NUTRITIONAL STATUS OF APPARENTLY HEALTHY PRIMARY SCHOOL CHILDREN IN A RURAL COMMUNITY IN IMO STATE, NIGERIA

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ABSTRACT

Background: Malnutrition is a major public health issue in most parts of the developing world because it is associated with increased morbidity and mortality in children. It also affects the academic performance of children and prevents children from fully benefiting from education. Our aim was to assess the nutritional status of apparently healthy school children in a rural community in Imo State, Nigeria.
Method: The study involved a cross sectional survey of 284 primary school children in a rural community in Imo State, Nigeria.
Results: The prevalence of stunting, underweight and wasting in the study population was 37.3%, 26.4 % and 3.5% respectively. The prevalence of underweight malnutrition was more in Males (30.5%) than in females (21.8%). This difference was however not statistically significant.
Conclusion: The high prevalence of stunting and underweight malnutrition in this study is worrisome. Therefore, there is need to strengthen the school feeding programme.
Key words :Malnutrition, stunting, underweight, wasting.

INTRODUCTION

Malnutrition is a major public health issue in most parts of the developing world, where it is associated with up to half of under-five mortalities.[1]This might explain why most of the available studies on childhood malnutrition focused on the pre-school age.[2-4]

However, it is noteworthy that nutritional impairment that begins during the pre-school age may progress into school age if it is left untreated and may have dire negative effects on the academic performance of school age children culminating in poor academic attainment and general well-being of the child.

Child nutritional status is an important measure of poverty in a population; and poverty, malnutrition and disease are interlinked with one another.[5]Malnutrition in children is the consequence of a range of factors, which are often related to poor food quality, insufficient food intake, severe and repeated infectious diseases; or frequently it involves varying combinations of the three.[5]These conditions, in turn, are closely linked to the overall standard of living and whether a population can meet its basic needs, such as access to food, housing and health care.[5] Therefore, child nutritional status assessment not only serves as a means for evaluating the health condition and survival of children but also provides an indirect measurement of the quality of life of an entire population.

Assessing the nutritional status of children is an integral part of monitoring community health and it is crucial for early detection of malnutrition. It is also important in monitoring long-term recovery from severe protein energy malnutrition, as well as in the evaluation of the effectiveness of preventive nutritional programmes.[6]

The nutritional status of children in Amaruru, a rural agrarian community in Imo State has not been studied. In view of the considerable morbidity and public health significance of malnutrition, it is necessary to determine the nutritional status of children where baseline data is not available. This study will serve as a baseline for any future evaluation of proposed nutrition programmes at schools in the area and the state in general.

Method
Study area.

The study was conducted in Amaruru, Orsu Local Government Area (LGA) of Imo State in South Eastern Nigeria.It is predominantly an agrarian community with a mixture of traders, artisans and civil servants. Food crops grown include maize, yam, breadfruit, oranges, bananas and plantain. There is however more emphasis on cultivation of cash crops. There are three Government approved primary schools and a primary health care centre in the community.

Study design

The study was a cross-sectional, school-based, descriptive study. The participants for the study were selected using a systematic sampling technique. Information was collected from all eligible pupils with the aid of a pre-tested questionnaire.

Study population

The study population comprised children from primary one to primary six in all the three schools irrespective of their age. The age of the children was determined by checking the age in the school record.

Ethical approval

Approval to carry out the study was obtained from the Ethics Committee of the Federal Medical Centre, Owerri and Imo State Universal Basic Education Board. Written informed consent was obtained from parents/guardians of the subjects through the Parents Teachers Association. Assent was also obtained from the children.

Inclusion criteria

Children whose parents gave consent.

Children who were duly registered in the school as shown by the school register

Exclusion criteria

Children with known chronic ailment such as sickle cell disease, bronchial asthma, etc.

Any child with deformity such as kyphosis, use of clutches or wheelchair.

Data collection

Pupils who met the inclusion criteria were physically examined using an examination checklist and anthropometric measurements were taken by the researcher. The weights of the children were measured using a clinical spring balance scale (RGZ-160, England) with a platform by the researcher. Each pupil was weighed in the school uniform without shoes and socks. The scale was standardized every morning prior to commencement of weighing using a standard weight of 5 kilograms, and after weighing 10 children in order to ensure the accuracy of the equipment and the quality of the measurements. Weight was recorded to the nearest 0.1 kilogrammes (kg).[7] Height was measured using a well-calibrated stadiometer (RGZ-160, England) with a movable headpiece by the researcher. Subjects were made to stand erect with feet placed together, back and heels in firm contact with the upright bar of the scale and eyes looking straight ahead (Frankfort Plane). With the child in this position, the headpiece was then adjusted until it touched the crown of the head. The height was recorded to the nearest 0.1 centimetre (cm).[7]

Data management and analysis

Statistical analysis of the data was performed using SPSS for Windows, Version 16.0. Chicago, SPSS Inc. Comparative analysis involving two categorical variables was done using chi-square test. The nutritional status of the children was determined using height for age, weight for height and weight for age

Z scores relative to CDC 2000 reference. Children were classified as stunted, wasted, and underweight if their height for age, weight for height and weight for age z score was less than - 2 Z score respectively. The level of significance of each test was set at $P < 0.05$.

Result

The distribution of the subjects based on age group, gender and socioeconomic class is shown in Table I. The mean weight in the subjects was $28.37 + 5.80$ kg, while the mean height was $113.82 + 11.34$ cm.

Table 1: Socio-demographic characteristics of the study population

CHARACTERISTIC	FREQUENCY (n)	PERCENTAGE (%)
AGE GROUP(YEARS)		
5-7	34	12.0
8-10	112	39.4
11-13	121	42.6
14-16	17	6.0
GENDER		
Male	151	53.2
Female	133	46.8
SOCIOECONOMIC STATUS		
Upper class	2	0.7
Middle class	87	30.6
Lower class	195	68.7

Anthropometric index	Age Group	Nutritional Status n (%)		Total n (%)	χ^2	P
		Normal n (%)	*Malnutrition n (%)*			
	5 – 7	28 (82.4)	6 (17.6)	34(100)		
	8 – 10	61 (54.5)	51 (45.5)	112(100)		
Underweight	11 – 13	103 (85.1)	18 (14.9)	121(100)		
	14 – 16	17 (100)	0 (0)	17 (100)	36.80	0.000*
	Total	**209 (73.6)**	**75 (26.4)**	**284(100)**		
	5 – 7	31 (91.2)	3 (8.8)	34(100)		
Stunting	8 – 10	93 (83.0)	19 (17.0)	112(100)		
	11 – 13	47 (38.8)	74 (61.2)	121(100)		
	14 – 16	7 (41.2)	10 (58.8)	17 (100)	64.39	0.000*
	Total	**178 (62.7)**	**106 (37.3)**	**284(100)**		
	5 – 7	34 (100)	0 (0)	34(100)		
	8 – 10	104 (92.9)	8 (7.1)	112(100)		
Wasting	11 – 13	119 (98.3)	2 (1.7)	121(100)		
	14 – 16	17 (100)	0 (0)	17 (100)	7.42	0.06
	Total	**274 (96.5)**	**10 (3.5)**	**284(100)**		

The prevalence of underweight, stunting and wasting was 26.4%, 37.3% and 3.5% respectively. This is shown in Table 1.

Table 1: shows the prevalence of underweight, stunting and wasting and the relationship to age group.

Anthropometric Index	Gender	Nutritional Status		Total n (%)	χ^2	P
		Normal n (%)	Malnutrition n (%)			
Underweight	Males	105 (69.5)	46 (30.5)	151 (100)		
	Females	104 (78.2)	29 (21.8)	133 (100)	2.72	0.09
	Total	209 (73.6)	75 (26.4)	284 (100)		
Stunting	Males	93 (61.6)	58 (38.4)	151 (100)		
	Females	85 (63.9)	48 (36.1)	133 (100)	0.16	0.68
	Total	178 (62.7)	106 (37.3)	284 (100)		
Wasting	Males	147 (97.4)	4 (2.6)	151 (100)		
	Females	127 (95.5)	6 (4.5)	133 (100)	0.72	0.39
	Total	274 (96.5)	10 (3.5)	284 (100)		

Discussion

The prevalence of underweight, stunting and wasting in the study population was 26.4%, 37.3% and 3.5% respectively. The prevalence rate is comparable to previously documented reports.[5,8] In Pakistan, Milan et al[9] that used the same methodology (Z score of less than -2 SD below the median reference) reported a similar result of 29.5% and 35% for underweight and stunting respectively. The reason for the similar results is probably due to the fact that the present study and the Pakistan study were done in developing countries that may have similar risk factors associated with poor socioeconomic status. The prevalence of malnutrition in the present study was lower than the result obtained by Goon et al[10] in Makurdi that documented a prevalence rate of 43.4% for underweight and 52.7% for stunting. One would have expected the prevalence of underweight and stunting among primary school children in Makurdi to be lower than the value obtained, because Benue state is regarded as the food basket of the nation. One possible explanation for the higher value may be because of the differences in the reference standards. The present study used CDC growth standards while the Makurdi study used National Health and Nutritional Examination Survey (NHANES) anthropometric standard. The NHANES anthropometric standard were/was derived from children in the affluent parts of US, thus;

it may not be truly representative of the growth pattern of children in the less privileged parts of the developing world. Hence, direct comparison can only be made with caution. The prevalence of malnutrition in the present study was higher than the prevalence reported in Jos by Akoret al.[11] They reported the prevalence of 10.3%, 11.1% and 2.4% for underweight, stunting and wasting respectively. Although both studies used Z scores of less than -2SD for the definition of malnutrition, the reason for the observed difference is not very obvious.

The high prevalence of underweight malnutrition and stunting in this study is worrisome. Therefore, there is need to strengthen the school feeding programme. For instance, in Imo State (where the study was conducted), children are not feed in the school by the government. The high prevalence rate of malnutrition also reflects poverty, which was widespread in the community as reflected in their socio-economic status. .

Gender differences were also observed in the nutritional status of the children studied. Males had a higher prevalence of underweight malnutrition and stunting than females. This observation is in tandem to the report of/by Fetugaet al.[1]

These studies show that females were generally better nourished than males. The reason for this is not very clear because one would have expected males to be better nourished than the females because the cultural priority placed on male children by the African culture.

This study also observed that chronic malnutrition (stunting) was more prevalent than acute malnutrition (wasting) among school children in the community studied. Similar results were obtained in Calabar, Nigeria by Meremikwu and colleagues.[4] The relatively high prevalence of chronic malnutrition could be a reflection of a longer duration of exposure of the pupils to factors such as poverty, intestinal helminthiasis, diarrhoeal disease and food shortage. This combination of a relatively high prevalence of underweight and a high prevalence of stunting in rural Imo state indicate a possible inadequacy of diet in the younger years. This implies problems with the past and recent nutrition. Therefore, there is need for the introduction of supervised school meals which would improve the poor nutritional status of primary school children living in rural communities in Imo state. Additionally, there is need to improve the socio-economic capacity of the family through strengthening of poverty alleviation schemes. It is hoped that these measures would address the preponderance of underweight and stunting among children in the community.

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