

UNIVERSITY OF GHANA

COLLEGE OF HUMANITIES

**THE INFLUENCE OF BODY SIZE ESTIMATION ON WEIGHT
MANAGEMENT BEHAVIOURS IN ACCRA, GHANA**

BY

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ACCEPTANCE

Accepted by the College of Humanities, University of Ghana, Legon, in fulfillment of the requirement for the award of Ph.D. Population Studies degree.

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DECLARATION

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

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ABSTRACT

Obesity has been a pertinent issue worldwide as it constitutes one of the major public health challenges. It poses a significant challenge because of the continuous increase in its prevalence and diverse health, social and economic implications. Although the associated consequences are widespread, there is evidence of preference for larger body size in sub-Saharan Africa due to some socio-cultural standards and perceptions about body size. These have implications for weight management, but there are limited studies on weight management, particularly the relationship between body size perception and weight management in sub-Saharan Africa.

This study examined the factors influencing the estimation of body size on weight management decisions in an urban poor context in Accra, Ghana. The study involved the collection of primary data and it was a cross-sectional data gathered using quantitative and qualitative research approaches. A total of 395 adults aged 18-70 years were involved in the survey. Logistic regression modelling was employed to examine the influence of body size estimation on weight management behaviours, while controlling for individual, interpersonal and community level factors. Focus group discussions and in-depth interviews were utilised to examine the respondents' perception of obesity and weight management.

A total of 8 focus group discussions and 14 in-depth interviews were held. A thematic network analysis was used for the analysis of the qualitative data with the aid of Atlas ti. The findings indicated that about 57% of the total sample was overweight or obese and 5% was underweight. However, 66.5% of them perceived themselves as overweight or obese and 3% considered themselves as underweight. There was therefore variations in perceived and actual body size: 55.7% of the respondents accurately estimated their body size while 44.3% inaccurately estimated their body size. Additionally, 58.5%, 29.6% and 11.9% respectively desired to maintain their body size, lose and gain weight. To achieve these goals, 60.3% and 39.7% respectively engaged in more healthy and less healthy practices.

The results further indicated that body size estimation had no significant influence on weight management behaviours. Factors such as age, marital status, length of stay in the community, household wealth status, community conduciveness and locality significantly predicted weight management behaviours. Moreover, the respondents were of the view that high cost of fruits and vegetables and the perception that the consumption of fruits and vegetables do not give satisfaction are the main barriers to healthy eating. Laziness and lack of time were mentioned as main factors that inhibit participation in physical activity. Additionally, while stigmatization of slimness and preference for fatness inhibited engagement in weight management, the decision to manage weight, social support from significant others, health professionals, church and media facilitated engagement in weight management.

In conclusion, body size estimation has no significant influence on weight management behaviour. However, societal representations about fatness and thinness influenced people's desire for larger body size and this affected the choice of weight management behaviours. This has programmatic implications in terms of health education strategies and messaging.

DEDICATION

I dedicate this work to my brother Mr. Alexander Frimpong, who supported and inspired me to pursue higher education.

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CHAPTER ONE

Introductory Chapter

1.0 Introduction

The rise in obesity prevalence and its associated adverse effects have become a challenging issue for health policy makers globally (Akinpelu et al., 2015; Azagba & Sharaf, 2012). Before 1980, obesity prevalence in the world was much lower than 10 percent but this rate has almost tripled in many countries since then (Cecchini et al., 2010; Ng et al., 2014). For instance, in 2016 nearly 2 billion (39 percent) adults were overweight, and out of these 650 million (13 percent) were obese globally (World Health Organization (WHO), 2018).

Obesity which were once considered a problem of developed countries are now increasing in developing countries too, particularly in urban areas (WHO, 2015). A review by Agyemang et al. (2016) on obesity in sub-Saharan Africa (SSA) indicates that there has been an increase in obesity rates in all African regions since 1990. For instance, in Western Africa, obesity prevalence has increased from 2.6 percent to 7 percent between 1990 and 2015 (Agyemang et al., 2016). Among Ghanaian women aged 15-49 years, overweight and obesity rates increased from 10 percent in 1993 to 40 percent in 2014. The highest rate of 57% was recorded in the Greater Accra Region. Also, obesity prevalence of 16 percent was recorded among Ghanaian males in 2014 (Ghana Statistical Service et al., 2015). In addition, Ofori-Asenso et al.'s (2016) systematic review on overweight and obesity epidemic in Ghana reported that nearly 43 percent of Ghanaian adults are either overweight or obese.

The rise in the prevalence of obesity in the developing world is said to be a result of a nutritional transition which is characterised by changes in nutrition and physical activity (Popkin, 2003; Popkin et al., 2012). There has been large shifts in diet and physical activity in modern societies due to structural factors including globalisation, industrialisation and urbanisation (Popkin et al., 2012; Steyn & Mchiza, 2014). There has also been a change in diet from the consumption of high fibre and grain-rich foods to high intake of energy-dense foods such as refined carbohydrates, fats, caloric sweeteners and animal source foods (Mayén et al., 2014). The change in diet has been accompanied by reduced physical activity and these are two modifiable behaviours contributing to the global obesity epidemic (WHO, 2015).

Obesity is an important contributing factor to various chronic non-communicable diseases (NCDs) including type II diabetes, hypertension and some cancers (Agyemang et al., 2016). Yet, some societies in Africa put pressure, particularly on women to desire a particular body size, specifically overweight. Women thus tend to prefer fatness in order to prevent stigmatization despite the associated consequences. The choices these women make may increase their risk of acquiring non-communicable diseases such as hypertension and type II diabetes (Matoti-Mvalo & Puoane, 2011).

Socio-cultural ideals and preferred body size may thus have contributed to the increasing prevalence of obesity (Rguibi & Belahsen, 2006; Ulijaszek & Lofink, 2006). Body image is an important part of the self-concept. Feelings and thoughts about the body are fundamental to an individual's health and well-being (Holmqvist, 2013). Body image is the internal representation of one's own outer appearance: one's unique perception of his or her body (Thompson &

Heinberg, 1999). It involves a self-perception that consists of both perceptual experience and subjective evaluation based partly on the reaction of others (Cash, 2004).

Perception about one's body size can be positive or negative and may be considered as accurate or inaccurate (an overestimation or underestimation of one's body) or a feeling of satisfaction or dissatisfaction towards one's body (Gilmartin, 2013). There is the recognition that individuals make decisions on weight management based on their perceived body size, actual body size as well as societal values of body size (Cheung et al., 2007; Wang et al., 2009). That is, individuals' knowledge, perception, and feelings about their body may motivate or discourage them to manage their body weight (Bhurtun & Jeewon, 2013; Yeng & Sedek, 2012).

Weight management encompasses aspects of achieving and maintaining a healthy weight for a healthy lifestyle. This is attained by gaining weight in a situation where one is underweight and losing weight in the case of overweight or obesity (Olaoye & Oyetunde, 2012). In Santos et al.'s (2017) systematic review and meta-analysis on weight management, they reported a prevalence of 42 percent and 43 percent respectively for adults trying to lose weight or trying to maintain their body weight. The behaviours for achieving this goal were varied. Weight management behaviours range from healthy practices such as dieting with foods including fruits and vegetables, lean protein food, whole grains, and increased physical activity levels to potentially harmful behaviours such as self-medicating with diet pills, laxatives, and skipping meals and fasting (Cheung et al., 2007; Vander Wal, 2011). The potentially harmful practices are associated with less healthy dietary patterns and therefore, may increase the risk for weight gain and the development of disordered eating behaviours (Neumark-Sztainer et al., 2012).

1.1 Statement of the problem

Obesity is of great concern to demographers and health policy makers because of its potential effects on morbidity, mortality and life expectancy (Himes, 2011). It increases risk for most chronic non-communicable diseases including heart diseases, stroke, hypertension, diabetes, and some cancers (Breast, colon, prostate, ovarian) which were the leading cause of deaths and disability globally in 2012 (Akinpelu et al., 2015; World Health Organisation (WHO), 2018). Annually, about 2.8 million people worldwide die from obesity-related diseases and an estimated 35.8 million (2.3%) of global disability-adjusted life-years (DALYs) are caused by overweight or obesity (WHO, 2011). In addition, obesity has been known to have some social, emotional and indirect effects, such as low self-esteem, depression, behavioural and learning problems, all of which affect human health and development (Cook et al., 2007).

Ghana like other developing countries faces a greater burden of the associated consequences of obesity. This is because the nation is already struggling to contain the high burden of infectious diseases and undernutrition due to its poor and under-resourced health system (de-Graft Aikins, 2010). Therefore, the rising burden of obesity only compounds the situation as it increases the risk for non-communicable diseases (NCDs) (Ghana National Nutrition Policy, 2013).

Besides, the related economic cost of managing NCDs is very expensive in Ghana and this has the potential to drive individuals and families into poverty. The poor are more vulnerable to under-nutrition and over-nutrition, and thus, are further pushed into extreme poverty (Agyei-Mensah & de-Graft Aikins, 2010). Also, the indirect burdens associated with NCDs such as loss of productivity are alarming, particularly among the poor (MOH, Ghana, 2012).

Notwithstanding the varied consequences of overweight and obesity, studies on weight management behaviours and body size perceptions are few in sub-Saharan Africa; a region where fatness may not be stigmatized (Batnitzky, 2011; Nour, 2010). Evidence from the African literature suggests that obesity is on the rise but some overweight or obese individuals, particularly women do not perceive their body size as such and are more likely to be satisfied with their body size. The satisfaction with overweight or obesity in sub-Saharan Africa has been ascribed to the association of fatness with beauty, wealth, fertility, and health (Holdsworth et al., 2004; Matoti-Mvalo & Puoane, 2011). The satisfaction of being overweight or obese, and the inaccurate perception of body size, have implications as they may result in less concern for weight management. This may further exacerbate weight problems (Holdsworth et al., 2004; Rguibi & Belahsen, 2006).

A systematic review of studies on obesity in sub-Saharan Africa shows that the few available studies focus mostly on the determinants of obesity (Amoah, 2003; Dake et al., 2010; Biritwum et al., 2005; Muhihi et al., 2012), association between body image perceptions and body mass index (Akinpelu et al., 2015), fattening practices (Rguibi and Belahsen, 2006), and body size perceptions and preferences (Holdsworth et al., 2004; Puoane et al., 2013; Tlili et al., 2008). There is dearth of information on perceptions about body size and weight management behaviours in Africa. Also, the underlying factors that facilitate or hinder weight management have remained under-researched. While Dake et al. (2016) examined issues on obesity in an urban poor context; the focus was on how the built environment influences obesity. Also, Duda et al. (2007) have examined perceptions of body size, but their focus was on females and

culturally valued body size.

Also, existing studies on obesity mostly focus on females; however males are not free from becoming overweight or obese. Globally, the evidence shows that the rate of obesity is increasing much faster in males (Kanter & Caballero, 2012; Lewis et al., 2011). Besides, males and females have different body image perceptions worldwide. While males have a tendency to underestimate their body size and are less worried about weight management, females tend to overestimate their body size irrespective of their body size and are more likely to manage their body weight. The disparities in obesity and body size estimation may influence weight management behaviours differently for males and females (Kakeshita & Almeida, 2008). However, in sub-Saharan Africa, these distinctions are unclear because body size and weight management issues among males remain under-researched.

In addition, the available studies are based on quantitative data with much focus on individual factors without incorporating the influence of the individual's environment. However, body size perceptions, and related activities do not develop in isolation of social conditions, interpretation of body weight and related practice. The perceptions people have about their body size and how they manage it largely depends on the socio-cultural environment in which they live (Brown & Sweeney, 2009; Nissen & Holm, 2015). For this reason, Celio et al. (2002) stated that body image studies are incomplete when the cultural framework that influences people are not considered.

Furthermore, barriers to weight management have been reported in urban poor settings due to urban poverty (Draper et al., 2015). Weight management is achieved through a balance of increased physical activity and healthy eating to equate energy expenditure and energy intake (Hill et al., 2012). However, some studies conducted in developed countries have demonstrated that urban residents in poor areas tend to consume more polished grains, high-fat foods, sugary and processed foods due to issues of affordability of healthy foods (Friel et al., 2007; Drewnowski, 2010). Challenges such as limited access to spaces and facilities such as parks and recreational centres which aid physical activity have been reported in poor urban communities (Wendel-Vos et al., 2007). This needs to be explored in Ghana, where the literature is limited.

This study sought to fill these gaps by investigating the factors influencing body size estimation and weight management decisions in urban poor communities in Accra Ghana.

1.2 Research Questions

In the light of the foregoing discussions, this thesis sought to answer the following questions:

- i. Does the respondents' body size perception correspond with their actual body size?
- ii. What are the weight management goals of the respondents?
- iii. What are the perceptions of obesity and weight management among the respondents
- iv. What weight management behaviours are practiced in the study areas and is body size estimation associated with weight management behaviours?
- v. What individual, interpersonal and community factors influence weight management behaviours among the respondents?

1.3 Rationale of the study

With a vision of creating a world free of the avoidable burden of non-communicable diseases, the World Health Assembly in 2013 endorsed the World Health Organisation Global Action Plan for the Prevention and Control of NCDs 2013-2020. Objective 3 of the action plan seeks to reduce modifiable risk factors (physical inactivity, unhealthy diets, harmful use of alcohol and tobacco use) of NCDs and underlying social determinants by means of creating health-promoting environments (W.H.O, 2013).

Also, obesity reduction is a key element of the 2030 Agenda for Sustainable Development set by the United Nations in 2015. The third Sustainable Development Goal (SDG) seeks to ensure healthy lives and promote well-being for people of all ages. Among the core priorities of this Goal is to reduce premature deaths from non-communicable diseases (NCDs) to one-third or less by the year 2030. Furthermore, target 2.2 of the SDGs focuses on ending all forms of malnutrition (including overweight and obesity) by 2030.

In addition, the government of Ghana in 2007 introduced a Regenerative Health and Nutrition policy which aims at transforming the life, health and development of Ghanaians. The policy lays emphasis on healthy lifestyles such as healthy eating, rest and environmental sanitation (MOH, Ghana, 2007). This study is therefore timely as it addresses key issues such as overweight and obesity and the factors that predispose individuals to these conditions.

Also, this study is significant because it will supplement the current explanation on obesity and enhance understanding of weight management. Weight management is related to body size, in that, underweight, overweight or obese individuals are expected to embark on healthy weight

management behaviours to attain a healthy weight. However, some underweight, overweight or obese people fail to recognise the need for weight management because they inaccurately estimate their body size (Boo, 2013; Duncan et al., 2011a). Therefore, being aware of and having an accurate body size perception is an integral part of weight management (Hwang et al., 2016).

Findings from this study will bring to light the weight management practices of people who accurately estimate their body weight, as well as those who inaccurately estimate their body size. The findings will also increase understanding of the factors that facilitate and inhibit adoption of weight management behaviours. This will increase understanding of what people do about their weight and inform policy makers to adopt appropriate intervention to attain a healthier population.

Furthermore, mixed method of quantitative and qualitative approaches was applied in this study to explore the impact of both individual and environmental factors on weight management behaviours. The use of both approaches for data collection and analysis help to offset the weaknesses of one type of data collection and draw on the strengths of the other (Bryman, 2006). That is, the mixed method approach gives a comprehensive understanding of the research problem.

Importantly, obesity and related issues are of interest to demographers. This is because, by knowing the prevalence of obesity, demographers will be informed about the associated factors, the change in prevalence over time, which segments (age groups or sex) of the population are

affected, and the effects on other aspects of life, including morbidity, social and economic (Himes, 2011).

In summary, the present study contributes to the literature on obesity regarding factors influencing body size estimation on weight management, and barriers and facilitators of weight management. Findings from the study will thus help formulate and develop appropriate context related interventions useful in addressing the increasing obesity burden and, thus, improve people's physical health and quality of life.

1.4 Objectives of the study

The general objective of the study is to examine the influence of body size estimation on weight management behaviours in two urban poor communities in Accra, Ghana.

Specifically, the study seeks

- i. To examine the concordance between respondents' body size perception and actual body size using quantitative methods.
- ii. To examine the perceptions of obesity and weight management among the respondents using qualitative approaches.
- iii. To examine the weight management goals and weight management behaviours practiced by the respondents.
- iv. To examine the influence of individual, interpersonal and cultural factors on weight management behaviours among the respondents using quantitative methods.

1.5 Organisation of the study

This thesis is organised into seven chapters. Chapter one- the introductory chapter gives an introduction to the study. It also covers the statement of the problem, research questions, rationale, objectives of the study and the organisation of the study. The next chapter focuses on the literature review; theoretical and conceptual frameworks and research hypothesis, while the third chapter details the methodology of the study. The fourth chapter describes the body size estimation, weight management goals/behaviours as well as the characteristics of the study participants. In the fifth chapter, the association between body size estimation and weight management goals and behaviours are examined. Similarly, the association between the background characteristics of the respondents and weight management goals/behaviours were examined. Chapter six examines the relationship between body size estimation and weight management behaviours while controlling for individual, interpersonal and community level variables. Chapter seven summarises findings, concludes the thesis and makes recommendations for policy intervention.

CHAPTER TWO

Literature Review

2.0 Introduction

This chapter reviews existing literature which explains body size perception and its nexus with weight management. It outlines three main literature: the overview of body image perception, overview of weight management behaviour and factors associated with weight management behaviour.

2.1 Overview of body image perception

Body image is a multi-dimensional subject that incorporates an individual's thoughts, perceptions and feelings about his or her body (Grogan, 2007). It is a psychosocial construct that encompasses two main themes: body size perception and body (dis)satisfaction (BD). Body size perception is the assessment of one's physical body and the extent to which this assessment is accurate. This is commonly referred to as body image distortion (BID) in the literature. BID is the discrepancy between actual and perceived body size (Bagchi, 2010; Skrzypek et al., 2001). BD focuses on whether or not an individual is happy with his or her body size (Burrowes, 2013; Skrzypek et al., 2001). It is the discrepancy between actual and ideal body size while (Bagchi, 2010; Skrzypek et al., 2001).

In this study, the term body size estimation is used in place of body image distortion. This was done because the term body image distortion connotes the inaccurate aspect of the measurement. Thus, in a way it excludes those who accurately estimate their body size. The use of body size estimation clearly points out those who accurately or inaccurately estimate their body size.

Body image develops over time and may change over a period of time. Prior to the twentieth century, larger body size was valued as fatness was considered sexually appealing and associated with wealth, power, strength, beauty, and fertility. On the other hand, thinness was perceived as a sign of ill-health or poverty (Cogan et al., 1996). Larger body size was preferred in both western and non-western societies and in some Pacific and African societies; females were overfed to induce body weight gain (Pollock, 1995). For instance, among the Polynesians, larger body size was endorsed through social practices such as deliberately fattening females to enhance their beauty and reproductive capacity. The practice included a seclusion period of six months of which the young female was not expected to go outside or engage in any work. The fattening practice was widespread throughout the Pacific long before the period of modernisation in the mid-20th century (Pollock, 1995).

In Fiji and Tonga, larger body size was a symbol of wealth, power, and health for both males and females. Tongans of chiefly rank were expected to be larger in body size than commoners as it demonstrated readiness to access high-status food and less physically active lifestyle (Becker, 1995; Mavoa & McCabe, 2008). Fatness was also linked to strength among the Sumo society in Japan. To qualify as a Sumo wrestler apprentice, one was required to have a larger body size (Hattori, 1995).

In Africa, fatness has been and is still valued in some societies (Scott et al., 2012). There is a presumed cultural valuation of fatness as a sign of good health, fertility, wealth, and beauty (Amoah, 2003; Puoane et al., 2005). In Cameroon, the inability to fasten one's shirt collar

because of a fat neck was considered a symbol of success among civil servants during the 1990s (de Garine, 1995). A study conducted by Aryeetey (2016) among overweight Ghanaian women reported that although overweight was considered undesirable by most women, some weight gain was admired as it was perceived as a sign of wealth and good care by a spouse. Mvo et al.'s (1999) study in South Africa also indicated that weight gain was seen as a reflection of well-being, especially among the married. Marital harmony was perceived to be the cause of increased body weight. In addition, a study conducted by Holdsworth et al. (2004) among urban Senegalese women found that overweight body size was considered as the most warm, friendly, happy, proud, sociable and easy going body size .

Females in some parts of Nigeria, Ghana, and Morocco had to go through fattening period prior to marriage. This was a period of seclusion with intentional feeding and physical inactivity with the purpose of being fat and beautiful to ensure one's fecundity (Brink, 1989; Sarpong, 1979; Rguibi & Belahsen, 2006). The fattening process was not only practiced by women but also men. Among the Akans of Ghana, a person elected to be a king undergoes a period of confinement. During this period, he is specially fed to put on weight. There is the belief that, there is more dignity in larger body size than a thin body (Anectotal evidence). A study carried out by de Garine and Koppert (1991) from 1976 to 1985 among the Massa of Northern Cameroon and Chad observed fattening periods which encouraged young men to gain weight to look handsome. Men were overfed mainly with milk and sorghum which contained animal protein and energy to make them fat.

Although thinness is currently the ideal body size in western societies, this has not always been the norm. Fatness was considered fashionable and erotic in most western countries. In the seventeenth century, the female ideal body size was fleshy, voluptuous, and full-bodied; this was a body viewed as “the reproductive figure”. This body size was represented in Ruben’s (the 1600s) and Renoir’s (1880s) paintings and it represented the aesthetic ideal body size of the time (Grogan, 2007). Before the 1890s, the French also traditionally associated fatness with good humour, prosperity and positive attributes of fatness including ‘fat people, good people’ were often cited (Stearns, 2002). In Italy, fatness was linked to happiness, power, beauty and dominance (Teti, 1995). The ruling class who exercised their power with violence were round and fat (Teti, 1995). Thinness was often associated with ill-health such as Tuberculosis in the United States and Britain in the early twentieth century (Rothblum, 1990).

The shift from preference for larger body size to thinness occurred in the early 1990s in the course of economic development (Cogan et al., 1996). The thin ideal body size is largely attributed to the effective advertisement by the fashion industry, which became the standard of beauty in developed countries (Grogan, 2007). In contrast to a few centuries ago, fatness is no longer fashionable as it is negatively perceived and linked with poverty, stress, ill-health, and laziness (Heatherthorn, 1998). Overweight and obesity is stigmatized and obese individuals face various forms of discrimination (Puhl & Heuer, 2009). Thinness is currently valued as the ideal body size in developed societies and is associated with success, self-control, and happiness (Grogan, 2007).

The thin ideal is gradually spreading through modernization and globalization to non-western societies, and this is evident particularly among the youth (Jennings et al., 2014; Amenyah &

Michels, 2016). There is a growing body of research to suggest that African females are experiencing a shift in larger idealized body size to value a slimmer body size. Tlili et al.'s (2008) study in Tanzania reported that women expressed preference for slimmer body size. This is because normal body size was associated with confidence, happiness, and good health while obesity was undesirable and linked to greediness and poor health. Gitau et al. (2014) study among adolescents in South Africa reported that having a normal body size was associated with respect, happiness, and being the best while an obesity was considered the unhappiest and worse body size and underweight as the weakest body size. There was therefore preference for a normal body size.

In Ghana, Duda et al.'s (2007) found that some obese women were dissatisfied about being obese and desired to maintain a healthy weight. Similarly, Puoane et al.'s (2013) study among South African adolescents reported preference for a low body mass index. This is because thinness was associated with being more girlish.

2.2 Overview of Weight management

Weight management behaviours can be defined as participating in activities to attain a healthy weight. Studies have shown that people manage their weight either through healthy or unhealthy weight management behaviours (Walcott-McQuigg, 2005). Healthy weight management behaviours include engaging in physical activity, limiting fat, sugar intake and increasing fruit and vegetable consumption. Physical activity is a fundamental determinant of energy expenditure, and therefore, it is central to energy balance and weight management (Chaput et al., 2010). Delien et al.'s (2015) study among Belgian University students found that being

physically active lowers overweight or obesity levels and decreases risk of chronic diseases. Experts recommend that adults should achieve at least 150 minutes of moderate-intensity leisure-time physical activity or at least 75 minutes of vigorous intensity physical activity in a week (WHO, 2011). However, studies have showed that levels of physical inactivity are rising globally with negative implications for the general health of people (Hallal et al., 2012).

Another important factor that helps in weight management is diet (Wang et al., 2009). Specific food choices such as whole grains, fruits and vegetables, lean protein food and low-fat dairy products may help with weight management, prevent heart disease, diabetes, and other chronic diseases (Mozaffarian et al., 2011). Fruits and vegetables play an important role in human nutrition, obesity prevention and weight management (Ridler & Ridler, 2015). Fruits and vegetables are low in fat and high in water and thus, give a relatively low-calorie density (kcal/g) (Rolls et al., 2004). Moreover, most fruits and vegetables are major suppliers of dietary fibre, vitamins C, folate and potassium which help to lower the incidence of obesity and cardiovascular diseases (Slavin & Lloyd, 2012; Ridler and Ridler ,2015).

On the other hand, the intake of high levels of caloric or high-energy foods, such as fats and sugars promote weight gain or obesity hence are considered unhealthy diets. This suggests that a reduction or elimination of the consumption of caloric foods is important for weight management (Misra & Khurana, 2008; Zienczuk et al., 2012). Excessive consumption of fat causes weight gain because it is the most energy dense macronutrient. Sugar-sweetened beverages also have a positive impact on body weight gain. Sugar contains little nutrient and contributes to increased energy intake (Zienczuk et al., 2012). Other unhealthy weight management behaviours including

the use of diet pills, laxatives, skipping meals, fasting, reduced physical activity, smoking and intake of medications have been reported in the United States (Mayer-Brown et al., 2016; Neumark-Sztainer et al., 2006). Ayisi-Ado et al.'s (2016) study in Ghana among newly enrolling clients in a commercial weight loss program reported that internet based diets (67.9%), commercial weight loss shakes (42.9%) and exercises (28.6%) were the three common programs that were practiced to lose weight.

The American Dietetic Association however suggests that a successful weight management requires a long life commitment to healthful lifestyle behaviours such as good eating practices and daily physical activity (Cummings, 2002). Weight management is achieved through a balance between energy consumed and energy expended. Therefore, regular physical activity together with a good dietary behaviour is the best strategy to manage body weight than either exercise or diet alone (Macera et al., 2003; Volek et al., 2005).

2.3 Body Mass Index (BMI), Body size perception and weight management

Studies have shown that weight management is related to the status of one's actual or perceived body size. However, the associations are not conclusive; while some studies have reported either positive or negative association, others have found no association (Bhurtun & Jeewon, 2013; Liechty, 2010). Markey & Markey's (2005) study among European Americans showed a positive association between BMI and dieting to lose weight. Weiss et al. (2006) also reported that trying to lose weight or trying not to gain weight was positively associated with increased BMI among United States of America adults. To lose or stay about the same weight, the respondents engaged in both healthy and unhealthy practices such as intake of less fatty foods, reduce food portion, drank a lot of water, skipped meals, diet pills and participation in physical activity.

Not only are overweight and obese individuals dissatisfied with their body size but also some normal weight individuals feel overweight and therefore desire to lose weight (Wardle et al., 2006). The concern about being overweight or obese influence weight-related behaviours and mostly puts them at risk of unhealthy weight management behaviours such as excessive exercise, purging, diet pill use and skipping meals (Cheung et al., 2007; Jaffari et al., 2011). These practices usually prevent individuals from achieving the desired outcome and may result in further weight gain, depression and consequently increase the risk of developing eating disorders (Dotse & Asumeng, 2014; Neumark-Sztainer et al., 2010).

In addition to actual body size, body size perception plays a key role in weight management (Bhurtun & Jeewon, 2013; Liechty, 2010). The influence of body size perception on weight management may either be direct or mediate the relationship between actual body size and weight management. Inaccurate body size estimation has been observed in many societies. Saleem et al.'s (2013) study among youth in Pakistan indicated that 42 percent of a sample of 1,400 misperceived their body weight. Inaccurate body size estimation was marginally higher among males (43 percent) than females (41 percent) and highest among those who were overweight (91 percent). In South Africa, Mchiza et al. (2015) found that 85 percent of adolescents aged 15 years and above either underestimated or overestimated their body size

Body size estimation varies by sex. Females tend to overestimate their body size while males underestimate their body size (Akinpelu et al., 2015; Bhurtun & Jeewon, 2013). Tanzanian overweight or obese males tended to underestimate their body size compared to females (Muhihi

et al., 2012). However, in Iran, more than 40 percent of normal weight women thought they were overweight or obese (Dorosty et al., 2014).

Body size estimation is a widespread concern and a growing importance due to its implication on weight management and general health (Jung & Lee, 2006; Lee, et al., 2009). Inaccurate body size estimation and body (dis) satisfaction may increase risks for unhealthy weight management behaviours, depression, low-self-esteem, and the development of eating disorders (Harring et al., 2010; Loth et al., 2015). However, accurately estimating one's weight is a component of effective behaviour change and has been linked to greater motivation to engage in good dietary and nutritional habits and a physically active life (Alwan et al., 2011; Yang et al., 2014).

A study among college students in the United States of America reported that although more than one-fourth (28 percent) of the respondents were actually overweight or obese, half of them (50%) reported attempting weight loss because they were dissatisfied with their body size. Of all the respondents who desired to lose weight, 38 percent combined increased physical activity and diet. Also, respondents who had inaccurate estimation about their weight used unhealthy weight management behaviours such as diet pills, vomiting, and use of laxatives to lose weight compared to those who had accurate body size estimation (Wharton et al., 2008). Yaqoob & Elhisadi's (2013) study in Libya reported that the prevalence of overweight and obesity among health workers was about 70 percent. However, only half of the health workers considered themselves as overweight or obese and one-third of them took weight reduction diet and oral medication to lose weight (Yaqoob & Elhisadi, 2013). A study conducted by Awosan et al. (2017) among office employees in Sokoto-Nigeria found that although 61 percent of 285

participants were overweight or obese, only 23.5 percent of them were engaged in weight management practices.

Duncan et al.'s (2011) study in USA report that inaccurate body size estimation among overweight adults was associated with a lower likelihood of engaging in physical activity. Also, a study carried out by Haring et al. (2010) found that women who overestimated their body size were more likely to engage in unhealthy weight management practices compared to those who accurately estimated their body size. However, accurate estimation of weight may not always be a motivating factor to engage in healthy weight management behaviours. Inaccurate body size estimation weight has been found to be associated with higher level of physical activity (Fredrickson et al., 2015; Matthiessen et al., 2013).

2.4 Weight management goals and weight management behaviours

The use of weight management behaviour is dependent on an individual's intentions or goals about his or her body weight. Findings from the United States of America and Australia show higher rates of attempted weight loss and use of unhealthy weight management behaviours particularly among adolescent females regardless of body size (Fredrickson et al., 2015; Liechty, 2010).

In Europe, findings from a four-country population survey (Italy, Belgium, Portugal and Spain) showed that behaviours such as diet regimens (e.g. hypocaloric diets), lifestyle changes (e.g. no alcohol intake) using specific slimming products, taking meal replacement products, herbalist products, slimming teas and use of medical drugs were practiced by individuals who had a goal of losing weight (Santos et al., 2010). Stigler et al.'s (2011) study in India found that majority (92

percent) of overweight and obese individuals who desired to lose weight engaged in at least one healthy weight management behaviour (e.g. exercise, less sweets, more fruits and vegetables). However, three-quarters (78 percent) of them practiced at least one unhealthy weight management behaviour (e.g., fasting, diet pills, skipping meals).

Also, a study conducted by Rguibi and Belahsen (2006) among Moroccan women reported that although overweight and obesity prevalence was 79 percent, the majority of Moroccan women desired to gain weight (42 out of 249) than to lose weight (8 out of 249). The authors attributed the desire to gain weight to the cultural acceptance of fatness and ignorance of the health risks associated with overweight and obesity. The study further showed that for women who wanted to lose weight, only two of them had previously used exercise and dieting. However, strategies including restriction of physical activity, overfeeding, and medications that stimulated hunger were used to gain weight (Rguibi and Belahsen, 2006). Also, Mchiza et al.'s (2015) study in South Africa reported that normal weight and underweight individuals who intended to gain or lose weight adjusted their diet and physical activity levels to attain their goals.

2.5 Socio-demographic characteristics and weight management

Sex difference in participation in weight management behaviour has been documented globally. This variation is as a result of differences in body mass index status, perceptions about body size and social expectations about body size (Choi et al., 2013; Assari & Lankarani, 2015; Lawler & Nixon, 2011). Generally, men have a higher likelihood of being physically active; engage in vigorous and strength-building exercises compared to women (Machado et al., 2012). In contrast,

women are more likely to diet and adopt potentially unhealthy behaviours such as fasting, meal skipping and medications to manage weight (Kuan et al., 2011).

Lowry et al. (2000) in the United States reported that females are less likely than males to be overweight. Also, compared to males, females are more likely to perceive their body size as overweight, attempt weight loss and to use exercise, diet pills, and vomiting to manage their weight. Also, a study carried out among undergraduate students in Malaysia found that females preferred to be slightly underweight as their ideal body size while the ideal body size for males was somewhat overweight. As a result, women dieted frequently, self-induced vomiting, and exercised to manage their weight compared to men (Kuan et al., 2011). The gender difference in weight management behaviours may exist partly because of the desire to lose weight among females while males desire to build muscle (Fredrickson et al., 2015).

With respect to age, higher prevalence of dieting and use of unhealthy weight management behaviours such as vomiting, skipping meals, and fasting have been reported among Greek and USA adolescent girls (Thogersen-Ntoumani et al., 2010 ; Vander Wal, 2011). Also, Leong et al.'s (2013) study among middle-aged New Zealand women reported the use of healthy than unhealthy weight management behaviours in an attempt to attain a healthy body size. In a study using a National Weight Control Registry in the USA, young adults (18-35years) reported using exercise to achieve weight loss on their own compared to old adults (36-50 years). The motivation for younger adults to lose weight has been linked to factors such as social influence and appearance (LaRose et al., 2013). Importantly, some studies have reported no significant association between age and weight management behaviours (Neumark-Sztainer et al., 2002).

Marital status has an important influence on body weight: the association is however inconclusive. Evidence in the United States of America demonstrates that married or cohabiting women and separated or divorced women considered themselves as overweight and desired to lose weight than those who were never married. However, marital status was unrelated to men's weight perception and desired weight change (Klos & Sobal, 2013). Tom et al. (2005) also reported that although married individuals perceived themselves as heavier, they were less dissatisfied and concerned to change to their ideal body size compared to those never married.

It is explained that unmarried individuals particularly women are concerned with weight management for the purpose of attracting a partner. However, once a relationship has been established, vigilance in the monitoring of one's weight may decrease (Averett et al., 2008; Klos & Sobal, 2013). The marital resource model also suggests that being married is associated with weight gain. This is because with the availability of a partner; there is a high tendency to eat together, eat at regular times and also eat more (Umberson et al. 2009). Additionally, the crisis model also postulates that widowhood and divorce is related to weight loss or gain. It explains that the loss of a partner may create stresses which subsequently has social and psychological consequences which may lead to weight loss or gain (Umberson et al., 2009).

Socio-economic status (SES) has been identified to have an effect on health behavioural choices (Friel et al., 2007; Mayén et al., 2014). SES is the position that a person occupies in the stratification system of society (Deliens et al., 2015; Sobal and Devine, 1997). Lower socioeconomic status has been associated with poorer health behaviours including low physical

activity levels and poor diet (Adler & Newman, 2002; Hanson & Chen, 2007). Choi et al. (2013) study among Korean Adults found that women with highest socioeconomic status were more likely to engage in weight management than those with lower socioeconomic status. In Britain, persons with higher socioeconomic status were more likely to lose weight by engaging in more rigorous physical activities and more restrictive dietary practices compared to those with lower socioeconomic status (Wardle & Griffith, 2001). Siu et al.'s (2011) study in Australia also found that socioeconomic disadvantage groups were less likely to engage in weight management compared with their more advantage counterparts.

Income as a component of SES provides resources that can be used in weight management (Sobal and Devine, 1997). The cost of food and the ability for a person to afford are key determinants of food choices (Drewnowski, 2010). The Behavioural pathways theory explains that some healthy behaviour such as healthy diet and joining a gym are expensive (Benzeval et al., 2014). While persons with high income have access to healthy diets, including low-fat foods, fruits, vegetables, and lean meats, those with low income have less ability to consume healthy diets which tend to be more expensive than less healthy food (Darmon & Drewnowski, 2008; Drewnowski, 2010).

Persons with lower income are also less likely to engage in a leisure-time physical activity. A study in Canada using data from the Canadian Community Health Survey found that the use of healthy weight management behaviour was less common among participants in lower income category compared to those in the higher income categories (Tu & Mâsse, 2012).

In South Africa, although Black women understood dieting as eating healthy foods, reducing food portions and limiting fat and oil in food preparation, financial constraint and difference in price between healthy and unhealthy foods were barriers to healthy dieting (Draper et al., 2015). Other qualitative studies of low-income groups have highlighted cost as one of the key barriers to healthy eating and exercise despite the knowledge about healthy lifestyle and a desire to manage weight (Withal et al., 2009). It is somewhat challenging to live healthily in environments without the needed resources (Cockerham, 2012).

Education as a measure of socioeconomic status has a positive influence on health and health behaviours (Cutler & Lleras-Muney, 2006; Simsek et al., 2014). Simsek et al.'s (2014) study among the elderly in Turkey reported that women who had no formal education and those with primary education had a higher risk for physical inactivity and unhealthy diet compared to those with higher education. Highly educated individuals are more likely to choose healthier behaviours including healthy diet, exercise and avoid unhealthy lifestyles than those who are less educated (Cutler & Lleras-Muney, 2006).

Education is fundamental because it helps people choose healthier lifestyles by providing them with better access to health information and improving their knowledge on the relationships between health behaviours and health outcomes (Kenkel, 1991; Pampel et al., 2010; Simsek et al., 2014). Besides, education has a direct effect on an individual's career opportunities and earning potential (Kenkel, 1991; Pampel et al., 2010). There is a high propensity for highly educated individuals to have better employment and higher income levels. This increase their power over health choices than the less educated (Devaux et al., 2011).

Additionally, employment status is another measure of SES which has an impact on the health of an individual. Being employed enhances health and therefore employed persons are likely to have better health compared to those unemployed (Adler & Newman, 2002; Griffiths et al., 2008). Employment provides income and thus improves the economic well-being of the individual and his or her ability to purchase healthy diets. In addition, work has time demands which may influence participation in physical activity and eating behaviours (Sobal and Devine, 1997). The workplace is also a good environment in which people can exchange health messages (Griffiths et al., 2008). The type of occupation also influences weight management. Occupations such as professional, managerial or clerical are more sedentary and not physically demanding compared to manual work. Individuals who are in manual, agricultural work are more likely to be physically active, therefore have a higher likelihood of engaging in healthy behaviours to manage their weight (Scott, 2012).

Furthermore, in every ethnic or cultural group, there are concepts of how food is associated with health and which foods are healthful or unhealthful. Food preparations and preferences, portion sizes, notions of what constitute meals and snacks are all culturally determined and therefore have an impact on food choices (Halperin, 2013). For example, high obesity levels have been found among the Ga-Dangme in Ghana compared to other ethnic groups and this has been associated with intake of high carbohydrate foods and more sedentary lifestyle (Biritwum et al., 2005). Moreover, cultural norms about body size vary within and across ethnic groups and this may influence weight management behaviours differently.

Importantly, the duration of time a person stays in a community plays a role in the health behaviours he or she engages in. Some studies have reported that newly migrants tend to have better health behaviours and health compared to non-migrants of their host nations. This phenomenon is termed the healthy-migrant effect (Dias et al., 2013; Acevedo-Garcia et al., 2010). However, as duration of stay in the community increases, they are more likely to adopt values, attitudes and beliefs of the host population (Joshi et al., 2014). Other researchers argue that migrants' health is at risk as a result of some experiences during the migration process and in the place of destinations (Dias et al., 2013). Migrants particularly those from low-to high income countries tend to adopt obesogenic behaviours and gain weight compared to their counterparts in their destination. These changes have been attributed to the process of acculturation-the gradual exchange between immigrants' initial attitudes and behaviour and those of the host culture (Delavari et al., 2013).

2.6 Social environment and weight management

The socio-cultural environment (the immediate social or physical setting in which people live) is a context in which body image develops and it plays an important role in the perception of, feelings and attitudes about the body (Bordo, 2004; Brown & Sweeney, 2009; McCabe et al., 2013). Social norms, values and expectations are important aspects of a culture and serve as a guide to social living (Kumanyika, 2008).

Cultural norms about body size vary within and across societies and apply differently to individuals. That is, the socio-cultural context provides meaning and interpretation of body size and this may influence whether and how individuals attempt to manage their weight (Kumanyika

and Morssink, 1997; McCabe et al., 2014). People become dissatisfied with their body sizes as a result of their perception of the cultural standard and opinion of whether or not they meet the cultural standard (Jaffari et al., 2011). That is, body image develops through the imagined appearance of oneself to others, the perceived judgment related to how one appears to others and feelings resulting from those perceptions (Kemper et al., 1994).

In communities where there is preference for larger body sizes, individuals within that context would be less likely to perceive themselves as overweight or obese (Scott et al., 2012). Similarly, people who have more obese persons in their social network or surroundings have a higher likelihood of becoming obese (Christakis & Fowler, 2007; Leahey et al., 2011). Christakis & Fowler (2007) observed that the likelihood that a person would become obese increases by 57% if a friend became obese. Also, an individual's chance of being obese increased by 40% if a sibling became obese and 37% if a spouse became obese. In such a case, larger body size may become acceptable. This may cause people to compare and contrast themselves to others in their surroundings and choose behaviours biased by the extent to which they are motivated to comply with the social norms (Lynch et al., 2009; Nicolaou et al., 2011).

Family, friends, co-workers, health workers and church groups can influence a person's decision-making and actions by providing negative or positive social support for his/her behaviours. Such support can be informational, emotional, tangible or as appraisal and feedback (Verheijden et al., 2005). Social support is important to human health due to its association with quality of life and greater participation in health-related behaviours (Smith et al., 2017).

Significant others may convey messages of encouragement or criticisms that may have an impact on weight concerns (Kemper et al., 1994; McCabe & Ricciardelli, 2005). Studies have shown a relationship between weight-teasing by significant others, body dissatisfaction and unhealthy weight management behaviours (Leme & Philippi, 2013; Neumark-Sztainer et al., 2010). In the United States, female adolescents who were teased by family members and peers because of their weight had greater body dissatisfaction and were about ten times more likely to use unhealthy weight management behaviours than those whose family members did not tease (Neumark-Sztainer et al., 2010).

McCabe & Ricciardelli, (2005) also reported in Australia that weight loss messages from parents strongly predicted behaviours for weight management among adolescents. In Central Massachusetts, co-workers' and friend's support for healthy eating and family support for physical activity were associated with weight loss among adults. On the contrary, family social support undermining for healthy eating is associated with weight gain (Wang et al., 2015). In an umbrella review on determinants of dietary behaviour among youth, family influence was significantly related to snack and fruits and vegetables consumption among youths. Parents are the main suppliers of home foods, and therefore, they have the ability to influence eating behaviours (Sleddens et al., 2015).

2.7 Social organisations and weight management

Another factor that plays a role in health related behaviours is social organisation. This is because most people spend time in organisational settings such as religious places, school, and work. Support from fellow church member has been reported to be associated with the decision

to adopt a healthy lifestyle among African American (Krause, Shaw, & Liang, 2011). Individuals who belong to religious groups tend to exhibit healthy lifestyles such as increased physical activity, healthy eating, non-use of alcohol and tobacco compared to those who do not associate with any religious group (Hill et al., 2010). McNabb et al. (1997) reported a significant weight loss (10.0lb) among African American women at risk of diabetes after participating in a church-based program targeted at weight loss.

The media as a social organisation also promote ideal body size. They influence perception about body weight and contribute concern to weight management and overall health (Morris et al., 2003). The emphasis on thin ideal body size portrayed by the media, partly explains body size overestimation and weight-related concerns, particularly among females in developed countries (Jaffari et al., 2011). Field et al. (1999) in the United States of America reported that pictures in magazines strongly influenced perception of body size. Also, there was a positive association between the frequency of reading women's magazines and the likelihood of dieting and initiating an exercise program to lose weight. Also, van den Berg et al.'s (2006) study among adolescents in the United States found that the odds of engaging in unhealthy weight management behaviours were twice as high for most frequent readers of magazine articles than non-readers.

The media has a purpose to entertain, inform, convince and even change behaviour and attitude. The media promote the consumption of both healthy and unhealthy foods through enticing packaging and advertisements (Jaffari et al., 2011). Some university students in Brussels, Belgium have reported that advertisements from the media enticed them to eat certain unhealthy foods by seeing the food on the television (Deliens et al., 2014). Also, analyses of a grocery store

receipt in the Netherlands indicated that health briefing reduced the purchase of high-calorie snacks among overweight and obese consumers. Individuals who received a recipe leaflet containing diet and health-related words purchased nearly 75% fewer unhealthy snacks than those who received leaflets without the diet and health-related words (Papiés et al., 2014). Also, long hours of television and computer viewing may be a sign of being physically inactive. However, the media is also effective at promoting physical activity as a healthy means of weight management (Miller, 2010; Tiggemann, 2003).

2.8 Physical environment and weight management

The physical environment in which people live is another factor that influences healthy behaviours including weight management. Availability and access to facilities such as recreational centres, and parks, have an impact on physical activity (Deliens et al., 2015; Giles-Corti & Donovan, 2002). Individuals who live in communities with access to environmental facilities including spaces for sports, recreational centres, well laid out streets and walkways promote healthy behaviours. This is because they makes it easier to adopt and maintain them (Van Holle et al., 2012; Wendel-Vos et al., 2007; Zenk et al., 2011). Also, perceiving one's community as unsafe lowers the likelihood of being physically active (Bennett et al., 2007; King et al., 2000).

In addition, availability and accessibility of certain foods in the home or community promote their consumption (Baranowski et al., 2003; Neumark-Sztainer et al., 2003). For example, individuals who live in homes or communities where fruits and vegetables are available and accessible have a higher likelihood of consuming them (Deliens et al., 2014).

2.9 Barriers and facilitators of weight management

Some qualitative studies have also identified barriers and facilitators of weight management. For instance, Abolhassani et al.'s (2012) study among overweight/obese participants in Iran reported that those who were dissatisfied about their body weight took measures to lose weight. However, the participants discontinued their weight management program due to barriers including obesity-related fatigue, the feeling of weakness, lack of time and family support. In South Africa, although black women had knowledge about the benefits of weight management, they were not managing their weight because of barriers such as higher cost of fruits and vegetables and association of weight loss with diseases including Tuberculosis and HIV (Draper et al., 2015).

Also, knowledge of the benefits of weight management influenced participation in weight management behaviours among women in United States of America. However, factors such as value of body size, time constraints, stress, bad weather, lack of self-control and motivation, created a barrier to weight management (Walcott-McQuigg, 2005). Aziz et al's. (2016) study among Malaysian overweight and obese housewives found that lack of time and support from family, friends and the environment were the key barriers to weight management. However, factors such as self-motivation, mind-set, appealing figure and family and friends support motivated them to lose weight.

Additionally, a qualitative synthesis on weight management among males showed that lack of social support from friends and family to new food choices were among the main reasons men did not engage in weight management. On the contrary, the perception that certain programs were effective and health concerns facilitated weight management (Archibald et al., 2015). Other

identified barriers to weight management include social norms about body size, social norms about physical activities (Chang et al., 2008), lack of accountability to someone else, difficulty in changing diets, lack of determination, laziness (Metzgar et al., 2015), limited availability of healthy foods and physical activity spaces, the desire for rapid weight loss results and lack of finance to access healthy foods (Woodruff et al., 2016).

2.10 Policies on obesity and weight management

This section reviews policies on obesity and weight management behaviours.

2.10.1 Global policy

In May 2004, the World Health Organisation's (WHO) Global Strategy on Physical Activity, Diet and Health was endorsed at the 57th World Health Assembly (WHA). The goal of the strategy is to protect and promote health by guiding the development of an enabling environment for sustainable actions at individual, community, national and global levels. This help reduce disease and death rates associated with physical inactivity and unhealthy diet.

The Global Strategy has four key objectives: (1) to reduce the risk factors for non-communicable diseases that arise from physical inactivity and unhealthy diets through public health actions, disease prevention and health promoting measures; (2) to intensify awareness and understanding of the positive impact of preventive intervention and of the influence of physical activity and diet on health; (3) to encourage the development and implementation of community, national, regional and global action plans and policies to increase physical activity and improve diets that are comprehensive, sustainable and multi-sectorial and (4) to monitor scientific data and key influences on physical activity and diet.

To help prevent major non-communicable diseases, national policies are to include the following recommendations: to achieve energy balance and a healthy weight; limit intake of free sugars; reduce energy intake from total fats and shift away from the consumption of saturated to unsaturated fats; increase intake of fruits and vegetables, whole grains, legumes and nuts, and ensure that salt is iodised. With reference to physical activity, it is recommended for adults to have at least 30 minutes of moderate-intensity physical activity on most days to help achieve weight control and reduce the risk of non-communicable diseases.

2.10.2 An example of a sub-Saharan African country

The government of South Africa has an agenda of attaining a long and healthy life for all South Africans by 2020 (Department of Health, Republic of South Africa, 2015). In view of this, a strategy for the prevention and control of obesity in South Africa was developed in 2015. The strategy has six main goals: (1) to create an institutional framework to support inter-sectorial engagement; (2) to create an environment that supports availability and accessibility to healthy foods; (3) to increase the percentage of the population engaging in physical activity; (4) to prevent obesity in early childhood; (5) to communicate, mobilise and educate communities and (6) to establish a surveillance system and strengthen monitoring, research and evaluation. The policy recognises the need for a multi-sectorial approach to prevent and control of obesity.

2.10.3 Ghana

Ghana's Ministry of Health has introduced a Regenerative Health and Nutrition Programme (RHNP), which aims to attain a healthy population through the promotion of healthy lifestyle practices (Ghana's Ministry of Health, 2008). The programme emphasised on four main areas: healthy diet; exercise se; rest and environmental sanitation. In relation to healthy diet, the focus is on increasing intake of fruits and vegetables (five servings each of fruits and vegetables per day), reducing intake of saturated fats/oils, salt intake, meat, drinking more water (eight glasses of water per day), and reducing or eliminating alcohol intake and smoking. For exercise, the programme recommends an increase in daily physical activity for at least 30 minutes three times in a week (Ghana's Ministry of Health, 2008).

The policies highlight on healthy eating and participation in physical activity which are essential to attain healthy population. However, guidelines in terms of the kinds of exercise to engage in for the various age groups (children, adults and aged) and also the time of the day to engage in physical activity were not clearly spelled out. These need to be emphasised. Additionally, the importance of weight management and hazards of excess weight to human life are not evident in the policies.

2.11 Theoretical framework and conceptualization

Obesity and weight-related issues have been explained by behaviour change models such as Trans-Theoretical model, the theory of planned behaviour; Health belief model and Theory of reasoned action (Chung & Fong, 2015; Metzgar et al., 2015). These theories focus on a single level analysis with emphasis on an individual's characteristics. However, given the complexities of health behaviour, a single level analysis of the individual's characteristics does not give a fuller understanding of behaviour (Townsend & Foster, 2013). In view of this, studies have highlighted the importance of the Socio-ecological model (SEM) which analyses behaviour from a multilevel perspective (Peterson et al., 2002; Robinson, 2008; Willows et al., 2012).

Therefore, to have a broader understanding of weight management and develop an effective intervention programme, the socio-ecological model (SEM) developed by Urie Bronfenbrenner (1979), is used as a theoretical background to the current study. SEM provides a comprehensive understanding of behaviour by taking into account individual level factors as well as the relationship between the individual and the social world (Hill et al., 2012). That is, it looks at the nature of a person's interaction with the social, physical and policy environment (Glanz et al., 2008; Mehtälä et al., 2014).

,The SEM has five main levels of influence: individual, interpersonal, organisational, community levels and public policies (Figure 2.1). The individual level factors include personal and biological traits such as perceptions, beliefs, age, sex which influence behaviour. At the interpersonal level, primary social groups, including family, friends or co-workers who provide support and social identity to the individual are considered. The organisational level factors focus

on media, religious and community organisations. These organisations provide social support and health promoting activities for behaviour change. The fourth level which is the community considers influences such as community norms and regulations on behaviour change. Regulatory policies, laws and procedure on improving health also protect the health of the individuals and the community at large. Therefore, the fifth level focuses on policies and laws that support or regulate healthy practices such as healthy diets and participation in physical activity (Robinson, 2008; Tehrani et al., 2016). Table 2.1 shows a schematic representation of the socio-ecological model.

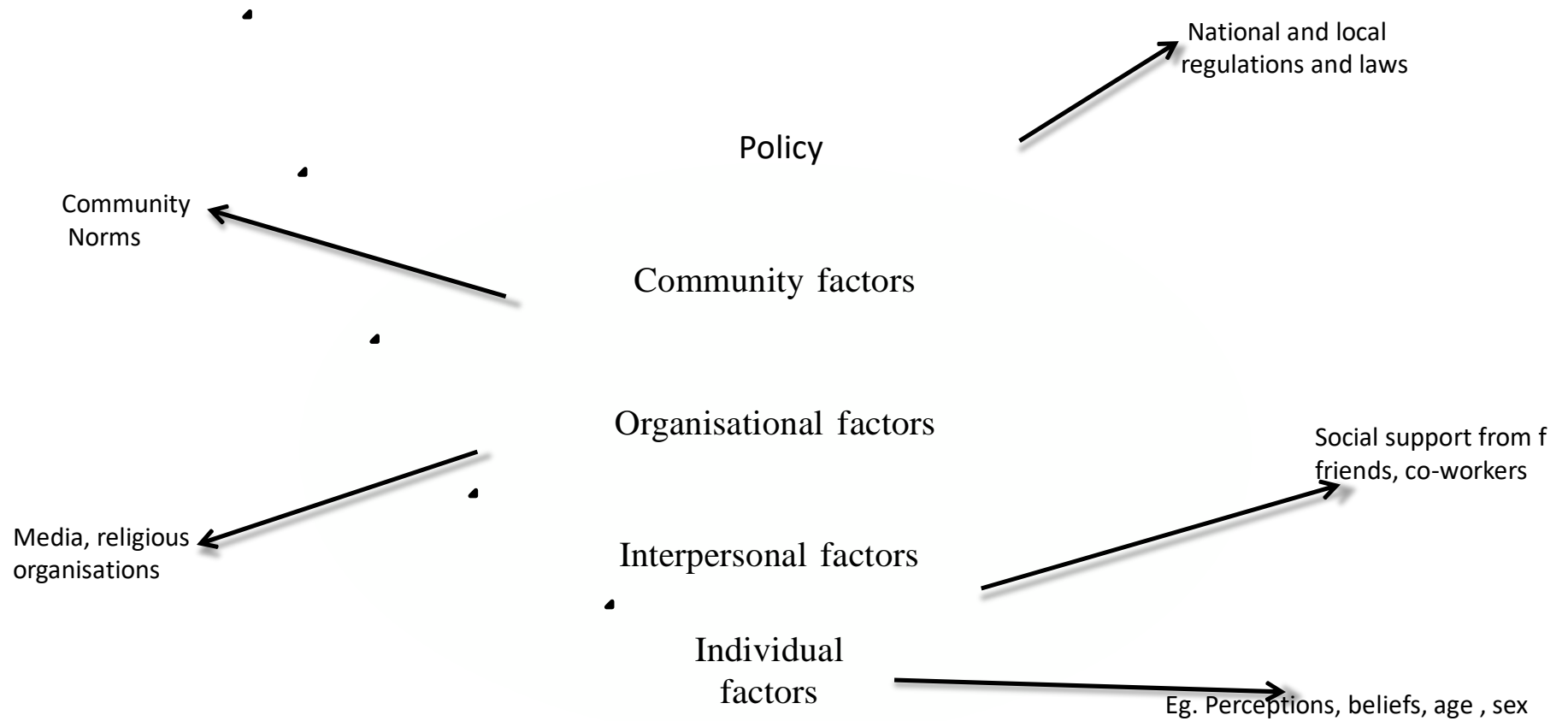


Figure 2. 1: Schematic representation of the socioecological model (SEM)

Source: Robinson, (2008)

2.11.1 Application of the socio-ecological model (SEM) to health and the current study

The SEM is useful in understanding health-promoting behaviours and has been identified as one of the most frequently used theories in obesity interventions, promoting healthy eating and physical activity (Tehrani et al., 2016; Townsend & Foster, 2013; Willows et al., 2012).

The theory is contextually relevant as it has been used in a number of health behaviours in sub-Saharan Africa. For instance, in a qualitative study conducted by Onono et al. (2015) in Western Kenya, the socioecological model was applied to understand barriers to prevention of mother-to-child transmission (PMTCT) service utilization among HIV infected mothers. Barriers such as lack of family support, fear of HIV status disclosure, stigmatisation and lack of accurate information on PMTCT in the community were identified. Self-efficacy and motivation also emerged as key facilitators of PMTCT utilization.

Also, findings from another study on perceptions of inhibitors and facilitators for adhering to hypertension treatment among insured patients in rural Nigeria supported the socioecological model (Oduola et al., 2014). The study found that adherence can be influenced by factors at the individual level (patient's knowledge and awareness), interpersonal level (interaction with family and other patients) organisational level (health care system), environmental (availability of healthy foods), and policy level (National health insurance).

Similar to previous studies, SEM is employed in the current study to help understand weight management behaviours among adults in Ga-Mashie. Weight management behaviour is conceptualised as an outcome which is influenced by individual, interpersonal, organisational, and environmental factors. Figure 2.2 shows the relationship between individual and environmental factors on weight management behaviours based on the socioecological model.

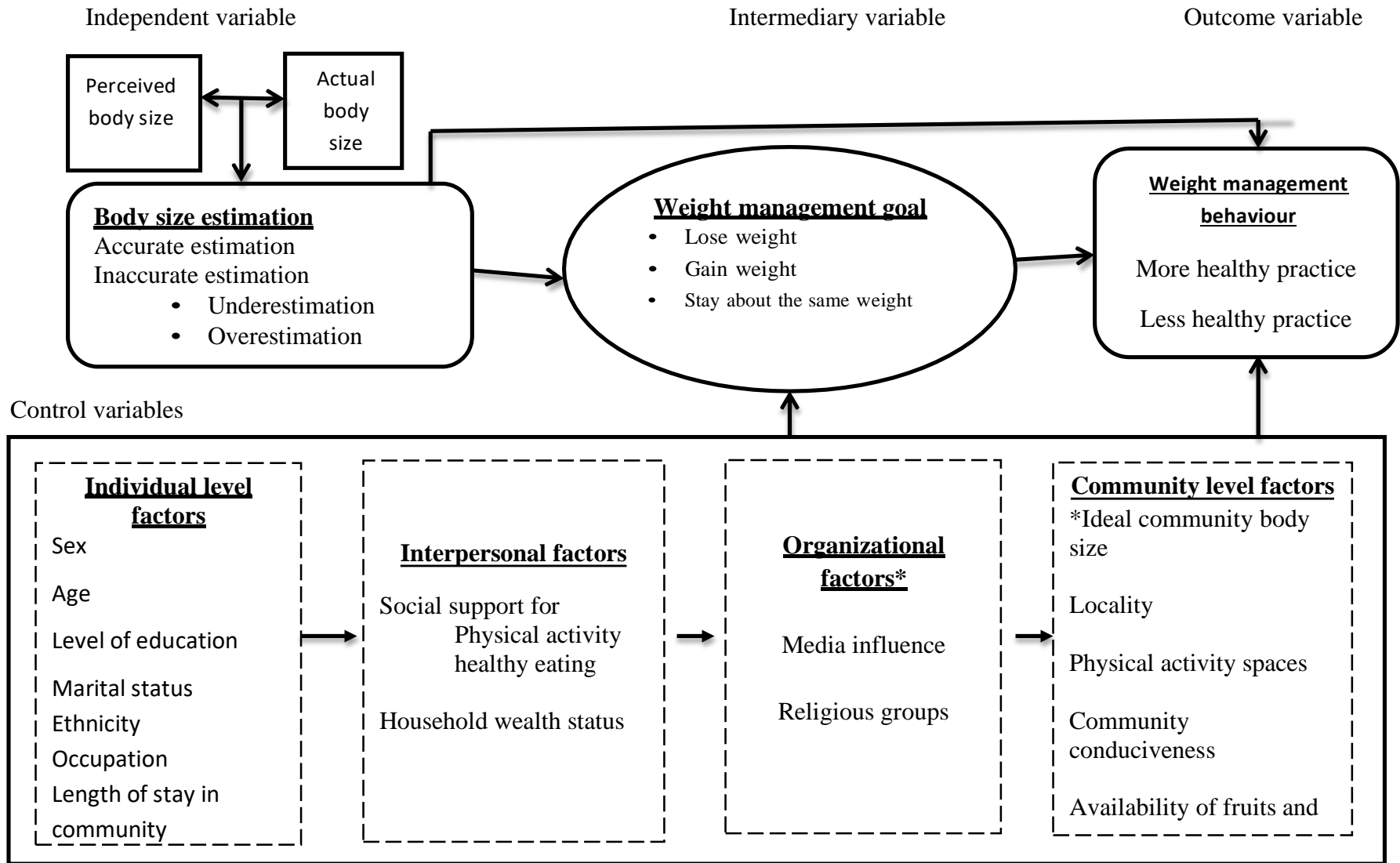


Figure 2. 2: A conceptual framework showing the influence of individual, interpersonal, organisational and environmental factors on weight management behaviour based on the socioecological model.

Source: Author's construct (2017) based on the socioecological model * Variables were explored using qualitative data

In the framework, weight management behaviour is conceptualised as an outcome which is influenced by individual, interpersonal, organisational, and community/environmental factors. The key independent variable considered in this study is body size estimation. This was derived by comparing the respondents' perceived body size to their actual body size (BMI status). An individual may accurately or inaccurately estimate his/her body size. Inaccurate body size estimation increase the likelihood of engaging in unhealthy weight management behaviours compared to having an accurate estimation of one's body size (Park, 2011). Therefore, in this study, it is expected that respondents who inaccurately estimate their body sizes will have a lower likelihood of engaging in more healthy practices compared to those who accurately estimate their body size.

Regarding the intermediary variable, individuals who have a goal to gain weight have been found to engage in unhealthy weight management practices such as the use of diet pills, overfeeding, no physical activity and medications that induce fat (Rguibi and Belahsen, 2006). It is expected that individuals who desire to gain weight will engage in less healthy practices compared to those who desire to stay about the same weight.

Based on the review of the literature, some individual level variables such as sex, age, marital status, level of education, ethnicity, occupation and length of stay in the community influence engagement in weight management behaviour. For example, sex differences in weight management behaviours have been recognized in the literature. Generally, females are more concerned with weight loss and hence engage in varieties of behaviours such as dieting, skipping meals, increased physical activity and the use of diet pills (Kuan et al., 2011). It is hypothesised that compared to males, females are less likely to engage in more healthy weight management practices.

Education has a positive influence on health behaviours (Simsek et al., 2014). Therefore, it is expected that compared to respondents who have no formal education, those with secondary and higher education will have a higher likelihood of engaging in more healthy practices. Being unmarried has been reported to be associated with engaging in weight management especially as they search for a spouse (Averett et al., 2008). Therefore, it is hypothesised that respondents who are married or cohabiting are less likely to engage in more healthy weight management practices compared to those never married. With respect to occupation, individuals into vigorous intensive jobs are documented to have a lower body mass index (Amoah, 2003). It is therefore hypothesised that compared with respondents who are unemployed, those with vigorous intensity jobs such as manual work are more likely to engage in more healthy practices.

Individuals who have lived in the study community for less than 5 years or 5 to 10 years are expected to engage in more healthy practices compared to those living there for more than 10 years. This group of people are likely to be migrants and as highlighted by the concept of healthy-migrant effect, migrants are more likely to have better health and health behaviours than individuals who have lived in the host community since birth (Dias et al., 2013).

Organisational groups can educate members about physical activity, nutrition and also encourage them to make better personal choices. Therefore, persons who associate themselves with social organisations such as religious groups tend to engage in better health behaviours such as intake of healthy diet, participating in physical activity, avoidance of alcohol and tobacco and better quality sleep compared to those with no organisational groups (Hill et al., 2007).

Media influence also plays a vital role in weight management. Frequent reading of magazines about weight loss has been reported to be associated with a higher likelihood of engaging in unhealthy weight management behaviours (van den Berg et al., 2007). Media influence and support from religious organisations on weight management were examined using qualitative approaches.

Social support for physical activity and healthy eating and household wealth status were considered at the interpersonal level as control variables. Social support from significant others helps to initiate and maintain weight management (Gellert et al., 2011; Kiernan et al., 2012). Lack of motivation from these key people may create a barrier to the initiation and maintenance of weight management (Verheijden et al., 2005; Yaemsiri et al., 2011). Therefore, the more an individual receives encouragement from family or friends to eat healthy, the higher the likelihood for him/her to engage in more healthy weight management practices. Furthermore, studies have demonstrated that healthy weight management behaviours are more likely to be practiced by individuals of higher wealth status than those of lower wealth status (Drewnowski, 2010).

Variables such as community's ideal body size, physical activity spaces, locality, community conduciveness and availability of fruits and vegetables in the community were considered as factors within an individual's community or environment which may influence weight management behaviours. In societies where fatness is cherished, people are more likely to value fatness and therefore subscribe to behaviours that encourage weight gain (Christakis and Fowler 2007). Similarly, there is a higher tendency to value thinness and weight loss in societies which consider thinness as the ideal body size (Wardle et al., 2006). Community's ideal body size and its influence on weight management were examined using qualitative approaches.

In addition, availability and accessibility of facilities such as recreational centres, parks, walkways increase the likelihood for individuals to be physically active (Deliens et al., 2015). Also, individuals are more likely to participate in outdoor physical activity if they feel safe in their communities (Bennett et al., 2007). Finally, individuals are more likely to consume fruits and vegetables provided they have access to them in their communities (Dake et al., 2016).

2.12 Hypotheses

- Respondents who inaccurately estimate their body size are less likely to engage in more healthy weight management practices compared to those who accurately perceive their body size.
- Respondents who have a goal to lose weight are more likely to engage in more healthy practices compared to those who intend to stay about the same weight.

2.13 Summary

In summary, the literature on weight management shows diverse behaviours are used in an attempt to manage weight. The behaviours may be healthy or unhealthy and are basically influenced by an individual's perceptions about body size or actual body size. There is evidence of variations in weight management behaviours and the variations are partly explained by an individual's socio-demographic characteristics such as sex, age, marital status, education and wealth status. Other factors, including interpersonal, organisational and cultural environment, have also been documented as influencing weight management. While there is much evidence on the influence of body size perception and weight management in Western countries, there is scanty evidence in developing countries, particularly in sub-Saharan Africa countries. Generally, most of the available evidence are based on quantitative data, with focus mostly on females and individual level factors.

CHAPTER THREE

Study areas and Methodology

3.0 Introduction

This chapter has two main sections. The first section describes the study communities and the quantitative methods (including sampling, data collection and analysis techniques used). The second section gives a description of the qualitative methods including sampling, data collection and analysis techniques. The limitations of the study are discussed afterwards.

3.1 Study Areas

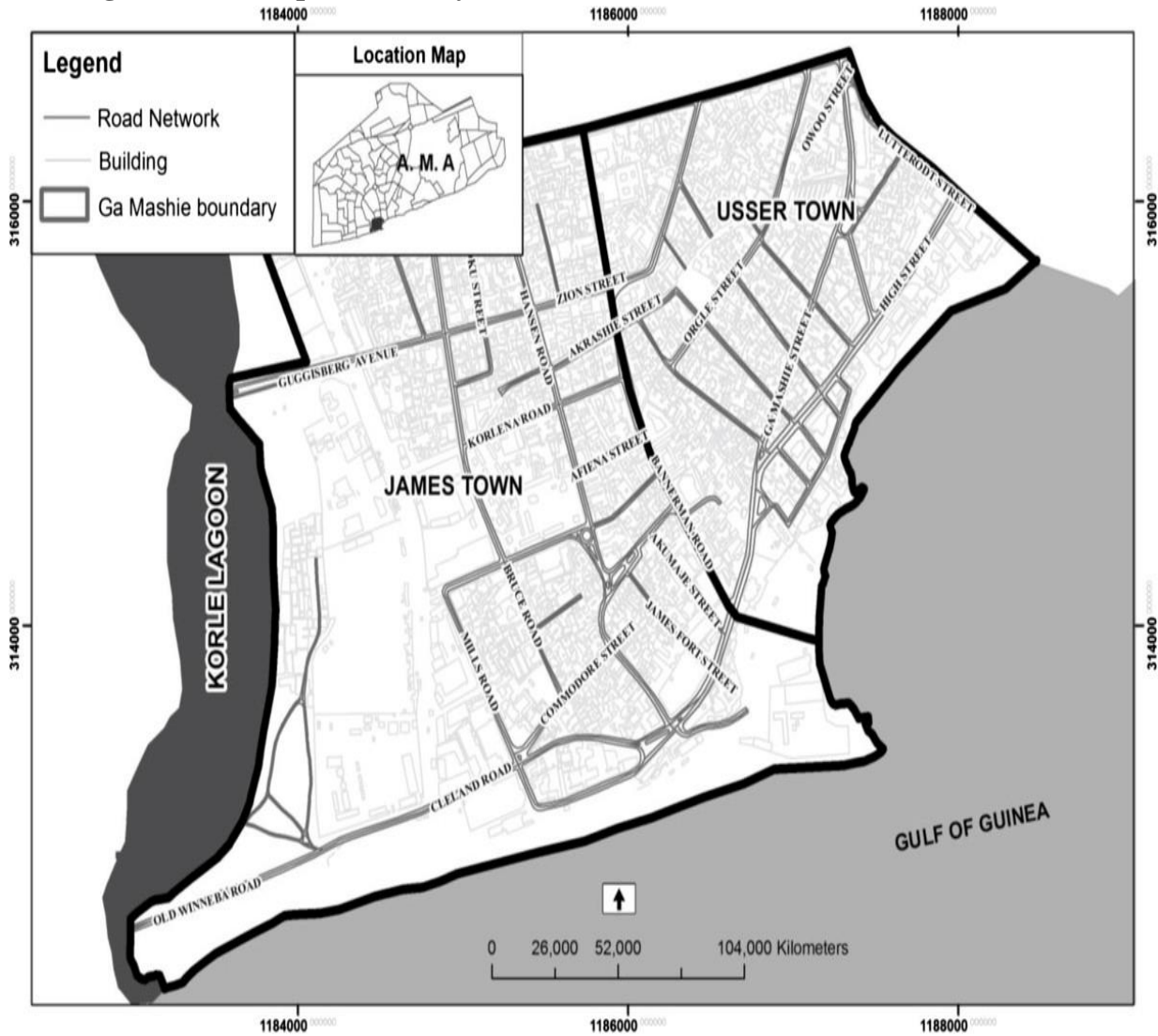
This study was conducted in two urban poor communities in Accra (Ussher Town and James Town) Ghana. These two communities are also known as Ga Mashie, meaning indigenous Gas. The main language spoken by these people is Ga and they practice the patrilineal system of inheritance (Ghana Statistical Service et al., 2014). Ga Mashie is located in the South of Accra, extending to the Atlantic ocean, and is bounded in the west by a lagoon, in the north by industrial area and in the east by business district (Gocking, 2005). (See Figure 2.3).

The study areas were chosen for various reasons. First, a high prevalence of obesity (41.8%) and associated consequences such as hypertension (28.3%), and diabetes have been reported in the communities (Awuah et al., 2014; Dake et al., 2016; de-Graft Aikins et al., 2014). Second, it is an indigenous and traditional community and therefore, serves as an important community to examine whether or not preference for larger body size are culturally entrenched (Duda et al., 2007; Mahama et al., 2011; Puoane et al., 2010).

Third, James Town and Ussher Town are formally labelled as urban poor communities in Accra (Owusu & Afutu-Kotey, 2010; AMA-UN-Habitat, 2011). A report by the Cooperative Housing Foundation International (CHF) (2010) indicates that out of 79 communities within Accra, Ga Mashie is one of the very high poverty zones (CHF, 2010). This was assessed based on five poverty indicators, including demographic characteristics, housing, urban services, economic and composite analysis. Also, the community's average household income of US\$ 3.5 per day is far lower than that of high-income areas, including Cantonment and Airport Residential (US\$ 294 per day) (CHF, 2010). Additionally, residents of Ga Mashie have poor housing structures, poor sanitation, and limited access to health care and low educational status (Mahama et al., 2011). Besides, the community is one of the most densely populated communities in Accra (Dake et al., 2016). The Population and Housing Census in 2010 recorded a population of 14, 279 for James Town and 28, 142 for Ussher Town (GSS et al., 2012).

Fourthly, the study areas are study sites for the Regional Institute for Population Studies and therefore there is prior knowledge about the culture and geography of the areas.

Figure 2.3: A Map of the study areas (James Town and Ussher Town)



Source: Oteng-Ababio (2014)

3.2 Quantitative methods

3.2.1 Sources of data and sampling design

The data for this study is primary, and was collected by the researcher from Ga-Mashie. It was a cross-sectional data gathered with quantitative and qualitative instruments. The convergent parallel mixed method was adopted for the data collection. This design enables the researcher to collect both the quantitative and qualitative data at approximately the same time and incorporates the information in the interpretation of the overall findings (Creswell, 2011). Triangulation of methods helps to expand the scope of the study, validates results and gives a broader understanding of the research problem better than what qualitative or quantitative approach alone does (Driscoll et al., 2007; Creswell and Clark, 2011). For instance, although quantitative methods have the power of generalization, it is weak in understanding the context of the respondents. The qualitative data thus help to understand the context of the study and also provides an explanation of the quantitative survey (Creswells and Clark, 2011).

In this thesis, the quantitative approach examined the significance of the association between body size estimation and weight management behaviours, using statistical measures while the qualitative approach examined perceptions that exist around body size and weight management.

The study adopted the sampling frame of the third wave of the Urban Poverty and Health Survey, which was conducted in October 2013 for selecting the sample for the study. The Urban Poverty and Health Survey is a research project undertaken by the Regional Institute for Population Studies (RIPS) at the University of Ghana. The aim of the project was to study health, demographic and environmental issues in an urban poor context and it was carried out in Ga Mashie.

The sampling frame consists of 2,769 households selected from 24 enumeration areas (EAs). James Town had eight EAs while Ussher Town had sixteen. These EAs were developed for the 2010 Population and Housing Census (PHC). The enumeration areas were chosen for varied reasons: they are representative of the study communities and there was prior knowledge about the culture and geography of the areas because of the variety of studies conducted previously in the EAs by RIPS. From the above sampling frame, a random number table was used to generate numbers for the sample selection for this study. A total of 305 households were randomly selected. Two household members were then selected from each of the selected households; this included the head of the household and any other member.

3.2.2 Determination of sample size

The study used Yamane's (1967:886) formula to calculate the sample size. This is a validated formula for sample size calculation (Isreal, 1992). It is a simplified way of computing sample size when there is not much information on the level of precision, the level of confidence or risk and the degree of variability in the attribute being measured (Miaoulis and Michener, 1976). It assumes a 95% confidence level, 0.5 level of variability and a 0.05 level of precision. It also considers the total population (N) in its sample size computation

Below is the formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size and e is the level of precision.

According to the 2010 Population and Housing Census (GSS, 2012), the total population of James Town was 14, 279 and that of Ussher Town was 28, 142. Therefore, the total population used for the sampling was 42,421. By substituting into equation 1, we have:

$$n = \frac{42421}{1 + 42421 (0.05)^2}$$

$$n = \frac{42421}{1 + 106.0525}$$

$$n = \frac{42421}{107.0525}$$

$$n = 396$$

Therefore, the estimated total sample size for the study was 396. However, at the end of the data collection, 395 individuals who answered all the questions participated in the study, thus, giving a response rate of 99.7%.

3.2.3 Eligibility criteria

This study was conducted among adults aged 18 years or above. In Ghana, a person is considered an adult when he/she is 18 years or older (The constitution of the Republic of Ghana, 1992). The adult population was chosen for this study because the incidence of obesity is reported to be more prevalent among adults than younger persons (World Health Organisation, 2016). Pregnant women and women lactating for less than 6 months were excluded from the study. This is because lactating and pregnancy may cause women to gain weight and this may bias the computation of their actual body sizes (BMI).

3.2.4 Definition of Terms

Obesity is an excess accumulation fat accumulation that may impair health (World Health Organisation, 2016).

Perception is an ideal, a belief or an image that you form as a results of how you can see or understand something (Oxford Dictionary, 2013).

3.2.5 Ethical approval

The study protocol was reviewed and approved by the institutional review board of the Ethics Committee for Humanities (ECH), University of Ghana on September 12, 2016 (ECH014/16-17). (See Appendix F). The protocol of the study was explained to each respondent and all the respondents gave their written consent to be voluntary participants in the study. They were assured that the information they provided would be treated confidentially and they could withdraw from the study at any time without facing any consequences. A sample of the consent form is provided in Appendix G.

3.2.6 Methods of data collection

A semi-structured questionnaire was used to solicit information on body size perceptions, weight management goal and behaviour and the socio-demographic characteristics of the respondents. Issues about social support for healthy eating and physical activity and the environmental characteristics of the respondents were also solicited. In addition, the weight and height of the respondents were taken. A sample questionnaire is provided in Appendix G.

The study instrument was administered face-to-face to the respondents in their homes by the researcher and five research assistants who have experience in conducting research. The researcher and the research assistants have been involved in several research works in the study communities and therefore had established a good rapport with the community members. A training session was organised for the interviewers during which the research instrument was reviewed. The training lasted

for two days. The data collection was administered in two local languages (Ga and Twi) that are widely spoken in the communities. The data collection lasted for a period of three weeks-beginning from 10th November to 1st December 2016. The questionnaire was piloted in Mamprobi, a community with similar characteristics as the study area. The pilot study helped the researcher to revise the questionnaire and interview guide.

3.2.7 Measurement of variables

3.2.7.1 Dependent variable

Weight management behaviour

The outcome of this study was measured as weight management behaviour. The variable was categorised as engaging in ‘more healthy practices’ and ‘less healthy practices’. Respondents were asked whether they were doing any of the following to manage their weight: intake of fruits and vegetables, consumption of less fatty and sugary foods, increasing physical activity, skipping meals, taking diet pills, consumption of fatty and sugary, and decreasing physical activity. Respondents were allowed to choose all options that applied to them.

Practices such as intake of fruits and vegetables, consumption of less fatty and sugary foods and increased physical activity are considered healthy while skipping meals, taking diet pills, consumption of fatty and sugary foods, and decreased physical activity are classified as unhealthy practices (Harring et al., 2010; Savage and Birch, 2010). Based on this, the responses were first numbered numerically by giving a score of 1 when any of the healthy practices was answered ‘Yes’, and 0 when answered ‘No’ (For example, with respect to intake of fruits and vegetables, respondents who chose ‘Yes’ were coded as 1 while those who responded ‘No’ were coded as 0). The unhealthy behaviours were also numbered

numerically by giving a score of 0 when answered 'Yes' and 1 when answered No (For example, skipping meals ----Yes [0], No [1]). Afterwards, a scale ranging from 1 to 7 was developed by summing up all the responses, and no respondent scored 0. This indicates that each respondent was engaging in at least one of the weight management practices. With a mean number of 4, those who fell below the mean (1-3) were classified as engaging in 'less healthy practice' while those who had a score of 4 and above were classified as engaging in more healthy practice.

3.2.7.2 Independent variable

Body size estimation

Body size estimation was used as the main independent variable for this study. This variable was derived from the respondents' perceived body size and actual body size (measured by Body Mass Index).

Regarding body size perception, it can be assessed using more than 40 instruments (Thompson et al., 1994). These instruments can be categorised into Figure Rating Scales (FRS) and questionnaires. However, the FRS has been identified as the most commonly used tool for the measurement of body image worldwide (Kostanski et al., 2004). It is a simple and low-cost instrument which does not require the use of high technology equipment (Kakeshita & Almeida, 2008).

The body size perception questions used for this study were adopted from the Research on Obesity and type 2 Diabetes among African Migrants: the RODAM study (Agyemang et al., 2014). It is one of the few body size perception measures which have BMI values assigned to the figural images. That is, the images correlate with the standard World Health Organisation BMI values. There are nine silhouettes that present sex-specific body sizes, ranging from underweight to obese. The figural images range from a BMI of 16 to 40 with constant increments of 3kg/m^2 . To help answer the questions, the study adopted

the Figural Stimuli developed by Pulvers et al. (2004) (Appendix I). This Figure Rating Scale measure was selected because it is an instrument developed for populations of African descents (Yepes et al., 2015). In addition, it is one of the few body size perception measures which have BMI values assigned to the figural images. That is, the images correlate with the standard World Health Organisation BMI values. There are nine silhouettes that present sex-specific body sizes, ranging from underweight to obese. The figural images range from a BMI of 16 to 40 with constant increments of 3kg/m^2 . The silhouettes are labelled A-I. Letter 'A' represents an underweight body image, 'B' and 'C' signifies a normal weight body image, the 'D' and 'E' images represent an overweight body image while 'F', 'G', 'H' and 'I' symbolize an obese body image. It is a similar measure for males and females (Appendix I). To assess the respondents' perceived body size, they were presented with the figural stimuli and were asked to indicate the body image which is most closely similar to their current body size (CBS).

Actual body size was measured using Body Mass Index (BMI). BMI is a measure of an individual's weight and height which is calculated by dividing a person's weight in kilograms by the square of his or her height in metres (kg/m^2) (WHO, 2004). It is an internationally accepted index for classifying adiposity in both adults and children and thus, enables comparisons between areas and across population sub-groups (National Obesity Observatory, 2009). BMI is a good measure of body size because it holds the authority of science and it is easy to compute and have been used in different studies (Boero, 2012).

Among adults, BMI is categorised as:

- Underweight ($<18.50\text{ kg/m}^2$)
- Normal weight (18.50 kg/m^2 - 24.99 kg/m^2)

- Overweight (25.00 kg/m²- 29.99 kg/m²)
- Obese (≥ 30.00 kg/m²)

In the computation of body size estimation, first, perceived body size and actual body size were coded numerically (0=underweight; 1=normal weight; 2=overweight and 3=obese) respectively. Afterwards, the difference between the values of perceived and actual body size was calculated. A score of zero indicated an accurate estimation of body size while score deviating from zero indicated inaccurate estimation of body size. That was further categorised as underestimation (negative scores) and overestimation (positive scores). Respondents with an underestimated body size viewed themselves as thinner than they actually were. On the other hand, those with an overestimated body size viewed themselves as bigger than their actual body mass index (Park, 2011; Quick et al., 2014).

3.2.7.3 Intermediate variable

Weight management goal

The mediating variable in the study is weight management goal. This was derived from the question: “During the past 12 months, what have you been trying to do about your body weight? Response choices included “1=lose weight”, “2=gain weight”, “3=stay about the same weight”

3.2.7.4 Control variables

The study controlled for some variables to help examine the independent effect of body size estimation on weight management behaviours. The control variables included individual, interpersonal and community level variables.

The individual level variables included socio-demographic characteristics such as sex, age, level of education, marital status, ethnicity, occupation and length of stay in the community. The sex of the respondents was a categorical variable (1=male, 2=female). Age was also measured categorically (< 30 years, 30-39 years, 40-49 years, 50-59 years and 60 and above). The highest level of education attained by the respondents was measured categorically as 1=no education, 2=primary education, 3=middle or junior high, 4=secondary and above. Marital status was classified as 1=never married, 2=currently married, 3=cohabiting and 4= divorced/separated/widowed. The ethnic affiliation of the respondents was categorically measured as 1=Ga, 2=Akan and 3=other ethnic group. The ‘Other ethnic group’ comprise of Ewe, Mole Dagbani, Guan and Hausa. Length of stay in the study community was also a categorical variable (< 5 years, 5-10 years and >10years).

Social support for healthy eating and participation in physical activity and household wealth status were the variables considered at the interpersonal level. The Social Support and Eating Habits Survey (10 items) and the Social Support and Exercise Survey (13 items) developed by Sallis (1987) were adopted to measure the respondents’ perceived support from family and friends for healthy eating and physical activity (Appendix G). Each measure has a 5-point Likert scale (1= none, 2 = rarely, 3 = a few times, 4 = often, 5 = very often) which determines the frequency of social support provided by family and friends in the last 3 months preceding the survey.

Social support for physical activity and diet were coded differently for family and friends. With respect to social support for eating habits, items 1-5 were summed to generate a composite score indicating “encouragement” (from family/friends) to eat healthy. On the other hand, a composite score of items 6-10 was generated to signify “discouragement” (from family/friends) to eat healthy (Appendix G). Among the items representing encouragement are: “Reminded me not to eat high fat, high salt foods”

and “Complimented me on changing my eating habits (“Keep it up”, “We are proud of you”). With reference to discouraging support for healthy eating, items included “Offered me food I'm trying not to eat” and brought home foods I'm trying not to eat”.

Social support for physical activity was measured by summing items 11-16 and 20-23 to create composite scores representing “participation” for both family and friends. Among the items representing support for participation in physical activity include “Discussed exercise with me” and “Exercised with me” (Appendix G).

The wealth status of a household was computed using nineteen household assets such as car, bicycle, boat/canoe, truck, an outboard motor, fishing net, gas/electric stove, refrigerator, freezer, generator, iron, computer, washing machine, radio, television, mobile phone, sofa, sewing machine, and clock. These items have been validated for the measure in previous studies. Using the above listed household items, the wealth index was computed using a factorial analysis. The analysis generated a factor score. The score was then divided into five parts, using a tool called visual binning. These quintiles are the standard categories of wealth index (Poorest, Poorer, Middle, Richer and Richest). These were re-categorised as, Poor=1, Middle=2 and Rich=3 due to fewer proportions of the categories.

The community variables which were used as control included the locality, availability of physical activity spaces, availability of fruits and vegetables and community conduciveness for physical activity. Locality was categorised as 1=James Town and 2=Ussher Town. The availability of physical activity spaces was classified as 1=available, 2=unavailable. Respondents were asked to rate how conducive their community is for physical activities (1=very conducive 2=somewhat conducive 3=not conducive). Availability of fruits and vegetables was also classified as 1=available and 2=unavailable. The

influence of media and religious organisations on weight management was explored qualitatively in this study by examining how these organisations influence weight management.

3.2.8 Methods of data analysis

Descriptive statistics including frequencies and percentages were used to describe the characteristics of the respondents. This included their individual, interpersonal and community characteristics as well as their BMI, body size perception, body size estimation, weight management goal and weight management behaviour. Also, Cramer's V, Phi test and Contingency coefficient were used to assess the relationship between body size estimation and weight management goal as well as weight management behaviour. The Cramer's V was used to test the association among the variables with unequal matrices. For a 2 x 2 matrix, a Phi value was used to assess the association between variables. A contingency coefficient value was used in the case of a 3x3 matrix. The intensity of the associations was not discussed because of the regression model applied in the study.

In addition, associations between the individual (age, sex, marital status, education, ethnicity, occupation and length of stay in community), interpersonal (household wealth status) and community variables (locality, community conduciveness availability of physical activity spaces and availability of fruits and vegetables) and weight management goal and behaviours were examined. One way ANOVA was used to compare means of social support and weight management goal. Independent T-test was also used to compare means of social support and weight management behaviour. The difference in means score were used to determine the social network indicator that influenced weight management goal and weight management behaviour among the respondents.

Logistic regression modelling was employed to assess the influence of body size estimation on weight management behaviours while controlling for other variables. This modelling was used because the outcome variable was treated as a categorical variable with two outcomes. Seven models were built: The first model examined the independent effect of body size estimation (with categories 1=accurate estimation and 2= inaccurate estimation) on weight management behaviours. In Model 2, the relationship between body size estimation and weight management behaviours was examined while controlling for weight management goal. In Model 3, individual level factors were included and interpersonal level factors were introduced in Model 4. Model 5 assessed the influence between body size estimation and weight management behaviours, controlling for individual, interpersonal and community variables.

In Model 6, respondents who accurately estimated their body size were excluded from the analysis. This reduced the sample size to 175 respondents. The model therefore only considered respondents who inaccurately estimated their body size (i.e. 1=underestimation and 2=overestimation). The justification for this was to find out management practices differ among individuals with inaccurate body size estimation.

In Model 7, respondents who accurately estimated their body size were included in the analysis. The model therefore considered all three categorisation of body size estimation (i.e. 1=accurate estimation, 2=underestimation and 3=overestimation). In this model, the respondents' BMI status was taking into consideration. For instance, the model sought to find out the weight management practices of overweight respondents who underestimated their body size compared to their counterparts who accurately estimated their body size. This was performed with the knowledge that weight management is not only based on perceptions about body size but also actual body size. Individuals who are overweight or obese, but underestimate their body size may have different weight management practice

compared to those who accurately estimate their body size. The proportion of the respondents who were underweight was small and therefore, the underweight category of BMI was combined with normal weight and considered as not overweight. Also, overweight and obese categories were combined and classified as not overweight (i.e. not overweight and 2=overweight). All associations were tested at 95% confidence level using Statistical Package for Social Sciences (SPSS).

3.3 Qualitative methods

3.3.1 Methods of data collection

In order to examine issues on social processes and community norms, focus group discussions (FGDs) were held on community perceptions and preferences of body size, barriers and facilitators of weight management and benefits of weight management. A semi-structured interview guide was used (Appendix H). The focus groups were segmented by age (younger adults-18-35 years; older adults 36 years and above) and sex (males and females). Eight focus group discussions were held with 44 individuals to gather shared knowledge of body size and weight management. The group discussions were conducted by trained field assistants in the local dialect (Ga and Twi) and were conducted in settings in the community where noise was minimal. The discussions lasted for an average of 38 minutes and were tape recorded.

In addition, fourteen individual interviews were conducted to examine an individual's knowledge on body size perceptions and weight management. The number of interviews was determined when the saturation of views was reached in the field. Respondents for the individual interviews were recruited from the survey sample. This was done to obtain a homogenous sample of respondents with similar backgrounds and experiences related to weight management (Metzgar et al., 2015). Every individual

who participated in the survey qualified for the in-depth interviews. However, those who were selected were based on their availability and willingness to participate in the interview.

3.3.2 Analysis of the qualitative data

In analysing the qualitative data, the audio recordings were prepared by transcribing texts from the narratives. The transcriptions were done verbatim from the languages in which the interviews were conducted (Ga and Twi) to English. The transcripts were repeatedly read in order to familiarise with the data and codes were developed with the aid of Atlas ti 7 software. The codes were then developed into themes (global, organising and basic themes) in a coding frame (Appendix D and E). A thematic network is presented to examine the perception of weight management among the sample.

3.4 Characteristics of the qualitative interview participants

Table 3.1 shows the characteristics of the respondents who participated in the focus group discussions (FGDs). The total number of the respondents were 44, out of which more than half (25) were males and half (22) were aged within 18-35 years. Twenty-one out of the 44 respondents had attained middle or Junior High school, 14 had secondary education and a few (two) had higher education. The Body Mass Index status (BMI) of the respondents indicates that half (22) of them had normal body size, twenty were overweight or obese and two were underweight. Thirty-two of them intended to stay about the same weight while 10 of them wanted to lose weight and two wanted to gain weight.

At the individual level, 14 interviews in all were held. More interviews were conducted with females (eight) than with males (6). An equal number (seven respectively) was held with younger and older adults. The educational characteristics show that four of the respondents had middle or JHS education; three had higher education while two had no education. The BMI status indicates that nine of them

were overweight or obese, four were normal weight and one person was underweight. Seven of the respondents wanted to stay about the same weight, five wanted to lose weight and two desired to gain weight (Table 3.1).

Table 3. 1: Characteristics of respondents who participated in the qualitative study

| Characteristics | Focus Group Discussion (Total Number=44) | Individual interviews (Total Number =14) |
|-------------------------------|---|---|
| Sex of respondents | | |
| Males | 25 | 6 |
| Females | 19 | 8 |
| Age | | |
| 18-35 | 22 | 7 |
| 36-71 | 22 | 7 |
| Level of education | | |
| No education | 5 | 2 |
| Primary | 4 | 3 |
| Middle/JHS | 21 | 4 |
| Secondary | 14 | 2 |
| Higher | 2 | 3 |
| Body mass index | | |
| Underweight | 2 | 1 |
| Normal weight | 22 | 4 |
| Overweight | 13 | 4 |
| Obese | 7 | 5 |
| Weight management goal | | |
| Lose weight | 10 | 5 |
| Gain weight | 2 | 2 |
| Stay about the same | 32 | 7 |

3. 5 Perceptions of obesity and weight management

The narratives on obesity and weight management are presented under a global theme called “Obesity and weight management perceptions”. The global theme is connected to four organising themes, namely: (1) community’s perception and preferences for body size (2) barriers to healthy weight management, (3) facilitators of weight management and (4) benefits of weight management. The organising themes were derived from basic codes which emerged from quotes of statements made by the respondents. Individual interviews (IIs) were conducted to examine the individual’s perception

about obesity and weight management while focus group discussions (FGDs) were organised to examine the community ideas about obesity and weight management. The themes that emerged from the IIs and FGDs were discussed together. The findings are mixed into the quantitative discussions in the subsequent chapters. That is, the qualitative interview accounts were used to explain the quantitative findings.

3.6 Limitations of the study

The study had some limitations that are worth noting. First, the study is cross-sectional in nature and a cross-sectional study does not allow inferences to be drawn with respect to the causal relationships among variables. To establish causality, a longitudinal study is required.

Second, an individual's health status, particularly having chronic non-communicable diseases such as hypertension and diabetes may influence his/her weight management behaviours. However, data on the respondents' health status were not captured in this study.

Another limitation is the possible error with the computation of the body weight estimation. The perceived body size using the silhouettes was measured as a whole number while the actual body size was measured as a decimal number. The difference between the two body size measures may not give the real representation of the disparity for a respondent due to the dissimilarities in the nature of the measures.

In spite of these limitations, the findings from this study hold true and provides vital recommendations to help curb the incidence of obesity.

CHAPTER FOUR

Body size estimation, weight management behaviours and characteristics of the study participants

4.0 Introduction

This chapter first describes the respondents' estimation about their body size and their weight management goals/behaviours. The characteristics of the study respondents are also described. First, the respondents' levels of body size estimation, weight management goal and weight management behaviour are described and discussed. Also, individual level factors such as sex, age, marital status, educational attainment, ethnicity, occupation and length of stay in community are described. For interpersonal factors, the characteristics described include household wealth status and social support for physical activity and healthy eating. Community level factors such as locality, community conduciveness for physical activity, availability of physical activity spaces and availability of fruits and vegetables are also described and discussed.

4.1 Perceived current body size

The results in Table 4.1 indicate that about two out of every five (39.2%) of the 395 respondents perceive their body size as overweight, a third (30.4%) consider their body size as normal weight and more than one-fourth (27.3%) of them perceive their body size as obese. Three percent also have the perception that they are underweight.

Table 4.1: Percentage distribution of respondents by perceived current body size

| Perceived current body size | Percentage (%) | Number |
|-----------------------------|----------------|------------|
| Underweight | 3.0 | 12 |
| Normal weight | 30.5 | 120 |
| Overweight | 39.2 | 155 |
| Obese | 27.3 | 108 |
| Total | 100.0 | 395 |

Source: Field survey, November-December 2016.

4.2 Body mass index (BMI) of the respondents

Table 4.2 shows the distribution of the respondents according to their BMI status. Overall, the mean BMI of the respondents is 28.5 kg/m^2 . This indicates that on the average, the study population is overweight. Specifically, one out of every three persons (33%) is obese, and about one out of every four persons (24%) are overweight. Also, thirty-eight percent of the respondents have normal body weight and about 5% are underweight. The results also indicate that on the average, obesity is more prevalent among females (*Mean BMI* = 30.2 kg/m^2) than males (*Mean BMI* = 25.2 kg/m^2).

Table 4.2: Percentage distribution of respondents by BMI status

| Body Mass Index (BMI) | Percentage (%) | Number |
|---|----------------|------------|
| Underweight | 4.6 | 18 |
| Normal Weight | 38.5 | 152 |
| Overweight | 24.1 | 95 |
| Obese | 32.9 | 130 |
| Total | 100.0 | 395 |
| Mean BMI (All) = 28.53 kg/m^2 Standard deviation = 9.93 Mean BMI (females) = 30.2 kg/m^2 Mean BMI (males) = 25.2 kg/m^2 | | |

Source: Field survey, November-December 2016.

The incidence of overweight and obesity (57 percent) found in this study is higher than the national prevalence of 43 percent reported by Ofori-Asenso et al. (2016) in their systematic review. The prevalence is also higher than what was reported by Dake et al. (2016) in the study area (41.7 percent). However, it is comparable to that of the Greater Accra Region (57 percent) (GSS et al., 2014). The sex difference in the prevalence of overweight and obesity found in this study is comparable to the prevailing global and urban poor sex disparities which shows higher overweight or obesity prevalence among females than males (Ettarh, 2013). The sex difference has been attributed to biological, behavioural and socioeconomic factors (Garawi et al., 2014). For instance, females are said to have greater adipose stores that help in the storage of fat than its mobilisation compared to males (Power & Schulkin, 2008). Also, females engage in lower levels of physical activity compared to males (Garawi et al., 2014).

In addition, the high prevalence of overweight and obesity found among the sample and also among females could be explained by the community's preference for fatness and the expectation of females in particular to be fat which were highlighted in the qualitative narratives.

4.2.1 Community's ideal body size

When the respondents were asked about the community's ideal body size, there was a consensus among the respondents that fatness is the body size which is cherished in the study communities. They indicated that the community cherish people with enough body-overweight or obese. This perception was highlighted in both the men and women's group.

“In this community, we value people who are fat and so they take in medicines to gain weight. If she does not gain weight how will a man be interested in her? If you are able to gain weight the men will be interested in you and you will be happy in the community” (FGD2, older women, James Town).

“We value fatness. The word big is an understatement, but someone who is extremely big. Someone who is more than overweight: someone who eats a lot”. (FGD 3, younger men, James Town).

“What I have seen in this community is that they cherish body; they cherish someone who is heavy and fat. A female who has buttock. And for a man if you are macho the women love you very much. This is because I had a macho friend, they were two but one is dead. When ever we walked together they get women faster than I do” (II overweight older man, Ussher Town).

The respondents also mentioned that generally females are expected to grow fat compared to males.

Males are however expected to look muscular.

“Yes, the females are to be fat, that is, they must have enough body so that the breast and the hips must come out big and the guys must look muscular” (FGD3, younger men, Ussher Town).

“Women are expected to weigh more than men. When a man grows bigger he is considered a fool” (II, an obese older woman who wants to lose weight).

“The women living in this community prefer a man who is tall. Muscular and well-built so that when he appears everyone will catch a glimpse of him. But when you go for a man who is slim and short, the women will take you for a ride (II, Obese older woman, ussher Town).

“When a slim man see a macho man he says, aaah, when will I become like this?” (II, Overweight older man, James Town)

In addition, the respondents reported that the community’s preference for fatness and expectation for females to be fat compelled some females in the community to take in medicines to enable them gain weight. These medications included ‘Bro. O.T’, ‘Dexacortin’, ‘Paratin, ‘Apetamin blood tonic’, and ‘Donewell blood tonic’. In some instances, these medications are mixed together and sold to individuals to stimulate hunger and longer sleeping hours, therefore, inducing weight gain

“The majority of the girls use non-prescribed medicines to put on extra weight because they want to attract men. When you take a critical look at them you will know that this is not fatness as a result of eating healthy food” (FGD 3, younger men, James Town).

“Yes, there is an ideal body size for everyone to have but the medicines they are taking are making them grow huge and fat. They are taking drugs to grow fat. That has become the order of the day” (II, an overweight older woman, Ussher Town).

“it is really worrying that many people are taking medicines to gain weight just because they see that their friends have also gained weight. Some of these medicines are not used for their purpose. For example, dexacortin is a drug meant for asthmatic patients, however, people are taking all of that and there are side effects so I support my sister when she says they should be banned” (FGD4, younger women, James Town).

The findings from the qualitative study clearly show that societal perception about ideal body size (fatness) has the tendency of increasing the risk of obesity and inaccurate body size estimation.

4.3 Body size estimation

The results presented in Table 4.3 indicate that more than half (56%) of the 395 respondents accurately estimated their body size. However, more than two-fifths (44.3%) had inaccurate estimation of their body size. Among those who inaccurately estimated their body size, close to one-fourth (24.6%) of them underestimated their body size while about one-fifth (19.7%) overestimated their body size. There was no statistically significant difference between the sexes with respect to body size estimation.

Table 4.3: Percentage distribution of body size estimation among the study sample

| Body size estimation | Percentages (%) | | |
|-----------------------|-----------------|-------------------------|-----------------|
| | ALL (N=395) | Males (N=129) | Females (N=266) |
| Accurate estimation | 55.7 | 53.5 | 56.8 |
| Inaccurate estimation | 44.3 | 46.5 | 43.2 |
| • Underestimation | 24.6 | 26.3 | 23.7 |
| • Overestimation | 19.7 | 20.2 | 19.5 |
| | | <i>Cramer's V=0.033</i> | <i>P=0.804</i> |

Source: Field survey, November-December 2016.

The finding of inaccurate body size estimation is comparable with other studies in sub-Saharan Africa (Alwan et al., 2011; Lahmam et al., 2008) and elsewhere (Bhanji et al., 2011; Yayawardena et al., 2013; Dorosty et al., 2014). The authors reported a high prevalence of body size underestimation particularly among all adults in different categories of Body Mass Index (BMI) and body size overestimation among normal weight individuals.

Inaccurate body size estimation could be the results of body size comparison. It has been shown that people base their body size perceptions and estimations on the body size of significant others or community's ideal body size. Perceptions about body size are influenced by the imagined appearance of one's self to others, the judgment associated with the appearance, and feelings of embarrassment or pride following those perceptions (Hoover, 1984 cited in Kemper et al., 1994).

As shown above, the community's ideal body size is fatness. Therefore, it is plausible that the respondents who underestimated their body size may have compared themselves to the community's ideal body size or individuals in the study community who are bigger than they are, and thus, underestimated their body size. Similarly, those who overestimated their body size may have compared themselves with others who are smaller in size than they are and thus considered themselves bigger. Inaccurate body size estimation is a risk factor for unhealthy weight management behaviours, and thus, has implications for health. Underestimation of body size may reduce the motivation for overweight or obese persons to lose weight and may motivate normal weight persons to gain weight. This may subsequently lead to further weight gain and thus increase risks for chronic non-communicable diseases. Also, overestimation of body size may motivate individuals who are underweight or normal weight to lose weight, which will negatively affect their health (Dorosty et al., 2014).

4.3.1 Benefits of weight management

Benefits of weight management were discussed under six basic themes. These include: (1) ‘reduce risk of diseases’; (2) ‘encourages physical movements’; (3) ‘promotes longer life’; (4) ‘prevents tiredness’ (5) ‘enables one to wear fashionable clothes’ and (6) ‘helps maintain clothes for longer periods’. The theme ‘reduce risk of diseases’ emerged as the dominant basic theme.

First, there was the perception that it was beneficial for an individual to manage his or her weight in order to prevent diseases because fatness increases one’s risk of diseases such as diabetes, hypertension, high cholesterol, and knee and waist pains.

“Health wise, it is good to manage weight because excessive weight is associated with cholesterol, blood pressure, diabetes, and the rest. You will therefore prevent all these when you have normal body size” (FGD 8, younger women, Ussher Town).

“The women also face challenges when they become overweight. When they get to a certain age their waist, knees and ankles start disturbing them. They will say their waist has become heavy, so it is not good to be overweight, you have to have a normal weight” (II, overweight older man, desires to stay about the same).

“Being fat is not a good thing because it comes with all sorts of illnesses” (FGD4, Younger women, James Town).

Secondly, the respondents mentioned that it was beneficial to manage weight in order to encourage physical movements such as walking. This is particularly peculiar to fat people since it was discussed that fatness restricts physical movements:

“Most of them (fat people) cannot walk. When they sit at one place for long, they find it difficult to move around. If they have something and it falls, they must call someone to pick it up for them (II, obese older woman, wants to lose weight).

“I think it is very beneficial to manage your weight. When you are of normal weight, walking about and going about your normal duties will not become a problem. I have been overweight before. I came back from abroad and became overweight. So I think it is good to maintain a normal body weight. This will help us to go about our normal body duties briskly (FGD 1, older men, James Town).

“Fatness is not good at all. You will have challenges in walking” (FGD4, Younger women, James Town).

Thirdly, longer life was stated as a benefit of weight management. The respondents shared that managing one’s body weight through exercising for instance, has the tendency of maintaining a healthy life and prolonging one’s life.

When you manage your body weight, you are able to stay healthy and live longer. When you engage in exercises, you are able to stay longer even though God is the giver of life” (FGD 5, older men, Ussher Town).

“If you can manage your weight you will live longer even though we will all die. So I think exercising to manage our weight will help us live longer” (FGD 3, younger men, James Town).

“If you are able to have a healthy body size, you able to live a longer life” (FGD5, Older men, Ussher Town).

Also, some of the respondents perceived that weight management reduces tiredness, when performing an activity. In other words, weight management enhances physical fitness.

“When you manage your weight, it does not make you get tired quickly when performing an activity. This is because you have a normal weight” (II, overweight young man, desire to stay about the same).

“When you are too slim, yeah, you cannot engage in works that you are expected to do. Instead of you to be more energetic, you become tired easily. I think these are some of the reasons to manage your weight” (II, normal weight young man, wants to gain weight).

Additionally, weight management enables a person to wear fashionable clothes, particularly ‘fitting’ (tight) clothes. In the younger women’s group there was a perception that managing one’s weight helps in losing excess fat and so it makes one to look attractive. In this regard, they are able to wear fashionable clothes.

“When you manage your weight you always look attractive in appearance. But when you gain excess weight with a big stomach, you cannot wear the fashionable dress called ‘fitting’. The big stomach becomes a threat to the dressing so sometimes the

weight management gives you a flat stomach to dress easily. There are some dresses that you would like to wear, but when you pick them you realize you cannot wear them” (FGD 8, younger women, Ussher).

Further, weight management helps an individual to keep his or her clothes for longer periods without buying new ones. This is because the person does not gain or lose weight hence can fit into his or her old clothes.

“Uhhh, nowadays the economic condition is bad, it’s difficult to get money so with a normal body size I am able to use my clothes and wear them to places I desire to go. Not long ago I built up a little and some of my clothes became smaller and I didn’t have money to buy new ones. As a result, I lost interest in training to build up. So, that has led to my current body size. Eeeh, at first I could not wear my clothes and I did not have money to purchase new ones. And I had new clothes I had not worn so I had to reduce in order to wear them” (II, an overweight older man, wants to stay about same).

4.4 Weight management goal

More than a half (58.5%) of the respondents reported that they desire to stay about the same weight while approximately 30% desire to lose weight. Also, a little above one-tenth (11.9%) intend to gain weight (Table 4.4). Statistically, there was a significant difference between the sexes with respect to weight management goals ($P=0.001$). However, the Craver’s V value of 0.195 indicated that the association is weak. More females (33.5%) intended to lose weight than males (21.7%). On the other hand, a higher proportion (20.2%) of males intended to gain weight compared to females (7.9%).

Table 4. 4: Percentage distribution of the respondents by weight management goal

| Weight management goal | Percentages (%) | | |
|----------------------------|-----------------|-------------------------|-----------------|
| | ALL (N=395) | Males (N=129) | Females (N=266) |
| Lose weight | 29.6 | 21.7 | 33.5 |
| Gain weight | 11.9 | 20.2 | 7.9 |
| Stay about the same weight | 58.5 | 58.1 | 58.6 |
| | | Cramer's V=0.195 | P=0.001 |

Source: Field survey, November-December 2016.

The finding that more than half of the respondents desired to stay about the same weight and close to 12% intended to gain weight is alarming considering the high prevalence of overweight and obesity among the sample. It is also thought-provoking based on the findings from the qualitative interview account indicating that the respondents are knowledgeable about the benefits of weight management. This finding may be as a result of the community's perceptions about body size: fatness is cherished and desirable in the community while loss of weight or slimness is abhorred and associated with ill-health, poverty and other derogatory terms.

Similar findings have been reported in South Africa where women indicated preference for overweight. Thinness was stigmatised with HIV/AIDS while larger body size was considered desirable (Matoti-MvaloT and Puoane, 2011; Puoane et al., 2010). Contrary, finding from the Carr and Friedman's study (2005) in the United States of America among adults reported that overweight and obese individuals were more likely to encounter interpersonal and employment discrimination compared to normal weight individuals. Overweight and obese persons therefore reported lower levels of self-acceptance. This indicates that the concept of obesity is different across cultures and thus influences weight management differently.

4.5 Weight management behaviours

Table 4.5 and Table 4.6 present information on the weight management behaviours of the respondents. Table 4.5 indicates that practices such as skipping meals (57.5%), consumption of fatty and sugary foods (49.9%), increasing physical activity (41.8%) consumption intake of fruits and vegetables (40.3%) and consumption of less fatty and sugary foods (30.4%) were more common among the respondents. Other practices that were less common included decreasing physical activity (7.3%) and intake of diet pills/medications (9.1%). Generally, the respondents engaged in more healthy practices (60.3%) than less healthy practices (39.7%). There was no difference between the sexes with respect to Weight management behaviours (Table 4.6).

Table 4.5: Specific weight management behaviours

| Weight management behaviour | Percentage reporting | |
|--|-----------------------------|---------------|
| | Yes (%) | Number |
| Consumption of less fatty and sugary foods | 30.4 | 120 |
| Increasing Physical activity | 41.8 | 165 |
| Intake of fruits and vegetables | 40.3 | 159 |
| Taking diet pills/medications | 9.1 | 36 |
| Skipping meals | 57.5 | 227 |
| Consumption of fatty and sugary foods | 49.9 | 197 |
| Decreasing physical activity | 7.3 | 29 |

Source: Field Survey, November-December 2016.

Table 4.6: Percentage distribution of weight management behaviours

| Weight management behaviours | Percentage (%) | | |
|------------------------------|----------------|--------------------------|-----------------|
| | ALL (N=395) | Males (N=129) | Females (N=266) |
| More healthy practice | 60.3 | 56.6 | 62.0 |
| Less Healthy practice | 39.7 | 43.4 | 38.0 |
| | | <i>Phi value = 0.052</i> | P=0.300 |

Source: Field Survey, November-December 2016.

Although for most respondents maintaining their weight is important, a substantial proportion (39.7%) of the sample engages in less healthy weight management practices. Similar findings have been reported in Morocco and Ghana: the majority of women who wanted to gain weight engaged in unhealthy practices such as overeating, less physical activity and the use of appetite enhancers (Rguibi and Belahsen, 2006) and some part of Ghanaian women who desired to lose weight adopted healthy behaviours, including exercise, fewer calorie intakes and reduced food portions (Duda et al., 2007).

The engagement in less healthy weight management behaviours can partly be explained by the finding that a considerable proportion of the respondents inaccurately estimated their body size. Inaccurate estimation of body size has an association with a higher likelihood of engaging in unhealthy weight management behaviours (Yeng and Sadek, 2012; Zaccagni et al., 2014). Additionally, the respondents indicated some barriers to healthy eating and participation in physical activity.

4.5.1 Barriers to healthy eating and participation in physical activity

Two main sub-organizing categories emerged under this domain: individual level barriers and community level barriers (Appendix A).

4.5.1.1 Individual level barriers

At the individual level, the respondents stated that the following factors created a barrier to healthy eating: ‘high cost of fruits and vegetables’, ‘fruits and vegetables are not filling’, ‘adverse reactions from fruit intake’, ‘lack of money/poverty’, ignorance about the benefits of fruits and vegetables and negative perceptions about fruits and vegetables.

With respect to high cost of fruits and vegetables, the respondents indicated that compared to some carbohydrate foods such as kenkey, fruits and vegetables are expensive. This prevents individuals from consuming fruits and vegetables to attain a healthy body size. The theme-high cost of fruits and vegetables was widespread at both the community and individual levels as well as among both males and females.

“You will see a small apple which costs two Ghana cedis, a small piece of watermelon for one Ghana cedi. That money can buy kenkey and fish. So you will rather eat the kenkey” (FGD5, older Men, Ussher Town).

“They believe fruits and vegetables are very expensive, so they will prefer to buy kenkey and fish instead of fruits. Looking at a ball of kenkey which is one cedi equating to a pineapple or watermelon at the same cost of one cedi, they will rather buy kenkey” (II, an obese young woman who wants to lose weight).

“For the cost, it is something that exists. Recently, I tried buying one but I was given 3 fingers of banana for GHc 2” (FGD, Younger women, James Town).

“Fruits and vegetables are expensive” (II, normal weight younger woman, desires to stay about same)

Not only do the respondents consider fruits and vegetables as expensive, they also expressed that the consumption of fruits and vegetables do not give satisfaction compared to foods which have carbohydrate. They also shared that they are poor, and therefore, do not have enough money to purchase fruits and vegetables. These perceptions were also across gender:

“I prefer food with lots of carbohydrates to fruits. Something that can sustain me for long hours”(FGD 8, younger women, Ussher Town).

“When you wake up in the morning , you might have about GHc2 to GHc 3 on you. But you need about GHc2 to buy these fruits and vegetables and they are also not food you can eat to fill satisfied. So these are some of the reasons why it is difficult to eat fruits and vegetables (II, Overweight older man, Ussher Town)

“They do not like eating fruits, because they believe that same amount of money can afford them a meal which will fill their stomach for longer hours, unlike the fruit that will not fill them for hours” (II, an obese young woman, wants to lose weight).

Weight management helps but here (in this community) it will not help me because with ten Ghana cedis, the four of us can buy banku for five Ghana cedis. So which money will we use to buy fruits? You see, it’s all due to poverty (FGD8, younger women, Ussher Town).

“Eating fruits and vegetables require money, it is money matter but there is no money”(FGD7, younger men, Ussher Town).

Moreover, the respondents mentioned that adverse reactions, especially diarrhoea, encountered from the intake of some fruits and ignorance of the benefits of fruits and vegetables prevented individuals from consuming fruits and vegetables.

“There are people who do not like to eat fruits like oranges because they believe that when they eat them, they end up having reactions like diarrhoea” (FGD1, older men, James Town).

“For me when I take in oranges my stomach hurts so I don’t like them. It is the same with apple so I don’t normally eat fruits” (FGD2, older women, James Town).

“Most of the times it is ignorance. They do not know the importance of fruit and vegetables. So, what they will use in buying fruits, they prefer to use it to buy alcohol so that they will have an appetite for their meal” (FGD3, younger men, James Town).

For exercise related barriers, four basic themes were discernible. These include ‘laziness’, ‘lack of time’, ‘stress’ and ‘side effects of exercising’. Laziness and lack of time emerged as major themes at both the individual and community levels.

There were much gender variations on the discussion of exercise related barriers. For instance, With respect to lack of time, more males than females stated that occupational activities took away the time

which could have been used to engage in physical activity. In the older women's group, there was the impression that exercise could only be performed at dawn; however, this was the time most people embark on their economic activities. The following excerpts illustrate the point:

“There are people who wake up at dawn to go to work. So they find it difficult to use the same time to exercise. At dawn, which they will exercise, they will be working to earn money at dawn instead of exercising. So its all about getting free time (FGD 2, older women, James Town).

It is all about getting free time If you are in the home doing nothing you can exercise as much as possible but immediately you get a job, you will not have such time anymore (FGD, Older women's group, James Town).

“What I have to say is that, some people are not able to exercise because they do not rest. They get home late and go to work early the next day (FGD, Older women's group, Ussher Town).

Also among males, laziness was mentioned as a key factor limiting participation in physical activity.

Interviewer: *What are some of the things that hinder people from exercising to manage weight?*

Respondent: *Laziness! Laziness! Laziness! That is what hinders a lot of people from exercising” (FGD1, older men, James Town).*

“Most at times it is laziness that prevents us from exercising”(II, obese older woman, desires to lose weight).

“For example, as a footballer if you feel lazy to play soccer you will not be able to do it. So, if you avoid laziness and decide to lose weight within a few months you can do it”(FGD3, younger men, James Town).

“The first thing is that I feel lazy to exercise” (II, overweight younger man, desires to stay about same).

In addition, while older men made reference to stress as a barrier to exercise, older women reported that they do not exercise due to some side effects encountered from exercising including hunger, weight gain.

“Sometimes stress also prevents exercising. It even makes it difficult for one to pray. So stress prevents people from exercising” (FGD1, older men, James Town).

“Most of the men of today do not have work to do. They have to hustle before making ends meet. So they are usually stressed up when they get home therefore they cannot exercise” (FGD2, older women, James Town).

“For me, when I start exercising then I become rather heavy, so I don’t exercise” (FGD 6, older women, Ussher Town).

“Exercise makes me go hungry that is why I have stopped exercising” (FGD 6, older women, Ussher Town).

4.5.1.2 Community level barriers

With respect to the community level barriers, the respondents indicated that slimness or loss of weight was not socially acceptable as it was associated with poverty and diseases including HIV/AIDs. In addition, it was mocked with derogatory terms such as ‘bones’, ‘fried fish’, ‘doll’ and ‘chingilingi’ (someone extremely slim). The perception that slimness is stigmatized was widespread at both the individual and community level and they were expressed predominantly by females.

“There are things in this community that will enable a person to lose weight. However, the mockery you will face will deter you from doing so. People may say that you are suffering from AIDs when they see that you have lost weight. Due to that I will not want to lose weight. When you are slim you would like to gain weight due to the mockery you will face. So over here, people try to gain weight a lot” (FGD, younger women).

“Over here, when you are slim, it is believed that you do not have money. So, most of the women here are doing everything possible to gain much weight or maintain their body size, when they are already big” (FGD, older men).

“Slimness is mocked. That is why they go in for the medicines and all that. Because at the end of the day the only thing someone will tell you is to look at how you have slimmed down like fried fish. Uhhmmm and all that...like a sick person.... like a doll” (II, underweight young woman, wants to gain weight).

“Someone can even ask you to look at yourself to see how dry you look. When that happens, you get worried, so you end up looking for a way to also gain weight. If I have money, I have to also get one of the medicines to gain weight” (FGD2, older women, James Town).

While slimness is stigmatized, the respondents expressed that fatness is cherished and linked with some positive attributes including beauty, respect, wealth and attractive dressing. With regards to the fashionable dressing, it was narrated that some traditional clothing including “Kaba and slit” is well suited to an overweight or obese body size than a slimmer size.

“In this community most at times the guys say they love those who are fat, so if you are fat they will say you are beautiful. It is only a few people who like the slim people. So, most women want to be fat” (II, an obese young woman, wants to lose weight).

“A lot of people think I have money because of my fatness. But as I’m sitting here now I don’t buy food from outside to eat so people think I have money, but I don’t have money”(II, an obese older woman, wants to lose weight).

“According to them (community members) when you are fat or have a big body size and you put on clothes like kaba and slit it is very attractive, so they prefer to gain weight” (II, normal young woman, desires to stay about the same).

“In this community if you are 18 years old and you are small in size, you will not receive the level of respect that is supposed to be given to you. This is because they feel you are a child, but if you are at that age and you are fat, they give you respect, but if your age and body is not in proportion they just play rough with you” (II, normal weight young woman who wants to stay about same).

The community’s staple food was also mentioned as a barrier to healthy eating. Some respondents reported that the community’s staple foods are high in fat and carbohydrates and the consumption of such foods may prevent them from attaining a healthy body size.

“Banku and Kenkey. That’s all they eat here. It is difficult to change and this also makes us to gain weight (FGD8, younger women, Ussher Town).

“In Ga, we have staple foods and that is “banku”, rice and “kenkey”. That is all we eat and this also affects our body size” (II, normal weight older man, desires to stay about the same).

“Oh fatty meat and fish, this is what we eat in the community even me I eat. But I am the one who has decided to stop eating these foods because before you take family planning methods your BP is checked for you and you are advised accordingly” (II, an overweight older woman, wants to stay about the same).

Furthermore, reference to ‘communal eating’ was made as a barrier to weight management. The respondents expressed the view that invitation from community member to eat together compelled them to overeat since it become difficult to turn down such invitations even if one is satisfied.

“What is disturbing us here is that when people cook they invite you to come and eat very frequently. Even if you are satisfied you are compelled to eat. This makes you over eat” (II, obese older woman, desires to lose weight).

Other barriers of weight management including ‘ignorance about the benefits of weight management’ and ‘unavailability of weight management medicines’ were reported by the respondents. These themes were mentioned at the individual level.

“The first thing is that here we don’t have..., no one has been educating us about why and how we should manage our weights”(II, normal weight young man, desires to gain weight).

“Also, the medicines for managing weight are not available here. Even if they are available, we cannot afford them” (II, normal young man, wants to gain weight).

These barriers may have compelled the respondents to subscribe to less healthy weight management behaviours. The study community is predominantly a Ga-Dangme society whose staple food (kenkey- a local food made from fermented maize dough) is relatively less costly than fruits and vegetables. The disparity in cost prevents individuals from having a healthy eating lifestyle. In addition, the respondents perceived that compared to the staple foods, fruits and vegetables are not filling and thus, one may need more of that before satisfying his/her hunger. This finding on high cost of fruits and vegetables corroborates Draper et al.’s (2015) study in South Africa which reported high cost of healthy foods relative to unhealthy foods as a main barrier to weight management. However, a study among overweight or obese women in Iran found the cost of diet as one of the least important barriers to weight loss. The authors explained that the participants had greater desire for weight loss and thus did not consider the associated cost (Sharifi et al., 2013).

The perception that fruits and vegetables are expensive may be explained by the respondents' limited financial resource. Comparable to other studies (Woodruff et al., 2016), respondents in this study made reference to poverty as a barrier to eat healthy. Thus, some people could not afford fruits and vegetables and so could not actively engage in weight management. The expression of high cost of fruits and vegetables coupled with issues of poverty demonstrate the extent to which socioeconomic status influences health inequality. Studies have reported a positive association between socioeconomic status and health (Lago et al., 2017). The poor or individuals of lower socioeconomic status have limited economic resources and this limits their ability to afford healthy foods (Friel et al., 2007).

Lack of time and laziness to exercise have been reported in Iran and Malaysia as the main barriers to engage in physical activity to manage weight (Sharifi et al., 2013; Aziz et al., 2016; Abolhassani, et al., 2012). For instance, Sharif et al.'s (2013) study in Iran among overweight and obese women reported that lack of time and exercising lonely were the main barriers to physical activity. In addition, a systematic review on barriers to regular exercise showed that lack of time, fear to exercise and laziness were among the perceived individual level barriers to exercise among individuals at risk of diabetes (Korkiakangas, Alahuhta, & Laitinen, 2009). The finding from this study that physical activity could only be performed at dawn and that engagement in economic activities deny people of that time to engage in physical activity is thought-provoking. This suggests that there is inadequate knowledge about physical activity and therefore, calls for policy intervention.

Besides the individual level barriers, stigmatization of weight loss or slimness emerged as the main barrier to healthy weight management at the community level. This is in accordance with the philosophy of the socioecological model which indicates that beyond individual level factors,

community norms and regulations influence behaviour. The finding indicated that while fatness is socially accepted and linked to beauty, respect and wealth, weight loss or slimness is mocked and associated with poverty and ill health, particularly HIV/AIDS. Similar findings have been reported in other studies. For instance Black South African adults considered thinness as undesirable as it was associated with someone experiencing depression and diseases, including HIV/AIDS, cancer and tuberculosis. However, an overweight body size was socially acceptable and desirable (Okop et al., 2016). Contrary, finding from the Carr and Friedman's study (2005) in the United States of America among adults reported that overweight and obese individuals were more likely to encounter interpersonal and employment discrimination compared to normal weight individuals. Overweight and obese persons therefore reported lower levels of self-acceptance. This indicates that the concept of obesity is viewed differently across cultures.

4.6 Background characteristics of the respondents

4.6.1 Individual level variables

The individual characteristics considered in this study are sex, age, marital status, education, ethnicity, occupation and length of stay in the community. Table 4.7 shows the individual level characteristics of the study respondents. The sample comprised of more females (67%) than males (33%). With respect to the age of the respondents, they range in age from 18 to 70 years, with an average age of 39 years. About a third (32.2%) of the respondents are less than 30 years. One-fifths (20.5%) of them are within the age group 40-49 years and a tenth (10.9%) are within the age group 60 year or more. Further, more than a third (36%) of the respondents are married, about one-third (31%) of them are never married and nearly one-fifth (19%) are divorced/separated/widowed (Table 4.7). With respect to educational attainment, the highest proportion (43%) of the respondents have Middle or Junior High-level education and a very small proportion (5%) have tertiary level education. However, 7% have no formal education. The sex and education characteristics of the respondents reflect that of the national population (Ghana Statistical Service (GSS), 2015).

The ethnic distribution of the respondents indicates that the majority (72.9%) of them belong to the Ga ethnic group, less than a fifth (18.2%) belong to the Akan ethnic group and less than one-tenth (8.8%) belong to other ethnic groups (Table 4.7). The occupational status of the respondents shows that about half (47.3%) of them are engaged in sales and services. Also, fourteen percent are engaged in manual work, while less than a tenth (8.9%) are engaged in professional work. However, approximately 30% of the respondents are unemployed (Table 4.7). In addition, the majority (78.2%) of them reported that they have lived in the study community for more than 10 years. Twelve percent had lived there within

5-10 years while close to one-tenth (9.6%) have lived in the community for less than 5 years (Table 4.7).

The finding that about half of the respondents are employed in sales or services could be explained by the low level of education attained by the respondents. This is because a person's occupation is linked to his or her educational level (GSS et al., 2015). In addition, the finding that the majority of the study sample was of the Ga-Dangbe ethnic group is because the study area is an indigenous Ga community (Mahama et al., 2011).

Table 4.7: Percentage distribution of the study sample by individual factors

| Variables | Percentage (%) | Number (Total n=395) |
|------------------------------------|-----------------------|-----------------------------|
| Sex of respondents | | |
| Male | 32.7 | 129 |
| Females | 67.3 | 266 |
| Age | | |
| | <i>SD=14.40</i> | <i>Mean age = 39.40</i> |
| <30 years | 32.2 | 127 |
| 30-39 | 21.3 | 84 |
| 40-49 | 20.5 | 81 |
| 50-59 | 15.2 | 60 |
| 60 and above | 10.9 | 43 |
| Marital Status | | |
| Never married | 31.4 | 124 |
| Married | 36.2 | 143 |
| Cohabiting/living together | 13.2 | 52 |
| Divorced/Separated/Widowed | 19.2 | 76 |
| Level of education | | |
| No education | 7.1 | 28 |
| Primary | 20.5 | 81 |
| Middle/JHS | 43.0 | 170 |
| Secondary | 24.1 | 95 |
| Higher | 5.3 | 21 |
| Ethnicity | | |
| Ga-Dangme | 72.9 | 288 |
| Akan | 18.2 | 72 |
| Other ethnic groups | 8.9 | 35 |
| Occupation | | |
| Professional/technical/managerial | 8.9 | 35 |
| Sales and services | 47.3 | 187 |
| Manual work | 14.9 | 59 |
| Not employed | 28.9 | 114 |
| Length of stay in community | | |
| <5 years | 9.6 | 38 |
| 5-10 years | 12.2 | 48 |
| >10 years | 78.2 | 309 |

Source: Field Survey, November-December 2016.

4.7 Interpersonal factors

4.7.1 Household wealth status

The distribution of the household wealth status of the respondents shows that two-fifths (40%) of them are in the upper household wealth status, one-fifth (20%) are in the average wealth category and about two-fifths (39.7%) are in the lower households wealth category (Table 4.8).

Table 4.8: Percentage distribution of respondents by Household wealth status

| Household wealth status | Percentage (%) | Number |
|-------------------------|----------------|------------|
| Lower wealth status | 39.7 | 157 |
| Middle wealth status | 20.3 | 80 |
| Upper wealth status | 40.0 | 158 |
| Total | 100.0 | 395 |

Source: Field survey, November-December 2016.

4.7.2 Social support for healthy eating and physical activity

The mean social support score indicates that there is a high score for friends' encouragement for participation in physical activity (14.6) than family members' encouragement (13.8) for physical activity participation (Table 4.9). Also, the mean score for family's encouragement for healthy eating is higher (9.2) compared to friend's encouragement (8.3). This indicates that friends' participation in physical activities is important for an individual to engage in physical activity than family members' participation. Also, encouragement received from family members to eat healthy is important to engage in healthy eating than support from friends. People share meals with family more than with friends and therefore the importance of family's encouragement to eat healthy foods.

Table 4.9: Mean scores of family and friend social support for healthy eating and physical activities

| | Social support for healthy eating | | | | Social support for physical activities | |
|--------------------|-----------------------------------|------------------|-------------------------|-------------------------|--|------------------------|
| | Family's Support | Friend's support | Family's discouragement | Friend's discouragement | Family participation | Friend's participation |
| Mean score | 9.2 | 8.3 | 6.6 | 6.6 | 13.8 | 14.7 |
| Standard deviation | 4.2 | 3.7 | 2.5 | 2.5 | 5.3 | 6.6 |

Source: Field Survey, November-December 2017.

4.8 Community characteristics

From Table 4.10, it can be seen that the vast majority (86%) of the respondents reported availability of spaces in the study community where they could engage in physical activities. Also, about two-thirds (62%) of them also reported that the community is very conducive for engaging in physical activities but a little over one-tenth (12%) reported that the community is not conducive to engage in physical activities. With respect to availability of fruits and vegetables, the majority (96%) of the respondents indicated that fruits and vegetables are available in the community (Table 4.10).

Although the majority of the respondents indicated availability of physical activity spaces, observations from the field show that there are only few places (e.g. parks for playing football, Gymnasiums, beaches) in the communities designated for physical activities. Also, there are fewer pedestrian walk ways and bicycle lanes. As a result, some community members engage in physical activity on streets and roads used by motor vehicles and this poses threats to them. Moreover, the few places designated for physical activities also served other purposes including funerals and naming ceremonies. This prevent the use of the spaces for physical activities purposes during such occasions.

The high proportion of the respondents indicating the availability of physical activity spaces and a safe community for physical activity suggests individuals in the community may have the tendency to subscribe to physical activity as a healthy weight management practice. Perception of neighbourhood safety is an important community factor for physical activity participation. Concerns about personal safety serve as obstacles to regular physical activity participation and local walking (Duncan and Mummery, 2005). A study in Nigeria indicated that neighbourhood safety from traffic and crime predicts physical activity participation (Ogwumike et al., 2012).

Table 4.10: Percentage distribution of respondents by community characteristics

| Community level variables | Percentage (%) | Number (Total N =395) |
|--|-----------------------|----------------------------------|
| Locality | | |
| James Town | 27.3 | 108 |
| Ussher Town | 72.7 | 287 |
| Physical activity spaces | | |
| Unavailable | 14.4 | 57 |
| Available | 85.6 | 338 |
| Community conduciveness | | |
| Very conducive | 62.3 | 246 |
| Somewhat conducive | 25.8 | 102 |
| Not conducive | 11.9 | 47 |
| Availability of fruits & vegetables | | |
| Unavailable | 3.8 | 15 |
| Available | 96.2 | 380 |

Source: Field survey, November-December 2016.

4.9 Summary

The aim of the analysis of this chapter was to examine the levels of body size estimation, weight management behaviours and also describe the characteristics of the respondents. The findings show that highest proportion of the respondents perceived themselves as overweight but their actual body size indicated that the highest proportion of them were obese. There was therefore a discrepancy in their perceived and actual body size: more than two-fifths of the respondents inaccurately estimated their body size and this negatively influenced their weight management goals and behaviours. More than half of them desired to stay about the same weight and they subscribed to skipping of meals, consumption of fatty and sugary foods, increasing physical activity to achieve their desires. Some individual (high cost of fruits and vegetables, perception of fruits and vegetables not filling the stomach, laziness and lack of time) and community level factors (preference for fatness, stigmatization of slimness and communal eating) also inhibited participation in weight management. This is in accordance with the first and fourth levels of the socioecological model and therefore implies that engagement in weight management behaviors cannot be explained from one level of influence. To have a holistic understanding of engagement in weight management, factors beyond the individual should be taken into consideration.

CHAPTER FIVE

Characteristics of the study participants and their association with weight management goals/behaviours

5.0 Introduction

This chapter examines the association between body size estimation and weight management goal and behaviour. It also examines the association between the individual level factors, interpersonal and community level factors and weight management goal and weight management behaviour.

5.1 Body size estimation and weight management goal and behaviour

Table 5.1 shows that respondents who overestimated their body size recorded the highest proportion (34.6%) of those who desired to lose weight. Those who underestimated their body size recorded the highest proportion (18.6%) of the respondents who wanted to gain weight. Marginally, individuals who underestimated their body size constituted the highest proportion (59.8%) of those who wanted to stay about the same weight. The association between body size estimation and weight management goal was statistically significant ($P > 0.05$).

Underestimation of body size, particularly among overweight and obese persons has been documented to be associated with less likelihood to attempt weight loss (Duncan et al., 2011). Individuals who underestimate their body size perceive themselves thinner than their actual body size and therefore have the desire to gain weight. This is alarming as it may be an obstacle to the prevention and management of obesity. This is because they may not be receptive to health messages about weight loss or attaining a healthy body size (Bhanji et al., 2011).

With regards to the behaviours adopted to manage weight, marginally, individuals who underestimated their body size constituted the highest proportion (62.9%) of the respondents who engaged in more healthy practices. The proportion was lowest among those who accurately estimated their body size (58.6%). The association between body size estimation and weight management behaviour was not statistically significant ($P>0.05$; Table 5.1).

Table 5.1: Association between body estimation and weight management goal & behaviour

| Body size estimation | Weight management goals (%) | | | Weight management behaviours (%) | | Number |
|----------------------|--|-------------|---------------------|----------------------------------|------------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less Healthy practice | More healthy practices | |
| Accurate estimation | 31.4 | 9.5 | 59.1 | 41.4 | 58.6 | 220 |
| Underestimation | 21.6 | 18.6 | 59.8 | 37.1 | 62.9 | 97 |
| Overestimation | 34.6 | 10.3 | 55.1 | 38.5 | 61.5 | 78 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Contingency coefficient=0.141 P=0.093</i> | | | <i>Cramer's V=0.038 P=0.750</i> | | |

Source: Field Survey, November-December 2016.

5.2 Weight management goal and weight management behaviour

There was no significant association between weight management goal and weight management behaviour ($P>0.05$). Nonetheless, individuals who wanted to gain weight reported the highest proportion (63.8%) of those who engaged in more healthy practices. The lowest proportion (58.1%) was recorded among respondents who wanted to lose weight (Table 5.2).

Table 5. 2: Association between weight management goal and behaviour

| Weight management goal | Weight management behaviour (%) | | |
|--------------------------|---------------------------------|-----------------------|-----------------------|
| | Less healthy practice | More healthy Practice | Number |
| Lose weight | 41.9 | 58.1 | 117 |
| Gain weight | 36.2 | 63.8 | 47 |
| Stay about the same | 39.4 | 60.6 | 231 |
| Total | | | |
| <i>Cramer's V= 0.035</i> | | | <i>P value= 0.784</i> |

Source: Field Survey, November-December 2016.

5.3 Individual level factors

5.3.1 Sex of respondents and weight management goal and behaviour

Table 5.3 shows that a higher proportion of females (33.5%) than males (21.7%) desired to lose weight. However, a higher proportion of males (20.2%) desired to gain weight compared to females (7.9%). The association between the sex of the respondents and weight management goal was statistically significant ($P < 0.05$).

The findings which indicate high prevalence of the desire to lose weight among females compared to males is comparable to other studies elsewhere (Weiss et al., 2006). Also, Yaemsiri et al.'s (2011) study in the United States of America among adults reported a higher prevalence of desire to lose weight among females (73%) compared to males (55%). Furthermore, Assari and Lankarani (2015) found that half of overweight or obese females intended to lose weight compared to a third of overweight or obese males. Females are more health conscious compared to males. Additionally, they have a higher tendency to overestimate their body size and experience body size dissatisfaction compared to males, therefore, the desire to lose weight (Bhogal & Langford, 2014). Moreover, as found in this study, overweight and obesity are more common among females than males. This may

have influenced females to desire weight loss compared to males.

With respect to weight management behaviour, a higher proportion of males (62%) engaged in more healthy practice compared to females (56.6%). The association between sex and weight management behaviour was not statistically significant ($P>0.05$ Table 5.3). This means that there is no difference in practices used to manage weight with respect to the sex of the respondents.

Table 5. 3: Association between sex of respondents and weight management goal and behaviour

| Sex of the respondents | Weight management goals (%) | | | Weight management behaviours (%) | | Number |
|------------------------|---------------------------------|-------------|---------------------|----------------------------------|------------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less Healthy practice | More healthy practices | |
| Male | 21.7 | 20.2 | 58.1 | 43.4 | 56.6 | 129 |
| Females | 33.5 | 7.9 | 58.6 | 38.0 | 62.0 | 266 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.6 | 395 |
| | <i>Cramer's V=0.195 P=0.001</i> | | | <i>Phi =-0.052 P=0.300</i> | | |

Source: Field Survey, November-December 2016.

5.3.2 Age of respondents and weight management goal and behaviour

Table 5.4 presents information on the association between age and weight management goal and behaviour. The Table indicates that the prevalence of the desire to gain weight increases as age increases. Respondents within the age group 50-59 years recorded the highest proportion (41.7%) of those who intended to lose weight. This was followed by those aged 60 years and above and the lowest proportion was found among those aged less than 30 years. Respondents aged 60 years and above recorded the highest proportion of those who intended to stay about the same weight. The lowest proportion (55.0%) was recorded among those aged 50-59 years. The association between age and weight management goal was statistically significant ($P<0.05$).

The older adults are more likely to engage in healthier weight management practices probably because of the effect of aging on chronic non-communicable diseases (Lee et al., 2004) . That is, older persons are at higher risk of acquiring chronic non-communicable diseases such as hypertension and diabetes and this may positively influence their weight management behaviours.

With respect to weight management behaviour, individuals within the age group 50-59 years recorded the highest proportion of those who engage in more healthy practices. This was followed by those aged 60 and above. The lowest proportion was recorded among those less than 30 years of age (P<0.05; Table 5.4).

The desire for weight loss as a person matures is comparable to Lee et al.'s (2004) study in the United States of America which reported that a third of the elderly were trying to lose weight. However, other studies in USA have also demonstrated that intentions to lose weight and the use of unhealthy weight control behaviours are higher among younger adults and adolescents compared to older adults (Neumark-Sztainer et al., 2000; Weiss et al., 2006).

Table 5. 4: Association between age of respondents and weight management goal and behaviour

| Age of the respondents | Weight management goal (%) | | | Weight management behaviours (%) | | Number |
|------------------------|---------------------------------|-------------|---------------------|----------------------------------|-----------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less Healthy practice | More healthy practice | |
| <30 | 21.3 | 21.3 | 57.4 | 49.6 | 50.4 | 127 |
| 30-39 | 31.0 | 10.7 | 58.3 | 36.9 | 63.1 | 84 |
| 40-49 | 29.6 | 9.9 | 60.5 | 40.7 | 59.3 | 81 |
| 50-59 | 41.7 | 3.3 | 55.0 | 28.3 | 71.7 | 60 |
| 60 and above | 34.9 | 2.3 | 62.8 | 30.2 | 68.9 | 43 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Cramer's V=0.172 P=0.003</i> | | | <i>Cramer's V=0.162 P=0.035</i> | | |

There was a significant association between marital status and weight management goal and behaviours ($P=0.000$; $P=0.035$ respectively). The results indicate that married individuals recorded the highest proportion (39.2%) of the respondents who desired to lose weight. This was followed by the respondents who were divorced/widowed/separated (31.6%). The lowest proportion (17.3%) was recorded among those who were cohabiting (Table 5.5). Also, those never married made up the highest proportion (21%) of those who wanted to gain weight. The lowest proportion (5.6%) was found among those married. Respondents who were cohabiting constituted the highest proportion (69.2%) of those who wanted to stay about the weight.

The finding that a higher proportion of married individuals desire to lose weight is comparable to that of Klos & Sobal (2013) which show that married and cohabiting women were more likely to desire to lose weight than single women. Married women may have experienced weight gain as a result of childbearing, which is more likely to occur in marriage, this may have caused body size dissatisfaction and therefore, the desire to lose weight (Klos and Sobal, 2013).

Considering weight management behaviours, marginally, individuals who were cohabiting constituted the highest proportion (71.2%) of the respondents who engaged in more healthy practices. This was followed by those who were divorced/widowed/separated (68.4%) and the lowest proportion (51.6%) was recorded among those who were never married. The association between marital status and weight management behaviours was statistically significant ($P<0.05$; Table 5.5). These findings in a way give credence to the marriage protection hypothesis which proposes that marriage has health benefits as a result of some protections that it provides. For instance, married individuals have partners who could monitor their health and discourage them from engaging in risky health behaviours, therefore they are

more likely to choose and maintain healthier lifestyle than those who are never married (Waldron et al., 1996). In addition, married women may experience weight gain as a result of childbearing which is more likely to occur in marriage. This may cause body size dissatisfaction and therefore, the desire to lose weight (Klos and Sobal, 2013).

Table 5. 5: Association between marital status and weight management goal and behaviours

| Marital Status | Weight management goal (%) | | | Weight management behaviours (%) | | Number |
|----------------------------|---------------------------------|-------------|---------------------|----------------------------------|-----------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less Healthy practice | More healthy practice | |
| Never married | 22.6 | 21.0 | 56.5 | 48.4 | 51.6 | 124 |
| Married | 39.2 | 5.6 | 55.2 | 40.6 | 59.4 | 143 |
| Cohabiting/living together | 17.3 | 13.5 | 69.2 | 28.8 | 71.2 | 52 |
| Divorced/separated/widowed | 31.6 | 7.9 | 60.5 | 31.6 | 68.4 | 76 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Cramer's V=0.178 P=0.000</i> | | | <i>Cramer's V=0.148 P=0.035</i> | | |

Source: Field Survey, November-December 2016.

5.3.4 Educational attainment and weight management goal and behaviour

Highest level of education attained by the respondents was not significantly associated with both weight management goal and behaviour ($P>0.05$). However, respondents who had no formal education constituted the highest proportion (35.7%) of those who desired to lose weight. This was followed by those who had middle/JHS education (31.8%) and lowest among those who had primary education (25.9%).

Also, individuals who had primary education recorded the highest proportion (14.8%) of the respondents who desired to gain weight. The lowest proportion of 4.8% was recorded among who had

higher education. In addition, respondents who had higher education recorded the highest proportion (66.7%) of those who desired to stay about the same weight. The lowest proportion (57.1%) was found among those who had no formal education.

With reference to weight management behaviour, marginally, individuals who had attained primary education constituted the highest proportion (63.0%) of those who engaged in more healthy behaviours. The lowest proportion (57.1%) was found among those who had no formal education ($P>0.05$; Table 5.6).

Table 5. 6: Association between educational attainment and weight management goal and behaviour

| Educational attainment | Weight management goal (%) | | | Weight management behaviour (%) | | Number |
|------------------------|---------------------------------|-------------|---------------------|---------------------------------|-----------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less Healthy practice | More healthy practice | |
| No education | 35.7 | 7.1 | 57.1 | 42.9 | 57.1 | 28 |
| Primary | 25.9 | 14.8 | 59.3 | 37.0 | 63.0 | 81 |
| Middle/JHS | 31.8 | 10.6 | 57.6 | 40.6 | 59.4 | 170 |
| Secondary | 27.4 | 14.7 | 57.9 | 40.0 | 60.0 | 95 |
| Higher | 28.6 | 4.8 | 66.7 | 38.1 | 61.9 | 21 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Cramer's V=0.074 P=0.825</i> | | | <i>Cramer's V=0.033 p=0.975</i> | | |

Source: Field Survey, November-December 2016.

5.3.5 Ethnicity and weight management goal and behaviour

The results presented on Table 5.7 indicate that individuals who belong to the Ga-Dangme ethnic group constituted the highest proportion (30.6%) of the respondents who desired to lose weight. The lowest proportion (22.9%) was found among those who belonged to other ethnic groups. Also, Ga-Dangme

individuals constituted the highest proportion (14.2%) of those who desired to gain weight. The lowest proportion (4.2%) was recorded among the Akan. Respondents of other ethnic group recorded the highest proportion (68.6%) of those who intended to stay about the same weight. The lowest proportion (55.2%) was found among the Ga. The association between ethnicity and weight management goal was not significant ($P>0.05$).

With reference to weight management behaviour, marginally, the highest proportion (63.9%) of those who engaged in more healthy practices was recorded among the Akan compared to 51.4% and 60.4% of the Ga and those of other ethnic groups respectively (Table 5.7). The association was not statistically significant ($P>0.05$).

Table 5. 7: Association between ethnicity and weight management goal and behaviour

| Ethnicity | Weight management goal (%) | | | Weight management behaviour (%) | | Number |
|---------------------|--|-------------|---------------------|--|-----------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less Healthy practice | More healthy practice | |
| Akan | 29.2 | 4.2 | 66.7 | 36.1 | 63.9 | 72 |
| Ga-Dangme | 30.6 | 14.2 | 55.2 | 48.6 | 51.4 | 288 |
| Other ethnic groups | 22.9 | 8.6 | 68.6 | 39.6 | 60.4 | 35 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Contingency coefficient=0.140</i> <i>P=0.097</i> | | | <i>Cramer's V=0.062</i> <i>P=0.463</i> | | |

Source: Field Survey, November-December 2016.

5.3.6 Occupation and weight management goal & behaviour

Table 5.8 shows the occupational status of the respondents. The table indicates that the prevalence of the desire to lose weight was highest (32.2%) among individuals who were engaged in manual work.

This was followed by those who were unemployed (30.7%) and the lowest proportion of 28.3% was found among those in sales and service work. The prevalence of the desire to gain weight was highest (17.1%) among the respondents who were engaged in professional work and the lowest proportion (9.6%) was recorded among those who were engaged in sales and services. The association between occupation and weight management goal was statistically not significant ($P>0.05$).

With respect to weight management behaviour, individuals in sales and service work recorded the highest (63.6%) proportion of those who engaged in more healthy practices. The lowest proportion (54.3%) was recorded among those engaged in professional work. The association between occupation and weight management behaviour was not statistically significant ($P> 0.05$; Table 5.8).

Table 5. 8: Association between occupation and weight management goal and behaviour

| Occupation | Weight management goal (%) | | | Weight management goals (%) | | Number |
|-----------------------------------|--------------------------------|-------------|---------------------|----------------------------------|-----------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less Healthy practice | More healthy practice | |
| Professional/technical/managerial | 28.6 | 17.1 | 54.3 | 45.7 | 54.3 | 35 |
| Sales and services | 28.3 | 9.6 | 62.0 | 36.4 | 63.6 | 187 |
| Manual work | 32.2 | 11.9 | 55.9 | 40.7 | 59.3 | 59 |
| Unemployed | 30.7 | 14.0 | 55.3 | 43.0 | 57.0 | 114 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Cramer's V=0.063 P=0793</i> | | | <i>Cramer's V= 0.070 P=0.586</i> | | |

Source: Field Survey, November-December 2016.

5.3.7 Length of stay in community and weight management goal and behaviour

The association between length of stay and weight management goal and behaviour were both not statistically significant ($P>0.05$). Nevertheless, a third (32.0%) of the respondents who had lived in the study community for more than 10 years desired to lose weight compared to 18.8% and 23.7% of those who had lived there for 5 to 10 years and less than 5 years respectively (Table 5.9). About 16% of the respondents who had lived in the community for less than 5 years desired to gain weight compared to 8.9% and 12% respectively for those who had lived there from 5 to 10 years and more than 10 years. Additionally, those who had lived in the community within 5-10 years constituted the highest (72.9%) proportion of those who intended to stay about the same weight. The lowest proportion (60.5%) was found among those living there for less than 5 years.

With respect to weight management behaviours, respondent who had lived in the community for more than 10 years recorded the highest proportion (62.8%) of those engaged in more healthy practices. The lowest proportion (45.8%) was recorded among those who had lived there within 5 to 10 years (Table 5.9).

Table 5. 9: Association between length of stay in community and weight management goal and behaviour

| Length of stay in the community | Weight management goal (%) | | | Weight management behaviour (%) | | Number |
|---------------------------------|---|-------------|---------------------|--|-----------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less Healthy practice | More healthy practice | |
| <5 years | 23.7 | 15.8 | 60.5 | 42.1 | 57.9 | 38 |
| 5-10years | 18.8 | 8.3 | 72.9 | 54.2 | 45.8 | 48 |
| >10years | 32.0 | 12.0 | 56.0 | 37.2 | 62.8 | 309 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Contingency coefficient= 0.087</i> <i>P=0.196</i> | | | <i>Cramer's V=0.113</i> <i>P=0.079</i> | | 309 |

5.4 Interpersonal level variables

5.4.1 Household wealth status and weight management goal and behaviour

Table 5.10 shows that a little more than half (51.6%) of the respondents with lower wealth category wanted to maintain their body size, about two-fifths (38.9%) of them wanted to lose weight and about one-tenth (9.6%) desired to gain weight. Among those with the upper wealth category, about two-thirds (60.8%) of them desired to stay about the same weight while one-fourth (25.3%) desired to lose. For those who belong to average wealth category, a little more than two-thirds (67.5%) wanted to stay about the same weight, one-fifth (20%) wanted to lose weight and 12.5% wanted to gain weight. The association between household wealth status and weight management goal was statistically significant ($P < 0.05$).

With respect to weight management behaviour, respondents with lower wealth category constituted the highest proportion of those who engaged in more healthy practices. The lowest proportion of 54.4% was recorded among those of upper wealth status. The association between household wealth status and weight management behaviour was not statistically significant ($P > 0.05$; Table 5.10.).

Table 5. 10: Association between household wealth status and weight management goal and behaviour

| Household wealth status | Weight management goal | | | Weight management behaviour | | Number |
|-------------------------|---|-------------|---------------------|--|-----------------------|------------|
| | Lose weight | Gain weight | Stay about the same | Less healthy practice | More healthy practice | |
| Lower wealth status | 38.9 | 9.6 | 51.6 | 34.4 | 65.6 | 157 |
| Middle wealth status | 20.0 | 12.5 | 67.5 | 38.8 | 61.2 | 80 |
| Upper wealth status | 25.3 | 13.9 | 60.8 | 45.6 | 54.4 | 158 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Contingency coefficient= 0.171</i> <i>P-value=0.019</i> | | | <i>Cramer's V=102</i> <i>P-value =0.126</i> | | |

Source: Field Survey, November-December 2016.

5.4.2 Social support and weight management goal and behaviour

Table 5.11 shows the association between weight management goal and social support.

Family encouragement to eat healthy was significantly associated with weight management goal. The mean social support score of family members' encouragement to eat healthy was highest (9.5) for individuals who desired to maintain their weight compared to those who desired to lose or gain weight (mean score 8.8; 7.9 respectively).

For friends' support to participate in physical activity, individuals who desired to gain weight had a highest mean score of 16.2 compared to 13.8 for individuals who desired to lose weight and 14.6 for those who intended to stay about the same weight. This means that there is a strong influence from friends of the respondents who desired to gain weight to participate in physical activity than those who desired to lose weight. Thus, respondents who desired to gain weight had their friends participating in their physical activities than individuals who desired to lose weight.

It is evidence from Table 5.12 that encouragement or discouragement from family and friends to eat healthy did not significantly influence weight management behaviour. Similarly, Friend's and family's participation in an individual's physical activity had no significant influence on his/her weight management behaviour. This indicates that engaging in more healthy or less healthy weight management practices does not depend on the encouragement or discouragement received from family or friends to eat healthy. Also, engaging in more healthy or less healthy weight management practices is not depended on friend's and family's participation in an individual's physical activity.

Table 5. 11: Mean Scores of Family and Friend Social Support for Healthy Eating and physical activities

| Weight management goal | Social support for healthy eating | | | | Social support for physical activities | |
|------------------------|-----------------------------------|----------------------|-----------------------|-----------------------|--|----------------------|
| | Family Encouragement** | Friend Encouragement | Family Discouragement | Friend Discouragement | Family participation | Friend participation |
| Lose weight | 8.8 | 8.2 | 6.4 | 6.2 | 13.7 | 13.8 |
| Gain weight | 7.9 | 7.9 | 6.2 | 6.7 | 12.9 | 16.2 ^b |
| Stay about the same | 9.5 ^a | 8.3 | 6.7 | 6.7 | 13.9 | 14.6 |

Source: Field survey, November-December 2016

^a Significant difference between those who desire to stay same and those who desire to gain weight; P-value = 0.015

^b Significant difference between those who desire to gain weight and those who desire to lose weight; P-value = 0.036

**Significant association with weight management goal: F-test = 3.428 and P-value = 0.033.

Table 5. 12: Independent t-test for Mean scores of Healthy Eating and physical activities and weight management behaviour

| Social support indicator | Weight Management behaviour | | t-test for equality of means | |
|-------------------------------|-----------------------------|------------------------|------------------------------|----------------|
| | Less Healthy Behaviour | More Healthy Behaviour | t-Test | Sig (2-tailed) |
| Family Encouragement diet | 8.8790 | 9.2983 | -0.985 | 0.325 |
| Friend Encouragement diet | 8.4140 | 8.1008 | 0.827 | 0.409 |
| Family Discouragement diet | 6.6178 | 6.5084 | 0.433 | 0.666 |
| Friend Discouragement diet | 6.5987 | 6.5000 | 0.394 | 0.694 |
| Family Participation Exercise | 13.8854 | 13.6723 | 0.397 | 0.692 |
| Friend Participation Exercise | 14.6688 | 14.4538 | 0.315 | 0.753 |

Source: Field survey, November-December 2016.

5.5 Community/environmental factors and weight management goal and behaviour

5.5.1 Locality and weight management goal and behaviour

The locality of the respondents was statistically associated with weight management behaviour, but not weight management goal (Table 5.13). More than a third (36.1%) of James Town respondents wanted to lose weight compared to a little over one-fourth (27.2%) of Ussher Town respondents. Also, a higher proportion (60.6%) of the respondents who resided in Ussher Town desired to stay about the same weight compared to James Town residents (52.8%). Moreover, marginally, a higher proportion (12.2%) of the respondents who lived in Ussher Town desired to gain weight compared to those in James Town (11.1%).

With respect to weight management behaviours, a higher proportion (69.4%) of James Town residents engaged in more healthy practices than residents from Ussher Town (56.8%). The association between locality and weight management behaviour was statistically significant ($P=0.014$; Table 5.13).

5.5.2 Community conduciveness for physical activity and weight management goal and behaviour

Table 5.13 illustrates a statistically significant association between availability of physical activity spaces and weight management goal ($P<0.05$) but not weight management behaviour ($P>0.05$). About two-thirds (60.7%) of the respondents who reported availability of physical activity spaces in the community wanted to stay about the same weight compared to 45.6% of those who reported unavailability of physical activity spaces. Also, close to half (47.4%) of individuals who reported unavailability of physical activity spaces wanted to lose weight compared to a little over one-fourth (26.6%) of those who reported availability of physical activity spaces in the community.

Considering weight management behaviour, marginally, a higher proportion (60.7%) of the respondents who reported unavailability of physical activity spaces engaged in more healthy practices compared of those who reported availability of physical activity spaces in the community (57.9%; Table 5.13).

Also, it is evident from Table 5.13 that about two out of every three (62.6%) of the respondents who perceived the community to be very conducive for physical activity desired to stay about the same weight, 26.0% wanted to lose weight while 11.4% intended to gain weight. Among those who perceived the community as not conducive, more than half (55.3%) wanted to stay about the same weight, a third (34.0%) desired to lose weight and one-tenth (10.6%) wanted to gain weight ($P>0.05$).

To achieve their desires, individuals who perceived the community as very conducive constituted the highest proportion (67.1%) of those who engaged in more healthy practices ($P=0.002$; Table 5.13). Having the perception that one's community is conducive for physical activity increases the likelihood of being physically active (Bennett et al., 2007). Physical activity is a healthy weight management practice; therefore, this may partly explain the finding that the respondents who perceived their community as very conducive recorded the highest proportion of those who engage in more healthy practice.

5.5.3 Availability of fruits and vegetables in the community and weight management goal and behaviour

Availability of fruits and vegetables was significantly associated with weight management goal ($P<0.05$) but not weight management behaviour ($P>0.05$). About a third (30.5%) of the respondents who reported availability of fruits and vegetables desired to lose weight compared to less than a tenth

(6.7%) of those who reported unavailability of fruits and vegetables (Table 5.13). However, two out of every five (40.0%) of those who reported unavailability of fruits and vegetables desired to gain weight compared to a tenth (10.8%) of those who reported availability of fruits and vegetables.

With respect to weight management behaviour, nearly the same proportion of the respondents who reported availability (60.3%) or unavailability (60.0%) of fruits and vegetables engaged in more healthy practices (Table 5.13).

Intake of healthy foods such as fruits and vegetables combined with adequate physical activity is important to attaining a healthy weight (Chaput et al., 2010). Also, the availability of fruits and vegetables in the community or home encourages their consumption (Neumark-Sztainer et al., 2003). This may partly explain why a substantial proportion of individuals who reported availability of fruits and vegetables indicated the desire to lose weight. They desire to lose weight probably because the mechanism for achieving the goal is available.

Table 5. 13: Association between community variables and weight management goal and behaviour

| Variables | Weight management goal (%) | | | Weight management behaviours (%) | | Total Number |
|--|--|-------------|---------------------|----------------------------------|------------------------|--------------|
| | Lose weight | Gain weight | Stay about the same | Less healthy practices | More healthy practices | |
| Locality | | | | | | |
| James Town | 36.1 | 11.1 | 52.8 | 30.6 | 69.4 | 108 |
| Ussher Town | 27.2 | 12.2 | 60.6 | 43.2 | 56.8 | 287 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Cramer's V=0.087 P=0.221</i> | | | <i>Phi= -0.115 P=0.022</i> | | |
| Physical activity spaces | | | | | | |
| Available | 26.6 | 12.7 | 60.7 | 42.1 | 57.9 | 338 |
| Unavailable | 47.4 | 7.0 | 45.6 | 39.3 | 60.7 | 57 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Cramer's V=0.162 P=0.006</i> | | | <i>Phi =0.020 P=0.694</i> | | |
| Community conduciveness | | | | | | |
| Very conducive | 26.0 | 11.4 | 62.6 | 32.9 | 67.1 | 246 |
| Somewhat conducive | 36.3 | 13.7 | 50.0 | 51.0 | 49.0 | 102 |
| Not conducive | 34.0 | 10.6 | 55.4 | 51.1 | 48.9 | 47 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Contingency coefficient=0.116 P=0.252</i> | | | <i>Cramer's V=0.179 P=0.002</i> | | |
| Availability of fruits and vegetables | | | | | | |
| Available | 30.5 | 10.8 | 58.7 | 39.7 | 60.3 | 380 |
| Unavailable | 6.7 | 40.0 | 53.3 | 40.0 | 60.0 | 15 |
| Total | 29.6 | 11.9 | 58.5 | 39.7 | 60.3 | 395 |
| | <i>Cramer's V= 0.183 P=0.001</i> | | | <i>Phi =0.001 P=0.984</i> | | |

Source: Field Survey, November-December 2016.

5.6 Summary

This chapter examined the association between the characteristics of the participants and weight management goal and behaviours. The results suggest that underestimating one's body size increases the desire to gain weight. This may be an obstacle to the prevention and management of obesity because they are more likely to engage in unhealthy weight management behaviours (Bhanji et al., 2011). The age of the respondents and marital status were the only individual level factors found to be significantly related to weight management goals and behaviours. Sex of the respondents was significantly related to only weight management goals. Household wealth status and social support for healthy eating and engagement in physical activity were also associated with weight management goal. At the community level, factors such as locality and community conduciveness were significantly related to weight management behaviours. These variables are expected to significantly influence participation in weight management behaviours in the multivariate analysis which is presented in the next chapter. As highlighted by the socioecological model, the findings has demonstrated that individual and environmental factors interact to influence behaviour.

CHAPTER SIX

The influence of body size estimation on weight management behaviour

6.0 Introduction

The influence of body size estimation on weight management behaviour is examined in this chapter using logistic regression models. The dependent variable has two categories: engaging in 'more healthy practice' and 'less healthy practice'. 'Less healthy practice' was used as the reference category (RC). The first section presents results on the independent effect of body size estimation (accurate versus inaccurate) on weight management behaviour (Model 1). The second section focuses on the association between body size estimation, while controlling for weight management goal (Models 1 and 2). Section three presents results on the influence of body size estimation on weight management behaviour, controlling for individual, interpersonal and community level variables (Models 3, 4 and 5). The final section presents and discusses results on the influence of body size estimation and weight management behaviours considering only respondents who inaccurately estimated their body size (Model 6) and the BMI status of the respondents (Model 7).

6.1 Body size estimation and weight management behaviour

Model 1 presents the independent association between body size estimation and weight management behaviour. The Nagelkerke R-square indicates that body size estimation explains only 0.2% of the variation in weight management behaviour. The results indicate no statistically significant association between body size estimation and weight management behaviour. However, respondents who inaccurately estimated their body size were 1.165 times as likely as those who accurately perceived their body size to engage in more healthy practice (Table 6.1).

6.2 Body size estimation, weight management goal and weight management behaviour

In Model 2, weight management goal was introduced and the Nagelkerke R-square increased to 0.003 (Table 6.1). This indicates that 0.3% of the variation in weight management behaviour was explained by body size estimation and weight management goal. The results indicate no statistically significant relationship between body size estimation and weight management behaviour. However, respondents who inaccurately estimated their body size were 1.153 times as likely as those who accurately estimated their body size to engage in more healthy practices ($P=0.494$).

Also, weight management goal was not a significant predictor of weight management behaviour. There was a lower likelihood for respondents who intended to lose weight to engage in more healthy practices compared to those who intended to stay about the same weight ($OR=0.905$; $P=0.667$). Also, respondents who wanted to gain weight were 1.128 times as likely as those who intended to stay about the same to engage in more healthy practices ($P=0.717$).

6.3 Body size estimation, weight management goal, individual, interpersonal and community level factors and weight management behaviour

In Models 3, 4 and 5, individuals, interpersonal and community factors respectively were introduced as control variables, while assessing the association between body size estimation and weight management behaviour. The Nagelkerke R-squares (0.091; 0.119, 0.179) for the Models 3, 4, and 5 indicate that the relationship between body size estimation and weight management behaviour improved. Model 5 recorded the highest value; the R-square suggests that 17.9% of the variation in the model was explained by the independent and control variables (Table 6.1).

In Models 3, 4 and 5, body size estimation was not a significant predictor of weight management behaviour even after the introduction of the control variables. However, in all the models, there was a higher likelihood for respondents who inaccurately estimated their body size to engage in more healthy weight management practices compared to those who accurately perceived their body size. For instance, the results in Model 5 indicate that respondents who inaccurately estimated their body size were 1.166 times as likely as those who accurately estimated their body size to engage in more healthy practices ($P=0.507$; Table 6.1). The hypothesis that individuals who inaccurately estimate their body size are less likely to engage in more healthy practices compared to those who accurately estimate their body size was not proven true, hence, the study fails to accept it.

This finding is consistent with Fredrickson et al. 's (2015) study in Australia which reported no significant association between accurate perception of body size and healthy weight management behaviours. However, it is contrary to studies elsewhere reporting significant association between body size estimation and weight management behaviour (Alyousefi et al., 2017). In the United States of America, Edward et al. (2010) reported that adolescents who accurately estimated their body size had higher odds of reporting healthy weight management behaviour compared to those who inaccurately perceived their body size. In addition, Dustin et al.'s (2011) study in the US found that inaccurate estimation of body size among overweight and obese individuals was significantly associated with less likelihood of attempts to lose weight and engage in physical activity.

The finding that body size estimation was not a significant predictor of weight management behaviour suggests that no matter how a person estimates his or her body size; he/she is likely to engage in more healthy or less healthy behaviour. Knowledge-Attitude-Behaviour (KAB) model proposes that as knowledge accumulates in a health behaviour domain, changes in attitude are initiated and over a

period of time results in behavioural change. However, knowledge about behaviour does not always results in behavioural change (Baranowski et al., 2003). Based on the same premise, perceptions or beliefs about health behaviours may not always translate into an actual behaviour. Thus, accurately or inaccurately estimating one's body size does not matter in relation to engagement in weight management behaviour.

In addition, Ghana (particularly, the urban poor community) is a less individualistic society compared to the Western societies; therefore, the community or cultural perception of weight may have a strong influence on the individual. Therefore, the individual's estimation of his/her body size alone may not lead to adoption of any health or nutrition behaviour. The importance of community norms on weight management behaviour was highlighted in the qualitative interview accounts. The respondents were of the view that fatness is the social norm and this influenced females in particular to desire to gain weight in order to attract men. The respondents also mentioned that the desire to gain weight compelled females to take non-prescribed medications (a less healthy practice) to attain their goal:

“In this community, we value people who are fat and so they (females) take in medicines to gain weight. If she does not gain weight how will a man be interested in her? If you are able to gain weight the men will be interested in you and you will be happy in the community” (FGD2, older women, James Town).

In this community they like to grow big because there are some people I know who were slim but they have all grown fat to the extent that you can tell that this fatness is as a results of taking medicines (overweight older woman, Ussher Town).

“The fatness we are talking about is that the men prefer females who are big with big breast and big buttocks. They prefer women who appear big in shape or have gained extra weight. Some of the women make remarks that having sexual intercourse with a slim woman is like chewing bone. So, they say that to insult their fellow females. The males also do same. Imagine a slim woman walking on the street, they can refer to her as shaking bones” (II, Obese older woman, Ussher Town).

“As for the medicines, they are not taken to lose weight. Many people want to gain weight; they apply the medicines to their buttocks, legs, face and everywhere. You will not see someone trying to lose weight. However, those who have gained weight continue to take medicines like Bro O.T and Dexacortin” (FGD, younger men),

These medications are said to stimulate hunger and longer sleeping hours, therefore, inducing weight gain. The intake of these medicines may have repercussions on people's health.

The weight management goal of the respondents did not significantly predict weight management behaviours in Models 3, 4, and 5. The overall results show that respondents who intended to lose weight were less likely to engage in more healthy practices compared to those who wanted to stay about the same weight. Those who wanted to gain weight were more likely to engage in more healthy weight management practices compared to those who wanted to stay about the same weight (Table 6.1). As found in this study, the highest proportion of the respondents who desired to lose weight overestimated their body size. The desire to lose weight may be obsessive to the extent of applying all measures to attain their goals or desires. Neumark-Sztainer et al. (1995) reported that the desire to lose weight particularly among people who overestimate their body size increases the risk for eating disorders and bulimia nervosa which are forms of unhealthy weight management behaviours.

Regarding the individual level factors, there was no statistically significant association between the sex of the respondents and weight management behaviours in Models 3, 4 and 5. Nonetheless, in all Models, females had a higher likelihood to engage in more healthy weight management practices compared to males (Table 6.1). It was an expectation to record a significant association between sex and weight management behaviour. This is because studies have shown that females express higher concerns about their appearance and health and are more likely to use unhealthy weight management behaviours than males (Mayer-Brown et al., 2016; Assari and Lankarani, 2015; Gonsalves et al., 2014). This study expected females to have a lower likelihood to engage in more healthy practices than males.

However, the findings showed no significant difference in weight management behaviour by the sexes, therefore the hypothesis was not accepted.

The age of the respondents was a significant predictor of weight management behaviour in Models 3, 4 and 5 (Table 6.1). Generally, as age increases, an individual is more likely to engage in more healthy practices. It is evident from Model 3 that respondents within the age group 50-59 years were 2.695 times as likely as those aged less than 30 years to engage in more healthy practices ($P=0.018$). Those aged 60 years and above were also 2.518 times as likely as those aged less than 30 years to practice healthy weight management behaviour ($P=0.051$).

Similarly, the association between age and weight management behaviour was again significant after the introduction of interpersonal variables. Respondents aged 50-59 years and those aged 60 years and above were 2.631 times and 2.575 times as likely as those aged less than 30 years to engage in more healthy practices ($P=0.025$; $P=0.055$ respectively).

Additionally, age remained a significant predictor of weight management behaviour when community level variables were introduced. Respondents aged 50-59 years had a higher likelihood to engage in more healthy practices compared to those aged less than 30 years ($OR=3.136$; $P=0.011$). Also, those aged 60 years and above were 2.814 times as likely as those aged less than 30 years to engage in more healthy practices ($P=0.043$). This finding is an indication that at older ages, people tend to be more engaged in healthy weight management. It is therefore contrary to that of LaRose et al. (2013) in the United States of America, which reported a higher likelihood for younger adults to engage in healthy weight management behaviour compared to older adults. The younger adults were expected to engage

in more healthy practices than the older persons because younger generations are more exposed to the media and messaging on thinness and health benefits of losing weight. However, the qualitative arm of this study indicate that fatness is considered socially attractive hence younger adults will want to remain attractive. This possibly explains why the younger adults (less than 30 years) have a higher likelihood of engaging in unhealthy weight management behaviours.

The effect of age on weight management reflect a life cycle process, that is, at older ages people tend to be more careful and conscious about health and related behaviours. This is because; aging increases an individual's risk of acquiring chronic non-communicable diseases, including hypertension, diabetes and cardiovascular diseases (Lee et al., 2004). Additionally, it is plausible that at older ages people become knowledgeable about healthy weight management practices and the benefits of attaining a healthy body weight.

Another individual level variable that predicted weight management behaviour was marital status. The results in Model 3 (Table 6.1) indicate that respondents who were cohabiting were 2.213 times as likely as those never married to engage in more healthy weight management practices ($P=0.039$). In Models 4 and 5 (Table 6.1), respondents who were cohabiting were 2.088 times and 2.083 times respectively more likely than those never married to engage in more healthy practices ($P=0.059$; $P=0.074$ respectively).

The findings generally suggest that never married respondents have a lower likelihood of engaging in more healthy weight management practice compared to those married, cohabiting or divorced/separated/widowed. This does not support the premise that individuals without partners are on

the marriage market, and therefore, are more concerned about their body size and weight-related behaviours than those who have partners (Averett et al., 2008). Cohabiting or married persons engaged in more healthy practices because they have partners who will possibly support, monitor and discourage them from engaging in unhealthy practices (Waldron et al., 1996). Additionally, having a partner provides financial resources which may increase one's affordability of healthy foods and recreational centres such as gymnasiums to exercise (Waldron et al., 1996). The qualitative narratives confirm the assertion that, support from partners facilitates weight management. The following narrative is illustrative:

“You asked whether there is a place in this community that we can go there for walk or stand to exercise. And I told you that there is no place like that except walking about. But if my husband asks me to take a walk with him, it will be of help so I will follow him. This will enable me to exercise” (II: A 49 year old woman, who wants to lose weight).

With respect to educational attainment, it was not a significant predictor of weight management behaviour in Models 3 to 5. However, the overall pattern of the results indicate that compared to the respondents who had no formal education, those who had some level of education (primary, middle, secondary and above) had a higher likelihood to engage in more healthy practices. Formal education has been documented to impart knowledge and enable people to make better choice particularly in health behaviours (Pampel et al., 2010). Therefore, it was an expectation in this study to find a significant difference in the weight management practice of the respondents who had no formal education and those who had lower or higher education. However, the results showed that no matter the level of education of a person, he/she is likely to engage in more or less healthy weight management behaviour.

Ethnicity had no statistically significant association with weight management behaviours in Models 3 to 5. However, in all three models, the Akan had a higher likelihood to engage in more healthy weight management practices compared to individuals of the Ga-Dangme ethnic group. Those of other ethnic groups were less likely than the Ga-Dangme to engage in more healthy practices (Table 6.1).

Length of stay in the community significantly predicted weight management behaviour. The results in Models 3, 4 & 5 show that respondents who had lived in the study community for less than 5 years have a higher likelihood to engage in more healthy practices compared to those living there for more than 10 years. Those who had lived there for 5-10 years were less likely to engage in more healthy practices compared to those living there for more than 10 years. For instance, in Model 5 (Table 6.1), respondents who had lived in the community for 5-10 years were 0.595 times less likely to engage in more healthy practices compared to those living there for more than 10 years ($P=0.004$).

The length of stay at a host location is a key determinant of the relationship between migration and health-related outcomes such as obesity (Dake et al., 2016). Respondents who had lived in the community for less than ten years are presumably migrants and they tend to have poorer healthy behaviours compared to non-migrants (Joshi et al., 2014). Also, Migrants are mostly target workers whose concern is to meet targets sets for themselves. Therefore, issues of weight management such as healthy eating and physical activities may be of less concern.

With respect to occupation, the results in Models 3 to 5 indicate that it does not significantly predict the respondents' weight management behaviour (Table 6.1). Nonetheless, the findings from Model 5 indicate that manual workers and those in sales and services were more likely to engage in more

healthy practices compared to those who were unemployed (OR=1.358; P=0.510; OR=1.208; P=0.417). The respondents who were engaged in professional/managerial work had a lower likelihood of engaging in more healthy practices than those who were unemployed (OR=0.856; P=0.374).

At the interpersonal level, household wealth status significantly predicted weight management behaviour in Models 4 and 5. Generally, there were lower likelihoods for respondents with middle and upper categories of wealth to engage in more healthy practices compared to those with lower wealth category. As shown in Models 4 and 5, respondents with upper wealth category were 0.575 times and 0.59 times as likely as those with lower wealth category to engage in more healthy practices respectively (P=0.030; P=0.049 respectively; Table 6.1).

This finding can be partly explained by the claim that increasing affluence is associated with the consumption of fatty and sugary foods which are considered unhealthy as they contribute to the incidence of obesity (Amoah, 2003). Also, respondents in lower household wealth status in this study constituted the highest proportion of the respondents who walk or use bicycle as a medium of transportation (Appendix J). This has a higher tendency of increasing their physical activity level compared to those of upper wealth status. The rich in urban poor communities have a higher tendency to use vehicles as a medium of transportation to signify their wealth.

With respect to social support, family's or friends' encouragement to eat healthy food was not a significant predictor of weight management behaviour in Models 4 and 5 (Table 6.1). Also, family's or friend's discouragement to eat healthy did not significantly predict the weight management behaviour

of the respondents. Similarly, family's or friend's participation in physical activities did not significantly influence an individual's engagement in weight management behaviours.

At the community level, locality, and community conduciveness were significantly associated the weight management behaviour. With respect to community conduciveness, individuals who perceived their community as very conducive for physical activity were 2.746 times as likely as those who perceived the community as not conducive to engage in more healthy practices ($P=0.008$; Model 5 (Table 6.1)). Similarly, those who reported that the community was somewhat conducive for physical activity were 1.158 times more likely to engage in more healthy practices compared to those who perceived the community as not conducive ($P=0.714$; Model 5).

The findings suggest that community conduciveness is very important for weight management. Robert wood Johnson's Foundation Thought Leaders Forum (2011) reported that fear and violence in the community influence whether or not people will walk around or engage in other outdoor physical activities. Also, communities which are unsafe tend to have limited healthy food options and these are associated with healthy or unhealthy weight management practices (Robert Wood Johnson Foundation Thought Leaders Forum, 2011). This suggests that in safe communities, there is availability of healthy food options and the liberty to walk and engage in other outdoor physical activities. This therefore explains the finding that perceiving one's community as very conducive for physical activity increases the likelihood to engage in more healthy weight management practices.

With respect to locality, Findings from Model 5 (Table 6.1) indicate that James Town residents were 2.04 times as likely as Ussher Town residents to engage in more healthy weight management behaviours (P=0.012).

The results suggest that although both communities are urban poor, there may be certain contextual factors that distinguish them. For instance, there are more spaces for recreation in James Town compared to Ussher Town (Appendix K). However, the underlying reasons for this finding were not examined in this study. This calls for further studies to identify the underlying reasons for this disparity.

The availability of physical activity spaces and availability of fruits and vegetables were both not significant predictors of weight management behaviour. However, in Models 5, respondents who reported availability of physical activity spaces in the community were 1.05 times as likely as those who reported unavailability of spaces to engage more healthy weight management practices (P=0.901). Respondents who reported availability of fruits and vegetables were 0.85 times less likely to engage in more healthy weight management practices compared to those who reported unavailability of fruits and vegetables.

| Variables | Weight management behaviour ^a | | | | | | | | | |
|-------------------------------|--|-------|-----------------|-------|-----------------|-------|-----------------|-------|-----------------|-------|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | |
| | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E |
| Intercept | 1.418** | 0.137 | 1.446** | 0.561 | 0.475 | 0.335 | 0.800 | 0.752 | 0.431 | 1.021 |
| Body size estimation | | | | | | | | | | |
| Accurate estimation (RC) | 1.000 | | | | 1.000 | | 1.000 | | 1.000 | |
| Inaccurate estimation | 1.165 | 0.208 | 1.153 | 0.208 | 1.140 | 0.220 | 1.139 | 0.224 | 1.166 | 0.231 |
| Weight management goal | | | | | | | | | | |
| Stay about the same (RC) | | | | | 1.000 | | 1.000 | | 1.000 | |
| Lose weight | | | 0.905 | 0.231 | 0.826 | 0.247 | 0.800 | 0.255 | 0.827 | 0.268 |
| Gain weight | | | 1.128 | 0.333 | 1.460 | 0.358 | 1.496 | 0.367 | 1.551 | 0.380 |
| Sex of respondents | | | | | | | | | | |
| Males (RC) | | | | | 1.000 | | 1.000 | | 1.000 | |
| Females | | | | | 1.216 | 0.255 | 1.251 | 0.284 | 1.311 | 0.294 |
| Age group | | | | | | | | | | |
| <30 (RC) | | | | | 1.000 | | 1.000 | | 1.000 | |
| 30-39 | | | | | 1.596 | 0.326 | 1.595 | 0.334 | 1.617 | 0.348 |
| 40-49 | | | | | 1.513 | 0.361 | 1.631 | 0.374 | 1.722 | 0.387 |
| 50-59 | | | | | 2.695** | 0.421 | 2.631** | 0.432 | 3.136** | 0.451 |
| 60 and above | | | | | 2.518* | 0.473 | 2.575* | 0.493 | 2.814** | 0.512 |
| Marital Status | | | | | | | | | | |
| Never married (RC) | | | | | 1.000 | | 1.000 | | 1.000 | |
| Married | | | | | 1.057 | 0.316 | 1.081 | 0.390 | 0.988 | 0.337 |
| Cohabiting/living t | | | | | 2.213** | 0.285 | 2.088* | 0.325 | 2.083* | 0.411 |
| Divorced/separated/wid | | | | | 1.283 | 0.403 | 1.421 | 0.413 | 1.069 | 0.432 |
| Ethnicity | | | | | | | | | | |
| Ga-Dangme (RC) | | | | | 1.000 | | 1.000 | | 1.000 | |
| Akan | | | | | 1.273 | 0.291 | 1.243 | 0.300 | 1.227 | 0.312 |
| Other | | | | | 0.709 | 0.389 | 0.623 | 0.401 | 0.555 | 0.421 |

Table 6. 1: Logistic regression of the association between body size estimation and weight management behaviour

Source: Field survey, Nov-Dec 2016. N=395 RC-reference category. ^aless healthy practices (RC) Nagelkerke R² (model(model 1=0.02); model 2= (0.003) model 3 (0.091), model 4 (0.119). Model 5(0.179) ** P<0.05 *** P<0.001

Table 6.1 continued

| Variables | Weight management behaviour ^a | | | | | | | | | |
|---------------------------------------|--|-----|-----------------|-----|-----------------|-------|-----------------|-------|-----------------|-------|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | |
| | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E |
| Educational attainment | | | | | | | | | | |
| No education (RC) | | | | | 1.000 | | 1.000 | | 1.000 | |
| Primary | | | | | 1.401 | 0.483 | 1.435 | 0.492 | 1.093 | 0.508 |
| Middle/JHS | | | | | 1.204 | 0.449 | 1.139 | 0.461 | 0.940 | 0.476 |
| Secondary+ | | | | | 1.882 | 0.482 | 1.824 | 0.494 | 1.441 | 0.509 |
| Occupation | | | | | | | | | | |
| Unemployed (RC) | | | | | 1.000 | | 1.000 | | 1.000 | |
| Professional/managerial | | | | | 1.052 | 0.434 | 0.978 | 0.444 | 0.856 | 0.457 |
| Sales and services | | | | | 1.249 | 0.275 | 1.178 | 0.278 | 1.208 | 0.287 |
| Manual work | | | | | 1.202 | 0.354 | 1.218 | 0.362 | 1.358 | 0.377 |
| Length of stay in community | | | | | | | | | | |
| >10 years (RC) | | | | | 1.000 | | 1.000 | | 1.000 | |
| 5-10 years | | | | | 0.490 | 0.337 | 0.508* | 0.347 | 0.480** | 0.357 |
| < 5 years | | | | | 1.038** | 0.382 | 1.124 | 0.391 | 1.082 | 0.411 |
| Household wealth status | | | | | | | | | | |
| Lower wealth category (RC) | | | | | | | 1.000 | | 1.000 | |
| Middle wealth category | | | | | | | 0.753 | 0.309 | 0.794 | 0.320 |
| Upper wealth category | | | | | | | 0.575** | 0.255 | 0.595** | 0.264 |
| Social support | | | | | | | | | | |
| Family's encouragement to eat healthy | | | | | | | 1.058 | 0.039 | 1.036 | 0.040 |
| Friend's encouragement to eat healthy | | | | | | | 0.924 | 0.044 | 0.932 | 0.045 |

Source: Field Survey, November-December 2016. N=395 RC-reference category. ^a less healthy practice
Nagelkerke R² (Model 1=0.002); Model 2= (0.003); Model 3 (0.091); Model 4 (0.119); Model 5(0.179) ** P<0.05 *** P<0.001.

| Variables | Weight management behaviour ^a | | | | | | | | | |
|--|--|-----|-----------------|-----|-----------------|-----|-----------------|-------|-----------------|-------|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | |
| | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E | Exp (β) | S.E |
| Family's discouragement to eat healthy | | | | | | | 0.995 | 0.062 | 0.991 | 0.065 |
| Friend's discouragement to eat healthy | | | | | | | 1.007 | 0.063 | 1.034 | 0.066 |
| Family's participation in physical activity | | | | | | | 0.970 | 0.028 | 0.981 | 0.029 |
| Friend's participation in physical activity | | | | | | | 1.023 | 0.025 | 1.015 | 0.026 |
| Physical activity spaces | | | | | | | | | | |
| Unavailable (RC) | | | | | | | | | 1.000 | |
| Available | | | | | | | | | 1.045 | 0.350 |
| Community conduciveness | | | | | | | | | | |
| Not conducive (RC) | | | | | | | | | 1.000 | |
| Very conducive | | | | | | | | | 2.746** | 0.380 |
| Somewhat conducive | | | | | | | | | 1.158 | 0.401 |
| Availability of fruits and vegetables | | | | | | | | | | |
| No (RC) | | | | | | | | | 1.000 | |
| Yes | | | | | | | | | 0.854 | 0.615 |
| Locality | | | | | | | | | | |
| James Town | | | | | | | | | 2.039** | 0.284 |
| Ussher Town (RC) | | | | | | | | | 1.000 | |

Table 6.1 continued.

Source: Field survey, Nov-Dec 2016. N=395 RC-reference category. ^a less healthy practice (RC) Nagelkerke R² (model 1=0.002); Model 2= (0.003); Model 3 (0.091); Model 4 (0.119); Model 5(0.179). ** P<0.05 *** P<0.001

6.4 The influence of body size underestimation and overestimation on weight management behaviour (Model 6)

In Model 6, shown in Table 6.2, body size estimation (underestimation vs. overestimation) was again not a significant predictor of weight management behaviour. The findings show that respondents who underestimated their body size were 1.005 times as likely as those who overestimated their body size to engage in more healthy practices ($P=0.992$).

Similarly, weight management goal was not a significant predictor of weight management behaviour (Tables 6.2). Similarly, variables such as sex, age, education, and length of stay in the community did not significantly influence weight management behaviour at the individual level.

However, variables such as marital status, ethnicity and occupation were the individual level factors that significantly predicted weight management behaviour. The results presented in Table 6.3 show that respondents who were cohabiting were 17.993 times as likely as those never married to engage in more healthy practices ($P=0.003$). Also, those who were divorced/separated/widowed, had a higher likelihood of engaging in more healthy practices compared to those never married ($OR=9.707$; $P=0.012$).

With reference to ethnicity, respondents who belonged to the Akan ethnic group were 5.235 times as likely as the Ga-Dangme to engage in more healthy practices ($P=0.029$). However, those of other ethnic groups were 0.851 times less likely than the Ga-Dangme to engage in more healthy practices ($P=0.850$). The study community (Ga Mashie) is predominantly a Ga society and people of this ethnic group are known to have preference for fatness (Biritwum et al., 2005). This was confirmed in the qualitative interview accounts:

“For the Gas, because of the kenkey we eat, we are fat. Since the Hausas eat a lot of meat, most of them are slim and tall. The moment you see their legs, you will be able to tell that this person is Hausa. Most of the Asante have normal body sizes, although some are fat (FGD 5, Older men, Ussher Town).

“ With respect to the Gas, they are fat but the Akans do not become fat like the Gas” (II, overweight older woman, James Town).

“We know the fat people are mostly the Gas” (FGD 3, Younger Men, James Town).

The preference for fatness among the Ga-Dangme may increase their desire to gain weight as individuals who have the desire to gain weight have a higher likelihood to adopt unhealthy practices (Rguibi and Belahsen, 2006). This partly explains the higher likelihood for the Ga to engage in less healthy weight management practices.

Occupation emerged as a significant predictor of weight management behaviour in Model 6 (Table 6.2). Respondents who were engaged in professional work were 0.158 times less likely to engage in more healthy practices compared to those who were unemployed ($P=0.076$). Those in sales and service work were 0.794 times less likely to engage in more healthy practices compared to those who were unemployed. However, respondents who were in manual work were 4.442 times as likely as those who were unemployed to engage in more healthy practices ($P=0.053$). Occupations such as manual work are more physically demanding compared to professional/managerial works which are more sedentary. As a result, manual workers have a higher likelihood to be physically active (Amoah, 2003). This partly explains the finding that manual workers have a higher likelihood of engaging in more healthy weight management practice compared to those who were unemployed.

At the interpersonal level, household wealth status and social support for healthy eating and physical activity were significant predictors of weight management behaviour (Table 6.2). Respondents with upper and middle wealth category were less likely to engage in more healthy practices compared to those with lower wealth category (OR=0.273; P=0.031; OR=0.659; P=0.432 respectively).

Considering social support, the more an individual is discouraged by his/her family to eat healthy food, the higher the likelihood for him/her to engage in more healthy practices (OR=1.288; P=0.045). Also, the more a respondent has his/her family participating in physical activity, the lower the likelihood for him/her to engage in more healthy practices (OR=0.880; P=0.028). This suggests that in the context of underestimation and overestimation, social support is an important variable to be considered for weight management intervention. The findings highlight the importance of the sources of social support and their influence on behaviour change. Perhaps, the respondents are discouraged to eat healthy food by members of the family who do not have enough influence on the individual. In such circumstance, their messages or criticisms would be less considered compared to those who have much influence on the individual. Social support from significant others has been documented to enable or inhibit weight management (Metzgar et al., 2015).

Community level variables that emerged as significant predictors of weight management behaviour were community conduciveness and locality (Table 6.2). Respondents who perceived their community as very conducive for physical activity were 5.599 times as likely as those who

perceived the community as not conducive to engage in more healthy practices ($P=0.018$). Also, those who perceived the community as somewhat conducive for physical activity had a higher likelihood of engaging in more healthy practices compared to those who perceived the community as not conducive ($OR=1.261$; $P=0.758$).

With respect to locality, respondents who lived in James Town were 5.27 times as likely as those in Ussher Town to engage in more healthy practices ($P=0.004$; Table 6.2). The availability of physical activity spaces and availability of fruits and vegetables did not significantly influence weight management behaviour.

Table 6.2: Logistic regression of the association of body size estimation (overestimation vs. underestimation) on weight management behaviour

| Variables | Weight management behaviour ^a | |
|-------------------------------|---|-------|
| | Model 6 (Nagelkerke R ² = 0.432) | |
| | Exp (β) | S.E |
| Intercept | 0.543 | 2.036 |
| Body size estimation | | |
| Overestimation (RC) | 1.000 | |
| Underestimation | 1.005 | 0.492 |
| Weight management goal | | |
| Stay about the same (RC) | 1.000 | |
| Lose weight | 0.708 | 0.518 |
| Gain weight | 2.894 | 0.704 |
| Sex of respondents | | |
| Males (RC) | | |
| Females | 0.981 | 0.552 |
| Age group | | |
| <30 (RC) | 1.000 | |
| 30-39 | 0.532 | 0.977 |
| 40-49 | 0.775 | 0.902 |
| 50-59 | 0.507 | 0.917 |
| 60 and above | 2.342 | 0.961 |
| Marital Status | | |
| Never married (RC) | 1.000 | |
| Married | 2.832 | 0.657 |
| Cohabiting/living together | 17.993** | 0.971 |
| Divorced/separated/widowed | 9.707** | 0.906 |
| Ethnicity | | |
| Ga-Dangme (RC) | 1.000 | |
| Akan | 5.235** | 0.760 |
| Other | 0.851 | 0.854 |
| Educational attainment | | |
| No education (RC) | 1.000 | |
| Primary | 0.311 | 1.095 |
| Middle/JHS | 0.261 | 1.058 |
| Secondary+ | 0.624 | 1.135 |

N=175 RC-reference category. ^a more healthy practice (RC) ** P<0.05

Table 6.2 continued.

| Variables | Weight management behaviour ^a | |
|--|---|----------------|
| | Model 6 (Nagelkerke R ² = 0.475) | |
| | Exponent (beta) | Standard Error |
| Occupation | | |
| Unemployed (RC) | 1.0000 | |
| Professional/managerial | 0.158 | 1.038 |
| Sales and services | 0.794 | 0.605 |
| Manual work | 4.442 | 0.771 |
| Length of stay in community | | |
| >10 years (RC) | 1.000 | |
| 5-10 years | 0.280 | 0.778 |
| <5 years | 0.832 | 0.751 |
| Household wealth status | | |
| Upper wealth (RC) | 1.000 | |
| Middle wealth status | 0.273** | 0.602 |
| Lower wealth status | 0.659 | 0.531 |
| Social support | | |
| Family's support to eat healthy | 0.965 | 0.078 |
| Friend's support to eat healthy | 0.978 | 0.082 |
| Family's discouragement to eat healthy | 1.288** | 0.126 |
| Friend's discouragement to eat healthy | 0.848 | 0.105 |
| Family's participation in physical activity | 0.880** | 0.058 |
| Friend's participation in physical activity | 1.077 | 0.054 |
| Physical activity spaces | | |
| Unavailable (RC) | 1.000 | |
| Available | 1.934 | 0.738 |
| Community conduciveness | | |
| Not conducive (RC) | 1.000 | |
| Very conducive | 5.599** | 0.730 |
| Somewhat conducive | 1.261 | 0.752 |
| Availability of fruits and vegetables | | |
| Unavailable (RC) | 1.000 | |
| Available | 1.396 | 0.973 |
| Locality | | |
| Ussher Town (RC) | 1.000 | |
| James Town | 5.266** | 0.573 |

N=175 RC-reference category. ^a more healthy practices (RC) ** P<0.05

6.5 The influence of body size estimation on weight management behaviour, taking into consideration BMI (Model 7)

Body size estimation was not significantly related to weight management behaviour when the respondents BMI status was considered in Model 7 (Table 6.3). The findings show that respondents who were not overweight, but overestimated or underestimated their body sizes were 2.707 times and 1.055 times ($P=0.243$; $P=0.897$ respectively) as likely as those who were overweight but accurately estimated their body size to engage in more healthy practices. However, those who were overweight, but underestimated their body size were 0.934 times less likely to engage in more healthy weight management practice compared to those who accurately perceived themselves as overweight ($P=0.897$).

Weight management behaviour was again not significantly related to weight management behaviour in Model 7 (Table 6.3). Also, individual level variables such a sex, ethnicity, occupation, and length of stay in community did not significantly influence weight management behaviour. However, age, marital status, and educational attainment significantly influenced weight management behaviour.

The findings indicate that, overweight respondents who were aged 40-49 years were 2.859 times as likely as those who were overweight but less than 30 years to engage in more healthy practices ($P=0.061$). Also, the respondents who were overweight and aged 50 years or more had a higher likelihood to engage in more healthy practices compared to those who were overweight but less than 30 years ($OR=5.886$; $P=0.003$).

For marital status, respondents who were not overweight, but were married significantly had a higher likelihood of engaging in more healthy practice compared to their counterparts who were never married (OR=3.130; P=0.064). Similarly, those who were not overweight, but were cohabiting and divorced/separated/widowed were more likely to engage in more healthy practices compared to those never married (OR=3.828; P=0.030; OR=4.330; P=0.064 respectively). Among the respondents who were overweight, there was a less likelihood for those who were cohabiting to engage in more healthy practices compared to those who were never married (OR=0.328; P=0.029). Also, those who were divorced/separated/widowed were less likely to engage in healthy practices than those who were overweight but never married (OR=0.286; P=0.054).

The lower likelihood for overweight respondents who were married or cohabiting to engage in more healthy practices could be explained by cultural influence. In the Ghanaian society, there is the presumption that being married makes a person (particularly females) beautiful because the partner will provide the needs of the spouse. Therefore, married individuals are expected to gain weight to indicate how well the partner provides for the spouse (Aryeetey, 2016). This may have influenced their choice of less healthy practice. The findings from Models 6 and 7 are similar to what were found in Models 3 to 5. That is, never married persons are at higher risk of engaging in less healthy weight management practices. This group of people particularly need to be targeted in an intervention for weight management.

Household wealth status again was a significant predictor of weight management behaviour.

The results presented in Table 6.3 indicate that overweight respondents who were in the upper wealth category were significantly less likely to engage in more healthy practices compared to those with lower wealth status (OR=0.232; P=0.003). These findings are similar to those found in Models 5 and 6. This indicates that generally, individuals with lower wealth category households have better weight management practices than those in middle or upper wealth category.

At the community level, community conduciveness and locality remained significant in predicting weight management behaviour (Table 6.3). The findings indicated that overweight individuals who perceived their community as very conducive for physical activity were 4.626 times as likely as those who were overweight, but perceived the community as not conducive to engage in more healthy practices (P=0.008; Table 6.3). Among the respondents who were not overweight, those who perceived the community as very conducive for physical activity were 3.242 times as likely as those who thought the community was not conducive to engage in more healthy practices (P=0.070).

Additionally, respondents who were overweight and lived in James Town were 2.12 times as likely as those in Ussher Town to engage in more healthy practices (P=0.061). Community conduciveness and locality continuously predicted weight management behaviour in this study irrespective of the context (Model built). This shows that they are important variables to be considered in the implementation of policy on obesity and weight management.

Table 6.3: Logistic regression modelling of the influence of body size estimation on weight management behaviour by Body Mass Index

| Variables | Weight management behaviour ^a | | | |
|-------------------------------|--|-------|--|-------|
| | Non Overweight | | Overweight | |
| | Model 7 (Nagelkerke R ² = 0.279) | | Model 7 (Nagelkerke R ² = 0.272) | |
| | Exp (β) | S.E | Exp (β) | S.E |
| Intercept | 0.129 | 2.038 | 1.363 | 1.952 |
| Body size estimation | | | | |
| Accurate estimation (RC) | 1.000 | | 1.000 | |
| Underestimation | 2.707 | 0.853 | 1.680 | 0.397 |
| Overestimation | 1.055 | 0.416 | 0.934 | 0.524 |
| Weight management goal | | | | |
| Stay about the same (RC) | 1.000 | | 1.000 | |
| Lose weight | 1.299 | 0.763 | 0.860 | 0.349 |
| Gain weight | 1.449 | 0.456 | 2.611 | 1.366 |
| Sex of respondents | | | | |
| Males (RC) | 1.000 | | 1.000 | |
| Females | 0.893 | 0.479 | 1.558 | 0.475 |
| Age group | | | | |
| <30 years (RC) | 1.000 | | 1.000 | |
| 30-39 | 1.031 | 0.536 | 2.331 | 0.533 |
| 40-49 | 0.597 | 0.692 | 2.859 | 0.561 |
| 50 and above | 2.199 | 0.879 | 5.886** | 0.588 |
| Marital Status | | | | |
| Never married (RC) | 1.000 | | 1.000 | |
| Married | 3.130 | 0.619 | 0.776 | 0.511 |
| Cohabiting/living together | 3.828** | 0.617 | 0.328** | 0.672 |
| Divorced/separated/widowed | 4.330 | 0.793 | 0.286 | 0.648 |
| Ethnicity | | | | |
| Ga-Dangme (RC) | 1.000 | | 1.000 | |
| Akan | 1.230 | 0.546 | 1.109 | 0.454 |
| Other ethnic groups | 0.579 | 0.708 | 0.520 | 0.634 |
| Educational attainment | | | | |
| No education (RC) | 1.000 | | 1.000 | |
| Primary | 8.954 | 1.535 | 0.531 | 0.606 |
| Middle/JHS | 5.768 | 1.478 | 0.629 | 0.560 |
| Secondary+ | 11.974 | 1.495 | 0.747 | 0.651 |

N=395 RC-reference category. ^a more healthy behaviour (RC) ** P<0.05

Table 6.3 continued.

| Variables | Weight management behaviour ^a | | | |
|--|--|-------|-------------------------------|-------|
| | Non Overweight | | Overweight | |
| | Model 6 (R ² = 0.) | | Model 6 (R ² = 0.) | |
| | Exp (β) | S.E | Exp (β) | S.E |
| Occupation | | | | |
| Unemployed (RC) | 1.000 | | 1.000 | |
| Professional | 0.941 | 0.751 | 0.632 | 0.669 |
| Sales and services | 1.632 | 0.497 | 0.910 | 0.405 |
| Manual work | 1.288 | 0.627 | 1.043 | 0.563 |
| Length of stay in community | | | | |
| >10 years (RC) | 1.000 | | 1.000 | |
| 5-10 years | 0.811 | 0.833 | 0.805 | 0.674 |
| <5 years | 0.293 | 0.610 | 0.402 | 0.784 |
| Household wealth status | | | | |
| Lower wealth(RC) | | | | |
| Middle wealth category | 1.223 | 0.531 | 0.454 | 0.488 |
| Upper wealth category | 1.150 | 0.450 | 0.323** | 0.383 |
| Social support | | | | |
| Family's encouragement to eat healthy | 1.065 | 0.074 | 1.000 | 0.057 |
| Friend's encouragement to eat healthy | 0.926 | 0.077 | 0.972 | 0.066 |
| Family's discouragement to eat healthy | 1.025 | 0.118 | 1.011 | 0.096 |
| Friend's discouragement to eat healthy | 0.852 | 0.122 | 1.146 | 0.102 |
| Family's participation in physical activity | 0.955 | 0.053 | 1.009 | 0.042 |
| Friend's participation in physical activity | 1.065 | 0.040 | 0.495 | 0.043 |
| Physical activity spaces | | | | |
| Available | 0.305 | 0.867 | 1.711 | 0.446 |
| Unavailable (RC) | 1.000 | | 1.000 | |
| Community conduciveness | | | | |
| Not conducive (RC) | 1.000 | | 1.000 | |
| Very conducive | 3.242* | 0.650 | 4.626** | 0.579 |
| Somewhat conducive | 1.501 | 0.692 | 1.075 | 0.608 |
| Availability of fruits and vegetables | | | | |
| Unavailable (RC) | 1.000 | | 1.000 | |
| Available | 1.405 | 0.816 | 0.456 | 1.429 |
| Locality | | | | |
| James Town | 2.216 | 0.528 | 2.123 | 0.402 |
| Ussher Town (RC) | | | | |

N=395 RC-reference category. ^a more healthy behaviour (RC)

** P<0.05

6.6 Facilitators of weight management

Factors that enable engagement in healthy weight management

The respondents discussed facilitators of weight management under three main sub-organizing themes: individual factors, interpersonal factors and organizational factors (see Appendix C).

The individual level factors included the following: ‘personal decision manage weight’ and ‘personal realisation of the effects of physical activity’. The respondents expressed that an individual has to personally decide to initiate weight management. Also, when one is able to see a reduction in weight after a period of exercising it encourages him/her to further exercise to manage weight. Below are quotes to buttress the points:

“The person really has to make up his mind to manage his weight. It is like a friend asking you to stop wee [marijuana] smoking. If you have the will power, you will stop” (FGD, younger men).

“If the person is slim I will not advise the person to be fat and if the person is the obesity type, I will advise her to do some little exercise. But if you do the exercise and still you are of the same size, then you don’t have to worry yourself” (II, an obese young woman, desires to lose weight).

‘Health practitioners’ advice’ and ‘support from partner’ constituted the interpersonal level factors. It was reported in the younger men’s group that health professional’s advice to eat healthy promotes weight management. An older woman also indicated that partner’s support to exercise facilitates weight management.

“Unless it is written from the doctors to eat healthy to manage weight, they will not do it. It is when doctors advice before they will put in the efforts to follow the doctors’ advice” (FGD, younger men).

“You asked whether there is a place in this community that we can go there for walk or stand to exercise. And I told you that there is no place like that except walking about. But if my husband asks me to take a walk with him, it will be of help so I will follow him” (II, overweight older woman, wants to lose weight).

In relation to the organizational factors, ‘media influence’, ‘support from church’ and ‘keep fit club’ were mentioned. ‘Support from church’ was the dominant theme. These organisational factors were stated only by women. For instance, they reported that in contemporary times the media show personalities who have normal body weight and this influence them to exercise to attain such body weight. Also, association with churches and keep fit clubs encouraged people to exercise. These organisations occasionally organise physical activities.

“Nowadays the media have influenced people. When they see the nice shape (size) then we the ladies, we also want to have such shape, so we try to exercise” (FGD, older women).

“For me, our church sometimes invites doctors and trainers around who help us with aerobics. So once in a while, I do exercise” (FGD, younger women).

Respondent: *Both men and women go for jogging together. Sometimes when the men wake up early, they call on the women and this helps because going to jogging by one’s self may be challenging.*

Interviewer: *is it something like a keep fit club?*

Respondent: *Yes, it usually takes place every Sunday morning. We go for jogging* (FGD, older Women).

6.6.1 Discussion

The factors that facilitated weight management were discussed under three levels of influence: individual, interpersonal and organisational levels. This relates to the socioecological model’s ideology that an individual’s engagement is influenced by his/her personal characteristics as well as his/her environmental factors including social primary groups and social organisations. At the

individual level, personal decision to manage weight and reduction in weight after a period of exercising facilitate weight management. These findings are not consistent with other studies which have reported that individual level factors such as self- body perception, knowledge about the benefits of weight management, and self-motivation facilitated weight management (Aziz et al., 2016; Gupta, 2014). It is indeed important to personally decide to manage weight to attain a healthy weight because for change to happen, the individuals must be prepared to initiate it.

At the interpersonal level, advice from health practitioners and support from partners also motivated individuals to manage their weight. Social support is a major factor in weight management, given that it can help or hinder efforts to manage weight (Kiernan et al., 2012; Metzgar et al., 2015). Social support from significant others has been reported in Montreal, Canada as an important facilitator as well as a barrier weight management (Dikareva et al., 2016). In a qualitative study conducted by Metzgar et al. (2015) among women in USA, social support was stated as both a barrier and facilitator to weight management. That is while support from family and friends motivated women to continue their weight management practices, the absence of social support created a barrier to weight management.

Finally, media influence, support from church and keep fit clubs were the organizational factors that facilitated weight management. These findings are comparable to other studies, including that of Hammarström et al. (2014) in Sweden, which provided intervention for women to lose weight. The support received from the project to eat healthy during group meetings and interactions with nurses and dieticians enabled them to eat healthy. In Pakistan, advertisement of thin body size as the ideal body size influenced the desire to lose weight (Jaffari et al., 2011). Also, studies have demonstrated that association with a religious group has a positive influence

on health behaviours (Krause, Shaw, & Liang, 2011). This is because they receive support from co-church members to practice healthy behaviours (Krause, Shaw, & Liang, 2011).

6.7 Summary

This chapter examined the predictors of weight management behaviours. Body size estimation had no significant influence on weight management behaviours. Other individual level factors including age, marital status and locality significantly influenced engagement in weight management behaviours. Also, environmental factors including household wealth status, locality and community conduciveness emerged as important factors that influence weight management behaviours. In addition, the decision to manage weight, support from partner and health practitioners, media influence and association with a church enables a person to engage in weight management. These findings conform to the socioecological model which argues that the performance of a health behaviour is influenced by the relationship between an individual's characteristics and his/her social world (Hill et al., 2012; Robinson, 2008). That is, engagement in weight management behaviours is based not only on a person's biological characteristics (e.g. age, marital status) but also the locality in which a person stays, whether or not the community is conducive to engage in physical activity and his or her household wealth status. It also depends on a persons decision to manage his/her weight, support from significant others and his association with some social organisations. These factors interactively determines whether or not an individual will engage in weight management behaviours.

CHAPTER SEVEN

Summary, Conclusions and Recommendations

7.0 Introduction

The increasing prevalence of obesity in many populations is a worldwide concern because of their adverse health, social and economic effects. Although obesity have been linked to changes in diet and physical activity as a result of structural factors including globalisation, industrialisation and urbanisation, individual and societal perceptions and preferences about body size have also been documented as contributing factors. This is because the decision to manage weight is to a larger extent, influenced by individual or social perceptions of body size. Yet, there has been little description of obesity in this regard in sub-Saharan Africa. This study contributes to the literature on the factors influencing the estimation of body size and weight management decisions in urban poor communities. The study used primary data and a mixed method of quantitative and qualitative approaches were employed to achieve the objectives of the study. The salient findings from the study, and recommendations for policy interventions are discussed below.

7.1 Summary of findings

The prevalence of overweight and obesity among the study population was high. About one out of every three persons of the total sample was obese. Consistent with global gender disparities, the levels of obesity was higher among females than males. There were variations in the perceive and actual body size of the respondents: generally, more than two-fifths of the sample inaccurately estimated their body size. Although obesity level was high among the sample, the majority of them desired to stay about the same weight. Skipping meals, consumption of fatty

and sugary foods and increasing physical activity were the common practices for weight management.

Healthy eating was inhibited by factors including high cost of fruits and vegetables, the perception that the consumption of fruits and vegetables do not give satisfaction, lack of money and adverse reactions from the intake of some fruits and vegetables. Also, laziness and lack of time were the key individual level factors that inhibit participation in physical activity. In addition, societal representation of body size emerged as the dominant community factor that influence engagement in weight management behaviours and this increase the risk of obesity.

However, having a personal decision to manage weight and personal realisation of the effects of physical activity motivated people to manage their body weight.

The results of the logistic regression analysis indicate that body size estimation was not a significant predictor of weight management behaviour in all the seven Models. Also, an individual's weight management goal did not significantly influence engagement in weight management. Rather, individual level factors such as age of the respondents, marital status and length of stay in the community significantly predicted engagement in weight management behaviours. Specifically, the likelihood of engaging in more healthy practices increases with increasing age. With respect to marital status, those who were cohabiting had a higher likelihood of engaging in more healthy practices than those who were never married.

At the interpersonal level, factors such as household wealth status predicted engagement in weight management behaviours. Also, advice from health practitioners, support from partners, church and media influence were reported as factors that facilitate weight management.

Community conduciveness and locality significantly predicted weight management behaviour at the community level. Specifically, compared to individuals who perceived their community as not conducive, those who perceived their community as very conducive had a higher likelihood of engaging in more healthy weight management practices. Also, respondents who lived in James Town had a higher likelihood of engaging in more healthy practices compared to Ussher Town residents.

7.2 Conclusions

This study indicates that there is high levels of overweight and obesity among the study sample. This supports the emerging pattern of rising levels of obesity among the poor in areas in developing countries (Ziraba et al., 2009). More females than males were obese in the study areas and this corroborate the global pattern of obesity (Seidcell and Halberstadt, 2015).

Studies have reported that body size estimation is a predictor of weight management behaviours (Joh et al., 2013; Atlanti et al., 2008; Bhurtun and Jeewon, 2013). The findings of this study contradicts earlier reports. Body size estimation did not significantly predict engagement in weight management behaviours. Engagement in weight management behaviours is based on age, marital status and locality. In addition, the perception that fruits and vegetables are expensive and also not filling, coupled with issues of poverty hindered engagement in healthy eating. Laziness and lack of time to exercise and the perception that exercise could only be performed at dawn prevent engagement in physical activity. However, to engage in weight management, an individual should personally decide, must receive social support from

significant others and associate with some social organisations such as the church and keep fit clubs.

Moreover, as found in this study, social representation of fatness (associated with beauty, wealth and respect) and thinness (associated with illness and poverty) do influence people's weight management behaviours despite the community's knowledge on the inconvenience of obesity in terms of health.

In summary, the findings from this study indicate that beyond the individual characteristics, environmental factors influence engagement in weight management. This supports the notion of the socioecological model that health behaviour is an outcome of a complex interaction between factors operating at different levels.

7.3 Recommendations

It was evident from this study that fatness and thinness were both not perceived as healthy by the participants. However, societal representations about fatness and thinness influenced people's desire for larger body size and this affected the choice of weight management behaviours (for example, the use of medications to gain weight). This has programmatic implications in terms of health education strategies and messaging. That is, there is the need to campaign against and undermine the traditional notion of associating fatness with wealth, beauty, respect and good health. This should be done by the Ghana Health service with community health nurses in charge.

Also, Health practitioners should provide support services on weight management and dietary counselling in health facilities and through periodic community campaigns. Attention should focus on the ill-effects of unhealthy weight management practices and the benefits of attaining a healthy body size as well as the hazards associated with obesity.

In addition, it was evident in this study that individuals do not consume fruits and vegetables because of the perception that fruits and vegetables are expensive and are also not filling. Health practitioners should therefore develop new ways of sensitizing the community so that they can have a new view of consuming fruits and vegetables as preventive health measures.

Furthermore, the respondents had the perception that the ideal time for the performance of physical activity is at dawn and this prevents people from engaging in physical activities because of work related issues. Given this background, this study recommends that Ghana's Regenerative Health and Nutrition Policy which aims to promote healthy lifestyles and dietary practices should clarify the time of the day of which a person could engage in physical activity.

Moreover, the findings indicate that perceiving the community as very conducive for physical activity increase the likelihood of engaging in more healthy practice. This calls for the need to ensure neighborhood safety.

All the intervention programs indicated above should target individuals of the different sub-groups of the population (The young, married, those who belong to household of upper wealth status and Ussher town residents).

REFERENCES

- Abolhassani, S., Doosti Irani, M., Sarrafzadegan, N., Rabiei, K., Shahrokhi, S., Pourmoghaddas, Z., Moattar, F. (2012). Barriers and facilitators of weight management in overweight and obese people: Qualitative findings of TABASSOM project. *Iranian Journal of Nursing and Midwifery Research*, 17(3)
- Adler, N. E., & Newman, K. (2002). Socioeconomic disparities in health: pathways and policies. *Health Affairs*, 21(2), 60–76.
- Acevedo-Garcia, D., Bates, L. M., Osypuk, T. L., & McArdle, N. (2010). The effect of immigrant generation and duration on self-rated health among US adults 2003–2007. *Social Science & Medicine*, 71(6), 1161–1172.
- Agyei-Mensah, S., & Aikins, A. de-Graft. (2010). Epidemiological transition and the double burden of disease in Accra, Ghana. *Journal of Urban Health*, 87(5), 879–897.
- Agyemang, C., Beune, E., Meeks, K., Owusu-Dabo, E., Agyei-Baffour, P., Aikins, A. de-Graft, Mockenhaupt, F. P. (2015). Rationale and cross-sectional study design of the Research on Obesity and type 2 Diabetes among African Migrants: the RODAM study. *BMJ Open*, 4(3), e004877.
- Agyemang, C., Boatemaa, S., Agyemang Frempong, G., & de-Graft Aikins, A. (2016). Obesity in Sub-Saharan Africa. *Metabolic Syndrome: A Comprehensive Textbook*, 41–53.
- Akinpelu, A. O., Oyewole, O. O., & Adekanla, B. A. (2015a). Body size perceptions and weight status of adults in a Nigerian rural community. *Annals of Medical and Health Sciences Research*, 5(5), 358–364.
- Akinpelu, A. O., Oyewole, O. O., & Adekanla, B. A. (2015b). Body size perceptions and weight status of adults in a Nigerian rural community. *Annals of Medical and Health Sciences Research*, 5(5), 358–364.
- Alwan, A., & others. (2011). *Global status report on noncommunicable diseases 2010*. World Health Organization. Retrieved from <http://www.cabdirect.org/abstracts/20113168808.html>
- Amoah, A. G. (2003). Sociodemographic variations in obesity among Ghanaian adults. *Public Health Nutrition*, 6(8), 751–757.

- Archibald, D., Douglas, F., Hoddinott, P., Van Teijlingen, E., Stewart, F., Robertson, C., ... Avenell, A. (2015). A qualitative evidence synthesis on the management of male obesity. *BMJ Open*, 5(10), e008372.
- Averett, S. L., Sikora, A., & Argys, L. M. (2008). For better or worse: relationship status and body mass index. *Economics & Human Biology*, 6(3), 330–349.
- Awuah, R. B., Anarfi, J. K., Agyemang, C., Ogedegbe, G., & Aikins, A. de-Graft. (2014). Prevalence, awareness, treatment and control of hypertension in urban poor communities in Accra, Ghana. *Journal of Hypertension*, 32(6), 1203–1210.
- Aryeety, R.N.O. (2016). Perceptions and experiences of overweight among women in the Ga East District, Ghana. *Front. Nutrition*. 3:13. doi: 10.3389/fnut.2016.00013
- Azagba, S., & Sharaf, M. F. (2012). Fruit and Vegetable Consumption and Body Mass Index A Quantile Regression Approach. *Journal of Primary Care & Community Health*, 3(3), 210–220.
- Aziz, N. S. A., Zaki, N. A. M., Nor, N. S. M., Ambak, R., & Man, C. S. (2016). Perspective on Obesity Problems and Associated Factors to Reduce Weight among Overweight and Obese Housewives: A Qualitative Study. *Journal of Womens Health, Issues and Care*, 2016.
- Bagchi, D. (2010). *Global perspectives on childhood obesity: current status, consequences and prevention*. Academic Press.
- Baranowski, T., Cullen, K. W., Nicklas, T., Thompson, D., & Baranowski, J. (2003). Are current health behavioral change models helpful in guiding prevention of weight gain efforts? *Obesity Research*, 11(S10), 23S–43S.
- Batnitzky, A. K. (2011). Cultural constructions of ‘obesity’: Understanding body size, social class and gender in Morocco. *Health & Place*, 17(1), 345–352.
- Becker, A. E. (1995). *Body, self, and society: The view from Fiji*. University of Pennsylvania Press.
- Bennett, G. G., McNeill, L. H., Wolin, K. Y., Duncan, D. T., Puleo, E., & Emmons, K. M. (2007). Safe to walk? Neighborhood safety and physical activity among public housing residents. *PLoS Med*, 4(10), e306.
- Benzeval, M., Bond, L., Campbell, M., Egan, M., Lorenc, T., Petticrew, M., & Popham, F. (2014). How does money influence health?

- Bhanji, S., Khuwaja, A. K., Siddiqui, F., Azam, I., & Kazmi, K. (2011). Underestimation of weight and its associated factors among overweight and obese adults in Pakistan: a cross sectional study. *BMC Public Health*, *11*(1), 363.
- Bhugal, M. S., & Langford, R. (2014). Gender differences in weight loss; evidence from a NHS weight management service. *Public Health*, *128*(9), 811–813.
- Bhurtun, D. D., & Jeewon, R. (2013). Body weight perception and weight control practices among teenagers. *ISRN Nutrition*, *2013*. Retrieved from <http://downloads.hindawi.com/journals/isrn.nutrition/2013/395125.pdf>
- Boero, N. (2012). *Killer Fat*. New Brunswick, NJ: Rutgers University Press. Retrieved from <http://muse.jhu.edu/books/9780813553726?auth=0>
- Boo, S. (2013). Body mass index and weight loss in overweight and obese Korean women: The mediating role of body weight perception. *Asian Nursing Research*, *7*(4), 191–197.
- Bordo, S. (2004). *Unbearable weight: Feminism, Western culture, and the body*. Univ of California Press.
- Brink, P. J. (1989). The fattening room among the Annang of Nigeria. *Medical Anthropology*, *12*(1), 131–143.
- Brown, P. J., & Sweeney, J. (2009). The anthropology of overweight, obesity, and the body. *Anthro Notes*, *30*(1), 612.
- Bryman, A. (2006). Integrating quantitative and qualitative research: how is it done? *Qualitative Research*, *6*(1), 97–113.
- Burrowes, N. (2013). Body image—a rapid evidence assessment of the literature. *A Project on Behalf of the Government Equalities Office*.
- Cai, L., Han, X., Qi, Z., Li, Z., Zhang, Y., Wang, P., & Liu, A. (2014). Prevalence of overweight and obesity and weight loss practice among Beijing adults, 2011. *PloS One*, *9*(9), e98744.
- Cash, T. F. (2004). Body image: Past, present, and future. *Body Image*, *1*(1), 1–5.
- Cecchini, M., Sassi, F., Lauer, J. A., Lee, Y. Y., Guajardo-Barron, V., & Chisholm, D. (2010). Tackling of unhealthy diets, physical inactivity, and obesity: health effects and cost-effectiveness. *The Lancet*, *376*(9754), 1775–1784.
- Celio, A.A., Zabinski, M.F. & Wilfley, D.E. (2002). African American body images. In Cash and Pruzinsky (Eds.) *Body image: A handbook of theory, research, and clinical practice*, New York: The Guilford Press (234-242).

- Chang, M.-W., Nitzke, S., Guilford, E., Adair, C. H., & Hazard, D. L. (2008). Motivators and barriers to healthful eating and physical activity among low-income overweight and obese mothers. *Journal of the American Dietetic Association*, *108*(6), 1023–1028.
- Cheung, P. C., Ip, P. L., Lam, S. T., & Bibby, H. (2007). A study on body weight perception and weight control behaviours among adolescents in Hong Kong. *Hong Kong Medical Journal*, *13*(1), 16.
- CHF International. (2010). Ga Mashie (Old Accra) Housing Improvement Survey.
- Choi, O., Cho, Y. G., Kang, J. H., Park, H. A., Kim, K. W., Hur, Y. I., & Yim, H. J. (2013). Weight control attempts in underweight korean adults: Korea national health and nutrition examination survey, 2007-2010. *Korean Journal of Family Medicine*, *34*(6), 393–402.
- Christakis, N. A., & Fowler, J. H. (2007). The spread of obesity in a large social network over 32 years. *New England Journal of Medicine*, *357*(4), 370–379.
- Chung, L. M. Y., & Fong, S. S. M. (2015). Predicting actual weight loss: A review of the determinants according to the theory of planned behaviour. *Health Psychology Open*, *2*(1), 2055102914567972.
- Cockerham, W. C. (2012). *Medical sociology* (12th ed.). Upper Saddle River, NJ: Pearson Education, Inc
- Cogan, J. C., Bhalla, S. K., Sefa-Dedeh, A., & Rothblum, E. D. (1996). A comparison study of United States and African students on perceptions of obesity and thinness. *Journal of Cross-Cultural Psychology*, *27*(1), 98–113.
- Constitution of the Republic of Ghana (1992) Reviewed. 1996 . Accessed on 12th November, 2017. <http://extwprlegs1.fao.org/docs/pdf/gha129754.pdf>.
- Cook, S. J., MacPherson, K., Langille, D. B., 2007. Far from ideal weight perception, weight control, and associated risky behaviour of adolescent girls in nova scotia. *Canadian Family Physician*, *53*, 678-684.
- Creswell, J. W., & Clark, V.L.P. (2011). Designing and conducting mixed method research-2nd ed. SAGE Publications, Inc.

- Cummings, S., Parham, E. S., & Strain, G. W. (2002). Position of the American Dietetic Association weight management. *Journal of the American Dietetic Association*, 102(8), 1145–1155.
- Cutler, D. M., & Lleras-Muney, A. (2006). *Education and health: evaluating theories and evidence*. National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w12352>
- Dake, F. A., Thompson, A. L., Ng, S. W., Agyei-Mensah, S., & Codjoe, S. N. (2016). The local food environment and body mass index among the urban poor in Accra, Ghana. *Journal of Urban Health*, 93(3), 438–455.
- Dalton, S. (1997). *Overweight and weight management: The health professional's guide to understanding and practice*. Jones & Bartlett Learning.
- Darmon, N., & Drewnowski, A. (2008). Does social class predict diet quality? *The American Journal of Clinical Nutrition*, 87(5), 1107–1117.
- de Garine, I. (1995). Sociocultural aspects of the male fattening sessions among the Massa of Northern Cameroon. *Social Aspects of Obesity*, 1, 45.
- de-Graft Aikins, A., Kushitor, M., Koram, K., Gyamfi, S., & Ogedegbe, G. (2014). Chronic non-communicable diseases and the challenge of universal health coverage: insights from community-based cardiovascular disease research in urban poor communities in Accra, Ghana. *BMC Public Health*, 14(2), S3.
- Deliens, T., Clarys, P., De Bourdeaudhuij, I., & Deforche, B. (2014). Determinants of eating behaviour in university students: a qualitative study using focus group discussions. *BMC Public Health*, 14(1), 1.
- Deliens, T., Deforche, B., De Bourdeaudhuij, I., & Clarys, P. (2015). Determinants of physical activity and sedentary behaviour in university students: a qualitative study using focus group discussions. *BMC Public Health*, 15(1), 1.
- Devaux, M., Sassi, F., Church, J., Cecchini, M., & Borgonovi, F. (2011). Exploring the relationship between education and obesity. *OECD Journal: Economic Studies*. Retrieved from <https://opus.lib.uts.edu.au/handle/10453/18833>.
- Dias, S., Gama, A., & Martins, M. O. (2013). Health status and preventative behaviours of immigrants by gender and origin: a Portuguese cross-sectional study. *Nursing & Health Sciences*, 15(3), 309–317.

- Dikareva, A., Harvey, W. J., Cicchillitti, M. A., Bartlett, S. J., & Andersen, R. E. (2016). Exploring perceptions of barriers, facilitators, and motivators to physical activity among female bariatric patients: implications for physical activity programming. *American Journal of Health Promotion, 30*(7), 536–544.
- Dorosty, A. R., Mehdikhani, S., Sotoudeh, G., Rahimi, A., Koohdani, F., & Tehrani, P. (2014). Perception of weight and health status among women working at Health Centres of Tehran. *Journal of Health, Population, and Nutrition, 32*(1), 58.
- Dotse, J. E., & Asumeng, M. (2014). Relationship Between Body Image Satisfaction and Psychological Well-Being: The Impact of Africentric Values. *Journal of Social Science Studies, 2*(1), 320.
- Draper, C. E., Davidowitz, K. J., & Goedecke, J. H. (2015). Perceptions relating to body size, weight loss and weight-loss interventions in black South African women: a qualitative study. *Public Health Nutrition, 1*–9.
- Drewnowski, A. (2010). Healthier foods cost more. *Nutrition Reviews, 68*(3), 184–185.
- Driscoll, D. L., Appiah-Yeboah, A., Salib, P., & Rupert, D. J. (2007). Merging qualitative and quantitative data in mixed methods research: How to and why not. *Ecological and Environmental Anthropology (University of Georgia)*, 18.
- Duda, R. B., Jumah, N. A., Hill, A. G., Seffah, J., & Biritwum, R. (2007). Assessment of the ideal body image of women in Accra, Ghana. *Tropical Doctor, 37*(4), 241–244.
- Duncan, D. T., Wolin, K. Y., Scharoun-Lee, M., Ding, E. L., Warner, E. T., & Bennett, G. G. (2011a). Does perception equal reality? Weight misperception in relation to weight-related attitudes and behaviors among overweight and obese US adults. *International Journal of Behavioral Nutrition and Physical Activity, 8*(1), 20.
- Duncan, D. T., Wolin, K. Y., Scharoun-Lee, M., Ding, E. L., Warner, E. T., & Bennett, G. G. (2011b). Does perception equal reality? Weight misperception in relation to weight-related attitudes and behaviors among overweight and obese US adults. *International Journal of Behavioral Nutrition and Physical Activity, 8*(1), 20.
- Ettarh, R. (2013). Overweight, obesity, and perception of body image among slum residents in Nairobi, Kenya, 2008–2009. *Preventing Chronic Disease, 10*. Retrieved from http://www.cdc.gov/PCD/issues/2013/13_0198.htm

- Fredrickson, J., Kremer, P., Swinburn, B., de Silva, A., & McCabe, M. (2015). Weight perception in overweight adolescents: associations with body change intentions, diet and physical activity. *Journal of Health Psychology, 20*(6), 774–784.
- Friel, S., Chopra, M., & Satcher, D. (2007). Unequal weight: equity oriented policy responses to the global obesity epidemic. *British Medical Journal, 7632*, 1241.
- Giles-Corti, B., & Donovan, R. J. (2002). The relative influence of individual, social and physical environment determinants of physical activity. *Social Science & Medicine, 54*(12), 1793–1812.
- Gilmartin, J. (2013). Body image concerns amongst massive weight loss patients. *Journal of Clinical Nursing, 22*(9–10), 1299–1309.
- Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behaviour and health education: theory, research, and practice*. John Wiley & Sons.
- Griffiths, J., Maggs, H., & George, E. (2008). Stakeholder Involvement. Retrieved from <http://158.232.12.119/dietphysicalactivity/griffiths-stakeholder-involvement.pdf>
- Grogan, S. (2007). *Body image: Understanding body dissatisfaction in men, women and children*. Routledge.
- Ghana Statistical Service. 2013. 2010 Population and Housing Census National Analytical Report. Ghana Statistical Service.
- Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF International. (2015). *Ghana Demographic and Health Survey 2014*. Rockville, Maryland, USA: GSS, GHS, and ICF International.
- Gupta, H. (2014). Barriers to and Facilitators of Long Term Weight Loss Maintenance in Adult UK People: A Thematic Analysis. *International Journal of Preventive Medicine, 5*(12).
- Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., Ekelund, U., ... others. (2012). Global physical activity levels: surveillance progress, pitfalls, and prospects. *The Lancet, 380*(9838), 247–257.
- Halperin, R. O. (2013). Weight-loss interventions for Hispanic populations: the role of culture. *Journal of Obesity, 2013*.
- Hanson, M. D., & Chen, E. (2007). Socioeconomic status and health behaviours in adolescence: a review of the literature. *Journal of Behavioural Medicine, 30*(3), 263–285.

- Harring, H. A., Montgomery, K., & Hardin, J. (2010). Perceptions of body weight, weight management strategies, and depressive symptoms among US college students. *Journal of American College Health, 59*(1), 43–50.
- Hattori, K. I. (1995). Sociocultural aspect of the male fattening sessions among the Massa of Northern Cameroon, In de Garine , I and Pollock N.J eds., *Social aspect of obesity*. Asterdam, Gordon and Breach.
- Heatherton, T. F., & Hebl, M. R. (1998). Body Image. *Encyclopaedia of mental health, 1*, 257-266.
- Hill, J. O., Wyatt, H. R., & Peters, J. C. (2012). Energy balance and obesity. *Circulation, 126*(1), 126–132.
- Hill, T. D., Ellison, C. G., Burdette, A. M., & Musick, M. A. (2007). Religious involvement and healthy lifestyles: Evidence from the survey of Texas adults. *Annals of Behavioural Medicine, 34*(2), 217–222.
- Himes, C. L. (2011). The Demography of Obesity. Retrieved from <http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199736362.001.0001/oxfordhb-9780199736362-e-003>
- Hindle L, Carpenter C. An exploration of the experiences and perceptions of people who have maintained weight loss. *Journal of Human Nutrition & Dietetics*. 2011;24(4):342-350.
- Holdsworth, M., Gartner, A., Landais, E., Maire, B., & Delpeuch, F. (2004). Perceptions of healthy and desirable body size in urban Senegalese women. *International Journal of Obesity, 28*(12), 1561–1568.
- Holmqvist Gattario, K. (2013). Body image in adolescence: Through the lenses of culture, gender, and positive psychology. Retrieved from <https://gupea.ub.gu.se/handle/2077/34266>.
- HU, F., (2008). *Obesity Epidemiology*. Oxford University Press, Inc. 198 Madison Avenue, New York, New York 10016.
- Hwang, J. H., Ryu, D. H., & Park, S.-W. (2015). Interaction Effect between Weight Perception and Comorbidities on Weight Control Behaviour in Overweight and Obese Adults: Is There a Sex Difference? *Journal of Korean Medical Science, 30*(8), 1017–1024.
- Isreal, G.D (1992). Determination of sample size. Revised April 2009. Reviewed June 2013. Accessed at <http://edis.ifas.u.edu>.

- Jaffari, M. W., Zaman, H. M. F., Hayat, Q., Munir, M. H., & Saleem, S. (2011). Do media develop eating disorders: a study with reference to young females of Pakistan. *European Journal of Scientific Research*, 57(1), 29–46.
- Jennings, P. S., Forbes, D., McDermott, B., Hulse, G., & Juniper, S. (2006). Eating disorder attitudes and psychopathology in Caucasian Australian, Asian Australian and Thai university students. *Australian and New Zealand Journal of Psychiatry*, 40(2), 143–149.
- Joh, H.-K., Oh, J., Lee, H.-J., & Kawachi, I. (2013). Gender and socioeconomic status in relation to weight perception and weight control behavior in Korean adults. *Obesity Facts*, 6(1), 17–27.
- Joshi, S., Jatrana, S., Paradies, Y., & Priest, N. (2014). Differences in health behaviours between immigrant and non-immigrant groups: a protocol for a systematic review. *Systematic Reviews*, 3(1), 61.
- Jung, J., & Lee, S.-H. (2006). Cross-cultural comparisons of appearance self-schema, body image, self-esteem, and dieting behavior between Korean and US women. *Family and Consumer Sciences Research Journal*, 34(4), 350–365.
- Kakeshita, I. S., & Almeida, S. S. (2008). The relationship between body mass index and body image in Brazilian adults. *Psychology & Neuroscience*, 1(2), 103.
- Kanter, R., & Caballero, B. (2012). Global gender disparities in obesity: a review. *Advances in Nutrition: An International Review Journal*, 3(4), 491–498.
- Kemper, K. A., Sargent, R. G., Drane, J. W., Valois, R. E., & Hussey, J. R. (1994). Black and white females' perceptions of ideal body size and social norms. *Obesity*, 2(2), 117–126.
- Kenkel, D. S. (1991). Health Behavior, Health Knowledge, and Schooling. *Journal of Political Economy*, 99(2), 287–305.
- Kiernan, M., Moore, S. D., Schoffman, D. E., Lee, K., King, A. C., Taylor, C. B., ... Perri, M. G. (n.d.). Social Support for Healthy Behaviors: Scale psychometrics and prediction of Weight Loss among Women in a Behavioral program. Retrieved from http://www.academia.edu/download/39845154/Social_support_for_healthy_behaviors_sca20151109-1561-fpz9nb.pdf
- King, A. C., Castro, C., Wilcox, S., Eyler, A. A., Sallis, J. F., & Brownson, R. C. (2000). Personal and environmental factors associated with physical inactivity among different

- racial–ethnic groups of US middle-aged and older-aged women. *Health Psychology*, 19(4), 354.
- Klos, L. A., & Sobal, J. (2013). Marital status and body weight, weight perception, and weight management among US adults. *Eating Behaviors*, 14(4), 500–507.
- Kostanski, M., Fisher, A., & Gullone, E. (2004). Current conceptualisation of body image dissatisfaction: have we got it wrong? *Journal of Child Psychology and Psychiatry*, 45(7), 1317–1325.
- Kratt, P., Reynolds, K., & Shewchuk, R. (2000). The role of availability as a moderator of family fruit and vegetable consumption. *Health Education & Behavior*, 27(4), 471–482.
- Krause, N., Shaw, B., & Liang, J. (2011). Social relationships in religious institutions and healthy lifestyles. *Health Education & Behavior*, 38(1), 25–38.
- Kuan, P. X., Ho, H. L., Shuhaili, M. S., Siti, A. A., Gudum, H. R., & others. (2011). Gender differences in body mass index, body weight perception and weight loss strategies among undergraduates in Universiti Malaysia Sarawak. *Malays J Nutr*, 17(1), 67–75.
- Kumanyika, S.K & Morssink, C.B. 1997. Cultural appropriateness of weight management programs. In: Dalton, S, ed. Overweight and weight management. The health professional's guide to understanding and practice. Aspen Publication. Maryland.
- Kumanyika, S. K. (2008). Environmental influences on childhood obesity: ethnic and cultural influences in context. *Physiology & Behaviour*, 94(1), 61–70.
- Lago, S., Cantarero, D., Rivera, B., Pascual, M., Blázquez-Fernández, C., Casal, B., & Reyes, F. (2017). Socioeconomic status, health inequalities and non-communicable diseases: a systematic review. *Journal of Public Health*, 1–14.
- LaRose, J. G., Leahey, T. M., Hill, J. O., & Wing, R. R. (2013). Differences in motivations and weight loss behaviors in young adults and older adults in the National Weight Control Registry. *Obesity*, 21(3), 449–453.
- Leahey, T. M., LaRose, J. G., Fava, J. L., & Wing, R. R. (2011). Social influences are associated with BMI and weight loss intentions in young adults. *Obesity*, 19(6), 1157–1162.
- Lee, G., Ha, Y., Vann, J. J., & Choi, E. (2009). Weight perception and dieting behavior among Korean adolescents. *The Journal of School Nursing*, 25(6), 427–435.

- Lee, J. S., Kritchevsky, S. B., Tylavsky, F. A., Harris, T., Everhart, J., Simonsick, E. M., ... others. (2004). Weight-loss intention in the well-functioning, community-dwelling elderly: associations with diet quality, physical activity, and weight change. *The American Journal of Clinical Nutrition*, 80(2), 466–474.
- Leme, A. C. B., & Philippi, S. T. (2013). Teasing and weight-control behaviors in adolescent girls. *Revista Paulista de Pediatria*, 31(4), 431–436.
- Leong, S. L., Madden, C., Gray, A. R., & Horwath, C. C. (2013). A nationwide survey of weight control practices among middle-aged New Zealand women. *The New Zealand Medical Journal (Online)*, 126(1386).
- Lewis, S., Thomas, S. L., Hyde, J., Castle, D. J., & Komesaroff, P. A. (2011). A qualitative investigation of obese men's experiences with their weight. *American Journal of Health Behaviour*, 35(4), 458–469.
- Liechty, J. M. (2010). Body image distortion and three types of weight loss behaviours among non-overweight girls in the United States. *Journal of Adolescent Health*, 47(2), 176–182.
- Loth, K. A., Watts, A. W., van den Berg, P., & Neumark-Sztainer, D. (2015). Does Body Satisfaction Help or Harm Overweight Teens? A 10-Year Longitudinal Study of the Relationship Between Body Satisfaction and Body Mass Index. *Journal of Adolescent Health*, 57(5), 559–561.
- Lowry, R., Galuska, D. A., Fulton, J. E., Wechsler, H., Kann, L., & Collins, J. L. (2000). Physical activity, food choice, and weight management goals and practices among US college students. *American Journal of Preventive Medicine*, 18(1), 18–27.
- Lynch, E., Liu, K., Wei, G. S., Spring, B., Kiefe, C., & Greenland, P. (2009). The relation between body size perception and change in body mass index over 13 years the Coronary Artery Risk Development in Young Adults (CARDIA) Study. *American Journal of Epidemiology*, 169(7), 857–866.
- Macera, C. A., Hootman, J. M., & Sniezek, J. E. (2003). Major public health benefits of physical activity. *Arthritis Care & Research*, 49(1), 122–128.
- Machado, E. C., Silveira, M. F. da, & Silveira, V. M. F. da. (2012). Prevalence of weight-loss strategies and use of substances for weight-loss among adults: a population study. *Cadernos de Saude Publica*, 28(8), 1439–1449.

- Mahama, S. A., Acheampong, A. T., Peprah, O. B., & Bofo, A. Y. (2011). Preliminary report for Ga Mashie urban design lab. *Millennium Cities Initiative. The Earth Institute at Columbia University and The University of Ghana.*
- Mallick, N., Ray, S., & Mukhopadhyay, S. (2014). Eating behaviours and body weight concerns among adolescent girls. *Advances in Public Health, 2014*. Retrieved from <http://www.hindawi.com/journals/aph/2014/257396/abs/>
- Markey, C. N., & Markey, P. M. (2005). Relations between body image and dieting behaviors: An examination of gender differences. *Sex Roles, 53*(7–8), 519–530.
- Matoti-Mvalo, T., & Puoane, T. B. (2011). Perceptions of body size and its association with HIV/AIDS. *South African Journal of Clinical Nutrition, 24*(1). Retrieved from <http://www.ajol.info/index.php/sajcn/article/viewFile/65390/53082>
- Mavoa, H. M., & McCabe, M. P. (2008). Sociocultural factors relating to Tongans' and Indigenous Fijians' patterns of eating, physical activity and body size. *Asia Pacific Journal of Clinical Nutrition, 17*(3), 375–384.
- Mvo, Z., Dick, J and Steyn, K. (1999). Perceptions of overweight African Women about acceptable body size of women and children. *Curations, 22*(2), 27-31.
- Maximova, K., McGrath, J. J., Barnett, T., O'Loughlin, J., Paradis, G., & Lambert, M. (2008). Do you see what I see? Weight status misperception and exposure to obesity among children and adolescents. *International Journal of Obesity, 32*(6), 1008–1015.
- Mayén, A.-L., Marques-Vidal, P., Paccaud, F., Bovet, P., & Stringhini, S. (2014). Socioeconomic determinants of dietary patterns in low-and middle-income countries: a systematic review. *The American Journal of Clinical Nutrition, ajcn*–089029.
- Mayer-Brown, S., Lawless, C., Fedele, D., Dumont-Driscoll, M., & Janicke, D. M. (2016). The effects of media, self-esteem, and BMI on youth's unhealthy weight control behaviors. *Eating Behaviors, 21*, 59–65.
- McCabe, M. P., & Ricciardelli, L. A. (2005). A prospective study of pressures from parents, peers, and the media on extreme weight change behaviors among adolescent boys and girls. *Behaviour Research and Therapy, 43*(5), 653–668.
- McCabe, M. P., Waqa, G., Dev, A., Cama, T., & Swinburn, B. A. (2013). The role of cultural values and religion on views of body size and eating practices among adolescents from Fiji, Tonga, and Australia. *British Journal of Health Psychology, 18*(2), 383–394.

- Mchiza, Z. J., Parker, W., Makoae, M., Sewpaul, R., Kupamupindi, T., & Labadarios, D. (2015). Body image and weight control in South Africans 15 years or older: SANHANES-1. *BMC Public Health*, *15*(1), 1.
- McNabb W., Quinn M., Kerver J., Cook S. and Karrison T. (1997). The Pathways church-based weight loss program for urban African-American women at risk for diabetes. *Diabetes Care*, 1997; *20*, 1518-1523.
- Mehtälä, M. A. K., Sääkslahti, A. K., Inkinen, M. E., & Poskiparta, M. E. H. (2014). A socio-ecological approach to physical activity interventions in childcare: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, *11*(1), 22.
- Metzgar, C. J., Preston, A. G., Miller, D. L., & Nickols-Richardson, S. M. (2015). Facilitators and barriers to weight loss and weight loss maintenance: a qualitative exploration. *Journal of Human Nutrition and Dietetics*, *28*(6), 593–603.
- Miller, Y. D. (2010). Psychological determinants and outcomes of sedentary and physical activity behaviours. *International Journal of Behavioral Medicine*, *17*(4), 243–245.
- Ministry of Health, Ghana, (2012). Strategy for the management, prevention and control of chronic Non-Communicable diseases in Ghana, 2012-2016.
- Ministry of Health, Ghana (2013). National Nutrition Policy For Ghana 2013–2017. Available at <http://extwprlegs1.fao.org/docs/pdf/gha145267.pdf>
- Ministry of Health, Ghana, (2007). Regenerative Health "Shifting the emphasis from cure to prevention". Policy Briefing Paper 002, January 2007.
- Misra, A., & Khurana, L. (2008). Obesity and the metabolic syndrome in developing countries. *The Journal of Clinical Endocrinology & Metabolism*, *93*(11_supplement_1), s9–s30.
- Mozaffarian, D., Hao, T., Rimm, E. B., Willett, W. C., & Hu, F. B. (2011). Changes in diet and lifestyle and long-term weight gain in women and men. *New England Journal of Medicine*, *364* (25), 2392–2404.
- Munt, A. E., Partridge, S. R., & Allman-Farinelli, M. (2017). The barriers and enablers of healthy eating among young adults: A missing piece of the obesity puzzle: A scoping review. *Obesity Reviews*, *18* (1), 1–17.
- National Obesity Observatory (2009). Body Mass Index as a measure of obesity. Available from: <http://www.thehealthwell.info/node/894434> [Accessed: 19th June 2017].

- Neumark-Sztainer, D., Bauer, K. W., Friend, S., Hannan, P. J., Story, M., & Berge, J. M. (2010). Family weight talk and dieting: how much do they matter for body dissatisfaction and disordered eating behaviors in adolescent girls? *Journal of Adolescent Health, 47*(3), 270–276.
- Neumark-Sztainer, D., Patterson, J., Mellin, A., Ackard, D. M., Utter, J., Story, M., & Sockalosky, J. (2002). Weight control practices and disordered eating behaviors among adolescent females and males with type 1 diabetes associations with sociodemographics, weight concerns, familial factors, and metabolic outcomes. *Diabetes Care, 25*(8), 1289–1296.
- Neumark-Sztainer, D., Rock, C. L., Thornquist, M. D., Cheskin, L. J., Neuhouser, M. L., & Barnett, M. J. (2000). Weight-control behaviors among adults and adolescents: Associations with dietary intake. *Preventive Medicine, 30*(5), 381–391.
- Neumark-Sztainer, D., Wall, M., Eisenberg, M. E., Story, M., & Hannan, P. J. (2006). Overweight status and weight control behaviors in adolescents: longitudinal and secular trends from 1999 to 2004. *Preventive Medicine, 43*(1), 52–59.
- Neumark-Sztainer, D., Wall, M., Perry, C., & Story, M. (2003). Correlates of fruit and vegetable intake among adolescents: findings from Project EAT. *Preventive Medicine, 37*(3), 198–208.
- Neumark-Sztainer, D., Wall, M., Story, M., & Standish, A. R. (2012). Dieting and unhealthy weight control behaviors during adolescence: associations with 10-year changes in body mass index. *Journal of Adolescent Health, 50*(1), 80–86.
- Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., ... others. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet, 384*(9945), 766–781.
- Nissen, N. K., & Holm, L. (2015). Literature review: Perceptions and management of body size among normal weight and moderately overweight people. *Obesity Reviews, 16*(2), 150–160.
- Nour, N. N. (2010). Obesity in resource-poor nations. *Reviews in Obstetrics and Gynecology, 3*(4), 180.

- Odusola, A. O., Hendriks, M., Schultsz, C., Bolarinwa, O. A., Akande, T., Osibogun, A., ... others. (2014). Perceptions of inhibitors and facilitators for adhering to hypertension treatment among insured patients in rural Nigeria: a qualitative study. *BMC Health Services Research*, *14*(1), 624.
- Ofori-Asenso, R., Agyeman, A. A., Laar, A., & Boateng, D. (2016). Overweight and obesity epidemic in Ghana—a systematic review and meta-analysis. *BMC Public Health*, *16*(1), 1239.
- Okop, K. J., Mukumbang, F. C., Mathole, T., Levitt, N., & Puoane, T. (2012). Perceptions of body size, obesity threat and the willingness to lose weight among black South African adults: a qualitative study. *Population*, *2*, 7–8.
- Olaoye, O. R., & Oyetunde, O. O. (2012). Perception of weight and weight management practices among students of a tertiary institution in south west Nigeria. Retrieved from <http://imsear.li.mahidol.ac.th/handle/123456789/151081>
- Onono, M., Kwena, Z., Turan, J., Bukusi, E. A., Cohen, C. R., & Gray, G. E. (2015). ‘You know you are sick, why do you carry a pregnancy again?’ Applying the socio-ecological model to understand barriers to PMTCT service utilization in Western Kenya. *Journal of AIDS & Clinical Research*, *6*(6).
- Oteng-Ababio, M. (2014). Rethinking waste as a resource: insight from a low-income community in Accra, Ghana. *City, Territory and Architecture*, *1*(1), 1-14.
- Owusu, G., & Afutu-Kotey, R. L. (2010). Poor urban communities and municipal interface in Ghana: A case study of Accra and Sekondi-Takoradi metropolis. *African Studies Quarterly*, *12*(1), 1.
- Pampel, F. C., Krueger, P. M., & Denney, J. T. (2010). Socioeconomic disparities in health behaviors. *Annual Review of Sociology*, *36*, 349.
- Papies, E. K., Potjes, I., Keesman, M., Schwinghammer, S., & Van Koningsbruggen, G. M. (2014). Using health primes to reduce unhealthy snack purchases among overweight consumers in a grocery store. *International Journal of Obesity*, *38*(4), 597–602.
- 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*(2), 57–64.

- Peterson, K. E., Sorensen, G., Pearson, M., Hebert, J. R., Gottlieb, B. R., & McCormick, M. C. (2002). Design of an intervention addressing multiple levels of influence on dietary and activity patterns of low-income, postpartum women. *Health Education Research*, *17*(5), 531–540. <https://doi.org/10.1093/her/17.5.531>
- Pollock, N. J. (1995). Cultural elaborations of obesity-fattening practices in Pacific societies. *Asia Pacific Journal of Clinical Nutrition*, *4*, 357–360.
- Popkin, B. M. (2003). The nutrition transition in the developing world. *Development Policy Review*, *21*(5–6), 581–597.
- Popkin, B. M., Adair, L. S., & Ng, S. W. (2012). Global nutrition transition and the pandemic of obesity in developing countries. *Nutrition Reviews*, *70*(1), 3–21.
- Puhl, R. M., & Heuer, C. A. (2009). The stigma of obesity: a review and update. *Obesity*, *17*(5), 941–964.
- Pulvers, K. M., Lee, R. E., Kaur, H., Mayo, M. S., Fitzgibbon, M. L., Jeffries, S. K., ... Ahluwalia, J. S. (2004). Development of a culturally relevant body image instrument among urban African Americans. *Obesity Research*, *12*(10), 1641–1651.
- Puoane, T., Fourie, J. M., Shapiro, M., Rosling, L., Tshaka, N. C., & Oeufse, A. (2005). 'Big is beautiful'—an exploration with urban black community health workers in a South African township. *South African Journal of Clinical Nutrition*, *18*(1), 6–15.
- Puoane, T. R., Fourie, J. M., Tsolekile, L., Nel, J. H., & Temple, N. J. (2013). What Do Black South African Adolescent Girls Think About Their Body Size? *Journal of Hunger & Environmental Nutrition*, *8*(1), 85–94.
- Puoane, T., Tsolekile, L., & Steyn, N. (2010). Perceptions about body image and sizes among black African girls living in Cape Town. Retrieved from <http://repository.uwc.ac.za/xmlui/handle/10566/293>
- Quick, V., Nansel, T. R., Liu, D., Lipsky, L. M., Due, P., & Iannotti, R. J. (2014). Body size perception and weight control in youth: 9-year international trends from 24 countries. *International Journal of Obesity*, *38*(7), 988–994.
- Rguibi, M., & Belahsen, R. (2006). Fattening practices among Moroccan Saharawi women. Retrieved from <http://apps.who.int/iris/handle/10665/117127>

- Ridler, C., & Ridler, N. (2015). The Consumption of Frozen Fruit and Vegetables in the Context of Malnutrition and Obesity; New Brunswick, Canada. In *MIC 2015: Managing Sustainable Growth; Proceedings of the Joint International Conference, Portorož, Slovenia, 28–30 May 2015* (pp. 35–44). University of Primorska, Faculty of Management Koper.
- Robinson, T. (2008). Applying the socio-ecological model to improving fruit and vegetable intake among low-income African Americans. *Journal of Community Health, 33*(6), 395–406.
- Rolls, B. J., Ello-Martin, J. A., & Tohill, B. C. (2004). What can intervention studies tell us about the relationship between fruit and vegetable consumption and weight management? *Nutrition Reviews, 62*(1), 1–17.
- Rothblum, E. D. (1990). Women and weight: fad and fiction. *The Journal of Psychology, 124*(1), 5–24.
- Saleem, M. D., Ahmed, G., Mulla, J., Haider, S. S., & Abbas, M. (2013). Weight misperception amongst youth of a developing country: Pakistan-a cross-sectional study. *BMC Public Health, 13*(1), 707.
- Sallis, J.F., Grossman, R.M., Pinski, R.B., Patterson, T.L., and Nader, P.R. (1987). The development of scales to measure social support for diet and exercise behaviors. *Preventive Medicine, 16*, 825-836.
- Santos, I., Sniehotta, F. F., Marques, M. M., Carraça, E. V., & Teixeira, P. J. (2017). Prevalence of personal weight control attempts in adults: a systematic review and meta-analysis. *Obesity Reviews, 18*(1), 32–50.
- Santos, O., Sermeus, G., do Carmo, I., Anelli, M., Kupers, P., & Martin, E. (2010). In search of weight loss—a four-country survey on what people were doing for losing weight at the turn of the century. Retrieved from <https://dspace.uevora.pt/rdpc/handle/10174/2063>.
- Sarpong, P. (1977). Girls' nobility rites on Ashanti. Tema, Ghana. *Ghana Publishing Corporation*.
- Scott, A., Ejikeme, C. S., Clottey, E. N., & Thomas, J. G. (2012). Obesity in sub-Saharan Africa: development of an ecological theoretical framework. *Health Promotion International, 27*(1), 38–45. doi:10.1093/heapro/kar038.

- Simsek, H., Doganay, S., Budak, R., & Ucku, R. (2014). Relationship of socioeconomic status with health behaviors and self-perceived health in the elderly: A community-based study, Turkey. *Geriatrics & Gerontology International*, *14*(4), 960–968.
- Skrzypek, S., Wehmeier, P. M., & Remschmidt, H. (2001). Body image assessment using body size estimation in recent studies on anorexia nervosa. A brief review. *European Child & Adolescent Psychiatry*, *10*(4), 215–221.
- Slavin, J. L., & Lloyd, B. (2012). Health benefits of fruits and vegetables. *Advances in Nutrition: An International Review Journal*, *3*(4), 506–516.
- Sleddens, E. F., Kroeze, W., Kohl, L. F., Bolten, L. M., Velema, E., Kaspers, P. J., ... Kremers, S. P. (2015). Determinants of dietary behavior among youth: an umbrella review. *Int J Behav Nutr Phys Act*, *12*(7). Retrieved from <http://www.biomedcentral.com/content/pdf/s12966-015-0164-x.pdf>
- Smith, G. L., Banting, L., Eime, R., O’Sullivan, G., & van Uffelen, J. G. (2017). The association between social support and physical activity in older adults: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, *14*(1), 56.
- Sobal, J., & Devine, C.M. Social aspect of obesity: influences, consequences, assessment and interventions. In: Dalton, S, ed. *Overweight and weight management: The health professional’s guide to understanding and practice*. Aspen Publication. Maryland
- Sonneville, K. R., Thurston, I. B., Milliren, C. E., Gooding, H. C., & Richmond, T. K. (2016). Weight misperception among young adults with overweight/obesity associated with disordered eating behaviors. *International Journal of Eating Disorders*, *49*(10), 937–946.
- Stearns, P. N. (2002). *Fat history: Bodies and beauty in the modern west*. NYU Press.
- Steyn, N. P., & Mchiza, Z. J. (2014). Obesity and the nutrition transition in Sub-Saharan Africa. *Annals of the New York Academy of Sciences*, *1311*(1), 88–101.
- Stigler, M. H., Arora, M., Dhavan, P., Shrivastav, R., Reddy, K. S., & Perry, C. L. (2011). Weight-related concerns and weight-control behaviors among overweight adolescents in Delhi, India: A cross-sectional study. *Int J Behav Nutr Phys Act*, *8*(1), 9.
- Tehrani, H., Majlessi, F., Shojaeizadeh, D., Sadeghi, R., & Hasani Kabootarkhani, M. (2016). Applying Socioecological Model to Improve Women’s Physical Activity: A Randomized Control Trial. *Iranian Red Crescent Medical Journal*, *18*(3).

- Teti, Vito, Food and Fatness in Calabria. In de Garine , I., & Pollock N.J eds.(1995) Social aspect of obesity. Amsterdam, *Gordon and Breach Science Publishers SA*.
- Th gersen-Ntoumani, C., Ntoumanis, N., & Nikitaras, N. (2010). Unhealthy weight control behaviours in adolescent girls: A process model based on self-determination theory. *Psychology and Health, 25*(5), 535–550.
- Thompson, J. K., Altabe, M., Johnson, S., & Stormer, S. M. (1994). Factor analysis of multiple measures of body image disturbance: Are we all measuring the same construct? *International Journal of Eating Disorders, 16*(3), 311–315.
- Thompson, J. K., & Heinberg, L. J. (1999). The media’s influence on body image disturbance and eating disorders: We’ve reviled them, now can we rehabilitate them? *Journal of Social Issues, 55*(2), 339–353.
- 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.
- Tlili, F., Mahjoub, A., Lefèvre, P., Bellaj, T., Ben Romdhane, H., Eymard-Duvernay, S., & Holdsworth, M. (2008). Tunisian women’s perceptions of desirable body size and chronic disease risk. *Ecology of Food and Nutrition, 47*(4), 399–414.
- Tom, G., Chen, A., Liao, H., & Shao, J. (2005). Body image, relationships, and time. *The Journal of Psychology, 139*(5), 458.
- Townsend, N., & Foster, C. (2013). Developing and applying a socio-ecological model to the promotion of healthy eating in the school. *Public Health Nutrition, 16*(6), 1101–1108.
- Tu, A. W., & Mâsse, L. C. (2012). The relationship between income and weight control strategies among canadian adults. *Health, 12*, 13.
- Ulijaszek, S. J., & Lofink, H. (2006). Obesity in biocultural perspective. *Annu. Rev. Anthropol., 35*, 337–360.
- Umberson, D., Liu, H., & Powers, D. (2009). Marital status, marital transitions, and body weight. *Journal of Health and Social Behavior, 50*(3), 327–343.
- van den Berg, P., Neumark-Sztainer, D., Hannan, P. J., & Haines, J. (2007). Is dieting advice from magazines helpful or harmful? Five-year associations with weight-control behaviors and psychological outcomes in adolescents. *Pediatrics, 119*(1), e30–e37.
- Van Holle, V., Deforche, B., Van Cauwenberg, J., Goubert, L., Maes, L., Van de Weghe, N., & De Bourdeaudhuij, I. (2012). Relationship between the physical environment and

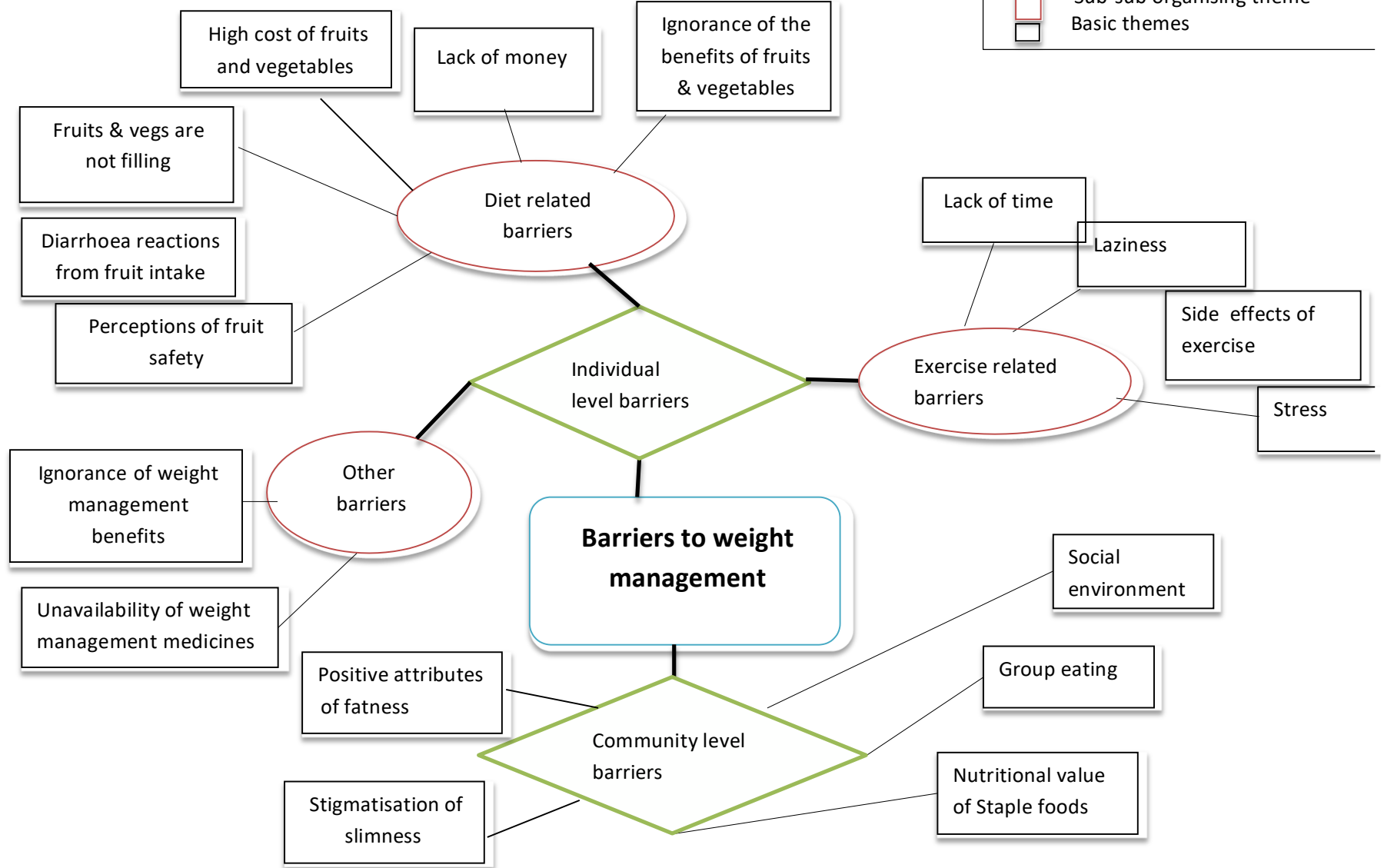
- different domains of physical activity in European adults: a systematic review. *BMC Public Health*, 12(1), 1.
- Vander Wal, J. S. (2011). Unhealthy weight control behaviors among adolescents. *Journal of Health Psychology*, 17(1), 110–120.
- Verheijden, M. W., Bakx, J. C., Van Weel, C., Koelen, M. A., & Van Staveren, W. A. (2005). Role of social support in lifestyle-focused weight management interventions. *European Journal of Clinical Nutrition*, 59, S179–S186.
- Volek, J. S., VanHeest, J. L., & Forsythe, C. E. (2005). Diet and exercise for weight loss. *Sports Medicine*, 35(1), 1–9.
- Walcott-McQuigg, J. A. (2005). Weight control behavior and women: a cross-cultural perspective. *Journal of International Women's Studies*, 7(2), 152–168.
- Waldron, I., Hughes, M. E., & Brooks, T. L. (1996). Marriage protection and marriage selection—prospective evidence for reciprocal effects of marital status and health. *Social Science & Medicine*, 43(1), 113–123.
- Wang, Y., Liang, H., & Chen, X. (2009). Measured body mass index, body weight perception, dissatisfaction and control practices in urban, low-income African American adolescents. *BMC Public Health*, 9(1), 1.
- Wardle, J., & Griffith, J. (2001). Socioeconomic status and weight control practices in British adults. *Journal of Epidemiology and Community Health*, 55(3), 185–190.
- Wardle, J., Haase, A. M., & Steptoe, A. (2006). Body image and weight control in young adults: international comparisons in university students from 22 countries. *International Journal of Obesity*, 30(4), 644–651.
- Weiss, E. C., Galuska, D. A., Khan, L. K., & Serdula, M. K. (2006). Weight-control practices among US adults, 2001–2002. *American Journal of Preventive Medicine*, 31(1), 18–24.
- Wendel-Vos, W., Droomers, M., Kremers, S., Brug, J., & Van Lenthe, F. (2007). Potential environmental determinants of physical activity in adults: a systematic review. *Obesity Reviews*, 8(5), 425–440.
- Wharton, C. M., Adams, T., & Hampl, J. S. (2008). Weight loss practices and body weight perceptions among US college students. *Journal of American College Health*, 56(5), 579–584.

- Wilborn, C, Beckham, J, Campbell, B, Harvey, T, Galbreath, M, La Bounty, P, Nassar, E, Wismann, J & Kreider, R. (2005). Obesity: Prevalence, Theories, Medical Consequences, Management, and Research Directions. *Journal of the International Society of Sports Nutrition*. 2(2): 4-31.
- Willows, N. D., Hanley, A. J. G., & Delormier, T. (2012). A socioecological framework to understand weight-related issues in Aboriginal children in Canada. *Applied Physiology, Nutrition, and Metabolism*, 37(1), 1–13. <https://doi.org/10.1139/h11-128>
- Withall, J., Jago, R., & Cross, J. (2009). Families' and health professionals' perceptions of influences on diet, activity and obesity in a low-income community. *Health & Place*, 15(4), 1078–1085.
- Woodruff, R. C., Schauer, G. L., Addison, A. R., Gehlot, A., & Kegler, M. C. (2016). Barriers to weight loss among community health center patients: qualitative insights from primary care providers.
- World Health Organization. (2002). *The world health report 2002: reducing risks, promoting healthy life*. World Health Organization.
- World Health Organization. (2013). Global action plan for the prevention and control of noncommunicable diseases 2013-2020.
- World Health Organization (WHO). (2011). WHO | New physical activity guidance can help reduce risk of breast, colon cancers. Retrieved 12 September 2017, from http://www.who.int/mediacentre/news/notes/2011/world_cancer_day_20110204/en/
- World Health Organization(WHO). (2015). WHO | Obesity and overweight. Retrieved 12 September 2017, from <http://www.who.int/mediacentre/factsheets/fs311/en/>
- Yaemsiri, S., Slining, M. M., & Agarwal, S. K. (2011). Perceived weight status, overweight diagnosis, and weight control among US adults: the NHANES 2003–2008 Study. *International Journal of Obesity*, 35(8), 1063–1070.
- Yamane, T. (1967). *Statistics: An introductory analysis*.
- Yang, K., Turk, M. T., Allison, V. L., James, K. A., & Chasens, E. (2014). Body mass index self-perception and weight management behaviors during late adolescence. *The Journal of School Health*, 84(10), 654–660. <https://doi.org/10.1111/josh.12195>

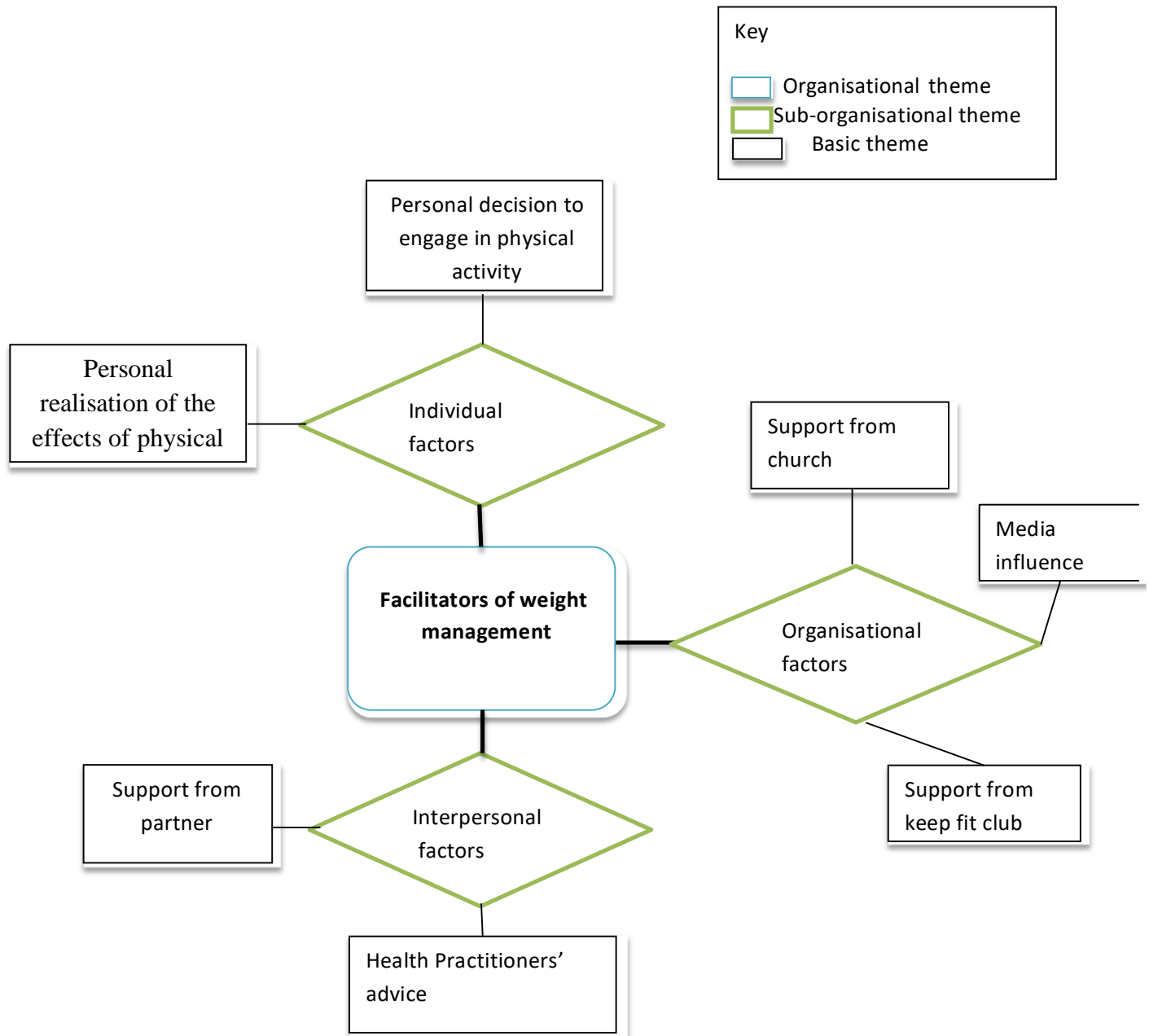
- Yaqoob, F. M., & Elhisadi, T. A. (2013). Overweight and Obesity among Health Workers at Wahda Hospital-Derna-Libya. *Science Journal of Medicine and Clinical Trials*, 2013. Retrieved from <http://www.sjpub.org/sjmct/abstract/sjmct-117.html>
- Yeng, P. P., & Sedek, R. (2012). The body weight perception and weight control behaviors among undergraduate students in National University of Malaysia (UKM). *Pakistan Journal of Nutrition*, 11(12), 1131.
- Yepes, M., Viswanathan, B., Bovet, P., & Maurer, J. (2015). Validity of silhouette showcards as a measure of body size and obesity in a population in the African region: A practical research tool for general-purpose surveys. *Population Health Metrics*, 13(1), 35.
- Zenk, S. N., Schulz, A. J., Matthews, S. A., Odoms-Young, A., Wilbur, J., Wegrzyn, L., ... Stokes, C. (2011). Activity space environment and dietary and physical activity behaviors: a pilot study. *Health & Place*, 17(5), 1150–1161.
- Zienczuk, N., Young, T. K., Cao, Z. R., & Egeland, G. M. (2012). Dietary correlates of an at-risk BMI among Inuit adults in the Canadian high arctic: cross-sectional international polar year Inuit health survey, 2007-2008. *Nutrition Journal*, 11(1), 73.

APPENDICES

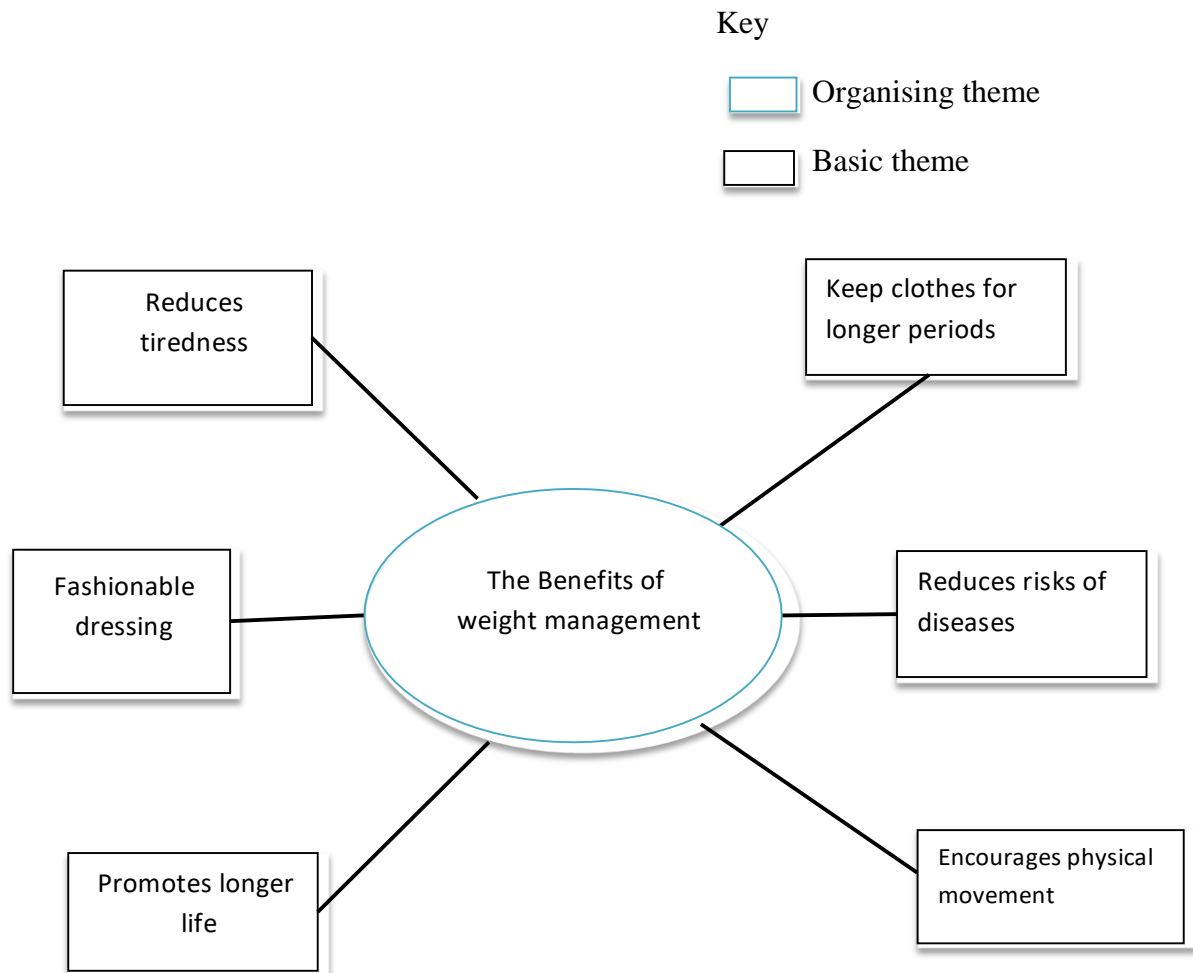
Appendix A: Thematic networks of barriers to weight management



Appendix B: Thematic networks of facilitators of weight management



Appendix C: Thematic networks of the benefits of weight management



Appendix D: Focus group discussions (FGDs) coding frame

| Global theme | Organising theme | Sub-organising theme | Basic Theme | Description | Number of responses | Sample Quote(s) |
|----------------------------------|-------------------------------|---------------------------|---------------------------------------|---|---------------------|--|
| Perceptions of weight management | Barriers to weight management | Individual level barriers | High cost of fruits and vegetables | High cost of fruits prevents individuals from choosing fruits as a weight management behaviour | 7 | <p>I: <i>What do you think will be the hindrances to intake of fruits and vegetables to manage weight?</i></p> <p>R: <i>The kenkey is what does that. Probably the person is only having 2 Ghana cedis. You know that you can buy kenkey and fish with that amount of money. However, the cost of the vegetables is expensive, and she might have to spend extra money to get that". (FGD, older women).</i></p> <p><i>"You will see a small apple costing 2 Ghana cedis, a small piece of watermelon for 1 Ghana cedis. That money can buy kenkey and fish. So you will rather eat the kenkey."</i> (FGD5, older Men, Ussher Town).</p> |
| | | | Diarrhoea reactions | Diarrhoea reactions encountered from the intake of some fruits prevent individuals from eating fruits | 4 | <p><i>"There are people who do not like to eat fruits like oranges because they believe that when they eat them, they end up having diarrhoea". (FGD1, older men, James Town).</i></p> <p><i>"For me when I take in oranges my stomach hurts so I don't like them. It is the same with apple so I don't normally eat fruits" FGD2, older women, James Town).</i></p> |
| | | | Fruits and vegetables are not filling | Consumption of fruits and vegetables do not give satisfaction | 3 | <p><i>"He will tell you it will not satisfy him, rather he will buy plenty spaghetti for one cedi and eat. Afterwards, he will drink pure water to survive the day" (FGD7, younger men, Ussher Town.)</i></p> <p><i>"I prefer food with lots of carbohydrates to fruits. Something that can sustain me for long hours"(FGD8, younger women, Usher Town)</i></p> |
| | | | Ignorance of benefits of fruits and | Ignorance about the importance of | 3 | <p><i>"Most of the time, it is ignorance. They do not know the importance of fruit and vegetables. So, what they will use in buying fruits, they prefer to use it to buy alcohol so that they will have an appetite for</i></p> |

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| | | | vegetables | fruits and vegetables is a barrier to weight management | | <i>their meal". (FGD3, younger men, James Town)</i> |
| | | | Poverty | Individuals lack money to eat healthy foods | 4 | <p><i>"Weight management helps, but here it will not help me because with GHC 10.00 the four of us can buy banku Ghc. 5.00 so which one will we use to buy the fruits? You see it is all due to poverty (FGD8, young women, Ussher Town).</i></p> <p><i>"They do not have money to go to a restaurant to buy salad". (FGD, younger men).</i></p> <p><i>"Most of the time, it happens when you do not have anything proper doing. You will usually stress yourself up in search of a job. Since you do not have enough money, you will not be able to buy any proper food. Some will even have to sleep with men before they get what to eat. So I believe if you have money, you will be able to eat healthy". (FGD5, older Men, Ussher Town)</i></p> |
| | | | Perceptions of fruits safety | Negative perceptions about fruits and vegetables prevent their consumption | 1 | <i>"Some people are of the view that most of the fruits are not good organically because of the fertilizer being used. So they end up contracting illness after consumption". (FGD3, younger men, James Town)</i> |
| | | Exercise related barriers | Stress | Stress prevents individuals from exercising to manage weight | 2 | <p><i>"Sometimes stress also prevents exercising. It even makes it difficult for one to pray. So stress prevents people from exercising". (FGD1, older men, James Town).</i></p> <p><i>"Most of the men of today do not have work to do. They have to hustle before making ends meet. So they are usually stressed up when they get home therefore they cannot exercise". (FGD2, older women, James Town).</i></p> |
| | | | Laziness | Laziness hinder | 3 | <i>I: What are some of the things that hinder people from exercising to manage weight?</i> |

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| | | | | individuals from exercising | | <p><i>R: Laziness! Laziness! Laziness! That is what hinders a lot of people from exercising". (FGD1, older men, James Town).</i></p> <p><i>"For example, as a footballer if you feel lazy to play soccer you will not be able to do it. So, if you avoid laziness and decide to lose weight within a few months you can do it". (FGD3, younger men, James Town).</i></p> |
| | | | Lack of Time | Individuals do not have the time to exercise | 5 | <p><i>"It is all about getting free time. If you are in the home doing nothing you can exercise as much as you can but immediately you get a job you will not have such time anymore" (FGD3, Younger men, James Town).</i></p> <p><i>"There are people who wake up at dawn to go to work. So they find it difficult to use the same time to exercise. At dawn, which they will exercise, they will be working to earn money at dawn instead of exercising (FGD2, older women, James Town).</i></p> |
| | | | Side effects of exercise | Side effects of exercising prevent individuals from exercising | 2 | <p><i>"For me, when I start exercising then I become rather heavy, so I don't exercise". (FGD6, older women, Ussher Town)</i></p> <p><i>"Exercise makes me go hungry, so I don't do it" (FGD6, older women, Ussher Town.)</i></p> |
| | | Community level barriers | Nutritional value of staple foods | The community staples are carbohydrate in nutrient | 3 | <p><i>"Banku and Kenkey. That's all they eat here. It is difficult to change and this also makes us to gain weight (FGD8, younger women, Ussher Town).</i></p> |
| | | | Community perception about body size | | | |
| | | | Stigmatisation of slimness | Slimness is mocked and stigmatised with illness, poverty | 4 | <p><i>"There are thing in this community that will enable you lose weight. However, the mockery you will face will deter you from doing so. People may say that you are suffering from AIDS when they see that you have loss weight. Due to that I will not want to lose weight. When you are slim you would like to gain weight due to the mockery you will face. So over here people try to gain weight a lot". (FGD4, younger women, James Town)</i></p> <p><i>"Over here, when you are slim, it is believed that you do not have</i></p> |

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| | | | | | | <p>money. So most of the women here are doing everything possible to gain much weight”. (FGD5, older men, Ussher Town)</p> <p>“Someone can even ask you to look at yourself to see how dry you look. When that happens, you get worried, so you end up looking for a way to also gain weight. If I have money, I have to also get one of the medicines to gain weight (FGD2, older women, James Town).</p> |
| | | | Fatness equates beauty | Fatness is associated with beauty | 3 | <p>“Yes, it is so in this community. When you grow fat, they say you have become fine. That is, you have become beautiful (FGD7, younger men, Ussher Town).</p> <p>“When you grow fat naturally, it is beautiful”(FGD4, younger women, James Town).</p> |
| | | Benefits of weight management | Reduces risk of diseases | Having a normal weight reduces an individual’s risk to contract diseases | 3 | <p>“Health wise, it is good to manage weight because excessive weight is associated with cholesterol, blood pressure, diabetes, and the rest. You will therefore prevent all these when you have normal body size” (FGD 8, younger women, Ussher Town).</p> <p>“They end up with various illnesses. So for me, I am not in support of anything like that. My mother is very big. As she got older, and has been feeling sick, I have been finding it very difficult to clean her up. So I was finding it difficult to get close to her because I do not find it easy at all, to even lift one arm of hers. I do not think being fat is a good thing at all”. (FGD5, older men, Ussher Town).</p> |
| | | | Encourages physical movement | Having a normal weight encourages physical movement | 3 | <p>“I think it is very beneficial to manage your weight. When you are of normal weight, walking about and going about your normal duties will not become a problem. I have been overweight before. I came back from abroad and became overweight. So I think it is good to maintain a normal body weight. This will help us to go about our normal body duties briskly”(FGD, older men).</p> <p>“Fatness is not a good thing at all. You will have challenges in walking, but someone who has the normal body size can easily move about (FGD, younger women).</p> |
| | | | Promotes | Weight management enables an | 2 | <p>“When you manage your body weight, you are able to stay healthy and live longer. When you engage in exercises, you are able to stay longer even though God is the giver of life”(FGD5, older men,</p> |

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| | | | longer life | individual to live longer | | Ussher Town) <i>"If you can manage your weight you will live longer even though we will all die. So I think exercising to manage our weight will help us live longer"</i> (FGD3, younger men, James Town). |
| | | | Fashionable clothes | Weight management makes dressing fashionable | 1 | <i>"When you manage your weight you always look attractive in appearance. But when you gain excess weight with a big stomach, you cannot wear the fashionable dress called fitting (tight clothes). The big stomach becomes a threat to the dressing so sometimes the weight management gives you a flat stomach to dress easily. There are some dresses that you would like to wear, but when you pick them you realize you cannot wear them"</i> (FGD8, younger women, Ussher Town) |
| | | Facilitators of weight management | Personal decision | An individual has to personally decide to exercise | 3 | <i>"The person really has to make up his mind to manage his weight. It is like a friend asking you to stop wee smoking. If you have the will power, you will stop".</i> (FGD3, younger men, James Town). |
| | | | Support from church | Support received from church enables one to exercise | 2 | <i>"For me, our church sometimes invites doctors and trainers around who help us with aerobics. So once in a while, I do exercise"</i> (FGD4, younger women, James Town) |
| | | | Media influence | The media influence people to exercise | 1 | <i>"Nowadays the media have influenced people. When they see the nice shape (normal size) then we the ladies, we also want to have such shape, so we try to exercise"</i> (FGD6, older women, Ussher Town). |
| | | | Health professional's advice | Advice from a doctor to eat healthy | 2 | <i>"Unless it is written from the doctors to eat health to manage weigh, they will not do it. It is when doctors advice before they will put in the effort to follow the doctors' advice".</i> (FGD, younger men) |
| | | | Keep fit club's support | Support from keep fit club to exercise | 1 | <i>Both men and women go for jogging together. Sometimes when the men wake up early, they call on the women and this helps because going for jogging by one's self may be challenging.</i> Interviewer: <i>is it something like a keep fit club?</i> Respondent: <i>Yes, it usually takes place every Sunday morning. We go for jogging</i> (FGD2, older Women, James Town). |

Appendix E: Coding frame derived from in-depth interview narratives

| Global theme | Organising Theme | Sub-organising theme | Basic Theme | Description | Number of responses | Sample Quote(s) |
|--|-------------------------------|---------------------------|---------------------------------------|---|---------------------|--|
| Perceptions of obesity and weight management | Barriers to weight management | Diet related Barriers | High cost of fruits and vegetables | High cost of fruits and vegetables prevents their consumption | 2 | <p><i>“Fruits and vegetables are expensive”. (II, normal weight younger woman, desires to stay about same)</i></p> <p><i>“They believe fruits and vegetables are very expensive so they will prefer to buy kenkey and fish instead of fruit. Looking at a ball of kenkey which is one cedi equating to a pineapple or watermelon at the same cost of one cedi, they will rather to buy kenkey”. (II, obese young woman, wants to lose weight).</i></p> |
| | | | Fruits and vegetables are not filling | Consumption of fruits and vegetables do not give satisfaction | 3 | <p><i>“They do not like eating fruits because they believe that same amount of money can afford them a meal which will fill their stomach for longer hours, unlike the fruit that will not fill them for hours”. (II, obese young Woman, desires to lose weight).</i></p> <p><i>“Someone might just have one cedi to buy breakfast or 2 cedi for the day. So he wants food that can satisfy and fill his stomach for the day but fruits cannot do that”. (II, normal weight younger woman, wants to lose weight).</i></p> |
| | | | Poverty | Individuals lack money to eat healthy foods | 1 | <p><i>“In this neighbourhood if we had the opportunity we will eat fruits and vegetables everyday but there is no money. If you are having 1 cedi on you and you want to buy any fruit or vegetable it might not be enough for you. If you have about 10 cedis on you, you can then buy some fruits and vegetables for about 3 cedis. You can buy a little pawpaw, pineapple, or sugarcane to eat and after about 10 minutes you can then go and buy some rice or fufu or waakye”. (II, overweight older woman, desires to stay about same).</i></p> |
| | | Exercise related barriers | Social environment | The social environment of the individual prevents physical activity | 1 | <p><i>“It is the environment. When you live around people who exercise you will be forced to join them, but here it is not so, so if we do not exercise it is not a bother to anyone”. (II, normal young woman, desires to stay about same)</i></p> |
| | | | Laziness | Laziness hinder physical activity | 4 | <p><i>“Laziness prevent a lot of people from exercising. Many people cannot even do what I have been doing. When you follow laziness you can't do</i></p> |

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| | | | | | | <p><i>it”(II, obese older woman, wants to lose weight).</i></p> <p><i>“The first thing is that I feel lazy to exercise “. (II, overweight younger man, desires to stay about same).</i></p> <p><i>Most at times it is laziness that prevents us from exercising”(II, obese older woman, desires to lose weight).</i></p> |
| | | | Lack of Time | Individuals do not have time to engage in physical activity | 1 | <i>“It’s time. In this place, they do not have time for themselves. They do not even have time for their children, or themselves. They don’t have time for themselves at all so they don’t even know what is even called exercise”. (II, obese younger woman, wants to lose weight).</i> |
| | | | Unavailability or affordability of weight management medicines | Weight management medicines are not available to help manage weight | 1 | <i>“The medicines for managing weight are not available here. Even if they are available here we cannot afford them”. (II, normal young man who wants to gain weight).</i> |
| | | Community level barriers | Communal eating | Invitation to eat from community members | 1 | <i>“What is disturbing us here is that when people cook they invite you to come and eat very frequently. Even if you are satisfied you are compelled to eat” (II, obese older woman, desire to lose weight).</i> |
| | | | | | | |
| | Community perception about body size | | Slimness is stigmatized | Slimness is mocked and stigmatized with illness, poverty | 6 | <p><i>“Like I told you earlier on when the overweight people reduce in size they believe that people will insult them that they are poor and for that matter do not have money for food” (II, an obese older woman who intends to lose weight).</i></p> <p><i>“Some of the women make remarks like having an affair with a thin woman is like chewing bones. Therefore, they use that to insult their fellow females. The males also do same. Imagining a slim woman walking on the street, they can refer to her as “shaking off bones”(II, overweight younger woman, desires to stay about same).</i></p> <p><i>“Yes, that is why they go in for the medicines and all that. Because at the end of the day the only thing someone will tell you is to look at how you have slimmed down like fried fish. Uhhmmm and all that...like a sick person....like a doll (II, an underweight younger woman who wants to gain weight).</i></p> |
| | | | Fatness equates beauty | Fatness is associated with | 5 | <i>“In this community most at times the guys say they love those who are fat, so if you are fat they will say you are beautiful. It’s only a few people who</i> |

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| | | | | beauty | | <p><i>like the slim people. So most women want to be fat". (II, an obese younger woman who wants to lose weight).</i></p> <p><i>"Ok in this community if you were known to have a normal body and in some few months you are seen to have gained weight which is different from the weight you had, they will say you are living good or well. You have become fine". (II, overweight young man, desires to stay about the same).</i></p> |
| | | | Fatness equates respect | Fatness is linked to respect | 2 | <p><i>"In this community if you are 18 years old and you are small in size, you will not receive the level of respect that is supposed to be given to you. This is because they feel you are a child, but if you are at that age and you are fat, they give you respect, but if your age and body is not in proportion they just play rough with you". (II, normal weight young woman who wants to stay about same).</i></p> |
| | | | Fatness is wealth | Fatness is associated with wealth | 3 | <p><i>"What I have witnessed in this society from fat women is that they think when you are fat you have money, but I told them that was a wrong concept but excessive fat is associated with illness and disease. The response was that when society feels that you have lost weight and for that matter become thin, you do not have money. So mostly their perception is that slim people are hungry and suffering, who cannot afford meal". (II, obese older woman, desires to lose weight).</i></p> <p><i>"A lot of people think I have money because of my fatness. But as I'm sitting here now I don't buy food from outside to eat so people think I have money but I don't have money". (II, obese older woman, desires to lose weight).</i></p> |
| | | | Fashionable dressing | Fatness makes dressing attractive or fashionable | 1 | <p><i>"According to them when you have the bigger body size and you put on clothes like Kaba and slit, it is very attractive, so they prefer to gain weight". (II, normal weight young woman, wants to stay about the same).</i></p> |
| | Benefits of weight management | | Reduce risk of diseases | Having a healthy body size reduces an individual's risk to contract diseases | 9 | <p><i>"The women also face challenges when they become overweight. When they get to a certain age their waist, knees and ankles start disturbing them. They will say their waist has become heavy, so it is not good to be overweight, you have to have a certain normal weight". (II, overweight older man, desires to stay about the same).</i></p> <p><i>You will not contract diabetes and hypertension when you manage your diet and weight." (II, normal weight young woman, wants to stay about the same).</i></p> |
| | | | Encourages physical | Having a healthy body size | 5 | <p><i>"Most of them cannot walk. When they sit at one place for long, they find it difficult to move around. If they have something and it falls, they must call</i></p> |

| | | | | | | |
|--|-----------------------------------|--|---|--|---|---|
| | | | movements | encourages physical movements | | <p><i>someone to pick it up for them". (II, obese older woman, wants to lose weight).</i></p> <p><i>"I know a woman who is too fat and cannot walk. So everywhere she goes, she must pick a car". (II, normal weight young woman, wants to stay about the same).</i></p> |
| | | | Longer life | Weight management makes an individual to live longer | 1 | <p><i>"You will lose weight well and you won't die early from weight gain. This is because when you are bigger than normal you can die before your time". (II, obese older woman, desires to lose weight).</i></p> |
| | | | keep clothes for longer periods | Maintain one's weight helps to wear clothes for longer periods | 1 | <p><i>"You may not be able to wear some of your clothes. Uhhh, nowadays the economic condition is bad, it's difficult to get money so with a normal body size I am able to use my clothes and wear them to places I desire to go. Not long ago I built up a little, some of my clothes became smaller, and I didn't have money to buy new ones. As a result, I lost interest in training to build up. So, that has led to my current body size. Eeeh, at first I could not wear my clothes and I did not have money to purchase new ones. And I had new clothes I had not worn so I had to reduce in order to wear them". (II, overweight older man, desires to stay about same).</i></p> |
| | | | Reduces tiredness | Weight management reduces tiredness | 2 | <p><i>"When you are too slim too people will laugh at you. Also, when you are slim, yeah, you cannot too much work that you are expected to do. Instead of you to be more energetic, you become tired easily. I think these are some of the reasons to manage your weight" (II, Normal weight young man, wants to gain weight).</i></p> <p><i>"When you manage your weight, it does not make you get tired quickly when performing an activity. This is because you have a normal weight". (II, overweight young man, desire to stay about same).</i></p> |
| | Facilitators of weight management | | Personal realisation of the effects of physical activity' | Loss in weight after exercise facilitates exercising | 1 | <p><i>"If you do the exercise and still you are of the same size, then you don't have to worry yourself" (II, obese young woman, wants to lose weight)</i></p> |
| | | | Partner's support | Support from partners encourages one to exercise | 1 | <p><i>"You asked whether there is a place in this community that we can go there for walk or stand to exercise. And I told you that there is no place like that except walking about. But if my husband asks me to take a walk with him, it will be of help so I will follow him". (II, an overweight older woman, wants to lose weight)</i></p> |

Appendix F, Ethical clearance form



UNIVERSITY OF GHANA
ETHICS COMMITTEE FOR THE HUMANITIES (ECH)

P. O. Box LG 74, Legon, Accra, Ghana

My Ref. No.....

10th October 2016

Ms. Grace Agyemang Frempong
Regional Institute for Population Studies
University of Ghana
Legon

Dear Ms. Frempong,

ECH 014/16-17: IS MY BODY SIZE IDEAL? THE EFFECT OF BODY MASS INDEX AND BODY SIZE PERCEPTION ON WEIGHT MANAGEMENT IN ACCRA, GHANA

This is to advise you that the above reference study has been presented to the Ethics Committee for the Humanities for a full board review and the following actions taken subject to the conditions and explanation provided below:

Expiry Date: 08/09/17
On Agenda for: Initial Submission
Date of Submission: 12/09/16
ECH Action: Approved
Reporting: Bi-Annually



Please accept my congratulations.

Yours Sincerely,

Rev. Prof. J. O. Y. Mante
ECH Chair

CC: Prof. Samuel N. A. Codjoe, Regional Institute for Population Studies

Appendix G: Sample Questionnaire used for data collection

The influence of body size estimation on weight management behaviours in Accra, Ghana

QUESTIONNAIRE

| IDENTIFICATION | |
|-------------------|-----------------------------|
| Individual's Code | _____ |
| Community | _____ |
| EA: | _____ |
| Date of Visit | ____/____/____ (dd/mm/yyyy) |

INFORMED CONSENT FOR INDIVIDUAL

My name is I am from Regional Institute for Population Studies, University of Ghana. The Institute is currently conducting a survey on body size perception and weight management in two communities in Ga Mashie: James Town and Ussher Town. The purpose of the survey is to explore the relationship between individual's body size perception and weight management practiced by them, in order to access interventions to deal with the obesity epidemic in the study areas.

In the course of the interview, I will only ask questions about you. I will not be conducting any medical examination or tests except for the measurements of your weight and height. There are no risks associated with participation in this study. You are free to decide if you want to be in this research. Your participation is entirely voluntary.

If you agree to be interviewed, your part of the research will last about 20 to 30 minutes. We would also be conducting a focus group discussion which may last for about 45 minutes to 1 hour. In the course of the discussion you may choose not to answer a question or even stop the interview altogether. If you choose to stop the discussion, all the responses you provide will be deleted from the study. However, if you consent to the interview, all the information that you give will remain confidential. We will protect information about you and your taking part in this research to the best of our ability. You will not be named in any reports. However, the staff of RIPS may sometimes look at your research records.

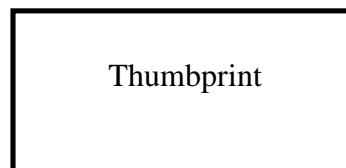
If you agree to the interview, I will take notes of the conversation between us on paper. Have I explained everything well enough to you? Do you have any questions for me?

After our interview, if you have any concerns regarding the study you may contact Prof. Ama de-Graft Aikins (0302500274). If you have any questions about your rights as a research participant in this study you may contact the Administrator of the Ethics Committee for Humanities, ISSER, University of Ghana at ech@isser.edu.gh / ech@ug.edu.gh or 00233- 303-933-866.

Consent to participate in survey

"I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent for me to participate in this study. I will not have waived any of my rights by signing this consent form. Upon signing this consent form, I will receive a copy for my personal records."

Respondent's Name-----
Respondent's Signature _____
Date: _____
Interviewer's signature _____
Date: _____



Start time:

End time:

| Part I: Demographic Information | | |
|--|---|---|
| Please tell me about yourself | | |
| Q NO. | QUESTION | RESPONSE |
| 100. | Sex of respondent 1. Male 2. Female | <input type="checkbox"/> |
| 101 | What is your date of birth? | Day <input type="checkbox"/> <input type="checkbox"/> Month <input type="checkbox"/> <input type="checkbox"/> Year <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 102 | How old were you on your last birthday? | <input type="checkbox"/> <input type="checkbox"/> |
| 103 | Have you ever attended school? 1. Yes 2. No | <input type="checkbox"/> <i>(if code 2 skip to 105)</i> |
| 104 | What is the highest level of education you have attained? 1. Pre-School 2. Primary 3. Middle/JHS 4. Secondary/SSS/SHS 5. Higher | <input type="checkbox"/> |
| 105 | What is your religion? 1. No religion 2. Catholic 3. Presby/Methodist/Anglican 4. Pentecostal/Charismatic 5. Other Christian 6. Islam 7. Traditional/Spiritualist 96. Other (specify) _____ | <input type="checkbox"/> |
| 106 | What is your ethnic group? 1. Akan 2. Ga-Dangme 3. Ewe 4. Guan 5. Gruma 6. Mole-Dagbani 7. Grussi 8. Mande 96 Other (specify) _____ | <input type="checkbox"/> |
| 107 | Are you currently employed? (any activity that earns you salary) 1. Yes 2. No | <input type="checkbox"/> |
| 108 | What is your occupation, that is, what kind of work do you mainly do? 1. Professional/Technical 2. Managerial 3. Clerical 4. Sales 5. Agriculture 6. Household and Domestic 8. Service 9. Skilled manual 11. Unskilled manual 12. Other (specify) _____ | <input type="checkbox"/> |
| 109 | What is your current marital status? 1. Never married 2. Married 3. Cohabiting/living together 4. Separated 5. Divorced 6. Widowed | <input type="checkbox"/> |
| | | |

| Part II: Household Wealth Status | | |
|----------------------------------|---|---|
| Q NO. | QUESTION | RESPONSE |
| 200 | Does your household have...? 1. Yes 2. No | |
| | Car <input type="checkbox"/> | Washing machine <input type="checkbox"/> |
| | Bicycle <input type="checkbox"/> | Television <input type="checkbox"/> |
| | Boat/Canoe <input type="checkbox"/> | Radio <input type="checkbox"/> |
| | Truck <input type="checkbox"/> | Telephone/Mobile phone <input type="checkbox"/> |
| | An outboard motor <input type="checkbox"/> | Clock <input type="checkbox"/> |
| | Refrigerator <input type="checkbox"/> | Electric/Gas stove <input type="checkbox"/> |
| | Freezer <input type="checkbox"/> | Sofa <input type="checkbox"/> |
| | Generator <input type="checkbox"/> | Sewing machine <input type="checkbox"/> |
| | Iron <input type="checkbox"/> | Electric fan <input type="checkbox"/> |
| | Computer <input type="checkbox"/> | Fishing net <input type="checkbox"/> |
| 201 | How long have you stayed in this community? _____ | |

| Part III: Physical Activity | | |
|-----------------------------|---|--|
| Q NO. | QUESTION | RESPONSE |
| 300. | Are there places in this community where you can engage in physical activity outside of your home? 1. Yes 2. No | <input type="checkbox"/> <i>If code 2 skip to 302</i> |
| 301 | How long does it take to walk at a normal pace from your house to the nearest physical activity space in this community? Hour(s) <input type="checkbox"/> <input type="checkbox"/> Minutes <input type="checkbox"/> <input type="checkbox"/> | |
| 302 | How would you rate your community as a place to be physically active? 1. Very conducive 2. Somewhat conducive 3. Not very conducive 4. Not at all conducive | <input type="checkbox"/> |
| 303 | Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate [like carrying, digging, heavy lifting] for at least 10 minutes continuously? 1. Yes 2. No | <input type="checkbox"/> <i>If code 2 skip to 306</i> |
| 304 | In a typical week, on how many days do you do vigorous-intensity activities as part of your work? Days <input type="checkbox"/> | |
| 305 | How much time do you spend doing vigorous-intensity activities as part of your work in a typical day? Hours <input type="checkbox"/> <input type="checkbox"/> Minutes <input type="checkbox"/> <input type="checkbox"/> | |

| | | |
|-----|--|--|
| 306 | Does your work involve moderate-intensity activity that cause small increases in breathing or heart rate like carrying light loads, cleaning, cooking or washing for at least 10 minutes continuously? 1. Yes 2. No | <input type="checkbox"/> <i>If code 2 skip to 309</i> |
| 307 | In a typical week, on how many days do you do moderate-intensity activities as part of your work? Days <input type="text"/> | <input type="text"/> |
| 308 | How much time do you spend doing moderate-intensity activities at work on a typical day? Hours <input type="text"/> <input type="text"/> Minutes <input type="text"/> <input type="text"/> | |
| 309 | Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places? 1. Yes 2. No | <input type="checkbox"/> <i>If code 2 skip to 312</i> |
| 310 | In a typical week, on how many days do you walk or cycle for at least 10 minutes to get to and from places? Days <input type="text"/> | |
| 311 | How much time do you spend walking or cycling for travel on a typical day? Hours <input type="text"/> <input type="text"/> Minutes <input type="text"/> <input type="text"/> | |
| 312 | Do you do any vigorous intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate [like running or playing football], for at least 10 minutes continuous? 1. Yes 2. No | <input type="checkbox"/> <i>If code 2 skip to 315</i> |
| 313 | In a typical week, on how many days do you do vigorous intensity sports, fitness or recreational (leisure) activities? Days <input type="text"/> <input type="text"/> | |
| 314 | How much time do you spend doing vigorous intensity sports fitness or recreational activities on a typical day? Hour(s) <input type="text"/> <input type="text"/> Minutes <input type="text"/> <input type="text"/> | |
| 315 | Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate [such as a brisk walking], cycling, swimming, volleyball for at least 10 minutes continuously? 1. Yes 2. No | <input type="checkbox"/> <i>If code 2 skip to 318</i> |
| 316 | In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities? Days <input type="text"/> <input type="text"/> | |
| 317 | How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day? Hour <input type="text"/> <input type="text"/> Minutes <input type="text"/> <input type="text"/> | |

| | | |
|-----|--|---|
| 318 | How much time do you usually spend sitting or reclining on a typical day? This refers to the day time. | <input style="width: 40px; height: 25px; border: 1px solid black;" type="text"/> <input style="width: 40px; height: 25px; border: 1px solid black;" type="text"/> |
| | Hour | Minutes |

| Part IV: Dietary Patterns | | |
|----------------------------------|--|--|
| Q NO. | QUESTION | RESPONSE |
| 400. | Are fruits and vegetables available in your community? 1. Yes 2. No | <input style="width: 40px; height: 25px; border: 1px solid black;" type="checkbox"/> |
| 401 | In the past 7 days, did you consume fruits and vegetables? 1. Never (0 days) 2. Sometimes (1-2 days) 3. Often (3-4 days) 4. Always (5-7 days) | <p style="text-align: center;"><i>Skip to Q404 if code 1 or 2.</i></p> |
| 402 | On average how many servings of fruits do you eat on a typical day? Servings per day. Eg 1 finger of banana, 1 small orange | |
| 403 | On average how many servings of vegetables do you eat on a typical day? Servings per day eg, small bowl, medium or big bowl | |
| 404 | If Never or Sometimes WHY? | |
| 405 | How often do you buy your meals outside the home? 1. Never 2. 1 day/week 3. Everyday 4. 2-3 days/week 5. 3-4 days/week 9. Other (specify)_____ | <p style="text-align: center;"><i>Skip to Q500 if code 2 or 5.</i></p> |
| 406 | How often do you or someone else in your home prepare your meals at home? Never 2. 1 day/week 3. Everyday 4. 2-3 days/week 5. 3-4 days/week 9. Other (specify) _____ | <input style="width: 40px; height: 25px; border: 1px solid black;" type="checkbox"/> |
| 407a | If you cook your meals, what kinds of cooking methods do you usually use? How many times do you use these methods in a day? 1. Never 2. Once 3. Twice 4. Three times 5. Four or more a. Frying <input style="width: 30px; height: 25px; border: 1px solid black;" type="text"/> b. Steaming <input style="width: 30px; height: 25px; border: 1px solid black;" type="text"/> c. Baking <input style="width: 30px; height: 25px; border: 1px solid black;" type="text"/> d. Grilling <input style="width: 30px; height: 25px; border: 1px solid black;" type="text"/> e. Boiling <input style="width: 30px; height: 25px; border: 1px solid black;" type="text"/> f. Roasting <input style="width: 30px; height: 25px; border: 1px solid black;" type="text"/> | |

| PART V: BODY IMAGE (Show body image cards to respondents and write letter) | | | |
|--|---|--|--------------------------|
| 500 | Which picture do you most look like right now? | | <input type="checkbox"/> |
| 501 | Which picture would you most prefer to look like? | | <input type="checkbox"/> |
| 502 | Which picture is most like your spouse? (<i>ask only married/cohabiting respondents</i>) | | <input type="checkbox"/> |
| 503 | Which picture is most like your closest friend? | | <input type="checkbox"/> |
| 504 | <u>Women only</u> Which picture is most like other women of your age in this community? | | <input type="checkbox"/> |
| | <u>Men only</u> Which picture is most like other men of your age in this community? | | <input type="checkbox"/> |
| 505 | <u>Women only</u> Which picture do you think most of the men around you would prefer women to be? | | <input type="checkbox"/> |
| | <u>Men only</u> Which picture do you think most of the women around you would prefer men to be? | | <input type="checkbox"/> |
| 506 | Which picture did your body weight look like 2 years ago? | | <input type="checkbox"/> |

| Part VI: Weight Management Goals/Behaviours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Q NO. | QUESTION | RESPONSE | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 600. | During the past 12 months, what have you been trying to do about your body weight? 1. Lose weight 2. Gain Weight 3. Stay about the same weight | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 601 | A. Are you currently doing/did you do any of the following to manage your weight? (<i>select all that apply</i>) 1. Yes 2. No a. Eating fewer calories b. Skipping meals c. Reducing food portion d. Taking diet pills e. Herbs/biomedicine f. Fasting | <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="text-align: center;">2</td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> </table> | 1 | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | |
|--|------------------------------------|--------------------------|--------------------------|
| | g. Increasing food portion | | |
| | h. Eating calorie dense food | <input type="checkbox"/> | <input type="checkbox"/> |
| | i. Intake of fruits and vegetables | <input type="checkbox"/> | <input type="checkbox"/> |
| | j. Increasing regular exercise | <input type="checkbox"/> | <input type="checkbox"/> |
| | k. Decreasing exercise activities | <input type="checkbox"/> | <input type="checkbox"/> |
| | l. Other (specify)_____ | | |

Part VII: Social Support and Eating Habit¹

Below is a list of things people might do or say to someone who is trying to improve their eating habits. We are interested in high fat foods. If you are not trying to make any of these dietary changes, then some of the questions may not apply to you, but please read and give an answer to every question.

Please rate each question twice. Under family, rate how often anyone living in your household has said or done what is described during the last three months. Under friends, rate how often your friends, acquaintances, or co-workers have said or done what is described during the last three months. Use the following rating scale:

1. None 2. Rarely 3. A few times 4. Often 5. Very often 8. Does not apply

| Q NO. | QUESTION | RESPONSE | | |
|-------|---|----------|---------|---------------|
| | During the past three months, my family (or members of my household) or friends: | | | |
| | | Family | Friends | Health Worker |
| 700 | Encouraged me not to eat "unhealthy foods" (cake, salted chips) when I'm tempted to do so | | | |
| 701 | Discussed my eating habit changes with me (asked me how I'm doing with my eating changes) | | | |
| 702 | Reminded me not to eat high fat, high salt foods | | | |
| 703 | Complimented me on changing my eating habits("Keep it up", "We are proud of you ") | | | |
| 704 | Commented if I went back to my old eating habits. | | | |
| 705 | Ate high fat or high salt foods in front of me. | | | |
| 706 | Refused to eat the same foods I eat. | | | |
| 707 | Brought home foods I'm trying not to eat | | | |

¹ Sallis, J.F., Grossman, R.M., Pinski, R.B., Patterson, T.L., and Nader, P.R. (1987). The development of scales to measure social support for diet and exercise behaviors. *Preventive Medicine, 16*, 825-836.

| | | | | |
|-----|---|--|--|--|
| 708 | Got angry when I encouraged them to eat low salt, low fat foods | | | |
| 709 | Offered me food I'm trying not to eat. | | | |

Part VIII: Social Support and Exercise²

Below is a list of things people might do or say to someone who is trying to exercise regularly. If you are not trying to exercise, then some of the questions may not apply to you, but please read and give an answer to every question. Please rate each question twice. Under family, rate how often anyone living in your household has said or done what is described during the last three months. Under friends, rate how often your friends, acquaintances, or co-workers have said or done what is described during the last three months. Use the following rating scale:

1. None 2. Rarely 3. A few times 4. Often 5. Very often 8. Does not apply

| Q NO. | QUESTION | RESPONSE | | |
|-------|--|----------|---------|---------------|
| | During the past three months, my family (or members of my household) or friends: | | | |
| | | Family | Friends | Health Worker |
| 800 | Exercised with me | | | |
| 801 | Offered to exercise with me | | | |
| 802 | Gave me helpful reminders to exercise ("Are you going to exercise tonight?") | | | |
| 803 | Gave me encouragement to stick with my exercise program | | | |
| 804 | Changed their schedule so we could exercise together. | | | |
| 805 | Discussed exercise with me | | | |
| 806 | Complained about the time I spend exercising. | | | |
| 807 | Criticized me or made fun of me for exercising | | | |
| 808 | Gave me rewards for exercising (bought me something or gave me something I like) | | | |
| 809 | Planned for exercise on recreational outings. | | | |
| 810 | Helped plan activities around my exercise. | | | |
| 811 | Asked me for ideas on how they can get more exercise. | | | |
| 812 | Talked about how much they like to exercise | | | |

¹ Sallis, J.F., Grossman, R.M., Pinski, R.B., Patterson, T.L., and Nader, P.R. (1987). The development of scales to measure social support for diet and exercise behaviors. *Preventive Medicine, 16*, 825-836.

Part IX: Anthropometric measures

| | | |
|-----|--|--|
| 900 | Do you know how much you weigh? 1. Yes 2. No | |
| 901 | What is your weight (<i>very recent weight checked</i>)? | |
| 902 | WEIGHT (Kg) | |
| 903 | HEIGHT (cm) | |
| 904 | WAIST CIRCUMFERENCE (cm) | |
| 905 | HIP CIRCUMFERENCE (cm) | |

WE HAVE COME TO THE END OF THE INTERVIEW, THANK YOU VERY MUCH FOR TAKING YOUR TIME TO ANSWER THESE QUESTIONS. DO YOU HAVE ANY QUESTION OR COMMENTS FOR ME?

RESPONDENT: COMMENTS/QUESTIONS

.....

Appendix H: Interview guide

Assessment of Perceptions of Body Size and Weight Management Behaviours

Focus Group Discussion and in-depth Interview Guide³

1. Do you think or believe there is an ideal body size in this community?

Note: Prompt respondents to describe the ideal body size

2. Are there any differences in the expectation of body size for males and females in this community?

Probe: respondents will be asked to describe the ideal body size for

(a) Women (18-35years); (b) women (36 years and above)

(c) Men (18-35years) (d) (36 years and above) using the body image cards as prompts.

3. Do you think there are different expectations for ethnic groups?

Probe: Gas, Asantes, Hausas, etc

4. Do you think that there are different degrees of body size?

Probe: views about being plump, big boned, overweight, obese

5. There is a popular view among Ghanaians that if you are fat, then you are beautiful, or wealthy or healthy. What do you think about this view? What about your community?

6. Do you think that people who do not have the ideal Ghanaian body size (for their age and gender) would be ashamed/ embarrassed about it?

Probe: whether respondent thinks people would be embarrassed enough to (a) wear clothes to make them look thinner; (b) wear clothes to make them look bigger; (c) avoid going out (d) take medication to lose weight.

³ Agyemang C, Beune E, Meeks K, et al. Rationale and cross-sectional study design of the Research on Obesity and type 2 Diabetes among African Migrants: the RODAM study. *BMJ Open* 2014;4:e004877. doi:10.1136/bmjopen-2014-004877

Section 2 in-depth interview

In this section, the questions focus on your perceptions about weight and the feelings you have about your own weight or body size.

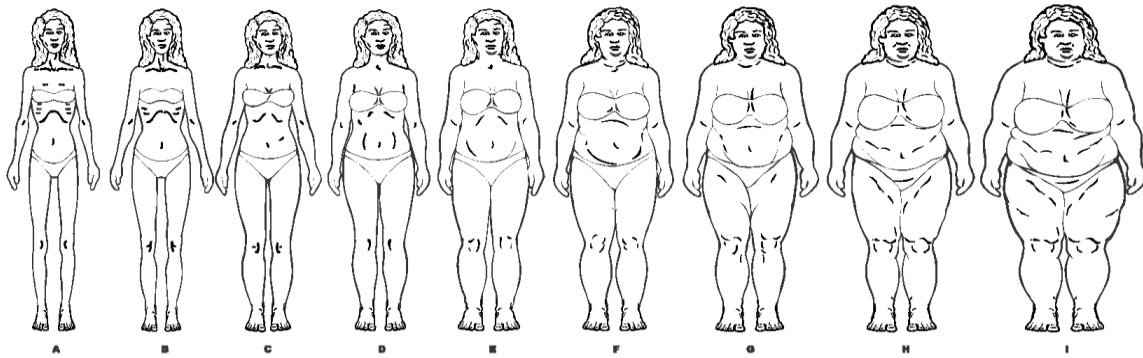
1. Do you think you have the ideal community size for your sex and age? Probe for current body size, ideal body size and reasonable body size
2. What are your feelings about your current size/weight?
Probe: emotions, happy, sad, indifferent, anxious
Does it has to do with your community's perception about body size?
3. Have/ will you consider changing your current size/weight?
Probe: If you would consider changing your size, would you want to put on some more weight lose some weight OR stay same?
4. Have you changed or altered your diet in the last 12 months?
Probe: what forms or different foods the respondents eat what you ate then and now.
5. Have you taken any medication in the last 12 months with the aim of changing or altering your size?
Probe: kinds of medications; list at least 3.
6. Have you done any exercise/aerobics aimed at changing your body size?
7. Do you think there are benefits of weight management? Explain.

****Barriers/enablers to healthy eating/physical activity**

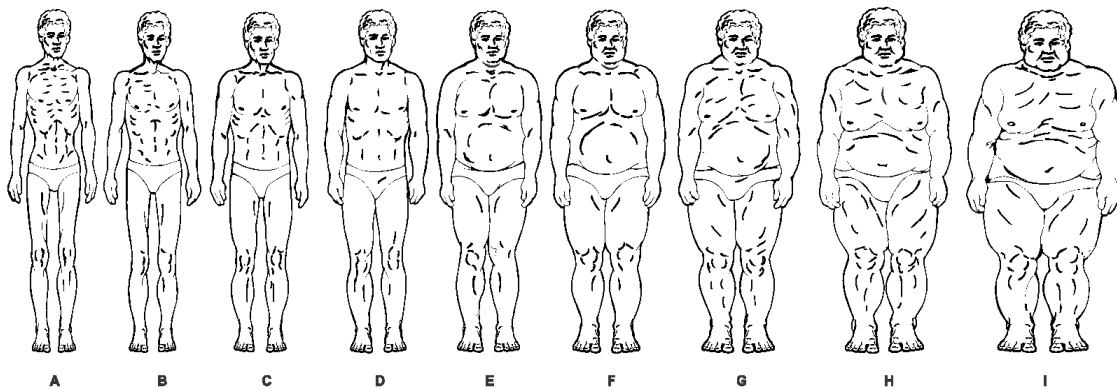
8. What are barriers to weight management in this community?
Probe for perceptions about ideal body size, cultural practices (intake of certain foods during postpartum periods, staple foods).
-What makes women beautiful?
Do you think the media, church, mosque and other social organisation influence weight management? Explain..
9. What are the enablers to weight management in this community?
10. Could you suggest recommendations for weight management in this community?

Appendix I: Figural stimuli⁴ (Pulvers et al., 2004)

Females' figural stimuli



Males' figural stimuli



⁴ Pulvers et al., 2004. Development of a culturally relevant body image instrument among urban African Americans. *Obes Res.* 2004;12:1641–1651.

Appendix J: Association between wealth status and walking or use of bicycle

| Wealth status | Walk or use bicycle as a means of transportation (at least 10minutes) | | Number |
|----------------------|--|-------------|------------|
| | No | Yes | |
| Lower wealth status | 26.8 | 73.2 | 157 |
| Middle wealth status | 42.5 | 57.5 | 80 |
| Higher wealth status | 39.2 | 60.8 | 158 |
| Total | 34.9 | 65.1 | 395 |
| | Chi =17.928 df=4 P value=0.019 | | |

Source: Field survey, Nov-Dec 2016.

Appendix K: Recreational centres and activity taken in James Town and Ussher Town.

JAMES TOWN

Recreational Center

Manstse Agonaa Park
 Wingo Court
 Sacred Heart Technical School
 Fire Service Training School
 James Town round about
 James Town Police Station
 James Town Beach

 Korle lagoon area
 Assembly spot
 Gamada Premises

Activity undertaken

Foot ball
 Basket Ball
 Hand ball and Basket Ball
 Football, Hand ball, and Jogging
 Foot ball
 Foot ball
 Jogging, football, swimming and general
 exercise
 foot ball
 Playing of Draft and playing cards.
 Boxing and theatre

USSHER TOWN

Bukom Park
 Ussher Town Beach

 Osekan Park
 Ussher fort Garden
 Creole Town
 Ussher fort

Football and jogging.

 Football, jogging, swimming and general
 exercise
 Football and jogging.
 Football and playing cards.
 Football and drumming and dancing
 Boxing gym