Comparative Study of Nutritional Status of Beneficiaries and Non-Beneficiaries of Primary School Feeding Programme in Akwa Ibom State

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Abstract

This study compared nutritional status of beneficiaries and non-beneficiaries of primary school feeding programme in Akwa Ibom State. Specifically, it determined the differences in anthropometric measurements of weight - for – age; height - for – age; and body mass index - for - age of children benefiting and those not benefiting from school feeding programme in Akwa Ibom State. The study adopted a cross-sectional descriptive survey design. The population for the study comprised 818,588 public primary school children (3 - 11 years). Questionnaire and anthropometric measures were used to collect data. Data were analyzed using frequencies and percentages. Data from the anthropometric measurement of pupils (weight-for-age, height-for-age and BMI-for-age) were analysed using WHO anthro plus software. The result was interpreted using Z-score (WHO Standard) and expressed in frequencies and percentages. Chi - Square test result showed that the weight-for-age (X^2 =13.437[a], P=0.00), height-for-age (X^2 = 7.736[a], P= 0.02) and BMI-for-age (X^2 = 10.281[a], P= 0.04) status of the beneficiaries of school feeding programme were comparable to the non beneficiaries at 0.05 level of significance. Thus, the three null hypotheses were accepted for all the parameters tested. In conclusion, school feeding programme has the potential to directly address malnutrition if it is effectively managed. The study recommended among others that Home Economists, Nutritionists and Dieticians should, in conjunction with the government undertake regular monitoring and evaluation of the programme to ensure that adequate and nutritious meals are served.

Keywords: Nutritional, Status, School, Feeding, Programme, Beneficiaries, Non-beneficiaries

Introduction

School feeding programme have been established in Nigeria to reduce malnutrition and improve child nutrition in order to lessen negative effects of malnutrition on the learning capacity of school aged children (World Food Programme, 2012). According to World Food Programme (2013), malnutrition disorders affect more than 42 percent of school children in Nigeria and are responsible for about 49 percent absenteeism of primary school-age children. The common causes of malnutrition are frequent and lack of access to adequate meals. School feeding

programme encourages school-aged children to be in school daily and as such helps in reducing malnutrition as the meal in schools provides macro and micro-nutrients that are often missing in diets of children from low-income background.

School feeding programme provides avenues where meals are served to pupils in schools, as well as take-home rations subjected to pupil's school attendance, to serve as a common way of enhancing school participation and also promoting learning and complementing the insufficient diets of school-aged children (Adelman, Gilligan and Lehrer, 2008). The Nigerian Home-Grown School feeding (NHGSF) programme aims to deliver a government-led, cost-effective school feeding programme using foods that are locally grown by small holder's farmers. The first implementation of Nigerian Home-grown school feeding programme was in 2004 beginning with twelve states selected from the six geopolitical zones. The programme stopped shortly after commencement in ten states due to insufficient funds. In 2016, the Federal Government of Nigeria reaffirmed its commitment to the Home-grown school feeding programme by setting a target of 12.8 million primary school- aged children to benefit from the programme (UNICEF 2006).

School-aged children are those between the ages of 5-12 years, it typically comes after pre-school age of 2-5 years which most public primary school have accommodated preschoolers into what is named 'Early Child Education' (ECE). It is also during this period, the pre-school age that most under nutrition in form of kwashiorkor, marasmus and anemia are common (Ene-Obong, 2001).

Nutritional status is defined as the health condition of an individual that is influenced by the intake and utilization of nutrients by the body. It provides an indicator of the well-being of individual living in a particular area (Goon, Toriola, Shaw, Amusa, Monyeki, Akinyeme and Alabi, 2011). Healthy eating behaviors among school-aged children play a key role in their mental and physical development and reduce many risks associated with both immediate and long-term health problems (Bordi, Park, Watkins, Caldwell and De Vitis, 2002). Children belong to the vulnerable groups and therefore, at greater risk of malnutrition in the society. They require healthy foods which include proteins, vitamins, calcium, carbohydrates and minerals for growth and development.

Anthropometry index can be sensitive indicators of health, growth and development in children (Medhi; Barua; Mahanta, 2006). Anthropometric is universally applicable and inexpensive method of assessing the size, proportion and composition of human body. Adequate diets are vital for proper growth and physical development to ensure optimal reactions and resistance to infections. Reversely, inadequate diets lead to severe forms of malnutrition in children including vitamin A deficiency and iodine deficiency disorders. (Amuta and Houmsou 2009; Zere, and Mcintyre, 2003).

According to World Food Programme (2013), malnutrition disorders affect more than 42% of school children in Nigeria and are responsible for about 49% absenteeism of primary school-age children. Poor nutritional and health status have been shown to affect learning outcomes in children. The common causes of malnutrition are frequent and

lack of access to adequate meals. Among the poor, there is insufficient food at home. A hungry child does not see going to school as being important. School feeding programme, if effectively managed has the potential to directly address malnutrition among preschool children. Many intervention programmes have been lunched to tackle the issue of malnutrition among children. In 2004, the Federal Government of Nigeria lunched the school feeding programme. Therefore, a comparative study on the nutritional status of beneficiaries and non beneficiaries of primary school feeding in Akwa Ibom State could form basis for monitoring and evaluation of school feeding programme necessary for improving the nutritional status, nutrition knowledge and practices of school- aged children in Nigeria.

Objectives of the study
The main objective of the study was to compare the nutritional status of beneficiaries and non-beneficiaries of school feeding programme (SFP) in primary schools in Akwa Ibom State. Specifically, the study determined differences in anthropometric measurements of children (3 - 11 years) who are benefiting and those who are not benefiting from school feeding programme, with regards to:
1. weight-for-age.
2. height-for-age.
3. body mass index-for-age

Hypotheses (HO$_3$)
There are no significant differences in anthropometric measurements of weight-for- age of children (3-11 years) who are benefiting and those who are not benefiting from school feeding

programme, at 0.05 level of significance, with regards to:
HO$_1$: Weight-for-age.
HO$_2$: Height-for-age.
HO$_3$: Body mass index-for-age

Methodology
Design of the study: The study employed a cross-sectional descriptive survey research design.

Area of the study: The study was conducted in Akwa Ibom State. The State is located in the coastal Southern part of the country. Akwa Ibom state consists of 31 local government areas (LGAs). The State is divided into three senatorial Districts. Akwa Ibom is one of the states in Nigeria running school feeding program to boast the nutritional status of children as well as increase the enrollment of pupils.

Population for the study: The population of the study was made up of 818,588 school children (3 - 11 years) from government (public) primary schools in Akwa Ibom state. Out of 1,160 public primary schools in the state, 1,101 schools operated the programme at the time of the study. The schools are mostly in the urban areas of each of the three senatorial districts. Fifty nine (59) schools did not operate the programme. The total number of pupils in each of the public primary schools varied. Pupils who were used for the study were registered in school for at least one academic section and there were selected from government primary schools that operated school feeding programme and government primary schools that do the operate the programme. Pupils within the age range of 3-11years were used for the study (Early Child Education to primary three).

Sample for the Study: Multistage sampling technique was used to select 400 children (3-11 years) who formed the sample for the study. Two local government areas (LGAs) were randomly selected from each of the three senatorial districts of the state to give a total of six LGAs. Three villages were purposively selected based on whether its primary school operated feeding programme or not. Among the three villages selected, two primary schools operating SFP and one not operating SFP were purposely selected. A total of 12 primary schools operating feeding programme and six primary schools not operating feeding programme in the state were used for the study. In each of the primary schools operating school feeding programme, 17 pupils were randomly selected. These children constituted the sample of 400 school aged children were used for the study.

Sample size determination

Instrument for data collection: Three types instruments were used for data collection. These include: Questionnaire which was used to collect data on the demographic characteristics (age, sex and class) of the children and the occupation of their parents. The questionnaire was validated by three lecturers Home Science.

Beam scale was used measure the weight of the children.

Tape measure was used to measure height of the children to the nearest 0.1cm. The tape was fixed to a rod with a head piece or a ruler.

Method of data collection: Appropriate permission was obtained from each of the schools involved in the study before data collection. One research assistant was trained for data collection. With the help of the research assistant and class teachers, 400 copies of the questionnaire were administered to the pupils who were guided by the teachers. The researcher ensured that all the questionnaires were retrieved from the respondents. Anthropometric measurements of weight and height were taken using standard procedures. The weight of the pupils was taken using weighing scale. The scale was adjusted to zero before each measurement. Pupils were not permitted to wear shoes and heavy clothing except their school uniforms for weight measurement. Each school child was made to stand on the scale without holding onto any support with feet closed, hands by the sides and head in a forward position. Weight was read immediately and recorded to the nearest 0.1 kg (Okeke ; Onyechi ; Ibeanu, 2011).

Height was measured to the nearest 0.1 cm using a non stretch tape. Before taking the measurements, respondents were asked to take off all foot wears and hats if any. Each pupil was made to stand with back against a wall, heels together and in line with the buttocks, shoulders and head (Okeke, *et.al,* 2011)..

Data Analysis Techniques: Information on demographic data (age, sex and class) of the pupils and the occupation of their parents from the questionnaire were analyzed using SPSS frequencies and percentages. Anthropometric measurements of weight and height of the children under study were used for computing weight-for-age, height-for-age and BMI-for-age status of the children and analyzed using WHO Anthro Plus (version 1.0.4, World Health Organization, Geneva 2009). Z scores were computed for weight-for-age, height-for-age and BMI-for-age and were used in assessing underweight, wasting,

stunting, overweight and obesity using WHO reference standards.

Data were interpreted by using the Z-score classification system. The children were classified into the following categories:

❖ Underweight (low weight-for-age <−2 Z-scores)
❖ Stunting (low height-for-age <−2 Z-scores)
❖ Wasting (low BMI-for-age <−2 Z-scores)
❖ Overweight (BMI-for-age Z-score >+1 and ≤+2)
❖ Obese (BMI-for-age Z-score >+2)
❖ Normal weight (BMI-for-age Z-score − 2 to + 1).
❖ Children with height-for-age Z-scores <−3.00 were defined as severely stunted.
❖ Children with BMI-for-age <−3 Z-scores were defined as severely wasted.
❖ Children with BMI-for-age Z-score >3 were severely obese. The values were set from the median values of the WHO international growth reference 2007 (De Onis *et al.*, 2007; WHO, 2009).

Chi-Square test was used in testing the differences (at 0.05 probability level) in nutritional status of the beneficiaries and non beneficiaries of the school feeding programme in primary schools in Akwa Ibom Stat

Results

Demographic Information of the Pupils: Data analysis on the demographic information of the pupils shows that more than half (58.3%) of the pupils were females while 41.7% were males. Majority (66.5%) of the pupils were between 6-8 years of age few (15.0%) and (18.5%) of the pupils were between ages 3-5 years and 9-11 years respectively. Some (31.3%) of the pupils were in primary three, a further (30.8%) were in primary two, (27.5%) were in primary 1, while few (10.5%) were in early child education (ECE). Some (33.0%) of the pupils had fathers who were traders with a further (26.3%) who were artisans while only few (5.3%) had fathers who were farmers. Some (25.5%) of the pupils had mothers who were public servants with a further (21.8%) of them having mothers who were farmers while just (18.8%) had mothers who were civil servants.

Table 1: frequencies; Percentages and X² of Differences between Nutritional Status of Beneficiaries and Non-beneficiaries of the SFP in Akwa Ibom State Using Weight-for-Age Parameters.

Variables	Beneficiaries (%)	Non Beneficiaries F (%)	Total F (%)	X^2	P-value
Weight-for-age				13.437^a	0.00
Severe underweight	0 (0.0%)	6 (1.5%)	6 (1.5%)		
Underweight	0 (0.0%)	7 (3.5%)	7 (1.8%)		
Normal	200 (100%)	187 (93.5%)	387 (96.8%)		
Total	200 (100%)	200 (100%)	400 (100%)		

F= Frequency; % = Percentage; X ² = Chi square

Table 2 shows the differences between the nutritional status of beneficiaries and non-beneficiaries of the school feeding programme. The result showed that while all the benefiting children from the school feeding programme had a normal

weight-for-age status underweight (3.5%) and severe underweight (1.5%) were observed among children not benefiting from the feeding programme.

Table 2: Frequencies; Percentages and X² of Differences between the Nutritional Status of Beneficiaries and Non-beneficiaries of the SFP in Akwa Ibom State Using Height-for-Age Parameters.

Variables	Beneficiaries F(%)	Non Beneficiaries F %	Total F(%)	X²	P-value
Height-for-age				7.736a	0.02
Severe stunting	1 (0.5%)	7 (3.5%)	8 (2.0%)		
Stunting	11 (5.5%)	20 (10.0%)	31 (7.8%)		
Normal	188 (94.0%)	173 (86.5%)	361 (90.3%)		
Total	200 (100%)	200 (100%)	400 (100%)		

F= Frequency; % = Percentage; X ² = Chi square

Table 2 shows that the prevalence of stunting (10%) and severe stunting (3.5%) observed among the non-beneficiaries of the feeding programme were higher than (5.5%) and (0.5%) observed among children benefiting from the school feeding programme.

Table 3: Frequencies; Percentages and X² Differences between the Nutritional Status of Beneficiaries and Non-beneficiaries of the SFP in Akwa Ibom State using Body Mass Index-for-Age Parameters.

Variables	Beneficiaries F (%)	Non Beneficiaries F (%)	Total F (%)	X²	P-value
BMI-for-age				10.281a	0.04
Severe wasting	0 (0.0%)	8 (4.0%)	8 (2.0%)		
Wasting	4 (2.0%)	8 (4.0%)	12 (3.0%)		
Normal	177 (88.5%)	170 (85.0%)	347 (86.8%)		
Overweight	18 (9.0%)	13 (6.5%)	31 (7.8%)		
Obese	1 (0.5%)	1 (0.5%)	2 (0.5%)		
Total	200 (100%)	200 (100%)	400 (100%)		

F= Frequency; % = Percentage; X ² = Chi square

The prevalence of wasting and severe wasting (4%) respectively observed among the non-beneficiaries of the feeding program were higher than 2% obtained for wasting among beneficiaries as none of the beneficiaries were severely wasted. The prevalence of overweight (9%) observed among benefiting children was higher than 6.5% observed among non-beneficiaries while obesity (0.5%) respectively was observed.

Table 4: Chi-Square tests

Variables	X²– Value	P- Value
Weight-for-age	13.437a	0.00
Height-for-age	7.736a	0.02
BMI-for-age	10.281a	0.04

Table 4 on the Pearson Chi- Square (X²) test result shows that the weight-for-age (X^2 =13.437a, P= .00), height-for-age (X^2 = 7.736a, P= 0.02) and BMI-for-age (^{2} = 10.281a, P=0.04 status of the beneficiaries of school feeding programme were

comparable to the non beneficiaries at 0.05 level of significance. Thus, the three null hypotheses were accepted for all the parameters tested.

Discussion of Result

This study revealed that all the benefiting children from the school feeding program had a normal weight-for-age status while underweight (3.5%) and severe underweight (1.5%) were observed among children not benefiting from the feeding program. The prevalence of underweight observed in this study was lower than prevalence of underweight recorded among school children by other studies, (59.7%) by Mekonnen, Tadesse and Kisi (2013), and (25.0%) by Kwena; Terlouw; De Vias ; Phillips-Howard; Hawley; Friedman; and TerKuile; (2003). This result was also lower than 20.3% reports by Oguizu and Nnadede (2016) among children 2-5 years in Isiala Ngwa North LGA and 13.8% reported by Oguizu and Okoro (2016) among school aged children in Ikwuano LGA all in Abia State. The normal weight-for-age recorded for all the benefiting children could be as the result of receiving supplementary food in schools intended to improve their nutrition. The prevalence of underweight observed in children not benefiting from school feeding programme confirms the findings of a study where the food being serve to the children by their guardians was found not to meet the recommended energy from macronutrient intake as set by World Food Programme (Prince and Laar, 2014). This could be as a result of the high level of poverty as most of the children were from low income families.

The prevalence of stunting (10%) and severe stunting (3.5%) observed among the non -beneficiaries of the feeding program were higher than (5.5%) and (0.5%) observed among children benefiting from the school feeding program. The prevalence of stunting observed in this study was far lower than the prevalence recorded by other studies conducted in Kenya as Mekonnen *et al* (2013) reported a prevalence of 30.7% while Kwena *et al* (2003) reported a prevalence of 42.0%. The result was significantly lower than the 37% prevalence reported by Nigerian Demographic and Health Survey (NDHS, 2014), 36% reported by Oguizu and Nnadede (2016) and 28.1% reported by Oguizu and Okoro (2016). Prevalence of stunting recorded among school-age children could be as a result of inadequate nutrition over a longer period of time. According to Eucher-Miller, Mason, Weaver, Mecabe and Boushey, 2009), stunting among school-age children might be due to the fact that cereal based monotone diet with poor quality, quantity and frequency of feeding does not fulfil micronutrient requirements such as iron, vitamin B12, foliate and other essential requirements for child growth.

The prevalence of wasting and severe wasting (4%) respectively observed among the non-beneficiaries of the feeding program were higher than 2% obtained for wasting among beneficiaries as none of the beneficiaries were severely wasted. The result obtained were significantly lower than that of NDHS (2014) where the prevalence of wasting was reported to be 18% and 10% reported by Oguizu and Nnadede (2016) and 13.8% reported by Oguizu and Okoro (2016). The rate of wasting observed among school-aged children could be attributed to infectious diseases as well as lack of access to clean water as these was

observed among children in rural communities.

The prevalence of overweight (9%) observed among benefiting children was higher than 6.5%s observed among non-beneficiaries while obesity (0.5%) respectively was observed. This result was comparable with prevalence rate of 7.6% found by Peltzer and Pengpid (2011) among a sample of children from Ghana and Uganda. However, it was higher than childhood overweight prevalence of 17.0% among children aged 10-16 years in Greece and Italy (Janssen et al., 2005). It was also lower than prevalence estimates of some other countries including Aboriginal families in Australia where 26.8% of children aged 5 - 15 years were overweight (Schultz, 2012) and Saudi Arabia where 29.0% of children aged 5-19 years were overweight (El Mouzan, Foster, Al-Herbish, Al-Salloum, Al-Omar and Qurachi 2010). The prevalence of overweight observed among the children could be due to parents inadequate knowledge on good nutrition practices necessary for providing their children with healthy foods. This could also be as a result of the nutritional transition characterized by consumption of more energy and high fat diet coupled with low physical activities in the school.

Report from values set from the median values of the WHO international growth reference, 2007 (De Onis *et al.*, 2007; WHO, 2009) revealed that normal height was defined as height for age which is between -2 and +2 Z score. Normal weight was defined as weight for age between -2 and +2 Z score. Stunting was defined as height for age less than -2 Z score. Underweight was defined as weight for age less than -2 Z score. Wasting was defined as BMI for age less than -2 Z score. Obesity was defined as BMI greater than +2 Z score, while overweight was defined as BMI for age between +1 and +2 Z score.

Findings from the study revealed comparable values in the nutritional status of the beneficiaries and non-beneficiaries of the school feeding program. These findings differed from the reports of Falada, Otemuyiwa, Oluwasola, Oladipo and Adewusi (2012) who reported a significant difference in the nutritional status of the beneficiaries and non-beneficiaries of the school feeding program in Osun state, Nigeria.

Conclusion

Research findings revealed that beneficiaries of school feeding in Akwa Ibom state had a better nutritional status compared to the non-beneficiaries although the differences were not significant at 0.05 probability level. However, the differences in their nutritional status as revealed in the anthropometric indices of weight-for-age ($X^2 = 13.437^a$, P=0.00), height-for-age ($X^2 = 7.736^a$, P= 0.02) and BMI-for-age ($X^2 = 10.281^a$, P= 0.04) status of the beneficiaries of school feeding programme were comparable to the non beneficiaries at 0.05 level of significance. The findings of this study should form data base for monitoring and evaluation of school feeding programme necessary for improving the nutritional status, nutrition knowledge and practices of school- aged children in Nigeria.

Recommendations

Based on the findings of the study, the following recommendations were made:
1. Home Economists, Nutritionists and Dieticians in conjunction with the government should undertake regular monitoring and evaluation of

the programme to ensure that adequate and nutritious meals are served. All sectors involved should comply and adhere to its core objectives.

2. Home Economists, Nutritionists and Dieticians should organize nutrition education seminars for school children, teachers, parents and the society at large.

3. School feeding programme should be functional in all the primary schools in Nigeria.

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