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Comparison of Nutritional Status of Children Participants and non-participants in Government School-meal-plus Programme in Nsukka Local Government Area of Enugu State.

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Abstract

A total of 300 children (2-11years old) selected from nine primary schools in Nsukka L.G.A. of Enugu state were used for this study. Out of the 300 children, 150 were randomly selected from schools involved in school lunch programme while 150 were picked from schools not involved in school lunch. Anthropometric measurements (weight and height) were conducted on these children. The study revealed that most of the children between 2-6years had mean weight and height values which exceeded the National Center for Health Statistics (NCHS) recommended standards. However, none of the children between 7-11years old met the NCHS recommended standard both for weight and height. Higher prevalence of malnutrition (stunting 30.7%, wasting 40% and underweight 20%) was observed among children who did not participate in the school-meal-plus programme when compared with the participating ones (stunting25.3%, wasting 17.3%, underweight 14.7%). However, the numbers of malnourished children in the two groups (participants and non-participants) were not statistically significant ($p < 0.05$).

Key words: Children, School-meal-plus, Weight, Height, Malnutrition.

Introduction

A child is a young growing person or individual within the age range of 0-

12 years (Wardlaw, 2002). There is a progressive increase in the child till he reaches adulthood; therefore children must consume adequate amounts of energy, protein, zinc and other nutrients (Wardlaw, Disilvestro and Hamp, 2005). Nursery school age is between 3-5 years while 6-12 years is considered as primary school age (Federal Republic of Nigeria (FRN), 2004). Nutrient intake is a major factor that influences the child's growth at this stage.

Malnutrition is a condition that develops when the body does not get the right amount of the vitamins and other nutrients it needs to maintain healthy tissue (Fyke, 2010). Malnutrition can come in the form of over-nutrition and under-nutrition. Over-nutrition results from eating too much, eating too many of the wrong things, not exercising enough, or taking too many vitamins or other dietary replacements. On the other hand, under-nutrition is a consequence of consuming too few essential nutrients or using or excreting them more rapidly than they can be replaced (Fyke, 2010). The evidence of malnutrition caused by poor nutrition includes dull motivation, impaired brain function, reduced play and exploratory in children (UNICEF, 2002). Inadequate nutrition results from failure to eat an adequate diet probably due to poor food habit, lack of nutrition knowledge and/or low economic status (Koher, 1998).

About two third (2/3) of Africans (especially children) suffer from moderate to severe malnutrition caused by starvation due to emergencies like disaster and civil war (Pelletier, Frongillo, and Schroeder 2002). About half (1/2) of the four million African children under five (5) years of age who die annually are found to be malnourished due to micronutrient deficiencies like iron, Vitamin C, Vitamin A and Iodine deficiencies (Viteri, 1997). Research has shown that one out of every three children in Africa is malnourished (UNICEF, 2002). Approximately, 200 million children under five years of age suffer from acute to chronic symptoms of malnutrition. The overwhelming majority of the undernourished are in developing countries. It has been estimated that forty four percent (44%) of the children in Nigeria are malnourished and are trapped early in life in a pattern of ill-health and poor development (WHO, 2003).

School lunch programme also known as *home grown school feeding and health programme* in Nigeria and *School- meal- plus* in Enugu state is a programme designed to improve the health and nutritional status of pre-primary and primary school children by providing one adequate meal daily in schools at noon to help them

meet their daily nutrient requirements (Administrative Committee on Co-ordination/Sub-committee on Nutrition, 2002). The food substances which are mostly of cereal and legume origin are used to supplement the home diet given to children. The programme is aimed at ensuring that children are fed well to ensure healthy citizens in future (Chang, Walker and McGregor, 2003). The school lunch is supposed to supply at least one third (1/3) of the child's recommended daily allowance (Cataldo and Debruyune, 1999). It should be nutrient-dense to supply proportionately adequate amount of nutrients for effective co-ordination of body activities to enable the child maintain good nutritional status.

Research findings carried out by government agencies, private individuals and some international donor agencies reveal that pre-primary and primary school children in Nigeria especially those in the rural communities are stunted at birth, under weight, malnourished, intellectually poor and wasted during growth (State Primary Education Board (SPEB), 2005). The Enugu state government introduced the school lunch programme called *school-meal-plus* programme, through the assistance of some international donor agencies-Department for International Development (DFID) of the British government and the United Nation's International Children's Emergency Fund (UNICEF). The Enugu state *school-meal-plus* programme was flagged off on January 26th, 2004 at Community Primary School, Uvuru in Uzo-uwani local government area (LGA), Enugu state (SPEB, 2005). It is expected that every child in all the primary school in Enugu State will benefit from the *school-meal-plus* programme when fully implemented. At the moment however, the pre-school children and primary one pupils in pilot public primary schools in each LGA of the state between 2-6 years are involved (SPEB, 2005). The *School- meal- plus* is a holistic educational programme designed by Enugu state government to reduce nutrient deficiencies in school children aged 2-6 in all the public primary schools in the state by providing them with one balanced meal at school daily. The objectives of the programme are to:

- create through improved nutrition, healthier and more productive generation to come.
- measure improvement in the cognitive, affective and psychomotor performance of the children through administration of academic achievement.
- improve the food handling and hygiene practices among the rural women and other women who will be participating in the

programme through nutrition and hygiene education.

It is expected that the nutritional status of pupils who are participating in the *school- meal- plus* programme would be significantly better than that of the non-participating pupils. Thus, the findings of this study will serve as a base line data to inform the government on the effectiveness of the *school-meal-plus* programme.

Purpose of study

The main purpose was to find out the effect of *school-meal-plus* program on the nutritional status of pre-primary and primary school children in Nsukka LGA of Enugu State.

Specifically, the study:

1. assessed the nutritional status of pre-primary and primary school children who participated in the *school-meal-plus* programme.
2. assessed the nutritional status of pre-primary and primary school children who did not participate in the *school-meal-plus* programme.
3. compared the nutritional status of pre-primary and primary school children who participated in the *school-meal-plus* programme with the non-participants.

Null hypothesis

There is no difference between the nutritional status of pre-primary and primary school children who participated in *school-meal-plus* programme and that of the non-participants.

Methodology

***Area of the study*:** The study was carried out in Nsukka Local Government Area. Nsukka Local Government Area lies between longitudes $7^{0}13^{1}00''$ – $7^{o}35^{1}30''$ and latitude $6^{o}43^{1}30''$ – $6^{o}43^{1}30''$ in Enugu State, Southern Nigeria. It has an area of 1,810km^{2} with an estimated population of 309,633. There are 110 primary schools in the area

***Population of the study*:** In Nsukka Local Government Area, there are one hundred and ten (110) primary schools with a total population of twelve thousand, six hundred and thirty three (12633) pupils. Out of this number, there were one thousand eight hundred and sixty (1860) primary one pupil and four hundred and ninety (490) pre-primary children.

***Sample of the study*:** Only thirteen (13) schools operated the *school-meal-plus* programme in the area of the study. Five of these schools were randomly selected for nutritional status assessment of the children participating in *the school-meal-plus* programme. Four other schools in the area not participating in the *school-meal-plus* programme were also purposefully selected to compare their nutritional status with

the schools that participated in the *school-meal-plus* programme. This was done to ensure that the two studies were carried out within the same environment so as to eliminate as many biases as possible. All the pre-primary and primary one children in all the selected schools were used for the study. In each of the two groups, one hundred and fifty pupils (150) were studied. This gave a total of three hundred (300) pupils.

***Instrument for data collection*:** Data for this study was collected using anthropometric (height, weight and age) measurements. The subjects' heights were measured using a height meter. This was made of a rod on which a tape measure calibrated in centimeter has been attached. A movable headboard was also attached on top of the rod. The subjects' weights were measured with a bathroom scale of 120kg capacity while their ages were obtained from school record

Data collection method: For height measurement, the subject stood erect on a flat surface against a wall, no shoes on, feet together, arms hanging by the side and held comfortably erect. A flat board attached to the top of the head was lowered to press the subject's hair until it is in contact with top of the head and the point on the rod was marked. The measurement was taken to the nearest meter to an accuracy of 0.5cm. Weight measurement was done with minimum clothing. Each subject stood erect on the centre of the scale without shoes and arms by the sides. The weight measurement was taken to the nearest kilogram to an accuracy of 0.1kg. The ages of the children were obtained from the school records. Anthropometric measurements yielded data used to determine nutritional status of the children using weight-for-age, height-for-age and weight-for-height indices.

Data analysis method: The mean and standard deviation of the heights and weight of the respondents were calculated for the direct age and for both sexes (male and female). These values were compared with the National Centre for Health Statistics (NCHS), 2003) recommended standard. t- test was used to test the hypothesis. Significance was accepted at 5% probability level ($P<0.05$).

Findings of the study

Table 1: Nutritional status of pre-primary and primary school children who did not participate in school-meal-plus programme.

Age	Mean Weight	NCHS	Mean Height	NCHS
4	17.000	16.35	98.000	102.25
5	19.00ā1.40	18.20	110.64ā4.46	109.15
6	20.28ā1.49	20.10	119.33ā3.65	115.35
7	21.49ā1.64	22.35	119.94ā4.06	124.15
8	23.32ā2.21	25.05	121.45ā5.03	126.70
9	24.60ā3.51	28.30	122.80ā6.10	132.20
10	30.000	31.95	137.000	137.90
11	26.50ā3.54	34.95	129.00ā9.90	141.20

ā = standard deviation; NCHS= National Centre for Health Statistics

Table 1 reveals that the mean weight and height of the children who did not participate in *school-meal-plus* programme were higher than the NCHS recommended standards at ages 4-6 and 5-6 respectively. All the children from 7-11years had lower weight and height than the NCHS standards. The table also showed that there was a progressive increase in weight and height from 4-10years after which there was a sharp drop at age 11.

Table 2: Nutritional status of pre-primary and primary school children who participated in school-meal-plus programme.

Age	Mean Weight	NCHS	Mean Height	NCHS
2	14.38ā1.41	12.05	96.83 ā5.39	85.05
3	16.42 ā2.23	14.35	101.25 ā1.86	94.40
4	18.09 ā2.43	16.35	106.91 ā4.93	102.25
5	16.67 ā2.24	18.20	108.44 ā0.73	109.15
6	20.80 ā2.79	20.10	116.23 ā2.68	115.35
7	21.95 ā3.08	22.35	121.00 ā4.78	126.70
8	25.7 ā3.30	28.30	128.75 ā1.50	132.20
9	25.7 ā3.30	28.30	128.75 ā1.50	132.20
10	26.11 ā3.02	31.95	123.33 ā4.44	137.90

ā=standard deviation; NCHS= National Centre for Health Statistics

Table 2, shows that both the mean weight and height of the children who participated in *school-meal-plus* were higher than the NCHS recommended standards at ages 2,3,4 and 6 respectively. All the children from 7-10year also had lower weight and height than the

NCHS recommended standards. The table also showed that there was a sharp drop in weight at age 5 and also a drop in height at ages 5and 10 respectively.

Table 3: Comparison of Nutritional status of participants in school-meal-plus with that of the non-participants.

Characteristics	Participants Frequencies(%)	Non-participants Frequencies(%)	P-value
Weight for age			
Normal	128(85.3)	120(80.0)	
Underweight	22(14.7)	30(20.0)	0.81
Weight for height			
Normal	124(82.0)	90(60.0)	
Waisting	26(17.3)	60(40.0)	0.92
Height for age			
Normal	112(74.7)	104(68.3)	
Stunting	38(25.3)	46(31.0)	0.73

(%) percentages

Table 3 shows that 14.7%, 17.3% and 25.3% of the children participating in school-meal-plus programme were underweight, wasted and stunted respectively. However, among the non-participants, up to 20.0%, 40.0% and 30.7% were underweight, wasted and stunted respectively. None of the observed differences was statistically significant ($p < 0.05$)

Discussion of findings

Result in table 1 and 2 showed that most of the children from 2-6years old in the two groups had weights and heights which exceeded the NCHS recommended standards while none of them from 7-11years old was able to meet the recommended standards for both height and weight. The fact that the younger children used in this study had better nutritional (weight and height) status than the older ones (7-11years) suggests that mothers take care of their tender children more while the older ones are believed to have grown and can take care of themselves. According to Armar-klemesu, Ruel, Maxwell, Carol, Levin and Moris (2000), mother's care practices towards their children in turn have large positive effect on children's nutritional status. Menon (1996) also reported that child care is a complex set of behavior that ranges from child feeding practices to responses that promote a safe and healthy environment for the child. For the comparison of the nutritional

status of the participating and non-participating children in school-meal-plus programme, the result in table 3 showed that the participants had lower prevalence of malnutrition. This may be due to the contribution of school lunch to their total nutrient intake. This agrees with Cataldo and Debruyune, (1999) who stated that the school lunch should be able to meet at least one third of the children's' daily recommended allowance.

The number of malnourished children (underweight 14.7%, wasting 17.3% and stunting 25.3%) who participated in the school-meal-plus programme were much lower than the national figure of 25% 9% and 42% (Maziya-Dixonm, Akinyele, Oguntona, Nokoe, Sanusi and Harris, 2004) when compared with the number of malnourished non-participating children (underweight 20%, wasting 40% and stunting 30.7%). This implies that school meal-plus programme can be an effective tool in combating malnutrition among school children. It also leads to the rejection of the null hypothesis that there is no different between the nutritional status of participants and non-participants in school-meal-plus programme. The larger number of non-participants who were underweight as compare to participants is consistent with the findings of Hijazii and Abdulatif (1986) in Jordan, where the weights of children participating in the lunch programme were generally higher than non-participants. Only 17.3% of the participants were wasted as compared to 40%of the non-participants. These results compared well with finding of Musamali, Walingo and Mbagaya (2007) in Kenya were 5% of the participants were wasted as compared to 18.2% of non-participants. The result of this study also compared well with those of Kielmann (1988) which also showed high prevalence of wasting among school children aged five to fifteen years. The higher level of stunting among the non-participants in the area of study as compared to the participants indicates that the school-meal-plus may have played a big role in reducing levels of stunting among participants. Since stunting is a long-term deficit, this implies that non-participants could have suffered food deprivation for a long time. According to Musamali *et al*, (2007), participating in the school lunch could thus reduce levels of stunting among them.

Conclusion

The nutritional status of the children who participated in school-meal-plus was better than that of the non-participants. This could be probably due to the contribution of school lunch to total food intake. Hence, effort should be directed towards

improving the nutritional status of school children and this can be fostered through school-meal-plus programme in our primary schools.

Recommendation

Based on the findings of this study, the following recommendations were made.

1. Government should ensure that the beneficiaries of school lunch will not just be pre-primary and primary one pupil in all the public schools rather, it should also include other classes such as primary 2-6 pupils.
2. Every state of the federation not just Enugu state should get involved in the school-meal-plus programme.
3. Priority should be given to increasing agricultural production to ensure the availability of food for consumption.

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