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UNIVERSITY OF GHANA, LEGON**

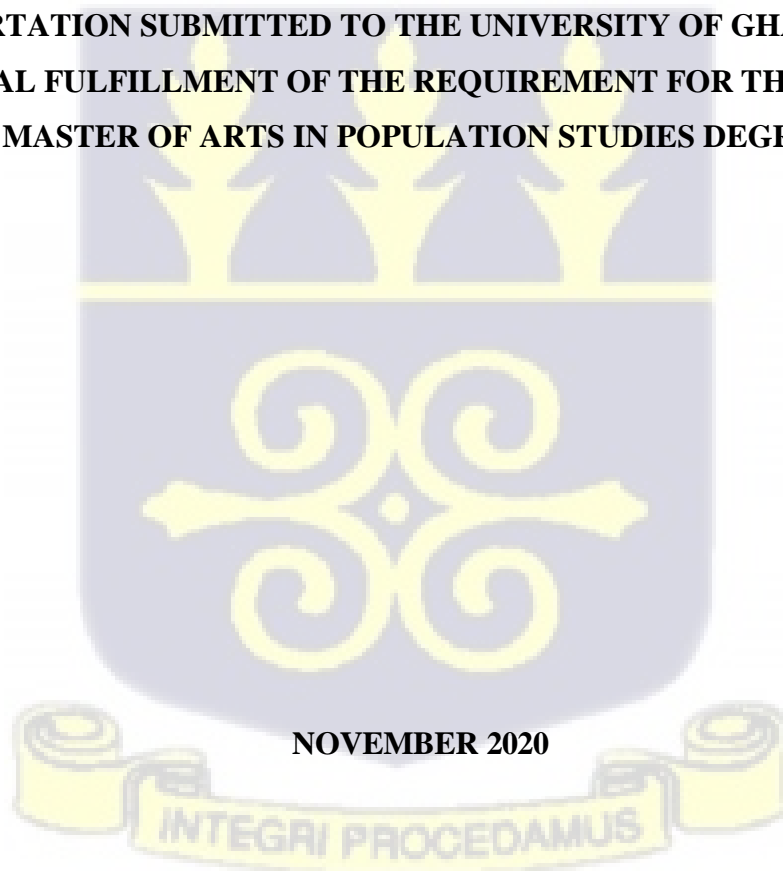
**DETERMINANTS OF OVERWEIGHT AND OBESITY AMONG THE YOUTH IN  
GHANA**

**BY**

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**10286290**

**A DISSERTATION SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON  
IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF  
MASTER OF ARTS IN POPULATION STUDIES DEGREE**

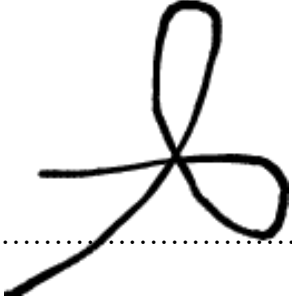


**NOVEMBER 2020**

**INTEGRI PROCEDAMUS**

**DECLARATION**

I, **DANIEL KWAME YIN**, hereby declare that, except for references to other people's work, which have been duly acknowledged, this is the result of my research, and it has been neither in part nor in whole been presented for another degree.



.....

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20 NOVEMBER 2020



**ACCEPTANCE**

Accepted by the Regional Institute for Population Studies (RIPS), College of Humanities,  
University of Ghana, Legon, in partial fulfillment of the requirements for the award of the  
degree of Master of Arts in Population Studies.

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**DATE:** 20 NOVEMBER, 2020

*Fidelía Dake*



## **DEDICATION**

This dissertation is dedicated to my Dad, Mum, and Siblings. May the good Lord richly bless you.



## ACKNOWLEDGEMENTS

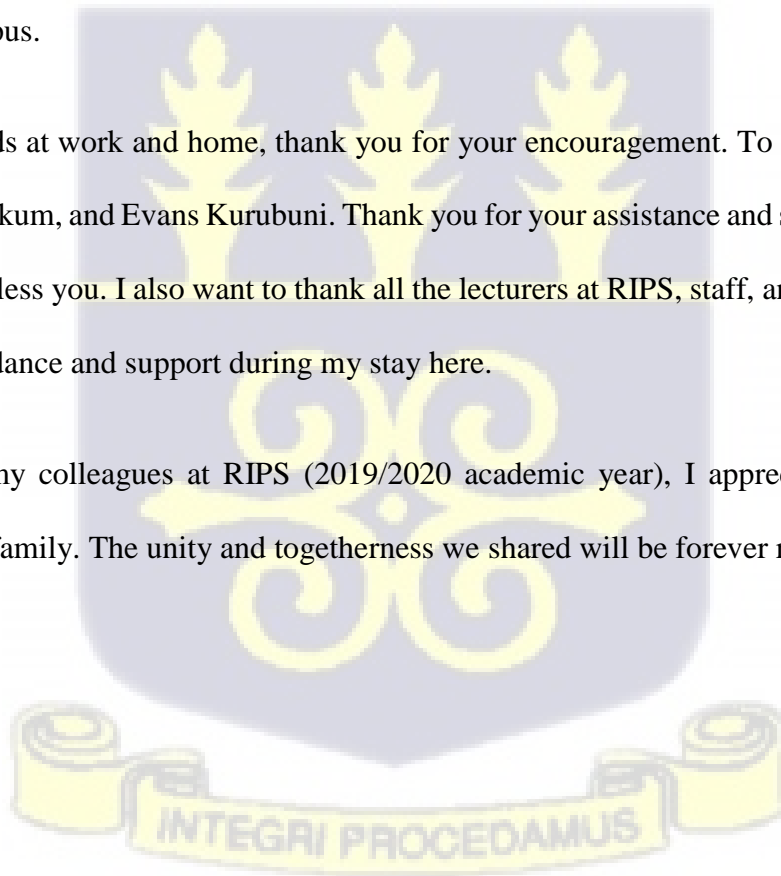
I am grateful to the almighty God for seeing me through the beginning to the end of this stage of my academic journey. I am extremely grateful to my supervisor, Dr. Fidelia Dake, who diligently gave me guidance and support right from the beginning of the study to the end. This study would not have been done without her professional academic input.

I also want to acknowledge the great contributions from my parents, Mr. and Mrs. Yin, my brothers, Patrick and Peter Yin, and their wives, Ama and Lillian Yin. Your support and prayers have made this come true.

I also want to show my profound gratitude to Mr. Charles Kwapong and his family, Mrs. Duchess Hinson, and her family for their immense support, and encouragement during my stay on campus.

To my friends at work and home, thank you for your encouragement. To Charles Asabere, Martin Agyekum, and Evans Kurubuni. Thank you for your assistance and suggestions. May God richly bless you. I also want to thank all the lecturers at RIPS, staff, and Ph.D. students for their guidance and support during my stay here.

Finally, to my colleagues at RIPS (2019/2020 academic year), I appreciate having you around as a family. The unity and togetherness we shared will be forever remembered.



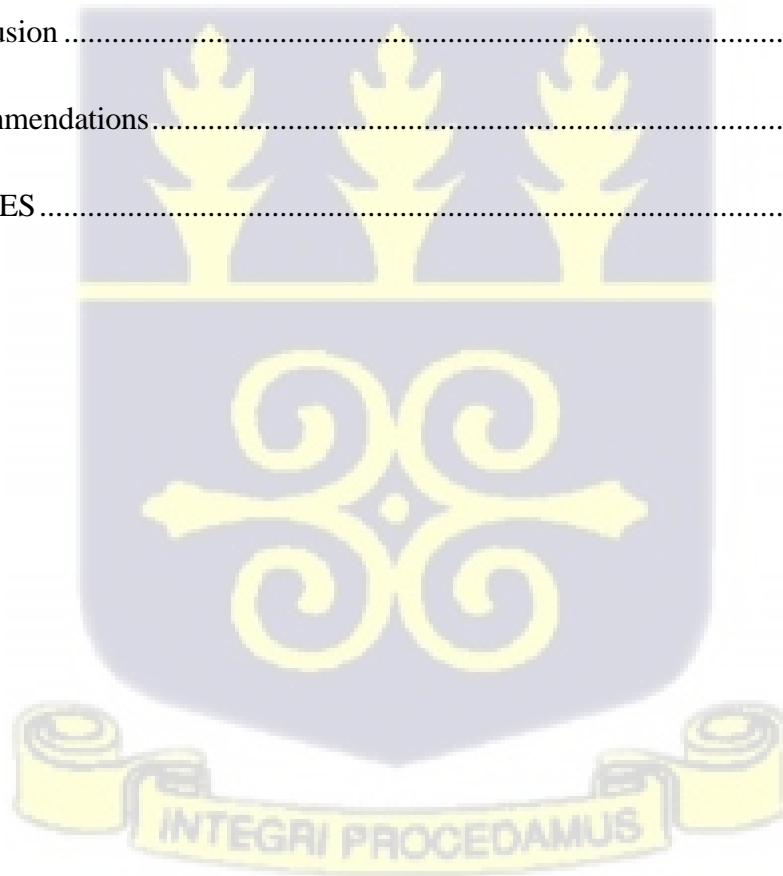
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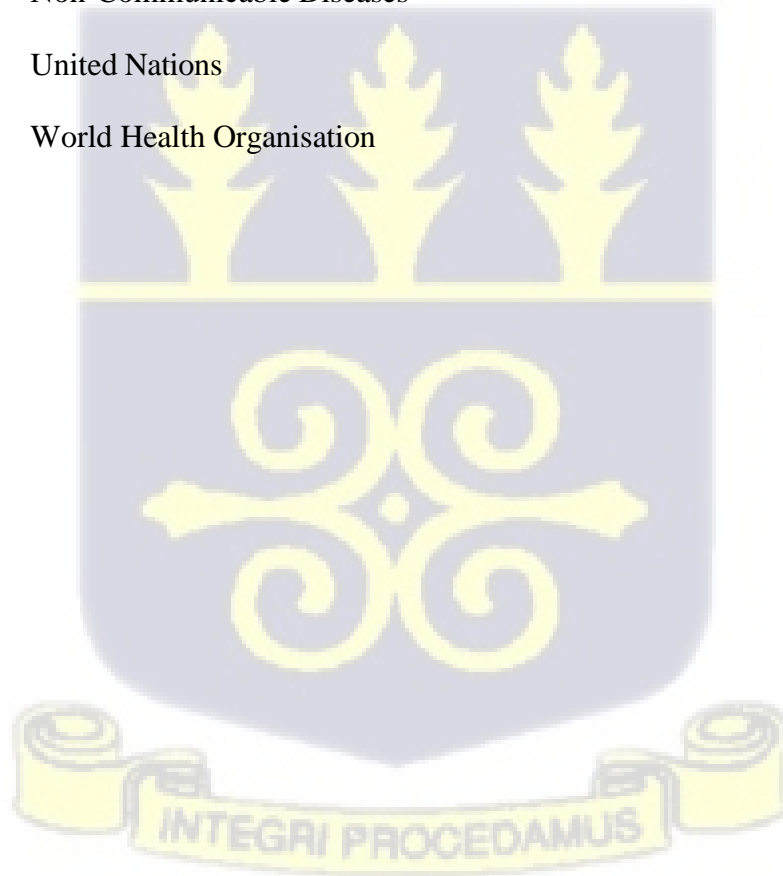
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## LIST OF ABBREVIATIONS

BMI	Body Mass Index
CT	Computerized Tomography
DEXA	Dual Energy X-Ray Absorptiometry
GDHS	Ghana Demographic and Health Survey
GHS	Ghana Health Service
GSS	Ghana Statistical Service
IASO	International Association for the Study of Obesity
IPAQ	International Physical Activity Questionnaire
kg/m <sup>2</sup>	Kilogram Per Meter Squared
MRI	Magnetic Resonance Imaging
NCDs	Non-Communicable Diseases
UN	United Nations
WHO	World Health Organisation



## ABSTRACT

Overweight and obesity, and associated conditions such as hypertension and diabetes, are global health issues that have an enormous financial burden on individuals and families at large. The prevalence of obesity and overweight is growing at an alarming rate in Ghana. The rising prevalence of these conditions affects the quality of life, increases mortality, and reduces productivity in the country. Unhealthy lifestyle behaviours, such as poor dietary habits and sedentary activities, are some of the factors that influence overweight and obesity. This study examined the socio-demographic factors associated with obesity and overweight among Ghanaian youth and how these factors could be addressed.

The study analysed data on 12856 youth aged 15–34 years who were interviewed in the seventh round of the Ghana Living Standard Survey. Obesity and overweight were measured using body mass index as the primary indicator. Univariate, bivariate, and multivariate techniques were employed in analysing the data. The overall prevalence of overweight and obesity was 16.1% and 9.4%, respectively. Obesity and overweight were more common among females (22.9% and 15.9%) compared to males (17.0% and 10.1%). Also, older, educated, rich, and urban-dwelling youth were found to be at a higher risk of being overweight or obese. At the multivariate level, females were 2.56 ( $p = 0.000$ ) times more likely to be obese as compared to males, while youth in the richest wealth quintile were 1.76 ( $p = 0.000$ ) more likely to be obese as compared to youth in the poorest wealth quintile.

Policymakers should help increase educational campaigns on the causes and health consequences of obesity and overweight among youth and the general population to create the needed awareness about these conditions. This can help the youth adopt healthy lifestyles such as exercising and eating healthy foods to prevent overweight and obesity.

## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background

The World Health Organisation (WHO) has reported that obesity and being overweight are some of the most blatantly visible but most neglected public health concerns that have become a global epidemic (WHO, 2017). Obesity has gained much attention and academic interest in public health discourse. This is because the global prevalence of obesity and overweight continues to increase among adults and children. Obesity and overweight are defined as the abnormal and excessive accumulation of fat that presents a health risk to an individual and has been identified as a risk factor for non-communicable diseases (NCDs) such as stroke, hypertension, type 2 diabetes, and some forms of cancer (WHO, 2010a, 2010b).

According to WHO (2017), the global prevalence of overweight and obesity among children and adults has increased more than four-fold between 1975 and 2016, from 4% to 18%. From the 1980s to the 2000s, obesity has increased more than threefold in regions such as North America, the United Kingdom, Australia, and China (WHO, 2003). Prentice (2006) further found that obesity and overweight are high among middle-aged adults but are increasingly affecting those in the youthful age group. In 2014, almost 2 billion young people aged 18 and above were projected to be overweight, of which more than 600 million were obese (WHO, 2017). In recent years, obesity and overweight have been viewed more among the adult population, yet recent reports show a developing pattern of overweight and obesity among children and young people. The WHO (2017) report on obesity indicated that, in 2014, around 41 million children under the age of five were

overweight or obese. This, according to De-Onis, Blossner and Borghi (2020), was projected to increase to about 60 million by 2020 if trends continued unabated.

The prevalence of obesity is not only limited to advanced countries; developing countries are also experiencing a rise in obesity and overweight (Pearce & Witten, 2010). Unhealthy lifestyle behaviours such as eating refined carbohydrates, fatty foods, and lack of physical activity are factors that can influence obesity and overweight (Arojo & Osungbade, 2013).

According to scholars, obesity, overweight, and their associated conditions generally develop in middle age after long exposure to unhealthy lifestyle such as engaging in sedentary activities and poor eating habits, mostly at younger ages (Nelson *et al.*, 2009). Therefore, the continuous poor eating habits and sedentary activities that individuals go through starting at an early age could have detrimental effects on their weight status even in later years (Steyn & Damasceno, 2006). Younger individuals (from the age of 15–19) going through the transition from adolescence to adulthood are mostly found to be engaging in unhealthy lifestyle behaviours.

The transition of younger youth from 19 to 24 years of age to older youth aged 25–29 years is by rapid physical development and also vital social and mental changes (Poobalan *et al.*, 2012). These interactions form a complex ecological network that may predispose youth to developing unhealthy eating habits and activities, leading to the development of overweight and obesity (Poobalan & Aucott, 2016).

Ghana is no exception to the increase in obesity and overweight and its associated conditions. Obesity and overweight, and associated conditions such as hypertension and diabetes, are currently among the top ten hospital-related reasons for death in the nation (Bosu, 2007). The treatment of overweight and obesity is placing an additional financial

burden on the health system. This financial burden leads to the faster deterioration of inadequate health facilities and poor health service delivery that compounds to poor treatment of patients. Similarly, WHO (2010), reported a significant number of deaths in Ghana of about 86,200 related to NCDs, of which obesity has been noted to be a risk factor. This explains how obesity-related conditions are gradually impacting the human resources of the country, particularly the youth.

Unhealthy lifestyles such as the increased consumption of foods that are energy-dense, high in salt, and refined carbohydrates are contributing to the high incidence of obesity and overweight in Ghana (Ministry of Health (MOH), 2007; WHO, 2015). Besides, automated machines and sedentary activities mainly in urban areas have replaced practices such as walking long distances to work and also human labour for farming (Steyn & Damasceno, 2006). This leads to lower physical activity and less energy expenditure, which increases fat accumulation and contributes to the risk of being obese. The growing number of obesity-related deaths and conditions among the youth in developing countries such as Ghana makes it a very important topic for research. Studies on the prevalence of obesity and overweight among youth would go a long way to help explore the various ways in which the problem can be addressed (Wells, 2012; WHO, 2017).

The youth category is the most fluid category by definition. This makes it very difficult to find a definite age range for young people. Different countries have their own age ranges for which they base decisions to meet their intended objectives. According to the United Nations, the youth comprise people between 15 and 24 years of age who form the bulk of most countries' total population (UN General Assembly, 2008). Ghana has one of the largest youth populations, which forms one-third of the total population. In Ghana, youth are defined as individuals who fall within the age bracket of 15–34 years (Ghana National

Youth Policy, 2010). This age group is expected to advance the current technology, education, politics, and peace of the country to attain growth. They are the backbone of every country's development and have the power to help a country develop and move towards progress. So, the health problems that come with being overweight or obese, especially among young people, can slow down a country's progress. This is because young people decide the future of a country.

### **1.1 Statement of the Problem**

The epidemic of obesity and overweight is growing among all age groups in the world, but developing countries are having to contend with some of the highest rates of people affected by obesity and overweight compared to developed countries (Stevens *et al.*, 2012; Ng *et al.*, 2014; WHO, 2017). WHO (2005) found that about three-quarters of the obese population in the world will be in the developing world, and Africa is estimated to have 20–50% of its urban population as either overweight or obese by 2025.

In terms of the impact of obesity and overweight, several studies have shown that children and adolescents who are obese are most likely to be obese adults (Ziraba *et al.*, 2009; Freedman *et al.*, 2009; Singh *et al.*, 2008). The rising prevalence of overweight and obesity in both adults and youth is an important public health concern and is of particular interest because of possible long-term associations with adult weight and morbidities such as diabetes and hypertension, which are likely to lead to reduced quality of life (Wells, 2012). The economic burden of overweight and obesity on the individual, family, and nation as a whole is enormous, which can affect development and productivity (Dixon, 2010; Park *et al.*, 2012). The rising prevalence of obesity and overweight can affect the life journey of youth with debilitating health conditions such as stroke as well as social and psychological implications such as low self-esteem and depression (Park *et al.*, 2012;

Cooke *et al.*, 2007). This is likely to impact development negatively, which affects production and may lead to reduced gross domestic product (GDP). In a recent review of literature among youth in developing countries, the prevalence of being overweight was 28.8%, while that of obesity was found to range between 2.3% and 12% (Poobalan & Aucott, 2016).

In Ghana, the prevalence of overweight and obesity has increased from 0.9% in the 1980s to about 14.1% (Amoah, 2003). Studies in Ghana have also shown a great increase in the prevalence of overweight and obesity, particularly among women (GDHS, 2014; Tuoyire *et al.*, 2016). Tuoyire (2020) found that there was a gradual increase in obesity and overweight prevalence among the adult age range of 15–24 years over a study period of 21 years. The rise in the proportion of obese and overweight adults was about 49% of the total adult population, which if not checked would have adverse effects on the nation.

According to Minicuci *et al.* (2014), about 10% of Ghanaian youth are obese. This is a very critical conclusion. Having such a huge number of youth being obese would burden the already inadequate health facilities in the country. These obese and overweight individuals can be affected by poorer mental health outcomes and low self-esteem, which would affect their productivity in their place of work.

While there have been many studies on obesity and overweight in Ghana (Dake *et al.*, 2011; Doku & Neupane, 2015; Benkeser *et al.*, 2012), literature on the prevalence of obesity and overweight and its associated effects on youth aged 15–34 years is limited. This gap in the literature is critical because the youthful stage is considered to be the period for optimal health and well-being as well as health promotion and disease prevention (Nelson *et al.*, 2008). In bridging this gap, it is vital to shed light on obesity and overweight among Ghanaian youth aged 15–34 years. In that regard, it is imperative

to investigate the socio-demographic factors associated with obesity and overweight among the youth as well as the prevalence of obesity and overweight among the youth in Ghana. This is very vital because the high prevalence of obesity and overweight among youth leads to psychological issues such as depression and low self-esteem, which affect the productivity of such people. Those with low self-esteem often experience anxiety and self-criticism that can lead to negative thinking, a lack of satisfying relationships, and reluctance to pursue future goals. The high prevalence of obesity and overweight also leads to high cardiovascular diseases such as stroke and high mortality, which significantly reduces the quality of life of the youthful population and in turn directly affects the workforce needed to develop the nation and contribute to resource mobilisation. Also, an additional burden is placed on the government to use the scarce resources to build additional health facilities to cater to obese patients and also import drugs to cater for these individuals. Most of these drugs are subsidised so that obese patients can afford them. This is one of the factors that lead to a high exchange rate where the government imports more than it exports, which is a factor of high inflation, thereby slowing development.

### **1.2 Rationale of the Study**

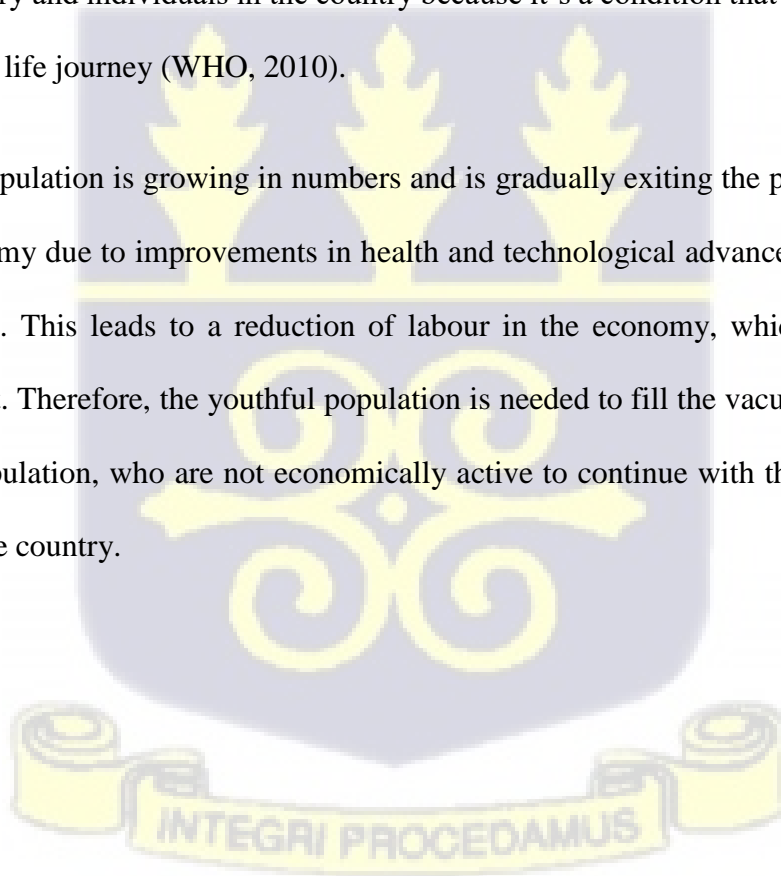
The study of obesity and overweight among youth is very imperative because it is at this stage that the youth need optimal health and wellbeing, so the prevention of such conditions needs to be important. This would help to reduce the health impact on youth and prevent negative health consequences. This study is important because it is during this period of development among youth that skills are developed for careers and aspirations, which would help the youth achieve their life goals. The study would provide the needed knowledge to help understand the different complexities and dimensions of overweight and obesity among youth, which would be very important for the development of effective

public health strategies to manage the increasing prevalence of obesity and overweight conditions.

Also, studies have found an association between socio-demographic factors and obesity, which makes this very important to examine, particularly among the youth. So, a study on how common obesity and overweight are among youth and the social and demographic factors that contribute to them would help us understand the health effects of obesity and overweight among youth and how to make them less common.

Obesity is a threat to human life and development. The increasing prevalence of obesity and overweight and their associated conditions should be explored to help manage the growing mortality rate in the country. The prevention of obesity and overweight should be a focus for the country and individuals in the country because it's a condition that one carries along on his or her life journey (WHO, 2010).

The older population is growing in numbers and is gradually exiting the productive sectors of the economy due to improvements in health and technological advancements (Minicuci *et al.*, 2014). This leads to a reduction of labour in the economy, which contributes to development. Therefore, the youthful population is needed to fill the vacuum that is left by the aged population, who are not economically active to continue with the developmental agenda of the country.



### **1.3 Research Questions**

This study seeks to answer the following research questions:

1. What is the prevalence of obesity and overweight among Ghanaian youth aged 15–34 years?
2. Which socio-demographic factors are associated with obesity among the youth (15–34 years) in Ghana?

### **1.4 Objectives**

#### **1.4.1 General Objective**

The main aim of this study is to examine the socio-demographic factors that influence obesity and overweight among youth in Ghana.

#### **1.4.2 Specific Objectives**

1. To estimate the prevalence of obesity and overweight among Ghanaian youth aged 15–34 years,
2. To examine how socio-demographic factors influence obesity and overweight among Ghanaian youth.

### **1.5 Organisation of the Study**

This study is organised into six chapters. The first chapter introduces the study and provides the statement of the problem, research questions, the rationale for the study, and the objectives of the study. The second chapter presents a review of important literature, the theoretical and conceptual framework, as well as the proposed hypotheses. Chapter three elaborates on the methodology that was used for the study. Chapter four presents the results that were found in the study. Chapter five discusses the findings from the results of the study. In chapter six, the study's results are summed up, a conclusion is reached, and suggestions are made based on what was found.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter reviewed the literature on the relationship between socio-demographic characteristics of youth and how they influence obesity and overweight among youth. The references to some of these studies provided avenues to access other studies.

#### 2.1 Concept of BMI

Body Mass Index (BMI) is a tool that is used to measure and indicate the nutritional status of adults and children. BMI is an international indicator that is used to assess the general prevalence of obesity and overweight among the general population. It is calculated by using the weight of the person in kilograms divided by the squared height of that person in metres (WHO, 2017; Cote *et al.*, 2013).

BMI categories for adults are categorized as follows Underweight =  $< 18.5 \text{ Kg/m}^2$ , Normal weight =  $18.5 \text{ Kg/m}^2 \leq \text{BMI} \leq 24.9 \text{ Kg/m}^2$ , overweight =  $25.0 \text{ Kg/m}^2 \leq \text{BMI} \leq 29.9 \text{ Kg/m}^2$ , Obese =  $\geq 30.0 \text{ Kg/m}^2$  (WHO, 2010). BMI among teenagers is expressed in relation to other children of the same sex and age as age and height change in relation to the body (WHO, 2017; Gibson, 2005; Bacha *et al.*, 2016). WHO (2020), Cote *et al.* (2013), and Bacha *et al.* (2016) classify BMI for children and teens ages 5 to 19 years as follows: underweight at the 5<sup>th</sup> percentile, normal weight at the 5<sup>th</sup> to 85<sup>th</sup> percentile, overweight at the 85<sup>th</sup> to 95<sup>th</sup> percentile, and obese at the 95<sup>th</sup> percentile.

There are various anthropometric ways of measuring body weight. The internationally accepted measure of obesity and overweight is the body mass index (BMI). BMI measurements are easier and quicker for calculating obesity and overweight status.

BMI can also be measured in other ways, such as waist circumference and waist to hip ratio (Nyamdorj *et al.*, 2008). The waist circumference and waist to hip ratio are used to estimate the abdominal fat, which is usually used to express central obesity. The waist circumference and waist to hip ratio measurements are mostly used to distinguish between fatness in the lower trunk (hip and buttocks) and fatness in the upper trunk (waist and abdominal areas). Due to their better accuracy in results (Gibson, 2005; Nyamdorj *et al.*, 2008), they are mostly used to predict the risk of cardiovascular diseases due to their waist circumference and waist to hip ratio.

## **2.2 Socio-demographic factors, overweight and obesity**

### **2.2.1 Age, overweight and obesity**

Weight tends to increase with age (Muhihi *et al.*, 2012). This can be attributed to the transition from puberty to adulthood, which leads to more fat accumulation. As individuals transition to older age, there is a tendency to engage in less physical activity, which can predispose people to being overweight or obese (Schutzer & Graves, 2004). Also, a study done by Biritwum (2005) and Amoah (2003) in Ghana among people aged 18 and older found that the prevalence of obesity and overweight increased with age up to 60 years. The reason is the fact that as an individual grows older, there is a reduction in muscle mass, which exposes the body to fat accumulation, which predisposes an individual to obesity and being overweight.

Musaiger *et al.* (2014) also found that older females aged 25 and older were more at risk of becoming obese and overweight than younger females. This can be attributed to older females who have gone through their puberty transition having accumulated more fat than younger females. Also, older females were more obese and overweight than younger females because they may have gone through various cycles of childbirth due to marriage.

### 2.2.2 Sex, overweight and obesity

The idea of having a large body size is a sign of affluence and prosperity in Ghanaian culture (Appiah *et al.*, 2014). Women who are obese or overweight are more desired, admired, and seen as marriage prospects than slimmer women. This cultural mind-set influences women to eat more to achieve a certain body weight, which in the long run exposes them to obesity and being overweight (Cohen *et al.*, 2013). Additionally, studies have reported that many Ghanaian communities show great admiration for large body sizes. Often, large body size is considered a sign of affluence, and women also tend to perceive this as constituting beauty, good health, and happiness in marriage (Appiah *et al.*, 2014). This social and cultural idea of the ideal body size may be a factor in the growing number of overweight and obese people in the U.S.

A study conducted by Biritwum *et al.* (2005) for ages 18 and older also found that in Ghana, females are more likely to be obese and overweight than males. This was attributed to less physical activity by the females compared to the males. In Ghana, women tend to settle for more sedentary occupations (e.g., table-top trading), and research has documented lower levels of physical activity among Ghanaian women than men. Appiah *et al.* (2016) looked at the factors that lead to overweight and obesity in a group of 18-year-old and older urban Ghanaian women and found that only about 21% of them were active enough.

Men and women have different degrees of becoming overweight or obese. Research has shown that females are more likely to be overweight or obese as compared to males. This can be attributed to women going through the cycle of childbirth where fat is mostly accumulated as a result of eating more and also being less physically active during this period (Al-Nuaim *et al.*, 2012). According to Ersoy & Imamoglu (2006), women are more

obese and overweight than men due to the accumulation of fat deposits among females at an earlier stage in life during puberty when men go through more muscle development. At this stage, men develop higher levels of testosterone hormones than women, which helps with muscle growth and less fat accumulation. Because men and women have different hormones, this difference can be linked to obesity and being overweight in women.

### **2.2.3 Education, overweight and Obesity**

Education plays a very important role in how people understand healthy living. Some studies have found a positive relationship between obesity and education. Education equips people with knowledge and information to make better healthy lifestyle decisions that would help reduce obesity and overweight. This can be in the form of healthy lifestyle habits such as eating healthy foods, less alcohol consumption and taking up sports like football (Al-Haqwi *et al.*, 201; Bharmal *et al.*, 2013; Memish *et al.*, 2014). Studies by Dinsa *et al.* (2012), Neuman *et al.* (2013), and Doku & Neupane (2015) conclude that education plays a role in predisposing an individual to becoming obese and overweight. Education empowers individuals to get better jobs, which enables them to have a higher income and gives them the ability to access and consume more, as can be seen through the purchase of fast foods. This, however, would lead to higher obesity and overweight prevalence.

Biritwum *et al.* (2005) looked at people in Ghana who were 18 years old or older and found that people with tertiary education were more likely to be obese or overweight than people with little or no education.

A study by Anyanwu *et al.* (2010) in Nigeria among the Ibos found among the youth aged 20 and older an inverse association between education and the chances of being obese and overweight among the youth. The study found that a year of education reduces the chances

of being overweight and obese and that education enables the young to make better decisions on healthy living to reduce the risk of becoming obese and overweight. For instance, the costs of being overweight or obese, in terms of the reduced labour market or marriage opportunities, seem to be higher for women than for men. So, education helps a person get better access to information about how to live a healthy life, which lets them make better decisions and choices that can help keep them from getting sick from being overweight.

#### **2.2.4 Place of residence, Obesity and Overweight**

The location of an individual can influence their obesity and overweight status. Studies by Amoah (2003) in Ghana among older adults 25 years and older found that rural dwellers had lower obesity and overweight rates than urban dwellers. The lower rate of obesity among rural dwellers was a result of long-distance walking to farms to work on farm lands due to less access to the use of automobiles. Walking and working on farms use up more energy, which helps keep young people in rural areas from becoming overweight or obese. People in urban areas are more likely to own cars and board vehicles rather than walk, and this has resulted in lower physical activity levels in urban areas compared to rural areas, where people walk over long distances to the farm or to fetch water. As a result, urban dwellers are more susceptible to becoming overweight and having an obese prevalence due to little to no physical activity. This gives credence to the westernisation and urbanisation theory.

A study by Dake *et al.* (2011) in Ghana among women aged 15–49 years on the socio-demographic factors that can influence obesity found that women who leave the urban areas were more likely to be obese than women who leave the rural areas. This can be attributed to urbanisation and westernisation theory. The westernisation theory states that

due to globalization, a western diet has been adopted in the country, which involves foods high in saturated fat, refined sugar, refined grains, and less consumption of fruits and vegetables, which predisposes an individual to becoming obese and overweight. Women who live in urban areas are more predisposed to becoming obese and overweight due to the consumption of and easier access to these foods high in fat and sugar. A study by Al- Nsour *et al.* (2013) among Jordanian women aged 15–49 years found that women who live in the rural areas are more likely to be obese and overweight as compared to women who live in the urban areas. The key to women in the rural areas being obese and overweight was that they had better economic power than the women in the rural areas. Economic power gives urban women the ability to purchase and consume more than their fellow women living in rural areas. This, in the long run, increases the weight of women in urban areas.

### **2.2.5 Region of residence, overweight and obesity**

According to research by Dake *et al.* (2011) among Ghanaian women aged 15–49 years, there is an increase in obesity and overweight prevalence in the three northern regions of Ghana. This can be attributed to the low economic status of women who consume more foods such as refined carbohydrates and frozen meat products. Because of globalisation and open market economies, people in these areas are more likely to adopt Western lifestyles and eat high-energy foods like refined fat, sugar, and salt. This is why the number of obese and overweight people is rising.

A study by Ofori-Asenso *et al.* (2016) in Ghana among adults 18 years and older found that obesity was highest in more developed regions than in developing regions. Greater Accra had the highest obesity prevalence of 30.1%, the Ashanti region at 26.9%, the Northern region at 21.9%, and the Central region at 16.0%. In recent times, more

Ghanaians are exposed to changes in telecommunication, transportation, and exposure to global markets. (Agyei-Mensah *et al.*, 2010; Agbeko *et al.*, 2013) These factors have led to drastic changes in lifestyle, such as eating more foods from the West and being less active. These changes have gained a lot of momentum, especially in these major regions of Ghana.

### **2.2.6 Wealth quintile, overweight and obesity**

Studies have shown that there is a positive correlation between income status and obesity and being overweight (Agbeko *et al.*, 2013). Agbeko *et al.* (2013) postulated that Ghanaian women 15 years and older who have greater wealth can access and consume more food that exposes them to overweight and obesity conditions. Wealth enables people to afford luxury foods (meat, fried foods such as chips, sugar, and chocolate) regularly. Individuals who consume these fast foods regularly are at risk of becoming overweight or obese (Renzaho, 2004). Moreover, evidence suggests that in Ghana, most fast-food joints and restaurants are crowded in wealthy neighbourhoods and tend to target high-class clients (Omari *et al.*, 2013). Agyei-Mensah and de-Graft Aikins (2010) also report that among the working (middle to high class) population in Ghana, aged 18 and older, there is an emerging trend of individuals working late or hanging out at after-work bars to beat the heavy evening traffic. These practices are implicated in late eating and increased alcohol intake, and by extension, increased obesity and overweight conditions.

In a study among youth in developing countries aged 18 and older, Dinsa *et al.* (2012) found that youth with lower socioeconomic status were more likely to become obese and overweight. This can be attributed to young people with lower incomes purchasing and consuming more cheap foods such as refined carbohydrates, red meat, and high-sugar foods that contribute to obesity and overweight. The fast growth of globalisation and open

market economies has made it easier for these kinds of products to be sold and consumed in these areas, which has led to a rise in the number of obese and overweight people.

In his study of obesity in developed and developing countries, McLaren (2007) found that men and women aged 25 and older in developed countries with higher socioeconomic status are less likely to be obese and overweight as compared to those with lower socioeconomic status. In developed countries, wealthy people can afford nutritious food, but they are under greater social pressure to remain slim, and they have more opportunities along with greater prospects for physical fitness. On the other hand, Agbeko *et al.* (2013) in their study in Ghana among women aged 15–49 years found a positive relationship between wealth status and obesity and overweight. In a country like Ghana, where the rich are expected to put on weight as proof of their success and prestige, chubbiness in successful individuals is expected. This is due to the increased income and purchasing power of women.

### **2.2.7 Occupation, overweight and obesity**

Occupation can determine the obesity and overweight status of a person. Scott (2012) found that sub-Saharan countries such as Ghana are experiencing a high rate of urbanisation and globalisation, which is changing the more manual occupation of farming into more sedentary occupations such as legislators, managers, and bankers. These jobs are more sedentary, which means they use less energy and make people more likely to become obese or overweight.

Abdulai (2010) in his study of Ghanaian women 18 years and older in Accra found that people who are involved in highly demanding physical occupations such as farming and fishing are less likely to be obese and overweight as compared to people with no occupation or women who sell at the market. When compared to selling in the market,

farming and fishing use more energy, which keeps people from becoming overweight or obese.

A study by Ofori-Asenso *et al.* (2016) in Ghana found globalisation has changed the landscape of the Ghanaian transportation and telecommunication system. People are getting their food delivered, and cars have become the most common way to get to their destinations. These changes in lifestyle make it more likely for people to be overweight or obese because they spend so much time sitting down and don't do much physical activity.

In their study in the United States among adults 18 years and older, Bonauto *et al.* (2014) found that occupations that are more physically demanding, involving heavy labour and sports, had significantly lower obesity and overweight prevalence as compared to those with less physically demanding occupations such as sales. Sportsmen and women are always expending energy through training and competitions, which safeguards them against becoming obese or overweight. The study also postulated that adults who work in the sales industry are more likely to be obese and overweight due to long hours of sitting, which is less physically demanding.

#### **2.2.8 Marital status, overweight and obesity**

In their research in Ghana among urban women aged 18 and older, Appiah *et al.* (2014) found that the marital status of a woman influences her obesity and overweight status. At this stage of married life, couples tend to do house chores together, such as washing and cleaning, which would reduce the energy expenditure an individual would have used to complete such chores, which leads to obesity and being overweight. Married couples also tend to eat together, which can increase the desire to consume more food. According to Agbeko *et al.* (2013), Ghanaian women, 15 years and older, who are married tend to have higher obesity and overweight prevalence as compared to women who have never been

married. Married women have financial support from their husbands, which gives them access to purchase and consume more. This could be because married women made and ate a lot of food when they were pregnant, which made them gain weight.

In their study of Ghanaian women aged 15–49 years, Dake *et al.* (2010) found a relationship between married women and obesity and overweight conditions. In Ghana, where most married women live, being overweight and obese is seen as a sign of beauty, health, and status. This is why many married women in Ghana are overweight.

A recent study by Agne *et al.* (2012) among Latino women aged 19 and older, irrespective of their marital status, found a gradual change in the cultural perception of weight gain that is associated with beauty and prestige. This is due to the health-related consequences associated with obesity and being overweight. So, women want to live in a healthy way and are willing to lose weight to avoid diseases like diabetes and heart attacks that are linked to obesity.

### **2.2.9 Religion, overweight and obesity**

Religious practices affect the lives of people through diverse ways of teaching and practicing. Studies by Amo-Adjei & Kumi Kyereme (2014) found a relationship between the Christian and Muslim faith and the prevalence of obesity and being overweight. Most of these Muslim and Christian platforms are used to promote healthy lifestyles that guard against obesity and overweight. Muslims are told to eat more fruits and vegetables during Ramadan, which can affect whether or not they are overweight or obese.

### **2.3 Health related risk of overweight and obesity**

Obesity and being overweight are conditions that lead to non-communicable diseases such as strokes, heart attacks, high blood pressure, etc. These noncommunicable diseases cause

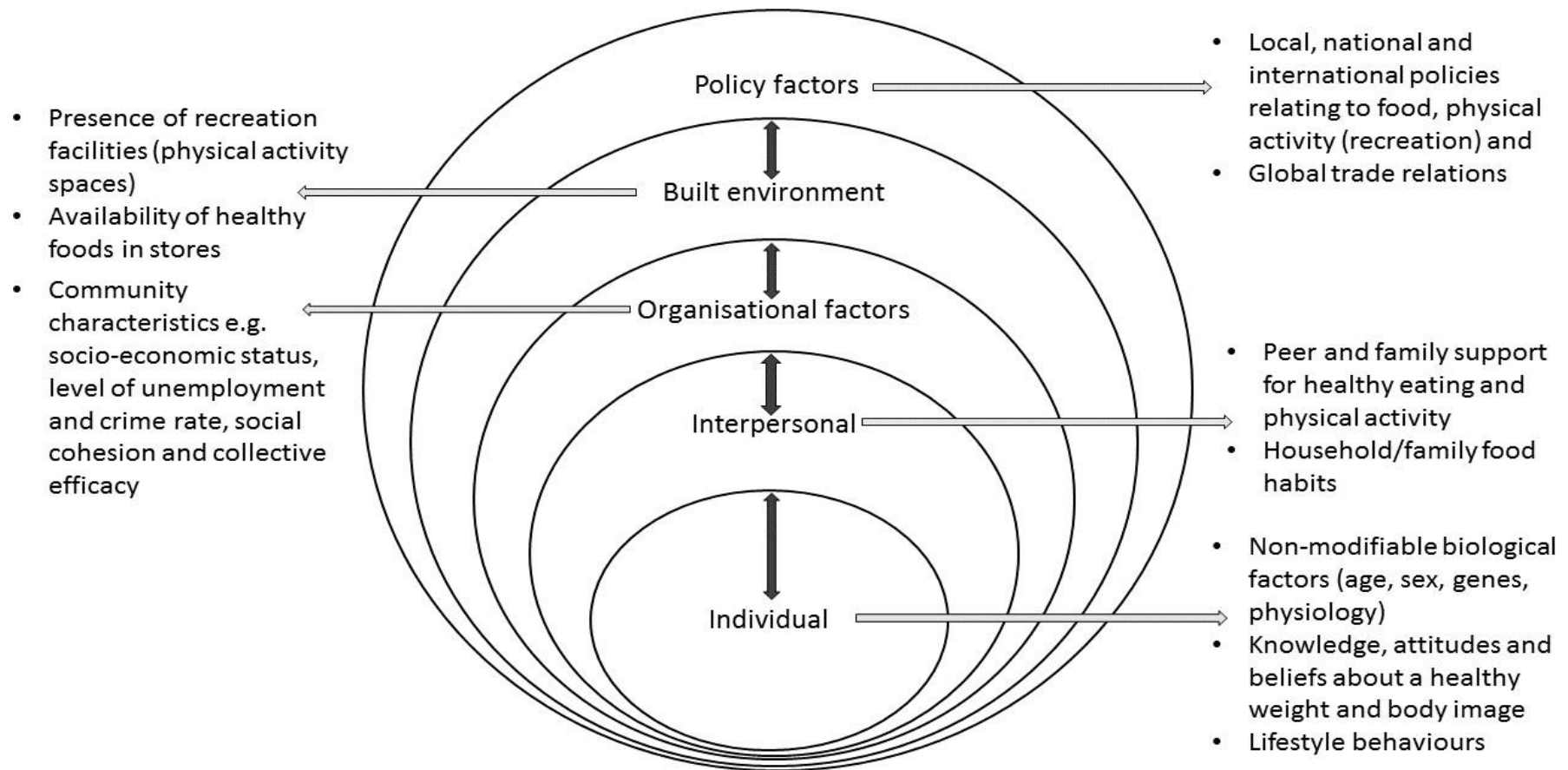
a slew of health issues for individuals. Obesity or being overweight is a combination of different factors such as dietary patterns, culture, and physical activity. (Van Cleave *et al.*, 2010; Swinburn *et al.*, 2011) This has become a global health problem that needs to be dealt with to stop the rise in sickness and death around the world.

Overweight and obesity affect all categories of people: infants, adolescents, and adults. People in these groups are more likely to get diabetes, cognitive heart failure, prostate cancer (in men), and colorectal cancer because they are overweight or obese (WHO, 2010).

Obesity and being overweight harm pregnant women and their unborn children. Such women are at risk of developing health conditions such as gestational diabetes and preeclampsia. This also affects their children, who might get non-communicable diseases like heart problems as they get older (Mighty & Fahey, 2007).

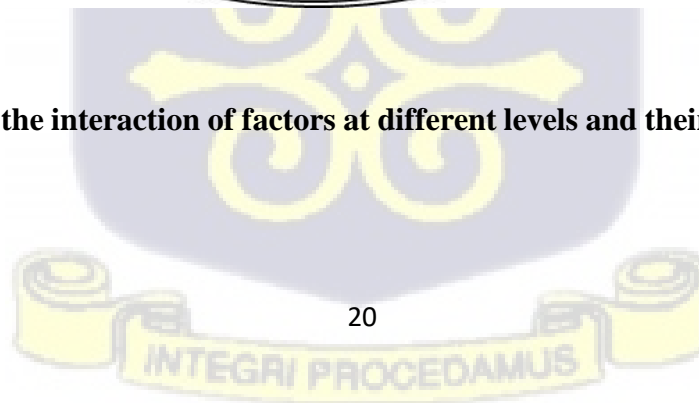
#### **2.4 Theoretical framework**

The socio-ecological framework is a framework for explaining the interaction of personal and environmental factors that determine behaviour. The framework conceptualises and integrates the built environment as a mediator of obesogenic behaviour (Richard *et al.*, 2011). The socio-ecological model shows obesity at the individual level as an outcome of the interaction between an individual's characteristics (age, sex, genetics, dietary habits), and interpersonal factors (culture, family, peers), organisational factors, and the built environment (the built environment includes the natural and manmade environment where physical activity is performed). The physical environment comprises the availability and access to playgrounds, sports facilities, gyms, etc. At the policy level, laws are made on the types of food that can be imported and accessed in the country, which affects energy consumption and expenditure where they are accessed.



**Figure 1** Socio-ecological model depicting the interaction of factors at different levels and their influence on overweight and obesity.

*Source: Willows et al., 2012*



The socio-ecological model explains the network of interactions between factors at different levels acting together to influence energy balance at the individual level. Applying the socio-ecological model to the conceptualisation of obesity research highlights the need to examine the factors beyond the individual level that influence obesity. For example, in understanding weight-related conditions among Aboriginal children in Canada, Willows *et al.* (2012) applied the socio-ecological framework to explain obesity. Willows *et al.* (2012) in explaining the prevalence of obesity among Aboriginal children in Canada saw several factors operating at different levels, including individual-level factors, interpersonal factors (family, peers), the built environment, societal factors, and historical factors. At the individual level, the main issue deals with the knowledge and skills the person have about obesity and being overweight, which would help him or her to understand more about the condition. It helps them understand how susceptible they are to obesity, its seriousness, and its threat. Their communications and conversations can help individuals understand the consequences and adverse effects of obesity and being overweight. At the organisational level, more people in different sectors of the community can be reached. Schools and workplaces can advocate for healthy lifestyles among people, providing counselling and making people aware of the health implications of obesity and being overweight. The built environment deals with how society creates a climate that can help curb or promote obesity and overweight. This can be done through the development of physical facilities such as football pitches, recreational parks, and also the availability of healthy food stores in the community. At the policy level, the government is in charge of developing policies that would help prevent the increase in obesity. The expansion of natural food products on the market, the development of national parks, and increasing the cost of refined products would go a long way to help curb obesity and overweight. The socio-ecological model has various levels

that influence obesity and overweight, but based on this study among Ghanaian youth, all the factors that can influence obesity and overweight can be found only in the individual and interpersonal levels of influence. These socio-demographic factors are sex, age, wealth quintile, and educational level, as well as marital status, place of residence, region of residence, religion, and occupation. This makes all these socio-demographic factors direct variables that can influence obesity and overweight among the Ghanaian youth, which this study seeks to explore.

## **2.5 Conceptual Framework**

The conceptual framework for this study is guided by the socio-ecological framework, which shows the linkages between socio-demographic variables on the one hand and BMI status on the other hand. The conceptual framework analyses and organises the various factors that influence obesity and overweight among youth. Literature has shown that some socio-demographic characteristics, such as age, wealth status, marital status, and sex, have a relationship with BMI status.

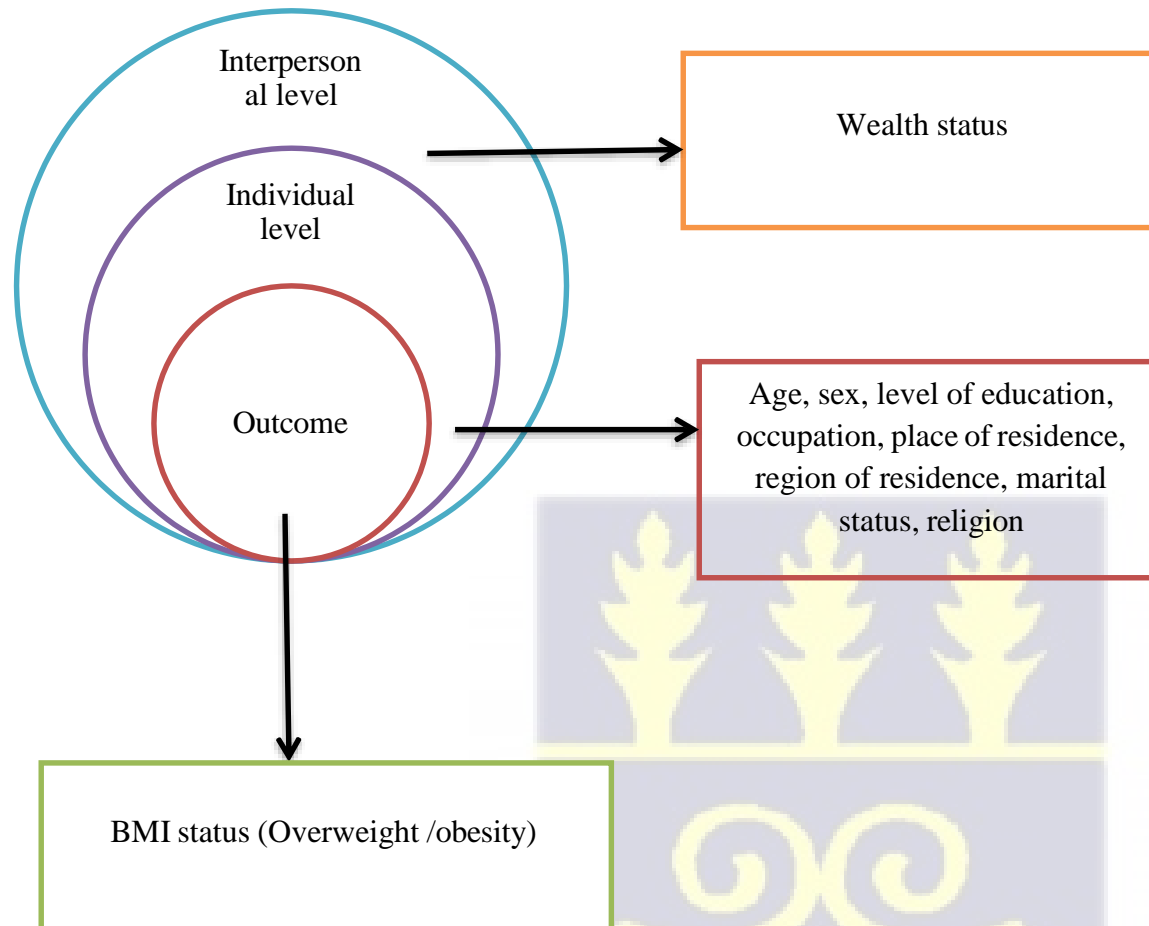
The socio-demographic characteristics such as the sex of an individual can influence their obesity status. Studies conducted by Kanter & Cabellero (2012) indicate that females have a higher risk of being obese compared to males. This can be attributed to childbirth, parity, and pregnancy, which influence weight gain in women. In developing countries such as Ghana, highly educated people have a higher risk of becoming obese and overweight, as found by Cohen *et al.* (2013), Dake *et al.* (2011), and de-Graft Aikins (2010). This is mainly because higher education comes with a better job and a higher income. This gives an individual the ability to purchase and consume unhealthy foods. Additionally, the age of an individual can influence their obesity status. Older individuals are more sedentary in nature and are less likely to engage in vigorous activities that expend more energy. This

would gradually lead to the accumulation of fat, which leads to obesity, as found by Muhihi *et al.* (2012). Moreover, the area where an individual resides can have an impact on their weight. Respondents in urban areas are more likely to be obese than their rural counterparts. These lifestyle attitudes among urban dwellers contribute to the higher prevalence of obesity and overweight among urban dwellers as found by Tuoyire (2020). Regions that are more urbanized are more likely to have a higher risk of obesity as compared to regions that are less urbanized.

In their study among Ghanaian adults 25 years and older in urban areas, they found that wealth gives people the ability to buy more, which can influence consumption, making wealthy people more likely to become obese. The purchasing power of an individual increases with wealth, so these fast foods high in sugar and salt found in the cities are easily accessible to them for consumption, leading to obesity and overweight.

Also, the kind of occupation a person engages in can influence their risk of obesity and being overweight. People who are into agriculture and fishing are less likely to be obese because this kind of occupation is more physically demanding with higher energy expenditure. However, people who are in managerial occupations are more likely to become obese due to less physical expenditure in their jobs. This is consistent with studies done by Abdulai (2010).

Also, people who are married are more likely to be overweight and obese as compared to never-married individuals (Dake *et al.*, 2011). de-Graft Aikins (2010) and Dake *et al.* (2011) found that married people have a higher prevalence of obesity. This can be due to the culture of beauty, health, and the prestige associated with weight gain, particularly for married women. Also, married couples have financial support from their partners, which increases their chances of buying and consuming more



**Figure 2: A Conceptual framework for studying socio-demographic determinants of overweight and obesity among Ghanaian youth.**

*Source: Authors construct 2020*

## 2.6 Hypotheses

1. Female youth are more likely to be obese as compared to male youth.
2. Youth who belong to the richest wealth quintile are more likely to be obese as compared to youth who belong to the poorest wealth quintile.
3. Older youth aged 25–34 years are more likely to be obese as compared to younger youth aged 15–24 years.
4. Youth who are currently married are more likely to be obese than youth who have never married.



## CHAPTER THREE

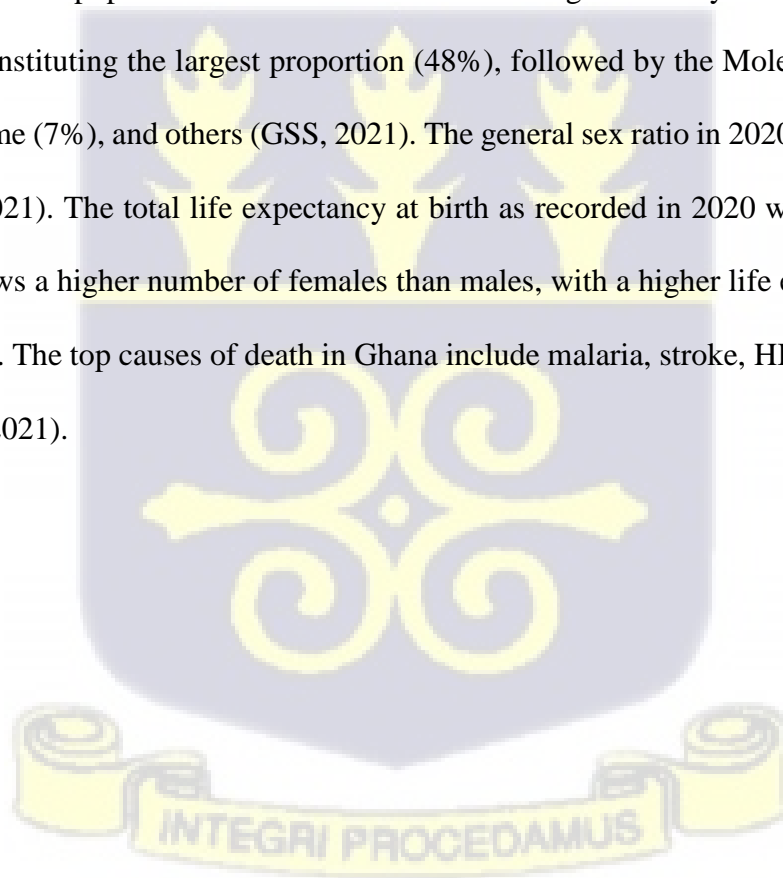
### METHODOLOGY

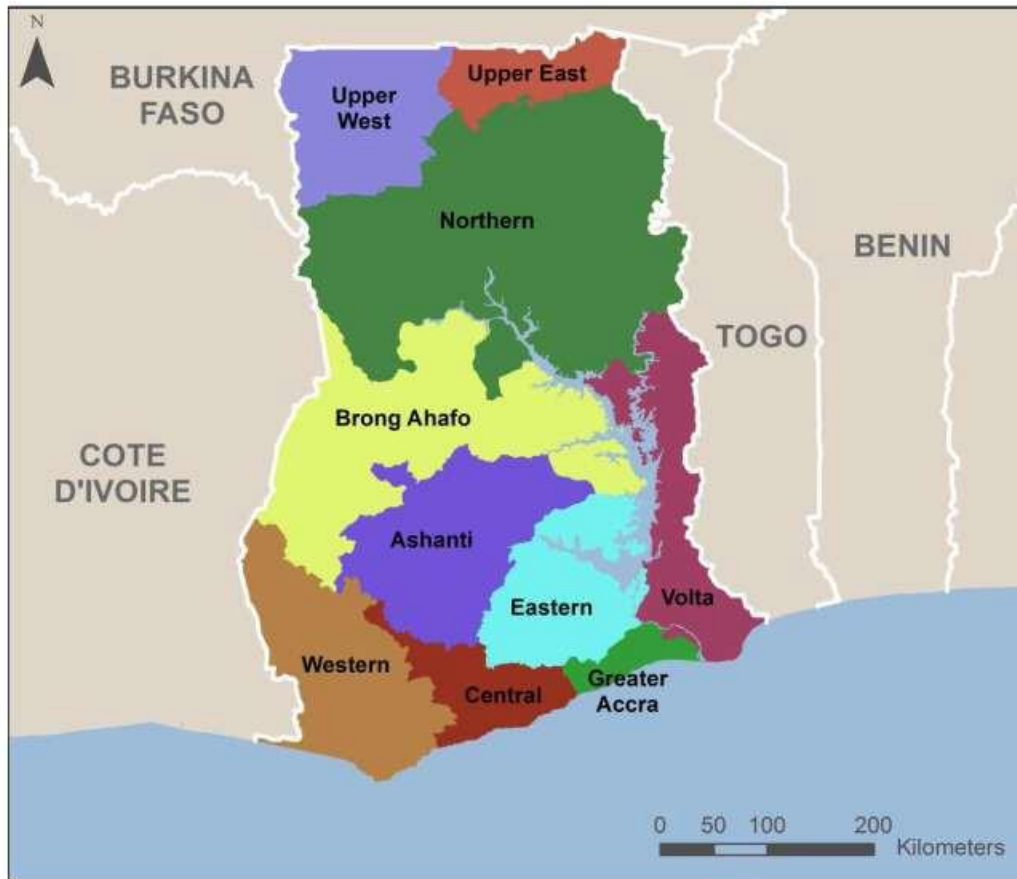
#### 3.0 Introduction

This chapter describes the study area, sources of data, the variables of interest, and the analytical methods employed in analysing the data. For the purpose of this study, the youth category would range between 15-24 years. They form the majority of the country's total population.

#### 3.1 Study Area

Ghana is a West African country with a land area of 238,537 square kilometres. Before 2018, Ghana had only ten administrative regions. But on December 27, 2018, a referendum was held across 47 districts in the country, leading to a landslide of yes voters to create a new six regions in addition to the previous ten regions (GSS, 2021). The current population of Ghana is a little over 33 million people, with a youthful population of 34%. Ghana is a multilingual country with several ethnic groups, with the Akan constituting the largest proportion (48%), followed by the Mole-Dagbani (17%), Ewe (14%), Ga-Dangme (7%), and others (GSS, 2021). The general sex ratio in 2020 was 97 males per 100 females (GSS, 2021). The total life expectancy at birth as recorded in 2020 was about 69.37%. The sex structure shows a higher number of females than males, with a higher life expectancy for women compared to men. The top causes of death in Ghana include malaria, stroke, HIV/AIDS, and neonatal disorders (GSS, 2021).





**Figure 3 Map of Ghana Showing the Administrative Regions**

**Source: Population and housing census, 2010**

*Adopted from the Ghana Statistical Service, 2010*

### **3.2 Data Source**

The data for this study is drawn from the seventh round of the Ghana Living Standard Survey. Data for GLSS 7 was collected using different sets of instruments, including a household questionnaire, a community questionnaire, and a questionnaire on the prices of food and non-food items. The household questionnaire includes different modules (A, B, C, and D) with different segments. The sections of module A of the household questionnaire included demographic characteristics, education and skills training, health and fertility behaviour, and migration, among others. The section on demographic characteristics of household members included sex, age, marital status, and level of education of household members. Section B contained the height and weight measurements for calculating the BMI. The household questionnaire was used for the study

(GLSS 7, 2017). The GLSS 7 data set is used in this study because it covers the entire country as well as all population subgroups in the country. The data set was best suited for this study because the height and weight of both males and females were needed to calculate the obesity and overweight status of youth (BMI), which cannot be found in other nationally available data sets. The height and weight information on males and females are duly represented in GLSS 7 as compared to other data sets, which makes it very vital for this study.

### **3.3 Study design and size**

The GLSS 7 sampled 15,000 households nationwide and collected 14,009 interviews successfully. The urban and rural areas were selected as the main sampling strata using the two stages of the census enumeration areas as guide. The sampling frame was the 2010 Ghana population and housing census, where the systematic probability sampling technique used for selection. About 43.9% were rural areas and 56.9% were urban.

The age category for the youth in this study is 15-34 years because these categories of individuals are the backbones of institutions and have the propensity to change the dynamics of a country's development. The sample size for this study is 12,856 respondents who had their BMI calculated for the purpose of this study. This is the sample size for respondents who fall within the three categories of analysis which are normal weight, overweight and obesity.

### **3.4 Selection procedure**

Based on the age of interest (15–34) a sample of 14,576 was extracted for the present study with 7,666 females and 6,910 males. This was done by filtering respondents whose ages were greater than 14 years, but less than 35 years. To ensure representativeness, and as well as correct for the issue of non-response; the data is weighted to ensure representativeness. Two files (B and D) from the household questionnaire were merged to form a single file. These two files B and D were relevant because each one of them contained the most relevant socio-demographic variables that were important to this study. Each file either had one variable or two but not all the variables on which this study is based, thus the two files were merged. The data were also weighted to ensure

representation. Using a multilevel analysis procedure, this study examines obesity and overweight as an outcome of socio-demographic indicators at the individual level.

The interest of the study is predicting obesity and overweight among the youth. As a result, after extracting the total sample from the GLSS 7 data set, BMI was computed for the total sample of 14,576. The BMI categories are four namely underweight, normal weights, overweight and obese. The focus of this study is on the factors that influence obesity and overweight among youth in Ghana. Therefore, at the bivariate and multivariate levels of analysis, all underweight categories were dropped to allow the study to focus on overweight and obese youth only. The final total sample for the bivariate and multivariate analysis is 12,856.

### **3.5 Measurement of Variables**

#### **3.5.1 Dependent variable**

Obesity was measured using the body mass index (BMI). Weight was measured in kilograms, while height was measured in centimetres. The height in centimetres was converted into metres by dividing it by 100, and the resulting height was then squared. BMI was generated for all respondents by dividing their weight in kilograms by their height in metres squared. Respondents were categorised based on three BMI values, namely normal weight (18.5 - 24.9 kg/m<sup>2</sup>), overweight (25.0 - 29.9 kg/m<sup>2</sup>), and obese ( $\geq 30.0$  kg/m<sup>2</sup>) based on the standard WHO classifications. The number of dependent variables in this study is one with three BMI categories namely overweight, normal weight and obesity.

#### **3.5.2 Independent variables**

With reference to age, respondents were asked to indicate their ages in completed years. Age in the data was coded as a continuous variable, but per the purpose of this study, age was recoded into two groups, 15–24 years and 25–34 years, with codes 1 and 2 respectively (Table1). The sex of the respondents was categorised as males and females with codes 1 and 2 respectively, as shown in Table 1. With regards to respondents' place of residence, they were asked about their place of

residence. The place of residence was categorised as urban and rural, with codes 1 and 2 respectively.

Respondents were asked about the region they reside in. The region of residence was coded based on the 10 administrative regions namely Western (1), Central (2), Greater Accra (3), Volta(4), Eastern (5), Ashanti (6), Brong Ahafo (7), Northern (8), Upper East (9), and Upper West (10). The household wealth quintile was grouped into five categories as poorest (1), poor (2), middle (3), rich (4), and richest (5). The categories were married (1), consensual union (2), separated (3), divorced (4), widowed (5), and never married (6). The variables were recoded into currently in union (1) (married and consensual union). Never married (2) was maintained while separated, widowed, and divorced were recoded as formerly married (3) (Table 1).

The religious denominations of respondents were maintained in this study as other religion (1) Catholics (2), Protestants (3), Pentecost/Charismatics (4), Other Christians (5), Islam (6), Traditionalist (7) and other religion (8) with codes. The occupations of respondents were coded as no occupation (1), managers (2) which includes, legislators, clerks, professionals, technicians, sales/service (3), skilled agric/fishery (4), artisans (5) which includes, craftwork, plant machine operators, elementary occupation, other occupation (6).

Respondents were asked to indicate whether they have been to school. Those who answered yes were further asked about their highest level of education with responses as kindergarten (1), primary (2), JSS/JHS (3), middle (4), SSS/SHS (5), secondary (6), Voc/Tech (7), Teacher/Agric/nursing training (8), polytechnic (9), university (bachelor) (10), university (postgraduate) (11), professional (12), and don't know (13) with codes 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13. The level of education was recoded as no education (1), primary and below (kindergarten, nursery =2), Junior high school (middle =3), Senior high school (vocational, technical, =4), Tertiary (teacher training, nursing, polytechnic, university bachelors, university graduate, and professionals =5).

**Table 1: Measurement of Variables**

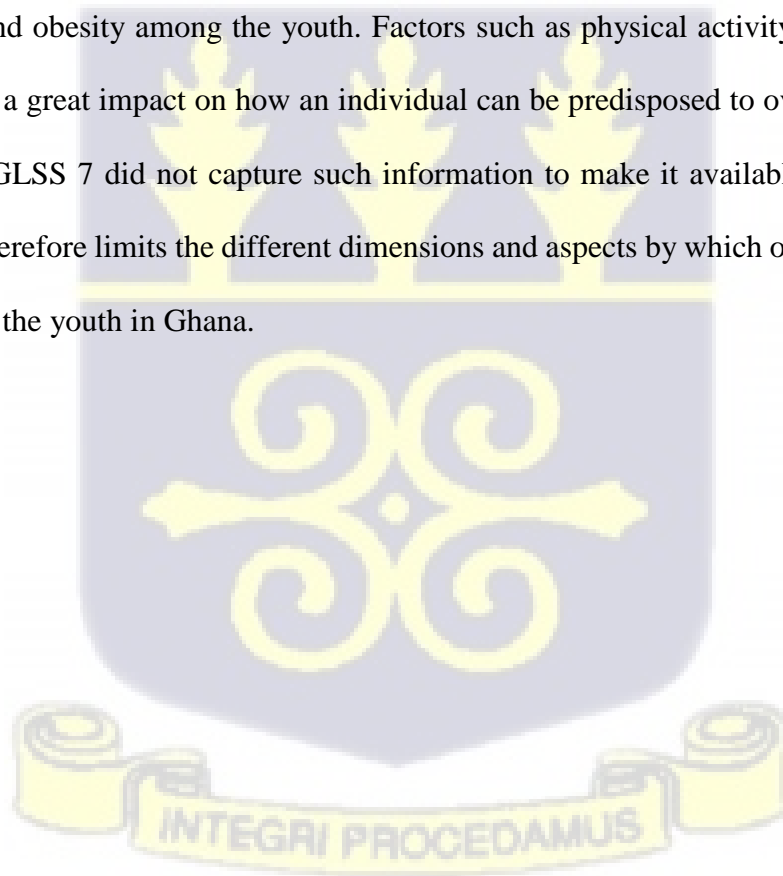
<b>Variables</b>	<b>Measurements</b>
<b>Age</b>	1= 15-24 years 2= 25-34 years
<b>Sex</b>	1= Male 2= female
<b>Place of Residence</b>	1= Urban 2= rural
<b>Region</b>	1= Western 2= Central 3= Greater Accra 4= Volta 5= Eastern 6= Ashanti 7= Brong Ahafo 8= Northern 9= Upper East 10= Upper West
<b>Marital Status</b>	1= Currently in union (married, consensual) 2= Formerly married (divorced, widowed, separated) 3= Never married
<b>Educational Level</b>	1= No education (don't know) 2= primary and below (kindergarten, nursery) 3= junior high school (middle) 4= senior high school (vocational, technical) 5= tertiary (teacher training, nursing, polytechnic, university bachelors and graduate, professional)
<b>Occupation</b>	1= No occupation 2= managers (legislators, professionals, technicians) 3= sales/service 4= skilled agric/fishery 5= artisans (craftwork, plant operators, elementary) 6= other occupation)
<b>Religion</b>	1= other religion 2= Catholics 3= protestants 4= Pentecostal/charismatics 5= Other Christians 6= Islam 7= traditionalists 8= no religion
<b>Wealth quintile</b>	1= poorest 2= poor 3= middle 4= rich 5= richest
<b>BMI Status</b>	1= (normal weight $18.5 \leq \text{BMI} \leq 24.9$ ) 2= (overweight $25.0 \leq \text{BMI} \leq 29.9$ ) 3= (obese $\geq 30.0$ )

### **3.6 Methods of analysis**

Three levels of analysis were employed in analyzing the data univariate, bivariate, and multivariate levels of analysis. The characteristics of the study sample and the distribution of BMI status were described using descriptive statistics such as percentage distribution. The association between the socio-demographic characteristics of the youth and their BMI status was examined using chi-square analysis. The factors associated with overweight and obesity was analysed using multinomial logistic regression analysis. BMI status was used as the dependent variable in the regression analysis, and normal weight was used as the reference category for the dependent variable. The statistical significance for the bivariate and multivariate analyses was set at the 0.05 alpha levels.

### **3.7 Limitation of Data**

The major shortcoming of the study is the availability of other factors that can influence overweight and obesity among the youth. Factors such as physical activity and dietary habits of the youth has a great impact on how an individual can be predisposed to overweight and obesity. As such the GLSS 7 did not capture such information to make it available for analysis for this study. This therefore limits the different dimensions and aspects by which overweight and obesity can influence the youth in Ghana.



**CHAPTER FOUR****RESULTS****4.0 Introduction**

This chapter presents the results of the descriptive statistics of all independent variables and the dependent variable provided in the conceptual framework and also the association between the variables as presented in the conceptual framework. The factors associated with being overweight and obesity are also presented.

**4.1 BMI Status of Study Sample**

Table 2 shows that approximately one in ten (13.3%) of the youth were obese. However, approximately 6 out of 10 (66.6%) of the youth had a normal BMI, while approximately 1 out of 5 (20.1%) were overweight.

**Table 2: Percentage distribution of study sample by BMI status**

<b>BMI status</b>	<b>Percentage (%)</b>	<b>Number (n)</b>
Normal weight	66.6	8,950
Overweight	20.1	2,422
Obese	13.3	1,484
<b>Total (%) (n)</b>	<b>100.0</b>	<b>12,856</b>

**4.2 Socio-demographic characteristics of the study sample**

The results in Table 3 indicate that respondents aged 15–24 years constituted a little more than half (54.0%) of the total sample. Similarly, female and urban-dwelling respondents constituted a little more than half of the total sample, representing 53.1% and 54.4%, respectively.

**Table 3: Percentage distribution of study sample by socio-demographic characteristics**

<b>Variables</b>	<b>Percentage (%)</b>	<b>Number (n)</b>
<b>Age Group</b>		
15-24	54.0	7,010
25-34	46.0	5,846
<b>Sex</b>		
Male	46.9	5,974
Female	53.1	6,882
<b>Educational Level</b>		
No Education	8.8	943
Primary and below	14.2	1,731
Junior high school	39.9	5,477
Senior high school	27.1	3,616
Tertiary	10.0	1,089
<b>Marital Status</b>		
Currently in Union	34.8	4,324
Formerly Married	2.7	399
Never Married	62.5	8,133
<b>Place of Residence</b>		
Urban	54.4	6,974
Rural	45.6	5,882
<b>Main occupation</b>		
No occupation	31.3	4,165
Managers	8.3	921
Service/sales	14.7	1,874
Skilled agric/fishery	21.7	2,875
Artisans	21.0	2,738
Other occupations	4.2	283
<b>Wealth Quintile</b>		
Poorest	16.4	2,040
Poorest	18.4	2,331
Middle	19.8	2,543
Rich	20.9	2,713
Richest	24.5	3,229
<b>Religion</b>		
Other Religion	2.1	91
Catholics	12.0	1,282
Protestants	15.0	2,090
Pentecost/Charismatics	37.0	5,255
Other Christians	12.6	1,671
Islam	17.6	2,351
Traditionalists	1.9	68
No religion	1.8	48

<b>Region</b>		
Western	10.0	1,293
Central	10.0	1,253
Greater Accra	17.8	2,427
Volta	8.2	1,027
Eastern	10.3	1,335
Ashanti	19.8	2,715
Brong Ahafo	9.3	1,184
Northern	8.0	1,000
Upper East	3.9	392
Upper West	2.7	230
<b>Total (%) (n)</b>	<b>100</b>	<b>12,856</b>

With regards to the educational level of respondents, about 2 out of 5 (39.9%) of the respondents have completed junior high school, while 10% have attained a tertiary level of education. Also, more than quarters (27.1%) of the respondents have completed senior high school, while more than a tenth (14.2%) has completed the primary level of education. Additionally, respondents with no formal education constituted 8.8% of the total sample. With reference to Table 3, the results show that never-married respondents were about two-thirds (62.5%) of the total sample, while those who were formerly married constituted only (2.7%) of the total sample. Those who were currently in a union constituted more than a third (34.8%) of the total sample.

Regarding occupation, respondents with no occupation constituted just over a third (34.4%) of the total sample, while respondents who are engaged in the agriculture or fishing sector formed about (21.7%) of the total sample. Also, managers constituted about a tenth (8.3%) of the total sample, while about one-fifth (21%) of the respondents were artisans. Service/sales workers made up (14.7%) of the total sample (Table 3).

Respondents in the richest wealth quintile category made up just about a quarter (24.5%) of the total sample, while those in the poorest wealth quintile category formed a proportion of 16.4%. Additionally, those belonging to the rich wealth quintile category made up about one-fifth (20.9%) of the total sample, while those in the middle wealth quintile category constituted 19.8%

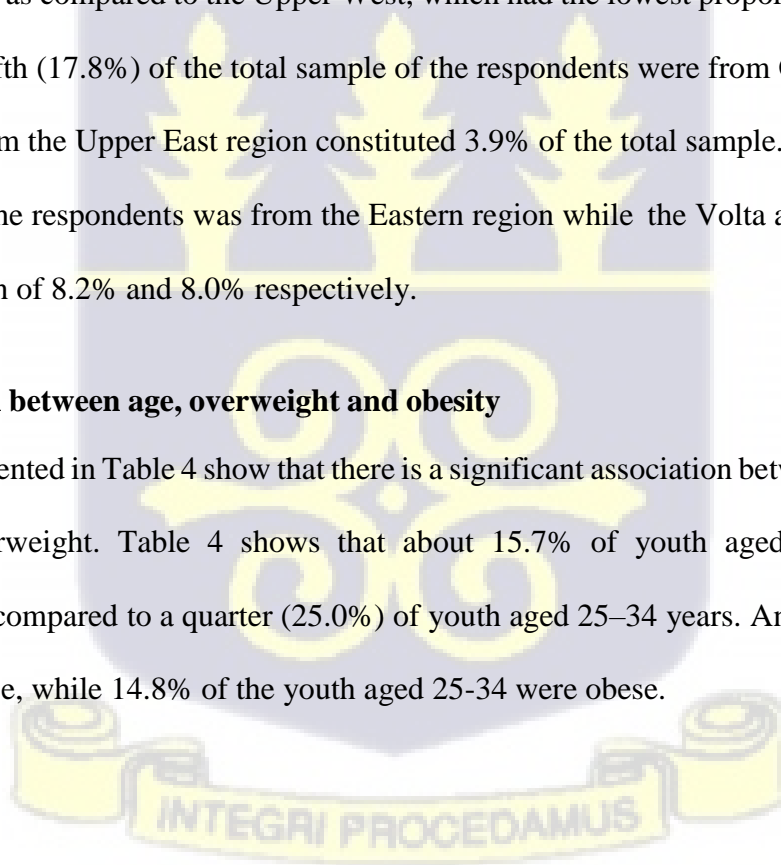
of the total sample. Respondents in the poor wealth quintile category constituted 18.4% of the total sample.

The results from Table 3 further show that Pentecostal/Charismatic respondents constituted more than a third (37%) of the total sample, while Traditionalists constituted a proportion of 1.9%. In addition, those of the Islamic faith formed about one-fifth (17.6%) of the total sample, while those of other religions also formed 3.9% of the total sample. Also, those belonging to the Catholic faith constituted 12.0% of the total sample, while those of the Protestant faith constituted 15.0% of the total sample. More than a tenth (12.6%) of the total sample was made up of people who follow other Christian faiths.

The distribution by residence indicates that 1 in 10 of the youth were from the Western and Central regions respectively. The Ashanti region, however, recorded the highest proportion of 19.8% of the total sample as compared to the Upper West, which had the lowest proportion of 2.7%. A little less than one-fifth (17.8%) of the total sample of the respondents were from Greater Accra, while respondents from the Upper East region constituted 3.9% of the total sample. Also, every 1 out of 10 (10.3%) of the respondents was from the Eastern region while the Volta and Northern regions had a proportion of 8.2% and 8.0% respectively.

#### **4.3 Association between age, overweight and obesity**

The results presented in Table 4 show that there is a significant association between age and obesity and being overweight. Table 4 shows that about 15.7% of youth aged 15–24 years were overweight, as compared to a quarter (25.0%) of youth aged 25–34 years. And 12.3% aged 15-24 years were obese, while 14.8% of the youth aged 25-34 were obese.



**Table 4: Percentage distribution of Ghanaian youth by age group, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal weight	Overweight	Obese	
Age group				
15-24	72.0	15.7	12.3	6486
25-34	60.2	25.0	14.8	6,370
<b>Total (%)</b>	<b>66.7</b>	<b>20.1</b>	<b>13.2</b>	<b>12856</b>

$\chi^2 = 677.78$ ,  $df = 2$ ,  $p\text{-value} < 0.001$

#### 4.4 Association between sex, overweight and obesity

The results presented in Table 5 show that being overweight was more common among females (22.9%) as compared to males (17.0%). In the same way, it was found that more women (15.9%) than men (10.0%) were overweight.

**Table 5: Percentage distribution of Ghanaian youth by sex, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal Weight	Overweight	Obese	
Sex				
Male	72.9	17.0	10.1	5,834
Female	62.2	22.9	15.9	7,022
<b>Total (%)</b>	<b>66.6</b>	<b>20.1</b>	<b>13.3</b>	<b>12,856</b>

$\chi^2 = 377.57$ ,  $df = 2$   $p\text{-value} < 0.001$

#### 4.5 Association between the level of educational attainment, overweight and obesity

The results from Table 6 show that obesity and overweight were more common among respondents with a tertiary level of education (13.9% and 24.8%) respectively, compared to respondents with no formal education (11.1% and 17.5%) respectively. Those with no education and those with only senior high education had a higher proportion of respondents who were of normal weight (71.4% and 69.6%), respectively.

**Table 6: Percentage distribution of Ghanaian youth by level of educational attainment, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal Weight	Overweight	Obese	
No Education	71.4	17.5	11.1	1,176
Primary	63.8	20.7	15.5	1,716
Junior high school	65.9	19.9	14.2	5,006
Senior high school	69.6	19.1	11.3	3,592
Tertiary	61.3	24.8	13.9	1,366
<b>Total (%)</b>	<b>66.6</b>	<b>20.0</b>	<b>13.4</b>	<b>12,856</b>

$\chi^2 = 354.36$ ,  $df = 8$ ,  $p\text{-value} < 0.001$

#### 4.6 Association between place of residence, overweight and obesity

The distribution of obesity and overweight by place of residence shows that obesity is more common among youth residing in urban areas (14.4%) as compared to those residing in rural areas (12.3%). Also, over a fifth (22.5%) of the urban residents were overweight, as compared to 17.4% of youth who live in rural areas. Also, more people in rural areas (70.3%) were of normal weight than in urban areas (63.1%).

**Table 7: Percentage distribution of Ghanaian youth by place of residence, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal Weight	Overweight	Obese	
Urban	63.1	22.5	14.4	7,106
Rural	70.3	17.4	12.3	5,750
<b>Total (%)</b>	<b>66.6</b>	<b>20.0</b>	<b>13.4</b>	<b>12,856</b>

$\chi^2 = 330.45$ ,  $df = 2$ ,  $p\text{-value} < 0.001$

#### 4.7 Association between marital status, overweight and obesity

The results in Table 8 show that obesity and overweight were more common among youth who are currently in unions (15.0%) and (25.1%) compared to youth who have never been married (12.2%) and (17.0%) respectively. On the other hand, youth who have never been married had a higher proportion of respondents who are of normal weight (70.8%) as compared to youth who are currently in a union (59.9%). More than a quarter of respondents who are formerly married were overweight (25.9%).

**Table 8: Percentage distribution of Ghanaian youth by marital status, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal Weight	Overweight	Obese	
Currently in union	59.9	25.1	15.0	4,367
Formerly Married	59.8	25.9	14.3	1,335
Never Married	70.8	17.0	12.2	7,154
<b>Total (%)</b>	<b>66.6</b>	<b>20.0</b>	<b>13.4</b>	<b>12,856</b>

$\chi^2 = 632.06$ ,  $df = 4$ ,  $p\text{-value} < 0.001$

#### 4.8 Association between wealth quintile, overweight and obesity

The results in Table 9 show that there is a correlation between wealth quintile, overweight and obesity among respondents. The table shows a positive association between wealth quintile, overweight and obesity. The proportion of respondents who are normal weight decreased as the wealth quintile increased. Obesity was more common among youth found in the richest wealth quintile category (14.7%) as compared to those in the poorest wealth quintile category (11.0%). Youth found in the rich wealth quintile category had a higher proportion of overweight respondents (21.7%), while youth in the poor wealth quintile category had a lower proportion (17.9%). Overweight and obesity were more common among the richest people.

**Table 9: Percentage distribution of Ghanaian youth by wealth quintile, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal Weight	Overweight	Obese	
Poorest	74.7	14.3	11.0	1,984
Poor	69.6	17.9	12.5	2,286
Middle	67.4	18.8	13.8	2,541
Rich	65.2	21.7	13.1	2,784
Richest	60.0	25.3	14.7	3,261
<b>Total (%)</b>	<b>66.7</b>	<b>20.1</b>	<b>13.2</b>	<b>12,856</b>

$\chi^2 = 648.6$ ,  $df = 8$ ,  $p\text{-value} < 0.001$

#### 4.9 Association between main occupation, overweight and obesity

Table 10 shows that obesity and overweight were less common among respondents who work in the skilled agriculture and fishing sectors (9.2% and 13.2%, respectively). Also, about three-quarters of those who work in agriculture or fishing (77.6%) were of healthy weight, while just over half of those who work in sales and service (59.5%) were of healthy weight.

**Table 10: Percentage distribution of Ghanaian youth by occupation, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal Weight	Overweight	Obese	
No Occupation	65.4	19.4	15.2	4,155
Managers	60.8	21.8	12.8	1,030
Service/Sales	59.5	23.4	17.1	2,036
Skilled agrici/fishery	77.6	13.2	9.2	2,749
Artisans	64.9	22.4	12.7	2,784
Other occupation	64.5	21.8	13.7	102
<b>Total (%)</b>	<b>66.5</b>	<b>19.9</b>	<b>13.6</b>	<b>12,856</b>

$\chi^2 = 807.67$ ,  $df = 10$ ,  $p\text{-value} < 0.001$

#### 4.10 Association between religion, overweight and obesity

From Table 11, respondents who were traditionalists, 77.9% were of normal weight, as compared to 70.6% of Catholics. On the other hand, about 1 out of 10 respondents who are Pentecostals were obese, while just about a fifth (16.1%) of Islamic respondents were obese. In relation to being overweight, just under one-fifth of Protestants (22.5%) were overweight compared to traditionalists (13.1%).

**Table 11: Percentage distribution of Ghanaian youth by religion, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal Weight	Overweight	Obese	
Other Religion	60.2	24.3	15.5	264
Catholic	70.6	17.9	11.5	1,302
Protestant	69.9	19.8	10.3	2,035
Pentecost	63.8	22.5	13.7	4,848
Other Christians	64.6	19.5	15.9	1,635
Islam	65.9	18.0	16.1	2,290
Traditionalist	77.9	13.1	9.0	247
No religion	74.4	16.4	9.2	235
<b>Total (%)</b>	<b>66.6</b>	<b>20.0</b>	<b>13.4</b>	<b>12,856</b>

$\chi^2 = 167.19$ ,  $df = 14$ ,  $p\text{-value} < 0.001$

#### 4.11 Association between region of residence, overweight and obesity

Table 12 shows that the Central region had the highest proportion of obese respondents (17.3%), while the Brong Ahafo had the least proportion (8.7%). The Greater Accra region had a higher proportion of overweight respondents (26.2%) than the Upper East region, which had the least proportion of overweight respondents (13.6%). On the other hand, Ashanti region youth had slightly higher obesity proportions (14.5%) as compared to Upper West region youth (12.6%). The Volta region had more youth (17.8%) who were overweight as compared to youth from the northern region (15.0%).

**Table 12: Percentage distribution of Ghanaian youth by region of residence, overweight and obesity**

Variable	BMI Status (%)			Total (n)
	Normal Weight	Overweight	Obese	
Western	67.7	20.4	11.9	1,274
Central	60.2	22.5	17.3	1,282
Greater Accra	59.6	26.2	14.2	2,293
Volta	71.8	17.8	10.4	1,034
Eastern	67.5	19.2	13.3	1,339
Ashanti	66.8	18.7	14.5	2,552
Brong Ahafo	70.4	20.9	8.7	1,284
Northern	73.1	15.0	11.9	996
Upper East	71.1	13.6	15.3	452
Upper West	74.7	12.7	12.6	350
<b>Total (%)</b>	<b>66.6</b>	<b>20.1</b>	<b>13.3</b>	<b>12,856</b>

$\chi^2 = 547.95$ ,  $df = 18$   $p$ -value  $< 0.001$

#### 4.5 Socio-demographic predictors of overweight and obesity among Ghanaian youth

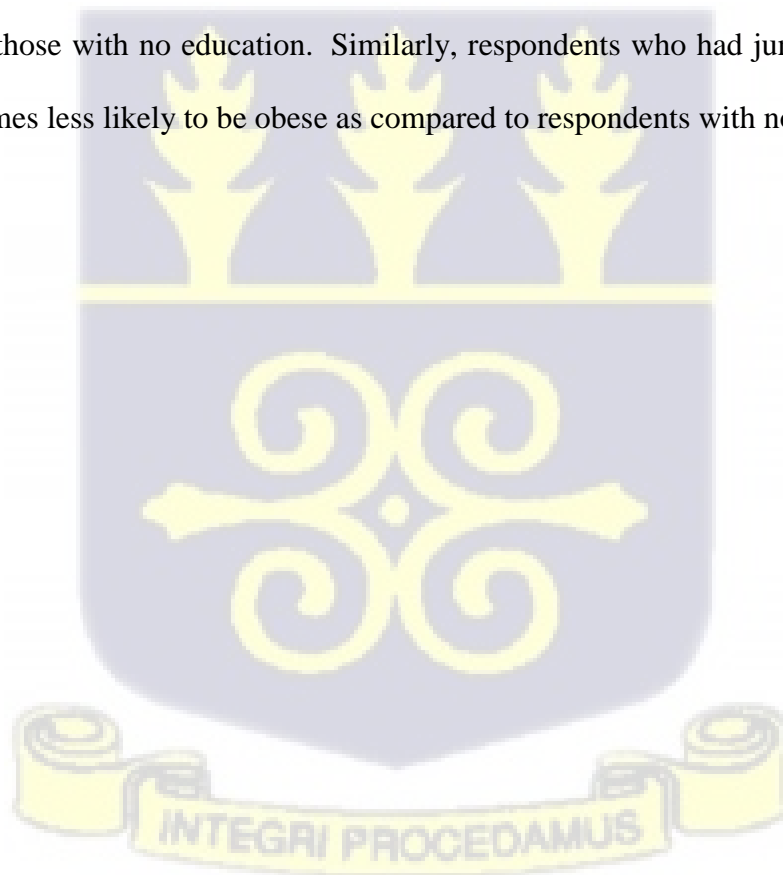
At the multivariate level, a multinomial logistic regression model was used to assess the influence of the socio-demographic factors on the BMI of respondents. In specifying the model, all the socio-demographic factors were used as predictor variables to predict the BMI status of respondents. Normal weight was used as the base category (reference category) for the dependent variable. For each of the socio-demographic variables, one category was selected as the reference category. The results were interpreted using the relative risk ratio, which represents the chance of a respondent being overweight or obese as compared to being normal weight. Respondents in every category aside from the reference category were compared to those in the reference category. Relative risk ratios greater than one denote an increased chance or greater likelihood of an outcome occurring, and those less than 1.0 indicate a decreased likelihood or chance of an outcome occurring. Statistical significance was set at 0.05. Any  $p$ -value less than 0.05 were considered significant.

#### 4.5.1 The influence of socio-demographic characteristics on overweight and obesity among Ghanaian youth

The results in Table 13 show a multinomial logistic regression analysis of factors associated with overweight and obesity among youth aged 15–34 years in Ghana.

The results show that, compared to males, females were 1.75 ( $p=0.001$ ) times more likely to be overweight rather than be of normal weight. Similarly, females were 2.56 ( $p=0.001$ ) times more likely to be obese rather than be of normal weight compared to males. Respondents who are 25-34 years were 1.65 ( $p= 0.001$ ) times more likely to be overweight as compared to respondents who are 15-24 years. Also, respondents who are 25-34 years are 2.01( $p=0.001$ ) times more likely to be obese as compared to respondents who are 15-24 years.

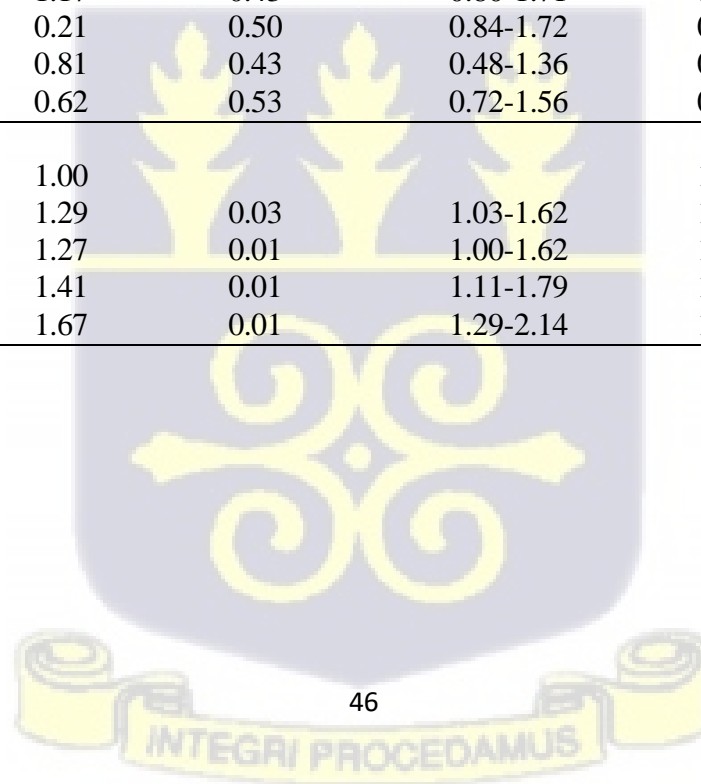
Concerning education, there were varied results among the various categories. Comparing those with primary education to those with no education, respondents with primary education were 0.28 ( $p=0.001$ ) times less likely to be overweight. Also, respondents with primary education were 0.62 ( $p=0.001$ ) times less likely to be obese as compared to those with no education. Similarly, respondents who had junior high school level of education were 0.50 times less likely to be obese as compared to respondents with no education.



**Table 13 Results of multinomial logistic regression analysis showing the influence of socio-demographic characteristics of overweight and obesity among youth**

Characteristics	(Relative Risk Ratio)					
	Overweight			Obese		
	RR	P-value	95% CI	RR	P-value	95% CI
<b>Sex</b>						
Males (R.C)	1.00			1.00		
Female	1.75	0.01	1.52-2.02	2.56	0.01	2.16-3.04
<b>Age Group</b>						
15-24 (R.C)						
25-34	1.95	0.01	1.64-2.32	2.01	0.01	1.66-2.44
<b>Educational Level</b>						
No Education (R.C)	1.00			1.00		
Primary	0.28	0.01	0.97-1.68	0.62	0.01	1.15-2.28
Junior high school	1.18	0.20	0.91-1.54	0.50	0.02	1.07-2.09
Senior high school	1.24	0.14	0.93-1.65	1.23	0.27	0.86-1.76
Tertiary	1.32	0.12	0.93-1.86	1.31	0.22	0.85-2.00
<b>Place of Residence</b>						
Urban (R.C)	1.00			1.00		
Rural	0.71	0.01	0.78-1.07	0.93	0.01	0.78-1.11
<b>Marital Status</b>						
Currently in Union (R.C)	1.00			1.00		
Formerly married	0.72	0.01	0.59-0.88	0.71	0.01	0.56-0.91
Never married	0.53	0.01	0.44-0.64	0.62	0.01	0.51-0.77

Characteristics	Overweight			Obese		
	RR	P-value	95% CI	RR	P-value	95% CI
<b>Main Occupation</b>						
No Occupation (R.C)	1.00			1.00		
Managers	1.02	0.87	0.78-1.34	1.08	0.67	0.77-1.49
Service/Sales	1.11	0.32	0.91-1.35	0.97	0.80	0.76-1.23
Skilled Agric/Fishery	0.53	0.00	0.42-0.67	0.42	0.00	0.33-0.53
Artisans	1.07	0.46	0.89-1.29	0.73	0.01	0.57-0.93
Other occupation	2.01	0.55	0.95-1.56	0.77	0.95	0.65-0.78
<b>Religion</b>						
Other Religion (R.C)	1.00			1.00		
Catholic	1.08	0.68	0.74-1.58	1.14	0.58	0.71-1.84
Protestants	1.03	0.86	0.72-1.48	0.86	0.52	0.54-1.37
Pentecost	1.26	0.17	0.90-1.77	1.39	0.13	0.91-2.15
Other Religion	1.17	0.43	0.80-1.71	1.72	0.02	1.09-2.73
Islam	0.21	0.50	0.84-1.72	0.95	0.01	1.23-3.10
Traditionalist	0.81	0.43	0.48-1.36	0.88	0.71	0.45-1.71
No religion	0.62	0.53	0.72-1.56	0.59	0.98	0.55-1.81
<b>Wealth Quintile</b>						
Poorest (R.C)	1.00			1.00		
Poor	1.29	0.03	1.03-1.62	1.30	0.06	0.99-1.70
Middle	1.27	0.01	1.00-1.62	1.47	0.01	1.10-1.97
Rich	1.41	0.01	1.11-1.79	1.43	0.02	1.06-1.92
Richest	1.67	0.01	1.29-2.14	1.76	0.01	1.29-2.40



Characteristics	Overweight			Obese		
	RR	P-value	95% CI	RR	P-value	95% CI
<b>REGION</b>						
Western (R.C)	1.00			1.00		
Central	1.40	0.01	1.08-1.82	2.06	0.00	1.53-2.75
Greater Accra	1.25	0.12	0.94-1.65	1.14	0.46	0.81-1.60
Volta	0.92	0.55	0.69-1.22	0.85	0.37	0.60-1.21
Eastern	1.07	0.63	0.80-1.44	1.30	0.11	0.94-1.79
Ashanti	0.84	0.22	0.64-1.11	1.11	0.50	0.82-1.52
Brong Ahafo	1.21	0.18	0.91-1.61	0.67	0.03	0.46-0.96
Northern	0.76	0.08	0.55-1.04	0.89	0.56	0.61-1.31
Upper East	0.63	0.01	0.45-0.88	1.45	0.03	1.03-2.04
Upper West	0.75	0.07	0.54-1.02	1.35	0.10	0.95-1.91

Total (n) = 12856

Log Likelihood = -6950520.3

Pseudo R<sup>2</sup> = 0.0893

RC=Reference Category

CI= Confidence Interval

RR= Relative risk ratio



Concerning occupation, there were also varied results among the various occupational categories. Respondents who are engaged in the agriculture/fishery sector were 0.53 less likely to be obese as compared to respondents with no occupation. Respondents who were artisans were also 0.73 times less likely to be obese as compared to respondents with no occupation. Regarding religion, those of the Islamic faith were 0.95 times less likely to be obese as compared to respondents who have other religious affiliations, while those of other Christian faiths were 1.72 times more likely to be obese as compared to respondents with no religious affiliation.

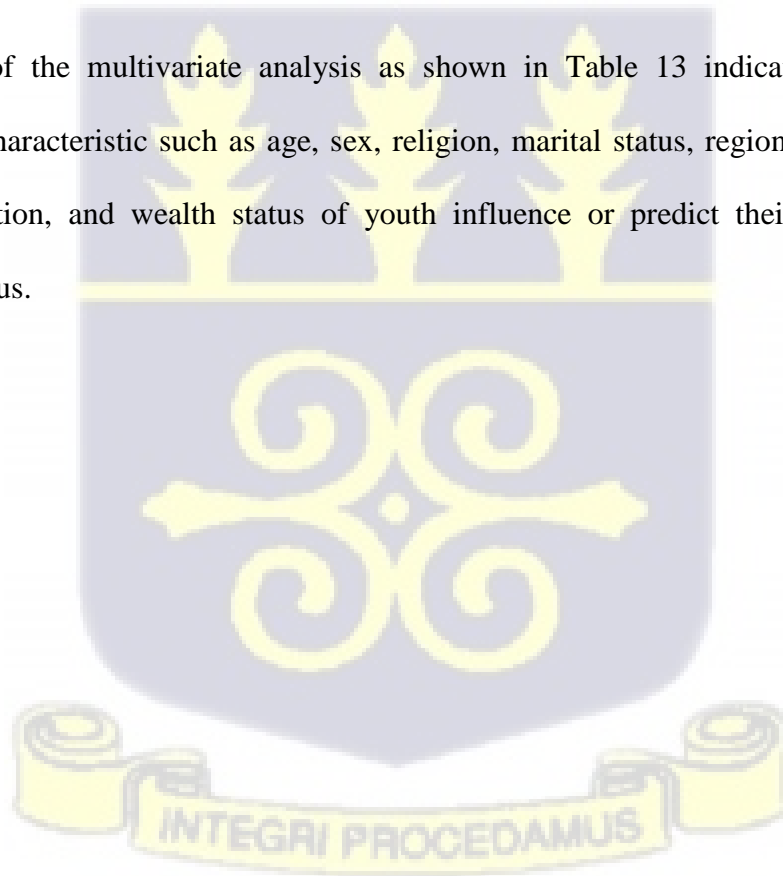
Compared to respondents from the Western region, respondents from the Central region were 1.40 and 2.06 times more likely to be overweight and obese, respectively. Also, compared to respondents from the Western region, those from the Upper East were 0.63 less likely to be overweight. Northern and Upper West respondents had a lower relative risk ratio of becoming overweight (0.76 and 0.75, respectively). This means respondents from the Northern and Upper West are less likely to be obese as compared to respondents from the Western region. Also, compared to respondents from the Western region, respondents from Brong Ahafo were 0.67 times less likely to be obese.

According to the findings, the relative risk ratio for being overweight or obese increased significantly with wealth quintile (Table 13). Respondents from the richest wealth quintile were 1.67 ( $p = 0.001$ ) and 1.76 ( $p = 0.001$ ) times more likely to be overweight and obese, respectively, compared to respondents from the poorest wealth quintile. Similarly, respondents from the rich wealth quintile were 1.41 ( $p = 0.001$ ) and 1.43 ( $p = 0.001$ ) times more likely to be overweight and obese compared to respondents from the poorest wealth quintile. Again, respondents in the middle and rich wealth quintile were 1.27 ( $p = 0.001$ ) and 1.47 ( $p = 0.001$ ) times more likely to be overweight as compared to respondents in the

poorest wealth quintile, respectively. Also, respondents from the poorer quintile had a relative risk ratio of 1.29 and 1.30 of becoming overweight and obese, respectively. This indicates that respondents in the poorer wealth quintile are also more likely to be overweight and obese as compared to the poorest respondents.

In terms of marital status, never married respondents were 0.62 ( $p=0.001$ ) times less likely to be obese compared to respondents who were in a union. Also, compared to respondents who were in a union, respondents who were formerly married were 0.72 ( $p=0.001$ ) times less likely to be overweight. Table 13 shows that youth who reside in rural areas are 0.71 ( $p=0.001$ ) and 0.93 ( $p=0.001$ ) less likely to be overweight and obese as compared to youth who reside in urban areas. The results clearly show a positive correlation between urban respondents and overweight and obesity among the youth.

The findings of the multivariate analysis as shown in Table 13 indicate that socio-demographic characteristic such as age, sex, religion, marital status, region of residence, level of education, and wealth status of youth influence or predict their obesity and overweight status.



## CHAPTER FIVE

### DISCUSSION OF FINDINGS

#### 5.0 Introduction

Obesity and being overweight are gradually becoming a problem among youth. There is a scarcity of studies on obesity and overweight among Ghanaian youth aged 15–34 years. This chapter presents the discussion of the key findings of this study in comparison to previous studies.

#### 5.1 Discussion of results

The first objective of the study sought to examine the prevalence of obesity and overweight among youth in Ghana. The results from the data presented so far show that there is a high obesity (9.4%) and overweight (16.1%) prevalence among Ghanaian youth. Overweight and obese Ghanaian youth from this study form about one-fourth of the study sample, which is very alarming and critical. These young people are susceptible to such health-related conditions such as stroke and heart attack, which affect their quality of life. The second objective of the study was to examine the socio-demographic factors that influence obesity and overweight among youth in Ghana. The results, as expected, indicated that the sex of a respondent was a significant predictor of obesity and overweight among youth. The results of this study conform to the findings in the literature which indicate that females are more likely to be obese compared to their male counterparts. Females during their growth development have a higher tendency to accumulate fat than males in their puberty stage. Also, the cycle of pregnancy and childbirth among females tends to influence obesity and overweight among females more than males (Ersoy & Imamoglu, 2006). In Ghana, it has been discovered that during pregnancy, women consume fat-inducing foods for breast milk such as palm nut soup, which is a risk factor

for female obesity and overweight (de-Graft Aikins, 2010). Support and care for postpartum women during this period constitute a risk factor for obesity and overweight among females due to low physical activity.

Also, the idea of having a large body size as a sign of affluence and prosperity in Ghanaian culture can be a factor that leads to obesity and overweight among women (Cohen *et al.*, 2013). Fat is seen as beautiful among females in African settings, and it is a sign of men's desire to marry such women. This puts females in the mindset of increasing weight to attract males for marriage. What this does is women go to all lengths to consume more food to achieve a bodyweight that influences obesity and overweight among females. The findings are also consistent with previous studies done by de-Graft Aikins (2010) and Dake *et al.* (2011) in Ghana. Additionally, this affirms the first study hypothesis, which states that female youth are more likely to be obese compared to male youth.

Concerning marital status, never married respondents were less likely to become obese and overweight as compared to respondents who are currently married. Married couples have the tendency to become overweight or obese because eating together influences people to eat more as compared to eating alone (Hassapidou *et al.*, 2010). These findings in this study are in tandem with previous studies done by Dake *et al.* (2011) and de-graft Aikins (2010), who explain that married women are more likely to be overweight and obese due to socio-cultural perceptions about being fat and beautiful as well as obesogenic factors associated with pregnancy and childbirth. This affirms the fourth hypothesis, which states that "youth who are currently married are more likely to be obese as compared to youth who have never been married."

The results from the multinomial logistic regression showed that other Christians and Islamic youth were less likely to be obese as compared to respondents with no religious faith. The Islamic religion preaches against alcoholism and smoking, which positively

Influences the obesity and overweight of youth. If the youth can abstain from such a habit, they will be less likely to be exposed to becoming obese and overweight (Mozaffarian *et al.*, 2011).

The study shows that age has a greater influence on obesity and overweight among the Ghanaian youth who are 25–34 years old as compared to those who are 15–24 years old. This could be because, as an individual grows, they undergo hormonal and physical changes. As the younger youth (15–24) years transition into older youth (25–34) years, they become less active physically, which leads to less energy expenditure, which would have helped curb weight gain. This can increase their risk of obesity and overweight status (Tuoyire *et al.*, 2016; Muhihi *et al.*, 2012). This, therefore, affirms the third hypothesis of the study, which states that older youth are more likely to be obese compared to younger age groups.

The occupational status of youth was positively associated with obesity and overweight (Abdulai, 2010). Youth who were engaged in the agriculture and fishing sector as well as respondents who work as artisans were the only categories that were found to be significantly associated with obesity and overweight. Also, globalisation has resulted in easier ways of transport where individuals do not have to walk and carry goods to their place of destination. The use of automobiles to transport individuals to their place of destination is also a factor that influences the obesity and overweight status of youth due to lower energy expenditure (Tuoyire *et al.*, 2016).

Education is a major factor in influencing overweight and obesity among youth. The educational level of youth can be associated with a higher risk of being overweight or obese. The findings in this study are in agreement with previous studies done by Dinsa *et al.* (2012). The finding is plausible because, education empowers people to get better jobs, which enable them to have higher incomes. This gives them the ability to buy and

Consume more. This, therefore, contributes to higher obesity and overweight prevalence among the youth in Ghana.

The wealth status of an individual can be associated with a higher risk of being overweight or obese (Doku & Neupane, 2015). From the study, the wealth status of youth was positively correlated to obesity and overweight. The rich are particularly susceptible to obesity and overweight due to their access to surplus and excess food for consumption and a lower level of engagement in manual labour-intensive occupations because the rich individuals are in less physically demanding jobs such as banking (Dinsa *et al.*, 2012). The findings in this study corroborate with previous studies done by Neuman *et al.* (2013) and Yeshaw *et al.* (2020), who found an association between wealth status and obesity in developing countries. This also affirms the second hypothesis of the study, which states that "youth who belong in the richest wealth quintile are more likely to be obese as compared to youth who belong in the poorest wealth quintile."

The youth in the Central, Brong Ahafo, Upper East, Upper West, and Northern regions were found to be overweight and obese in this study. This can be due to the gradual urbanisation of these regions, which has changed the traditional ways of living into western ways of living. The development of fast-food joints where foods high in sugar and salt are sold has sprung up and is easily accessible to people who reside in these regions, which when consumed has the potential to influence the risk of obesity and overweight among youth. Also, a study by the United Nations Population Fund (2008) found that in the Northern region of Ghana, there was a gradual rise in obesity and overweight prevalence among adult women. This was due to the gradual change of occupation that these women were involved in. Farming and fetching of water over long distances, which

Involved expending high energy, were replaced by the usage of machines to undertake these activities, which led to obesity and overweight among adult women.

This study shows that the place of residence of youth can influence obesity and overweight among youth. The study shows that youth who reside in rural areas are less likely to be obese and overweight as compared to youth in urban areas. The high rate of urbanisation and westernisation in the urban areas has gradually led to an unhealthy lifestyle of eating more fried, fatty, and sugary foods. These foods are very high in energy and their frequent consumption can influence obesity and overweight (de-Graft Aikins, 2010). Urban areas are characterised by many people owning their vehicles and also boarding cars to their places of destination rather than walking. This has resulted in reduced physical activity levels in urban areas compared to rural areas where people walk over long distances to the farm or to fetch water. These urban areas are also prone to high levels of vehicular traffic congestion due to their densely populated nature. As a result, spending long periods in traffic and not engaging in physical activities can influence the obesity and overweight status of youth due to urbanisation (Dake *et al.*, 2011). These lifestyle behaviours associated with living in urban areas contribute to the increasing prevalence of obesity and overweight in urban areas.

Overweight and obesity are conditions that should be high on the agenda of national policy makers. This growing condition among the youth is gradually having adverse effects on the human resources of the country on which development is built. The study shows that all socio-demographic factors that were considered had an influence on whether the youth became overweight or obese. This therefore shows that socio-demographic factors are predictors of overweight and obesity.

## CHAPTER SIX

### SUMMARY, CONCLUSION, AND RECOMMENDATIONS

#### 6.0 Introduction

This chapter presents the summary, conclusion, and recommendations of this study. The chapter highlights the key findings of the study, draws conclusions based on the findings, and makes recommendations to help expand knowledge on obesity, overweight, and related topics among youth.

#### 6.1 Summary

This study explored the prevalence of overweight and obesity among Ghanaian youth and also examined the socio-demographic characteristics of youth and how these influence overweight and obesity. The study was a quantitative study based on data from the GLSS 7, with a total sample of 12,856 youth aged 15–34 years for the analysis.

The objective of the study is to examine the factors that influence obesity and overweight among Ghanaian youth. The socio-demographic factors examined were sex, age, and level of education, occupation, place of residence, region of residence, marital status, wealth quintile, and religion. The methodologies used in analysing the data include univariate, bivariate, and multivariate methods of analysis. The first stage of analysis involved the use of percentage and frequency distributions to interrogate the socio-demographic characteristics of respondents. In the second stage of analysis, the Pearson chi-square test statistic was used to explore the association between each socio-demographic characteristic and overweight and obesity. In the third stage of analysis, a multinomial logistic regression analysis was used to explore the association between the socio-demographic characteristics of the youth and their obesity and overweight status, with significance set at the 95% confidence level.

The first objective was to estimate the prevalence of obesity and overweight among youth aged 15–34 years. The prevalence of obesity was found to be 9.4%, while being overweight was 16.1%. The second objective was to examine the relationship between socio-demographic characteristics of overweight and obesity among youth in Ghana. The study found that obesity was more common among females compared to males. Also, the 25-34 age groups had a higher obesity prevalence of 13.0% as compared to the 15–24 age groups, whose prevalence was 6.3%. Respondents who reside in urban areas showed a higher obesity prevalence of 10.9% as compared to respondents who reside in rural areas (7.5%). On the other hand, respondents who worked as fisher folks and farmers had lower obesity prevalence (4.8%) as compared to respondents who worked as service or sales personnel (14.5%). Respondents who were in a union at the time of the survey had higher obesity prevalence (13.1%) as compared to respondents who had never been married (7.1%). Respondents who fall within the poorest wealth quintile category had lower obesity prevalence (5.4%) as compared to respondents who fall into the richest wealth quintile category (12.0%). Also, respondents who had no formal education had the lowest obesity prevalence (8.2%) as compared to respondents who had completed tertiary education (12.3%). The results indicate that these socio-demographic characteristics are factors that can influence obesity and overweight among youth.

At the multivariate level, the multinomial logistic regression results showed that age, sex, region of residence, religion, marital status, level of education, occupation, place of residence, and wealth status are significant predictors of obesity and overweight among youth. Therefore, all the socio-demographic factors that were explored in this study highlighted their importance in how they influence obesity and overweight among the youth in Ghana. The study, therefore, accepts the first hypothesis that states that females are more likely to be obese as compared to males. The second hypothesis, which states

that youth who belong to the richest wealth quintile category are more likely to be obese as compared to youth who belong to the poorest wealth quintile category, was also accepted. The third hypothesis, which states that the older youth aged (25–34) years are more likely to be obese as compared to the younger youth aged (15–24) years, was also accepted. Lastly, the fourth hypothesis, which states that respondents who are currently in a union are more likely to be obese as compared to respondents who have never been married, was also accepted.

The findings show that socio-demographic characteristics are significant predictors of obesity and overweight among Ghanaian youth. Also, the findings show that obesity and overweight among Ghanaian youth are high and need policy attention to help manage the increasing prevalence.

## **6.2 Conclusion**

This study shows that the prevalence of obesity and overweight among Ghanaian youth is high. The study found that socio-demographic factors, including wealth quintile, place of residence, region of residence, and religion, were all significant predictors of obesity and overweight among Ghanaian youth. Married youth and older (25–34) year olds were found to be more prone to obesity and overweight than never married and younger (15–24) year olds. The high prevalence of obesity and overweight among youth has health implications that affect their self-esteem and quality of life. The high trend of health conditions such as stroke and diabetes is very much associated with obesity and overweight, which needs public health attention. The youth should therefore be encouraged to take up a healthy lifestyle, including exercising and eating healthy foods that can curb the increase in overweight and obesity.

### 6.3 Recommendations

The findings show a high prevalence of obesity and overweight among youth and therefore the need for greater attention from policymakers to help manage the growing conditions of overweight and obesity among youth. As a result, the following recommendations can be proposed.

Policymakers should drive educational campaigns on the causes, conditions, and health consequences of obesity and overweight targeted at youth to create the needed awareness among the Ghanaian youth and the general population at large. This would go a long way to enable the youth to adopt healthy lifestyles such as exercising and eating healthy foods to help curb obesity and overweight among the youth. The government should also develop audio and visual programmes on healthy living that would be shown and played on television and radio nationwide in all Ghanaian languages to drive the needed knowledge on obesity and overweight.

The government can also help to change the built environment by creating more open parks and playgroups to promote physical activities such as volleyball and soccer, which can help the youth exercise and expend energy, thereby helping to reduce obesity and overweight. Lastly, the government should help subsidise healthy foods such as fruits and vegetables that are high in vitamins and minerals so more young people can consume such foods to help manage overweight and obesity in the long term.



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