A COMPARATIVE ASSESSMENT OF THE EPIDEMIOLOGY OF MALNUTRITION AMONG PUPILS IN PUBLIC AND PRIVATE PRIMARY SCHOOL IN JOS NORTH LOCAL GOVERNMENT AREA OF PLATEAU STATE

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ABSTRACT

Background: *Majority of school children lack adequate amount of food, thereby inducing malnutrition, which now poses a serious threat to education, particularly in developing countries, including Nigeria. The importance of good nutrition in the proper and optimal development in childhood is indispensible because children are at a stage in life when all the tissues and cells are rapidly growing and organs are developed for specific functions in the child's life.*

Methodology: *A descriptive cross sectional study was conducted among pupils of selected Public and Private schools in Jos North Local Government Area of Plateau state, Nigeria. A multistage sampling method was used to recruit the calculated sample size of 500 pupils; an interviewer administered questionnaires, weighing scale, measuring tape meter were the instrument used for data collection.*

Results: *The socio demographic data of 290 and 210 pupils of the public and private schools respectively were compared. The pupils' ranged between 5-17years with majority between 6-10 years in all the schools. Pupils in the private school were more nourished and had an appropriate weight-for-age more than 90% of the normal range with an ideal height-for-age of 48.0% more than those in the public school.*

Conclusion: *Nutritional imbalance can affect the educational outcome of the children amongst many other things. Measures such as school feeding should be introduced on a national scale in order to alleviate any deficiency state of the pupils.*

Key words: *Malnutrition, pupils, undernutrition, overnutrition, weight-for-age, height-for-age.*

Introduction

Nutrition may be defined as the science of food and its relationship to health. Nutrition is concerned primarily with the processes by which nutrients are utilized for body growth, survival and maintenance. It is the process by which food is assimilated and used for growth of body cells, synthesis of enzymes, hormones, production of energy and substances needed for growth, repair and maintenance of a sense of wellbeing.[1-3] A relationship exist between nutrition and health, failure of an individual to eat the adequate amount of the needed food may lead to the inability of the body to accomplish the necessary growth and development thus leading to wide range of nutritional deficiencies [4-6]; which are the common features of children in the Sub Saharan African, Nigeria inclusive. In Sub-Saharan Africa, 41% of under-five children are malnourished and deaths from malnutrition are increasing on daily basis in the region. Malnutrition is widespread in Nigeria, especially undernutrition in most part of the rural areas.[7, 8] Nutritional deficiencies may arise either as a sequel to disease or as a complication or may be a precursor to the certain childhood conditions. It is of

great significant to a developing nation like Nigeria, who apart from the burden of infectious diseases, it is also faced with an array of evolving non-infectious diseases. The importance of good nutrition in the proper and optimal development in childhood is indispensible because children are at a stage in life when all the tissues and cells are rapidly growing and organs are developed for specific functions in the child's life. Malnutrition in the early years of life, while the brain is in its period of rapid growth can have a serious effect on intellectual development either directly by damaging the central nervous system or indirectly through its deleterious effects on responsiveness to stimuli and interference with learning. Nutritional deficiencies can also have a synergistic relationship with other key illnesses affecting children such as malaria, acute respiratory tract infections and measles. Malnutrition can also be caused by diseases which have the tendency to cause diarrhoea, by reducing the body's ability to convert food into usable nutrients.

Many low income families are unable to provide adequate food that provide good nutrients to the children due to financial constraint and this may be further compounded by a large family size to cater for; and if eventually these children will acquire western form of education, the parents may only be able to afford to enrol them in public primary schools with lesser financial demand [9]; but the reverse is usually the case for the higher income families who tend to fed better and may likely afford to enrol their children in privately owned primary schools with a usually higher financial demand.

The concept of nutritional survey in children is to assess nutritional problems early enough so that proper intervention may be instituted. However these nutritional problems include both problems of under and over nutrition. Presumably, children from middle and upper classes may have more than enough to consume which may give rise to over nutrition in the form of obesity while those from poor financial settings are at an increased risk of under nutrition and its related diseases like diarrhoea, measles, anaemia and gastroenteritis. On the overall, undernutrition and micronutrient deficiency are still the major forms of malnutrition in the Nigerian Child.

Nutritional status of an individual may be determined by conducting a nutritional assessment which may be by anthropometry, biochemical evaluation, clinical examination, dietary intake, ecological studies, functional assessment or vital and health statistics. The most frequency used method is the anthropometry which is the science of measuring the human body such as height, weight, and size of component parts, including skin fold thickness to study and compare the relative proportions under normal and abnormal conditions. Changes in body dimensions reflect the overall health and welfare of individuals and populations. Anthropometry is used to assess and predict performance, health and survival of individuals and reflect the economic and social well being of populations. It has the advantage of its cost effectiveness and non-invasive measure of the general nutritional status of an individual or a population group. Anthropometry can be used for various purposes; it can be used to assess weight-for-height (for measuring short-term changes in nutritional status), weight-for-age (identifies the condition of being underweight, for a specific age. The advantages of this index are that it may reflect both acute and chronic undernutrition although it is unable to distinguish between the two. It can also be used to identify children who are overweight due to overnutrition) and height-for-age (is an indicator of chronic malnutrition. It cannot measure short term changes in malnutrition. This is because immediate changes that take place in acute malnutrition are reflected in weight rather than height).

Data on nutritional state are globally deficient. The statistics most frequently cited is that from the Food and Agriculture Organization (FAO). In its most recent 2010 estimate, 925 million people were undernourished showing a slight decrease when compared with the 2009 figure of about 1025 million people [10] though this is still high when compared with the targets of the Millennium Development Goals. The 2003 Nigeria Demographic and Health Survey revealed that 38% of under-five children in Nigeria are stunted, 29% underweight and 9.2% wasted.[11] The 2004 Food Consumption and Nutrition Survey reported similar trends with 42% stunted, 25% underweight and 9% wasted. [12] This unfavourable trend may be attributed to factors such as the current worldwide economic crisis and the significant increase of food prices in the last several years which have been devastating to those with only a few dollars a day to spend.

Objectives
? To access and compare the socio-demographic characteristics of the pupils in public and private schools.
? To determine the prevalence of malnutrition among the pupils.

Methodology

This was a descriptive cross sectional study conducted among pupils in a Public and Private school all in Jos North Local Government Area (LGA) of Plateau state, Nigeria. This LGA covers an area of 291 km² and a population of 429,300 at the 2006 census. Its headquarters are in the State capital of Jos.[13] A multistage sampling method was used to recruit the calculated sample size of 500 pupils; a total of 290 and 210pupils participated from the Public and Private schools respectively. An interviewer administered questionnaires, weighing scale and measuring tape meter were the instrument used for data collection. Ethical clearance was obtained from the Education Secretary of the LGA.

Results

The socio demographic data of 500 pupils of the public and private schools were compared. The pupils' ranged between 5-17years though majority were between 6-10 years in all the schools.

Table 1: Comparison of socio-demographic characteristics of pupils

Characteristics	Schools			
	Public n=290	%	Private n=210	%
Age(yrs)				
0-5	0	0.0	25	11.9
6-10	120	41.4	140	66.7
11-15	100	34.5	40	19.0
>15yrs	70	24.1	5	2.4
Sex				
Male	170	58.6	130	61.9
Female	120	41.4	80	38.1
Religion				
Christianity	270	93.1	200	95.2
Islam	20	6.9	10	4.8
Ethnicity				
Indigenous	215	74.1	113	53.8
Non-indigenous	75	25.9	97	46.2
Class				
Lower primary	144	49.7	135	64.3
Higher primary	146	50.3	75	35.7
Family type				
Nuclear	113	39.0	153	72.9
Polygamous	90	31.0	42	20.0
Extended	87	30.0	15	7.1
Father's occupation				
Government employed	152	52.4	132	62.9
Non-government	118	40.7	73	34.7
employed	20	6.9	5	2.4
None				
Mother's occupation				
Government employed	114	39.3	129	61.4
Non-government	136	46.9	54	25.7
employed	40	13.8	27	12.9
None				

Two hundred and ninety and 210 pupils from the public and private schools respectively participated in the study. Pupils above 15years old were 24.1% in the public school and both schools had more males than females; Christianity is the most practiced religion. The indigenous tribe among the pupils comprised of Berom, Anaguta, Afizere, Tarok, Mhagawul, Von and Naraguta and the non-indigenous tribe are Igbo, Yoruba, Idoma, Nupe and Tiv. Pupils in lower primary i.e. pre-primary to primaries 2 are more in number in the private but with no obvious distinction between pupils in the higher primaries i.e. primaries 3-6 in the public school.

Table 2: Prevalence of malnutrition among the pupils

Characteristics	Schools			
	Public n≤290	(%)	Private n≤210	(%)
Height-for-age (%)				
<80	15	5.2	5	2.4
80-87.5	75	25.8	41	19.5
87.5-95	55	19.0	12	5.7
>95	145	50.0	152	72.4
Weight-for-age (%)				
<60	19	6.6	10	4.8
60-74	37	12.8	18	8.6
75-89	79	27.2	16	7.6
≤90	155	53.4	166	79.0

The overall prevalence of nutritional stunting was 50.0% and 27.6 %; of these, the severely impaired stunting accounting for 5.2 % and 2.4% respectively among the pupils in the public and private schools. The prevalence of underweight was found to be 46.6% and 21.0%; and the severe category accounting for 6.6% and 4.8% respectively among pupils in the public and private schools. On the overall, pupils in the private school were more nourished and had an appropriate weight-for-age more than 90% of the normal range with an ideal height-for-age of 48.0% more than those in the public school.

Discussion

Malnutrition is the single most common cause of immunodeficiency in the world. Protein energy malnutrition has been identified as a major health and nutritional problem in children especially in parts of the developing world.[14] This is of significance in these group because it can lead to permanent impairment of physical and possibly, of mental growth of those who survive from this condition. The epidemiology of malnutrition will include the frequency of malnutrition among the pupils, where these pupils reside, the location of the school, the family background, individual factors such as base line health status or any inherited

contributory factors detriment to a good healthy condition are among many other factors to be considered to address the concept of epidemiology of malnutrition.

Though there are numerous other contributory factors to these such as poor environment, large family size, poor maternal education, adverse cultural practices, social class of the family and poor feeding practices.[15] An attempt at inquiring about contributory factors was made from the question on the pupils' sociodemographic characteristics. Most of the parents are employed by the government; though the details of their job description was not ascertained by this study which may serve as an important factor that determines the family income and social status because it is an immediate cause and has a direct relationship with feeding practices.

Mother's education contributes to the well being of the children nutritionally and otherwise, however occupation is often closely linked to the level of education attained; majority of the mothers' of pupils in the public schools were not government employed they are either petty traders, farmers or manual workers. A mother's poor knowledge of proper diet in terms of ignorance will affect her weaning practices, alteration of food composition by processing and cooking etc. Other factors, beside food also play an important role in the aetiology of malnutrition such as infection which has the ability of reducing appetite; increase nutrient demand and may cause malabsorption and impair utilization.[16]

Using the Gomez classification for malnutrition which is based on weight retardation, using the percentage weight-for-age, about 53.4% and 79.0% of the pupils in the public and private schools had an ideal weight for age, others having different degrees of malnutrition. A higher prevalence of malnutrition observed among government school children may be due to inadequate dietary intake due to poverty as a factor from a low socio economic background. Measurement of weight-for-age is disadvantaged because by using only this parameter, it is difficult to know if the low weight is due to a sudden acute episode of malnutrition or to a long- standing chronic undernutrition. Height-for-age measurements assess the effect of nutritional status on long term growth; this may be affected by hereditary traits from the family determining height as differences may be seen in some families and other racial factors. Malnutrition assessment using weight for a normal height can

overcome the problem of the commonly used anthropometric measurements which are age dependent; a factor that can limit its usefulness in most developing countries where the correct ages of the children are not always available and even when provided are usually given as an estimate.

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