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Research Article

Food Environment and Nutritional Status of Children Living in Orphanage Homes in Ogun State, Southwest Nigeria

Ajuzie N. C.¹, Ani I. F.², Idemudia, S.O.³, Ewumi O. A.⁴

^{1,2,4} *Department of Nutrition and Dietetics, Babcock University, Ilishan-remo, Ogun State, Nigeria.*

³ *Department of Human Nutrition and Dietetics, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria*

ABSTRACT

Children living in orphanage homes world-wide often present with nutritional deficiencies. This can be attributed to lack of proper food environment which encompasses the availability, accessibility and affordability of food. This study examined the food environment and nutritional status of children living in orphanage homes in Ogun State. The study was a descriptive cross-sectional survey that adopted the survey research method with 200 children both males and females aged between 5-11 years were randomly selected from 4 Orphanage homes in Ogun State. Among the children surveyed, 3.2%, 10%, 0.5%, 3.5% were normal nutritional status wasted, stunted, underweight, and overweight respectively. There were more girls stunted and wasted than boys, more boys were underweight than girls and more girls were overweight than boys. This study showed that food is affordable, accessible, and available in the orphanage homes and the food environment does not affect the nutritional status of the children living in orphanage homes in Ogun State. In this study, high prevalence of malnutrition was observed among children between 5 to 7 years old. The findings of this study showed that prevalence of malnutrition among children living in orphanage homes in Ogun State is low.

Keywords: *Food Environment, Nutrition, Malnutrition, Orphanage Homes, Children*

*Author for correspondence: Email: ajuzienn@babcock.edu.ng; Tel: +234-8063511132

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INTRODUCTION

Food environment is the physical, social, economic, cultural, and political factors that impact the accessibility, availability, and adequacy of food within a society or region (Turner *et al.*, 2017; Shauna *et al.*, 2020). It is also related to food security in the sense that it encompasses three main concepts: availability, accessibility and utilization (Kuku-Shittu *et al.*, 2016). The food environment in markets constrains and signals consumers on what to purchase (Mekonnen *et al.* 2021). Food environments may be defined in terms of geographic access to food in a community or neighborhood, consumer experiences inside food outlets, services and infrastructure in institutional settings, or the information available about food. The food environment has been shown to influence food choices and dietary patterns (Glanz *et al.*; 2009; Chen and Antonelli, 2020).

Malnutrition by definition is all deviations from adequate nutrition. According to World Health Organization (WHO, 2021) malnutrition, in all its forms, includes under nutrition (low weight for height, low height for age, and low weight for age), insufficient vitamins or minerals, overweight, obesity, and resulting diet-related non-communicable diseases. It still remains a major source of concern in development (De Onis

et al., 2010). The cost of malnutrition can be serious in infants and children. Present research findings including follow up of involvement trials indicate that chronic malnutrition can have a long-term negative effect on various aspects of child development (Dewey and Begum, 2011; De Sanctis *et al.* 2021). There is growing facts of the link between childhood under-nutrition and chronic diseases in adulthood (De Onis *et al.*, 2010).

According to UNICEF (the United Nations Children's Emergency Fund), there are roughly 153 million orphans worldwide. The most recent estimate shows there are approximately 140 million orphans in the world (CAFO, 2018). For this number, an orphan is defined as a child who has lost one or both parents. Children living in orphanage homes world-wide often present with nutritional deficiencies (Orphans Nutrition, 2015: Fatma *et al.* 2019). The orphan problem is rampant in Asia and Africa (OHI, 2015; Dorcas and Pius, 2018; Militao *et al.*, 2022). Several orphanage homes have been established in different parts of the country by charitable organizations and people to help reduce the suffering and death due to malnutrition especially of children who are separated abruptly from their parents by death or abandonment. Situations with orphanage homes statistics is

even direr, as the government itself does not know for sure how many orphanage homes operate within the country (Falae, 2018). Some problems associated with orphanage homes in Nigeria are; lack of staffs, overpopulation, and illegal orphanage homes, etc. Orphans face enormous challenges to their health and development and it is estimated that 95% do not receive any type of medical, emotional, social, material, or school-related support (NPC, 2013). It was revealed in a cross-sectional study of 2015 that more than a quarter of orphans and vulnerable children in Nigeria showed symptoms of mild to moderate malnutrition. In addition, close to 70% experienced household food insecurity, putting them at risk for malnutrition (Tagurum et al., 2015). Nutrition is openly or in some way associated to the seventeen Sustainable Development Goals (SDG) (NPC, 2014), also it is vital in the overall enlargement of individuals and the entire nation. SDG aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

The burden of malnutrition commonly occurs within the African and Asian countries of the world. The prevalence of underweight among under-five children was 19.9%, just at the margin of the 20% that it has been since 2014. The prevalence of stunting was 32% and has remained the largest burden of malnutrition with stagnated rates of above 30% since 2014. The overweight prevalence at 1.2 has remained below the 7% threshold in all 37 domains. Overall, only 64% of children in Nigeria are growing healthily without being stunted or wasted (NNHS 2018)..

MATERIALS AND METHODS

Study population: All children aged between 5 to 11years living in orphanage homes and their caregivers.

Study Design: The study was a descriptive cross-sectional. Convenient sampling technique was used to select orphanage homes within Ogun State. Information from the orphanages' records was used and simple random sampling method was applied to get the required number of orphans and their caregivers. The caregiver of the sampled orphans was automatically included in the study.

The sample size was obtained using the Taro Yamane formula; Yamane (1967). A total of 200 children in the orphanage homes in Ogun State were taken from the different homes.

Method of data collection: Data was collected using interviewed administered questionnaires for the child and the caregivers. Personal and socio-demography data, perceived food environment questions, 24 hours dietary recall, and anthropometric data of the child were collected. Anthropometric Measurement such as weight of the respondent was taken using Digital Weight Scale and height was measured using a Height Meter. This was used to calculate their Body Mass Index (BMI). Perceived food environment questionnaire was used to collect information on perceived food environment and 24 hour dietary recall questionnaire: was used to collect information on the specific food intakes and usual portion sizes after due informed consent.

Data Analysis: Data was analyzed using statistical package for social science (SPSS) software program version 20.0. Data on anthropometric measurement (Age, Height and Weight) was analyzed on the WHO Anthro-plus software to determine the weight for height, weight for age, height for age and this will be compared with the WHO child growth standards 2006. Descriptive statistics was used to analyze the food environment data and the information on usual portion sizes reported on the 24 hour dietary recall questionnaire was converted into weight of food in grams and analyzed for adequacy in nutrient intake using the Adapted Total Dietary Assessment (TDA 1.0.4) software.

Table 1:
Socio-Demographics Characteristics of the Respondents (Children)

Characteristics	Variables	Frequency (F)	Percentage %
Sex	Male	86	43.0
	Female	114	57.0
	Total	200	100
Age	5-7	73	36.5
	8-9	78	39
	10-11	49	24.5
	Total	200	100
Ethnic Group	Yoruba	150	75.0
	Igbo	37	18.5
	Hausa	13	6.5
	Total	200	100
Religion	Christianity	179	89.5
	Islam	21	10.5
	Traditional	--	--
	Total	200	100
Class	Pry 1	29	14.5
	Pry 2	17	8.5
	Pry 3	35	17.5
	Pry 4	47	23.5
	Pry 5	42	21.0
	Pry 6	9	4.5
	JSS	21	10.5
	Total	200	100
Sex	Male	3	12.5
	Female	21	87.5
	Total	24	100
Age	Below 20	2	8.3
	21-40	15	62.5
	41-60	5	20.8
	Above 60	2	8.3
	Total	24	100
Marital Status	Single	2	8.3
	Married	17	70.8
	Divorced	--	--
	Widow	5	20.8
	Total	24	100
Ethnic Group	Yoruba	17	70.8
	Igbo	7	29.2
	Hausa	--	--
	Total	24	100
Religion	Christianity	24	100
	Islam	--	--
	Traditional	--	--
	Total	24	100

Ethical Clearance: Permission to carry out the study was obtained from Babcock University Health Research Ethics Committee (BUHREC). Informed consent was sought from the heads of the orphanage homes and confidentiality was assured.

RESULTS

Table 1 shows the socio-demographic characteristics of the respondents (both the children and caregiver). 57% of the study populations were females while 43% were males. Majority of the respondent (children) (39%) were between 8-9years, 36.5% were 5-7years and 24.5% were 10-11years. The respondents (children) were more from the Yoruba ethnic group (75%) than Igbo (18.5%) and Hausa (6.5%) ethnic groups. Majority of the respondents are Christians (89.5%) and 10.5% were Muslims.

Table 2: Nutritional Status of the Respondents

Characteristics	Variable	Frequency	Percentage
Height for Age	Normal	180	90
	Mild	19	9.5
	Moderate	1	0.5
	Total	200	100
BMI for Age	Underweight	1	0.5
	Normal	192	96.0
	Overweight	7	3.5
	Total	200	100

Table 3: Nutrient Intake of the Respondent by Sex

	Male		Female		Total	
	F	%	F	%	F	%
Energy (kcal)						
Inadequate	23	11.5	13	6.5	36	18
Adequate	46	23	96	48	142	71
Excess	17	8.5	5	2.5	22	11
Carbohydrate (g)						
Inadequate	10	5	18	9	28	14
Adequate	72	36	95	47.5	167	83.5
Excess	4	2	1	0.5	5	2.5
Protein (g)						
Inadequate	18	9	27	13.5	45	22.5
Adequate	55	27.5	59	29.5	114	57
Excess	13	6.5	28	14	41	20.5
Fats (g)						
Inadequate	12	6	10	5	22	11
Adequate	58	29	95	47.5	153	76.5
Excess	4	2	9	4.5	13	6.5
Iron (mg)						
Inadequate	12	6	15	7.5	27	13.5
Adequate	60	30	85	42.5	145	72.5
Excess	14	7	14	7	28	14
Vitamin A(mcg)						
Inadequate	18	9	17	8.5	35	17.5
Adequate	49	24.5	65	32.5	114	57
Excess	19	9.5	32	16	51	25.5
Vitamin C(mg)						
Inadequate	8	4	13	6.5	21	10.5
Adequate	67	33.5	92	46	159	79.5
Excess	11	5.5	9	4.5	20	10

A total of 24 respondents (caregivers) were subjected to this study with a female predominance (87.5%) and 12.5% male in which majority of them were aged between 21-40years, this accounted for 62.5% of the total population while the remaining 37.5% was unevenly distributed between below 20years (8.3%), 41-60years (20.8%) and above 60years (8.3%). Most of the respondents (caregiver) were married (70.8%) while the remaining 29.2% was distributed between single (8.3%, and widow (20.8) with no divorced. Majority of the respondents (70.8%) were Yoruba while the remaining 29.2% were Igbo and no respondent was Hausa. All the respondents were Christians with 100%.

Table 2 shows the nutritional status of the respondent using the WHO Anthro Plus. Majority of the respondents had normal height for age (90%) while the remaining 10% was unevenly distributed between mild (9.5%) and moderate (0.5). Majority of the respondents (96.0%) had normal BMI for age and the remaining 4% was unevenly distributed between underweight (0.5) and overweight (3.5%).

Table 3 showed the nutrient intake of respondents by sex. Majority of the respondents had adequate energy intake (71%) while 18% are inadequate and 11.0% had excess energy, majority of respondents adequate Carbohydrate intake while 14% had inadequate and 2.5% had excess carbohydrate intake. For Protein, 57.0% were adequate, 22.5% inadequate while 20.5 were excess. 76% of the respondent had adequate intake of Fat while 11.5% inadequate and 6.8 excess. For Iron 72.5% were adequate, 13.5% inadequate while 14.0 were excess, Vitamin A 57.0% were adequate, 17.5% inadequate while 25.5 were excess, Vitamin C 79.5% were adequate, 10.5% inadequate while 10% were excess.

Table 4 shows the perceived food of the respondents (children). Majority (54%) of the respondents (children) agreed that the quantity of healthy foods offered by the orphanage home is sufficient while 57% agreed that the variety of healthy foods offered by the orphanage home is sufficient and 51.5% agreed that the quality of healthy foods offered by the orphanage home is acceptable. Majority (52.5%) of the respondents agreed that I have easy access to healthy foods in the orphanage home, 56.5% of the respondents agreed that healthy foods are always available in the orphanage home, 43.5% of the respondents agreed that the information in the media about food and nutrition positively influences their diet, 51.5% of the respondents neither agrees nor disagree that fast-food restaurants are easily accessible from my orphanage home.

Table 5 shows the perceived food environment of the respondent (caregiver). Majority (62.5%) of the respondents agreed that the cost of healthy foods offered by my main food retailer is affordable while 58.3% of the respondents agreed that I have easy access to a food retailer with a good variety of foods near the orphanage home and 70.8% of the respondents agreed possessing the necessary equipment in order to integrate healthy foods to the meals served in the orphanage home, 58.3% of all the respondents takes 15-20 minutes from the orphanage home to your main food retailer by car. Majority 41.7% agrees that it takes more than 30mins from the orphanage home to your main food retailer on foot.

Table 4:
Perceived Food Environment of the Respondent (Children)

Characteristics	Variables	f	(%)
I consider that the quantity of healthy;	Strongly Agree	70	35.0
	Agree	108	54
	Neither agree or disagree	20	10.0
	Strongly disagree	2	1.0
	Disagree	--	--
Total		200	100
I consider that the variety of healthy;	Strongly Agree	57	28.5
	Agree	114	57.0
	Neither agree or disagree	24	12.0
	Strongly disagree	3	1.5
	Disagree	2	1.0
Total		200	100
I consider that the quality of healthy	Strongly Agree	53	26.5
	Agree	103	51.5
	Neither agree or disagree	37	18.5
	Strongly disagree	--	--
	Disagree	7	3.5
Total		200	100
I consider that I have easy access to healthy	Strongly Agree	50	25.0
	Agree	105	52.5
	Neither agree or disagree	38	19.0
	Strongly disagree	5	2.5
	Disagree	2	1.0
Total		200	100
I consider that healthy food are available	Strongly Agree	48	24
	Agree	113	56.5
	Neither agree or disagree	32	16.0
	Strongly disagree	4	2.0
	Disagree	3	1.5
Total		200	100
I consider that the information in the media	Strongly Agree	66	33.0
	Agree	87	43.5
	Neither agree or disagree	37	18.5
	Strongly disagree	2	1.0
	Disagree	8	4.0
Total		200	100
I consider that fast-food are easily accessible	Strongly Agree	1	0.5
	Agree	45	22.5
	Neither agree or disagree	103	51.5
	Strongly disagree	16	8.0
	Disagree	35	17.5
Total		200	100
I consider that I have easy access to junks	Strongly Agree	1	0.5
	Agree	40	20.0
	Neither agree or disagree	97	48.5
	Strongly disagree	16	8.0
	Disagree	46	23.0
Total		200	100

DISCUSSION

Malnutrition continues to be a serious public health and development concern not only in developing countries but also in the world (Gabbad & Hossain, 2014; Dukhi, 2020). The study found out that prevalence of malnutrition to be low because over 90% among the respondent had normal nutritional status and this indicates that the food environment

is proper which is not in line with the finding in India (Shukla & Shukla, 2011), where more than half of the children living in orphanages were malnourished, irrespective of their age and gender. However, the result of the present study is in line with the findings of other studies (Vaida, 2013; Braitstein et al., 2013; Sadik, 2010) who found that the majority of the participants had normal nutritional status and that there was no clear relationship between the nutritional status of the children and the food environment.

Table 5:
Perceived Food Environment of the Respondents (Caregiver)

Characteristics	Variable	f	%
I consider that cost of food is affordable	Strongly Agree	6	25
	Agree	15	62.5
	Neither agree or disagree	--	--
	Strongly disagree	--	--
	Disagree	3	12
Total		24	100
I consider that I have easy access to variety foods	Strongly Agree	5	20.8
	Agree	14	58.3
	Neither agree or disagree	4	16.7
	Strongly disagree	--	--
	Disagree	1	4.2
Total		24	100
I consider that there is necessary equipment	Strongly Agree	4	16.7
	Agree	17	70.8
	Neither agree or disagree	3	12.5
	Strongly disagree	--	--
	Disagree	--	--
Total		24	100
How much does it take from home to get to food retailer by car	< 5mins	1	4.2
	From 5-15mins	2	8.3
	From 15-20mins	14	58.3
	From 20-30mins	7	29.2
	More than 30mins	--	--
Total		200	100
How much does it take from home to get to food retailer by foot	< 5mins	--	--
	From 5-15mins	--	--
	From 15-20mins	5	20.8
	From 20-30mins	9	37.5
	More than 30mins	10	41.7
Total		200	100

This study observed that girls were more likely to be malnourished than boys in the orphanages and children between the ages of 5-7years are prone to malnutrition but from this study majority of the respondents had normal intake of nutrients, a total of 3.5% out of 200 children between the ages of 5-11years included in this study were found to have high BMI-for-Age and underweight 0.5% , it is the measure that can be used continuously from age 2 to 20years to screen for obesity, overweight, or underweight. 10% were stunted. Children that fell under low/high BMI-for-age were between the ages of 8-9years while children between the ages of 5-7years were prevalent with low BMI-for-age and low height-for-age.

The perceived food environment was based on availability, affordability and accessibility of food and it was observed that the children living in orphanage homes in Ogun state have access to healthy food and not junk foods (Turner et al., 2017). Majority also responded that food is affordable and available with the vicinity of each orphanage homes which is contrast with the cross-sectional study (Tagurum et al., 2015) that more than a quarter of orphans and vulnerable children in Nigeria showed symptoms of mild to moderate malnutrition and close to 70% experienced household food insecurity, putting them at risk for malnutrition. .

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