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An Investigation into the Adolescents Nutritional and Dietary Requirements among Secondary Schools in the Volta Region of Ghana

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Abstract

Nutritional requirements change as humans move through different life stages. Adolescence in particular form critical stages in human growth since growth spurt during adolescence stage. Growth and change is rapid during adolescence stage such that kids gain 20% of adult height and 50% of adult weight. For this reason, the requirements for all nutrients increase during adolescence, and this is especially true of calcium and iron. This study examines the adolescent's nutritional and dietary requirements in secondary schools in Ghana. Using three senior high schools, the study found that meals served to students were monotonous and lacked variety. Also, 63.0% of students do not eat breakfast before going to school. This study recommends that schools should engage the services of nutritionists who will be responsible and advice the schools on the nutritional needs of the students. This study hopes to contribute to the study of nutrition and dietary among adolescents, while providing special insight on students in Volta Region and Ghana as a whole.

Keywords: *Nutrition, Dietary, Adolescence, Students, Volta Region, Ghana*

1. Introduction

Several studies have shown that good nutrition form an important part of leading a healthy lifestyle and eating a balanced diet is most appropriate. With the help of physical activity, diet can help reach and maintain a healthy weight, reduce risk of chronic diseases, and promote overall health. Food contains several different types of nutrients, which are all necessary for the development of many vital processes within the human body.

The growth spurt as children move into adolescence because they need plenty of kilojoules and nutrients. This is particular among girls that generally occur between 10 and 11 years of age and among boys between 12 and 13 years. Proper nutritional diet is of great importance in health. Lack of certain foods or an increase of unhealthy foods in a diet can lead to malnutrition, illness and diseases such as iron deficiency, vitamin D deficiency and diabetes among others. Studies have shown an increase in obesity and chronic diseases in children and adolescents are due to the consumption of improper foods, these rates are especially high in deprived communities due to lack of resources, financial limitations among others (Adow et al., 1991; Anderson, 1981; Bennio, 2009; Samuelson et al, 1996). A survey on adolescent food consumption at the adolescent Clinic, Oakland children's Hospital indicates that dietary habits that affect food preferences, energy consumption and nutrient intakes are generally developed in early childhood and particularly during adolescence. The home and school environments play a major role in determining a child's attitude and consumption of individual foods (Glanz et al., 1990; Gutherie, 1979; Khan et al., 1990).

Normally, the energy requirements of adolescents tend to affect their growth rate, and individuals assess their energy needs by their appetite with remarkable precision. As a result a majority of adolescents maintain energy balance, and a varied food intake to provide sufficient nutrients to ensure optimal growth and development. Stress and emotional upsets can seriously affect the energy balance in adolescents, resulting in the consumption of too little or too much food. Mild or severe infections, nervousness, menstrual, dental or skin problems can result in depression of appetite, and those adolescents on marginal diets are the most vulnerable. Emotional stress is often associated with food faddism and slimming (Samuelson et al, 1996). Tuner and Helms (1996) on the other hand discuss the prevalence of overweight and obesity in children and adolescents to be a major nutritional problem and the condition is likely to persist into adulthood.

Ghana as a country, has not progressed generally when it comes to the issue of malnutrition. The problem of adolescence failing to meet dietary requirements is a major challenge in Ghana. Reports indicate that most adolescents often fail to meet dietary recommendations both in terms of overall nutritional status and specific nutrient intakes which leads to common illness in schools. A recent report from the Food and Agriculture Organization of The United Nations (FAO) indicates poor health indicators among children are stagnating. For example, "low access to health services and to safe water and sanitation, high incidence of malaria and malnutrition as an underlying factor are among the main causes of mortality" (www.fao.org). According to FAO, Ghanaian diet is largely composed of starchy roots (cassava, yams), fruit (plantain) and cereals (maize, rice) (www.fao.org). Starchy foods are common whilst diversity of diet is very low. This situation is different from people who lived in rural and semi-urban areas. The report further indicates that the quantity of protein and lipids in dietary energy supply among the Ghanaian population is lower than recommended (www.fao.org).

Studies on nutrients and dietary among children are on the increase (Burton and Foster, 1988; Champman, 1993; Dennison, 1987). However, studies examining dietary and nutrients in school going adolescents in Ghana is very scanty and limited. Thus, this study examine whether adolescents dietary requirements are met in boarding schools in Ghana. Ghana's population is fast growing and adolescents constitute the greatest part of the population (GSS, 2010). A study into the dietary and nutrition among adolescents in Ghanaian schools will inform policy makers, politicians, bureaucrats,

and nutritionists, particularly, in Ghana Education Service (GES) to be wary of the dangers of poor nutrition among adolescents in Ghana and how to address it.

The rest of the paper is structured as follows: section two examines adolescents and nutrition. The third section assesses the nutritional intake of adolescents in Ghana. The fourth section details the research design and methodology. While the fifth section examines the results, the sixth section details the discussion, conclusion, limitation and recommendations for future research.

2. Adolescents and Nutrition

The adolescent age is a fast growing period in the life of an individual. According to Kumar (1989), adolescence refers to a period of physical transition to maturity that starts usually at the age of twelve or thirteen years. Attitudes towards adolescence differ in different cultures, and the social and psychological impact on the adolescent gets varied in accordance with cultural and social patterns. Hurlock (1973) traces the term adolescence from the Latin word 'adolescent', meaning 'to grow' or 'to maturity'. Primitive people in earlier civilizations did not consider puberty and adolescence to be distinct periods in which reproduction is possible (Dwyer, 1981; Fleck and Munves, 1962; Furthing, 1991). The term "adolescence" today has a broader meaning and includes mental, emotional, social as well as physical maturity. Legally, in Ghana, an individual is mature at the age of eighteen. However, studies of changes in behaviour throughout adolescence have revealed not only are changes more rapid at the beginning than in the latter part of adolescence but also that behaviour and attitudes in the early part of the period are markedly different from those in the latter part. The distinction between early and late adolescence is arbitrarily placed at around seventeen years, the age when the average boy or girl enters Senior High School. Tuner and Helms (1996) also says that adolescence is the stage of life between childhood and adulthood. Like other phrases of life cycle, adolescence offers numerous developmental changes including pronounced physical change, psychological search for identity, and heightened levels of socialisation (Glanz et al., 1990; Gutherie, 1979; Khan et al., 1990).

In the past, in Ghana, it was fashionable to refer to adolescence as a storing and stressful stage of life. Inner turmoil was an expected companion and attention was usually directed towards teenagers' problems. Though adolescents can have problems, most of today's researchers have altered their perspective of the teenage years. The general conclusion that there is conflict and disruption throughout all of life's domains is not a typical pattern of development for adolescents (New and Livingstone, 2001; Ruxton and Livingston, 1995; Samuelson et al., 1996). The excluding focus on problems of adolescents is misleading because most teenagers successfully meet changes of this age.

Wardlaw and Insel (1993) indicate that adolescents at the peak of their growth velocity required large quantities of nutrients. Adolescents require twice the amount of calcium, iron, zinc, magnesium and nitrogen in their bodies during the years of growth spurt as compared to that of other years. Nutrition influences growth and development throughout infancy, childhood, and adolescence (WHO, 2004). During the growth spurt, 37% of bone mass may be accumulated. Malnutrition delays physical growth and maturation in adolescence. Stunning delayed nutrition compounded risks of adolescent pregnancy (Manual for Health Provers, 2005). Poor nutrition may delay the onset of menarche due to decreased available energy (WHO, 2004). Iron deficiency is recognized as the main nutritional problem in adolescents especially in girls. Malaria, schistosomiasis, hookworm infections, tuberculosis and HIV may further increase iron requirements in adolescents. Calcium requirements for skeletal growth are greater in adolescence than in childhood (WHO, 2004). Girls especially need adequate calcium intake to reach peak bone mass and to minimize bone loss during menopause. Adolescents who are less than two years post-menarche may enter pregnancy with reduced nutritional deficiencies. The likely pregnancy outcomes are low birth weight and prematurity, material mobility and mortality and other socio-cultural and economic consequences.

In their study on Food Habits and Energy and Nutrient intake in Swedish Adolescents approaching the year 2000, Samuelson et al (1996) state that sound nutrition plays a potential role in the prevention of several chronic diseases, including obesity, coronary heart disease, and certain types of cancer, stroke and type 2-diabetes. Nutrition is a priority area for healthy people. To help prevent diet-related chronic diseases, healthy eating behaviours should be established in childhood and maintained during adolescence. Unfortunately, national surveys have found that adolescents often fail to meet dietary recommendations, both in terms of overall nutritional status and specific nutrient intakes. Many adolescents receive a higher proportion of energy from fat and have a lower intake of vitamin A, folic acid, fibre, iron, calcium, and zinc than recommended. Vitamin A and calcium consumption decrease with increasing age (Samuelson et al, 1996). The low intake of iron and calcium function and physical performance, and inadequate calcium intake may increase the risk of developing osteoporosis in later life. Samuelson et al, (1996) argue that understanding adolescent eating habits is the key to evaluating nutritional adequacy and preventing diet-related diseases in life.

3. Nutritional intake of Adolescents in Ghana

Ghana is a lower middle income country located in Sub-Saharan Africa with GDP of $38.65 billion and a population of 26.44 million (World Bank, 2014). Like any lower middle income country, there are many challenges in domestic production of food, not to mention production for export. As such, many of these countries that are in the lower middle income country group rely on importation of food. The adolescent population is fast growing with many problems that confront them, including the consumption of well-balanced diet for adequate growth. Owusu et al (2007) in their study found that Ghanaian adolescents consumed for an average of 3 servings of fruit, 2 servings of vegetables and 3 to 4 servings of milk per week. The consumption of candy and soft drinks is between 2 and 4 times per week. The result of this study shows the lack of well-balanced diet in the food consumed by adolescents in Ghana. The nutritional requirements of the adolescents were conditional primarily by increased appetite and a spurt in growth which occurs at puberty; in boys this was responsible for a gain in height of about 20cm and in weight of 19kg but usually less in girls (Southon, 1993; Weaver, 2000). Studies have shown that serious nutritional problems in addition to obesity are wilful starvation (anorexia nervosa) bulimia nervosa and iron deficiency anaemia, and that, adolescent pregnancies further

complicated the marginal nutrition by introducing health risks to both the mother and the frequently low-birth weight babies (Burton et al, 1988).

Rapid urbanization is gradually changing food consumption patterns in urban areas in Ghana. This is due to the increasing demand for imported products, including food, especially wheat and rice (www.fao.org). FAO reported that the last decade has seen a considerable decrease in the prevalence of undernourishment in Ghana. However, purchasing power and problems of physical access due to a lack of road infrastructure remains a huge problem that confronts Ghana as a country. This hinders access to food and other amenities in majority of the areas that lack good roads.

Bone and muscle growth in boys, according to Mottram (1979) are the dominant features of the adolescent growth spurt. Food containing calcium and protein of high biological value should therefore be given in large amounts at this time. Similarly, girls at puberty should eat more of iron-rich foods since the loss of iron was becoming larger than boys due to menstruation (Mottram, 1979). Iron deficiency anaemia is perhaps the most common disorder among women the world over and Ghana is no exception. Zinc is another important nutrient in adolescence because of rapid rate of growth and sexual maturation. Many nutrients that support adolescence development is lacking in diet of school going adolescents in Ghana. Iodine deficiency disorders are still prevalent in Ghana, even though, the national programme on the use of iodized salt has been implemented (www.fao.org).

The Recommended Dietary Allowance (RDA) is based on age and not on the growth rate of adolescents. Hence, must not be applied to individual adolescents but rather, serve as a basis for discussing nutritional needs of adolescents in general and evaluating diets of grown-ups (Hutchings, 1979). Studies have found that as many as 50% of female adolescents selected diets had less than 2/3 of the RDA for vitamin B6, there is considerable debate about the amount of niacin, riboflavin and thiamine required for normal growth. Though, the nutritional requirements for boys and girls reach the maximum during the period of adolescence (Fleck and Munves, 1962). It is only pregnancy and lactation that girls surpass their teenage requirements Girls are generally considered to be at higher risk of inadequate riboflavin intake than boys (Fleck and Munves, 1962). There have been various programmes on nutrients and dietary supplementation in Ghana, coverage of these programs remains to reach many towns and villages to address the dietary challenge facing Ghana as a low middle income country in sub-Saharan Africa.

4. Research Design and Methodology

4.1. Research design

Descriptive survey research design was used to examine whether adolescents dietary requirements are met in boarding schools in Ghana. According to Gay (1987), descriptive research involves collecting data in order to test hypothesis or to answer questions concerning the current status of a subject of the study. Best and Khan (1987) also posit that, descriptive research methods is a non-experimental research design and are ideal for dealing with the relationship among non-manipulative variables. Babie (1990) further recommends that descriptive sample survey can be used for the purposes of generalizing from a sample of a population so that inferences can be made about some characteristics, attributes or behaviours of population. Hence, generalizations can be made from the sample used in this study to make it applicable to other schools, particularly, community schools in Ghana.

Three schools were randomly selected from the population of all 50 senior secondary schools located in the Volta Region of Ghana. Each school has three levels, including first year, second year and third years. Each level also has four streams of classes with an average population of twenty students per each stream. One stream of class was randomly selected from each level from each of the three schools. The total number of randomly selected students for the study was 180 and a total of 174 students participated in the study from the three schools. Based on the official enrolment information provided by the Regional Directorate of the Ghana Education Service (GES), the sample was representative of the senior high school population in the Volta Region.

According to Obeng (1996), the possibility of reaching valid conclusion depends on a sample population based on two general laws. Thus, the sample population should be reasonably large from a truly random selection, and the larger the number, the more reliable the information provided. Out of a total of 180 students randomly selected from the three schools and received survey questionnaires, 174 completed the questionnaires and returned them, indicating 96.3% response rate.

4.2. Data collection

The data collection is a major challenge that confronts developing countries and Ghana is no exception. Most challenging is the unreliable nature of the postal system in Ghana. For this reason, the researcher distributed the questionnaire to the participants in person and collected them in person after two weeks. A guided interview was also adopted to ensure that the results are reliable and reflect the true intent of the study participants.

A total of twenty questions were used to collect information from the students. The questionnaire covered demographical information (names, sex, schools, and age). The questions covered types of food eaten, food enjoyed mostly, how often meals were skipped, number of times they ate at school and others. Their knowledge of the nutritional values of the food served was obtained through structured interviews. In order to ensure that the questions are valid, a pre-test was conducted on a sample population which is not part of the selected sample for the main study. This was to ensure that the questions were precise and unambiguous. Percentages, frequency distribution tables and figures were used to analyse the data collected. Comparison of data in the Tables and descriptive statistics were used to analyse the data.

5. Results

Table 1 below shows the distribution of questionnaire among the three schools that participated in the study. Of the total of one hundred and eighty questionnaires distributed to students in the three Senior High Schools. One hundred and seventy four questionnaires were retrieved indicating 96.3% response rate

Table 1 Distribution of Questionnaires

School	No. Distributed	Response Rate
Mawuli School	60	57 (95%)
Mawuko Girls	60	59 (98%)
OLA Girls	60	58 (96%)
Total	180	174

The study revealed that as high as 63.0% of students in the three senior high schools did not eat breakfast before going to school. The respondents cited time constraints and poverty of their parents as contributing factors. Majority of the students (84.36%) who ate breakfast generally preferred taking light breakfast. Time constraints were cited for their preference. Most of the respondents who were day students explained that light breakfast takes shorter time to prepare than heavy breakfast. Results of the study also reveal that the students generally ate rice and kenkey with stew for lunch and dinner. Their food intake usually was adequate in carbohydrate, protein and fruits (72.0%). The foods are varied and meet the standard daily requirements for nutritional and dietary. However, the study reveal that majority of the students do not take breakfast which is one of the important meal of the day and a necessary meal for a growing adolescents like those in senior high schools.

6. Discussion, Conclusion, Limitations and Direction for Future studies

This study seeks to examine whether adolescents dietary requirements are met in senior high schools in Ghana. Reports indicate Ghana has made steady progress in achieving the Millennium Development Goals (MDGs) of the United Nations (www.fao.org). However, the nutrition, health and mortality condition of young children, adolescents, and women remains a challenge. Undernutrition which is associated with widespread micronutrient deficiencies is very high in Ghana. The situation if not checked will lead to deficiencies in many young children and growing adolescents. The need to address these challenges should be giving urgent attention.

In examining whether the adolescent dietary requirements are met in senior high schools, three senior high schools were randomly selected in the Volta Region of Ghana. The results of the study show that most students do not eat breakfast before going to school. Time constraints and the level of poverty of their parents were cited as the contributing factors. In the instances where breakfast is taken, they are mainly of carbohydrates, protein and fruits. The food eaten to a large extent, meet the standard dietary and nutritional requirements of adolescents. The study further reveals that majority of the students have adequate knowledge on the nutritional value of the foods they consume. Even though the food students eat meet dietary and nutritional requirements for adolescents, there is the need to address the challenge of inability of students to take breakfast before coming to class in the morning to have morning lessons.

This study is without limitations. This study is limited to senior high schools located in Ghana and Volta Region in particular. The study focuses on nutritional and dietary requirements for adolescents. Hence, the study is limited to only adolescents only. The study is further limited to students in senior high schools, excluding students in Colleges and Universities or other tertiary institutions across Ghana. Generalizing the findings in this study to all adolescents in Ghana will be problematic since the study only focuses on school going adolescents in senior high schools.

Since the study is limited to the nutritional and dietary requirements for adolescents in three Senior High Schools, this study recommends that future studies should focus on junior high school and colleges and Universities. Also, assessment methods like clinical and laboratory tests and skin fold measurements which were not taken in this study should be added in further studies. Additionally, future studies should use parametric model with larger sample size.

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