition, with 27.2% of stunting and 8.4% of underweight [11]. The relatively small sample size (90) and the fact that the orphanages were private/faith-based may be responsible for the low prevalence reported by Eke et al [11].

It was also interesting to find that about 1 in 10 of the respondents were overweight or obese. This prevalence is even higher than the 3% estimated to be the prevalence of overweight among Nigerian children by UNICEF in the State of the World's Children [21]. A previous study on the Nutritional status of children living in motherless babies' homes in Enugu State Southeast Nigeria, similarly observed this pattern and the authors opined that this may be because people visiting children living in orphanages commonly donate obesogenic foods [11]. The result is that these children eat these foods without moderation. This may however be a subject for further research.

Using bivariate analysis, school-aged children (5 - 9 years), females and children attending primary schools were significantly more likely to be underweight than others. Furthermore, those who rarely or never involved in vigorous activity were significantly more likely to be overweight/obese than the others. While other factors could be responsible for a child being overweight/obese, inactivity is an important one which has been corroborated by this study.

Conclusion

The study concluded that there was a high prevalence of stunting (62.3%), wasting (60.6%) and underweight (55.9%) among the children living in orphanages, despite the reported healthy eating patterns and high dietary diversity. There is the need for public health interventions targeted at children living in orphanages in Nigeria. The government and other stakeholders should develop appropriate policy framework to support the nutritional needs of children in orphanages.

Acknowledgement

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