

# Prevalence And Determinants Of Overweight And Obesity Among School-Aged Children In Selected Churches In Abura-Pedu In Cape Coast North Constituency

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**Abstract:** *The impact of overweight and obesity on children is dire because besides its physical and health consequences on them, it also retards their educational progress. These conditions have become public health concerns and therefore engaged the attentions of practitioners and organisations including the World Health Organisation. With several studies reporting of a rapid growth in child overweight and obesity, this research sought to determine the prevalence and related factors of overweight and obesity among school-aged children from some selected churches in Abura-Pedu within the Cape Coast North Constituency of the Central Region. It specifically assessed the physical activities and dietary behaviours of the children and further examined the socio-demographic risk factors of overweight and obesity.*

*A quantitative cross-sectional design was employed, and a questionnaire was designed and administered to 254 mothers of the children who were randomly selected from four main churches in the area. In addition, the anthropometric measurements were taken on the children to determine their percentile body mass indexes based on WHO's (2000) standards. Data were captured, validated and analysed using the SPSS.*

*It was found that a substantial proportion of the children were either overweight or obesity. The study concluded that since mother's level of education is a significant predictor of the body mass index of their children, equipping them with adequate knowledge on child nutrition and physical activities is crucial in having healthy children and by extension, a happy family.*

**Keywords:** *Overweight, Obesity*

## I. INTRODUCTION

### BACKGROUND OF THE STUDY

Overweight and obesity are major public health problems in many parts of the world, with significant impact on both physical and psychosocial health. Obesity affects all ages and socio-economic groups (Dehghan, Khtar-Danesh & Merchant, 2005; Summerbell, Waters, Edmunds, Kelly, Brown & Campbell, 2009). The prevalence of obesity is increasing at an alarming rate worldwide in both developing and developed countries World Health Organization, (WHO, 2008).

Obesity is a condition of abnormal or excessive fat accumulation in the adipose tissue to the extent that health maybe impaired (WHO, 2002). Obesity results when the number or size of fat cells in a person's body increases. A normal sized person has between 30-35 billion fat cells which increase in size and later in number (Wabitsch, 2002). Childhood obesity is rapidly emerging as a global epidemic (WHO, 2002). Childhood obesity is not only a daily problem for most pediatricians and parents in most economically developed countries but also it is becoming a burden for developing countries as well (Wang, Montein and Popkin, 2002).

Childhood overweight and obesity have been an issue of concern for both developing and developed countries (Lobstein, Baur & Uauy, 2004). Janssen et al., (2005) identified childhood overweight/obesity prevalence at 25.4% in Malta and 21.2% in Wales. A high prevalence of childhood obesity has also been reported in developing regions such as Latin America and Asia (Bellizzi, & Dietz, 1999).

A study in Brazil reported a childhood overweight/obesity prevalence of 22% among 7-10 year olds (de Assis et al., 2005). In Saudi Arabia, El Mouzan et al., (2010) reported a childhood and adolescent overweight, obesity and severe obesity prevalence of 23.1%, 9.3% and 2% respectively. Over the past thirty years, the prevalence of obesity and obesity-related diseases in the United States (U.S) has risen sharply. Since the early 1970s, the percentage of children aged 6 to 19 classified as overweight has more than tripled, from 5% to 17% (Ogden et al., 2004). A study conducted by Ene-Obong et al., (2012) in Nigeria identified overweight and obesity prevalence of 11.4% and 13.0% among children aged 5 - 14 years. Similar findings have been reported in South Africa, Tanzania, Pakistan, Mexico, Australia and Brazil (de Assis et al., 2005; Mosha & Fungo, 2010; Mushtaq et al., 2011; Renzaho et al., 2006). Diseases related to under nutrition and infectious diseases coexist with obesity-related diseases contributing substantially to the burden of disease (WHO, 2002).

Obesity in early life is of particular concern due to its associated health consequences and its influence on young people's psychosocial development (Bray, Bouchard, & James, 2004). Overweight children face an increased risk of compromised physical and mental well-being. Indeed, the consequences of childhood obesity are far reaching, implicating not only children, but parents, schools, communities, and health care systems (Bray, Bouchard, & James, 2004). Moreover, there is evidence that childhood obesity may become a lifetime sentence (Bray, Bouchard, & James, 2004).

However, there are limited representative data available from African countries for studying the trends on childhood obesity (IOTF, 2002). Prevention is the only possible option for reduction of this epidemic since current treatment practices for obese children and adolescents are largely aimed at bringing the problem under control rather than effecting a cure (Cole, Paul & Whitehead, 2002).

Consequently, if this problem is controlled we will not only increase the transition of childhood obesity to adulthood but health problems associated with it will be increasing. Therefore, the life expectancy of these children will be reduced. There is limited evidence of childhood obesity not only in Africa but also in Ghana. This study sought to determine the prevalence and related factors of overweight and obesity among school-aged children in selected churches in Abura-Pedu.

#### STATEMENT OF THE PROBLEM

Childhood obesity / overweight is one of the most serious public health challenges affecting children Worldwide (Ebbeling, Pawlak & Ludwig, 2002). The worldwide prevalence of childhood overweight and obesity increased

dramatically from 4.2% in 1990 to 6.7% in 2010 (Lobstein, Baur, & Uauy, 2004). Globally a total of 42 million children under the age of five were estimated to be overweight or obese in 2010 and 92 million were at risk of overweight. A high proportion of this burden (35 million children) was borne by developing countries (Lobstein, Baur, & Uauy, 2004). The estimated prevalence of childhood overweight and obesity in Africa in 2010 was 8.5% (Lobstein, Baur, & Uauy, 2004). This upward trend is expected to reach 9.1% (60 million) worldwide and reach 12.7% in Africa in 2020 (Lobstein, Baur, & Uauy, 2004).

Evidence in recent years suggests that childhood obesity is growing rapidly across the globe (Freedman et al., 2001; Lobstein, Baur & Uauy, 2004; Reilly et al., 2003; Viana, Sinde & Saxton, 2008). The rate of growth is alarming considering that overweight and obesity are major risk factors for serious health consequences, including, type 2 diabetes, cardiovascular diseases, osteoporosis, and some cancers (Freedman et al., 2002; Lobstein, Baur & Uauy, 2004; Reilly et al., 2003; Viana, Sinde & Saxton, 2008). The World Health Organization (2010) estimated that by the end of the 2010 there would be over 43 million overweight children under the age of 5. It has been shown that lack of exercise, irregularity in meal time, and unhealthy dietary habits are factors which contribute to overweight (National Health Survey Information Centre, 2010).

According to WHO (2002) a modern society is characterized by urban residence with facilitated transport with decreased levels of physical activity and poor dietary practices which are risk factors associated with occurrence of obesity. Thus, there is a need to provide information on prevalence and factors associated with occurrence of overweight and obesity among children in selected churches in Abura-Pedu. The age group of 5-15 years was selected because studies have indicated that obesity management at a younger age may have a greater effect than during adulthood; body fat starts to increase at this age (Aballa, 2010).

Ghana, like many other developing countries, is experiencing a childhood obesity epidemic. Yeboah (2007) reported statistics on the prevalence of overweight and obesity in seven African countries. The author indicated that Ghana had the largest number of overweight and obese people; more than 3 million out of the estimated population of 20.7 million (Yeboah, 2007) this number reflected both adult and children. According to Ebbeling, Pawlak and Ludwig (2002), childhood obesity and the permanent health damage associated with it are difficult to treat. Measures therefore should be taken to avoid developing obesity at its onset rather than allowing it to develop and looking for a lifelong treatment. Knowing the prevalence and determinants of overweight and obesity is the most important step in preventing childhood obesity. There is limited information on overweight and obesity in school age children in Ghana. This study therefore intends to determine the prevalence and related factors of childhood obesity in school -age children in Abura-Pedu in Cape Coast North Constituency.

## PURPOSE OF THE STUDY

The aim of this study is to determine the prevalence and related factors of overweight and obesity among school-aged children in selected churches in Abura-Pedu.

## SPECIFIC OBJECTIVES

The specific objectives of this study were;

- ✓ To determine the prevalence of overweight and obesity among school-age children in selected churches in Abura-Pedu, Cape Coast, North Constituency;
- ✓ To assess whether socio-demographic factors have a relationship with overweight and obesity in this population;
- ✓ To assess the physical activities of the school aged children in selected churches in Abura-Pedu; and
- ✓ To determine the dietary/nutritional behaviors among the children; and
- ✓ To determine the relationship between the dietary/nutritional behaviors and their BMI of the children.

## RESEARCH QUESTIONS

The study sought to answer the following questions;

- ✓ What is the prevalence of overweight and obesity among school-age children in selected churches in Abura-Pedu?
- ✓ Is there a relationship between socio-demographic characteristics and BMI of respondents?
- ✓ What types of physical activity are being performed by the school-age children in the selected churches in Abura-Pedu?
- ✓ What are the dietary/nutritional behaviors among the children?
- ✓ Is there a relationship between nutritional/dietary behaviors and BMI of the school-aged children in selected churches in Abura-Pedu?

## SIGNIFICANCE OF THE STUDY

The study is significant for many reasons. The study will be the first to examine the prevalence of overweight and obesity among children in Abura-Pedu in Cape Coast, within the Central Region of Ghana. The study will also add to the body of knowledge of the existing prevalence of overweight and obesity. Findings of the study would also serve as a guide for future researchers in the field of health. The results of this study are critical in adding new knowledge that will facilitate training guidelines for curricula of health personnel. The prevalence of overweight and obesity is a very important indicator of health status in any given country and it is critical to have research-based evidence to help stakeholders and officials of various institutions to make budgetary allocations for the promotion of health and disease prevention priorities.

Finding from this study will intensify the awareness of the providers who care for children, the children themselves, parents, and the communities in which they live. It will strengthen understanding of current growth monitoring practices. By monitoring children's growth more effectively

one can identify children who are at risk for poor health related to childhood obesity. The significance to advanced practice nurses is that the opportunity exists to play a role in both the search for understanding of childhood obesity and the effective management of children who are or who may be at risk of becoming obese.

## DELIMITATION OF THE STUDY

The study was conducted using school-aged children in selected churches in Abura-Pedu. Specifically, the study population was delimited to following churches: Methodist, Catholic, Pentecost, and Presbyterian.

## ORGANIZATION OF THE STUDY

This work is broken down into five chapters. Chapter one presents the overview of the study. It focuses on a general background and the statement of the problem of the study. It includes the research questions, general and specific objectives of the study. Chapter two deals with the review of empirical studies and theoretical framework on the subject matter of the study. Chapter three considers the methodology of the study. Chapter four presents research results and findings. It is organized around the specific objectives of the study, discussion and interpretations of the research findings. Chapter five presents the conclusion and recommendations from the research findings. The references and the appendices follow.

## II. RESEARCH METHODOLOGY

This chapter presents the procedures and materials for the study. This chapter contains the research design, the population, sample and sampling procedure used and the basis for the approach as well as method of data collection. It also describes the instruments that were used for data collection, procedure followed in conducting the research and the data analyses plan used. A summary of the approach used to ensure validity and reliability of the data is clarified and ethical considerations, pre-testing and data analysis observed are also offered. It detected the prevalence of overweight and obesity among school-aged children, the relationship between socio-demographic characteristics of the mothers and BMI of their children, the types of physical activity being performed by the school-aged children, dietary/nutritional behaviours, and the relationship between nutritional/dietary behaviours and BMI of the children.

## RESEARCH DESIGN

A quantitative cross-sectional design was used. According to Kerlinger and Lee, (2000) quantitative studies provide an accurate representation of characteristics of a particular individual, or group. The design can be used to investigate a relatively large population within the shortest possible time. Quantitative studies also enable the researcher to explore the interrelationships among variables of interest, without researcher intervention (Polit & Beck, 2010).

## RESEARCH SETTING

The study was conducted in Abura and Pedu, an urban settlement in the regional capital of the Central Region of Ghana. These Churches of residence were conveniently sampled because it was much easier accessing the respondents allocated for the study due to their proximity and clearly defined settlement as compared to other churches and contained the highest target population. The actual study was limited to four selected churches within Abura and Pedu. The main heads of churches within Cape Coast North Constituency are located in these localities. Methodist, Catholic, Pentecost, and Presbyterian are the main churches used for the study. Most of the school-aged children in Abura and Pedu worship on Sunday (Sunday school) and they come with their parents. Hence, the parent was available to provide informed consent necessary to include the child in the study and answer the questionnaire for their selected wards on the same day. Using the churches allowed simultaneous access to the child and adult.

## POPULATION

Koul (2000) defined population as a complete set of individuals (subjects or events) having common observable characteristics in which the researcher is interested. This implies that a population can be of any size and that it will have at least one and sometimes several identifiable characteristic that sets it off from any other population. Macmillan (1999) also considered population as a group of elements or cases that conform to specific criteria and to which it is intended to generalize the results of the research. All school-aged children in Abura-Pedu in Cape Coast constituted the target population of the study whereas the accessible population was male and female school aged-children (age 5-15 years) attending the main churches within Abura-Pedu. The number of school-aged children by church was: Pentecost (200), Presbyterian (130), Catholic (110), Methodist (300); totaling 740 students in the population. The study population comprised all School aged-children age 5-15 years in Abura-Pedu who were residents in the Cape Coast North Constituency for a period of more than 3 months and attended one of the selected churches.

## SIMPLE RANDOM SAMPLING

The small number from which information is obtained is what is referred to as a sample. According to Fink (2010), a sample is a portion or a subset of a larger group: it is a representation of a larger group. It is a representation of the population with important characteristics (e.g. age, gender, status) which are distributed similarly in both groups.

Sampling refers to the process of selecting a portion of the population to represent the entire population. Generally, sampling enables the researcher to study a relatively small number of units in place of the target population to obtain a representation of the whole target population. According to Sarantakos (1999), in many cases, a complete coverage of the population is not possible. Sampling provides a better option since it addresses the survey population in a short period of

time and produces comparable and equally valid results. Samples are thought to offer more detailed information and a high degree of accuracy because they deal with relatively small number of units. Stratified random sampling technique was used.

Stratified random sampling technique was used. All individuals were chosen in such a way that each had an equal and independent chance of being selected (Krishinaswami, 2002). These aimed at dividing the respondents into strata, in this case male and female to provide homogeneity. This is because subjects may have similar characteristics. The advantages of using this method are ,a smaller sample size is used to achieve the same degree of representativeness as a large sample acquired could be used , sampling error decreases, power increases, and data collection time is reduced. The major disadvantage in that the sample will likely be biased.

These Churches of residence were conveniently sampled because it was much easier accessing the respondents allocated for the study due to their proximity and clearly defined settlement as compared to other churches. Also most of the school-aged children attend Sunday school with their parents and contained the highest target population.

## SAMPLE SIZE CALCULATION

Yamane's (1999), formulae for calculating sample size was used to calculate the sample size with a confidence level of 95% confidence interval margin of error, ( $p=.5$ ).

$$n = \frac{N}{1+N(e)^2}$$
 Where n is sample size, N is the population size, and e is the level of precision . This formula was applied to the above population of 740:

$$n = \frac{740}{1+740(0.005)^2} \quad n = \frac{740}{1+740(0.0025)} \quad n = \frac{740}{1+1.85} \quad n = \frac{7.40}{2.85} n = 260$$

$$Pentecost = \frac{200}{740} = 27\% \quad Presbyterian = \frac{130}{740} = 17.5\% \quad Methodist = \frac{300}{740} = 40.5\% \quad Catholic = \frac{110}{740} = 14.8\%$$

A proportionate ratio was used for each church to determine the sample size for each facility. The results of that are as follows:

Pentecost = 70students, Presby = 46students, Methodist = 105students, Catholic = 39students, Total = 260.

## SAMPLING METHOD

An introductory letter from School of Nursing and Midwifery, College of Health and Allied Sciences, University of Cape Coast was given to the Head Pastors/Rev. Ministers of the churches to obtain permission to do the study at the church. Informed consent forms were given to the subjects' parents to obtain their consent for the proposed study. Upon agreeing to participate, the purpose of the study was made known to selected parents and children. The researcher gave the questionnaire to parents in the church to fill out and return it the following Sunday when coming to church or through the Sunday school teachers to the researcher. At the same time the research team specialists filled out the second questionnaire with the children taking their anthropometric measurements.

The sampling procedure involved dividing the respondents into strata, in this case male and female and assignment of numbers to all seats in the Sunday school and

randomly selecting and labeling participating seat. The school-aged children who attended Sunday school with their parents and sat on a labeled seat were then recruited.

#### INCLUSION AND EXCLUSION CRITERIA

School aged-children in Abura-Pedu who were residents in the Cape Coast North Constituency for a period of more than 3 months and attended one of the selected churches were eligible for participation. Parents of the children were part of the study.

Exclusion criteria: Those children whose parents never gave consent, those children who were not in the age bracket (5-15 years)

#### INSTRUMENTATION

Data collected included the weight, height, and age of the selected children. The BMI was calculated based on the height and weight obtained using weighing scale. Weight was measured to the nearest 0.5kg by means of a UNICEF electronic scale manufactured by SECA (Item No.0141015 Scale, mother/child electronic with a capacity of 150kg). Height was measured to the nearest 0.1cm using a Stadiometer/microtoise manufactured by SECA.

The subjects were asked to remove all excess clothing (such as sport shirt and pullover), and to stand upright on the scale without shoes, with feet together and arms at the side in a complete upright position. The weight of the subject was recorded in kilograms to the nearest whole number. The height was recorded in meters. Body Mass Index (BMI) variable was calculated using the following formula:  $BMI = \text{Weight (kg)}/\text{Height (m)}^2$ . Body-mass-index-for-age Z-scores defined by the World Health Organization (WHO) 2006 standard criteria for children was used. The statistical packaging for social sciences (SPSS) software version 22 was used to record the data.

Questionnaire was designed for the parents to answer for their children. A questionnaire was appropriate because it was expected that the target population could read and write. A questionnaire could be taken home and returned the next Sunday. The questionnaire for parents (Appendix A) was in three sections (A, B and C). Section A addressed personal demographic information while section B identified physical activity performed by the school-aged children, and C assessed the nutritional/dietary behaviors of the school-aged children.

#### DATA COLLECTION

Data collection was done with the help of four nurses who were trained to assist in the data collection exercise, observing protocol, personal outline, and purpose of the study. They were taken through the objectives of the study to understand the purpose and the need for the exercise. In addition, the research assistants were taken through the research instruments to ensure uniform understanding and proper way to weigh and measure height.

Data collection was conducted weekly, that is every Sunday for four weeks. All the measurements were taken by

the researcher and supported by trained nurses under same conditions to ensure intra-rater consistency.

#### DATA ANALYSIS

Data were collected and cleaned to exclude errors, and re-organized for efficient analysis. Access to the data was limited to the researcher and the supervisor at the initial stage of the research till completion. Data was analyzed using statistical package for social sciences (SPSS) software version 22. The researcher employed both descriptive and inferential statistical tools in analyzing the data. Among these statistical tools were frequencies, percentages, tables, , the Chi-square test. Results were presented in tables and interpretations of findings were made as possible.

The data were presented through frequency distributions, mean  $\pm$  SD, correlations for quantitative variables. Results were calculated based on 95% confidence interval ( $\alpha=0.005$ ). Results were presented in tables and graphs and interpretations of findings were made as possible. Relationships between the variables were tested using chi-square, t-test and Pearson's product moment correlation. All relationships were tested at 0.05 level of significance.

#### ETHICAL CONSIDERATION

Approval for the study was obtained from the University of Cape Coast Institutional Review Board (UCCIRB) before commencement. Permission letters were sent with a cover letter from the School of Nursing and Midwifery of the University of Cape Coast, seeking permission from the heads of the various selected churches for the study to be conducted. The study took into consideration the basic principles of biomedical ethics for the participating individuals and the community. Informed consent for children to participate was obtained from the parents. The aims and the processes of the research were fully explained to the parent and their informed consent obtained for participation. Parents of participants were informed about the content of the questionnaire to enable them understand and to give their full approval. The importance of the study was explained to the participants. Participation was voluntarily; thus, individuals were given the right to or not to take part in the study. Only consenting individuals were chosen to answer the questionnaire and had the measurements taken of the child. Although the data were handled by the researcher and supervisor, confidentiality was guaranteed as respondents were selected individually.

Findings from measurements were communicated to individual respondents/parents during the time of measurement. Necessary advice was rendered based on individual status.

#### PRE-TESTING

A pre-test of the questionnaire was carried out on a sample of 20 respondents with similar characteristics outside the selected churches of the study. Wesley Methodist Cathedral was used for the pre-test. One day training was done for four research assistants who were recruited for this

exercise Training topics included the research objectives, skills, respondent selection, obtaining consent, ethics in research, exclusive criteria and other aspects to enhance quality control, after the pre-test was revised, finalized, and printed. The time needed for instruction and completion of the instruments was determined from the pilot procedure as well as determining clarity of instruction and restructuring of the questionnaire, to ensure that the procedures were clear and that the items were understandable and instruments were accurate. Extra sheets of paper were attached to questionnaires for respondents to comment on any identified inaccuracies and inadequacies. After explaining what the research was about to the parents and their children, informed consent was sought. They read the items critically and indicated those that were not clear. This resulted in a number of modifications. The results of the pilot did not form part of the analysis for the main study. The use of piloting increased the validity and reliability of the data by ensuring that the questions were clear and unambiguous and internal consistency of the tool.

Reliability was also ensured by double data entering. The researcher at all times during data entry ensured that the data were recorded correctly by referring to the raw data again and again. The same quality data control was employed during data analysis.

#### VALIDITY AND RELIABILITY OF THE INSTRUMENT

According to Kaliyaperumal (2004), validation should be aimed at assessing their ease of comprehension, relevance to their intended topics, effectiveness in providing useful information, and the degree to which the questions are interpreted and understood by different individuals. The validity and reliability of the data collection tools was ensured through standardization of the questions and through a pilot study conducted with twenty (20) school-age children from Wesley Methodist church outside the study settings.

The validity and reliability of the data collection tools and procedures were determined; Cronbach alpha was calculated as a measure of internal consistency for the final 86-item instrument; the total instrument was found to have adequate internal consistency, with an alpha coefficient of 0.978.

### III. RESULTS AND DISCUSSION

This chapter presents the results from the analysis performed on the data gathered from the respondents and the discussion of same. The aim of this study was to determine the prevalence and related factors of overweight and obesity among school-aged children in selected churches in Abura-Pedu in the Cape Coast North Constituency in the Central Region. It examined the prevalence of overweight and obesity among school-aged children, the relationship between socio-demographic characteristics of the mothers and BMI of their children, the types of physical activity being performed by the school-aged children, dietary/nutritional behaviours, and the relationship between nutritional/dietary behaviours and BMI of the children.

Out of the 260 respondents, 254 of them completed and returned the questionnaire for a response rate of 97.69%.

#### DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

The study sought to describe the respondents including background characteristics since these characteristics and attributes could influence the kind of nutritional practices used for their children, which in turn may affect their BMI. Characteristics included age, marital status, church denomination, educational attainment, employment, occupation, and gender and age of child. Table 2 presents details on the afore-mentioned variables.

Variables	Frequency	Percentage	Statistic
<b>Age (in years)</b>			
20 – 29	12	4.7	p=.000
30 – 39	124	48.8	
40 – 49	95	37.4	
50 – 59	17	6.7	
60 – 69	6	2.4	
<b>Marital Status</b>			
Single	20	7.9	p=.000
Married	204	80.3	
Separated	7	2.8	
Divorced	11	4.3	
Widowed	10	3.9	
Cohabiting	2	0.8	
<b>Denomination</b>			
Methodist	113	44.5	p=.000
Catholic	57	22.4	
Pentecost	43	16.9	
Presbyterian	41	16.2	
<b>Highest Educational Level</b>			
No formal education	126	49.7	p=.000
Primary	9	3.5	
Middle School	49	19.3	
JHS	18	7.1	
SHS	12	4.7	
Tertiary	40	15.7	
<b>Employment Status</b>			
Full-time	119	46.9	p=.000
Part-time	12	4.7	
Self-employed	116	45.7	
Unemployed	6	2.3	
Pensioner	1	0.4	
<b>Occupation</b>			
Trading/business	100	39.4	p=.000
Farming/fishing	12	4.7	
Hairdressing/dress-making	29	11.4	
Teaching/Nursing	87	34.2	
Artisanship	3	1.2	
Others	19	7.5	
<b>Gender of Children</b>			
Male	125	49.2	p=.802
Female	129	50.8	
<b>Age of Children (in years)</b>			
5 – 7	53	20.9	p=.007
8 – 10	74	29.1	

11 – 13	80	31.5
14 – 15	47	18.5
<b>Total</b>	<b>254</b>	<b>100.0</b>

Table 1: Demographic Characteristics of Respondents

Table 2 indicated that a substantial proportion of the respondents (48.8%) were aged 30-39 years. Ninety-five (37.4%) were between the ages of 40-49. The average age of the respondents was 39.8 years. The Chi-square test results showed that there were statistically significant differences in the ages of the mothers, since the p-value was less than .05.

With respect to their marital status, the results showed that a large majority of the respondents (80.3%) were married. On whether there was a significant difference in the proportion of the respondents with regard to their marital status, the Chi-square test revealed that there was a significant difference in their numbers.

It can also be seen that nearly half of the respondents (49.7%) received no formal education. However, the remaining had attained some level of education. In fact, 15.7% (40) had tertiary education. The Chi-square test produced a p-value less than .05; implying a significant difference in the educational status of the respondents.

Only six representing 2.3% of the respondents were unemployed. As many as 119 (46.9%) of them said that they were in full-time employment, while 116 (45.7%) were self-employed. About 39% of the respondents were traders, while 87 (34.2%) were teachers or nurses. A further test showed that there were significant differences in the proportions of the respondents with respect to their employment status.

On the gender of their wards, 50.8% of the school-aged children were females, while the remaining 125 (49.2%) indicated male. However, the test of significant difference revealed that there was no statistically significant difference in the proportions of males and females in the study, since the p-value obtained was greater than .05. Eighty (31.5%) were aged 11-13 years, while 74 (29.1%) were within 8-10 years. The mean age of the school-aged children was 10.3 years. The Chi-square test showed significant differences in the proportions of the children with respect to their ages.

**RESEARCH QUESTION 1: WHAT IS THE PREVALENCE OF OVERWEIGHT AND OBESITY AMONG SCHOOL-AGED CHILDREN IN SELECTED CHURCHES IN ABURA-PEDU?**

One aim of this research study was to determine the prevalence of overweight and obesity in school-aged children. The study therefore computed the BMIs of the children based on their gender. Table 3 presents the summary of descriptive statistics on their height (m), weight (kg) and BMI.

Indicators	Males (n=125)	Females (n=129)	Overall (N=254)	Statistic
<b>Weight (kg)</b>				
Mean	34.38	35.39	34.99	p=.9038
SD	11.00	11.09	11.04	
Range	18.0-71.0	17.5-67.2	17.5-71.0	
<b>Height (m)</b>				
Mean	1.41	1.71	1.41	p=.8652
SD	0.16	0.17	0.16	
Range	0.95-1.84	0.95-1.83	0.95-1.84	
<b>BMI</b>				
Mean	17.27	17.72	17.50	p=.9394

SD	4.80	4.63	4.71
Range	9.06-52.40	9.45-51.00	9.06-52.39

Table 2: Children's Weight, Height, BMI

The data revealed that the overall mean weight of the children was 34.99 kg with a variability of 11.04 kg. The mean weight of the males was 34.38 kg with a standard deviation of 11.00, while that of the girls were 35.39 and 11.01, respectively. The results showed that the females weighed slightly more than their male counterparts and higher than the overall average, although the difference was not statistically significant.

Similarly, with respect to their heights (m), it was seen that the females were taller compared to the boys. Whilst the average height of the girls was 1.71m, that of the boys was 1.41m, with an overall average of 1.41m. Using the t-test, the results indicated that the difference in the mean values was insignificant, since the p-value was greater than .05. Consequently, the mean BMI of the females was also higher than that of the boys, although the difference was statistically insignificant at .05 level of significance. This agrees with the normal growth and development pattern of children. Girls are usually seen to develop faster than their male counterparts in their tender ages, while the boys catch up with them later.

Further analysis on their respective BMIs is summarised in Tables 5 and 6, respectively.

Weight status category	Percentile range	Calculated values	Frequency	Percent
Underweight	Less than the 5 <sup>th</sup> percentile	<10.71	2	1.6
Normal weight	5 <sup>th</sup> percentile to less than the 85 <sup>th</sup> percentile	10.71<15.93	51	39.5
Overweight	85 <sup>th</sup> to less than the 95 <sup>th</sup> percentile	15.93<16.33	8	6.2
Obese	Equal to or greater than the 95 <sup>th</sup> percentile	≥16.33	68	52.7
<b>Total</b>			<b>129</b>	<b>100.0</b>

p=.000

Table 3: BMI of Females

The results from Table 4 showed a very disturbing prevalence rate of obesity according to WHO's (2000) classification formula for overweight calculation. WHO recommends that children with BMI of equal to or greater than the 95<sup>th</sup> percentile should be classified as being obese. More than half of the female children (52.7%) were found to be obese, while an additional 8 (6.2%) were overweight. Although, a substantial proportion of them (39.5%) were of normal weight and a few of them (2 representing 1.6%) were in the underweight category. Majority of the girls being obese and underweight, the results suggest a high level of malnutrition. A further test of significant difference in the proportions weight category showed that there were significant differences, since the p-value was less than .05. This mean that the differences realised was not attributable to chance.

Weight status category	percentiles BMI for age and sex	Calculated values	Frequency	Percentage
Underweight	Less than the 5 <sup>th</sup>	<10.64	4	3.2

	percentile			
Normal weight	5 <sup>th</sup>	10.64<15.86	50	40.0
	percentile to less than the 85 <sup>th</sup>			
Overweight	85 <sup>th</sup> to less than the 95 <sup>th</sup>	15.86<16.24	6	4.8
	percentile			
Obese	Equal to or greater than the 95 <sup>th</sup> percentile	≥16.24	65	52.0
<b>Total</b>			<b>125</b>	<b>100.0</b>

$\chi^2=91.864, df=3, p=.000$

Table 4: BMI of Males

Table 5 revealed that majority of the males (52%) were obese. Similarly, 6 (4.8%) and 4 (3.2%) were diagnosed of being overweight and underweight, respectively. The results indicated that only 40% of them were nutritionally healthy according to the WHO's (2000) classification formula, which is 5<sup>th</sup> percentile to less than 85<sup>th</sup> percentile of the all BMIs of the males, while the larger proportion of them were not. The difference in proportions according to the various categories was statistically significant at .05 level of significant.

Comparatively, the overweight and underweight prevalence rates among both males and females were similarly very high with 52.0% and 52.7%, respectively. A further test showed no statistically significant difference in the overweight/underweight prevalence levels at 5% level of significance. On a whole, the prevalence of malnutrition among children in the Abura-Pedu area of Cape Coast was extremely high.

This is comparable to childhood overweight/obesity prevalence rates of some developed countries. An overweight/obesity prevalence of 17% has been reported among children aged 10-16 years in Greece and Italy (Janssen *et al.*, 2005). It is however lower than prevalence estimate of other countries, including Chicago in the US where 40.5% of 6-12 year old children were obese (Margellos-Anast *et al.*, 2008); among Aboriginal communities in Australia where 26.8% children aged 5-15 years were overweight/obese (Schultz, 2012); Saudi Arabia where 29.0% aged 5-19 years were overweight/obese (El Mouzan *et al.*, 2010) and Sub-Saharan African Immigrants and refugees in Australia where 27% children aged 3-12 years (Renzaho *et al.*, 2006). The childhood overweight/ obesity found in this study is high.

It was found that the averages for weight and height of the children were 35kg and 1.41m, respectively.

#### RESEARCH QUESTION 2: IS THERE A RELATIONSHIP BETWEEN SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE MOTHERS AND BMI OF THEIR CHILDREN?

The study sought to assess the nature of relationship between the socio-demographic characteristics of the mothers/guardians and the BMI categories of their school-aged wards. The socio-demographic variables of the mothers included age, marital status, denomination, educational level, occupation and employment status. In addition, the study also assessed the relationship between the gender and age of

children, and the BMIs using the Chi-square test with a 5% significance level. Table 6 presents the details of the results.

Socio-demographics	BMI				Total (N=254)	P Values
	Underweight (n=12)	Normal (n=204)	Overweight (n=26)	Obese (n=12)		
<b>Age (in years)</b>						<b>0.440</b>
20 – 29	1	8	2	1	12	
30 – 39	6	101	13	2	124	
40 – 49	4	75	8	7	95	
50 – 59	0	12	3	2	17	
60 – 69	1	5	0	0	6	
<b>Marital Status</b>						<b>0.804</b>
Single	1	15	3	1	20	
Married	10	165	20	9	204	
Separated	1	6	0	0	7	
Divorced	0	8	1	2	11	
Widowed	0	8	2	0	10	
Cohabiting	0	2	0	0	2	
<b>Denomination</b>						<b>0.001</b>
Methodist	2	85	18	8	113	
Catholic	1	49	5	2	57	
Pentecost	8	34	1	0	43	
Presbyterian	1	36	2	2	41	
<b>Highest Educational Level</b>						<b>0.0344</b>
No formal educ.	2	107	9	8	126	
Primary	0	8	0	1	9	
Middle school	5	31	10	2	49	
JHS	3	13	2	0	18	
SHS	0	11	1	1	12	
Tertiary	2	34	4	0	40	
<b>Employment Status</b>						<b>0.973</b>
Full-time	5	98	9	6	119	
Part-time	0	9	2	1	12	
Self-employed	7	90	14	5	116	
Unemployed	0	5	1	0	6	
Pensioner	0	1	0	0	1	
<b>Occupation</b>						<b>0.343</b>
Trading/business	7	77	11	5	100	
Farming/fishing	0	8	3	1	12	
Hairdressing/dress	1	27	1	0	29	
Teaching/nursing	2	73	6	6	87	
Artisanship	0	2	1	0	3	
Schooling	1	2	1	0	4	
Others	1	15	3	0	19	
<b>Gender of Children</b>						<b>0.619</b>
Males	8	99	13	5	125	
Females	4	105	13	7	129	
<b>Age of Children</b>						<b>0.4166</b>
5 – 7	3	42	6	2	53	
8 – 10	4	63	4	3	74	
11 – 13	5	64	7	4	80	
14 – 15	0	35	9	3	47	
<b>Total</b>	<b>12</b>	<b>204</b>	<b>26</b>	<b>12</b>	<b>254</b>	

Table 5: Chi-Square Test for Socio-Demographics of Mothers and BMI of Children

The Chi-square test performed by the cross-tabulation between age of the mothers/guardians and the BMI of their school-aged children produced statistically insignificant results since it *p*-value of .440 was greater than the .05 significance level. This means that there was no significant relationship between the age of a mother and the BMI of her child. Similarly, a Chi-square value of 10.244 with an associated *p*-value of .804 was obtained for the relationship between mothers' marital statuses and their children's body mass indexes; therefore a significant relationship did not exist. The implication is that the two variables are statistically independent of each other.

However, a significant relationship was found between a mother's denomination and her child's BMI. The Chi-square value of 33.042 produced a *p*-value of <.001, which is less than .05. This means that the BMI of a school-aged child may be influenced by his/her mother's Christian denomination. For example, 23% of the Methodists had children who were overweight and obese. About 12% and 10% of Catholics and Presbyterians respectively had children who were overweight and obese. Among the Pentecostals, only 2% were in the

categories of overweight and obesity. However, as many as 8 (18.6%) of the Pentecostals had children who were underweight.

The study established a significant relationship between mother's educational qualification and the child's BMI. A Chi-square value of 26.422 with a corresponding *p*-value of .034 was ascertained as shown in Table 7.

The relationships between the employment status and occupation of mothers and the BMIs of their children were statistically insignificant (*p*-values >.05). Similarly, the gender and age of children were not important determining factors of their weights (*p*-values >.05). The educational status of mothers was an important predictor of the weight of their children (*p*-values >.05). The results confirmed that the higher a mother's educational achievement, the lower the risk of her child being underweight, overweight or obese and vice versa.

**RESEARCH QUESTION 3: WHAT TYPES OF PHYSICAL ACTIVITIES ARE BEING PERFORMED BY SCHOOL-AGED CHILDREN IN THE SELECTED CHURCHES IN ABURA-PEDU?**

The aim of this research question was to find out the physical exercises in which school-aged children engaged and the amount of time they spent doing such exercises. Table 8 – 9 presents the results

Types	Gender of Child		Total Freq. (N=254)	Percent (%)
	Males (n=125)	Females (n=129)		
Walking	56	50	106	41.7
Ampe	18	73	91	35.8
Football	78	10	88	34.6
Distance running	13	18	31	12.2
Bicycling	14	13	27	10.6
Volleyball	6	13	19	7.5
Swimming	6	9	15	5.9
Other	3	5	8	3.1

*p* = .000

Table 6: Types of Exercise

Table 7 shows that the main physical exercises of the children reported by the mothers were walking, "Ampe" and football. Of the 106 (41.7%) children who reported walking, more than half (52.8%) were boys. In terms of Ampe, as expected, a greater proportion of those who played it were girls. Interestingly, a few boys (n=18) reported playing Ampe. Similarly, 34.6% of the children played football, with overwhelming majority (78) being boys.

The study also found that 31 (12.2%) and 27 (10.6%) of the children were engaged in distance running and bicycling running. While more females engaged in distance running, their male counterparts were mainly engaged in bicycling and running. In terms of playing volleyball, out of the 19 players, 13 (68.4%) were females. But how long did they engage in these activities – for example, 10 minutes would be of no help. The further analysis showed that there was a significant difference between boys and girls with respect to their types of exercise. This is because the *p*-value obtained was less than .05.

Table 8 gives the daily activities in which the children engaged. Frequencies and percentages were expressed and the average minutes spent per activity were also computed.

Activity	Gender of Child		Total (N=254) f(%)	Average Number of minutes
	Males (n=125) f(%)	Females (n=129) f(%)		
Watching television	72 (49.3)	56 (39.4)	128 (44.4)	57.3
Assisting in household chores	50 (34.2)	68 (47.9)	118 (41.0)	40.6
Playing on computer	22 (15.1)	17 (12.0)	39 (13.5)	44.5
Learning	2 (1.4)	1 (0.7)	3 (1.0)	120.0

*p* = .1291

Table 7: Daily Activities Undertaken by Children

Table 9 revealed that the main daily activities of the school-aged children were watching television and doing household chores. About 44% of the 254 respondents reported that their children watched television daily for about 57 minutes, with more boys (49.3%) watching. More girls were found to assist in household chores such as cooking, washing of plates, scrubbing, and sweeping. On the average, boys and girls spent 40.6 minutes daily on this activity. Thirty-nine representing 44.5% said that their children played on computers, with 22 (56.4%) being boys. The mothers further reported that their wards spent an average of 44.5 minutes daily in performing such activity. Only three respondents spent time to learn. The Chi-square test indicated that there was no significant difference between the daily activities of males and females, since the *p*-value is greater than .05.

The study also delved into the means by which the children get to school.

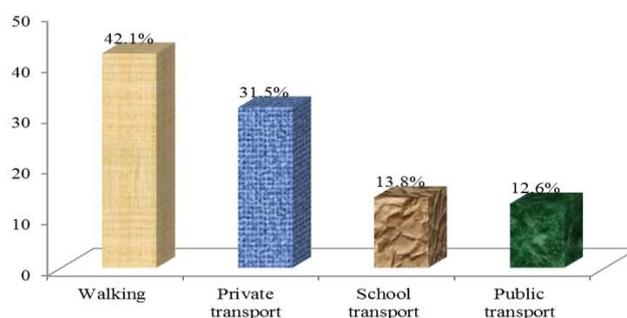


Figure 1: Means of going to school

Figure 2 shows that a substantial proportion of the children (42.1%) walked to their respective schools. The main reason cited for this was that the schools were not far from their homes. However, other parents (31.5%) used private cars to send their wards to schools. A further interrogation revealed that they did so because of fear of their wards crossing the highways and the distance to school.

In addition, information on the individuals who motivated the children to engage in physical activities was gathered. The summary of their responses are contained in Table 9.

Motivators	Frequency	Percentage
Mother	59	23.2
Nobody	53	20.9

Father	35	13.8
Siblings	35	13.8
Class teacher	28	11.0
P.E. teachers	27	10.6
Others (grandparents and friends)	17	6.7
<b>Total</b>	<b>254</b>	<b>100.0</b>

$p = .000$

Table 8: Sources of Motivation for Children to Exercise

From Table 10, it can be seen that 59 (23.2%) of the respondents indicated that they motivate their wards to exercise. A good number of them (53 representing 20.9%), revealed that no one motivated child while 35 (13.8%) said the fathers encouraged them to engage in physical activities.

RESEARCH QUESTION 4: WHAT ARE THE DIETARY/NUTRITIONAL BEHAVIOURS AMONG THE CHILDREN?

The study sought to assess the dietary behaviours of the children and further classify them into two main categories, namely, those with positive and those with negative dietary behaviour groups based on a 50% criterion. In applying this criterion, an indexing was done with the responses. Thus, a respondent was assigned/scored 1 for each of the 13 items on nutritional behaviour for response as contained in Table 11. Therefore, any respondent with at least 50% of 13, which is 6.5 with the exception of carrying food to school which is not dietary habit, was classified as having positive nutritional behaviour. Those with less than 6.5 were classified as having negative or poor nutritional behaviour. The nutritional behaviours of the children were looked at from the perspectives of what they consumed and types of foods consumed by respondents in the last 24-hours.

Items	Frequency	Percentage
<b>Does your child usually eat breakfast?</b>		
Everyday	203	79.9
Sometimes	38	15.0
Never	13	5.1
<b>Does your child eat lunch?</b>		
Everyday	228	89.7
Sometimes	20	7.9
Never	6	2.4
<b>Does your child eat dinner/supper?</b>		
Everyday	243	95.7
Sometimes	8	3.1
Never	3	1.2
<b>Does your child eat while watching television?</b>		
Everyday	67	26.4
Sometimes	82	32.3
Never	105	41.3
<b>On average, how many times per week does your child eat outside your house?</b>		
Never	77	30.4
1 – 2	96	37.4
3 – 5	79	31.0
6 and above	3	1.2

<b>Do you give any kind of vitamins such as Vitamin A, B, and D supplement daily?</b>		
Yes	133	52.4
No	121	47.6
<b>Do you use any kind of mineral supplements, such as Calcium and Magnesium daily?</b>		
Yes	82	32.3
No	172	67.7
<b>Does your child eat snacks in between meals?</b>		
Yes	144	56.7
No	110	43.3
<b>Does your child eat sweet snacks such as (biscuits, cake, and chocolate)</b>		
Yes	228	89.8
No	26	10.2
<b>Who makes the choice of snack to be carried to school/church?</b>		
Child	109	42.9
Parent/Guardian	145	57.1
<b>Does your child drink soft drinks (Coke, Fanta, Abele)</b>		
Yes	228	89.8
No	26	10.2
<b>Are there times your child goes without a meal in a day?</b>		
Yes	40	15.7
No	214	84.3
<b>Does your child carry food to school?</b>		
Yes	134	52.8
No	120	47.2
<b>Total</b>	<b>254</b>	<b>100.0</b>

Table 9: Dietary Habits

The results showed that out of the 254 children, nearly 80% ate breakfast every day, while 38 (15.0%) parents said sometimes. Similarly, approximately 90% of the children were found to have eaten their lunch every day, while 20 (7.9%) respondents said their wards sometimes ate their lunch. With regards to supper, an overwhelming majority (95.7%) stated they had it daily. The results indicated that majority (58.7%) of the children watched television while eating. In addition, only 77 (30.4%) of the children were said not to have eaten outside their homes per week. In fact, as much as 82 (32.2%) ate outside the home an average of three time in a week.

A little over half of the respondents (52.4%) said that they usually gave their wards vitamins A, B and D supplements daily. When asked whether they usually gave mineral supplements such as calcium and magnesium to their wards daily, majority of the parents 67.7% said "No". The results also revealed that 144 (56.7%) of the children ate snacks in between meals. The eating of sweet snacks such as biscuits, cakes and chocolates was common among the children as indicated by as much as 90% of their mothers. More than half of the respondents said that they personally made snack choices for their wards to carry to school and/or church. However, a substantial proportion (42.9%) indicated that their children usually made the choice of snack. Similarly, overwhelming majority of the parents (89.9%) agreed that their wards drank soft drinks like Coke, Fanta and Abele. As to whether their children go without a meal in a day, only 40 (15%) responded in the affirmative. Meanwhile, 134 (52.8%) of the mothers/guardians reported that their children always carried food to school.

Twenty-five items were listed for the respondents to use in the recall of what the child ate within the previous 24 hours. Table 12 presents the findings.

Foods	N	Breakfast	Mid-break	Lunch	Between lunch-supper	Supper
		Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Tea/bread	89	86 (96.6)	2 (2.2)	0 (0.0)	0 (0.0)	1 (1.2)
Milo/bread	35	35 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Cocoa/bread	11	4 (36.4)	4 (36.4)	2 (18.2)	1 (9.0)	0 (0.0)
Milk	7	3 (42.9)	3 (42.9)	0 (0.0)	1 (14.2)	0 (0.0)
Cereals	57	11 (19.3)	23 (40.4)	4 (7.0)	18 (31.6)	1 (1.7)
Yogurt	55	1 (1.8)	33 (60.0)	2 (3.6)	19 (34.6)	0 (0.0)
Soda	4	0 (0.0)	2 (50.0)	1 (25.0)	1 (25.0)	0 (0.0)
Porridge	88	85 (96.6)	2 (2.3)	0 (0.0)	1 (1.1)	0 (0.0)
Fruit juice	105	2 (1.9)	56 (53.3)	5 (4.8)	42 (40.0)	0 (0.0)
Sweet drink	79	0 (0.0)	58 (73.4)	0 (0.0)	21 (26.6)	0 (0.0)
Chips	91	0 (0.0)	21 (23.1)	2 (2.2)	68 (74.7)	0 (0.0)
Sweets/chocolates	53	1 (1.9)	20 (37.7)	0 (0.0)	32 (60.4)	0 (0.0)
Plantain/stew	57	0 (0.0)	2 (3.5)	34 (59.6)	3 (5.2)	18 (31.7)
Rice/vegetables	29	3 (10.3)	1 (3.4)	14 (48.3)	0 (0.0)	11 (37.9)
Gari/beans	31	0 (0.0)	1 (3.2)	26 (84.0)	2 (6.4)	2 (6.4)
Rice/soup	21	2 (9.5)	2 (9.5)	11 (52.4)	1 (4.8)	5 (23.8)
Rice/stew	122	11 (9.0)	5 (4.1)	68 (55.8)	2 (1.6)	36 (29.5)
Jollof rice	65	2 (3.1)	2 (3.1)	41 (63.0)	2 (3.1)	18 (27.7)
Chips/chicken	12	1 (8.3)	0 (0.0)	3 (25.0)	6 (50.0)	2 (16.7)
Chips/sausages	14	1 (7.1)	0 (0.0)	4 (28.6)	6 (42.9)	3 (21.4)
Fufu/Okro	10	0 (0.0)	1 (10.0)	1 (10.0)	3 (30.0)	5 (50.0)
Banku/Okro	78	0 (0.0)	0 (0.0)	7 (9.0)	2 (2.5)	69 (88.5)
Pizza	82	6 (7.3)	2 (2.4)	16 (19.5)	1 (1.2)	57 (69.6)
Spaghetti/stew	11	0 (0.0)	1 (9.1)	2 (18.2)	6 (54.5)	2 (18.2)
Tea/cake	19	1 (5.3)	0 (0.0)	1 (5.3)	1 (5.3)	16 (84.1)

Table 10: 24-Hour Dietary Recall (N=254)

It can be seen that 35 (12.2%) children drank milo with bread for breakfast. Similarly, out of the 11 children (36.4%) who drank cocoa with break, 8 (72.8%) did that either as breakfast or mid-break, obviously before lunch. Out of the 254 children, 105 (41.3%) reported they took fruit juices. Among them, 56 (53.3%) and 42 (40.0%) took the juices during mid-break and in-between lunch and supper, respectively.

It was also seen that 91 (35.8%) of the children ate chips within the last 24 hours, with majority (74.7%) eating chips in-between lunch and supper. Similarly, porridge was taken by 88 (34.6%) of the children mainly as breakfast. Out of the 254 children, 78 (30.7%) were reported to have eaten Banku with Okro soup/stew particularly at dinner. With regard to Jollof rice, 65(25.6%) of them ate it either for lunch or supper.

The study also included five main food types which were not nutritionally healthy for children. These were soda, sweet drinks, sweet/chocolates, pizza and tea with cake. It was seen that the consumption of such foods was relatively low compared the other recommended foods. The prevalence rate of eating pizza among the children within the last 24 hours was 32.3%. This was mainly taken for dinner. With regard to drinking of sweet drinks, 74 (31.1%) took such drinks within the last 24 hours, which they usually took during the mid-break-Similarly, 52 (20.5%) reported eating sweets/chocolates within the 24 hours. These were particularly taken in-between lunch and supper.

**RESEARCH QUESTION 5: IS THERE A RELATIONSHIP BETWEEN NUTRITIONAL/DIETARY BEHAVIOURS AND BMI OF THE SCHOOL-AGED CHILDREN IN SELECTED CHURCHES IN ABURA-PEDU?**

One of the aims of the study was to assess, the nature of the relationship that existed between the nutritional behaviours and the body mass index of the children. After applying the 50% criterion as noted in Table 11, the results are presented in Figure 2.

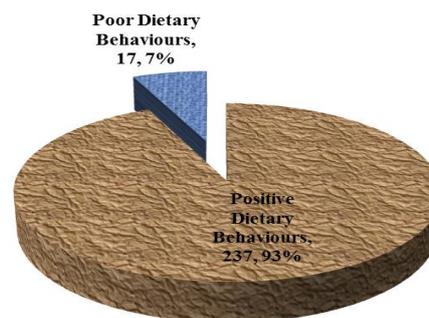


Figure 2: Classification of children according to their dietary behaviours

Based on the categorisations of nutritional behaviours, overwhelming majority of the children (93%) were considered to have positive nutritional behaviours. This means they had nutritional behavioural score of at least 6.5.

On the other hand, 17 (7%) of them were classified as having poor nutritional behaviours. The study employed the Chi-square test of association to estimate the association between children’s nutritional behaviours and the body mass index (nutritional status) at a 5% significance level. Table 14 presents the details of the results.

BMI of Children	Dietary Behaviours				Total	
	Poor		Positive		Freq.	%
	Freq.	%	Freq.	%	Freq.	%
Underweight	0	0.0	6	2.5	6	2.4
Normal weight	5	29.4	96	40.5	101	39.8
Overweight	1	5.9	13	5.5	14	5.5
Obese	11	64.7	122	51.5	133	52.3
<b>Total</b>	<b>17</b>	<b>100.0</b>	<b>237</b>	<b>100.0</b>	<b>254</b>	<b>100.0</b>

p=.692

Table 11: Cross tabulation between BMI and Dietary Behaviours

Out of the 17 children found to have had poor nutritional behaviours, 64.7% of them were obese, while only 5 (29.47%) were of normal weight. However, a large majority (80.7%) of those considered to have practiced proper nutritional behaviours had 51.5% of their children to fall into the obese category compared to 96 (40.5%) children who were of normal weight. Using the Chi-square test, a value of 1.456 with an associated p-value of .692 was obtained. This means that the relationship between the dietary/nutritional behaviours and BMI of the children was statistically insignificant; implying that nutritional behaviours are not an important predictor of BMI among the school-aged children. Thus, the nutritional behaviours of the children do not affect their nutritional status.

**DISCUSSIONS**

A study to determine the prevalence and related factors of overweight and obesity among school-aged children age 5-15 year in selected churches in Abura-Pedu in the Cape Coast North Constituency.

**RESEARCH QUESTION 1: WHAT IS THE PREVALENCE OF OVERWEIGHT AND OBESITY AMONG SCHOOL-**

## AGED CHILDREN IN SELECTED CHURCHES IN ABURA-PEDU?

The study revealed as much as 52.7% and 52.0% prevalence rates of obesity among girls and boys, respectively. Similarly, 6.2% of girls and 4.8% of boys were overweight. The high prevalence of overweight and obesity among both genders of children has been widely documented by several researchers (Lobstein, Baur & Uauy, 2004; Janssen et al., 2005; Bellizzi & Dietz, 1999).

Lobstein, Baur & Uauy (2004) reported of overweight/obesity prevalence rate of 25.4% in Malta and 21.2% in Wales. Similarly in Brazil, de Assis (2005) found a childhood overweight/obesity prevalence to be 22% among 7-10 year olds.

It appears that overweight and obesity are becoming common health conditions among children. Ogden's et al. (2004) found the tripling of these conditions among some Nigerian children after three decades. The study is in consistent with El Mouzan et al. (2010) find a similar trend in Saudi Arabia, with overweight /obesity 23.1%, 9.3%, respectively. A study among children aged 2 to 18 years in Nigeria reported a childhood overweight/obesity prevalence of 14.2% (Ene-Obong et al., 2012). Another study by Peltzer and Pengpid (2011) among a sample of 5613 Ugandan and Ghanaian children aged 13-18 years found a significant association between gender and overweight/obesity. In their study more girls were found to be more overweight/obese than boy's overweight/obesity prevalence of 7.6%.

But the differences could be due to the different methods used in the classification of weight status of the children. The Nigerian study defined overweight/obesity using the International Obesity Task force cut-off points. (IOTF) The IOTF makes use of BMI-for-age Z-scores instead of the WHO BMI-for-age percentile used in this study. The Ugandan and Ghanaian study measured the heights and weights of the studied participants based on self-report. The use of self-reported weight and heights may lead to underestimation of overweight and obesity (Elgar, Roberts, Tudor-Smith & Moore, 2005)

The results in agreement with the findings of McDonald et al., (2009) study among Columbian children (aged 5 to 12 years) and Schultz (2012) among Australian children (aged 5 to 15 years) ,that overweight/obesity was not associated to gender.

Contrary to the findings of this study, a study by Peltzer and Pengpid (2011) among a sample of 5613 Ugandan and Ghanaian children aged 13-15 years found a significant association between gender and overweight/obesity. In their study more girls were found to be more overweight/obese than boys. The sample population of the Ugandan study was largely adolescents among which several studies in developing countries have shown a positive relationship between the male and female gender and overweight/obesity. (Armstrong et al., 2006; Hamaideh et al., 2010; Kimani-Murage et al., 2011). Toriola et al., (2012) reported no significant gender differences in BMI at age groups 10, 11, and 12 years but found that girls at ages 13-16 years exhibited significantly higher mean BMI values compared to the boys. As such gender differences is not so significant among school-aged

children but more significant among adolescents. This perhaps backed to the differences

The WHO (2002) postulating that diseases related to under-nutrition and infectious diseases coexist with obesity-related diseases contributing substantially to the burden of disease. Scott, Elizabeth, Romulo & Camila (2011) also identified that obesity occurs due to an imbalance between energy intake (dietary habits) and energy expenditure (physical activity). Likewise, Lake, Power & Cole (1999) observed that the prevalence of overweight and obesity increased by more than 50% between generations. A study from the UK and further reported of a strong association between higher parental overweight and child overweight and obesity in later life. All this findings are contradictory to this study results. Also there are several dire consequences (emotional and psychological) of overweight and obesity in children including high discontentment, low self-esteem, self-image, and self-concept (Cornette, 2008; Saxena et al., 2004), in this study the emotional and psychological effect of overweight and obesity were not sought after.

## RESEARCH QUESTION 2: IS THERE A RELATIONSHIP BETWEEN SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE MOTHERS AND BMI OF THEIR CHILDREN?

Educational level and religious denomination of mothers were the only significant predictors of the body mass indexes (BMIs) of the children. The results confirmed that the higher a mother's educational achievement the lower the risk of her child being underweight, overweight or obese ( $p$ -value of 0.344). The finding is comparable to Asumadu (2012) South Africa, also find out that, lower level of parents education is a high risk factor of overweight and obesity. Similar to this study finding of socio-economic status (SES) having associations with overweight and obesity among children, this study also found two of such SESs used in the study. However, no significant relationships were discovered with SES such as age, marital status, employment status and occupation. this may be due to different settings

On the nutritional status of children, Jotangia, Moody, Stamatakis, & Wardle (2005) and Bray, Bouchard & James (2004) revealed that UK children from lower income households showed higher prevalence rates for obesity than children in households with higher levels of income (15.8% compared with 13.3%). Similarly, Wang, Monteiro & Popkin (2002) said in the US, obesity is high in low income areas but in Brazil obesity is increased in high income families, while for Russia and China there were no difference between SES and family income level.

Clearly, the influences of social factors (e.g., religion and educational level of mothers) have not been given serious attentions in literature by many researchers. Asumadu (2012) is among the few researchers who reported lower levels of education of mothers as risk factors in child overweight and obesity. These findings are critical to advance research on the risk factors of overweight and obesity across the world.

## RESEARCH QUESTION 3: WHAT TYPES OF PHYSICAL ACTIVITIES ARE BEING PERFORMED BY SCHOOL-

## AGED CHILDREN IN THE SELECTED CHURCHES IN ABURA-PEDU?

This study found that a large proportion of the children engaged in some form of physical activity. For example, walking to school, (41.7%), ampe (35.8%) and playing football (34.6%). Although several studies concluded that inactivity is a palpable cause of overweight and obesity among children this study's finding could not confirm this. Although almost 72% of the children in this study exercised daily, a large proportion of them were still found to be overweight and obese. The duration of the activity were less than 30 minutes which was probably not enough.

The study results is In agreement with the findings of the Canadian Fitness and Lifestyle Research Institute (1999), that found that the prevalence of physical inactivity among youth worldwide had increased and at the international level, 67% of young children in Canada meet the average physical activity guidelines to achieve optimal growth and development .According to Asumadu (2012), the lack of physical activity has reduced the overall amount of energy expended in the course of a day, contributing to the development of obesity and overweight. Parents and teachers have the duty to encourage and help their children develop a positive attitude towards engaging in physical exercises .Also parents and teachers as guardians should be role models by exercising regularly. Parents and teachers have to watch their child/children as they play sports, identified sport talent in them if possible take them to professional matches so that they can get inspired by watching their sporting heroes in action.

However these results could also be due to lack of an objective definition for physical activity and ascertainment of the amount of time spent in doing this activities could have contributed to the differences observed in this study. Parental report or self-report of physical activity by children has been shown to have a low validity (Kohl, Fulton & Caspersen, 2000). It is therefore recommended that more elaborate research into objective measurement of these exposures to establish their true relationship with childhood overweight/obesity

### RESEARCH QUESTION 4: WHAT ARE THE DIETARY/NUTRITIONAL BEHAVIOURS AMONG THE CHILDREN?

The study reported of an overwhelming majority of the children (93%) had positive dietary behaviours after analysing their 12-hour recalls of meals. Dietary practices are found to be important in the nutritional status of children. The children are still in the stage of growth and development. They require nutrients from all the five groups of food sources. However they require more energy sources to aide not only their growth and development but also to replace the energy lost during physical activity. offering a variety of foods from which the children could choose. some of the meals offered by parent were balanced however; certain foods offered were high in fats for example chips and sausages, Fanta abele coke chocolate such sweets should be discouraged by parents not to give to their children.this could also contribute to overweight and obesity.

Studies by Ludwig, Peterson & Gortmaker have found majority ate sweet snacks and sweet drinks – these are not positive behaviors and contribute to overweight and obesity. This Studies is in agreement with Ludwig, Peterson & Gortmaker, study. According to (Ludwig, Peterson & Gortmaker, 2001), the rising prevalence of obesity in children could be due to the consumption of sugar sweetened drinks. To them, there is a 1.6 times increased risk of becoming obese for each additional serving of sugar sweetened drink consumption. The findings contradict with Asumadu (2012) South Africa, who also examined the relationship between prevalence of overweight and obesity with high consumption of sugar as a risk factor for overweight and obesity. Ludwig and colleagues (2001), find that consumption of sugar, sweetened contribute to prevalence of obesity. The differences could be due to the difference in the research setting. Massachusetts school children may do less physical activity as compared to other areas. However, this finding is peculiar to the study by Field et al., (2004) reported a non-significant association between the consumption of snack foods and body weight in 9-to-14 year old children in the U.S.

### RESEARCH QUESTION 5: IS THERE A RELATIONSHIP BETWEEN NUTRITIONAL/DIETARY BEHAVIOURS AND BMI OF THE SCHOOL-AGED CHILDREN IN SELECTED CHURCHES IN ABURA-PEDU?

There was no statistically significant relationship between the dietary/nutritional behaviours and the nutritional status of the children. This contradicts the notion of an existing relation between the two variables. Clearly, there could be other concomitant variables explaining the causes of overweight and obesity other than behaviour nutritional of the children. The mothers appeared to be providing their children with the right amount and quality of foods; therefore knowledge levels on nutrition could be said to be high. This could mean that the obesogenic environment, which includes nutrition (over consumption of energy dense foods) and physical activity as propounded by Swinburne and Egger (2002), could not correspond to the findings of this study. In agreement with Swinburne and Egger (2002), Benton (2004) also linked family and cultural patterns of food selection to childhood obesity, which this study could not authenticate.

## IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

In this chapter, the study is summarized with the key results from the data analyses and discussion highlighted. It also includes the conclusions drawn based on the findings as well as recommendations offered to draw attention to prevalence and determinants of overweight and obesity among school-aged children.

### SUMMARY

The purpose of the study was to determine the prevalence and related factors of overweight and obesity among school-aged children in selected churches in Abura-Pedu in the Cape

Coast North Constituency of the Central Region. It specifically sought to address the following research questions: (1) What is the prevalence of overweight and obesity among school-aged children in selected churches in Abura-Pedu?; (2) Is there a relationship between socio-demographic characteristics of the mothers and BMI of their children?; (3) What types of physical activity are being performed by the school-age children in the selected churches in Abura-Pedu?; (4) What are the dietary/nutritional behaviours among the children?; and (5) Is there a relationship between nutritional/dietary behaviours and BMI of the school-aged children in selected churches in Abura-Pedu?

A quantitative cross-sectional design was employed and a questionnaire was designed and administered to the mothers of the children selected from four main churches in the area. All school-aged children in Abura-Pedu in Cape Coast constituted the target population of the study whereas the accessible population was male and female school aged-children (age 5-15 years) attending the main churches within Abura-Pedu. The number of school-aged children by church was: Pentecost (200), Presbyterian (130), Catholic (110), Methodist (300); totaling 740 students in the population. Stratified random sampling technique was used

The sampling procedure involved dividing the respondents into strata, in this case male and female strata and assignment of numbers to all seats in the Sunday school and randomly selecting and labeling participating seat. The school-aged children who attended Sunday school with their parents and sat on a labeled seat were then recruited.

Anthropometric measurements of the children were obtained with assistance from four research assistants who were qualified nurses. The study received IRB approval and informed consent for participation was obtained prior to data collection. Pre-test had an overall Cronbach's reliability coefficient of .818 based on 43 items. Response rate was 97.7%. In analysing the data, SPSS version 22 was used.

## KEY FINDINGS

The major findings that emerged from the study were as follows;

The results on their socio-demographic characteristics indicated that most mothers were aged 30-39 years and about 80% were married. Generally, the educational attainment of the respondents was very low as almost half (49.7%) had no formal education. Large majorities (97.3%) were working and trading was seen as their main occupation.

Among the children, 50.8% were females and had a mean age of 10.3 years. Almost 40% of the children were of normal BMI. The results showed that the females weighed slightly more than their male counterparts. More than half of the female children (52.7%) were found to be obese, while 8 (6.2%) were overweight. On whole, the prevalence of overweight and obesity among children in the Abura-Pedu area of Cape Coast was high.

The highest educational level and denomination of the mothers were the only two significant predictors of the body mass index (BMI) of the children. It was found that the educational status of mothers was an important predictor of the weight of the children. The results confirmed that the

higher a mother's educational achievement the lower the risk of her child being underweight, overweight or obese ( $p$ -value of 0.0344). The age and gender of children was not associated with BMIs.

It emerged that a large proportion of the children (72.4%) engaged in daily physical exercises such as walking to school, (41.7%), Ampe (35.8%) and playing football (34.6%). In addition, the children reported that their mothers, teachers and self were their main motivators to engaging in physical activities.

An overwhelming majority of the children (93%) had positive dietary behaviours. There was no statistically significant relationship between the dietary/nutritional behaviours and BMI of the school-aged children.

## LIMITATIONS OF THE STUDY

Limitations of this study include:

The churches were selected by the use of a convenience sample at a single point in time and may not necessarily be representative of all school-aged children of residence in Abura-Pedu.

This study design required parent permission to answer the question about their children and for their measurement to be taken, the data collection excluded those children whose parent were absent therefore, limited the representativeness of all school-aged children in the selected church in Abura-Pedu

This was a cross sectional study, it just has described the situation of the small sample making it difficult to generalize the findings to all school-aged children with Abura Pedu in Cape Coast North Constituency

This study tried to describe overweight and obesity status and some related factors only, did not mentioned about causal relationship.

## CONCLUSIONS

Child nutrition has, over the years, been brought to the fore especially due to the high prevalence of underweight, overweight and obesity among children. The possible causes of these phenomena have been attributed to several factors such as genetic, metabolic, behavioural, environment, socio-economic, dietary behaviour, physical activity and environmental factors. The health implications of overweight and obesity among children can be dire.

The identification of the level of education and denomination of mothers as predictors of the body mass indexes reinforce the fact that mothers should be given consideration when the weights of children are being discussed

The lack of a statistically significant relationship between dietary/nutritional behaviours and BMI of the school-aged children is a testament that there could be other factors responsible for the prevalence of overweight and obesity status among children other than solely due to their diets. Effort to identify or unearth these factors is critical for child nutrition, which has become important component of the national and international health policies such as the Millennium Development Goals (MDGs 3&4).

## RECOMMENDATIONS

Recommendations for practice and educations and research are as follows:

### PRACTICE

- ✓ Ministry of Health (MOH) and Ghana Health Service (GHS) should make weight and height measuring equipment available in schools and school and community nurses should increase emphasis on weight management.
- ✓ The children should be encouraged by teachers, parents and community and school nurses to continue to engage in physical activities to maintain their fitness.
- ✓ Nutrition education should be provided to both parents and children on good nutrition i.e. wise choices when selecting meals and snack by parent and, teachers.
- ✓ Parents need to be advised or sensitized by the public and school health nurses to set aside time for healthy meals, physical activity and limit television viewing.
- ✓ Education should be given to all people at all levels on the essence impacts of overweight and obesity using various media such as newspapers, radios, symposia, for parents and televisions broadcasts.

### AREAS FOR FURTHER RESEARCH

This study should be repeated and expanded to include more children in the Cape Coast Metropolis.

A study need to be conducted to measure the knowledge level of children on balanced diet (nutrition) to help food choice.

A study should be conducted to assess the prevalence, awareness of obesity and its health hazards among school-age children of different age groups among selected educational institutions in Cape Coast

A study to identify the type of exercises that can effectively work out overweight and obesity among school children within a limited range of time is needed. For this case, an experimental study with effective diet management between the experimental group and control group is suggested.

A study ought to be piloted with more advanced method to study the impact of overweight and obesity on children's learning behaviors and outcomes. Such method may include conducting a longitudinal study that will help to get systematic progress of overweight and obese children.

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