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Assessment of Nutritional Status of Queens College Students of Lagos State, Nigeria

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Abstract: Malnutrition is a major public health and social problems among secondary school students in Nigeria. The study focuses on the assessment of nutritional status of 40 Queens College Students of Lagos State age 10-19 years. It was glaringly shown that most of the nutrients are lacking with inadequate energy intake especially among students of younger ages.

Key words: Malnutrition, boarding secondary school, dietary intake, anthropometric characteristics

INTRODUCTION

Food supply the body with energy, amino acids, vitamins and minerals which are needed for growth, efficiency and maintenance of cells and tissues in the body and the nutrient requirements of the body depends upon the age, gender, size of the body and the activity patterns needed for survival in a given environment. The process of supplying and receiving nourishment from food is called nutrition. Good nutrition is a prerequisite to child growth and critical for socio economic development. Nutrition assessment is thus the system of determining conditions of nutritional health of a person, or a group of persons. Nutrition can be categorized into 2 distinct classes as adequate nutrition and malnutrition.

Adequate nutrition, i.e., balanced dietary intake, is the right proportion of food nutrients needed for growth, energy and maintenance.

Malnutrition is a pathological state resulting from a relative or absolute deficiency or wrong proportion of essential nutrients. One in three preschool children in the developing world is undernourished, thus violating their human rights and are more likely to have impaired immune system, poorer cognitive development, lower productivity as adults and greater susceptibility to diet related chronic diseases (Smith and Haddad, 2000). Children who suffer malnutrition are more likely to have slowed growth, delayed development, difficulty in school and high rates of illness and they may remain malnourished to adulthood (Scrimshaw, 1998; Abidoye and Eze, 2000). Malnutrition constitutes the most serious risk factor in causing ill health and death (Muller and Krawinkel, 2005), its incidence during early childhood has irreversible negative effects on the intelligence, educability, disease resistance and productivity. Pelletier *et al.* (1995) see malnutrition as a major waste of human energy, causing more than half of all children's deaths worldwide. Malnutrition has damaging implications for people and communities thus hindering the socio economic and human development of a nation, it remains one of the most critical health issues because of its long lasting negative effects. Forbes (1987) estimated that over 400 million worldwide are undernourished, while WHO (2002) and FAO (2004) estimate that 852 million people are undernourished worldwide with most (815 million) living in developing countries. This confirms the ever increasing figure of people that are undernourished globally.

There are essentially four forms of malnutrition viz:

Undernutrition: The consumption of inadequate quantity of food (energy and protein) over an extended period of time, the severe state of undernutrition is referred to as starvation which implies the almost total elimination of food. The effects of undernutrition include among many others, weight loss and wasting. Indices of undernutrition are:

- Stunting, Poor growth in the height of children, i.e., linear growth that failed to reach genetic potential as a result of sub optimal health or nutrition conditions. It is measured via height with respect to age
- Wasting, describes a recent and severe process that has produced a substantial weight loss, usually as a consequence of acute shortage of food or severe sickness. It reflects weight relative to height
- Underweight, a composite of stunting and wasting which is measuring weight with respect to age i.e., body mass relative to age as influenced by the height and weight of the person. Weight 10% below average for height and sex of the individual is said to be underweight

Specific deficiency: The relative or absolute lack of individual nutrients, example is kwashiorkor which is caused by protein deficiency. This is either caused by

non availability or inability to afford such food nutrients due to poverty. A recent study by Okwu *et al.* (2007) shows that age groups below 20 and 20-24 years have greater risk of protein energy malnutrition.

Imbalance: The resultant disproportionate consumption among essential nutrients with or without the absolute deficiency of any nutrient as determined by the requirements of a balanced diet e.g., excessive consumption of carbohydrates which results in pellagra. This sometimes results when persons have preference over some types of food to the other or may be due to season especially in rural areas where the community shifts to a particular brand of food during harvesting.

Over nutrition: The excessive consumption of food quantity over an extended period of time, which results in caloric excess. Indices of over nutrition are:

- Overweight, weights that are >10% above average for height and sex of the individual
- Obesity, a situation where body weight is above 20% than ideal body weight

Body Mass Index (BMI) is a major tool for measuring malnutrition. While according to United Nations (1992) Report on the World Nutrition situation classification, BMI <18 is considered severely malnourished, 18-20 moderately malnourished, 21-24 normal, 25-27 overweight and above 27 obese; the World Health Organization (WHO) expert on physical growth (1995) gave the following classifications of BMI for:

Underweight in kg/m^2 as:
- 17.00-18.49 mild underweight
- 16.00-16.99 moderate underweight
- <16.00 severe underweight

Which are considered to be chronically energy deficient (CED)

Overweight in kg/m^2 as:
- 25.00-29.99 Grade 1
- 30.00-39.99 Grade 2
- >40 Grade 3

A study by Rotimi *et al.* (1999) shows that mortality rates among CED individuals in Nigeria who are mildly, moderately and severely underweight are 40, 140 and 150% greater, respectively than rates among non CED individuals.

Nutritional status contributes significantly to the attendance, concentration and academic achievements of students in schools. Secondary school students are more susceptible to truancy, gangsterism and other social norms if they don't find the school environment comfortable especially due to poor nutrition. To overcome this ugly phenomenon, most parents send their children to boarding schools where the schools are solely responsible for their accommodation and feeding with the high expectation of balanced nutrition, moral discipline and qualitative education based on the extremely higher fees paid in comparison to the fees of day students who return to their parents on daily basis. Unfortunately these boarding schools especially the government's owned have greatly deteriorated and depreciated in quality and service due to poor management, funding and share greed. They now live basically on past glory whereby failure rate of external examinations is on increase. Therefore the purpose of this study is to analyze the nutritional status of one of the oldest and best boarding secondary schools, Queens College of Lagos State, Nigeria.

MATERIALS AND METHODS

Subjects: A sample of forty students was selected across all classes using simple random sampling and the anthropometric characteristics and dietary intake were recorded. The measurements include body weight, body height, age, foods intake, energy intake and corresponding percentage contributions. Probability sampling is necessary for any nutrition survey so that the research findings will at best be certain, unbiased and correct. Witts (1964) points out that with correct sampling, investigation of only a portion of the population can provide accurate, unbiased and representative results with a consequent savings of time, money and staff and less disruption of the entire population. The relatively small sample is justified because of the homogeneous population as a health survey.

Measurements: Anthropometric measurements and dietary characteristics were obtained from the sampled students. The measurements include: Age, body weight, body height, energy intake and food intake while the following were calculated: BMR, BMI and energy balance. To assess the nutritional status of the students, the measurements were compared with international reference standards. Energy balance was used to ascertain their nutrition level, with negative values indicating deficient energy intake. FAO/WHO (1974, 1985) recommended intake of nutrients and energy by age and gender are summarized in Table 1.

RESULTS

The mean distribution of anthropometric variables and dietary characteristics are presented in Table 2.

From Table 2, each age group is deficient in energy, 40% of age group 10-12 years, 15% of age group 13-15 years are deficient in protein while a total of 15% are deficient in protein. It is clear that students in the lower classes suffer more nutritional deficiency. Vitamin C deficiency is prevalent in the school, 80% in age 11-12 years, 70% in age 13-15 years 25% in age 16-19 years and total of 63% overall. About 15% of the sample are CED (BMI <18.5), on the energy balance, 37.5% are deficient.

Table 1: FAO/WHO recommended intakes of nutrients

	---------- Female ----------					---------- Male ----------				
		Energy					Energy			
	Weight	----------		Protein		Weight	----------		Protein	
Age years	Kg	Kcal	MJ	grams	Vit C	Kg	Kcal	MJ	grams	Vit C
10-12	38	2350	9.8	29	20	36.9	2600	10.9	30	20
13-15	49.9	2490	10.4	31	30	51.3	2900	12.1	37	30
16-19	54.4	2310	9.7	30	30	62.9	3070	12.8	38	30

Table 2: Mean measurements of anthropometric and dietary characteristics by age group

		Mean	Mean		Mean energy intake		Mean	Mean
Age	No.	weight	height	BMI	----------		protein	Vit C
(years)	students	(Kg)	(m)	(kg/m^2)	Kcal	KJ	(g)	(mg)
10-12	5	54	1.6	19.8	1179.6	4935.6	38.5	19.4
13-15	27	59.7	1.7	21.6	1543.2	6456.9	55.0	25.7
16-19	8	59.5	1.7	21.9	1788.3	7482.3	70.5	52.4
Total	40	58.9	1.7	21.4	1546.8	6471.8	56.0	30.3

DISCUSSION

In Nigeria today, most secondary school students are malnourished due to socio economic conditions of the parent/guardian. The scenario becomes worrisome in boarding schools where students are grossly underfed with some important nutritional requirements almost lacking in their intake despite exorbitant boarding fees paid by their parents.

The findings of the study show that the energy and nutrients intake of the students are generally low. The findings agree with other findings which establish nutritional deficiencies among rural and urban Nigerian children and adolescents (Ijarotimi, 2004; Okwu *et al.* 2007). Malnutrition among boarding secondary school students has a long term damaging effects on the students and the country at large, public boarding schools that used to be a safe haven and epitome of academic excellence is fast becoming a den of miscreants. It is no more business as usual as many parents loose trust in them and those who can afford the exorbitant rates charged by private secondary schools now opt for them.

Conclusion: Malnutrition in school children remains a major public health and social problem in Nigeria. Most children from low socio economic background who cannot afford the expensive boarding fees get engage in hawking and other "after school hours" job before they can be fed. In view of this, it is recommended that appropriate nutritional intervention programmes be put in place to address the problem.

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