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Association Between Care Practice and Child's Anthropometry among School Aged Children in Selected Schools in Owerri Metropolis, Imo State Nigeria

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Abstract

Background: Every year children die as a result of complications from different illness and malnutrition in rural areas, it is mainly inadequate nutrition, and poor care practices that may contribute to poor growth and mortality.

Objective: The study assessed the association between care practice and child's anthropometry among school aged children in selected schools in Owerri metropolis, Nigeria.

Methodology: The study adopted a cross sectional and descriptive survey design to assess the research variables among 399 primary school children selected using multistage sampling technique. Data was collected using well-structured interviewer administered questionnaire and data was analysed using SPSS version 25.0.

Results: This study revealed that the body mass index classification (73.4%), most of the children were underweight while only (14.0%) of the children were normal. There was a significant relationship ($P < 0.001$) between anthropometric characteristics of respondents and care practice they received, child's food consumption practices and the outcomes of their anthropometric characteristics ($P < 0.001$). However, child care practices was a major determinant of underweight among respondents thus establishing a positive significant relationship ($P < 0.001$) among both variables. Furthermore, there was a high level of underweight (73.4%) among respondents and this was closely related/ associated with child care practices (45.6%).

Conclusion: Therefore, there is need for government and other NGOs to involve parents and schools in nutritional sensitization programmes/care practices because the high level of underweight observed among respondents needs immediate intervention and child care practices campaigns should be taken to schools and parents as well though organization of interactive sections with parents and teachers on ways to promote the health and nutrition of children because this is a critical component that has a direct influence of the wellbeing both academics and otherwise.

Keywords: *Nutritional Status; School Aged Children; Care Practice; Child's Anthropometry*

Introduction

During the past two decades, the role of care as an input into child health and nutrition alongside with food security, availability of health services and healthy environment has been the focus of various scientific investigations. Nutritional care encompasses all

behaviours and practices at the household level of those who give care to children (caregivers), translating available food and health care resources into a child's, growth and development. Care practice is therefore manifested in the ways a child is fed, nurtured, taught, and guided [13]. In the study of care practices in Accra, [41] reported a strong association between caregiver quality of care practice and child nutritional status.

Attention of nutritional status is especially important in paediatric patients as they are undergoing the complex processes of growth and development which are influenced by the genetic makeup of the individual and coexisting medical illness in addition to nutritional status [1]. Nutritional status is the balance between the intake and utilization of nutrient for development [31] and according to [18] is an integral component of the overall health of an individual and provides an indicator of the well-being of children living in a particular region.

School aged is an active growing phase of childhood [54] which represents a dynamic period of physical growth (5 to 12 years) as well as of mental development of the child. Research indicates that health problem due to miserable nutritional status in school age children are among the most causes of low school enrolment high absenteeism, early dropout and unsatisfactory classroom performances [45].

Malnutrition which refers to an impairment of health either from a deficiency among children all over the world especially in developing countries [2].

More than 200 million school age children are stunted, overweight and underweight and if no action is taken and at this rate, about one million children will be growing up to 2020 with impaired physical and mental development [48]. The foundational UNICEF framework for child health emphasizes that child care practice (CCP) are vitally important in promoting child nutrition and health. Socio demographic factors (e.g. parental education and income) are also emphasized in the UNICEF framework and are consistently found to have a graded relationship with health. However, little is known about the degree to which CCP are consistently related to child health in the face of the widely differing socio demographic backgrounds that characterize societies. Child care is a complex concept including a range of behaviours and practices of caregivers that provide the food, health, care, stimulation, and emotional support necessary for children's healthy survival, growth and development [49]. As part of CCP, feeding and healthcare underlie dietary sufficiency and protection from disease; which is turn impacts child health, for which physical growth is a critical marker.

A robust finding in public health research is that of a graded relationship between socio demographic status (SDS) and health. Low SDs translates predictably into lessened food security and reduced access to healthcare. However, even in households with food insecurity due to poverty and poor access to healthcare, families can optimize the use of the existing resources to promote health.

In the global south, interventions to reduce child under nutrition focus often on household food security (adequacy of food availability), without taking into consideration the complementary role of quality child care. This can be seen in most of the nutrition intervention programmes in Ghana, yet food security alone is not enough to improve children's nutritional status, and the significance of care practices to improving children's nutritional status has been documented repeatedly.

Despite the fact that quality of childcare has a demonstrated role in alleviating child under nutrition in resource-constrained settings such as Ghana, there have been only two Ghanaian studies (of which we are aware) that have examined the role of childcare in relation to children's nutritional status. The pioneering study of [41] in urban Accra used a composite care practices variable (care practice index) to examine the importance of care for healthy child nutrition. The other study, by Nti and Lartey, was conducted in one rural area; both studies found a significant association between care practices and children's nutritional status. However, the setting specificity of these two studies limits the general inability of their findings. Addressing this limitation, this paper presents an analysis of the relationship between care practices and children's nutritional status in Ghana, using a national representative sample. The primary objective of this analysis was to examine the influence of CCP on children's height-for-age Z-scores (HAZ), controlling for covariates and potentially confounding

factors at child, maternal, household and community levels. The secondary objective was to establish whether care practices were more important to growth in some sociodemographic subgroups of children compared with others.

Anthropometric measurements are a series of quantitative measurements of the muscle, bone, and adipose tissue used to assess the composition of the body. The core elements of anthropometry are height, weight, body mass index (BMI), body circumferences (waist, hip, and limbs), and skin fold thickness. These measurements are important because they represent diagnostic criteria for obesity, which significantly increases the risk for conditions such as cardiovascular disease, hypertension, diabetes mellitus, and many more. There is further utility as a measure of nutritional status in children and pregnant women. Additionally, anthropometric measurements can be used as a baseline for physical fitness and to measure the progress of fitness.

Methodology

Area of study

This study was carried out in the three Local Government Areas that make up of Owerri Zone; Owerri Municipal, Owerri West and Owerri North. Owerri is a capital of Imo state in Nigeria.

Population of the study

- The population of the study comprises all the primary school children in the Owerri metropolis within 6 - 11 years of age.
- The population in primary schools in the area is 133,414; male 65,909 and female 67,505 [23].

Study design

The study was a cross sectional and descriptive in design.

Sampling techniques and sample size

There are several possible indications for anthropometric measurements. In children, indications include stunting, wasting, and being underweight. Stunting is when children have a low height-for-age, wasting is a low weight-for-height, and underweight is a low weight-for-age. Mid-upper arm circumference (MUAC) is a viable measurement in children or pregnant women as a marker of nutritional status [16]. BMI is another commonly employed index of nutritional status and used to gauge malnutrition in children and adults. BMI is useful to identify obesity and the severity of obesity. Anthropometric measurements are often also used as part of the evaluation of fitness in athletes [52].

There are few contraindications to anthropometric measurement. The contraindications would result from conditions that would make taking the measurement impossible or inaccurate, such as amputations or casting.

A multistage sampling technique was used to select the respondents from the study area. The study area comprised of 3 LGAs; Owerri Municipal, Owerri North and Owerri West, with a total of 119 primary schools according to records of the State Primary Education Board (SPEB).

A stratified sampling method was used to group the schools according to the 3 LGAs while a simple random sampling was employed to select a school from each LGA strata.

The sample size of 399 was distributed among the 3 selected schools, where each had a total of 133 respondents. From each school a systematic sampling was used to select an average of 22 respondents across the classes (primary 1 - 6) using the nominal roll, where in

every group of 5 pupils, 2 were selected.

The sample size was determined using Yaro Yahmen's formula:

$$n = \frac{N}{1+N(e)^2}$$

Where:

N = Total population

e = Error or level of precision (5% or $0.05)^2$

n = Sample size

Substituting into the formula

$$n = \frac{133414}{1+(133{,}414\ x(0.05)^2}$$

$$= \frac{133414}{1+133{,}414\ x(0.0025)}$$

$$= \frac{133414}{334.535} = 398.8 = 399$$

Informed consent

A letter of introduction was collected from Nutrition and Dietetics Department, Imo State University, Owerri and presented to the leaders of the Communities and heads of schools to obtain permission/access of consent.

Method/instrument of data collection

Questionnaire

A well-structured questionnaire was used to collect data on food consumption, care practice and feeding pattern. The questionnaire was read out by the researcher while assistants helped the children fill their response.

Anthropometry

Data on children's anthropometry was obtained by measuring the weight (Kg) with a bathroom scale, height (m) with a meter rule, skin fold thickness (mm) with skin fold calliper.

Data analysis

Data collected was coded and analysed using descriptive statistics and result was presented in percentage using statistical chart such as bar chart while regression analysis was used to assess the association between care practices and anthropometric measures at 5% level. Probability value (P. value) was used to interpret the results.

Results

Table 1 shows the socio-demographic features of the respondents. 52.9% of the respondents were female and less than half (47.1%) of the respondents were male, 99.0% of the respondents were Igbo, 0.5% of the respondents were Hausa and 0.5% of the respondents were Yoruba.

Parameter	Frequency	%
Sex		
Female	211	52.9
Male	188	47.1
Total	399	100.0
Ethnicity		
Igbo	395	99.0
Hausa	2	0.5
Yoruba	2	0.5
Total	399	100.0

Table 1: *Socio-demographic data.*

Table 2 shows the family history of the respondents. The result showed that 24.1% of the parent's occupations were traders, 11.5% are farmers, 27.1% are civil servants and 37.3% are within the category of others.

Parameter	Frequency	%
Parent Occupation		
Trader	96	24.1
Farmer	46	11.5
Civil Servant	108	27.1
Others	149	37.3
Total	399	100.0
Who Do You Stay With		
Parent	317	79.4
Relative	68	17.0
Non Relative	14	3.5
Total	399	100.0
Your caregiver		
Mother	318	79.7
Father	39	1.7
Sister	26	6.5
Nanny	16	4.0
Total	399	100.0
Number of Siblings		
1-2	74	18.5
3-4	183	45.9
5-6	102	25.5
7-8	34	8.5
9-10	6	1.5
Total	399	100.0
When You Feel Sick, Where Are You Taken To		
Chemist	109	27.3
Traditional Doctor	18	4.5
Hospital	262	65.7
Prayer House	10	2.5
Total	399	100.0

Table 2: *Family history.*

More than half (79.4%) of the respondents stay with their parents, 17.0% of the respondents stay with their relatives, while 3.5% of the respondents stay with their non-relatives.

More than half (79.7%) of the respondents are been taken care of by their mothers, 1.7% of the respondents are been taken care of by their fathers while 6.5%of the respondents are been taken care of their nanny.

18.5% of the respondents has 1 - 2 number of siblings, less than half (45.9%) of the respondents has 3 - 4 number of siblings, 25.5% of the respondents has 5 - 6 number of siblings, 8.5% of the respondents has 7 - 8 number of siblings while 1.5% of the respondent has 9 - 10 number of siblings.

More than half (65.7%) of the respondents were taken to the hospital when they feel sick, 27.3% of the respondents were taken to the chemist, 4.5% of the respondents were taken to traditional doctors while 2.5% were taken to prayer house.

Table 3 shows the food history, of the respondents. More than half (84.2%) of the respondent's foods were prepared by their mothers, 2.0% foods were prepared by their father, 98.3% of the respondents food were prepared by their relatives, 3.0% of the respondents food were prepared by house help while 2.0% of the respondents foods were prepared by others.

Parameter	Frequency	%
Who prepares the food at home		
Mother	336	84.2
Father	8	2.0
Relatives	33	8.3
House Help	12	3.0
Others	8	2.0
Total	399	100
How Many Times Do You Eat Per Day		
Once	46	11.5
Twice	52	13.0
Thrice	250	62.7
More Than Three	51	12.8
Total	399	100.0
How Often Do You Eat Before to School		
Daily	29.8	74.7
Occasionally	77	19.3
Weekly	18	4.5
Monthly	2	0.5
None	4	1.0
Total	399	100.0
How Many Times Do You Carry Food to School		
Once	70	17.5
Twice	37	9.3
Three	46	11.5
More Than Three Times	144	36.1
None	102	25.6
Total	399	100.0

Table 3: *Food history.*

More than half (62.7%) of the respondents eat three times a day, 11.5% of the respondents eat once a day, 13.0% of the respondents eat twice a day while 12.8% of the respondents eat more than three times a day.

74.7% of the respondents eat daily before going to school, 19.3% of the respondents eat occasionally, 4.3% of the respondents eat weekly. 0.5% of the respondents eats monthly, 1.0% of the respondents don't eat before going to school.

36.1% of the respondents carries food to school more than three times a week, 17.5% of the respondents carries food to school twice a week, 11.5% of the respondents carries food to school three times a week while 25.6% of the respondents don't carry food to school.

Table 4A shows the food frequency of table of respondents. Less than half (40.9%) of the respondents consume fufu, 19.5% of the respondents consume yam, 19.8% of the respondents cocoyam, 19.8% of the respondents consume sweet potato.

Starchy roots/tubers	Frequency	Percentage
Yam	78	19.5
Cocoyam	79	19.8
Fufu	163	40.9
Sweet Potato	79	19.8
Total	399	100.0
Time of Consumption		
Daily	98	19.5
1 - 3 t/W	158	39.3
4 - 6 t/W	84	21.1
Occasionally	79	19.8
Total	399	100.0
Cereals		
Maize	79	19.8
Wheat	157	39.3
Rice	163	40.9
Total	399	100.0
Time of Consumption		
Daily	157	39.3
1 - 3 t/W	163	40.9
4 - 6 t/W	79	19.8
Total	399	100.0
Legumes		
Beans	79	19.8
Cowpea	78	19.5
Groundnut	242	60.7
Total	399	100.0
Time of Consumption		
Daily	242	60.7
1 - 3 t/W	78	19.5
4 - 6 t/W	79	19.8
Total	399	100.0

Table 4A: *Food frequency table.*

Less than half (39.3%) of the respondents consume yam. Cocoyam, fufu and sweet potato 1-3 times a week, 19.5% of the respondents consume them daily, 21.1% of the table 4B shows food frequency table; Less than half (39.3%) of the respondents consume coconut, 40.9% of the respondents consume African oil bean, 19.8% of the respondents consume cashew nut. More than half 60.4% of the respondents consume oil seed and nuts daily while 39.6% of the respondents consume them 1-3 times weekly.

Food group	Frequency	Percentage
Oil Seed and Nut		
Coconut	157	39.3
African Oil Bean	163	40.9
Cashew Nut	79	19.8
Total	399	100.0
Time of Consumption		
Daily	158	39.6
1 - 3 t/W	241	60.4
Fat and Oil Butter		
Vegetable Oil	241	60.4
Palm oil	158	39.6
Total	399	100.0
Time of Consumption		
Daily	242	60.7
1 - 3 t/W	39.3	39.3
Total	399	100.0

Table 4B: *Food frequency table.*

More than half (60.4%) of the respondents consume vegetable oil while oil 39.3% of the respondents consume this oil 1 - 3 times per week daily while 60.7% consumes oil daily.

Respondents consume 4 - 6 times a week, and 19.8% of the respondents consume them occasionally. 39.3% of the respondents consume wheat, 40.9% of the respondents consume rice while 19.8% consume maize.

Less than half (40.9%) of the respondents consume maize, rice and wheat 1 - 3 times a week, 19.8% of the respondents consume them 4 - 6 times a week, 39.3% of the respondents consume daily.

More than half (60.7%) of the respondents consume groundnut daily, 9.3% of the respondents consume cowpea 1 - 3 times per week, 19.8% of the respondents consume beans 4 - 6 times per week.

Table 4C shows food frequency table of respondents.

Less than half (39.6%) of the respondents consume crayfish, 19.5% of the respondents consume frozen fish, 19.8% of the respondents consume cow meat.

Food group	Frequency	Percentage
Meat/Fish		
Crayfish	158	39.6
Chicken	78	19.5
Frozen Fish	84	21.1
Cow Meat	79	19.8
Total	399	100.0
Time of Consumption		
Daily	79	19.8
1 - 3 t/W	79	19.8
4 - 6 t/W	241	60.4
Total	399	100.0
Snacks		
Puff-Puff	79	19.8
Chin-Chin	79	19.8
Egg Roll	84	21.1
Fish Roll	78	19.8
Pepper Roll	78	19.8
Total	399	100.0
Time of Consumption		
Daily	157	39.3
1 - 3 t/W	79	19.8
4 - 6 t/W	84	21.1
N/Con.	79	19.8
Total	399	100.0
Fruit and Vegetables		
Orange	84	21.1
Banana	158	39.6
Mango	78	19.5
Apple	79	19.8
Total	399	100.0
Time of Consumption		
Daily	236	59.1
1 - 3 t/W	79	19.8
4 - 6 t/W	84	21.1
Total	399	100.0

Table 4C: *Food frequency table.*

Less than half (19.8%) of the respondents consume crayfish, chicken, frozen fish and cow meat daily, 19.8% consume them 1 - 3 times a week while 60.4% consume 4 - 6 times a week. 19.8% of the respondents consume puff-puff, 19.8% of the respondents consumes

chin-chin, 21.1% of the respondents consume egg roll, 19.8% of the respondents consume fish roll, 19.8% of the respondents consumer pepper roll. Less than half (39.3%) of the respondents consume snacks 1-3 times a week, 21.1% of the respondents consume snacks occasionally. Less than half (21.1%) of the respondents consume orange, 29.6% consume banana, 19.5% consume mango, 19.8% consume apple. More than half (59.1%) of the respondent consumes fruits daily, 19.8% of the respondents consume fruits 1-3 times a week, 21.1% of the respondents consume 4-6times a week.

Table 5 shows body mass index classification.

	Frequency	Percentage
Underweight	293	73.4
Normal	56	14.0
Over Weight	29	7.3
Obese	15	3.8
Extremely Obese	6	1.5
Total	399	100.0

Table 5: *Body mass index classification.*

Approximately 73.4% of the respondents both male and female school aged children were underweight, 7.3% of the respondents were overweight, 3.8% of the respondents were obese. However, 14.0% were normal while 1.5% of the respondents were extremely obese.

Table 6 shows the comparison of anthropometric status between male and female children. Mean Age of male respondent (1.42 ± 0.51) were ($p < 0.05$) higher than the female counterparts with mean value 1.36 ± 0.48.

Parameter	Sex	N	Mean	P-Value	Df
Age	Male	188	1.42 ± 0.51	0.00	N-2
	Female	211	1.36 ± 0.48		
Height	Male	188	1.33 ± 0.10	0.42	N-2
	Female	211	1.834 ± 0.10		
Skin Fold Thickness	Male	188	5.82 ± 3.07	0.00	N-2
	Female	211	7.30 ± 4.22		
Weight	Male	188	33.45 ± 10.89	0.361	N-2
	Female	211	34.95 ± 10.86		

Table 6: *Cross tabulation of parameters.*

Mean height of the female respondent was 1.834 ± 0.10 ($p > 0.05$) and higher than that of the male counterpart, there is no significant difference ($p > 0.05$).

Mean skin fold thickness of female respondents was 7.30 ± 4.22 ($P < 0.05$) and higher than that of the male counterpart (5.82 ± 3.07).

Means weight of the female respondents was 34.95 ± 10.86 ($p > 0.05$) and higher than that of the male counterpart (33.45 ± 10.89). There is no significant difference ($p > 0.05$) between the mean weight of both male and female respondents.

Table 7 shows There was a significant ($p < 0.05$) relationship between anthropometric characteristics of respondents and care practice they received ($p < 0.001$).

Anthropometric indices	Care practice			Chi-Square value	df	P-Value
	Good	Poor	Total			
Underweight	120	173	293	30.915	4	0.000
Normal	56	0	56			
Overweight	29	0	29			
Obese	8	7	15			
Extremely obese	4	2	6			
Total	217	182	399			

Table 7: *Relationship between care practice and anthropometric indices.*

All anthropometric indices of the respondents showed good relationship in their care-practices.

Table 8 shows, there was a significant relationship ($P > 0.05$) between child's food consumption practices and the outcomes of their anthropometric characteristics ($P < 0.001$).

Anthropometric indices	Child's food consumption practices			Chi-Square value	df	P-Value
	Good	Poor	Total			
Underweight	72	221	293	69.331	4	0.000
Normal	54	2	56			
Overweight	21	8	29			
Obese	11	4	15			
Extremely obese	0	6	6			
Total	158	241	399			

Table 8: *Relationship between child's food consumption practices and anthropometric indices.*

All anthropometric indices showed very good relationship between all classes and the child's food consumption practices.

Table 9 shows that child care practices was a major determinant of underweight among respondents thus establishing a positive relationship among both variables ($p < 0.001$).

Body mass index	Care practice			Chi-Square value	df	P-Value
	Good	Poor	Total			
Underweight	120	173	293	43.008	1	0.000
Others	97	9	106			
Total	217	182	399			

Table 9: *Relationship between care practice and underweight.*

Discussion

From the study 52.9% were females while 47.1% were males, this could be attributed to the fact that girl child are now being trained in school against the ancient belief of a girl child's education being a waste and unnecessary because they belong to the kitchen. This is supported by the Global Gender Gap Report (2020), which reported that 88% of females worldwide had primary education. Although, this high rate of school participation differs according to regions in Nigeria. Most of the respondents (98%) were Igbo while 0.5% respectively comes from Hausa and Yoruba. Those from other minority tribes were mostly house-helps staying with extended relatives.

In the study, the overall care practices as shown in table 2 and 3 revealed that most of the respondents had good care practice while few had poor care practices. This was in keeping with the findings of the study [21] where more than 50% of their respondents had good child care practices. A contrasting finding was however observed in another study by [2] where 74.3% respondents had a history of poor child care practices.

This study (Table 3) observed that majority (84.2%) of respondent's foods were prepared by the mothers, 2.0% were from the fathers, 8.3% from relatives, 3.0% from house help while 2.0% from others. This concluded that females/mothers take massive care of the children feeding [57]. Moreso, fathers should cook and feed the children to build more relationship with the children. This is in line with African mentality where it is believed that the females are meant to take care of the home and the children.

Furthermore, this study also showed that some of the respondents do not carry food to school while some carry once and three times a week respectively. This could be as a result of lack of parental care, unavailability of food at home. However, this is why school feeding programs is important and should be initiated in primary schools. Studies have shown that school food program has gone a long way in positively affecting the nutritional status of school age children [54].

This study showed that respondents consume root and tubers on daily basis. This could be attributed to food availability and affordability of food by their parents. This is in line with daily life observation. Less than half (40.9%) consume wheat, less than half (39.3%), (19.8%) of the respondent consume maize, and rice respectively. This could also be accounted for food availability and because of parent choice. This is also in line with daily life observation. More than half (60.7%) of the respondent consume groundnut while less than half (19.8%, 19.5%) of the respondent consume beans and cowpea. This could be as a result of food habit and food preference. A child develops food preferences by responding to what he or she is fed and observing adults; the availability of food in the immediate environment also plays a role [37].

The study showed furthermore, that respondents consume crayfish, fish, meat and chicken as protein food sources. This could be attributed to food availability. These could be attributed to the income levels of the families, as most of them were civil servant, traders etc. (27.1% and 24.1%). According to the Global Nutrition Report [17] which reported non-affordability of nutritious diets (fish, meat and chicken) among 11 developing countries where Fill the Nutrient Gap (FNG) has been conducted. The data shows a range of non-affordability depending on the region in each country - for example, across different regions of El Salvador, 9% to 44% of households cannot afford a nutritious diet.

Moreso, most of the children consume snacks daily especially egg rolls (21.1%). This high consumption of egg roll observed in this study could be attributed to its readily availability, children's preference, patronage and love for snacks. Children are no different when it comes to snacking. These points to the strong influence of parents, teachers, caregivers and other adult kids know and trust. If a parent, caregiver or teacher, has a good snacking or eating habits, this can influence what the child eats well too. A University of Cincinnati study on eating and snacking behavior of 167 fourth-and-fifth grade elementary school children in the Cincinnati, Ohio area over a 24-hours period (2012) finds intentions as a major factor behind a child's snack choice. This is driven by several variables, such as the child's attitude towards eating healthy or unhealthy foods, as well as social or peer pressure the child feels.

Again, less than half (39.6%, 21.1%, 19.8%) consume fruits on daily basis. This could be accounted for availability and children choice. Less than half (39.3%, 40.9%, and 19.8%) consume coconut, African oil been and cashew nut occasionally (60.49%). This could be as a result of food habit and food preference. A child develops food preferences by responding to what he or she is fed and observing adults; the availability of food in the immediate environment also plays a role [37].

More than half (60.4%) (Table 4C) consume vegetable oil daily. Less than half (39.6%) consume palm oil daily. This could be as a result of parents regular usage is preparing foods at home. More than half (60.4%) of the respondents consume vegetable oil daily with less than half (39.6%) consuming palm oil daily. This could be linked to the most consumed stable food (Rice) which requires vegetable oil as a major recipe. Also, this study was carried out in the South East region where palm oil production is high and accessible.

In the current study, the body mass index classification, most of the children (Table 5) were underweight (73.4%). Underweight could be accounted for high activity level and poor dietary pattern. This is because the children exercise more and feed poorly. This is in line with a study carried out on school aged children in Makassar, Indonesia [33] on prevalence of underweight and overweight among school aged children and its association with children's socio demographic and lifestyle, which shows that factors such as mother's level of education, having an underweight father and playing outdoor on weekend for more than 2-hours were significantly associated with underweight children.

Underweight can result to infection, infertility physiological conditions, weakened immune system mortality and morbidity. This is consistent with Srilaksmi [44], which states that nutrition is concerned with socio-economic, cultural and psychological implication of care practice, food and eating habits. This is a disturbing finding and needs immediate intervention because the nutrition of school age children has direct effect on their overall health status and academic performance. In contrast to this finding that was observed in the study by Hermanussen [22] where 67.9% respondents had normal BMI while 12.1% were underweight. Similarly, Reinsma, Nkuoh and Nshom [40] reported that 89.4% respondents were of normal BMI. Again, only (1.5%) of the respondents were extremely obese. This can be attributed to lifestyle issues - too little activity and too many calories from food, drinks and snacks but genetic and hormonal factors might play a role as well [32].

In this study also, there was a significant relationship between anthropometric characteristics of respondents and care practice they received ($P < 0.001$) (Table 7). A congruent finding was observed in the study carried out by Ene-Obong., *et al.* [21] on the effect of two child-care practices of market women on Diarrhoea prevalence, Feeding Patterns and Nutritional status of children Aged 0-24months where anthropometric characteristics of respondents and care practice they received ($P = 0.022$). Another similar finding was observed in the study carried out by Amosu., *et al.* [2] on child care practice and nutritional status of infants of working mothers in day care centres in Irewole L.G.A Oshun State, Nigeria where a care provider who has the available resources is more likely to give effective care and therefore maintain good child nutrition; and there was a positive correlation between care practices and body mass index of respondents. A corresponding finding was observed in another study by Kamau-Thuita., *et al*. [27] on child care practice and nutritional status of children aged 0 - 2 years in Thuka, Kenya where there was a relationship between anthropometric characteristic and the amount and type of care that is given to children.

In the current study also, there was a significant ($P < 0.05$) relationship between child's food consumption practices and the outcomes of their anthropometric characteristics ($P < 0.001$). In keeping with this finding it was observed in the study by Amosu., *et al.* [2] on child care practice and nutritional status of infants of working mothers in day care centres in Irewole L.G.A Oshun State, Nigeria where the outcome of the study showed that a care provider who has the available resources is more likely to give effective care and therefore maintain good child nutrition.

Similarly in the study, child care practices was a major determinant of underweight among respondents thus establishing a positive relationship among both variables ($P < 0.001$). A corresponding finding was observed in the study by Ene-Obong., *et al.* [21] where child

care practices was a core determinant of BMI of respondents (P=0.003). A contrasting finding was however observed in studies conducted by Amosu., *et al.* [2] and Kimell-Ratiff-Schamb., *et al*. [27] where children that were underweight were mostly those with poor care practices from their parents.

Conclusion

In conclusion, there was a high level of underweight among respondents and this was closely related/ associated with child care practices. Therefore, there is need for government and other NGOs to involve parents and schools in nutritional sensitization programmes because the high level of underweight observed among respondents needs immediate intervention and child care practices campaigns should be taken to schools and parents as well though organization of interactive sections with parents and teachers on ways to promote the health and nutrition of children because this is a critical component that has a direct influence of the wellbeing both academics and otherwise.

Recommendation

Based on the findings of the current study, the following recommendations were made:

- There is need for government and other NGOs to involve parents and schools in nutritional sensitization programmes because the high level of underweight observed among respondents needs immediate intervention.
- Child care practices campaigns should be taken to schools and parents as well though organization of interactive sections with parents and teachers on ways to promote the health and nutrition of children because this is a critical component that has a direct influence of the wellbeing both academics and otherwise.
- Parents and schools should be educated about feeding practices for children in order to provide the best nutritional options from the locally available foods rather than feeding children with meals poor in essential nutrient suitable for them.
- Also, as part of school health assessments, routine assessment of anthropometric characteristics of school children should be carried out to ensure immediate discovery of deterioration in health of children and attendance to discovery.
- Routine inspection of physical features of children should be carried out in order to observe if their nutrition is adequate or compromise and to provide the family with nutritional advice that can be beneficial to the child's overall health.
- Based on the findings of this study, I recommend further studies on knowledge of school teachers about the importance of nutrition in the overall health and activity level in school aged children in selected schools Owerri Municipal, Owerri West and Owerri North LGAs, Imo State.

Bibliography

1. Adegun JA., *et al*. "Differences in The Nutritional Status of Young School Children and Public and Private Owed Schools in Ekiti, Nigeria". *European Scientific Journal ESJ* 9.7 (2013).
2. Amosu U Hounsou E and Summary R. "Assessment of Nutritional Status of School Children in Markudi, Benue State". *Pastan Journal of Nutrition* 8 (2012): 69-694.
3. Anrig CDC. "The Obese Child". *Dynamic Chiropractic* 21 (2003): 27-31.

4. Aubey F. "The Detrimental Effect of Malnutrition on School Achievement Evidence from Two Destructs of Madagascar" (2012): 1-34.

5. Black R., *et al*. "Maternal and Child under-Nutrition Global and Regional Exposures and Health Consequences". *Lancet* 371 (2008): 243-260.

6. Browne KD., *et al*. "A, European Survey of the Number and Characteristics of Children Less Than Three Years Old In Residential Care at Risk of Harm". *Adoption and Fastening, Sage Journals* 29.4 (2005): 23-33.

7. Cahajic S., *et al*. "Children and institutions in Bosnia and Herzegovina: First report of capacity building research. Sarajevo: UNICEF, Bosnia and Herzegovina". Pub Med 7 (2003): 29-30.

8. Cambridge Biomedical Research Centre (2016).

9. Canadian Press. Expert Says Canada Losing Child Obesity Battle (2003).

10. Centres for Disease Control and Prevention (CDC). Global Water, Sanitation, and Hygiene. Global WASH fast Facts. USA: Atlanta. Hyperlink reference not valid (2016).

11. Chea MS., *et al*. "Household food security, Dietary practices and Nutritional status of preschool children in Bahari Division, Kilifi County". *International Journal of Health and Research* 1 (2017): 237-247.

12. COC (Centers of Disease Control and Prevention), National Health and Nutrition Examination Survey: Prior to 1999 Data, Questionnaire and Related Documentation (2014).

13. Engell RE and Lim SS. "Does it matter? An updated analysis of water supply and sanitation interventions and diarrhea diseases". *Journal for Health and Research* 381.2 (2013): 544.

14. FAO. "Protecting and promoting good nutrition in crisis and recovery". Resource guide. Rome: FAO/United nations (2005).

15. Food and Agriculture Organization of the United Nations (FAO) and The International Food Policy Research Institute (IFPRI) (2004).

16. Gabbett T and Georgieff B. "Physiological and anthropometric characteristics of Australian junior national, state, and novice volleyball players". *The Journal of Strength and Conditioning Research* 21.3 (2007): 902-908.

17. Global Nutrition Report". Shining a Light to Spur Action on Nutrition (2018): 69-92.

18. Goon TO., *et al*. "Anthropometrically Determined Nutritional Status of Urban Primary School Children Markudi". *Nigeria MBC Public Health Journal* 11 (2011): 769.

19. Groak C., *et al*. "Environment, caregivers and children in Three Central American orphanages". *Infant Mental Health Journal* 32.2 (2011): 232-250.

20. Guerrant RL., *et al*. "The impoverished gut-a triple burden of Diarrhea, Stunting and Chronic Disease". *Journal of Health and Research* 10 (2013): 220-229.

21. Hennetta N Ene-Ebong., *et al*. "The Effect of Two Children Practices of Market Women on Diarrhoea Prevalence, Feeding Patterns And Nutritional Status of Children Aged O.24 Months. 1998 International Center for Diarrhoeal Disease Research, Bangldesh". *Diarrhoeal Disease* 16.3 (1998): 173-179.

22. Hermanussen Micheal. Auxology studying human growth and Development, Schweizerbart (2013): 9783510652755.

23. Imo State Basic Education Board Primary Schools Pupils Data (2017).

24. Infant Feeding Practices and Their Relationship with Diarrhea and Other Diseases in Huascar (Lima) Peni. *Pediatics* 83: 31-40.

25. International Food Policy Research Institute (IFPRI). Global nutrition report. From promise to impact: Ending malnutrition by 2030. Washington, DC: IFPRI (2016).

26. Kail Rober V. "Children and their development (6th edition) Englewood Cliffs". N.J. Practice Hall (2011).

27. Kimmel SR and Ratiff-Schamb K. "Growth and development in raked". Re, Edition. Textbook of family medicine–sticed. Philadelphia. PA Elsevier Saunders; chap (2011): 32.

28. Kliewer KKe J and Belury M. "Short term Food Restitution Followed by Controlled Refeeding Promoties Gorging Behaviour". Enhance Fat Deposition and Diminishes Insulin Sensitivity (2015).

29. Kohlberg's and Fowers. "Theories and factors affecting growth and development". *Journal of Medicinal* 4 (2012): 456.

30. Levin, Madeline. "Breakfast For Learning: Scientific Research on the Link Between Children's Nutrition and Academic Performance". Food Research and Action Center. Fall (2011).

31. Magbood A Oslen and LE Stallings VA. "Clinical Assessment of Nutrition in Pediatrics 4th Edition Hamilton, Ontario Canada BC Deaver Inc 5 (2008): 13.

32. Mayo Foundation for Medical Education and Research (MFMER 2020).

33. Mwaniki EW and Makokha AN. "Nutrition status of children in orphanages in selected primary schools within Dagoretti Division Nairobi, Kenya". *Journal of Nutrition and Food Science* 4.248 (2013).

34. National Scientific Council on the Developing Child (NSCDC). The science of Neglect: The persistent absence of responsive care disrupts the developing brain: Working paper 12 (2012).

35. Neiman P. Childhood Obesity Petirve (2004).

36. Obiakor-Okeke PN and Nnadi BC. "Nutritional status, care giving and feeding practices of infant and pre-school children (0-5 years) in motherless babies homes in Owerri Metropolis, Nigeria. 3rd October. Department of Nutrition and Dietetics". Owerri: Imo State University 4.17 (2014): 190-198.

37. Oliver SA Ellison., *et al*. "Parent. Greche Attendant Relationship In Nutrient Intake: The Framingham Children's Study". *American Journal of Clinical Nutrition* 56 (2000): 593-398.

38. Onyango CA., *et al*. "Assessing nutrient intake and nutrient status of HIV seropositive patients attending clinic at Chilaimbo sub-district hospital, Kenya". *Journal of Nutrition and Metabolism* 1.6 (2012): 24-60.

39. Pai MP and Paloucek FP. "The origin of the ideal body weight equations". *The Annals of Pharmacotherapy* 34.9 (2000): 066-1069.

40. Reinsma KG., *et al*. "The potential effectiveness of the nutrition improvement program on infant and young child feeding and nutritional status in the Northwest and Southwest regions of Cameroon". *Central Africa* 16 (2016): 654.

41. Ruel MT., *et al*. "Et Al Good Care Practices On Mitigate The Negative Effects Of Poverty And Low Material Schooling On Children Nutritional Status: Evidence From Accra". *World Dev* 27 (1999): 1993-2009.

42. Smith PK Cowie H and Plades M. "Understanding Children development (4th edition) Black Well Publishing (2003).

43. Smyke AT., *et al*. "The caregiving context in institution-reared and family reared infants and toddlers in Romania". *Journal of the Child Psychology and Psychiatry* 48 (2007): 210-218.

44. Srilaksmi T. "Nutrition's Factors, Cognitive Decline and Dementia, Brain". *Research Bulletin* 69.10 (2008): 1-19.

45. Srivastava A., *et al*. "Nutritional Status of School Aged Children". A Scenario of Urban Slums in India, Archives of Public Health 70 (2012): 8.

46. Syaru LR Kimura., *et al*. "Ahmad Prevalence of Underweight and Overweight Among School - Aged Children And It's Association With Children's Scio-Demographic Lifestyle In Indonesia". *International Journal of Nursing* (2016).

47. Tobis D. "Moving institutions to community-based social services in Central and Eastern Europe and the former Soviet Union". Washington, DC: The World Bank (2000).

48. UNICEF. The State of Worlds Children (Accessed 5th October, 2012) World Health Organization, Country Cooperation Strategy For WHO And Egypt 2010-2014 (2004).

49. UNICEF. "Improving Child Nutrition: The Achievable Imperative for Global Progress". New Fork: UNICEF (2013).

50. University Of Cincinnati. "The Eating and Snacking Behaviours Of 167 Fourth – And Fifth Grade Elementary School Children in The Cincinnati, Ohio, Area Over A 24-Hours Period". Public in the International Quarterly of Community Health Education (2012): 513-556.

51. Van Ijzendoorn MH., *et al*. "Plasticity of growth in height, weight and head circumference: Meta-analytic evidence of massive catch-up of children's physical growth after adoption". *Journal of Developmental and Behavioral Pediatrics* 28 (2007): 334-343.

52. Vasconcelos AP., *et al*. "Comparison of the effect of different modalities of physical exercise on functionality and anthropometric measurements in community-dwelling older women*". Journal of Bodywork and Movement Therapies* 20.4 (2016): 851-856.

53. Wells Mike. Clinical: The paper tape sanguine 1.2 (2013).

54. WFP (World Food Program). "State Of School Feeding Worldwide". Rome, Italy: WFP (2013).

55. WHO. "Water, Sanitation and Hygiene Links to Health. Facts and Figures". Geneva: World Health Organization (2004b).

56. WHO/UNICEF/USAID. Fact sheet. Infant and Young Child Feeding. Geneva: WHO/UNICEF (2016).

57. Wiley T. "Does Amount of Time Spent In Child Care Predict Socio Emotional Adjustment During The Transition To Kindgaten?" *Child Development* (2003): 976-971.

58. Wilms JD. "Early Childhood Obesity: A Call for Early Surveillance and Preventive Measures". *Canadian Medial Association* 171 (2004): 243-244.

59. Zeanah CH., *et al*. "Orphanages as a developmental context for early childhood". Institute of infant and early childhood mental health. Tulane University: Health Sciences Center (2005).

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