SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

BODYWEIGHT PERCEPTIONS AND NUTRITIONAL ATTITUDES OF UNIVERSITY OF GHANA STUDENTS

BY

PRINCE KELLY EDEM ANYOMITSE

10275702

THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE.

JULY, 2015

DECLARATION

I, Prince Kelly Edem Anyomitse, do hereby declare that, with the exception of other people's works which have been duly acknowledged, this dissertation is the result of my own original research under the supervision of Dr. Phyllis Dako-Gyeke, and that this work, either in whole or in part has not been presented elsewhere for another degree.

....

PRINCE KELLY ANYOMITSE **DATE**
(STUDENT)

....

DR. PHYLLIS DAKO-GYEKE **DATE**
(SUPERVISOR)

DEDICATION

I dedicate this work to all those on whose shoulders I stood to make it this far in my education. Special dedication to my uncle, Mr. Emmanuel Lambi Aba (Sergeant Lambi) who was a father-figure in my life but I sadly lost whiles working on this research. God bless you for the life you lived here on earth.

ACKNOWLEDGEMENT

My sincere gratitude first of all goes to God Almighty for his grace, strength and wisdom as well as the guidance of the Holy Spirit throughout the entire period of this work. My heartfelt appreciation goes to my supervisor; Dr. Phyllis Dako-Gyeke for her guidance, inputs and support throughout my study. I particularly want to thank her for her patience with me in times that i was way behind schedule in the delivery of my work.

To my very supportive colleagues and field assistants; Miss Delia Bandoh, Miss Bridgette Abaka, Mr Prince Odeneho and Miss Andromeda Dzifa Houston, thanks so much for your support during the period of my data collection. Indeed, your encouragements during those discouraging moments really urged me on.

My profound gratitude goes to Dr. Folson (Head of Nutrition Dept., Nugouchie Memorial Institute) and her Laboratory technician, Martin, for the provision of apparatus for my data collection.

To Mr. Bernard Yeboah-Asiamah, i want to say thank you for all the help during my data analysis.

My appreciation will be incomplete without commending Mrs. Angelina Lily Armah and her hardworking team at the School of Public Health library for the provision of all necessary information needed to help me put together this work.

Finally, I say a big thank you to all the lecturers, support staff and colleagues of the School of Public Health of the University of Ghana, Legon for helping me in diverse ways towards the completion of this thesis.

ABSTRACT

Introduction: An individual's perception about their bodyweight can either be a true reflection of their body mass index or not. Underestimation or overestimation of one's bodyweight has been identified to be a determinant of the kind of weight management measure they engage in. The nutritional attitude of such individuals has been observed to be one major weight management measure. The youth are very concerned about their bodyweight hence this study was targeted at finding out how students of the University of Ghana perceived their bodyweight and its relationship with their nutritional attitude.

Method: Quantitative data on socio-demographic characteristics, bodyweight descriptions, nutritional attitude and anthropometry (weight and height) were collected on 392 students of the University of Ghana. Determinants of bodyweight perception were identified in a multinomial logistic regression using Stata version 12.0.

Results: Most (70.9%) students of the University of Ghana accurately perceived their bodyweight. Underestimation of bodyweight was observed in 16% of the participant whiles 14% overestimated their bodyweight. Whiles 74.2% perceived themselves to be normal, 71.4% were actually normal. Participants who attributed reasons for their bodyweight description to comments passed by family and friends were more likely (OR 3.43; 95% CI, -2.28 to 3.77) to perceive themselves as overweight. An individual's sex ($p<0.001$), nationality ($p<0.001$) and hall of residence ($p<0.001$) were also observed to be significantly associated with the kind of perception one held about their bodyweight. The nutritional attitude of participants was however not associated ($p>0.05$) with bodyweight perception of the students.

Conclusion: University of Ghana students can be said to be very much conversant with their bodyweight but the future risks posed by their current nutritional attitude is high.

This calls for a concerted effort by the University authorities and groups focused on the health of the youth to help put structures and policies in place to change it. It also demands of the Ministry of Health as well as the Youth and Sports committee in Parliament to consider such issues in drafting policies.

TABLE OF CONTENTS

Content **Page**

_Toc431514352

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BMI	Body Mass Index
BW	Bodyweight
FFQ	Food frequency Questionnaire
ISH	International Students' Hostel
NHANES	National Health and Nutrition Examination Survey
NGO	Non Governmental Organization
SSNIT	Social Security and National Insurance Trust
UG	University of Ghana
WHO	World Health Organization

DEFINITION OF TERMS

Body weight Perception- how an individual perceives him or herself as underweight, overweight or being normal weight

Body Mass Index- a scientifically approved means of categorizing individuals into bodyweight categories for their age group

Nutritional Attitudes- emotional, perceptive and cognitive beliefs that positively or negatively influence the practices of an individual in relation to consumption of foods and specific nutrients

Youth- Individuals that fall within the age group of between 18 and 35

Fast Food- Easily prepared processed food served in snack bars and restaurants as a quick meal or to be taken away. For the purposes of this study, it includes Noodles, Pizza, Hamburgers, French fries, Fried rice and Shawarma.

Stadiometer- An instrument used for measuring the height of adults

CHAPTER ONE

INTRODUCTION

1.1 Background

Human lifestyle over the years has transitioned from one stage to another. This phenomenon has to a large extent affected several aspects of man's life including nutrition, diet and physical activity. One way in which this is manifested clearly is through an individual's bodyweight (Kim, 2007). With the recent rise in awareness about how an individual's weight can be a key indicator of health status, especially with regards to contracting Non-Communicable diseases, a lot of people are very much concerned about their bodyweight (Field et. al, 2001).

Concerns about body weight, whether, overweight or underweight, have in recent times become a significant public health issue according to the World Health Organization.
Body weight perception refers to the personal evaluation of one's weight as "underweight" or "Normal weight" or "overweight" irrespective of actual body mass index (BMI). One's perception does not always reflect reality.

Several factors have been identified to be associated with perceptions people have about their body weights. These include nutrition, socio-demographic factors (gender, age, country), and psycho-social factors such as stress, social support and quality of life (El Ansari et. al, 2010).Weight loss behaviours that are adopted by individuals are also strongly related to body weight perceptions and in some occasions independent of actual body weight (Chang & Christakis, 2001; 2003). In other studies, false bodyweight perception has been associated with nutritional and eating disorder tendencies that usually affect the youth (Musaiger et. al, 2012).

It would therefore be essential to find out the way the youth (University students) perceive their bodyweights and how it is associated with their nutritional habits. This group of students are in a transitional stage of their lives hence responsible for making certain nutritional choices which go a long way to affect their long term health and that of those they are responsible for (Dissen et. al, 2011). Body image satisfaction is known to be a strong mental preoccupation for such people until about age 30 (Dissen et. al, 2011). It is therefore very essential to explore the various perceptions young people have about their bodyweight, sources of information about such perceptions and the accompanying nutritional attitudes they are engaged in so as to develop appropriate interventions in that regard.

1.2 Statement of Problem

Based on the definition of the World Health Organization, an individual is said to be overweight when they have a BMI of above 25kg/$m^2$and underweight when he/she is less than 18.5kg/m^2 whereas anything between these two values is considered normal (WHO, 2002).The health consequences of being overweight or underweight have largely been reported in several researches around the world (WHO, 2007; 2008; Cheung *et al.*, 2011) and also more importantly, the measures taken by such individuals to remedy their situation.

However, the inability of an individual to rightly judge their weight category has the tendency of affecting their health not only in the immediate but also long term. Underestimation and overestimation of bodyweights contribute to denial of current weight hence contributing to increased health problems. These health problems range from medical to even psychological to the extent that some individuals develop a low self-esteem about themselves. Individuals who rightly perceive their bodyweight are likely to take the most appropriate measure in managing such; however the opposite poses the danger of adapting measures that have the tendency of running counter to what your true bodyweight requires (Cilliers, Senekal and Kunneke, 2006).

Several studies conducted around the world (USA, UK, Ireland, Mauritius, Turkey, Nigeria and Ghana) on bodyweight perceptions revealed staggering proportions of individuals interviewed having a poor perception of their bodyweight (Augustine and Poojara, 2003; Benseker *et al*. 2012; Frempong, 2013). This had caused some of them (such as the educated) to adopt bad nutritional and eating habits such as binge eating, starvation, diet pills, consumption of junk foods, aerated beverages, ice cream and deliberate skipping of meals in addressing their perceived bodyweight problems (Appiah *et al*. 2014). Adolescents and young women also consciously start smoking as a means of controlling their weight (Cilliers *et al*., 2006).

The young adult in a university is presumed to be very well informed hence up to date on issues concerning adoption of a healthy bodyweight, good nutrition as well as appropriate lifestyles. The exposure to these current awareness is very likely to cause them to engage in activities that will make them fit into the society's (media, peers, significant individuals etc.) definition of a healthy individual (defined by bodyweight and nutritional attitudes). It

must however be ensured that, the desire to achieve this does not compel them to engage in unhealthy nutritional practices that could have dire consequences (nutritional deficiencies and reduced cognitive abilities of themselves as well as their children).

This study sought to investigate the perceptions of body weight and nutritional attitudes among University of Ghana students since very little data is available in Ghana.

1.3 Justification

Understanding the determinants of perceptions held by young people about their bodyweight as well as the kind of nutritional attitudes they are currently engaged in using a quantitative approach will provide information on how prevalent bodyweight misperception is among the educated youth, considering that they are supposed to be more enlightened. It is also very important due to the association of false bodyweight perception with several inappropriate and detrimental weight management strategies that have the tendency of negatively affecting the health of the individual. A good and appropriate nutritional attitude does not only enhance the health of individuals but is also one of the fundamental and most healthy means of managing bodyweight concerns. On the other hand, if inappropriate nutritional and eating habits are engaged in, the individual is exposed to adverse health effects such as chronic diseases, negative birth outcomes or even death in certain cases.

The health of students studying at tertiary educational institutions is a matter of increasing concern. The transition from high school to a tertiary institution is known to be an especially problematic stage in adult development and has been found to be associated with a decrease in self-concept, psychological distress, depression and anxiety (Cilliers *et*

al., 2006). The transition implies that students have to adapt to a new social, academic and psychological environment in which they are now suddenly free to make their own decisions. In order to adapt and find a way of becoming accepted or popular with their peer group, they become increasingly concerned about maintaining an attractive and culturally acceptable bodyweight.

Uncovering perceptions the youth hold about their bodyweights, the mediums that drive these perceptions and the attitudes (nutritional) being adopted to address such perceptions is very vital. It will be essential in putting together policies, programs and interventions that provide support for them towards promoting good health and the prevention of lifestyle diseases. With particular reference to the universities, courses can be put together to highlight the effects of poor body weight perceptions as well as the role of good nutrition in the attainment of the appropriate body weight for any age as categorized by the World Health Organization. Most universities make provisions for weight loss centers on their campuses, hence, finding out perceptions the students have about their bodyweight will provide an avenue for managers of such facilities to plan appropriate ways meeting demands of their clients.

Findings from this study will also inform the planning of key programs put together by NGO's that tackle youth related issues since poor body weight perception can result in low self-esteem which could adversely affect their development.

The future of the youth and their off-springs with relation to their nutritional status as well as maintenance of healthy weight will be adequately catered for if current mindsets about these two are known. This research will add up to current information available on this

topic as well as provide an avenue for future studies to be conducted in this field of public health.

1.4 Conceptual framework

1.4.1 Theoretical framework

The theoretical framework explains the theory that underpins the conceptual framework. This study adapts the Social Cognitive Theory which deals with understanding behavioral change by looking at the cognitive, emotional and aspects of behaviour of an individual (Bandura, 2002). The theory expatiates on how an individual attains and sustains certain behavioral patterns while allowing for changes through interventions. The social cognitive theory of Bandura (SCT) centers on the concepts of reinforcement and observation, giving more importance to the mental internal processes as well as to the interaction of the subject with others (Bandura, 2002).

This theory posits that, assessing an individual's behavioral changes rely on the environmental, individual (personal factors) and behavioral factors (Bandura, 2002). The environmental refer to the external factors that can influence an individual's behavior. These factors comprise of the social and physical environment in which the person finds him/herself. The social environmental factors look at influences from family and friends, and colleagues while the physical environmental factors take into consideration the physical things an individual is surrounded with, such as ambient temperature, availability of food and others. The personal factors refer to the cognitive or mental representation of the environment that may affect a person's behavior. The personal factors are made up of "perception'. The theory states that the environment and the personal factors provide a

framework for understanding behavior. The environmental, personal and behavioral factors are constantly influencing one another (Bandura, 2002).

For the purposes of this study, the Social Cognitive Theory will be used in finding out how the perceptions people have about their body-weight (personal factor) is related to certain socio-demographic characteristics (environmental factor), their nutritional attitudes (behavioral factor) as well as their actual body-weight. This model was adapted due to changes in the socio-environmental setting and to suit conditions around the University.

Socio-demographic characteristics such as sex, age, nationality, ethnicity and perceived stressors have been identified in other studies across the world as having a role to play on the way an individual perceives his or her bodyweight (Appiah *et al.*, 2014; Olaoye and Oyetunde, 2012; Ard, 2007;Benkeser *et al.* 2012). Body Mass Index (BMI), however, from some studies has not been clearly defined as to having a direct influence on body weight perecption or not, thus, whiles some conceed that it does (Ard, 2007) others object to this assertion (Ural *et al.*, 2005; Olaoye and Oyetunde, 2012,)

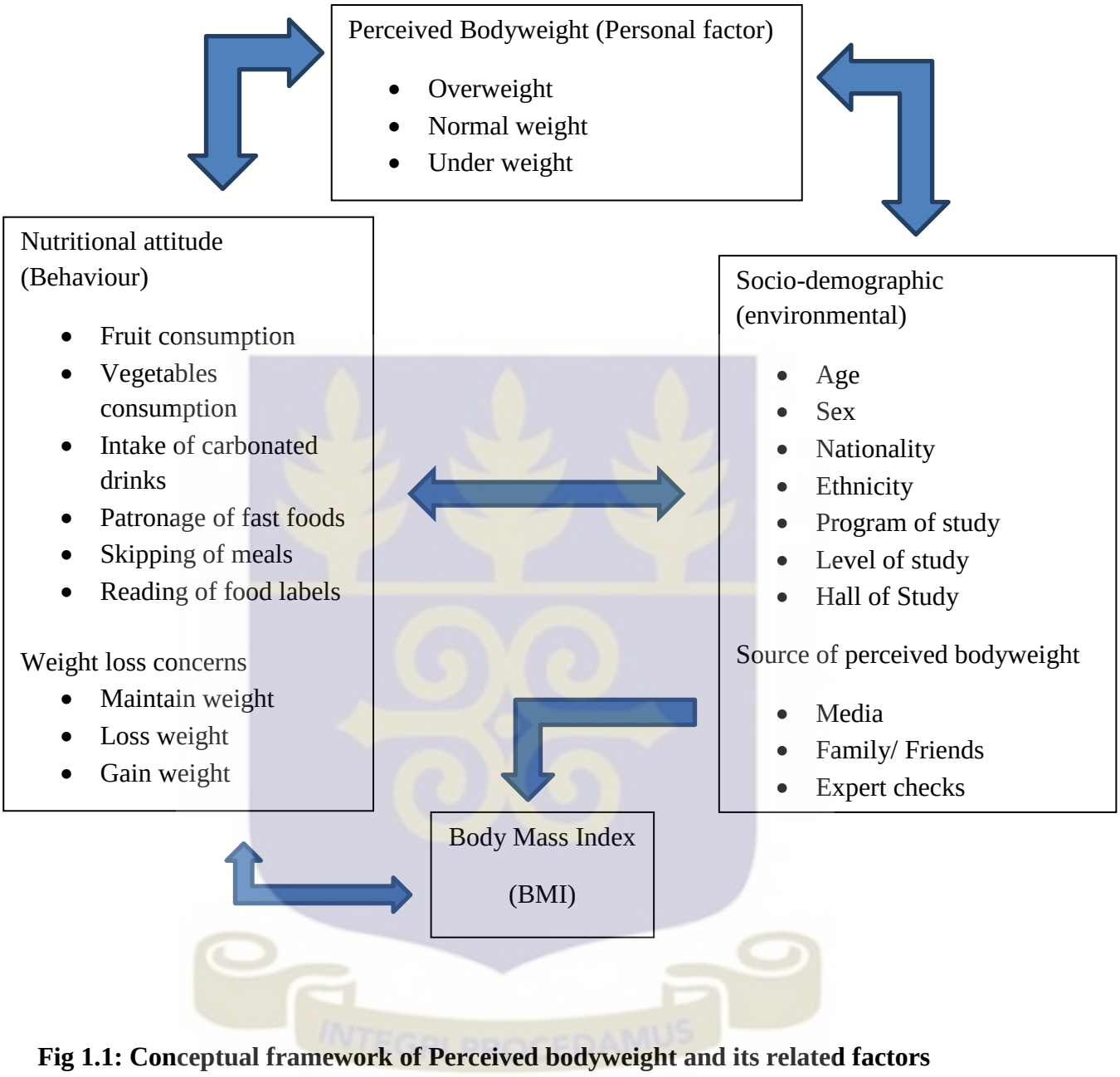

Fig 1.1: Conceptual framework of Perceived bodyweight and its related factors

Source: Bandura (1986). Overview of social cognitive theory

1.5 Research Questions

1) What bodyweight description do university of Ghana students give about current their body weight?

2) What factors promote these body weight descriptions among university of Ghana students?

3) What is the relationship between their perceived bodyweight and the Body Mass Index?

4) What nutritional attitudes pertain among university of Ghana students?

5) How do body weight perceptions among University of Ghana students influence their nutritional attitudes?

1.6 Study Objectives

1.6.1 General objective

To investigate bodyweight perceptions and nutritional attitudes among University of Ghana students.

1.6.2 Specific objectives

1) To identify descriptions of bodyweight among of University of Ghana students.
2) To determine the association between perceived bodyweight and the actual bodyweight (BMI) of University of Ghana students.
3) To identify factors that promote the bodyweight Descriptions University of Ghana students have about themselves.
4) To identify the nutritional attitudes as well as eating behaviors among University of Ghana students and to ascertain its association with perceived bodyweight.

CHAPTER TWO

LITERATURE REVIEW

2.1Introduction

A projection by the World Health Organization (2010) points to the fact that nearly one in three people worldwide will be overweight, and one in ten will be obese by 2015. These projections in no way overshadow the continuous existence of cases of Underweight in certain places around the world especially in Africa and Asia.

The proximate cause of weight gain or loss is energy imbalance, with food energy intake not commensurate with total energy expenditure (Swinburn et al, 2011). The rising incidence of these problems spells doom for the future of the health of humans especially the youth. To effectively curb this menace and its corresponding health consequence, adolescents and young adults must recognize this problem and develop an accurate self-perception of their weight (Cilliers *et al.*,2006).

This section is to provide the current theoretical and scientific knowledge about issues concerning bodyweight and nutritional attitudes. All information that has been put together is based on scientific documents that carry researches conducted not later than twelve (12) years ago (2002-2015). The aim of this literature review was to investigate bodyweight perceptions in the context of the youth as well as its impact on the nutritional attitudes of such individuals.

The literature search was conducted using the following databases: JSTOR, Medline, Hinari and PubMed. A combination of the following key words and phrases were inputted into the databases: overweight and underweight prevalence, bodyweight problems,

obesity, bodyweight perception, implications of poor bodyweight perception, and nutritional attitudes of adolescents and effect of poor bodyweight perception on nutritional attitudes. The four common themes that emerged from the literature are: prevalence of bodyweight problems, factors influencing bodyweight perception, health implications of poor bodyweight perceptions and relationship of bodyweight perception with nutritional attitudes.

For the purposes of this discussion, the literature would be reviewed and categorized under the four main themes outlined above.

2.2 Prevalence of Bodyweight Problems

The existence of either excess or insufficient amount of body fats for an individual's height is referred to as bodyweight problems. Bodyweight problems for the purposes of this study are grouped into underweight, overweight and obese.

In recent years, the prevalence of bodyweight problems, particularly overweight and obesity has increased dramatically, both globally and in sub-Saharan countries such as Ghana, with a myriad of factors affecting this change (Inoue, 2007; WHO, 2002; Flegal, 2006). Urbanization, Industrialization and Globalization have been identified as some key reasons for this trend. Its global burden is said to have more than doubled since 1980 (WHO, 2007). Rates of obesity among children are estimated to have tripled during the last 20 years (Rocchin, 2002). In 2004, the global prevalence of overweight and obesity among children and adolescents (5 to 17 years) was estimated by the International Obesity Task Force (IOTF) to be 10% (Ani, Uvere, & Ene-Obong, 2013). 42 million children under 5 years were overweight in 2013 (WHO, 2015). The same WHO report of 2015 reveals that, in developing countries with emerging economies (classified by the World

Bank as lower and middle income countries), the rate of increase of childhood overweight has been more than 30% higher than that of developed countries.

The WHO in 2006 looking at trends at that time went ahead to project that by 2015, an estimated 2.3 billion adults will be overweight with more than 700 million of that number being obese (Agyemang, 2008). True to that projection, the WHO in 2014 reported that more than 1.9 billion adults worldwide (39%) aged 18 years and over were overweight with about 600 million (13%) of them being obese.

Most researches have shown that the prevalence of overweight is observed much more in females than males. Women were more likely to be overweight and obese than men (Addo, Smeeth & Leon, 2009; Abubakari & Bhopal, 2008; Ani et al., 2013; Flegal, Carrol, Kit & Ogden, 2012). According to Flegal, Carrol, Kit & Ogden (2012), 35.8% of adult American women are overweight compared to 35.5% in their male counterparts.

The prevalence of overweight in West Africa has been identified to keep surging from the last two (2) decades of the 20th century and into the 21st century. Data from a 2008 WHO Global Database on BMI shows a high prevalence of over-nutrition in sub-Saharan Africa. In 25 out of 33 countries, the percentage of the adult female population with a BMI >25 was 19.8 %. In a similar survey conducted between 2000 and 2004, a review of obesity prevalence in West Africa indicates, 10% of West African adults were obese (Abubakari et al. 2008). In this time period, according to the same study, half of the urban population in general and 60% of urban, West African women were either overweight or obese (Benkeser, Biritwum, & Hill, 2012).

Narrowing down to the youth, a study conducted in Enugu states in Nigeria on adolescents both from rural and urban settings revealed some very interesting results. The prevalence of overweight, obesity and thinness among adolescents were 7.5%. 2.1% and 13.9%, respectively. The prevalence of obesity among the adolescents in urban areas was 4.1% while none of the rural adolescents was obese. There was a higher prevalence rate of overweight among females (11%-Urban and 6%-Rural) than among males (10.3%-Urban and 2%-Rural)(Ani et al., 2013).

In Ghana, between 1993 and 2008, national obesity rate increased from 10 to 30 %. The highest rate was recorded in the Greater Accra Region at 45 % (GSS et al., 2009). Besides, other studies such as Amoah (2003) in two urban areas (a high and a low class) and a rural suburb of the Greater Accra Region reported that the overall crude prevalence of overweight and obesity in Accra was 23.4% and 14.1% respectively among adults aged 25 years and above. Using the WHO criteria for BMI, Benkeser, Biritwum and Hill (2012) reported 27.8% and 37.1% respectively in overweight and obesity among urban Ghanaian women. In the same study, analyzing socio-demographic characteristics of the participants revealed that higher levels of relative wealth and having given birth to two or more children are both associated with higher risk of overweight. Being unmarried and haven grown up in a rural setting were observed to have negative associations with overweight whereas education level had no significant association (Benkeser et al., 2012).

Despite these significant records of excess body weight, appreciable cases of underweight (BMI< 18.5) has also been observed (Cheung, Lee, Ho, Li, Lam, Fan & Yip 2011). A National Health and Nutrition Examination Survey (NHANES) conducted between 2007-

2010 on U.S adults aged 20 years and over revealed an estimated 1.7% of them being underweight.

Significant gender differences were seen in underweight prevalence among U.S. adults. Women were observed to be more likely to be underweight than men, 2.3% in women and 0.9% in men (Fryar and Ogden,2010). The WHO Global database on Body Mass Index for the year 2008 reported that 14.5% of the adult female population in sub-Saharan Africa is underweight (Agyemang, 2008).

Over time being overweight has become a social norm and, as a result, people often no longer recognize that they are carrying excess weight. The health consequences of being overweight or obese are many and varied, ranging from an increased risk of premature death to several debilitating illnesses that have an adverse effect on quality of life. Being overweight or obese are major risk factors for non-communicable diseases such as type 2 diabetes, cardiovascular disease and certain cancers including kidney, breast and endometrial cancer.

2.3 Factors influencing Bodyweight Perceptions.

Bodyweight perception as put across by Chang *et al* (2003) refers to the way an individual considers him or herself in reference to categorization of their own bodyweight, thus; overweight, underweight or just the right weight (normal).In a similar vein, Body weight perception referred to as a personal evaluation of one's weight as "underweight "or "normal weight" or "overweight" irrespective of actual body mass index (Bhurtun & Jeewon, 2013). Taking time to have a self-assessment of your bodyweight is considered very appropriate in every regard considering the numerous health implications this has on

an individual. Acceptance of the view that 'thin is good' and 'fat is bad' is considered paramount for successful public health control (Flegal,2006; Wills, Backett-milburn, Gregory, & Lawton, 2006). There have been several reports about increasing focus on body weight or image among the youth ((Bhurtun & Jeewon, 2013; El Ansari et al., 2010; Rocchin, 2002; Olaoye and Oyetunde, 2012) and reasons identified in these reports range seem to be very diverse. Significant among the factors that influence body weight perceptions are age, gender, family influence, peers, media and ethnicity. Age is very important in people's self-perception, with younger men and women more likely to judge themselves to be in a higher weight category (Chang & Christakis, 2003). Among the three (3) age categories used for this study, the youngest grouping (20-34) had the greatest odds (3.42) of an individual of classifying themselves in a higher weight category.

The institutionalized cultural practices and internalization of cultural norms may influence people's perception about their body weight' (Agyemang, 2008), thus, whereas certain body sizes are glorified in Africa, it is abhorred in other parts of world such as the western world. There is a presumed cultural valuation of fatness as a sign of prosperity, beauty, health and prestige in some Sub-Saharan African (SSA) populations. It signifies strength, wealth, beauty and also makes one look respectable (Renzaho et al., 2012; Puoane et al., 2010; Shaibu et al., 2012; Amoah, 2003).Thinness on the other hand, is mostly linked to poverty and illness while increasingly rapid weight loss is associated with HIV/AIDS (Kruger et al., 2005; de-Graft Aikins, 2006; Shaibu et al., 2012). With relation to gender, studies suggest that whereas males perceive themselves as "too thin" or "just right", females are more likely to feel they were "too fat" (El Ansari et. al. 2010; Frempong, 2013; Olaoye & Oyetunde, 2012). This, however, some researchers have attributed to the fact that very limited studies have been conducted on bodyweight perception with males

being subjects. This reason was however sharply disproved in a study conducted by Musaiger et al., (2012) among high school adolescents which found a higher number of males (18.5%) perceiving themselves to be overweight than females (13.1%).

In a world where a myriad of factors contributes to perceptions that individuals hold, picking on just one such factor to establish influence might be misleading, this school of thought also pertains to body weight perceptions. Weight perception could be a result of a peer and family effect. People base their weight status perceptions on the weights of significant others (El Ansari et. al. 2010). Weight-teasing of thinness by family members and peers have also been found to be related to problematic weight related outcomes and disordered eating behaviors. Individuals who were teased frequently about their slim body sizes were about ten times more likely to binge eat as compared to those whose family members did not tease them. Eating too much may eventually increase BMI status (Neumark-Sztainer *et al.*, 2010).

The media also promotes images of unrealistic body shape and serves to perpetuate people's dissatisfaction with the way they look (Tiggerman, 2003; Cohen, 2006). Each form of media (either print or electronic) serves a different purpose but overall seeks to inform, convince, entertain, and change the individual by feeding them with ideas (Jaffari et al., 2011). The importance the media places on the thin and smart ideal body figure may be responsible for body size overestimations that females in particular make. The views people have about themselves are greatly influenced by how they imagine others perceive their appearance and personality (Cohen, 2006). That is, development of self-image involves the imagined appearance of oneself to others, the imagined judgment associated

with how one appear to others, and feelings of pride or embarrassment resulting from those perceptions. Individuals will compare and contrast themselves to others in their society and choose behavioral styles biased by the extent to which they are motivated to comply with the social norms (Cohen, 2006).

2.4 Poor Bodyweight perceptions and its Health Implications

It has been identified that individuals generally have a poor judgment about their bodyweight since most perceptions are influenced by the media, close family ties, societal influence, perceived stressors and stigmatization by the society (Appiah *et. al* 2014; Benkeser *et al.* 2012).

Poor weight perceptions have been observed by several studies conducted in numerous societies around the world and this goes to confirm the assertion made by Bhurtun & Jeewon (2013) that, bodyweight perception is poorly associated with actual bodyweight status. In a study conducted among teenagers in Mauritius (a developing country just like Ghana), less than half (42.2%) of the respondents surveyed correctly perceived their weight. Among participants with a normal or overweight BMI, 31.7% thought they were overweight. A similar observation was made among the overweight participants and in both cases, it cuts across sexes (Bhurtun & Jeewon, 2013). Bhanji *et al.* (2011) identified that among overweight and obese adults in Pakistan, a very high proportion of individuals (73% overweight and 50% obese) underestimated their weight status, thus, they were bigger than they perceived themselves to be.

In Tanzania, four out of five (78%) of overweight and obese people interviewed, failed to perceive their weight as being too high (Muhihi *et. al., 2012).* A study among adults in the Seychelles reported that 54% of overweight participants and 18.8% of obese participants underestimated their body size (Alwan et al., 2010). Olaoye and Oyetunde (2012) found underestimation and overestimation of weight respectively among underweight and overweight students. 31% of students thought they were overweight whereas the BMI confirms that only 18% was actually overweight. Also, 5.5% out of 15.5% who believed they were underweight were actually underweight. All these events of weight misperception are very capable of having health implication on the individuals.

A very significant observation of most of the studies reviewed, revealed that gender difference was observed in most results that were obtained in the various studies conducted. In the case of the Mauritian teenage students survey carried out by Bhurtun & Jeewon (2013), it was observed that a whopping 61.1% of the ladies overestimated their weight whiles only 14.4% of their male counterparts did same. In a study conducted to examine the influence of socio-demographic factors on Americans' perceptions of their weight appropriateness Chang & Christakis (2003) observed that 27.5% of women and 29.8% of men misclassified their own weight status by medical standards. Of particular note, 38.3% of normal weight women thought they were overweight while 32.8% of overweight men thought they were "about the right weight" or "underweight".

Underestimation or overestimation of an individual's weight has several health implications on the individual (Field *et al*., 2001). It contributes to denial of current weight being a health risk and thus predisposes such individuals to weight related lifestyle diseases such as Diabetes, Hypertension, Stroke and other several cardiovascular diseases.

It has also been documented by other studies that individuals who misperceive their bodyweight are very likely to have an apathetic attitude towards weight management practices (Field *et. al,* 2001). People who are truly overweight but perceive themselves to be normal or underweight have the tendency of engaging in excessive eating and less physical activity, a practice which would rather expose them to the chances of becoming obese and predisposed to obesity related health conditions (Dissen *et al.,* 2011). On the other hand, a study conducted in the US among adolescents revealed that individuals who were underweight but perceived themselves to be overweight, developed certain eating disorders such as Anorexia nervosa as well as starving themselves in their quest to loss their own perceived weight. Such practices rather expose such adolescents to serious health problems such as malnourishment or even ulcer in the case of starvation.

Beyond these, other psychological problems such as depression, anxiety low self-esteem are associated with perceiving oneself to be of a bodyweight which they are not.

2.5 Nutritional Attitudes, Eating behaviors and their Relationship with Body weight perception

Nutrition is a fundamental factor that determines health outcomes (Wang et al., 2009). Increased total caloric intake has been observed to have a direct link with development of overweight and obesity (Gibson, 2005). Nutritional attitudes and eating habits have been identified as two of the most engaged in behavioral measures usually adopted by individuals who perceive their bodyweight in a particular way and wish to work on it. A cross-sectional study among Dutch men and women found that individuals who perceived themselves as overweight and obese restricted the intake of caloric diets as a means of weight control (Blokstra et al. 2004). Also, Lemon et al. (2009) reported that 59% of 899

Massachusetts employees who perceived themselves overweight and trying to lose weight used dietary strategies such as low-fat diet. Again, majority (80%) of female college students in the United States used dieting strategies such as eating or drinking low fat or fat free versions of foods/drinks for weight loss. They believed they would have increased in weight if they had not dieted (Malinauskas et al., 2006). Likewise, a study by Fields et al. (2010) among adolescents and young female adults who wanted to reduce weight in the US reported that limiting calories, fat, or snacks and sweets together with frequent exercise resulted in significantly less weight gain.

Additionally, in Ghana, 17.7 % of women who perceived themselves to be overweight and tried to decrease their weight did so by eating less food or food with fewer calories (Benkeser et al., 2005, Biritwum *et.al*, 2005). It is very admirable to notice from all the above studies that the participants recognized the role of high caloric diets and would therefore want to cut down its consumption in their quest to lose weight. This observation gives credence to the vital role played by Nutrition knowledge. Other very common nutritional behaviours identified to be adopted by teenage university students in Mauritius included; increasing fruit and vegetable consumption; reducing the amount of food eaten at meal times, reducing the quantity of snacks consumed between meals and having a balanced diet (Bhurtun and Jeewon, 2013). Skipping meals and fasting, though also noticed in the above study were of a low frequency (5.1%). Nutrition education programmes are designed to improve nutrition knowledge, with the aim of supporting sound dietary intake within the community or a specific target population. The knowledge gathered from this education goes a long way to prevent or manage lifestyle diseases such as diabetes, CVD or other Non-communicable diseases that are enhanced by inappropriate weight.

Several factors have been well documented to be influential on an individual's nutrition knowledge and behavior. Some of these include age, sex, level of education and socio-economic status (Spronk, Kullen, Burdon and Coonor, 2014). Women tend to have higher levels of nutrition knowledge than men, and this difference has been attributed to their more dominant role in food purchasing and preparation or a lower interest in nutrition by men (Saules, Collings, Hoodin, Andelella, Alschler. Iveraj, Saunders-Scott and Wiedemann, 2009). Higher levels of nutrition knowledge have been reported in those with higher education or socio-economic status (Cilliers et al., 2006) and greater levels of nutrition knowledge have been typically found in middle-aged as opposed to younger or older persons (Saules et al.,2009). These demographic factors also influence dietary intake.

The issue of eating disorders represents a serious potential threat to physical and psychological well-being. This is the problem weight misperception especially Over-estimation poses to individuals. They indulge in eating disorders such as anorexia nervosa and anorexia bulimia just so they can attain or fall within the normal bodyweight category, thus according to Malinauskas *et al*. (2006) in a study conducted on Iranian students to find out major determinants of bodyweight perception and satisfaction. They recognized that, overestimation of one's weight has the tendency of making them impatient hence is significantly associated with their quest to engage in bad dietary behaviors.

On the other hand, a research conducted to find out the eating behaviors and bodyweight concerns among adolescent girls, came out with the findings the ladies were less satisfied with their bodyweight. In specific reference to those who underestimated their bodyweight and wished they were a lot bigger, were found engaging in binge eating as well as

deliberately consuming high caloric and fatty foods just so to make up for their desired bodyweight (Bhurtun and Jeewon, 2013). In the same study, individuals who correctly perceived their bodyweight were found to be highly satisfied with their bodyweight and at about five (5) times more likely to engage in healthy eating behaviors.

CHAPTER THREE

METHODS

3.1 Type of Study

This was a descriptive study that used a cross-sectional survey design to gather information on the bodyweight perceptions and nutritional attitudes of University of Ghana students.

3.2 Study Area

The University of Ghana (UG) was built in 1948 (then as University of Gold coast) as the premier degree awarding institution in the country and is responsible for churning out most of the nation's human resource. The university lies about 13 kilometers north-east of Accra, the capital city of the West African country. Its main campus is specifically sited at Legon, in the Ayawaso West Wougon constituency, a suburb of the Capital city at an altitude of between 90 and 100 meters. It is the largest of Six (6) public universities and numerous private universities in the country. The University currently has a student population of about Twenty nine thousand seven hundred and fifty four (29754). The undergraduate students' hold close to 88% (26154) of the entire population whereas the post-graduate community manages about 1816 of this number with a general male to female ratio of 2:1 respectively (Planning and Information Services Directorate, UG, 2008).

The international community enjoys quite an appreciable proportion of this population with almost 4% (1142) of the students being foreign nationals which adds to the rich blend of culture within this community (Planning and Information Services Directorate, UG, 2008).

3.2.1 Facilities within the school

Residential facilities are available to provide accommodation for both undergraduate and post-graduate students. There are currently Eighteen (16) Halls of residence located at different sections of the campus and these comprise of; Five (5) traditional halls of which two (2) are same sexed; all male (Commonwealth) and all female (Volta). Four (4) recently constructed unisex Hostel facilities, Two (2) International Students' Hostel (ISH), Two (2) postgraduate hostel facilities and Five (5) privately owned hostels of which Two (2) are owned by SSNIT. Most of these halls have within their premises catering facilities and shopping centers where students can purchase all sort of items with varying nutritional content. Also located at different sections of the campus are Supermarkets, local markets, cafeteria and fast food joints that provide services to students some with very healthy nutritional contents whereas others are very questionable.

The university has also put in place structures that cater for the health of students in times of infirmities. A clinic facility is sited within the school to provide prompt services to students by acting as a first aid point whiles a university hospital which is located some few meters away from the main campus serves as a referral center for major cases.

The university has in place a number of facilities that seeks to promote healthy living amongst students. A gymnasium, swimming facility, a Sports stadium and a number of handball, lawn tennis and basketball courts are located on the campus. The four (4) newly built hostel facilities have within them basketball and badminton courts. Students are very commonly found patronizing such facilities and these by extension can be associated with the health conscious nature of these students. All the above in addition to the fact that University of Ghana-Legon campous has the largest gathering of educated youths are the reasons why the university was selected as the study site for this research.

Fig 3. 1: Map of the University of Ghana showing some halls of residence

3.3 Variables

3.3.1 Independent variables

3.3.1.1 Socio-demographic characteristics

1) Age
2) Sex
3) Nationality
4) Ethnicity
5) Course of study
6) Level of study

3.3.1.2 Nutritional Attitudes

1) Patronage of fast foods
2) Fruit consumption
3) Vegetable consumption
4) Consumption of carbonated drinks
5) Skipping of meals
6) Reading of food labels

3.3.1.3 Social Factors that promote bodyweight perception

1) Family Friends
2) Friends
3) Media

3.3.1.4 Anthropometric measurements (BMI)

1) Weight
2) Height

3.3.2 Dependent variable (Perceived Bodyweight)

1) Overweight
2) Underweight
3) Normal weight

3.4 Study Population

The study population comprised of undergraduate and postgraduate students (both male and female) registered in any one of the residential facilities within the campus and a resident of such halls. Due to the sampling technique that was adopted, students of foreign descent as well as those based in same sex halls were automatically chosen as part of the population.

3.5 Sampling

3.5.1 Sample size calculation

Considering the type of study conducted (Cross-sectional), the type of outcome (proportion for one mean) as well as the type of analysis that would be employed, the Cochran's formula was used in arriving at the sample size for the study. Using a 95% confidence interval, a 5% margin of error and assuming 50% prevalence of bodyweight perception among the students considering that there is no data available as a baseline for bodyweight perception among my study population, the sample size was arrived at through;

$$n = \frac{z^2 * p(1-p)}{e^2 0.05^2} = \frac{1.96^2 * 0.5 * 0.5}{} = 385$$

Where; z= the z-score associated with the assumed confidence interval
p= assumed proportion of students who have a bodyweight perception
e= is the desired level of precision

This figure of 385 arrived at was appreciated by 15%, making it up to about 425 subjects in order to take care of incomplete questionnaires and ones that might not be returned by study participants.

3.5.2 Sampling procedure/method

This study employed the use of proportionate stratified sampling and simple random sampling techniques. A proportionate stratified sampling is the equitable division of a population into sub-groups called Strata based on a characteristic that is important to control for in the study. On the other hand, a simple random sampling is a sampling procedure where every member of the population has equal probability of being selected. The residential affiliations of the students provide a very good and less complicated avenue for the selection of the students hence formed the basis for the stratification.

First of all, all the halls were grouped into four (4) strata based on criteria that would make it as representative as possible. The groupings were based on; same sex halls (traditional halls), foreign student's hall, postgraduate halls and unisex halls.

Figures were then assigned to each of the halls in every category and two out of these figures randomly picked. Any two numbers picked that corresponds to the one assigned a hall of residence in each category would automatically be picked.

At the hall level, respondents were selected proportionally based on that halls population. The number of students within each hall was divided by the total number of students from

all the eight halls (6297) selected put together. The quotient was then multiplied by the Total sample size (425) to determine the number to be interviewed. I then proceeded to calculate a sampling interval by dividing the total number of rooms within each hall with the designated number of individuals to be interviewed from that hall. When this value was arrived at, the direction for the start of the sampling was also randomly selected by either going Right or Left and this was done by picking randomly from these directions written on a paper. The specific room to be begin from was also then decided randomly where in this case numbers between 1 and the sampling interval figure (for instance 4,thus,if the interval arrived at was every 4th room) was written on a piece of paper and randomly picked. Whichever number was picked decided the room from which the interview begins and the subsequent rooms were then based on the sampling interval. Every first person met in such a room, became the subject for the study, however, in situations where the individual declined, the next available individual within the same room then qualifies to be used. In the very few situations where there is no one in the room, the immediate next room in the same direction was used.

Outlined in Table 3.5.2.1 below is the methodology employed in arriving at the number of individuals to be interviewed from each hall:

Table 3.1: Distribution of participants selected from each hall of residence

Name of Hall	Student Population (n)	Sample from Hall (n / N) * 425	Sample after data was collected
Volta	644	44	43
Commonwealth	995	68	78
Pentagon	776	52	34
Valco (Phase 2)	184	12	12
ISH 2	200	15	23
Jean Nelson	1474	98	75
Hilla Limann	1524	103	108
Bani	500	33	19
Total (N)	**6297**	**425**	**392**

3.6 Data Collection Technique/Tools

The tools that were used in this study's data collection comprised of a structured questionnaire, a weighing scale and a stadiometer.

The structured questionnaire (interviewer administered) was made up of three (3) sections; section A, B and section C. Section A sought to get information on respondents' socio-demographic characteristics, their perceived bodyweight description, sources of information that influenced these perceptions and general information of perceptions about bodyweight. It was composed of close ended questions that answered the various research questions. Section B was made up of questions that examined the frequency of respondents' engagement in some nutritional practices. This helped provide information

on their current nutrition practices and following up from there to find out their nutritional attitudes.

Anthropometry

Anthropometric measurements comprising the weight and height of the participants was also measured. All measurements were taken with participants wearing clothing. However, those with heavy clothing such as jackets and sweaters were asked to remove them. They were also required to remove shoes or sandals, belts, watches or other jewellery on their wrists and empty their pockets prior to measurements. Weight was measured using the TANITA weighing scale (model TBF-300A, TANITA Corporation, USA). A wall-mountable height rod (model HR-200, TANITA Corporation, USA) was used to measure the height of the participants. Height and weight measurements of the students were used to compute the Body mass index (BMI) of the participants.

3.7 Quality Control

The recruitment and training of the research assistants responsible for conducting the interviews considered highly their competence, possession of requisite knowledge about data collection and to ensure diligence and dedication to the work, material and financial rewards was ensured. They were trained on how to administer questionnaires to participants, guide them in filling it, accurate measurement of body mass index and how to enter as well as clean data.

The four (4) assistants used included individuals from both the School of Public Health (University of Ghana) and the Department of Nutrition and Food Science; all of whom

have had some previous experience in data collection. Regular checks were carried out on the questionnaires to ensure they are filled completely and correctly. Weighing scales (TANITA Model) were checked and calibrated regularly (once in every five measurements) to avoid errors. It was ensured that respondents' weights were measured in light clothes to the nearest 0.1 kg whiles height was measured corrected to the nearest 0.1 cm. The measurements were carried out in duplicates to reduce errors to the barest minimum. BMI categories were computed using the WHO standards of overweight, underweight and normal weight.

As a guard against data loss, data collected was kept in 3 different locations; my laptop, an external hard disk and a copy sent into my email. All these were password protected to prevent access by individuals other than the Principal Investigator.

To ensure that the data collected was rigorous enough before analysis were carried out, questionnaires were cross-checked for completeness before data entry, Data was entered twice into Excel and once directly into Stata by two different individuals as well as cleaned to avoid errors and this was validated by comparing or matching basic frequencies.

3.8 Data Processing and Analysis

3.8.1 Data Analysis Procedure

Based on a template that was developed after initial pretesting of the questionnaire, responses to questions were coded; data entered into Microsoft excel and Stata, cleaned and exported into Statistical software Stata (version 12) for analysis. Bodyweight

description categories were defined as underweight, normal weight and overweight and were entered as the main outcome variable. As a first point of call, descriptive statistics (frequencies and percentages) was used in summarizing the characteristics of the participants and how the various variables were distributed among the participants based on bodyweight description and actual body mass index.

Frequency distributions and percentage of all the variables were showcased in tables. A diagrammatic presentation of Perception levels and Nutritional attitude levels were carried out using bar charts. Cross tabulations (bivariate analyses) were done firstly for each socio-demographic factor against Bodyweight description (perceived bodyweight) and secondly among the socio-demographic factors.

A Chi-square analysis was done to test the association for cross tabulations and to establish how proportions of my various independent and background variables compare between the categories of my outcome variable (perceived bodyweight). The test of association was done by setting a 5% significance level and any variable with a Probability value (p-value) below it was considered significantly associated with bodyweight description (perceived bodyweight).

Since bi-variate analyses do not consider confounding effects, a logistic regression was done to identify how strong socio-demographic variables were associated with bodyweight description (perceived bodyweight). The socio-demographic variables selected were those whose p-value were less than 0.05.

3.8.2 Logistic regression (Multinomial Logistic regression)

In this study, bodyweight description category (normal weight=1, underweight=2, overweight=3) was used as the dependent variable with normal weight as reference category in a multinomial logistic regression model using the enter method. This logit provides the opportunity to see the interaction between more than two categories of an outcome (in this case, perceived bodyweight) and predictors (in these case, selected socio-demographic factors). The socio-demographic factors; sex, Nationality, Ethnicity, Level of Study and Hall of residence were considered as the independent variables.

In the model, all socio-demographic factors were entered in one block using one category as a reference category for each factor. For instance regarding sex, the Male category was used as the reference category to which the likelihood of a participant describing themselves as either underweight or overweight as against being normal weight in the other sex category (female) was compared. The *R*2 of model and the significance of each predictor variable were obtained. The resulting regression coefficients revealed the decreased or increased chance of being in each perceived bodyweight category considering the effect of the independent variables. Thus, the likelihood of being underweight or overweight was reported and interpreted using odds ratios (Exp β) with confidence intervals where estimates of odds greater than 1.0 were indicative of higher risk of perceived underweight or overweight than that of the reference category while odds ratios less than 1.0 indicated a lower risk of perceived underweight or overweight compared to reference category.

3.9 Ethical Considerations/Issues

Permission and Study Approval was granted by the Ghana Health Service Ethics Review Committee. Permission from the various hall authorities was rightfully asked for before any of the residents were approached to partake in this study. Ethical issues in research design and procedures such as voluntary participation, refusal right, benefits, safety of procedure and confidentiality were fully addressed.

3.9.1 Voluntary participation/ Refusal Right

A written informed consent was obtained from participants prior to their participation in the study. Participation was absolutely voluntary and no one was compelled against their own will. Respondents were assured of their right to withdraw from the study at any time they deemed it necessary to do so. It was affirmed and re-echoed that opting out of the study was not going to attract any punishment.

3.9.2 Potential risks/benefits

Study participants were fully assured of the fact that they stand no potential risks by partaking in the study. No physical, mental or emotional harm was to be caused to them as a result of their participation. There were no benefits or rewards, either in monetary or non-monetary terms, for the participants of this study. However, findings from the study will be used to benefit both the study population and the society at large.

3.9.3 Confidentiality/Anonymity

Questionnaires were labelled with unique ID numbers as this ensured anonymity since no participant's name was made to appear on any questionnaire. Data was also reported in aggregates to reduce possibility of tracing information gathered back to respondents. This was done to ensure confidentiality of information that was collected from participants.

3.9.4 Data storage and usage

Pre coded answered questionnaires were kept under lock and key in a cupboard and the key kept only by the principal investigator. Data collected was entered few days after collection, and was saved under a password known to only the principal investigator. Soft copy of data was stored on an external hard drive as well. All data collected in this study will be kept by the principal investigator for 3-4 years to allow for publication of research, after which questionnaires will be destroyed.

3.9.4 Conflict of interest

Apart from the academic and public health importance of this study the principal investigator has no personal interest in the study

3.10 Pretesting

Questionnaires were administered and pretested in Alexander Kwapong Hall which was not originally part of the halls selected for the study but had the same characteristics based on the criteria for selection. Responses obtained from the pretesting brought to light the shortfalls in my questionnaire and helped me shape and redesign it to enable me derive the appropriate responses from the participants.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents the socio-demographic characteristics of the respondents, personal descriptions of their bodyweights, the factors which promote these bodyweight descriptions, sources of information on actions to be taken about current bodyweight, body mass indices of respondents, perception level on bodyweight issues and attitude level of respondents with regards to nutrition. The section also covers the associations between the outcome variable, bodyweight descriptions and other independent variables such as socio-demographic characteristic, body mass index and nutritional attitudes.

4.2: Socio-demographic characteristics by bodyweight descriptions and respondent's BMI

Of the total number of University of Ghana students who participated (n= 400) in this study, a 98% response rate was recorded. The mean age of respondents was 21.88 (SD= 3.035), with the majority of them 355 (90.56%) in the age category 17-24. There were more males (57.40%) than females but all respondents cut across various National, ethnic as well as Program of study backgrounds with Akans (56%), Ghanaians (94%) and Arts (57%) being majority respectively. Close to one-third (28%) of the respondents resided in Hilla Limann whiles the Graduate school had the least (3%). Across most of the socio-demographic variables measured, majority of the respondents described themselves as having a normal weight and their BMI measurements shows similar findings. The few exceptions were the Non-African nationals and the 'None' category of Ethnic groups which recorded 66.67% and 50% respectively describing themselves overweight.

However, in describing one's bodyweight as overweight, the female sex scored a higher percentage (25.15%) compared to 7.11% for their male counterpart.

According to BMI measurements, less than a quarter (24%) of the males was either overweight or underweight.

Table 4.1: Socio-demographic characteristics by bodyweight descriptions and respondent's BMI

Characteristic	Total respondents N (%)	Bodyweight descriptions, n (%)			Body mass index, n (%)		
		Under	Normal	Over	Under	Normal	Over
Age							
17-24	355(91)	40(11)	261(74)	54(15)	40(11)	256(72)	59(17)
25-30	29(7)	2(7)	23(79)	4(14)	1(4)	19(66)	9(31)
> 30	8(2)	1(12)	7(88)	0(0)	0(0)	5(63)	3(38)
Sex							
Male	225(57)	24(11)	185(82)	16(7)	21(9)	171(76)	33(15)
Female	167(43)	19(11)	106(64)	42(25)	20(12)	109(65)	38(23)
Nationality							
Ghanaian	370(94)	41(11)	282(76)	47(13)	38(10)	266(72)	66(18)
Non-Ghanaian	10(3)	0(0)	7(70)	3(30)	0(0.00)	6(60)	4(40)
Non-African	12(3)	2(17)	2(17)	8(67)	3(25)	8(67)	1(8)
Ethnicity							
Akan	218(56)	23(11)	170(78)	25(12)	27(12)	157(72)	34(16)
Ga-Adangbe	60(15)	9(15)	42(70)	9(15)	7(12)	38(63)	15(25)
Ewe	66(17)	6(9)	49(74)	11(17)	1(2)	51(77)	14(21)
Dagomba	18(5)	3(17)	14(78)	1(6)	2(11)	14(78)	2(11)
Guan	8(2)	0(0)	7(88)	1(13)	1(13)	6(75)	1(13)
None	22(6)	2(9)	9(41)	11(50)	3(14)	14(64)	5(23)
Level of study							
100	68(17)	6(9)	56(82)	6(9)	6(9)	57(84)	5(7)
200	87(22)	13(15)	51(59)	23(3)	17(20)	57(66)	13(15)
300	128(33)	13(10)	101(79)	14(11)	12(9)	99(77)	17(13)
400	81(21)	9(11)	59(73)	13(16)	4(5)	50(62)	27(33)
600	22(6)	1(5)	19(86)	2(9)	2(9)	14(64)	6(27)
Phd	6(2)	1(17)	5(83)	0(0)	0(0)	3(50)	3(50)
Program of study							
Science	132(34)	14(11)	106(80)	12(9)	15(11)	97(74)	20(15)
Arts	225(57)	25(11)	163(72)	37(16)	22(10)	160(71)	43(19)
Business	29(7)	4(14)	19(66)	6(21)	4(14)	18(62)	7(24)
Medicine	2(1)	0(0)	1(50)	1(50)	0(0)	1(50)	1(50)
Law	4(1)	0(0)	2(50)	2(50)	0(0)	4(100)	0(0)
Hall of residence							
Jean Nelson	75(19)	8(11)	62(83)	5(7)	6(8)	61(81)	8(11)
Hilla Limann	108(28)	10(9)	83(77)	15(14)	12(11)	73(68)	23(21)
Commonwealth	78(20)	10(13)	65(83)	3(4)	9(12)	63(81)	6(8)
Volta	43(11)	10(23)	19(44)	14(33)	8(19)	24(56)	11(26)
Pentagon	34(9)	1(3)	26(77)	7(21)	2(6)	20(59)	12(35)
Bani	19(5)	2(11)	13(68)	4(21)	0(0)	16(84)	3(16)
Graduate hostel	12(3)	0(0)	12(100)	0(0)	1(8)	7(58)	4(33)
ISH	23(6)	2(9)	11(48)	10(44)	3(13)	16(70)	4(17)

4.3: Bodyweight perception and Nutritional attitude levels of respondents.

More than half (67%) of the respondents indicated that their eating habits have contributed to their current bodyweight. A similar proportion of 53% also agreed that their level of physical activity is responsible for their bodyweight. Most of them (62.76%) indicated that Good nutrition and eating habit is the healthiest means of managing one's bodyweight, thus; losing, gaining or maintaining weight. Responses such as those above and a few others combined put most of the respondents in the category of individuals with Good bodyweight perception (81.89%). Whiles over 40% of the respondents disagreed that healthy and nutritious eating was difficult to engage in, more than half (50.77%) of them also refuse to concede that it was difficult distinguishing between healthy and non-healthy foods. Majority (52.30%) of them disagreed on the assertion that you can eat anything if you do enough exercise while close to 30% were left undecided. When asked about how frequently they consumed a selected number of food items, majority of the respondents chose 1-3 days per week for most of the food items. A few of these include Fruits (51%), Fast foods (45%) and Carbonated drinks (46%).

The bar chart below represents the levels for both bodyweight perception and nutritional attitudes of the respondents.

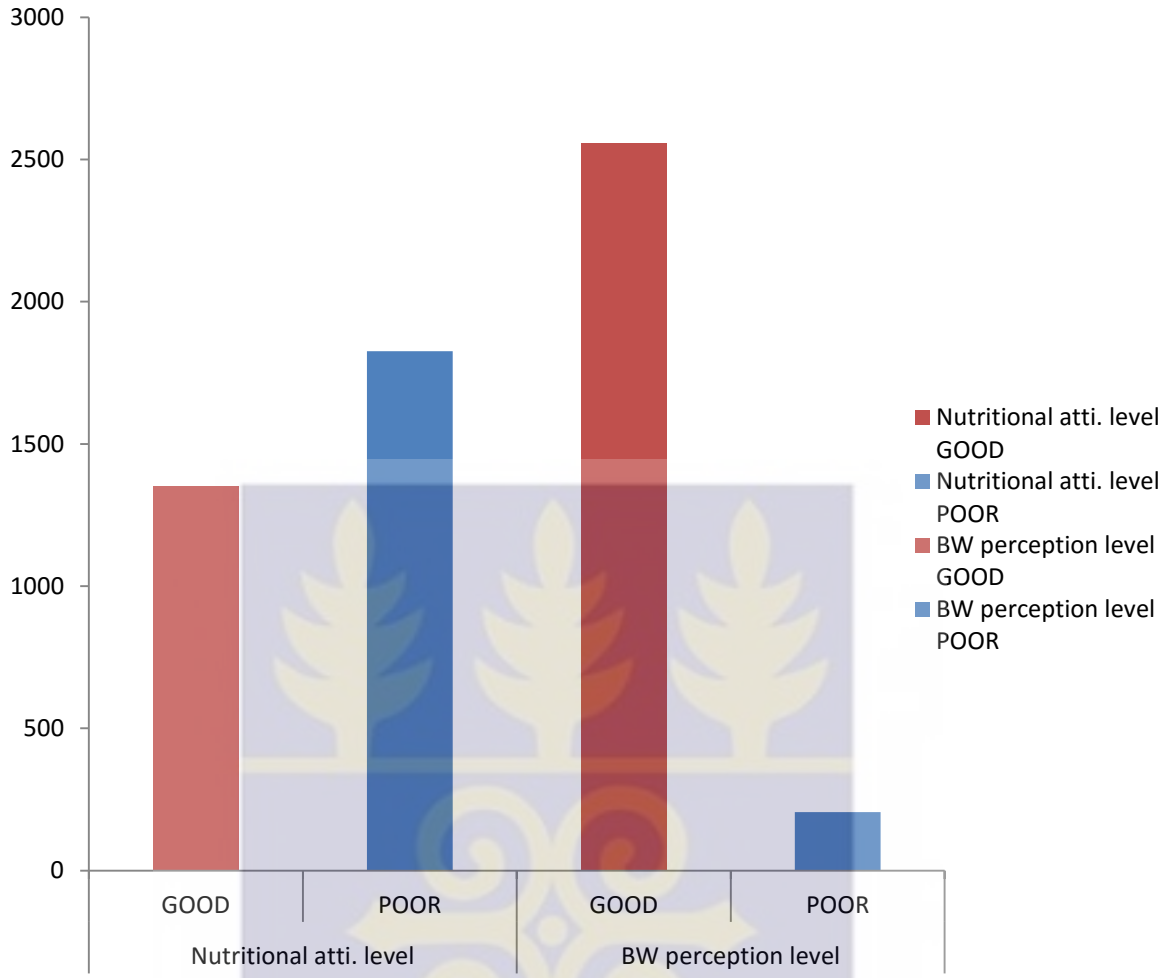

Figure 4.1: Bodyweight perception and Nutritional attitude levels of respondents.

4.4 Associations between variables and bodyweight descriptions

This table shows the results of a Pearson Chi-square test conducted to establish whether or not an association exists between bodyweight description (outcome variable) and the independent variables which are nutritional attitudes, bodyweight perception level, reasons for bodyweight description and socio-demographic characteristics. A respondent's sex, nationality and hall of residence was identified to be associated ($p<0.005$) with their bodyweight description. BMI and reasons for bodyweight description were also significantly associated with the outcome whiles nutritional attitudes were not significantly associated with it. Generally, most of the respondents (70.9%) accurately described their bodyweight. Over three-quarters (79%) of respondents whose BMI was Normal accurately described it as such. Only about a fifth of them misperceived and classified themselves as either Underweight (7.22%) or Overweight (13.40%). Whereas 23 out of the 53 respondents, constituting 40%, of those who perceived themselves overweight were rather underweight, more than half (53.45%) of them, however perceived accurately. In the case of the underweight category, most of them (60.47%) perceived themselves to be Normal.

The Chi-square values represent the relationship between each variable and the outcome (bodyweight description), however the significance of the association is determined by the p-value. All p-values less than 0.005 ($p<0.05$) mean those variables are significantly associated with bodyweight descriptions.

Table 4.2: Association between variables and bodyweight descriptions

Characteristic	Bodyweight descriptions, n (%)					
	Under	Normal	Over	Df	χ^2	p-value
Age						
17-24	40(11)	261(74)	54(15)			
25-30	2(7)	23(79)	4(14)	**4**	**2.04**	**0.728**
> 30	1(13)	7(88)	0(0)			
Sex						
Male	24(11)	185(82)	16(7)	**2**	**25.66**	**0.000***
Female	19(11)	106(64)	42(25)			
Nationality						
Ghanaian	41(11)	282(76)	47(13)			
Non-Ghanaian	0(0.	7(70)	3(30)	**4**	**31.51**	**0.000***
Non-African	2(17)	2(17)	8(67)			
Ethnicity						
Akan	23(11)	170(78)	25(12)			
Ga-Adangbe	9(15)	42(70)	9(15)			
Ewe	6(9)	49(74)	11(17)			
Dagomba	3(17)	14(78)	1(6)	**10**	**27.97**	**0.002***
Guan	0(0)	7(88)	1(13)			
None	2(9)	9(41)	11(50)			
Level of study						
100	6(9)	56(82)	6(9)			
200	13(15)	51(59)	23(26)			
300	13(10)	101(79)	14(11)			
400	9(11)	59(73)	13(16)	**10**	**19.34**	**0.036***
600	1(5)	19(86)	2(9)			
Phd	1(17)	5(83)	0(0)			
Program of study						
Science	14(11)	106(80)	12(9)			
Arts	25(11)	163(72)	37(16)			
Business	4(14)	19(66)	6(21)	**8**	**11.44**	**0.178**
Medicine	0(0)	1(50)	1(50)			
Law	0(0)	2(50)	2(50)			
Hall of residence						
Jean Nelson	8(11)	62(83)	5(7)			
Hilla limann	10(9)	83(77)	15(14)			
Commonwealth	10(13)	65(83)	3(4)			
Volta	10(23)	19(44)	14(33)	**14**	**54.88**	**0.000***
Pentagon	1(3)	26(77)	7(21)			
Bani	2(11)	13(68)	4(21)			
Graduate hostel	0(0)	12(100)	0(0)			
ISH	2(9)	11(48)	10(44)			
Reason for description						
Personal assessment	25(10)	196(79)	27(11)			
Check by expert	4(6)	52(80)	9(14)	**6**	**25.68**	**0.000***
Media descriptions	1(7)	8(53)	6(40)			
Family and friends	13(20)	35(55)	16(25)			

Perception level						
Good	31(10)	249(78)	41(12)	**2**	**10.34**	**0.006***
Poor	12(17)	42(59)	17(24)			
Nutr. Attitude level						
Good	14(8)	141(79)	23(13)	**2**	**4.7274**	**0.094**
Poor	29(14)	150(70)	35(16)			
Body mass index						
Normal	21(7)	231(79)	39(14)	**4**	**94.01**	**0.000***
Underweight	16(37)	26(61)	1(2)			
Overweight	4(7)	23(40)	31(53)			

The data shown represent the number of number **(n)** of respondents and the proportions (%); **df**, degree of freedom; χ^2, Pearson's chi-square value and p-value.
***Variables that are statistically significant and would be used in the regression analyses

4.5 Associations between Variables and Nutritional attitudes

This table reflects the results of a Pearson Chi-square test conducted to establish whether or not an association exists between the various variables and the nutritional attitudes of the respondents. Only two (Nationality and Hall of residence) out of the socio-demographic characteristics were significantly associated ($p<0.005$) with the nutritional attitudes of the respondents.

Table 4.3: Association between Variables and Nutritional Attitude levels

Variables	Nutritional Attitude Level, n (%)		df	χ^2	p-value
	Good	Poor			
Age					
17-24	157(44.23)	198(55.77)	**2**	**6.0143**	**0.049**
25-30	14(48.28)	15(51.72)			
> 30	7(87.50)	1(12.50)			
Sex					
Male	101(44.89)	124(55.11)	**1**	**0.0574**	**0.811**
Female	77(46.11)	90(53.89)			
Nationality					
Ghanaian	164(44.32)	206(55.68)	**2**	**7.2560**	**0.027***
Non-Ghanaian	4(40.00)	6(60.00)			
Non-African	10(83.33)	2(16.67)			
Ethnicity					
Akan	97(44.50)	121(55.50)			
Ga-Adangbe	24(40.00)	36(60.00)	**5**	**5.4793**	**0.360**
Ewe	32(48.48)	34(51.52)			
Dagomba	9(25.00)	9(50.00)			
Guan	2(25.00)	6(75.00)			
None	14(63.64)	8(36.36)			
Level of study					
100	27(39.71)	41(60.29)			
200	39(44.83)	48(55.17)	**5**	**7.649**	**0.177**
300	57(44.53)	71(55.47)			
400	36(44.44)	45(55.56)			
600	16(72.73)	6(27.27)			
Phd	3(50.50)	3(50.00)			
Program of study					
Science	69(52.27)	63(47.73)			
Arts	94(41.78)	131(58.22)	**4**	**5.4070**	**0.248**
Business	13(44.83)	16(55.17)			
Medicine	0(0.00)	2(100.00)			
Law	2(50.00)	2(50.00)			
Hall of residence					
Jean Nelson	28(37)	47(62.67)			
Hilla limann	38(35.19)	70(64.81)			
Commonwealth	44(56.41)	34(43.59)	**7**	**21.6953**	**0.003***
Volta	21(48.84)	22(51.16)			
Pentagon	16(47.06)	18(52.94)			
Bani	6(31.58)	13(68.42)			
Graduate hostel	9(75.00)	3(25.00)			
ISH	16(69.57)	7(30.43)			
Bodyweight description					
Normal	141(48.45)	150(51.55)			
Underweight	14(32.56)	29(67.44)	**2**	**4.7274**	**0.094**
Overweight	23(39.66)	35(60.34)			

The data shown represent the number of number **(n)** of respondents and the proportions **(%)** ; **df**, degree of freedom; χ^2, Pearson's chi-square value; ***** represent significant p-values *****Variables that are statistically significant and would be used in the regression analyses

4.6 Determinants of association between variables and bodyweight descriptions

Holding the Normal bodyweight as a reference, the degree of association was determined between the outcome variable (bodyweight description) and some independent variables comprising socio-demographic (sex, nationality, hall of residence, ethnicity and level of study), reasons for bodyweight description, fast food consumption and nutritional attitude. Females are more than twice (2.67) likely to describe themselves as overweight compared to their male counterparts. Residents of Volta hall are about seven (7.16) times more likely to describe themselves as overweight whereas those in Commonwealth are just a little over one time more likely (1.20) to describe themselves as overweight. Compared to their Ghanaian colleagues, the non-African nationals were more than thirty (31.57) times more likely to describe themselves as underweight and close to fifty times (47.64) more likely to describe themselves overweight. Respondents who consumed fast foods not more than three times in a week were less likely (0.80) to describe themselves as underweight. However, whiles those who rarely consumed fast food were about six times (0.65) less likely to describe themselves overweight, the ones who consumed at least once but not more than three times a week, were more likely (1.50) to describe themselves overweight.

Table 4.4: Multinomial logistic regression analyses for factors associated with respondents' bodyweight description

Factor	Bodyweight description (Reference: Normal weight)	
	Underweight, OR (p-value)	**Overweight, OR (p-value)**
Sex		
Male	**1.00**	**1.00**
Female	0.80 (-0.64 - 1.38)	2.67 (-0.45 - 1.38)*
Nationality		
Ghanaian	**1.00**	**1.00**
Non-Ghanaian (African)	0.00 (-3543 - 3519)	3.03 (0.20-1.67)
Non- African	31.58 (-0.04 - 2.13)*	47.64 (-1.25- 2.46)*
Ethnicity		
Akan	**1.00**	**1.00**
Ga-Adangbe	1.57 (-0.09 - 1.53)	1.29 (-1.02 - 0.96)
Ewe	1.02 (-0.46 - 1.21)	1.99 (-1.36 - 0.79)
Dagomba	1.53 (-1.38 - 1.71)	0.52 (-1.37 - 2.06)
Guan	0.00 (-2036 - 2008)	0.66 (0.34 - 5.60)
None	omitted	omitted
Hall of residence		
Jean Nelson	**1.00**	**1.00**
Hilla Limann	1.09 (-0.48 - 1.56)	2.45 (0.31 - 2.84)
Commonwealth	1.34 (0.60 - 1.62)	1.20 (-0.35 - 2.49)
Volta	4.92 (0.01 - 1.21)*	7.16 (0.06 - 2.90)*
Pentagon	0.32 (0.30 - 2.73)	4.25 (-1.83 - 3.17)*
Bani	1.07 (0.94 - 1.99)	4.66 (0.05 - 4.31)*
Graduate hostel	0.00 (0.99 - 3.06)	0.00 (0.99 - 3.14)
ISH	0.54 (0.61 - 1.69)	1.94 (-0.85 - 3.04)
Reasons for description		
Personal assessment	**1.00**	**1.00**
Check by expert	0.653 (0.45 - 0.61)	1.331 (-1.03 - 0.94)
Media descriptions	0.773 (-1.25 - 0.74)	2.610 (-2.12 - 0.23)
Family and friends	2.892 (-0.73 - 1.96)*	3.426 (-2.28 - 3.77)*
Fast Food Consumption		
4-6days/week	**1.00**	**1.00**
1-3days/week	0.80 (-1.01 - 0.57)	1.50 (-0.38 - 1.19)
None/Occasionally	0.81 (-1.07 - 0.65)	0.65 (-1.38 - 0.51)
Nutritional attitude		
Good	**1.00**	**1.00**
Poor	1.64 (-0.26 - 1.25)	1.55 (-0.33 - 1.06)

*variables that are statistically significant determinants of bodyweight descriptions

4.7 Factors associated with respondent's BMI.

BMI (as dependent variable) and other independent variables comprising socio-demographic characteristics, reasons for bodyweight description, fast food consumption and nutritional attitude were put into a multinomial logistic regression model to determine the association among them. Results indicate that compared to students who were aged less than 25 years (the Ref.), those who were above thirty (30) years were more than once (1.57) more likely to be overweight. With respect to Nationality, whiles other African nationals were more than twice (2.69) more likely to be overweight, the Non –Africans rather similarly likely (2.63) to be underweight and rather about half less likely to be overweight. Estimates of the odds for level of study of the participants reveal that the likelihood of a student being overweight increased as the level of study also increased.

Table 4.5: Multinomial logistic regression analyses for factors associated with respondents' Body Mass Index

Factor	Body Mass Index (Reference: Normal weight)	
	Underweight, OR (95% CI)	**Overweight, OR (95% CI)**
Sex		
Male (Ref)	**1.00**	**1.00**
Female	1.27 (-0.82 - 1.30)	1.12 (-0.74 - 1.97)
Age		
17-24 (Ref)	**1.00**	**1.00**
25-30	0.06 (-6.46 - 0.70)	0.87 (-1.73 - 1.44)
> 30	0.00 (-3848.51 - 3813.44)	1.57 (-2.13 - 3.03)
Nationality		
Ghanaian (Ref)	**1.00**	**1.00**
Non-Ghanaian (African)	0.00 (-1674.61 - 1647.94)	2.69 (-0.30 - 2.28)
Non- African	2.63 (-0.40 - 2.34)	0.50 (-2.78 - 1.41)
Level of study		
100 (Ref)	**1.00**	**1.00**
200	1.56(-0.80 - 1.68)	1.51 (-0.95 - 1.77)
300	0.75(-1.57 - 0.99)	1.79 (-0.71 - 1.88)
400	0.47(-2.35 - 0.83)	9.12 (0.87 - 3.56)
600	0.23(-0.54 - 7.05)	9.63 (0.16 - 4.69)
Hall of residence		
Jean Nelson (Ref)	**1.00**	**1.00**
Hilla Limann	2.24 (-0.43 - 2.04)	1.31 (-0.85 - 1.40)
Commonwealth	1.84 (-0.75 - 1.96)	0.63 (1.85 - 6.93)
Volta	2.33(0.71 - 2.40)	2.32 (0.51 - 2.19)
Pentagon	1.56 (0.39 -2.28)	3.04 (0.20 - 2.42)
Bani	0.00 (-2592.09 - 2561.98)	1.03 (0.12 - 2.07)
Graduate hostel	0.37 (0.02 - 3.01)	1.03 (2.02 - 4.07)
ISH	1.09 (2.44 - 2.61)	1.15 (1.98 - 2.26)
Reasons for description		
Personal assessment (Ref)	**1.00**	**1.00**
Check by expert	0.57 (-1.74 - 0.61)	0.84 (-1.12 - 0.77)
Media descriptions	0.69 (-2.38 - 1.64)	0.44 (-3.20 - 1.58)
Family and friends	0.32 (-2.47 - 0.18)	1.24 (0.70 - 1.13)
Fast Food Consumption		
None/Occasionally	**1.00**	**1.00**
4-6days/week (Ref)	0.81 (-1.05 - 0.98)	2.65 (0.24 - 0.46)
1-3days/week	0.80 (1.67 -1.98)	1.50 (0.06 - 0.38)
Skipping of meals		
No (Ref)	**1.00**	**1.00**
Yes	0.56 (0.29 - 0.88)	1.92 (0.71 - 2.31)
Nutritional attitude		
Good (Ref)	**1.00**	**1.00**
Poor	1.94 (0.41 - 2.90)	3.2 (1.54 - 3.90)

CHAPTER FIVE

DISCUSSION

5.1 Introduction

The purpose of the study was to investigate the body weight perceptions students of the University of Ghana had about themselves and the attitudes these students adopted towards their nutrition. The findings from the study are situated within findings from previous studies. The bodyweight descriptions most respondents gave were consistent with the actual bodyweight status as determined using their BMI. Beyond that, the knowledge majority of them had with regards to issues relating to bodyweight was very good. In addition, a respondent's sex ($p<0.001$), nationality ($p<0.001$), ethnicity ($p<0.01$), hall of residence ($p<0.001$) and reasons for bodyweight description were observed to have been associated with bodyweight perception but had no relation with the actual Body Mass Index. Interestingly, age difference had no association with bodyweight perception but influenced an individual's BMI. Many more females overestimated their body weight than males; however nutritional attitudes among the respondents (both sexes) within all weight categories showed no significant difference. Generally, they demonstrated a poor attitude towards their nutrition.

5.1 Perceived bodyweight category and actual BMI among respondents

In Ghana and the world at large, consciousness about the risk posed by unhealthy bodyweight is gradually gaining grounds. The relationship that was observed between the bodyweight descriptions of respondents and their BMI was statistically significant. Generally, most of the respondents were able to accurately judge the bodyweight category to which they belonged. This observation is similar to results of a study of students' ideal weight in Nigeria that recorded 82.76% of such students accurately predicting their

bodyweight group (Buowari, 2010). In one other study by Olaoye and Oyetunde (2012) within the same country, it was found out that 65.5% of medical and pharmacy students of a University who were quizzed about the perceptions of their bodyweight were able to accurately tell which category they belonged to. However, it is worth noting that these findings seem to disagree with popular observations from other studies which indicate that bodyweight perceptions tends to be inaccurate when compared with BMI. Brener, Eaton, Lowry and McManus (2004) in their study of association between bodyweight perception and BMI among high school students realized most of them (69.3%) wrongly judged their weight category with a lot of them thinking they were normal whereas they were actually overweight. In a similar fashion, when a secondary data analysis of weight accuracy assessment was carried out among female United States adolescents, the level of bodyweight misperception was very significant (Yost, Krainovich-Miller, Budin and Norman, 2010).

From all the above studies, it will be noticed that all the ones that shared similar findings with this study were conducted among students from tertiary institutions in Africa. Interestingly enough, not only were the ones that disagreed with these findings either among the general adolescent group or pre-tertiary students but also in non-African settings. This observation can therefore be explained away by the fact that, the African youth is a lot more likely to accurately predict their bodyweight than the non- African youth. Also, at the level of tertiary education, the likelihood of an individual being exposed enough to truly judge their bodyweight is higher than being in a pre-tertiary institution where most of the judgments are done based on comments from others which can even come in the form of weight teasing. An observation made in a qualitative study,

found out that overweight adolescents had few friends and stood a higher risk of weight teasing (Janssen, Craig, Boyce and Pickett, 2004). They therefore observed that reasons attributed to weight description among these adolescents was weight teasing. Majority of the respondents in this study admitted to either doing a self assessment of their bodyweight or had a health expert carry it out for them. Bhurtun and Jeewon in a study conducted in 2013 among Mauritian teenagers seeking to find out their bodyweight perceptions and weight control practices laid claims to the fact that, the teenagers who were able to accurately perceive their bodyweight are most likely individuals who consciously monitor their bodyweight.

In focusing on the respondents who misperceived their bodyweight in this study, it was observed that individuals who were either overweight or underweight did misperceive their bodyweight a lot more compared to those whose BMI was normal. Whiles not downplaying the health consequences of misperceiving ones weight in any weight category, being in an already risk prone category such as overweight or underweight and not accurately judging may be of much concern. Similar issues of inaccurate bodyweight perception among the youth have been documented in other studies conducted. Wiedemann and Saules (2013) in a study to establish the relationship between eating behaviours and weight problem perception among psychology students of the Midwestern University, established that close to half of the respondents misperceived their bodyweight. The result of not accurately perceiving bodyweight, especially when its Overweight or underweight is the denial of health consequences and likelihood of adopting weight management practices such as unhealthy eating habits and disorders such anorexia nervosa and anorexia bulimia.

These results regarding inaccurate weight perception are similar to those seen in studies from both developed and developing countries. High proportions of misperception regarding weight in the youth populations were reported from USA (Park, 2010), Turkey [Kurdak *et al*., 2010), China (Xu *et al*., 2011), Mexico (Andrade *et al*., 2012) and Spain (Jaurequi-Lobara et al., 2011).

5.2 Factors associated with perceived bodyweight of respondents

A number of factors were identified as determinants of bodyweight perception among the students. These factors ranged from age, sex, nationality, ethnicity, and hall of residence to the reasons for bodyweight description. These factors and more (media) were also found to have influenced bodyweight perceptions in a study conducted by Gregory *et al*., (2008) and Kim (2007).

The sex of respondents was identified by this study as associated with bodyweight perception. The female sex was specifically observed as a significant predictor of perceived overweight. Female students within the University of Ghana are more than twice (2.67) likely to perceive themselves as overweight compared to their male colleagues. This observation runs consistent with findings from several other studies around the world that identified the female sex as the ones who usually overestimate their bodyweight with the male sex either underestimating theirs or accurately predicting it (Shi *et al*., 2007; Brener *et al*., 2004; and in France by Hansel *et al*., 2011). According to Keifer, Leitner, Bauer and Reider (2007), the desire to be thin is a critical factor in women's outlook toward their bodies and body image perception. The biological make-up of females causes them to have a lot more fat cells than males hence the higher chances of

putting on weight. This phenomenon is therefore possibly what makes it easier for them to perceive themselves as overweight with the minimum weight gain. However, the mere fact that one sex is predisposed to gaining weight should not necessarily make an individual perceive him or herself to be overweight with the little weight gain.

The nationality of students was observed to be associated with an individual's perceived bodyweight. Being a Non-African national makes a student forty-seven (47) times more likely of perceiving themselves to be overweight compared to their Ghanaian counterparts. The cultural difference between Ghana and Non-African nations such as China, USA and the UK is striking enough to influence people's perception. For most Non-Africans, being "thin" or of a smaller bodyweight is the most desired body size (Chang and Christakis, 2003) hence the most minimum gain in weight by anyone especially females can be misconstrued as being overweight. On the other hand, there is a presumed cultural valuation of fatness as a sign of prosperity, beauty, health and prestige in some Sub-Saharan African (SSA) populations. It signifies strength, wealth, beauty and also makes one look respectable (Renzaho et al., 2012; Puoane et al., 2010; Shaibu et al., 2012; Amoah, 2003). It therefore stands to make sense that most people are not likely to consider themselves overweight even if they were because that body size is deemed normal in their cultural setting. It is very consistent with findings from an earlier study among Senegalese women where the authors realized that the term 'overweight' made very little sense to them. As such, overweight body sizes (but not extremely obese) were seen in a positive light (Holdsworth *et al.*,2004). This assertion is reaffirmed by the absence of any statistical difference in the bodyweight perceptions held by other African nationals compared to their Ghanaian counterparts. Ghanaians and other African nationals had an equal probability of perceiving themselves as underweight.

Age of the participants had no association with the perception they held about their bodyweight. Being older or younger than 25 years had no influence on the way the participants perceived their bodyweight. This observation runs contrary to some studies that have identified adults (usually above 30 years) as individuals who are more likely to perceive themselves as belonging to higher weight categories (Holdsworth *et al*., 2008; Omisore and Davies, 2008). In a study by Saleem *et al*., (2013) among Pakistani youth, they observed that bodyweight perception increased with the increasing age of participants. Similar result has also been shown by a study conducted in Spanish adolescents (Jauregui-Lobera *et al*., 2011) who reported a higher mean age for those who misperceived as compared to the others. In this study however, majority of the respondents are undergraduate students and less than 10% of the entire study population were above 25 years of age. It therefore stands to reason that, there is very little age disparity among them to be able to contribute to differences in the way they perceive their bodyweight. The effect of young people perceiving themselves of either being overweight or underweight has been identified to be grounds for body weight dissatisfaction. Being dissatisfied with your bodyweight at a very young age can compel an individual to engage in unhealthy weight management habits and eating disorders (Andrade *et al.*, 2012).

The ethnic group to which an individual belonged was observed to have a significant relationship with the perception held about their bodyweight. Ethnicity is very revered in most African nations and is known to be the basis for some beliefs and ideologies held by a group of people. However some studies (Olaoye and Oyetunde, 2012; Simeon *et al*., 2003) have made observations that show its irrelevance in relation to bodyweight perception among University students. In the case of University of Ghana which is situated within the cosmopolitan city of Accra, the influence of an individual's ethnicity

which would be thought to be overshadowed by peer influences rather showed a significant relationship with their bodyweight. Compared to Akans, respondents with Ewe descent were close to two times (1.99) times more likely to perceive themselves overweight. Being a Ga-Adangbe or a Dagomba makes a student about one and a half times more likely to be underweight. Similarly in other studies, the race or ethnicity of an individual is a predictor of how they perceive their bodyweight. Boyd et al. (2011) as well as Duncan, Duncan and Schofield (2010) identified bodyweight perception as varying significantly along the lines of ethnicity. In the case of Neumark-Sztainer et al. (2010), it was noted that African American adolescent girls were less likely than their Caucasian counterparts to perceive themselves as overweight.

Students who participated in this study resided in separate halls at different parts of the University campus and this was observed to be associated with the perception they held about their bodyweight. Residents of the all-ladies (Volta) hall were more than seven times (7.164) more likely to perceive themselves as overweight compared to their colleagues in Hilla Limann (a unisex hall). This observation gives credence to the assertion that females are at a higher probability of perceiving themselves as being in a higher weight category (Cilliers, Senekal and Kunneke, 2006). A similar observation was made among the residents of the private hostels (Pentagon and Bani hostels) who also were about four (4) times more likely to perceive themselves as overweight compared to the unisex halls. Interestingly, residents within the graduate hostels had equal likelihood as the Unisex halls of perceiving themselves as either overweight or underweight. The dynamics of activities within the various halls on the university campus is different based on its location and inhabitants. This may possibly account for why residents in the various halls perceived their bodyweight differently.

Reasons assigned by respondents for their bodyweight description was observed to be significantly associated with perceived bodyweight. Students whose bodyweight description was as a result of comments from family and friends were about three times more likely to perceive themselves either underweight (2.89) or overweight (3.43). This observation was very similar to findings in other studies conducted which indicate that individuals are very likely to be influenced by the environment in which they find themselves (Bhurtun and Jeewon, 2013; Gregory *et al.,* 2008; Kim, 2007).

The Social Cognitive Theory (SCT) by Bandura (1986) looks at behavioural change based on factors originating from the environment, personal and behavior. These factors constantly influence one another. The decision to engage in a behavior is said to be informed based on the SCT by two main determinants; believe in the benefits of undertaking the behavior as against the costs as well as the individual's self-efficacy in performing the bahaviour (Maliski et. al., 2006). The study used the Social cognitive theory to find out how perceptions held by people about their body-weight (personal factor) are related to certain socio-demographic characteristics (environmental factor), their nutritional attitudes (behavioural factor) as well as their actual body-weight. Environmental factors such as sex, hall of residence, nationality as well as influence from family and friends were observed to be significantly associated with the Bodyweight Perception (personal factor) of participants. This association between these variables was even given further credence by the admission of participants that they will engage in weight management practices for societal acceptance. On the other hand, whiles some of the environmental factors (hall of residence) had influence on the behavioural factor (nutritional attitude); it had no relationship with the personal factor (bodyweight perception). The findings from this study have therefore shown to some extent how

effective the Social Cognitive Theory can be used in understanding the behaviour of individuals. It has proven that before steps are taken by people towards any action, they consider their personal understanding or belief (cognitive) as well as influences from the environment they find themselves in. It was therefore observed that even though most students would have wished to maintain a normal bodyweight to gain admiration from family and friends, they do not have the good nutritional discipline that assures this.

5.3 Nutritional attitudes of participants

On a whole, most of the participants had a very poor attitude towards their nutrition. Their opinions and practices on nutrition were not positive and poses a risk to their future health. The sex of the respondents did not show any significant association ($p>0.05$) with their nutritional attitude hence running contrary to some studies that seek to associate good nutritional attitudes usually with the female sex (Saules *et al*., 2009). Other studies (Bano, Alshammari, Bushra-Fatima and Al-shammri, 2013) however sought to indicate that females are more likely to adopt very poor nutritional attitudes. In that study it was observed that, respondents belonging to the female sex skipped breakfast and consumed fast foods a lot more frequently than their male counterparts.

It was also observed that, being resident in a particular hall of residence had a significant association ($p<0.005$) with a respondent's nutritional attitude. Being in the International Students hostel (ISH), Graduate hostel or Commonwealth (all male) hall puts an individual at 3.84, 5.04 and 2.17 times more likely to be engaged in a good nutritional attitude. The private hostels (Pentagon and Bani) recorded the highest patronage of fast foods and carbonated drinks whereas ISH, Graduate hostel and Volta recorded the least. This

observation can be attributed to the fact that, most of these private hostels have several shops within their premises that sell a lot of processed foods. On the other hand, the proximity of the local market (night market) to the other halls on the university campus makes it easier for them to patronize a lot more of fresh foods such as fruits and vegetables. Though not exactly the same but in similar fashion, findings from one study in Sudan among female students by Elhassan et al., (2013) indicated that, respondents who prepared their own meals and less processed foods were much more likely to give nutrition a thought.

The program of study surprisingly had no association with the nutritional attitudes of the respondents. This observation varies totally from a study among college students in Iran which reported that students doing Medical science as well as Physical activity programs had a lot more positive nutritional attitude (Barzegari, Ebrahimi, Azizi & Ranjbar, 2011).

Another interesting observation was that, an individual's perception of their bodyweight had no significant association ($p>0.05$) with their nutritional attitude. This is quite interesting because it means no nutritional measures are being taken by participants whether they presume themselves overweight or underweight, notwithstanding its potential health risk. Surprisingly enough, respondents who perceive themselves to be normal are rather doing very well with their nutritional attitude (48.5% for good and 51.6% poor) whiles those who perceive themselves as either overweight (60.3%) or underweight (67.4%) are doing very poorly. Such a situation increases the risk of these individuals suffering from the consequences of their poor nutritional attitude. The above observation was not shared by Bhurtun and Jeewon (2013) in their study. They found out in their research that, teenagers who perceived themselves as overweight practiced good

nutritional habits by reducing fat consumption and increasing vegetable intake. Saleem et al. (2013) states that, the intake of proper food and diet with regular eating hours coupled with the awareness of being underweight or undernourished can improve the complications associated with being underweight.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

A very high level of accurate bodyweight perception was observed among respondents. Bodyweight descriptions most people gave themselves did not vary widely from their actual BMI. Just a few respondents underestimated (16%) or overestimated (14%) their bodyweight. The sex, nationality, ethnicity and hall of residence of the participants significantly influenced how they perceived their bodyweight. The influence of family and friends was significantly associated with how participants perceived themselves and stood out as one factor which promotes bodyweight descriptions among the students. The above observation gives credence to the relationship that the Social Cognitive Theory says exists between environmental and personal factors.

The bodyweight perception participants had about their bodyweight did not have any influence on their nutritional attitude. Most of the participants (54.6%) were engaged in poor nutritional attitudes irrespective of the bodyweight category they perceived themselves to be. Skipping of meals, excessive consumption of carbonated drinks and fast foods were observed to be part of the most practiced among the students.

University of Ghana students can be said to very much in tune with matters regarding their bodyweight however their future risks posed by their current nutritional attitude calls for a concerted effort by all stakeholders to help modify it. The conceptual framework to a large extent has excellently

6.2 Recommendations

- Despite the impressive level of accuracy in describing their bodyweights, the University and its relevant institutions as well as other youth oriented organizations must encourage students to regularly check their BMI to avoid the likelihood of misperceiving their bodyweight.
- Regular nutritional education should be carried out by the Department of Nutrition and Food science and other resource persons within the various halls of residence.
- A nutrition education component should be added to the services offered at the Sports directorate. This will reach out to all individuals irrespective of their bodyweight since the consequences of poor nutrition can be very risky to the health of the students. The educational campaigns should touch on healthy eating and consequences of unhealthy eating habits.

REFERENCES

Abubakari, A.R., Lauder, W., Agyemang, C., Jones, M., Kirk, A. and Bhopal, R. S. (2008). Prevalence and time trends in obesity among adult West African populations: a meta-analysis. *Obesity reviews*, 9: 297–311.

Addo, J., Smeeth, L. and Leon, D. A. (2009). Obesity in urban civil servants in Ghana: association with pre-adult wealth and adult socio-economic status. *Public Health*, 123: 365–370.

Agyemang, C., Owusu-Dabo, E., Jonge, A., Martins, D., Ogedegbe, G. and Stronks, K. (2008). Overweight and obesity among Ghanaian residents in The Netherlands: How do they weigh against their urban and rural counterparts in Ghana? *Public Health Nutrition*, 12(7): 909-916

Alwan H, Viswanathan B, Williams, J., Paccaud F and Bovet P. (2010). Association between weight perception and socioeconomic status among adults in the

Amoah G.B.A. (2003). Socio-demographic variations in obesity among Ghanaian adults. *Public Health Nutrition* 6, 751 -757

Andrade, F.C.D., Raffaelli, M., Teran-Garcia, M., Jerman, J.A and Garcia, C.A (2012). Weight status misperception among Mexican young adults. *21* (October), 184-188. Doi:1016/j.bodyim.2011.10.006

Ani, P.N, Uvere, P.O and Ene-Obeng, H.N (2013). Prevalence of overweight, obesity and thinness among adolescents in rural and urban areas of Enugu State, Nigeria. *International Journal of basic and applied sciences* 3(1): 1-7.

Appiah, C. A., Steiner-asiedu, M., & Otoo, G. E. (2014). Predictors of Overweight / Obesity in Urban Ghanaian Women, *2*, 60–68. doi:10.12691/ijcn-2-3-3

Ard, J. D., Greene, L. F., Malpede, C. Z., & Jefferson, W. K. (2007). Association between body image disparity and culturally specific factors.

Bandura, A. (1986), Social foundation of thought and Action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (2002). Health promotion by social cognitive means. *31*(April), 143–164.doi:10.1177/1090198104263660

Benkeser, R. M., Biritwum, R., & Hill, A. G. (2012). Prevalence of overweight and obesity and perception of healthy and desirable body size in urban , ghanaian, *46*(2).

Bhanji, S., Khuwaja, A.K., Siddiqui, F., Azam, I and Kazm, K. (2011). Underestimation of weight and its associated factors among overweight and obese adults in Pakistan: a cross sectional study. *BMC Public Health*, 11:363

Bhurtun, D.A and Jeewon, R. (2013). Bodyweight perception and weight control parctices among teenagers. *25* (July), 235-253.doi.org/10.5402/2013/395125

Biritwum, R.B., Gyapong. J., and Mensah, G.(2005). The Epidemiology of Obesity in Ghana. *Ghana Medical Journal*, 39(3), 82-85

Blokstra A, Burns C.M and Seidell J.C., (1999). Perception of weight status and dieting behaviour in Dutch men and women. *International Journal of Obesity*, 23:7-17

Boyd, E.M, Reynolds, J.R, Tillman, K.H and Martin, P.Y (2011). Adolescent girls' race/ethnic status, identities and drive for thinness. *Journal of Social science research.* 40: 667-684. doi:10.1016/j.ssresearch.2010.11.003.

Brener, N. D., Eaton, D. K., Lowry, R., and McManus, T. (2004). The association between weight perception and BMI among high school students. *Obesity Research*, *12*(11), 1866-1874.

Chang, V. W., and Christakis, N. (2003). Self-perception of weight appropriateness in the United States. *American Journal of Preventive Medicine*, *24*(4), 332–339. doi:10.1016/S0749-3797(03)00020-5

Chang, C. T., Chang, K. H. and Cheah, W. L. (2009). Adults‟ perceptions of being overweight or obese: a focus group study. *Asia Pacific Journal of Clinical Nutrition*, 18(2): 257-264.

Cheung, Y.T., Lee, A.M, Ho, S.Y, Li, E.T., Lam, T.H, Fan, S.Y. and Yip, P.S.(2011). Who wants a slimmer body? The relationship between body weight status, education level and body shape dissatisfaction among young adults in Hong Kong. *BioMed Central Public Health* 11,835

Cilliers, J., Senekal, M. and Kunneke, E. (2005). The association between the Body mass index of first year female university students and their weight-related perceptions and practices, psychological health, physical activity and other physical health indicators. *Public Health Nutrition* 9 (2), 234-243. doi: 10.1079/PHN 2105846.

Cognitive - behavioural approaches. (n.d.).

Cohen, S. B. (2006). Media Exposure and the Subsequent Effects on Body Dissatisfaction, Disordered Eating, and Drive for Thinness: A Review of the Current Research. Mind Matters: *The Wesleyan Journal of Psychology*, 1, 57-71

Coreil, J. (n.d.). Behavioral and Social Science Theory, *6*(2008), 101–114.

de-Graft Aikins, A. (2006). Reframing applied disease stigma research: a multilevel analysis of diabetes stigma in Ghana. *Journal of Community and Applied Social Psychology*, 16(6), 426-441.

Dissen, A. R., Policastro, P., Quick, V., & Byrd-Bredbenner, C. (2011). Interrelationships among nutrition knowledge, attitudes, behaviors and body satisfaction. *Health Education, 111*(4), 283–295. doi:10.1108/09654281111144256

Duncan, J.S., Duncan, E.K and Schofield, G. (2010). Association between weight perceptions, weight control and body fatness in a multi-ethnic sample of adolescent girls. *Public Health Nutrition* 14 (1): 93-100. doi:10.1017/S1368980010000236

El Ansari, W., Clausen, S. V., Mabhala, A., & Stock, C. (2010). How do I look? Body image perceptions among university students from England and Denmark. *International Journal of Environmental Research and Public Health*, *7*(2), 583–95. doi:10.3390/ijerph7020583

Field, A.E, Coakley, E.H, Must A, Spadano J.L, Laird N, Dietz W.H, Rimm E, Colditz G.A.(2001). Impact of overweight on the risk of developing common chronic diseases during a 10- year period. *Arch Intern Med 2001*, 161:1581-1586

Flegal, K. M., Carroll, M. D., Kit, B. K. and Ogden, C. L. (2012). Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. *The Journal of the American Medical Association*, 307(5): 491-497.

Ghana Statistical Service (GSS), Ghana Demographic and Health Survey, GDHS (2008) Noguchi Memorial Institute for Medical Research (NMIMR), and ORC Macro. 2009. Calverton, Maryland: GSS, NMIMR, and ORC Macro.

Gibson, R.S. (2005). Principles of Nutritional Assessment. 2nd edition. *Oxford university press*

Gregory, C. O., Blanck, H. M., Gillespie, C., Maynard, L. M., and Serdula, M. K. (2008). Health perceptions and demographic characteristics associated with underassessment of body weight. *Obesity*, *16*(5), 979-986.

Hansel, B., Giral, P., Coppola-Xaillé, A., Monfort, G., Regnault, M., and Bruckert, E. (2011). L'enquête Internet nationale «Dukan, et après?»: premiers résultats. *Obésité*, *6*(3), 146-153.

Holdsworth, M., Hovette, P., Eymard-Duvernay, S and Delpeuch, F. (2008). Perceptions of Congolese urban men and women on healthy and desirable body sizes. Proceedings of the Nutrition society 67: doi: 10.1017/s0029665108009968

Inoue, M., Toyokawa, S., Miyoshi, Y., Miyano, Y., Suzuki, T., Suyama, Y., ... & Kobayashi, Y. (2007). Degree of agreement between weight perception and body mass index of Japanese workers: MY Health Up Study. *Journal of occupational health*, *49*(5), 376-381.

Jaffari, S.I.A., Waseem, M., Zaman, H.M.F., Hayat, Q., Munir, M.H., Saleem, S and Zain-Ul- Abideen. (2011). Do Media Develop Eating Disorders: A Study with Reference to Young Females of Pakistan. *European Journal of Scientific Research*, 57(1), 29-46

Jáuregui-Lobera, I., Bolaños-Ríos, P., Santiago-Fernández, M.J, Garrido-Casals, O and Sánchez, E. (2011). Perception of weight and psychological variables in a sample of Spanish adolescents. *Diabetes MetabSyndrObes.*, **4:**245-251.

Kim, K. H. (2007). Religion, weight perception, and weight control behavior. *Eating Behaviors*, *8*(1), 121–31. doi:10.1016/j.eatbeh.2006.03.001

Kruger, H.S, Puoane T., Senekal, M and van der, M.T. (2005). Obesity in South Africa: challenges for government and health professionals. *Public Health Nutrition*, 8:491–500

Lemon S.C, Rosal M.C, Zapka J, Borg A and Anderson V. (2009). Contributions of weight perceptions to weight Loss attempts: Differences by Body Mass Index and Gender. *National institute of health Public Access*, 6(2), 90–96

Malinauskas, B.M, Raedeke, T.D, Aeby, V.G, Smith, J.L and Dallas, M.B (2006). Dieting practices weight perceptions and body composition: a comparison of normal weight overweight and obese college females. *Nutrition Journal*, **5:**11.

Muhihi, A.J.(2012). Obesity, Overweight, and Perceptions about Body weight among Middle- Aged Adults in Dar es Salaam, Tanzania. *International Scholarly Research Network*, 1-6

Musaiger, a O., bin Zaal, a a, & D'Souza, R. (2012). Body weight perception among adolescents in Dubai, United Arab Emirates. *Nutrición Hospitalaria*, *27*(6), 1966–72. doi:10.3305/nh.2012.27.6.5830

Neumark-Sztainer, D., Bauer, K.W., Friend, S., Hannan, P.J and Story, M.(2010). Family weight talk and dieting: How much do they matter for body dissatisfaction and disordered eating behaviors in adolescent girls? *Journal Adolescent Health*, 47(3), 270–276

Olaoye, O. R., & Oyetunde, O. O. (2012). Perception of weight and weight management practices among students of a tertiary institution in south west Nigeria, *02*(01), 81–84.

Omisore, D.L and Davies, G.J (2009). BMI and physical activity in Black Afro-Carribean adults.Proceedings of the Nutrition society 67:E327. doi:10.1017/S0029665108009993.

Park, E. (2011). Overestimation and Underestimation: Adolescents' Weight Perception in Comparison to BMI-Based Weight Status and How It Varies Across Socio-Demographic Factors. *Journal of School Health*, 81: 57–64. doi: 10.1111/j.1746-1561.2010.00561.

Puoane, T., Tsolekile, L and Steyn, N.(2010). Perceptions about body image and sizes among Black African girls living in Cape Town. *Ethnicity and Disease*, Winter, 20(1), 29-34.

Renzaho, A. M. N., McCabe, M and Swinburn, B.(2012). Intergenerational Differences in Food, Physical Activity, and Body Size Perceptions among African Migrants. *Qualitative Health Research*, 22: 740

Saleem, M.D., Ahmed, G., Mulla, J., Haider, S.S and Abbas, M. (2013). Weight misperception amongst youth of a developing country: Pakistan-a cross-sectional study.27 (January), 13(707). doi:10.1186/1471-2458-13-707

Saules, K. K., Collings, A. S., Hoodin, F., Angelella, N. E., Alschuler, K., Ivezaj, V., Saunders-Scott, D. and Wiedemann, R. (2009). The contributions of weight problem perception, BMI, gender, mood, and smoking status to binge eating among college students. *Journal of eating behaviors*, 10(1), 1–9. doi: 10.1016/j.eatbeh.2008.07.010

Shaibu, S., Holsten, J. E., Stettler, N., Maruapula, S. D., Jackson, J.C., Malete, L., Mokone, G., Wrotniak, B.H. and Compher, C.W.(2012). Adolescent Obesity Prevention in Botswana: Beliefs and Recommendations of School Personnel. *The Journal of School Nursing* 28(3) 220-229

Shi, Z., Lien, N., Kumar, B.N and Holmboe-Ottensen, G. (2006). Perceptions of weight and associated factors of adolescents in Jiangsu Province, China. *Public Health Nutrition* 101 (3):298-305. doi: 10.1017/S1368980007352488

Spronk, I., Kullen, C., Burdon, C and O'Connor, H (2014). Relationship between nutrition knowledge and dietary intake. *British journal on nutrition* 111: 1713-1726. doi: 10.1017/s0007114514000087.

Tiggemann, M. (2003). Media exposure, body dissatisfaction and disordered eating: television and magazines are not the same! *European Eating Disorders Review*, 11(5), 418–430.

Ural, I. N., In, V. I., Frica, S. O., Faber, M., & Kruger, H. S. (2005). Dietary intake , perceptions regarding body weight , and attitudes toward weight control of normal weight , overweight , and obese black females, *15*.

Wang Y, Liang H and Chen X.(2009). Measured body mass index, body weight perception, dissatisfaction and control practices in urban, low-income African American adolescents. *BioMed Central Public Health* 9,183

Wills, W., Backett-Milburn, K., Gregory, S and Lawton, J. (2006). Young teenagers' perception of their own and others' bodies: A qualitative study of obese , overweight and 'normal' weight of young people in Scotland. *Journal of Social science and medicine*. 62: 396-406. doi:10-1016/j.socscimed.2005.060.014

Wieddemann, A.A and Saules, K.K (2013). The relationship between emotional eating and weight problem perception is not a function of body mass index or depression. *Journal of eating behaviours* 14:525-528. doi:10.1016/j.eatbeh.2013.07.003.

World Health Organization (2002). Controlling the global obesity epidemic. World Health Organization[http://www.who.int/nutrition/topics/World Health Report 2002:

reducing risks,promoting healthy life. Geneva, WHO, 2002.

World Health Organization (2007). Prevention of cardiovascular disease. Guidelines for Assessment and management of cardiovascular risk. http://www.who.int/cardiovascular_diseases

World Health Organization-WHO (2011). Global status report on non-communicable diseases 2010. WHO Press, Geneva. Retrieved on March 13, 2012

Xu, B.Y, Zhang, Y.H, Ma, W.J, Xu, Y.J, Song, X.L and Nie, S.P (2011). Prevalence regarding weight misperception and related influencing factors among residents in Guangdong province. *Zhonghua Liu Xing Bing XueZaZhi*, **32**(10)**:**964-968.

Yost, J., Krainovich-Miller, B., Budin, W., & Norman, R. (2010). Assessing weight perception accuracy to promote weight loss among US female adolescents: a secondary analysis. *BMC Public Health*, *10*(1), 465.

APPENDICES

Appendix 1: Consent Form

Title: Bodyweight Perceptions and Nutritional attitudes of University of Ghana students

Principal Investigator: Mr. Anyomitse Prince Kelly

Qualification: BSc (Nutrition and Food Science)

Address: Box LG 13, Department of Social and Behavioral Sciences, School of Public Health, College of Health Sciences, University of Ghana, Legon. Tel: 024 660 8180.

Email: panyomitse@gmail.com

Introduction:

You are invited to participate in this survey about Bodyweight Perceptions and Nutritional attitudes among University of Ghana students'. This is a research being conducted as part of requirements for the award of a Masters in Public Health Degree. The study site for this research is the Legon campus of the University of Ghana and the focus is on student occupants of the various halls of residence.

As part of the study you would be required to furnish us with information concerning how you perceive your own bodyweight, what influences this perception, current nutritional attitudes you have adopted, as well as information on your current weight and height which would be measured during the course of the study. The above information would help us effectively design appropriate interventions in resolving issues bothering on bodyweight and nutrition with respect to the youth.

The study population would be both graduate and undergraduate students residing on Legon campus and duly registered with any one of the halls of residence. Study participants will be contacted to partake in an interview by providing responses to certain questions in a questionnaire which would take not more than Fifteen (15) minutes to complete. Details about the various procedures are indicated in the sections that follow.

Your participation in this study is voluntary and there would be no negative consequence for refusal and withdrawal at any stage of the study. The procedure involved in this study is safe, simple, quick and will only involve weight and height measurements which would be done with great care and with no physical, mental or emotional harm. No invasive method would be used in the process of information collection.

Confidentiality will be maintained by ensuring that questionnaires, informed consent forms are stored in locked cabinets under the custody of the Principal Investigator, data will be entered into Stata statistical software by Research assistants. Interviewers given ID number for each participant and not the names of the subjects, responsible person for the data is the PI and these would be assessed only by members of the study team.

There would be no compensation in monetary or non-monetary terms to the eligible person who consented to participate.

If you have any questions about the study do not hesitate to contact the Principal Investigator, **ANYOMITSE PRINCE KELLY on 024 660 8180**. Furthermore, if you have any question about your right as a research participant or anything that bothers on the violation of your ethics, you may also kindly contact **Ms. Hannah Frimpong on 0243235225 or 0507041223**.

Ms. Frimpong is the administrator of the Ghana Health Service Ethics Review Committee, a body which was responsible for approving this study.

I……after understanding the purpose of the study agree to voluntarily participate.

Signature of the participant……..

Date……

Signature of the Interviewer……

Date…….

Appendix 2: Research Questionnaire

SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA

Interviewer: …… ID: ……. Date: ……..

I am a student from the School of Public Health conducting a research into the nutritional attitudes and bodyweight perceptions of students in University of Ghana. This questionnaire seeks to collect information on demographics, nutritional characteristics, bodyweight perceptions and anthropometric measurements of your weight and height. Any information collected would be treated with maximum confidentiality. Thanks for your cooperation and the process would not take much of your time.
Please tick your most appropriate choice

SOCIO-DEMOGRAPHIC CHARACTERISTICS

No	Questions	Coding Categories		Codes
A1	Respondent's Age			RA
A2	Respondent'sSex	M F	1 2	RSMF
A3	Respondent's Nationality	Ghanaian Non-Ghanaian(African) Non-African	1 2 3	RN
A4	Ethnicity (For Ghanaian Students Only)	Akan Ga- Adangbe Ewe Dagomba Others (specify)……...	1 2 3 4 5	EOR
A5	Level of Study	100 200 300 400 600	1 2 3 4 5	RLOS
A6	Program of Study	Bachelor of Science Bachelor of Arts Business Others (specify)……	1 2 3 4	RPOS
A7	Hall of Residence	Alex Kwapong Jean Nelson Commonwealth Volta ISH Graduate Hostel Pentagon	1 2 3 4 5 6 7	RHOR

		Bani Hilla Limann	8 9	

No	Questions	Coding Categories		Codes
Section A. BODYWEIGHT PERCEPTIONS				
A8	How would you describe your current bodyweight?	Underweight Normal weight Overweight Don't Know	1 2 3 4	**DCW**
A9	What are your reasons for describing your weight as such?	Personal assessment Weight check by expert Media descriptions Comments by Family/Friends Other (specify)……..	1 2 3 4 5	**RFDBW**
A10	Which of these has had the most significant influence on your current bodyweight?	Personal actions Advice from expert Comments by family and friends Media Other (specify)**……**	1 2 3 4 5	**SIOBW**
A11	What would you want to do about your current bodyweight?	Loss some Gain more Maintain	1 2 3	**WTDAB**
A12	What is your reason for answer in **A11** above?	Societal Acceptance Health considerations Self-satisfaction and confidence Meet media's ideal look description Other (specify)…….	1 2 3 4 5	**RFBWA**
A13	What is the source of your information in helping you achieve your goal in **A11?**	Personal search and reading Information from friends/family Information from expert Media advertisements Other (specify)……..	1 2 3 4 5	**SOWA**
A14	Which of these are you willing to engage in achieving your goal?	Use of Pills Good Nutrition Exercising Herbal drinks None Other (specify)……	1 2 3 4 5 6	**WTEI**
A15	Which of these are you currently engaged in?	Use of Pills Good Nutrition Exercising Herbal drinks None Other (specify)……	1 2 3 4 5 6	**WCEI**

	STATEMENTS	Agree (1)	Neither Agree nor Disagree (2)	Disagree (3)		Codes
A16	I am satisfied with my current bodyweight					**SWCB**
A17	Which of these provide the most credible information on bodyweight? a) Personal-weight check b) Advice from expert c) Media d) Family/ Friends					**PCBI 1** **PCBI 2** **PCBI 3** **PCBI 4**
A18	In your opinion, has the following actions contributed to your current weight? a) Eating habits b) Level of physical activity c) Genetics (runs in the family) d) Health Condition					**ACTB1** **ACTB2** **ACTB3** **ACTB4**
A19	My current bodyweight is as a result of the environment I live in.					**CBROE**
A20	My current bodyweight has a negative effect on my medical condition					**EOBMC**
A21	My current bodyweight has anegative effect on my psychological wellbeing					**EOBPW**
A22	My current bodyweight has a negative effect on the social relationships I have with others					**EOBSR**
A23	My current bodyweight has a major negative effect on my future health					**EOBFH**

A24	I believe I can do something about my current bodyweight						**DSABW**
A25	Which of these do you believe will enable you achieve your goal fastest?						
	a) Pills/ Herbal drinks						**BAGF1**
	b) Good Nutrition and Eating habits						**BAGF2**
	c) Exercising						**BAGF3**
A26	Which of these do you believe is the healthiest means of achieving your goal?						
	a) Pills/ Herbal drinks						**HMAG1**
	b) Good Nutrition and Eating habit						**HMAG2**
	c) Exercising						**HMAG3**

Section B.Information on current nutritional attitudes. This is in reference to your current opinions and behavior concerning nutrition (Please tick the most appropriate answer)

	STATEMENTS	**Daily**	**4-6 days/wk**	**1-3 days/wk**	**None**		**Codes**
B27	How many times do you eat fruits in a week? (Do not count fruit juices)?						**FCPW**
B28	Apart from soups and stews how often do you make any conscious effort to consume vegetables?						**VCPW**
B29	How many times do you drink a can, bottle or glass of carbonated drink such as Coke, Pepsi or Sprite in a week?						**CDCPW**
	STATEMENTS	**Daily**	**4-6 days/wk**	**1-3 days/wk**	**None**		**Codes**
B30	How many times do consume any hard liquor or alcoholic drink in a week? (Quantity of at						**ADCPW**

	least a mini bottle of 'Star')						
B31	How many times do you drink natural fruit juice such as Blue skies juice?						**NJCPW**
B32	How often do you consume snacks in a week?						**FOSC**
B33	How many times do you patronize fast foods in a week? (Foods such as Indomie, Pizza, Burgers, Fries, Shawarma and Fried rice)						**FFCPW**
B34	What time in the day do you usually patronize fast foods?	Morning Afternoon Evening Anytime				1 2 3 4	**TOFFC**
B35	What do you usually consume as snack? (Tick more than one if required)	Carbonated drinks Pastries Fruits Vegetables Other (specify)				1 2 3 4 5	**WICAS**
B36	Do you usually skip meals?	No Yes				1 2	**SOM**
B37	Whichof the following do you skip most?	Breakfast Lunch Supper None				1 2 3 4	**WMIS**
	STATEMENTS	**Agree (1)**	**Neither agree nor disagree (2)**	**Disagree (3)**			**Codes**
B38	Healthy/ nutritious eating is difficult to engage in						**HNED**
B39	I get confused over what's supposed to be healthy and what isn't						**CAHAN**
B40	If you do enough exercise you can eat whatever you like						**EXCEW**
B41	I read Nutritional labels on items when shopping						**RNLS**
B42	If you read Nutritional labels, which of these do you look out for?	Ingredients Nutrients Caloric value Expiry dates				1 2 3 4	**WLOF**

Section C: Anthropometry	**Codes**	1	2
WEIGHT (kilograms)	**SWT**	___ ___ .__	_____ .__
HEIGHT (cm)	**SHT**	__ __ __.__	___ __.__
BMI	**SBMI**		

THANK YOU FOR YOUR TIME

Appendix 3: Distribution of respondents' nutritional attitude levels

Statements	**Agree N (%)**	**Don't know N (%)**	**Don't agree N (%)**
Healthy and nutritious eating is difficult to engage in	117(30)	117(30)	158(40)
It is confusing to distinguish between which foods are healthy and those that are not	101(26)	92(24)	199(51)
I read nutritional labels on items when shopping	148(38)	92(24)	151(39)
If you do enough exercise, you can eat whatever you like	93(24)	94(24)	205(52)
I am very particular about the portion sizes of foods I consume	163(42)	106(27)	123(31)
Healthy and nutritious foods are not enjoyable	48(12)	120(31)	224(57)

Statements	**4-6 days/week**	**1-3 days/week**	**None or Rarely**
Fruit consumption	94(24)	198(51)	100(26)
Vegetable consumption	114(29)	139(36)	139(36)
Carbonated drink consumption	142(36)	181(46)	69(18)
Fast food consumption	105(27)	175(45)	112(29)
Fruit juice consumption	71(18)	169(43)	152(39)

Nutrition attitude level	**Frequency N (%)**
Good	178(45.4)
Poor	214(54.6)
Total	392(100)

APPENDIX 4: Distribution of respondents' perception levels on their bodyweight

Statements	**Agree N (%)**	**Don't know N (%)**	**Don't agree N (%)**
My eating habits have contributed to my current bodyweight	262(67)	17(4)	113(29)
My level of physical activity has contributed to my current bodyweight	208(53)	29(7)	155(40)
My current bodyweight is as a result of genetics (runs in my family)	110(28)	51(13)	231(59)
Bodyweight can have a negative outcome on medical conditions	43(11)	67(17)	282(72)
Bodyweight can have a negative effect on psychological well being	44(11)	68(17)	280(71)
Bodyweight can have a negative effect on the social relationship with others	30(8)	54(14)	308(79)
I have the power to do something about my current bodyweight	312(80)	60(15)	20(5)
Nutrition and exercising is the healthiest way of managing bodyweight	258(66)	72(18)	62(16)

Bodyweight perception level	**Frequency N (%)**
Good	321(81.9)
Poor	71 (18.1)
Total	392(100)