OBESITY STATUS OF BASIC SCHOOL PUPILS IN CAPE COAST, GHANA

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ABSTRACT

The purpose of this study was to assess the obesity status among primary school pupils in Cape Coast, Ghana. A secondary purpose was to establish the differences in obesity status between male and female pupils. Two hundred and eighty-nine primary four pupils (males = 123, females = 166, mean age = 11) were purposively selected for the study. Centre for Disease Control standards for Body Mass Index, (weight-for-age growth charts for girls and boys) were used in classifying the weight status of the pupils. Additionally, independent sample t-Test was used to explore the difference between boys and girls in their obesity levels. The results indicated that 21% of the pupils studied were obese. Additionally there was a significant difference, t (287) = -2.26, p < .05, between male and female pupils with the females more obese (M = 19.60, SD = 5.63) than the males (M = 18.28, SD = 3.67). This indicates that obesity is high in primary school children with rates are higher in girls than in boys. It was recommended among others that body composition screening be incorporated into the admission process of every school and be carried out at regular intervals.

Key Words: obesity, children, body mass index, primary school pupils

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Introduction

Everyone desires to have better health without diseases. It is the ultimate objective for utmost happiness in human life. Healthy living is about making healthy choices everyday; healthy choices that keep us fit physically, mentally and socially. As people compile lists of what they wish to get out of life, most people wish to have good health. Unfortunately, in today's sedimentary society most people are simply unwilling to do anything to reach this goal of utmost importance. What is a mansion, or even a loving family, when one is incapacitated or dead due to a harmful way of life? Edlin, Golanty and McCormack-Brown (2002), and Miller (2010) have identified factors that are strongly associated with good health and vitality. Prominent among these factors are diet and exercise, which if not balanced will cause obesity (World Health Organization [WHO], 2014a).

Poor nutrition can lead to reduced immunity and increase peoples likelihood to contracting diseases (WHO, 2014). There were 923 million malnourished people in the world in 2007, an increase of 80 million since 1990 (Diet, 2010). Malnutrition is estimated to contribute to more than one third of all child deaths, although it is rarely listed as the direct cause (WHO, 2010b). In the developing world, an estimated 230 million (39%) children under the age of five are chronically malnourished and about 54% of deaths among children younger than five are associated with malnutrition. Malnutrition is a major public health and development concern with important health and socioeconomic consequences (de Poel, Hosseinpoor, Jehu-Appiah, Vega & Speybroeck, 2007).

WHO (2010c) notes that levels of inactivity are high in virtually all developed and developing countries. In developed countries more than half of adults are insufficiently active. WHO (2002) estimates that about 3% of disease burden in developed countries are caused by physical inactivity. In rapidly growing large cities of the developing world, physical inactivity is an even greater problem. Physical inactivity can significantly impact on a person's health by contributing to a number of conditions such as stroke, diabetes and hypertension. Unhealthy diets and physical inactivity are two of the main risk factors for raised blood pressure, raised blood glucose, abnormal blood lipids, overweight or obesity and more importantly major chronic diseases. Obesity is an independent risk factor for cardiovascular disease (Yusuf , Vaz & Pais, 2004) and ultimately cardiovascular disease (CVD) risks have been established in people particularly obese children (Ogden, Flegal, Carroll & Johnson, 2002). Children who are obese are at risk for adult health problems such as heart disease and stroke (Freedman,

Wang, Thornton, Mei, Sopher, Pierson, et al., 2009).

Ghana had the largest number of overweight and obese people of over three million out of the estimated population of 20 million when compared to seven African countries (Ghana News Agency, 2007). In Accra, cardiovascular diseases rose from being the seventh and tenth cause of death in 1953 and 1966 respectively, to becoming the number one cause of death in 1991 and 2001 (Agyei-Mensah, 2004). Ghana Statistical Service, Noguchi Memorial Institute for Medical Research and ORC Macro (2004) also demonstrate that prevalence of obesity or overweight among adult (non-pregnant) women across the country increased 2.5 folds in ten years from 10% in 1993 to 25% in 2003. Hill, Anarfi, Darko and Duda (2005) reported that 66% of cohorts of 3,200 women in Ghana were overweight and 6% were morbidly obese.

Genes are important in the determination of a person's susceptibility to weight gain (Rosenbaum, Leibel & Hirsch, 1997). That notwithstanding, the global epidemic of obesity has resulted mainly from societal factors that promote sedentary lifestyles and the consumption of high-fat diets (WHO, 2000). According to WHO (2002), environmental factors may discourage children in urban or city centres from participating in physical activity. An increase in the use of "passive" modes of transport at these places has also been associated with declining physical activity levels. Television and computers have become the major forces in the issue of physical inactivity which is a growing problem in today's urban centres. WHO (2013) stressed that childhood obesity is a grave public health concern of the 21st century that needed the attention of all governments. It has become imperative to be responsive to childhood obesity because according to WHO (2013), overweight and obese children are likely to stay obese into adulthood and more likely to develop non communicable diseases like diabetes and cardiovascular diseases at a younger age. It has therefore become necessary to ascertain the enormity or otherwise of the situation and devise measures to address them.

Conceptually, a child's weight status is determined using an age and sex specific percentile for BMI (Centers for Disease Control and Prevention [CDC], 2012). This percentile compares the child's weight to that of the peers of the same age and sex. CDC Growth Charts are used to determine the corresponding BMI-for-age and sex percentile. According to Barlow and the Expert Committee (2007), for children and adolescents (aged 2—19 years), obesity is defined as a BMI at or above the 95th percentile for children of the same age and sex.

Ofei (2005) asserted that obesity is a common but often underestimated condition of clinical and public health importance in many countries around the world. He lamented on how societies have embraced obesity as a sign of well-being or a symbol of high social status and how health care professionals and the public have refused to recognize it as a disease in its own right. The amount of excess fat in absolute terms, and its distribution in the body, either around the waist and trunk (abdominal, central or android obesity) or peripherally around the body (gynoid obesity) contribute to the weight status of every individual and have important health implications.

According to Jay, Kalet, Ark, McMacken, Jo Messito, Richter, et al. (2009), obesity is associated with a greater risk of disability or premature death due to type 2 diabetes mellitus and CVDs such as hypertension, stroke, coronary heart diseases, gall bladder disease, certain cancers (endometrial, breast, prostate, and colon). They emphasized that the condition is also associated with non-fatal conditions including gout, respiratory conditions, gastro-oesophageal reflux disease, osteoarthritis and infertility. Obesity also carries serious implications for psychosocial health, mainly due to societal prejudice against fatness.

Obesity among Ghanaian adults is common, particularly among the elderly, females and urban dwellers (Amoah, 2003). Amoah's survey which involved two urban and one rural communities in the Greater Accra Region showed an overall crude prevalence of obesity with Body Mass Index (BMI e" 30 kg/m2) of 20.2% and 4.6% for females and males, respectively. The age-standardized prevalence of adult obesity was 13.6%. Obesity increased with age, peaking in the 55 to 64 year age group. Residents from the high-class residential area had higher BMI compared to subjects from the lower class suburb. Urban residents had higher BMI compared to rural subjects.

Obesity during adolescence has been found to increase mortality rates during adulthood (Must, Jacques, Dallal, Bajema & Dietz, 1992). Childhood obesity has direct positive correlation to adult obesity (Goran, 2001; WHO, 2013) resulting in its associated risk of psychosocial, physical disabilities and other health consequences. This study ascertained the obesity status among primary school pupils in Cape Coast, Ghana. A secondary purpose was to establish the differences in obesity status between male and female pupils.

Methodology

The study was a descriptive survey. The target population of 1,237 (The Admission List) constituted all pupils in one primary school for the 2011/2012 academic

year. The accessible population was all primary four pupils who were in school at the time of data collection. The sample size was 289 participants (Aged 8-11 years) comprising five streams. The research instrument used for the study was the Body Composition Analyzer SC 330 and the HR-200 Wall Mounted Height Rod in measuring the BMI of the pupils. These devices have been validated by the Food and Drugs Administration (FDA) of the United States of America (Tanita, 2010). The FDA (2009) reported that the above devices are safe and effective and can be used by the populace. Data collection was done at the premises of the school, after the school authority have consented to participate. Again parents of the pupils were written to. Only children whose parents consented were included in the study. In measuring the BMI, participants' heights were measured in centimetres using the Tanita HR-200 Wall Mounted Height Rod. This instrument was mounted against a wooden plank (which had been fixed 90Ú to the ground). The participants were then asked to stand on the BMI Analyzer which automatically displayed the pupil's weight. An input of the height was made. The Body Composition Analyzer then gave a print-out indicating the BMI. One week was used for the data collection. In data analysis, the various BMI's of the pupils were plotted into the CDC's Growth Chart to delineate those that were obese. Independent samples t-Test was employed to explore the significance or otherwise in the observed differences in obesity levels between boys and girls.

Results

Table 1: Weight Status of Pupils

Categories	f	%
Obese	60	20.8
Overweight	11	3.5
Normal	208	72
Underweight	10	3.8
Total	**289**	**100**

Results in the Table 1 indicated that 60 (20.8%) pupils studied were obese. This means that about 21% of pupils have weights that are too much for their ages and which may impair their health.

Table 2: Independent Samples t-Test between Male and Female Pupils on Obesity Status

Parameter	Groups	N	$\bar{x}$	SD	t	df	Sig.
Obesity Status	Male	123	18.3	3.7			
					2.26	287	.02
	Female	166	19.6	5.6			

Table 2 showed the t-Test value (t [287] = -2.26, p<.05), is indicative of a significant difference between males and females pupils in their obesity status. The mean values of 18.28 and 19.60 for males and females respectively meant the females were more obese than the males. There is therefore enough statistical evidence to reject the hypothesis that there is no significant difference between male and female pupils in their obesity status.

Discussions

A good number of pupils studied were obese. For as many as 21% of primary four pupils alone, to be obese showed the enormity and gravity of the obesity situation in basic schools. This result was expected due to transitional trends in urbanization, a shift in dietary patterns from reliance on traditional staples such as maize and sorghum to more processed foods and decreased physical activity levels (Yusuf, Reddy, Ounpuu & Anand, 2001).This situation can be described as a "time-bomb". This revelation has been envisaged by a number of researchers (Ghana Statistical Service, Noguchi Memorial Institute for Medical Research & ORC Macro, 2004) who have warned of dire consequences if the trend is not reversed. Obesity is increasing at an alarming rate both in developed and developing countries due mainly to unhealthy diets and physical inactivity (American Heart Association, 2003; WHO, 2000). At an individual level, a combination of excessive food energy intake and a lack of physical activity are thought to explain most cases of obesity (Lau, Douketis, Morrison, Hramiak, Sharma & Ur, 2007). Limited number of cases are due primarily to genetics, medical reasons, or psychiatric illness (Bleich, Cutler, Murray & Adams, 2008). In contrast, increasing rates of obesity at a societal level are felt to be due to an easily accessible and palatable diet (Drewnowski & Specter, 2004), increased reliance on cars, and mechanized manufacturing (James, 2008). According to WHO (2000), environmental factors have been the main driving force

behind increasing obesity levels and that has to be dealt to curb the menace. WHO (2010c) is of the view that at least 60% of the world's population has fail to complete the recommended amount of physical activity required to induce health benefits.

A review (Keith, Redden & Katzmarzyk, 2006) identified ten other possible contributors to the recent increase of obesity. These were insufficient sleep, endocrine disruptors (environmental pollutants that interfere with lipid metabolism), decreased variability in ambient temperature, increased use of medications that can cause weight gain (e.g., atypical antipsychotics), proportional increases in ethnic and age groups that tend to be heavier, pregnancy at a later age (which may cause susceptibility to obesity in children), epigenetic risk factors passed on generationally, natural selection for higher BMI, and assortative mating leading to increased concentration of obesity risk factors (this would increase the number of obese people by increasing population variance in weight). While there is substantial evidence supporting the influence of these mechanisms on the increased prevalence of obesity, the evidence is still inconclusive.

In children, physical activity levels are declining because of less walking and physical education (Salmon & Timperio, 2007). In both children and adults, several researches (Gortmaker, Must, Sobol, Peterson, Colditz & Dietz, 1996; Vioque, Torres & Quiles, 2000) have established an association between physical inactivity and obesity. A 2008 meta-analysis found 63 of 73 studies (86%) which indicated an increased rate of childhood obesity with increased media exposure, with rates increasing proportionally to time spent watching television (Ezekiel, 2008). Obesity in children is associated with severe impairments in quality of life. It is associated with a greater risk of disability or premature death due to type 2 diabetes mellitus and CVDs such as hypertension, stroke, coronary heart diseases, gall bladder disease, certain cancers (endometrial, breast, prostate, colon) and non-fatal conditions including gout, respiratory conditions, gastro-esophageal reflux disease, osteoarthritis and infertility. Obesity also carries serious implications for psychosocial health, mainly due to societal prejudice against fatness.

According to WHO (2001), obese children are more likely than their non-obese counterparts to grow into obese adults. This means that the growing concern of obese adults in Ghana (Ghana Statistical Service, Noguchi Memorial Institute for Medical Research & ORC Macro, 2004; Hill, Anarfi, Darko & Duda, 2005) was probably due to the high prevalence of obese children.

Several studies (Borders, 2006; Martorell, Kettel Khan, Hughes & Grummer-Strawn, 2000; Puoane, Steyn, Bradshaw,

Laubscher, Fourie, Lambert et al., 2002; WHO, 2010d) have stressed that differences exist in male and female obesity status and that females are more obese than males. Puoane, Steyn, Bradshaw, Laubscher, Fourie, Lambert et al. revealed that more women are either overweight or obese, with rates of obesity five times higher for black women than for black men.

Literature points to several risk factors (calorie intake-expenditure balance, reduction in physical activity and too refined diets) for obesity in developing countries (Popkin, 1994; WHO, 2000). However, by themselves, these factors cannot explain why the rates of obesity are significantly higher for women than for men in developing countries. According to Kannel (1988) the differences in obesity levels may be due to higher levels of low density lipoproteins (LDLs) cholesterol in females. Research (American Heart Association, 2010; Collins, 2007) has shown that high cholesterol levels are strongly linked with obesity.

Though the general understanding is that females are more obese than males, there are few researchers who think otherwise. According to Catala-Niell, Estrany, Proenza, Gianotti and Llado (2008) and Yakar, Nunez, Pennisi, Brodt, Sun, Fallavollita et al. (2006), male mice have a higher susceptibility to becoming obese compared to female mice. This of course is in animal studies but has not stood its grounds in the humanities. Globally, men and women face different risks of obesity. Data from the WHO suggest that in most Western European countries, obesity is more prevalent among women than men. In 138 of 194 countries for which the WHO reported obesity statistics, women were more than 50% more likely to be obese than were men (WHO, 2010d).

Revelation from this study emphasizes the utmost need to take physical education (PE) serious in schools. It is through physical education and sports that pupils exercise their bodies. Unfortunately, most schools have even remove physical education from the school's time table. A poll conducted by Harvard School of Public Health (2013) indicated that almost seven in 10 parents (68%) report that their child's school does not provide daily physical education classes. Cornell University (2013) founds that increasing the amount of time that elementary schoolchildren spent in gym class reduces the probability of obesity. Models developed by Cawley, Frisvold & Meyerhoefer (2012) indicate that additional time in PE lowers a child's BMI z-score and the probability of becoming obese. It is recommended that students to participate in PE for at least 150 minutes per week (US Department of Health and Human Services, 2010). Therefore schools should be encouraged and monitored to provide physical education lessons.

Again, diet is critical in accumulation of excess weight. A global shift in diet towards increased intake of energy-dense foods that is high in fat and sugars but low in vitamins, minerals and other healthy micronutrients may be responsible for the obesity situation (WHO, 2014b). Schools have to intensify nutrition education and encourage parents to have their wards fed healthy meals in school.

Conclusions

Based on the findings, it was concluded that obesity may be high in primary school children in urban centers. Gender may be a determining factor in obesity with rates higher in girls than boys.

Recommendations

The following recommendations have been made based on the findings of the study:

1. The Parent-Teacher Association (PTA) and schools should organize periodic health education campaigns and talks for parents and pupils. With the cooperation of the headteacher, health talks should be delivered during PTA meetings, Speech and Prize Giving Days and Club Meetings. These campaigns or talks should press home the need for regular health examination since it is through these that teachers, pupils, and more especially parents might be made aware of the obesity situation and the need for precautionary measures.
2. Departments involved in issues of health and health groups in and around Cape Coast should be encouraged to embark on body composition screening programmes for primary school children in Cape Coast.
3. Body composition screening should be included in the admission requirements of basic schools and conducted at regular intervals so that parents and teachers could monitor the weight of pupils.

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