The Relationship between Lifestyle Behaviours and Body Mass Index (BMI): The Case of Youth in Ghana

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ACCEPTANCE

This thesis is accepted by the Faculty of Human and Social Science, North-West University (Mafikeng Campus), in partial fulfilment of the requirements for a PhD degree in Population Studies.

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DECLARATION

I, Phidelia Theresa Doegah, hereby declare that this work is the result of my own research undertaken under supervision and any references made to other people's work has been duly acknowledged. This study has neither in part nor in whole been presented for another degree elsewhere.

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DEDICATION

I dedicate this work to my husband, Pascal, my sons, Felix Nuna and Carl Nukunu, and my parents, Jacob and Christiana. They bear witness that this is a work of love.

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ABSTRACT

When considering the major contributors to morbidity and mortality, a shift is evident in both the pattern and burden of disease as a result of the epidemiological transition. Specifically, the shift involves a move from primarily infectious diseases to non-communicable diseases (NCDs), such as stroke, cardiovascular disease, diabetes and chronic respiratory disease. Unhealthy lifestyle behaviours, particularly poor dietary practices, physical inactivity and smoking are major risk factors for conditions like overweight and obesity. Obesity has been identified as a major risk factor for some NCDs. NCDs consequently not only lead to reduced quality of life given their protracted nature, but they also lead to premature deaths. It is against the backdrop of the increasing prevalence of these lifestyle diseases amongst the youth in sub-Saharan Africa that the present study is conducted.

This study examined the relationship between lifestyle behaviours and body mass index (BMI) among Ghanaian youth aged 15 to 34 years. The study used the data from the 2008 Ghana Demographic and Health Survey and applied a purposive sampling technique to eight focus group discussions. Both descriptive and analytical statistical techniques such as domain analysis and regression analyses were employed for the quantitative component of the data, while thematic analysis was used to analyse the qualitative data.

The analysis identified various socio-demographic characteristics associated with dietary behaviour (fruit and vegetable consumption), health risk behaviour (smoking and alcohol use), physical activity, hours of rest and water consumption amongst male and female youth. Results however showed no support for the relationship between total lifestyle (poor, good and very good lifestyle) and BMI of female youth. However, an obesity prevalence rate of 7.77% indicates a risk for NCDs in female youth. Further, varied perceptions regarding body sizes in the Ghanaian context were observed and the youth were noted to form perceptions about lifestyle behaviours, which influence the choices they make as well as the barriers they perceive to be preventing them from practicing healthy lifestyle behaviours.

The fact that socio-demographic factors impact the lifestyles of the youth suggests that policies and programmes that seek to promote healthy lifestyles should aim to reduce the risk of NCDs by considering these differential factors between males and females.

The presence of obesity is a risk factor for NCDs among the youth and requires intense policies to reduce this risk. Additionally, contextual factors perceived to be related to BMI and lifestyle behaviours need to be addressed in order to reduce the risk of NCDs among the youth.

Keywords: Lifestyles, BMI, Youth, Perceptions, Ghana

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APARQ	Adolescent Physical Activity and Recall Questionnaire
BMI	Body Mass Index
BSE	Breast Self-Examination
FGDs	Focus Group Discussions
GDHS	Ghana Demographic and Health Survey
HBM	Health Belief Model
WHO	World Health Organisation
IRR	Incidence Risk Ratio
IPAQ	International Physical Activity Questionnaire
MS	Mean Sum of Squares
MOH	Ministry Of Health
NHANES	National Health and Nutrition Examination Survey
NCDs	Non-Communicable Diseases
NIDs	Non-Infectious Diseases
PHC	Population and Housing Census
RHNP	Regenerative Health and Nutrition Programme
RRR	Relative Risk Ratio
SWHS	Shanghai Women's Health Survey
SD	Standard Deviation
SSA	Sub-Saharan Africa
SS	Sum of Squares
TB	Tuberculosis

CHAPTER 1

INTRODUCTION

1.1 Background

The epidemiological transition theory describes the changing patterns of population distributions in relation to changing patterns of mortality, fertility, life expectancy, and leading causes of death (Omran, 1971). The theory posits five propositions that:

(1) mortality is an elemental factor in population dynamics;

(2) a long-term shift occurs in mortality and disease patterns whereby pandemics of infection are gradually displaced by degenerative and man-made diseases as the main form of morbidity and primary cause of death;

(3) the most profound changes in health and disease patterns are found among children and young women;

(4) the shifts in health and disease patterns are closely associated with the demographic and socioeconomic transitions that constitute the modernization complex; and

(5) the peculiar variations noted in the pattern, pace, determinants and the consequences of population change would differentiate the three basic models of the epidemiologic transition: the classical or Western model, the accelerated model and the contemporary or delayed model.

Like any developing country, Ghana is undergoing socioeconomic transition and is experiencing increases in life expectancy, improvement in hygiene as well as changing lifestyles due to the increasing number of middle class citizens because of the socioeconomic transition. Additionally, it is also experiencing a combination of infectious and non-infectious diseases. The present study therefore is positioned in the second proposition and situated within the third stage. According to this second proposition, a general shift is expected in the pattern of disease and mortality from primarily infectious diseases to what have come to be called “chronic” diseases.

From the late 19th and 20th centuries, society has been noted to have moved to the third stage of the second proposition, termed the Age of Degenerative and Man-made Diseases (Orman, 1971). In this phase it has been observed that infectious diseases pandemics would be replaced as major causes of death by degenerative

diseases. Specifically, infectious agents as the major contributor to morbidity and mortality would be overtaken by anthropogenic (man-made) causes. Thus, deaths attributable to infectious diseases decline and deaths from chronic and degenerative diseases increase as a result of the new environmental hazards associated with industrial development and the increase in living in urban areas. However, it is noted that this shift from communicable to non-communicable diseases has completed its cycle in the developed countries, while the process has just begun in developing counties (WHO, 2005; Lopez et al., 2006; Anderson & Chu, 2007; Daar et al., 2007; Hemingway, 2013).

According to the World Health Organization (WHO) (WHO, 2009), there has been a shift in the major causes of death from infectious to modifiable non-communicable diseases (NCDs). Non-communicable diseases are conditions which include cardiovascular diseases, stroke, diabetes, chronic respiratory disease and cancer. According to scholars, non-communicable diseases usually emerge in middle age after a long exposure to such unhealthy lifestyle behaviours as the use of tobacco and alcohol, a lack of regular physical activity, and consumption of diets rich in saturated fats, sugars, and salt (e.g. Chitson, 1994; Steyn & Damasceno, 2006). However, in recent years, studies have observed the prevalence of these diseases amongst the youth in sub-Saharan Africa (Steyn & Damascena, 2006; Patton et al., 2009). Obesity, which refers to the accumulation of excessive fat and hence impairs health, has been identified as a risk factor for NCDs such as hypertension, type 2 diabetes and some forms of cancers. Statistics from WHO show the growing prevalence of obesity, while under-nutrition has persisted in some sub-Saharan African (SSA) countries. For instance, according to the WHO (‘AFRICA’, n.d.) in Madagascar in 1992, just 1.6% of children were overweight however, by 2004, this proportion had increased to 6.2%; the rate of overweight and obese women also doubled between 1997 and 2004 to 8.1% overall. Gupta, Goel, Shah, & Misra (2012) found the prevalence of obesity and overweight among pre-school aged children to be 6% in West Africa, 7% in Eastern Africa, 9% in Central Africa, and 8% in Southern Africa. Northern Africa has been reported to have the highest rates with one in six pre-school aged children being overweight or obese. According to the WHO Global InfoBase, in SSA countries, the prevalence of overweight in men was 15% in the United Republic of Tanzania and 17% in the Sudan. Similarly, the prevalence of

overweight women was reported to be 22% in both Kenya and Uganda, 27% in the United Republic of Tanzania and about 29% in the Sudan. Manyanga, El-Sayed, Doku, & Randall (2014) estimated overweight and obesity amongst adolescents aged 11–17 years in Egypt to be 31.4% and 9.3% respectively. In South Africa, the rate of obesity stands at 29% among men and 56% among women.

In many developing countries, research and investment in health have been devoted mainly to infectious diseases, despite the growing need to address non-infectious diseases (NID's) (WHO, 2005). As far as Ghana is concerned, NIDs such as stroke, hypertension, type 2 diabetes and other cardiovascular diseases are on the increase and are now among the top ten in-patient causes of death in the country (Bosu, 2007). About 86,200 NCD deaths are reported to occur during 2008 in Ghana (WHO Global status report on non communicable diseases 2010', n.d.) and obesity has been noted to be a risk factor for these chronic non-communicable diseases. The work by Amoah (2003) in urban and rural Accra in Ghana showed that the overall crude prevalence of overweight and obesity was 23.4% and 14.1% respectively among adults aged 25 years and older. Agyemang, Bruijnzeels, & Owusu-Dabo (2005) noted that obesity levels in Ghana increased by 2.5 fold between 1993 and 2003. Furthermore, results from the Ghana Demographic and Health Survey 2003 (Ghana Statistical Service, Noguchi Memorial Institute for Medical Research, & ORC Macro, 2004), reported that the Greater Accra Region had the highest obesity prevalence rates at 45.3%. Based on the national female obesity prevalence peaked at 9.3% in 2008, in the percentage global prevalence of adult obesity country rankings, Ghana is rated 100 out of 142 countries based on the national female obesity prevalence peaked at 9.3% in 2008 (International Association for the Study of Obesity, 2012).

The growing incidence of lifestyle diseases in Ghana has been attributed to the decreasing consumption patterns of traditional, local food products such as vegetables, fruits, legumes, roots and tubers (Ministry of Health, 2007; WHO, 2015). At the same time, processed foods that are energy-dense, high in salt, refined carbohydrates and saturated fats are being imported and consumed at excessive rates (WHO, 2015). Moreover, in SSA countries according to Steyn and Damasceno (2006), traditional practices such as walking long distances, and habitual physical labour have been replaced by motorized transport and sedentary activities, especially,

in urban settings. Other risk factors that have been identified as contributing to the increasing burden of NCDs include smoking, alcohol use, and physical inactivity. WHO (2005) and Campbell & Campbell (2007) have noted that NCDs not only lead to reduced quality of life given their protracted nature, but they also lead to premature deaths.

1.2 The Context of the Study

Lifestyle behaviours, which refer to personal choices such as diets, drinking of alcoholic beverages, use of tobacco and other substances and physical activity that influence health, are reported to be the main causes of obesity. Obesity has been noted to be difficult and expensive to treat (NIH Technology Assessment Conference Panel, 1993) and associated with numerous co-morbidities. Additionally, NCDs result from cumulative practices of unhealthy lifestyles over time. With an expanding ageing population, it is important for all persons especially, the youth, to engage in healthy lifestyle practices in order to lessen such negative health outcomes as they age. For instance, the Mediterranean diet, which contains plenty of fruit and vegetables, legumes, unsaturated fatty acids and fish, has been linked to lower risks of Alzheimer's disease. Such practices will have the effect of reducing the burden on the already over-stretched health facilities and health professionals especially in the developing countries (Scarmeas Stern, Tang, Mayeux, & Luchsinger, 2006).

According to Wister (2003), national, provincial, and local health strategies have adopted a population-health perspective that positions healthy lifestyle and the reduction of risky behaviours (e.g. smoking and alcohol use) at the heart of many policies and programmes. Because of the fact that lifestyles are the product of life choices accumulating over a person's life, and can have some serious, albeit unintended, consequences for persons especially in their old age, it is crucial to deal with lifestyle behaviours amongst the youth before it becomes too late for them. One identifiable means to tackle the menace is to provide reliable evidence that would facilitate intervention.

In Ghana, a few attempts have been made to combat non-communicable diseases. One such attempt was the development of a lymphoma centre in the mid-1960s, a national cancer registry in the early 1970s and the NCD Control Programme in the 1970s (Bosu, 2007). Other recent establishments include the chronic disease public services, including the Ghana Heart Foundation in 1992, the Ghana Diabetes

Association and two diabetes centres (one in Accra the capital city and one in Kumasi, the second largest city). However, the programmes are based mainly in the south of the country, and are often staffed by health workers who are not trained in chronic disease prevention and care (Atobrah, 2010; Kratzer, 2012). Moreover, it is significant to note that some of these initiatives have faced a number of political and procedural challenges and as a consequence, have not make a significant impact on NCD rates (Bosu, 2007).

Recognising the burden of NCDs and the fact that lifestyles contributing to obesity are changeable, the WHO (2004) upon the request of member states, developed a global strategy on diet, physical activity and health. Due to the WHO global strategy, a Regenerative Health and Nutrition Programme (RHNP) was developed by the Ministry of Health (MOH) in the country, which included a number of health-promoting activities and took a public health approach to treating and preventing chronic disease (Ghana Ministry of Health, 2007).

1.2.1 Overview of the Regenerative Health and Nutrition Programme in Ghana

In 2005, the MOH as part of its new paradigm for health promotion and its maintenance in Ghana adopted the RHNP (MOH, 2008). The main aim of this programme was to prevent ill-health. This initiative by the Ministry has been inspired by the principles and practices as implemented for almost four decades by the entire community of African Hebrew Israelites, in the "Village of Peace" in the southern Israeli town of Dimona. Hence, it is known as the "Dimona model". The model is a comprehensive social structure of a way of life that has been developed and practiced by these African-Hebrew Israelites. After almost 50 years of living the Dimona model, it has produced measurable results for both genders of all ages within the community. Most practices listed in the model have been inspired by past traditional African practices and therefore making the village of peace a modern African village.

The Dimona model advocates for the use of organic, non-processed foods wherever and whenever possible, with emphasis on the consumption of lots of vegetables, fruits, whole grains, nuts, seeds and natural food supplements. This dietary lifestyle, combined with regular physical exercise, taking in adequate amounts of potable or clean water, sufficient rest, and attention to personal and environmental sanitation, form the basis for the eradication of both common communicable and non-communicable diseases of today.

In order to implement the RHNP the MOH produced a manual to that effect. The health aspects of the manual were founded upon a simple, yet profound holistic platform. That is, humankind could enjoy long and healthy life spans if they paid attention to a total lifestyle and especially two aspects of it. The first is whatever we eat and drink and secondly, our respective levels of regular physical activity. It postulated then that, in reality, good health begins in the home, not in the hospital or clinic (MOH, 2008). The programme also advocated increasing levels of physical activity, proper rest to reduce emotional stress, and maintaining personal and environmental cleanliness.

The manual focuses on three modules:

(1) water and nutrition,
(2) mother and child health; and
(3) healthy lifestyles.

The healthy lifestyle component comprises of healthy diet, exercise, drinking water, rest and hygiene (MOH, 2008). These were then used to prepare regenerative health and nutrition standardized health messages for the purpose of health advocacy. These messages are: fruits and vegetables are medicine, exercise is medicine, rest is medicine, water is medicine and cleanliness is medicine. Also inclusive in the manual are information on different groups of the population (pregnant women, babies, the elderly etc.) and their nutrient requirements based on the various local Ghanaian foods.

The programme was piloted in 10 districts within seven regions (Greater Accra, Eastern, Volta, Central, Northern, Upper East and Upper West) in 2006 to promote the reduced consumption of alcohol and fatty foods, adequate exercise and increased intake of vegetables and fruits.

The RHNP feeds into the global initiative proposed by the WHO (2004) to address the increasing burden of NCD and obesity through healthy lifestyle. A series of questions on fruit and vegetable intake, physical exercise, rest, water consumption, smoking and alcohol intake were asked of respondents in the GDHS 2008 to examine the extent to which the youth are practicing these lifestyles.

1.3 Statement of the problem

There is a global epidemic of obesity in all age groups in both developed and developing countries. The global number of obese adults increased to over 600

million in 2014 (WHO, 2016), while it was estimated that over 115 million people in the developing countries suffer from obesity-related problems (WHO, 2008). In terms of health effects, several studies have found that children and adolescents who are obese are likely to be obese as adults (Guo & Chumlea, 1999; Freedman et al., 2005; Freedman Dietz, Srinivasan, & Berenson, 2009 and Freedman, Khan, Serdula, Srinivasan, & Berenson, 2001).

Thus, obese children and adolescents are said to be more at risk for adult health related problems such as heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis. Moreover, the inability to prevent obesity among the youth could decrease the quality of life of those affected in adulthood and significantly increase morbidity and mortality through the increase in NCDs and also increase the burden on health systems.

The review of literature shows that there has been a myriad of studies concerned about lifestyle behaviours. While this growing body of knowledge on lifestyle behaviours has explored modifiable determinants of excess weight gain in general populations and to a lesser extent, in children, other important age groups have been understudied, especially, the youth. Nelson, Story, Larson, Neumark-Sztainer, & Lytle (2008) noted this situation is rather unfortunate because even though once considered to be an age of optimal health and well-being, the transition from adolescence to young adulthood is gaining recognition as an important period for health promotion and disease prevention. Not only is the presence of obesity and unhealthy lifestyle characteristics at this life stage associated with increased chronic disease risk, it may also be a critical period during which young people establish independence and adopt lasting health behaviour patterns (Kvaavik, Tell, & Klepp, 2003).

According to Minicuci et al., (2014), about 10% of Ghanaian adults are obese. Yet, the extant literature on the country shows that studies of the relationship between lifestyle behaviours and Body Mass Index (BMI) on persons age 15–34 are scanty. As a result of this gap in research on the lifestyles of the youth, there is little understanding of how the lifestyle behaviours of the youth in the country affect such health-related problems as BMI. It is against this backdrop of the paucity of data on the relationship between the lifestyles of the youth and BMI in Ghana that the present study is undertaken. Specifically, the aim of the present study is to examine the

relationship between the practice of lifestyle behaviours and BMI among young people in Ghana.

1.4 Study's Objectives

The main aim of this study is to examine the practice of lifestyle behaviours and how this influences the BMI status of Ghanaian youths.

Specifically, the present study seeks to achieve the following objectives:

i. To estimate the prevalence of obesity among youths aged 15–34 years.

ii. To examine the relationship between selected socio-demographic factors and lifestyle behaviours.

iii. To examine the relationship between lifestyle behaviours and BMI status.

iv. To explore perceptions regarding lifestyles and BMI among the youth.

1.5 Justification/Rationale for the study

The RHNP of the MOH in Ghana sought to increase the intake of fruits and vegetables, regular physical activity, encourage sufficient rest, drinking adequate water among others with the aim of preventing obesity among the population and thereby reducing the risk to NCDs. However, most studies on Ghana in terms of lifestyles have focused mostly on the general population and children in some instances (Tampah-Naah & Amoah, 2015; Amo-Adjei & Kumi-Kyereme, 2014; Doku, Darteh & Kumi-Kyereme, 2013; Tagoe & Dake, 2011; Peltzer & Pengpid, 2011), whilst few others addressed the relationship between lifestyles and BMI (e.g. Peltzer & Pengpid, 2011).

Amo-Adjei & Kumi-Kyereme's (2014) study also used a nationally representative data like the present study to investigate fruit and vegetable consumption; however their focus was on a much broader population and addressed only fruit and vegetable intake compared to the other aspects considered in the present study. Tampah-Naah & Amoah (2015) and Doku, Darteh, & Kumi-Kyereme (2013) employed a nationally representative data and addressed alcohol use in women and smoking among males respectively in a more general population. In contrast, this study focused on both smoking and alcohol use in male and female youth. Additionally, Tagoe & Dake (2011) used data from two nationally representative data

to study fruit and vegetable intake, alcohol use, smoking and physical activity among a much more general population compared to the present study that focuses on youth. Peltzer & Pengpid (2011) did a study on BMI in Uganda and Ghana, however their study sample was limited to adolescents in school.

Thus, while knowledge on lifestyles among the population is widely known, studies on youths are quite sparse, a situation which underscores the need to focus on youths since at this stage in their lives the youth are still acquiring and shaping habits. Consequently, a study that examines how the practice of lifestyle behaviours influence the BMI status of youths would provide knowledge regarding this relationship as a basis for promoting the practice of healthy lifestyle behaviours to reduce their risk of obesity and consequently the risk of NCDs to ensure aging into a healthy lifestyle.

1.6 Organisation of the study

This study is divided into seven chapters. This first chapter provides the introduction. Chapter two discusses the literature review and conceptual framework. Chapter three comprises the study's methodology (a description of the study area, sources of the data, and methods of data analysis). Chapter four consists of statistical analyses of the socio-demographic factors affecting lifestyle behaviours of the youth in Ghana. Chapter five looks at the estimated prevalence of obesity among the youth and also examine the relationship between the lifestyle behaviours and BMI status. Chapter six discusses perceptions regarding the lifestyle behaviours and BMI, while Chapter seven discusses the summary of findings, conclusions and recommendations.

CHAPTER 2

REVIEW OF THE LITERATURE AND THE THEORETICAL FRAMEWORK

2.1 Introduction

In recent decades, many studies have been carried out in various contexts around the world that look at the relationship between socio-demographic characteristics and lifestyle behaviours and BMI. This chapter is divided into three sections. The first section reviews literatures that show the relationship between the selected socio-demographic variables on one hand and lifestyle behaviours or BMI on the other. The second discusses the relationships between lifestyles and BMI, while the third section discusses the theoretical and conceptual framework of the study.

The literature review was conducted by use of data bases such as Google Scholar, science Direct and JSTOR with focus on studies not more than five (5) years i.e. from 2011 to 2015. The references for some of these studies provided avenue to access other studies. Additionally, there was a subscription to BioMed Central for email alert with regards to current studies.

2.2 Socio-demographic Predictors of Lifestyle Behaviours and BMI

2.2.1 Age

Age of individuals determine their actions and inactions for example when an individual leaves school or enters employment among others (Kpedekpo, 1982). This is evidenced by the fact that age has been shown to be associated with lifestyle behaviours and BMI status, although the findings about the relationship have not been consistent. While some studies have observed a negative relationship between age and fruit and vegetable intake, other studies have found a positive association between age and fruit and vegetable consumption. Yet other studies have found no relationship at all between age and fruit and vegetable consumption. For instance Azagba & Sharaf (2011) found a negative relationship between age and consumption of fruit and vegetables among Canadians aged 18–69 years. As age increased, the consumption of fruits and vegetables declined among the respondents. Those aged 30–59 years were found to consume less fruits and vegetables than those aged 18–29 years. This was confirmed in a study with aged Chinese, where inadequate fruit and vegetable intake was reported to increase with increasing age (Li et al., 2012). On the other hand,

positive association between age and fruit and vegetable consumption was reported in a study by Yen, Tan & Nayga Jr. (2011) among 25–64 years Malaysians. They identified all other age groups to consume more fruits and vegetables than those in the age group of 25–31 years. In other words, there was an increment in fruit and vegetable intake as age increased. Also, Dehghan, Akhtar-Danesh, & Merchant (2011) with 18–64 years Canadians using the Community Health Survey, Cycle 3.1 found increasing age to be associated with the intake of fruits and vegetables. A study by Yen & Tan (2012) revealed that older respondents took in more fruits than the young. Abe et al., (2013) found among 18–60+ adults in the former Soviet Union that increasing age was associated with increase in fruit and vegetable consumption. Grosso et al., (2014) found older Italians (50–60+) to consume more fruits and vegetables in comparison with those under 35 year old. In Ghana, Amo-Adjei & Kumi-Kyereme (2014) found that among Ghanaians aged 15–59 years there was increase in fruit and vegetable consumption as age increased. Yet, other studies have found no relationship between age and consumption of fruit and vegetables. El Rhazi et al., (2012) failed to find any significant association between age and fruit and vegetable intake among Moroccans aged 18–50+. In view of the fact that youths 25–34 years are likely to be more concerned about their health status, in this study youth aged 25–34 are expected to consume more fruits and vegetables than their counterparts aged 15–24.

Besides lifestyle behaviours such as the consumption of fruit and vegetables, many studies have observed age to be associated with health risk behaviours such as smoking and alcohol consumption. But like the literature on the relationship between age and lifestyle behaviours the findings about the relationship between age and health risk behaviours are at best mixed. For example, many studies have found positive relationship between age and health risk behaviours. Manimunda et al., (2012) found increasing age to be associated with smoking among Indians aged 14–60+ years using a cross-sectional representative sample. Also, Mamudu, John, Veeranki, & Ouma (2013) using data from the Madagascar Demographic and Health Survey 2005–2010 observed that as respondents aged they smoked more. Likewise, Khanal, Adhikari, & Karki (2013) in Nepalese men aged 15–59 years found a positive relationship between age and smoking; males aged 36–49 years were found to smoke than those aged 15–24 years. In Ghana, Doku et al., (2013a) found older men (25–59

years) smoked more than younger men (15–24 years) using data from the Demographic and Health Survey 2003-2008. Moreover, Seo, Torabi, Kim, Lee, & Choe (2013) observed that older persons smoked more using a representative sample of college students from 21 institutions in six East Asian economies. Furthermore, using a nationally representative data, Singh & Ladusingh (2014) found among Indians 15–65+ observed a higher likelihood for smoking among males 25–44 years than for those aged 15–24 years. Lakew & Haile (2015) in a study among Ethiopians found the probability of smoking to increase as age increased. Specifically, respondents 20–24 years, 25–29 years, 30–34 years, 40–44 years and 45–49 had higher odds of smoking compared to those aged 15–19 years. Berg et al., (2015) found the older age group to be more likely to be associated with smoking than the younger age groups in their study among Indians and Pakistanis using representative surveys. Also, among Ghanaian females aged 15–49 years, Tampah-Naah & Amoah (2015) found that those aged 45–49 years were more likely to consume alcohol compared to those aged 15–19 years.

However, other studies have found a negative relationship between age and health risk behaviours. A study by Singh & Ladusingh (2014) among Indians 15–65+ observed a higher likelihood for smoking among males 25–44 years than for those aged 15–24 years, while among females they found a higher likelihood for smoking was observed for those aged 15–24 years. Also, Lee, Ko, & Park (2013) found that amongst Koreans aged 20–49, younger aged women (20–29) smoked and drank alcohol more than those aged 40–49 years. In this study youths 15–24 years are expected to report health risk behaviour than youth 25–34 years because, younger age youths (15–24) are likely to perceive themselves immune to the health effects of health risk behaviours.

Age has similarly been observed to be associated with physical activity across different contexts, but again the results have been inconclusive at best. Some studies have shown that age is positively associated with physical activity. For example, Biernat & Tomaszewski (2015) in a survey which used a shorter version of International Physical Activity Questionnaire (IPAQ) among working individuals aged 20–69 years in Warsaw, Poland, found that the elderly belonged to the category of sufficient physical activity than the younger respondents (20–30 years). Similarly, Seabra, Mendonça, Thomis, Malina, & Maia (2011) using a psychometrically

validated questionnaire in a across-sectional survey among 10–18 year old Portuguese adolescents revealed increasing physical activity uptake as respondents aged.

However, Pengpid et al., (2015) in their study among university students aged 16–30 years in twenty-three (23) low-middle-and high income countries using IPAQ found that older persons aged 22–30 years engaged in less physical activity compared to younger persons aged 16–21 years. Also, using data from six randomly selected wards of the Jhaukhel-Duwakot Health Demographic Surveillance Site in Nepal, with the aid of IPAQ, a decline in physical activity was reported as individuals aged. Wallmann-Sperlich & Froboese (2014) using a wide cross-sectional national data among the Germans aged 18–65 years, showed that older persons reported less physical activity than younger respondents. a cross-sectional study in Abuja, Nigeria less physical activity was reported among older individuals (<30 to ≥50) than younger age respondents (<30) (Akarolo-Anthony & Adebamowo, 2014). Yet other studies have found no association between age and physical activity. For example, Adegoke & Oyeyemi (2011) in a cross-sectional survey among 16–39 year old Nigerian University students indicates no association between age and physical activity of respondents. Shokrvash et al., (2013) used a modified version of the Adolescent Physical Activity and Recall Questionnaire (APARQ) in a school-based cross-sectional study in Tabriz, Iran on adolescents aged 12 years and 14+ years. They found no relationship between age and physical activity. Moreover, Oyeyemi, Oyeyemi, Jidda, & Babagana (2013) studied Nigerians aged 20–82 years living in the Maiduguri Metropolis in a cross-sectional survey and found no association between age of respondents and physical activity. Also, using a cross-sectional data of nurses in Riyadh, Saudi Arabia (<30 to >50) no association was observed between age and physical activity. In view that youth 25–34 are likely to be concerned about physical activity and its health benefits, in this study youths 25–34 years are expected to report more physical activity than their counterparts 15–24 years.

The numbers of hour's people spend resting or sleeping has been shown to be influenced by age. In a representative cross-sectional data on school children aged 12–17 years in Quebec, Canada, no relationship was observed between age and hours of sleep (Laberge, Ledoux, Auclair & Gaudreault, 2014). Ryu, Kim, & Han (2011) used data from community health surveys on adults 19–44 years in Gwangju

Metropolitan City, Korea and observed short (≤ 6) hours of sleep among older respondents.

Similarly, Kachikis & Breitkopf (2012) in a cross-sectional survey of women 18–55 years in Southeast Texas categorised sleep duration as ≤ 6hrs (short sleep), 7–8hrs (normal/average), ≥9 hours (long sleep). They found that advanced age was associated with short sleep duration. Also, Yoon et al., (2015) among Koreans (40–69 years) used the Health Examinees Study and found older age associated with short and longer hours of sleep than normal hours of sleep (6–7 hrs). Whinnery, Jackson, Rattanaumpawan, & Grandner (2014) applied a nationally representative data on respondents aged 18 to ≥80 years. They identified longer hours of sleep with older age (≥80) than younger age (18–64). Because of household chores and other responsibilities, in the present study it is hypothesised that respondents aged 25–34 years will be less likely to have adequate rest than respondents aged 15–24 years.

Many studies have documented the relationship between age and water intake. According to a study in the U.S. by Park, Blanck, Sherry, Brener, & O'Toole (2012), found that persons aged 15 years or younger drank less water. Goodman et al., (2013), using a nationally representative data in the United States also found that respondents aged 18–34 years drank more water compared to those aged 55 or older. Also, Drewnowski, Rehm, & Constant (2013) obtained data from the National Health and Nutrition Examination Survey (NHANES) (2005–2010) and found older adults (≥71) to consume lesser amount of water compared to younger persons (20–50 years). Because individuals 25–34 may be more health conscious, in the present study they are expected to consume more water than those within 15–24 years.

Age of an individual has been associated with BMI status. Some studies have observed older age related to overweight/obesity among older respondents. In a study by Biritwum, Gyapong, & Mensah (2005) in Ghana amongst persons aged 18–64 years, the authors found the prevalence of obesity to increase by age up to 60 years. According to Iannotti & Wang (2013), using quadrennial surveys among U.S adolescents 11–16 years, with regards to age, BMI were found to be higher in older adolescents than the younger ones. Berg et al., (2014) observed that older females were more likely to be overweight or obese, similarly Musaiger, Al-Roomi, & Bader (2014) in a cross-sectional study among secondary school students (15–18 years) in an Arab Gulf country showed that as age increased the prevalence of obesity also

increased among respondents. Di Milia, Vandelanotte, & Duncan (2013) among Australian adults in three cities in central Queensland found an association between increasing age, obesity and overweight of respondents. Letamo (2011) in a cross-sectional survey amongst aged 20–49 years in Botswana found an increasing BMI as age increased. Also, Al Nsour, Al Kayyali & Naffa (2013) with data from the Jordan Population and Family Health Survey reported respondents 35+ to be more obese. Some studies have also observed lower BMI amongst older aged respondents. Rivas-Marino et al., (2015) in a study in Mexico observed a lower mean BMI for respondents 80 years or older and a higher mean BMI for those 50–59 years. Similarly, Garza et al., (2011) observed lower odds of overweight or obesity with older age (15–19 years) than younger age (10–14 years).

However, in a cross-sectional survey of university students in Ghana (18–36 years), age was found not significant in determining BMI status (Mogre, Nyaba, Aleyira, & Sam, 2015). Because, youths 25–34 years are expected to be concerned with their physical appearance, thus it is hypothesized in the present study that those 25–34 years will be less likely to be obese than those 15–24 years.

2.2.2 Education

Many studies have found a positive association between education and fruit and vegetable consumption (Amo-Adjei & Kumi-Kyereme, 2014; Azagba & Sharaf, 2011; Dehghan et al., 2011; Grosso et al., 2014; Hong, Kim & Kim, 2012; Yen & Tan, 2012; Yen, Tan & Feisul, 2015; Yen et al., 2011). However, Abe et al., (2013) reported increasing intake of fruits and vegetables in individuals with a lower level of education, while Rieth, Moreira, Fuchs, Moreira, & Fuchs (2012) found no association between education and consumption of fruits and vegetables. In view of the fact that education is likely to inform individuals about the health benefits of eating fruits and vegetables, in this study we expect educated respondents to consume more fruits and vegetables than their counterparts with no education.

Many studies have observed associations between educational attainment and health risk behaviours (smoking and alcohol use). For example, some studies have found a negative association between education and cigarette smoking (Berg et al., 2015; Doku et al., 2013a; Mamudu et al., 2013; Manimunda et al., 2012; Singh & Ladusingh, 2014; Sreeramareddy, Pradhan, Mir & Sin, 2014). Formal education is expected to provide a protective means to individuals by means of health education.

Thus, in the current study, respondents who have attained no formal education are expected to smoke and use alcohol more than their counterparts with higher education.

The evidence about the relationship between education and physical activity appears to be inconsistent at best. For example, some studies have found no relationship between the two variables (Almajwal, 2015; Oyeyemi et al., 2013; Teh et al., 2014). However, other studies have found a negative relationship between education and physical activity (Vaidya & Krettek, 2014; Wallmann-Sperlich & Froboese, 2014), while still other studies have found a positive association between education and physical activity (Win et al., 2015). Because education is expected to provide knowledge on benefits of physical activity, in the present study, respondents with higher educational level are expected to report more physical activity than those with no formal education.

The relationship between education and rest/sleep has been reported in different contexts. A study by Kachikis & Breitkopf (2012) among Southeast Texas women, observed education to determine sleep duration, as individuals with higher education reports less duration of sleep. Tu et al., (2012) using the Shanghai Women's Health Study (SWHS) revealed an inverse association between education and hours of sleep. In that, individuals who had attained middle, high, college or above level of education, reported both short and long sleep duration compared to those with elementary education or less. On the other hand, Lallukka et al., (2012), Whinnery et al., (2014) and Yoon et al., (2015) found individuals with low education to report either less (short or very short) or more/long duration of sleep than respondents with higher educational level. Since level of education corresponds with type of job and consequently influences hours of rest, in the present study respondents with higher education are expected to report less hours of sleep than their counterparts with no education.

As far as the relationship between education and BMI is concerned, some studies have observed a positive association between education and BMI (Biritwum et al., 2005; Letamo, 2011; Memish et al., 2014) On the other hand, other studies have found a negative relationship between education and BMI (Atella & Kopinska, 2014; Al-Haqwi et al., 2015; Bharmal et al., 2013), while still others have found no relationship between education and BMI (Al Nsour et al., 2013; Guerra, Stringhini,

Vollenweider, Waeber, & Marques-Vidal, 2015). Because education is expected to provide knowledge on the health benefits of normal weight, respondents with higher education are expected to have normal weight compared to their counterparts with no formal education.

2.2.3 Religion

Religion affects the lifestyles of people through the various doctrines, teachings, proscriptions and prescriptions of different religious faiths. Despite the fact that religion affects behaviours of followers, some studies have not found any association between religion and the consumption of fruits and vegetables (Chopra et al., 2012; Peltzer & Phaswana-Mafuya, 2012; Sharma, Grover, & Chaturvedi, 2011). On the other hand, other studies have found religion to be a predictor of fruit and vegetable consumption (Amo-Adjei & Kumi-Kyereme, 2014; McAloney et al., 2012). As most Christian platforms are used to promote healthy dietary behaviour, this study hypothesizes that Christian youth will consume more fruits and vegetables than traditionalist/spiritualists youth. On the other hand, as the Muslim Ramadan consists of fruit usage mostly to break fast they are expected to consume more fruits and vegetables compared to Christians.

Health risk behaviours of individuals are expected to be moderated by doctrines of their religious groups. However, some conform and others do not. According to Hodge, Marsiglia, & Nieri (2011) among Latinos in North West of America, youths who professed a religion were more likely to use substances than those who did not profess to any religion. Mamudu et al., (2013) in Madagascar found that male Muslims, Traditionalists and Other religionist were less likely to smoke compared to Christian males. In their study among Ghanaian men (Doku, et al., 2013a) reported an association between religion and smoking. They found that male traditionalists, Muslims and Other religion had lower odds of smoking compared to their Christian counterparts. Among a representative sample of college students 17–24 years sampled from 21 institutions in six East Asian economies, results showed a relationship between religion and smoking in china and South Korea whilst they reported no association between religion and smoking in Hong Kong, Malaysia, Singapore and Taiwan (Seo et al., 2013). Also, Sreeramareddy et al., (2014) found an association between religion and smoking among females in India, Philippines and Cambodia. Similarly, an association was observed between religion and smoking

amongst male respondents in India, Nepal, Cambodia and Timor Leste. Further, Chen (2014) using a national survey of Taiwan, found no association between religion and health risk behaviour (smoking and alcohol intake). In addition, Lakew & Haile (2015) in a study in Ethiopia, found that respondents who belonged to the traditional and Islamic religions smoked more compared to Christians. Because it is a social control mechanism, individuals who belong to a religious body are expected not to indulge in health risk behaviours. Thus, the present study hypothesizes that youth who are Muslims will be less likely to indulge in health risk behaviours than those with no religion. Also, Muslims will be less likely to report health risk behaviours compared to Christians. This is because Christians mostly interpret the Biblical doctrine for their convenience.

Regarding the relationship between religion and physical activity, few studies have been conducted. However, the few studies that have been done have found no association between religion and physical activity (Adegoke & Oyeyemi, 2011; Akarolo-Anthony & Adebamowo, 2014). Christian denominations are noted to organise physical activities to keep members healthy (Anecdotal). Thus in this study, Christian youths are expected to report more physical activity than youths with no religion, Muslims or traditional/spiritualist youth.

To our knowledge, no studies on the relationship between religion and sleep and/or water intake have been done, probably, religion has not been perceived as important in influencing sleep or water intake. In spite of this lack of empirical evidence in regard to the relationship between religion and sleep or water intake, the present study hypothesizes that Christians will have inadequate rest than youths within the other religious groups. This is because Christians pray a lot thus forfeiting sleep. Also, Christians will consume more water than Muslims, traditional/spiritualist or youths in 'Other' religion. Because of continual fasting among Christians they are likely to replace food with water resulting in more water intake among them.

2.2.4 Ethnicity

Ethnic variations have been reported by some authors with regards to the consumption of fruits and vegetables. Yen & Tan (2012) observed that Chinese and India ethnic groups in Malaysia consumed more fruits than those who belonged to the 'Other' ethnic group. In Ghana, Amo-Adjei & Kumi-Kyereme (2014) found vegetable intake higher among Mole-Dagbani respondents than the Akans. In this study it is

hypothesize that Mole-Dagbanis will consume more vegetables and fruits than Ga-Dangme's. It is also hypothesize that youths belonging to the "other" ethnic group will consume more fruits and vegetables than Ga-Dangmes. This is because the staple food of the Mole-Dagbanis and the "other" ethnic group is more inclined towards vegetables and there is availability of wild fruits within their context that requires no purchase thus its consumption may become habitual overtime as against the Da-Dangmes.

In terms of ethnicity and health risk behaviour, few studies have reported this relationship. For instance, Manimunda et al., (2012) found members of the Non-settlers, Ranchi tribes and Pre-42 Social group to have lower odds of smoking compared to settlers in India. Also, Tampah-Naah & Amoah (2015) found that among Ghanaian females aged 15–49 years Ga-Dangme females had higher odds of drinking alcoholic beverages than Akan females. In the current study, it is hypothesize that Ga-Dangme youth will report more health risk behaviours than respondents who belong to the Ewe group. Ga-Dangme youth are expected to consume alcoholic beverages more because of available alcoholic beverages provided at their usually huge traditional ceremonies. Also, Mole-Dagbani youth are expected in the present study to report more health risk behaviours compared to youths who belong to the Ewe ethnic group. This is because Mole-Dagbanis are noted for brewing local alcoholic beverages and thus more likely to consume it.

The evidence regarding the relationship between ethnicity and physical activity is inconclusive. Adegoke & Oyeyemi (2011) observed that respondents who belonged to the Hausa ethnic group were more active physically than those in the other ethnic groups among university students in Nigeria. Also, in Malaysia, Teh et al., (2014) found that among persons aged 16–65 years or more in other ethnic groups were more physically active while the Chinese and Indians were less likely to be physically active than the Malay ethnic group. Further, Vaidya & Krettek (2014) observed less physical activity among the Brahmin, Chhetri, Newar than respondents in the ethnic minorities. However, Win et al., (2015) found no relationship between ethnicity and physical activity. Since Mole-Dagbanis are physically active in terms of their daily work, in the present study, it is hypothesize that Mole-Dagbani youth will be physically active than youths of the other ethnic groups.

In terms of ethnicity and water intake, some studies have not found any association (Drewnowski et al., 2013; Park et al., 2012), however, Goodman et al., (2013) in the US showed a low probability for subjects belonging to "other" ethnic group in drinking adequate amount of water compared to whites. Because of their warmer location, in this study, respondents who are of the "other" ethnic group or Mole-Dagbani group will be more likely to consume water than the other ethnic groups.

Findings regarding ethnicity and hours of rest have shown mixed results. For example, some studies have found no association between ethnicity of respondents and hours of sleep (Kachikis & Breitkopf, 2012; Whinnery et al., 2014). Due to the social activities such as clubbing among others engaged in by Akan and Ga-Dangme youths by virtue of residing in the major cities, in the present study, they will report inadequate hours of rest compared to youths in the other ethnic groups.

Studies have established a relationship between ethnicity and BMI status in various contexts. As far as ethnicity goes, Biritwum, Gyapong & Mensah (2005) in Ghana found that, obesity was highest amongst the Ga-Dangme, Ewes and Akans (14.6%, 6.6% and 6.0% respectively). Iannotti & Wang (2013) in a study of U.S adolescents, found that African-Americans were less likely to be underweight and more likely to be obese than White adolescents. Moreover, adolescents with Hispanic origin were more likely to be overweight or obese compared to Whites. Moreno, Johnson-Shelton, & Boles (2013) in their study among US elementary school children found ethnicity to predict a child's weight. Robles et al., (2014) observed that African American and Hispanic women were more likely than white women to be overweight and obese in LA County in the U.S. Due to their sedentary lifestyle, Ga-Dangme youths are expected in the present study to be obese than youths belonging to the other ethnic groups.

2.2.5 Marital Status

Studies have reported various relationships between marital status and the consumption of fruits and vegetables. In one group of studies, an association between persons who are married and the consumption of fruits and vegetables were reported (Azagba & Sharaf, 2011; El Rhazi et al., 2012; Li et al., 2012), while another group of studies has found no association between marital status and fruit and vegetable consumption (Grosso et al., 2014; Yen & Tan, 2012). In the present study, it is

hypothesize that married/in union youths (males or females) will consume more fruits and vegetables than youths who are single. The married ones have support of each other financially thus enabling the intake of fruits and vegetables affordable to them.

In terms of marital status and health risk behaviour (smoking and alcohol use), Manimunda et al., (2012) in a study in India among persons aged 14–60 and older, observed a higher probability of smoking amongst those formerly married compared to never married individuals. However, no association was observed between married individuals and those who had never married. In a study by Khanal et al., (2013) married males had higher odds of smoking compared to unmarried males. Also, in Madagascar married males were more likely to smoke compared to unmarried males, while no association between marital status and smoking among females was found (Mamudu et al., 2013). Lee et al., (2013) found more smokers and alcohol users to be unmarried than married women in Korea. Further, Sreeramareddy et al., (2014) in using the DHS of several countries, found married men to smoke more except in Bangladesh whilst married women in the Philippines were found to smoke more than those in Indonesia and Maldives. In addition, Lakew & Haile (2015) observed higher odds of smoking for formerly married individuals against the never married. Since marriage is expected to serve as a protection against behaviours such as smoking and alcohol use, in this study, married/in union male or female youth will be expected not to engage in health risk behaviour compared to their never married counterparts.

Regarding marital status and physical activity, Biernat & Tomaszewski (2015) observed inadequate physical activity among married and cohabiting persons compared to those who were single working individuals in Warsaw, Poland. Among Mexican adults 50+, married respondents engaged in more physical activity than respondents of other marital statuses (Rivas-Marino et al., 2015). In the present study, married females will be expected to engage in less physical activity than the single probably due to the extra household chores they engage in. Even though to our knowledge, there are no studies that examine the relationship between marital status and water intake, in this study, it is hypothesize that married/in union youth will consume more water than the singles. Because of healthy lifestyle towards conception, married respondents are more likely to report the intake of water.

Many studies have observed that marital status impacts hours of sleep but the findings are inconsistent. Ryu et al., (2011) from a community health survey reported

long hours of sleep among the divorced or widowed individuals than the married. A study conducted in China using the Shanghai Women's Health Study (SWHS) found short hours of sleep associated with married women than the unmarried (Tu et al., 2012). Also, Lallukka et al., (2012) among Finn adults found <5 hours and 6 hours of sleep among those who were divorced/separated; the never married were reported to have 6 hours and ≥10 hours of sleep whilst those who were widowed had 5 hours of sleep. Additionally, Yoon et al., (2015) in Korea observed short hours of sleep (<6 hours) and long hours of sleep (8–9hrs and ≥10 hours) with those who were single. However, Kachikis & Breitkopf (2012) observed no association between marital status of respondents and duration of sleep. Due to domestic chores coupled with careers, it is hypothesized in the present study that, married youth will be more likely to have inadequate hours of rest than those who are single.

An individual's marital status has been identified as a predictor of BMI status by some studies. In Botswana, Letamo (2011) found high prevalence of overweight and obesity among currently married females compared to those never married. Similarly, Al-Haqwi et al., (2015) identified increasing level of obesity amongst married females in Saudi Arabia. Also, Memish et al., (2014) observed higher odds of obesity among formerly married females than the currently married females. Furthermore, compared to married men, males living with a partner, widow/widower, or never married were less likely to be obese. Whilst amongst female respondents all other categories were less likely to be obese compared to those who were married in South Africa (Sartorius, Veerman, Manyema, Chola & Hofman, 2015). In this study, it is hypothesize that married/in union females will be obese than females who are single or formerly married. This is because, married females spend much time preparing food and consuming much when pregnant and these may contribute to their weight gain.

2.2.6 Place of Residence

An individual's place of residence has been identified as a risk or protective factor in terms of many health issues. Some studies found association between urban dwelling and increasing intake of fruits and vegetables (Abe et al., 2013; El Rhazi et al., 2012), while a negative association between urban dwelling and fruit and vegetable consumption has been found by Grosso et al., (2013). And still other studies have found no association between residence and the consumption of fruits and

vegetables (Hoffmann, Bryl, Marcinkowski, Rzesos, & Wojtyla, 2012; Peltzer & Phaswana-Mafuya, 2012). It is hypothesized in the present study that youth resident in urban areas will consume more fruits and vegetables as against youths in the rural areas. This is because, majority of fruits and vegetables produced in the rural areas and those imported into the country end up in the urban areas.

Place of residence has been found to be associated with health risk behaviours. Peer, Bradshaw, Laubscher, Steyn, & Steyn (2013) observed that in South Africa youths in urban areas smoked and drank more than their counterparts in rural areas. Also, Mamudu et al., (2013) found that males resident in urban centres compared to the rural centres smoked more while no relationship was observed between residence and smoking for females. In a study conducted among Indians, Singh & Ladusingh (2014) found that respondents in rural areas were more likely to smoke compared to their urban counterparts. Moreover, Sreeramareddy et al., (2014) in their study among several countries, revealed that male respondents in rural areas smoked more than urban dwellers while females in the rural areas of Nepal and Cambodia were found to smoke more. In this study, it is hypothesize that youth in rural areas will engage in health risk behaviours than urban dwellers. Because of the high school dropout and unemployment characterising rural areas, youths take to such behaviours.

The results of the relationship between residence and physical activity are inconsistent. While a study has found that women in urban areas engage less in physical activity (Najdi et al., 2011), Teh et al., (2014) found no relationship between place of residence and physical activity in women; rural men engaged in more physical activity than their urban counterparts. Also, Wallmann-Sperlich & Froboese (2014) found no association between place of residence and physical activity among the Germans. In the present study it is hypothesize that youth resident in urban areas will report more physical activity compared to those resident in rural areas because of the relative availability of avenues for physical activities and the awareness among urban dwellers.

To our knowledge, only one study has been done on the association between place of residence and hours of sleep (Lallukka et al., 2012). They found that rural residents reported more hours of sleep ($\geq$ 10 hours) than urban residents in Finland. In the current study, it is hypothesize that urban youth will report less hours of sleep

compared to rural residents. Urban dwellers tend to leave home early and return late due to unbearable vehicular traffic and this reduces their hours of rest.

Place of residence has been found to predict BMI status of individuals. But, while some studies have found overweight/obesity associated with urban dwellers than rural dwellers (Petribú, Tassitano, Nascimento, Santos, & Cabral, 2011; Msyamboza, Kathyola, & Dzowela, 2013; Hill, You, & Zoellner, 2014; Rivas-Marino et al., 2015), others have found a higher prevalence of obesity in rural residents compared to urban residents (Befort, Nazir, & Perri, 2012) and Al Nsour et al., (2013) found no association between urban or rural place of residence and BMI among respondents aged 15–49 years in Jordan. Out of home eating is associated with urban residence and usually considered as unhealthy. This continuous lifestyle may result in obesity. Thus in the current study, it is hypothesize that urban residents will be more obese than their rural counterparts.

2.2.7 Region of Residence

The relationship between region of residence and fruit and vegetable intake has been observed by many studies. For example, in a study by Azagba & Sharaf (2011) among 18–69 year old Canadians, residents of the Atlantic, Western, British Columbia and Ontario provinces consumed fruit and vegetables less often compared to the Quebec province. Yen & Tan (2012) observed that persons who lived in the metropolitan states in Peninsular Malaysia and East Malaysia consumed more fruit and vegetables than those who lived in non-metropolitan states. Also, Jiménez-Aguilar et al., (2014) found children aged 6–12 years in the central or northern regions of Mexico consumed more fruits and vegetables than those resident in the Northern region. In the current study, we expect youth in the Eastern, Ashanti, or Brong Ahafo regions to consume fruits and vegetables than those in the other regions. Due to the location of these regions (Eastern, Ashanti or Brong Ahafo) in the forest belt where the bulk of fruit and vegetable productions are done it is expected they will consume more.

Region of residence has been noted to explain the behaviour of smoking and alcohol use. Khanal et al., (2013) in Nepalese men showed males in the Western region had lower odds of smoking compared to those in the Central region. Singh & Ladusingh (2014) observed that male respondents in all other regions smoked with the exception of those in the Southern region while female respondents in the North-

eastern region smoked more than those in the Northern region. Lakew & Haile (2015) found that respondents in Afar, Oromiya, Somali, Benshanlgul-gumz, SNNP, Gambella and Harari more likely to smoke than those in the Tigray regional state, whilst residents in the two main cities of Addis Ababa and Dire Dawa smoked more compared to those in the Tigray regional state. Also, Berg et al., (2015) found that individuals in Karachi or Delhi were more likely to smoke compared to those in Chennai. Additionally, in Ghana, Tampah-Naah & Amoah (2015) observed that female residents in the Upper West region drank more alcoholic beverages than females in the Western region. In the current study, it is hypothesized that youth in the Greater Accra region will smoke and/or use alcohol more than youth in other regions. Because the companies producing alcoholic beverages or importing cigarettes among others are located within the Greater Accra region, youths resident there are expected to indulge more in their use.

As far as the relationship between region and physical activity is concerned, a study reported that in the Netherlands persons who lived in the regions of North Limburg and North-Brabant were more physically active than those in the South Limburg region (Mesters, Wahl & Keulen, 2014). To our knowledge no studies have been done in Ghana on the relationship between region and physical activity. The scarcity of such studies in Ghana notwithstanding, in this study, it is hypothesize that youth in the Greater Accra region will be more physically active than their counterparts in the other regions. This is because as the region which contains the national capital there is ready availability of such facilities as gymnasiums etc.

Goodman et al., (2013) in a study in the U.S. found a statistically significant association between region of respondents' residence and water intake. Specifically, they found that respondents in the Northeast region had a lower probability of consuming adequate water compared to their counterparts in the South. The present study hypothesizes that respondents in the Northern, Upper East or Upper West regions will consume more water than residents in other regions of the country. This is because these regions are warmer in comparison to the other regions.

To our knowledge, no studies exist on the relationship between region of residence and hours of rest. Yet, in this study, it is hypothesize that youth in the Greater Accra region will report inadequate hours of rest than those in other regions

because the nature of vehicular traffic and social activities may affect the time individuals' sleep, wake up and also return home.

Al Nsour et al., (2013) observed that obesity and excessive weight was highest among Jordanian women who lived in the southern part of the country compared to those in the middle regions. In the current study, it is hypothesize that youth who reside in the Greater Accra region will be less obese than those in the other regions. Due to the availability of physical activity venues and knowledge on healthy diet, youths resident there are expected to utilise these and thus acquire a normal BMI.

2.3 Relationship between Lifestyle Behaviours and BMI

2.3.1 Fruit and vegetable intake (Dietary Behaviour)

As far as the relationship between fruit and vegetable consumption goes, many studies have shown an association between them but the results are inconsistent. For instance, while some studies have found that lower intake of fruits and vegetables is associated with excessive weight and obesity (Dehghan et al., 2011; Grosso et al., 2014), Charlton et al. (2014) observed that a high intake of fruits and vegetables was associated with obesity among women aged 45–90 years and above in Australia. And still other studies have found no association between fruit and vegetable consumption and BMI status (Peltzer & Pengpid, 2011; Nikolaou, Hankey, & Lean, 2015; Petribú et al., 2011; Valery et al., 2012).

In the present study, because fruits and vegetables contain more water and fewer calories compared to carbohydrates, it is hypothesized that youth who eat more fruits and vegetables will have a lower BMI value.

2.3.2 Smoking and alcohol use (Health Risk Behaviours)

Studies have reported mixed results on the relationship between health risk behaviour (smoking or alcohol use) and BMI status in various contexts. Even though in their study, Peltzer & Pengpid (2011) found no association between alcohol use and overweight or obesity, they observed that smoking cigarettes was associated with overweight or obesity. In Northeast Brazil, Petribú et al., (2011) observed that alcohol consumption was associated with excessive weight in respondents. However, in their studies Di Milia et al., (2013) found a negative relationship between smoking and obesity among adults in Australia. Moreover, in Jordan, Al Nsour et al., (2013) observed that women who were overweight and obese were not smokers, while in

Malawi Msyamboza et al., (2013) found that women aged 25–64 years who smoked were neither overweight nor obese compared to those who do not smoked. In the current study, it is hypothesize that youth who drink and/or smoke will be more likely to be obese than those who do not drink or smoke. Alcoholic beverages and cigarettes/tobacco make individuals crave for more food thus its users are inclined to eat more.

2.3.3 Physical activity

Physical activity has been shown to predict BMI by some studies. For example, in Brazil, Petribú et al., (2011) observed that people who were inactive were overweight, while Dupuy, Godeau, Vignes & Ahluwalia (2011) in France found that physical activity was significantly and negatively associated with overweight in adolescents. In Australia, Valery et al., (2012) found among adolescents that less days of physical activity were associated with overweight/obese of their subjects, while among adults Di Milia et al., (2013) observed that less physical activity led to obesity among the respondents. Moreover, in Mexico, Rivas-Marino et al., (2015) found that engaging in moderate/rigorous physical activity was related to a lower BMI mean. However, other studies have found no significant association between physical activity and obesity and or overweight (Musaiger et al., 2014; Peltzer & Pengpid, 2011). Because regular physical activity keeps the body healthy by shedding unwanted body fat and helps the body to equal energy input to output, in this study, it is hypothesize that youth who undertake more physical activity will be less obese compared to those who engage in less physical activity.

2.3.4 Water intake

In their U.S. study, Park et al., (2012) and Chang, Ravi, Plegue, Sonneville, & Davis (2016) found that low water intake was significantly associated with being obese. Research on the relationship between water consumption and BMI, are scanty a situation which suggests further investigation, especially, in a different context. Since water contains no calories, in the present study, it is hypothesize that youth who consume adequate water will be less obese than those who do not consume adequate water.

2.3.5 Sleep duration

In terms of the hours of rest and BMI, studies have shown the relationship of various hours of rest with BMI. For example, some have observed that short hours of sleep was related to overweight and or obesity (Garaulet et al., 2011; Di Milia et al., 2013; Santiago, Zazpe, Martí, Cuervo, & Martínez, 2013). Others also reported longer or adequate/normal hours of sleep associated with a normal BMI status (Guo et al., 2012; Al-Hazzaa, Musaiger, Abahussain, Al-Sobayel, & Qahwaji, 2012; Martinez et al., 2014). In contrast, normal sleep duration was related to overweight or obesity among female university students in 26 African countries (Peltzer & Pengpid, 2015). Still studies identified no relationship between sleep duration and BMI (Meyer, Wall, Larson, Laska & Neumark-Sztainer, 2012; Nikolaou et al., 2015). Sleep naturally rests the body and is therefore important one gets what is adequate. Inadequacy of it tends to make individuals consume sweets for energy. This results into more calories for the body and increasing one's BMI. In this study, youth who reported adequate hours of sleep (≥7hours) are expected to have a normal BMI status than those who reported inadequate hours of sleep (< 7).

2.4 Theoretical frameworks

Behaviours such as alcohol consumption, smoking, dietary, physical activity are major leading causes of mortality (Ezzati et al., 2002). Behavioural theories are therefore employed to understand lifestyle choices among populations in order to reduce overweight and obesity. Discussed here are some behavioural frameworks.

2.4.1 Theory of Reasoned Action

Ajzen and Fishbein formulated the theory of reasoned action (TRA) in 1980. Ajzen and Fishbein formulated the TRA after trying to estimate the discrepancy between attitude and behaviour. This TRA was related to voluntary behaviour. Later on behaviour appeared not to be 100% voluntary and under control. This resulted in the addition of perceived behavioural control and the theory was called the theory of planned behaviour (TPB). The theory of planned behaviour is a theory which predicts deliberate behaviour, because behaviour can be deliberate and planned.

According to the theory (see Figure 2.1), a person's behaviour is determined by his or her intention to perform the behaviour and that this intention is, in turn, a function of his or her attitude toward the behaviour and his or her subjective norm.

The best predictor of behaviour is intention. Intention is the cognitive representation of a person's readiness to perform a given behaviour, and it is considered to be the immediate antecedent of behaviour. This intention is determined by three things: one's attitude toward the specific behaviour, subjective norms and perceived behavioural control. The theory of planned behaviour holds that only specific attitudes toward the behaviour in question can be expected to predict that behaviour. In addition to measuring attitudes toward the behaviour, we also need to measure people's subjective norms i.e. their beliefs about how people they care about will view the behaviour in question. To predict someone's intentions, knowing these beliefs can be as important as knowing the person's attitudes. Finally, perceived behavioural control influences intentions. Perceived behavioural control refers to people's perceptions of their ability to perform a given behaviour. These predictors lead to intention.

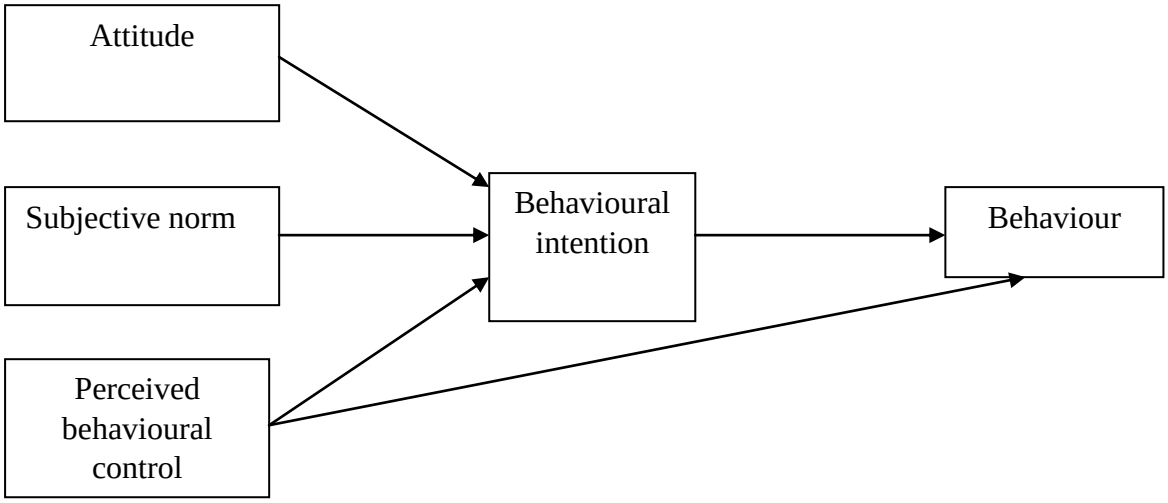

Figure 2.1: Theory of Planned Behaviour (TPA). Source: *Ajzen, I. (1985)*

2.4.2 Protection Motivation Theory

The Protection Motivation Theory (PMT) (1983) is based partially on the work of Lazarus (1966) and Leventhal (1970) and describes adaptive and maladaptive coping with a health threat as the result of two appraisal processes namely a process of threat appraisal and a process of coping appraisal in which the behavioural options to diminish threat are evaluated. The appraisal of the health threat and the appraisal of the coping response result in the intention to perform adaptive responses (protection motivation) or may lead to maladaptive responses. Maladaptive responses are those

that place an individual at a health risk. They include behaviour that lead to negative consequences (e.g. smoking) and the absence behaviours, which may eventually lead to negative consequences (e.g. not participating in breast cancer screening and thus missing the opportunity of early detection of a tumour).

According to PMT (see Figure 2.2) the threat appraisal process evaluates the components that are relevant for an evaluation of the threat. In the case of health behaviour these are, for example, estimates of the chance of contracting a disease (perceived vulnerability or susceptibility) and estimates of the seriousness of a disease (perceived severity). Perceived vulnerability and perceived severity of a disease are expected to inhibit the probability of maladaptive responses.

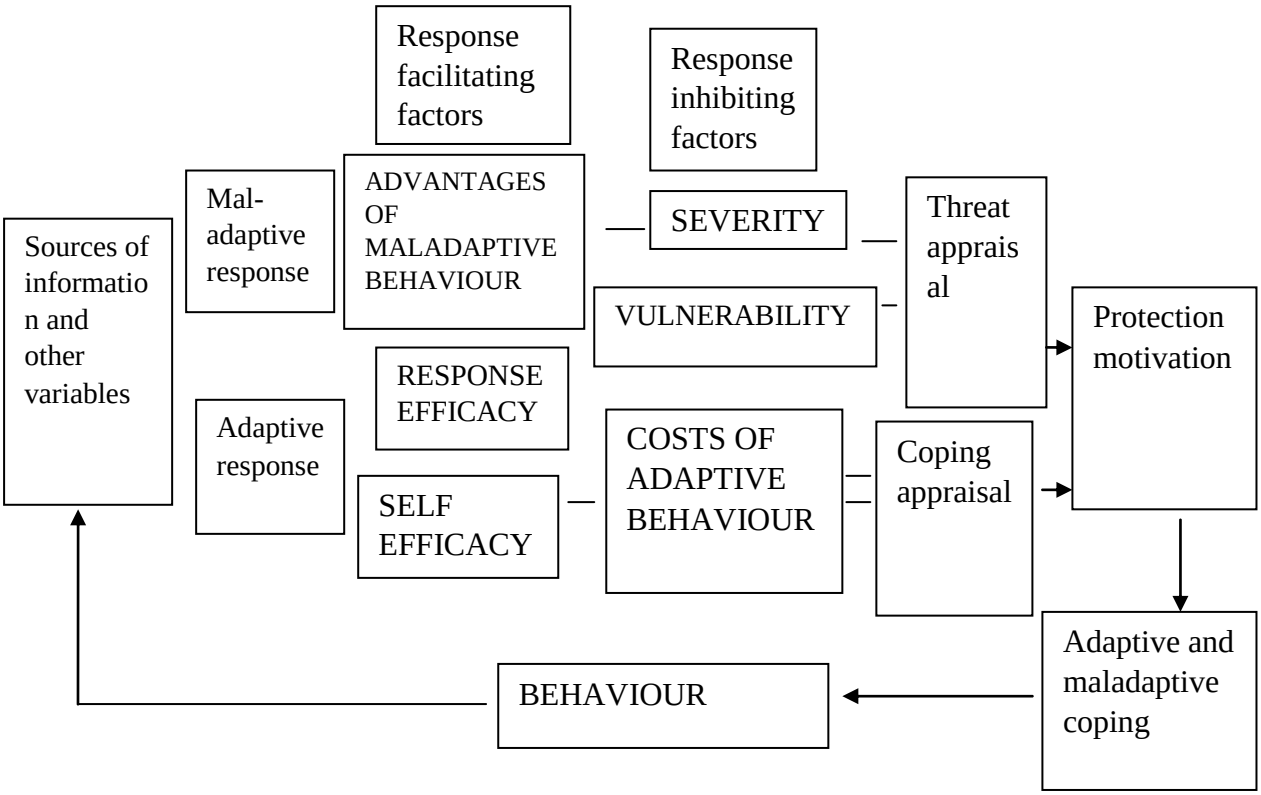

Figure 2.2: A schematic representation of protection motivation theory. Source: Rogers (1985) cited in Boer & Seydel (1996)

The coping appraisal process evaluates the components that are relevant for the evaluation of the coping responses. These components are the individual's expectancy that carrying out recommendations can remove the threat (response efficacy) and the belief in one's ability to execute the recommended courses of action successfully (self-efficacy). Self-efficacy was added to the original model (Rogers,

1975) in 1983 and is taken from the social learning theory of Bandura (1977, 1986). According to the protection motivation theory, adaptive behaviour (protection motivation) is enhanced by the belief that the behaviour is effective in reducing the threat (response efficacy) and by the expectation that one can successfully execute the advised adaptive behaviour (self-efficacy). Protection motivation is the result of the threat appraisal and the copping appraisal. Protection motivation is a mediating variable whose functioning is to arouse, sustain and direct protective health behaviour.

Originally (Rogers, 1975) perceived severity, vulnerability and response efficacy were hypothesised to combine multiplicatively to arouse protection motivation. This multiplicative relation was proposed because a protection motivation would be aroused if the value of any of the three components were zero. This combinational rule, however, failed repeatedly to receive empirical support.

2.4.3 Health Belief Model

The theoretical framework that guides the current study is the Health Belief Model (HBM) originated by Hochbaum, Rosenstock and Kegels in the 1950s. The HBM is a social psychological model that attempts to explain and predict health behaviours. The theory focuses on the attitudes and beliefs of individuals with regards to health-seeking behaviours and has been used widely in the public health literature since the 1950's (see Figure 2.3). According to the model, action in the HBM is guided by the following:

(1) Beliefs about the impact of illness and its consequences (threat perception) which depends on:
   (a) perceived susceptibility or the beliefs about how vulnerable a person considers him or herself to a certain illness or health problem; and
   (b) perceived severity of illness or health problems and its consequences.

(2) Health motivation or readiness to be concerned about health matters.

(3) Beliefs about the consequences of health practices and about the possibilities and the effort to put these health behaviours into practice. The behavioural evaluation depends on:
   (a) perceived benefits of preventive or therapeutic health practices;
   (b) perceived barriers, both material and psychological (for example 'will-power'), with regard to a certain health practice.

(4) Cues to action, which includes different, internal and external factors, which influence action such as the nature and intensity (organic and symbolic) of illness symptoms, mass media campaigns, advice from significant others (family, friends, health staff, etc.). (5) Beliefs and health motivation conditioned by socio-demographic variables (class, age, gender, religion, etc.) and by the psychological characteristics of the individual (personality, peer group pressure, etc).

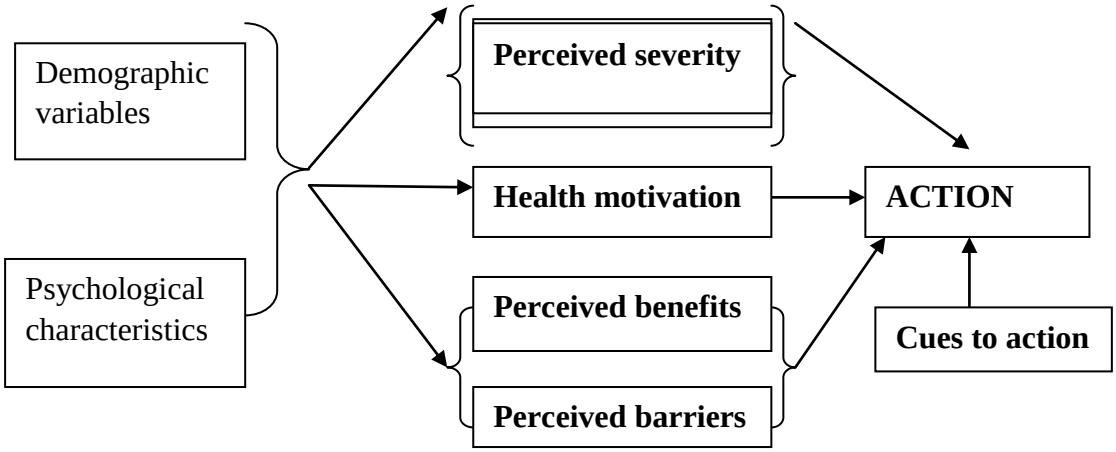

Figure 2.3: The Health Belief Model (HBM). Source: Hochbaum, Rosenstock & Kegels (1950s) cited in Sheeran & Abraham (1995).

Specifically, Figure 2.3 shows that, an individual's behaviour or action e.g. dietary behaviour (eating of fruits and vegetables, etc.) depends on:

1) *perceived susceptibility* - how that individual sees him or herself in relation to a particular health problem, e.g. obesity,
2) *perceived severity* - the seriousness of the health problem and its consequences, e.g. of obesity,
3) *perceived benefits* - benefits of the preventive health practice(s), e.g. in consuming the recommended fruit and vegetable,
4) *perceived barriers* - obstacles concerning the preventive health practices that is consuming the recommended fruit and vegetable, and

5) *cues to action* - the nature of the illness symptoms, and interventions such as campaigns for instance the RHNP campaigns which prompt a person to take action.

A study by Gutierrez & Long (2011) in Philadelphia VA Medical Centre and the Bedford VA Medical Centre evaluated the reliability and validity of existing HBM scales developed to assess HBM domains in a population of patients with both diabetes and serious mental illness (SMI). The domains of the extended HBM assessed were perceived benefits, side effects and barriers to diabetes medication taking, perceived susceptibility to and severity of diabetes, diabetes self-efficacy, diabetes locus of control, and perceived diabetes control among 152 veterans with diabetes and SMI. Results showed the HBM seems to be a salient model for patients with diabetes and SMI and these scales seem to be a psychometrically sound approach to measuring HBM domains in this population

Kim, Ahn, & No (2012) in their study among university students investigated how nutritional beliefs of students influence their health behavioural intention. Applying the Health Belief Model, this study attempts (a) to investigate college students' health behaviour, (b) to address the determinants of eating behaviour and physical activity and (c) to assess if those underlying factors are interrelated. The insight into how and why health behaviours are developed is important to the success and adaptability of promoting healthy lifestyles to college students. The results validate that objective nutrition knowledge was a good predictor of college students' nutrition confidence. Perceived benefit of eating healthy food and perceived barrier to not eating healthy food had significant effects on Behavioural Intentions and was a valid measurement to use to determine Behavioural Intentions.

One problem that has plagued the HBM is that different questions are used in different studies to determine the same beliefs; consequently, it is difficult both to design appropriate tests of the HBM and to compare results across studies. Another reason why research does not always support the HBM is that factors other than health beliefs also heavily influence health behaviour practices. These factors may include: special influences, cultural factors, socioeconomic status, and previous experiences.

However, the components of the HBM were not measured by the GDHS to enable any empirical assessment by the present study.

2.4.4 The Conceptual framework

Figure 2.4 was developed based on available data to adequately study variables the present study seeks to examine amongst the youth in Ghana. The conceptual framework for the present study specifically shows the linkages between socio-demographic variables on one hand and BMI on the other directly or indirectly through the lifestyle behaviours. Also the relationship between lifestyle behaviours and BMI are explained from the framework. In addition, perceptions individuals have with regards to lifestyle behaviours and BMI status were also explored qualitatively. This is because perceptions of people in a context or setting may explain prevailing lifestyle behaviours and BMI status.

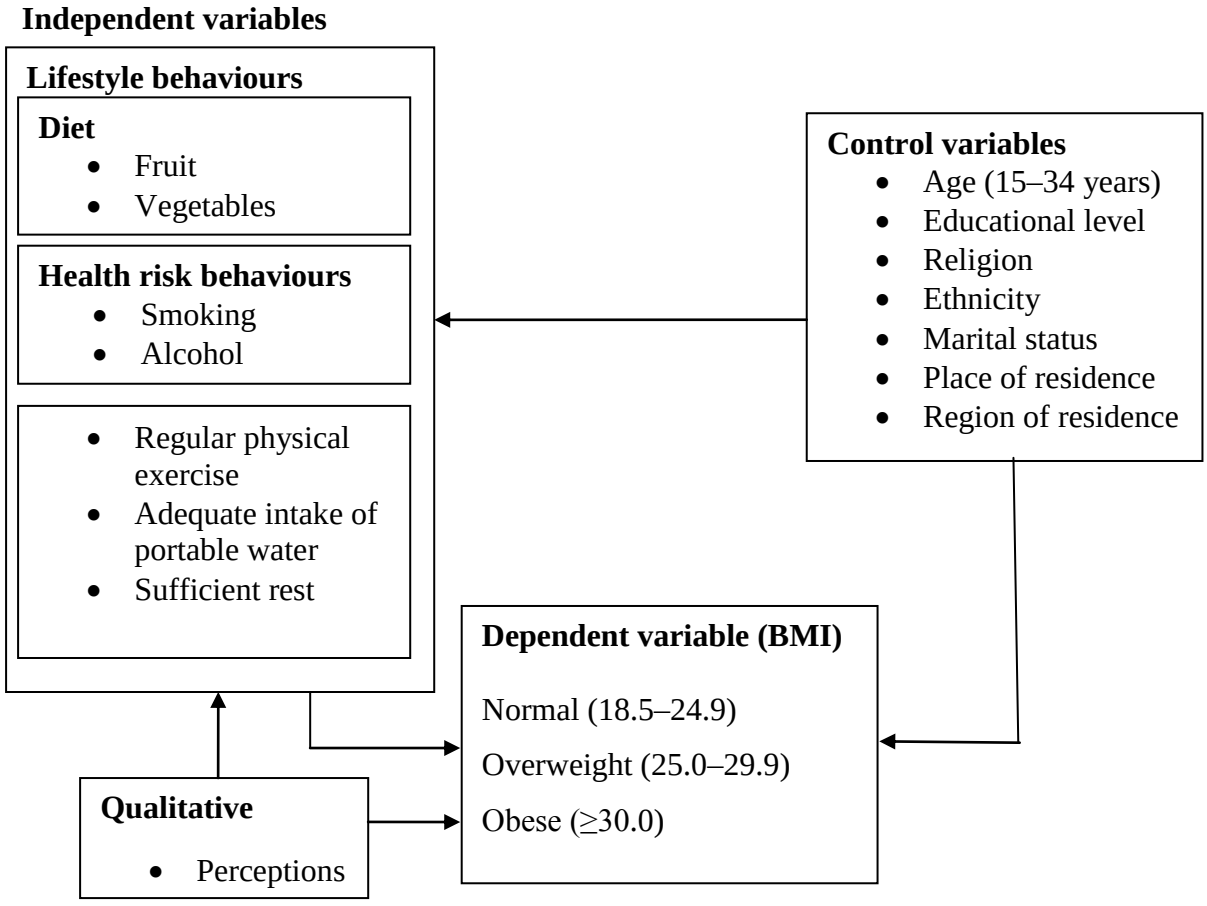

Figure 2.4: Conceptual framework for studying lifestyle behaviours of youths and their BMI status. Source: author's construct (2014).

2.5 Summary

As the above review of the literature has shown the evidence about the relationship between socio-demographic factors and such lifestyle behaviours as the consumption of fruits and vegetables are at best mixed. This situation is also the case with regards to the relationship between fruit and vegetable consumption, health risk behaviour, physical in/activity, hours/duration of rest on one hand, and BMI status on the other. With regard to the evidence on the relationship between socio-demographic characteristics and hours of rest/sleep or water intake, the challenge has been the scarcity of empirical studies done on the subject, especially, in the Ghanaian context. It is against the background of inconclusive research findings with regard to the impact of socio-demographic factors on lifestyle behaviours on one hand and the relationship between lifestyle behaviours and BMI status on the other hand and paucity of data on the effect of duration of sleep and water consumption that the present study is undertaken. The study employs the data from the 2008 Demographic and Health Survey in Ghana to investigate the above-mentioned relationships among youth aged 15–34 years. The HBM is the theoretical framework guiding the present study as a socio-psychological model to explain and predict health behaviours. With the exception of socio-demographic variables the other dimensions of the HBM are absent from the GDHS 2008 data thus preventing any empirical assessment in the present study.

Outlined in the following chapter is the background information on the study area and the methods employed in undertaking this study.

CHAPTER 3

METHODOLOGY

3.1 Study setting

The Republic of Ghana is located centrally on the West African coast with a total land area of 238,537 square kilometres. It is bordered on the east by the Republic of Togo, west by La Cote d'Ivoire, north by Burkina Faso and south by the Gulf of Guinea with a coastline of 560-kilometre (PHC, 2012) (see Figure 3.1). Ghana has completed five censuses since gaining independence in 1957. The first one was conducted in 1960 and reported a population of 6.7 million. The 1970 census recorded 8.6 million people and the 1984 census, 12.3 million. In 2000, the Population and Housing Census (PHC) recorded 18.9 million, while 24.7 million was reported in the 2010 PHC. Of the total population, 51% are reported to dwell in urban areas as at 2010 (GSS, GHS & ICF, 2015). Life expectancy at birth for males is 60 and that for females is 63 (GSS et al., 2015). The proportion of the population under age 15 has also decreased from 45% in 1960 to 38% in 2010, while the proportion of the population age 65 years and older increased from 3% to 5% over the same period. The sex ratio was peaked at 95.2 males per 100 females.

3.2 Study design

This study makes use of a method known as explanatory sequential design. This design entails the collection and analysing of quantitative data followed by qualitative data. which means that both quantitative and qualitative designs are triangulated in the current study. The aim is to use the qualitative data to explain quantitative findings. The combination of quantitative and qualitative methods as a research strategy helps to capture the complexity of social reality. For this study, it helped in better understanding various lifestyle behaviours and BMI further as it relates to the Ghanaian context and especially with regards to the youth.

3.3 Quantitative Data

The quantitative component of the data comes from the GDHS 2008, which is the fifth round in a series of national level population and health surveys conducted in Ghana under the worldwide Demographic and Health Surveys programme (GSS et al., 2008). Specifically, the GDHS 2008 has the primary objective of providing

current and reliable information on fertility levels, marriage, sexual activity, fertility preferences, and a number of health indicators including anthropometric measurements.

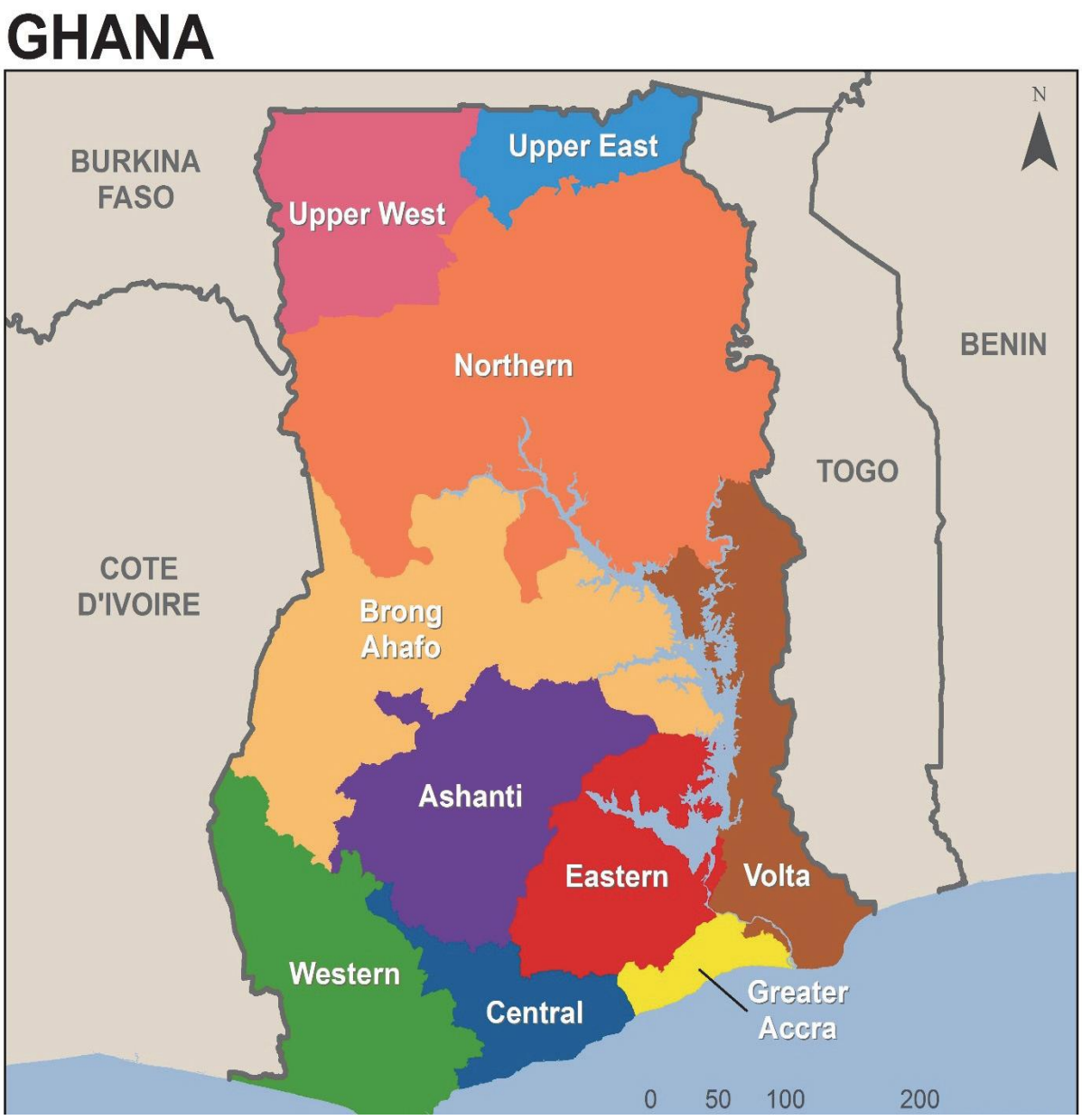

Figure 3.1: The map of Ghana. Source: GSS et al., 2015

3.3.1 Sample design

The GDHS 2008 was a household-based survey implemented in a representative probability sample of more than 12,000 households selected nationwide stratified by region and residence.

The GDHS 2008 employed a two-stage sampling design. The first stage involved selecting sample points or clusters from an updated master sampling frame constructed from the 2000 Ghana Population and Housing Census. A total of 412 clusters were selected from the master sampling frame. The clusters were selected using systematic sampling with probability proportional to size. The second stage of selection involved the systematic sampling of 30 of the households listed in each cluster. For security reasons, data were not collected in one of the selected clusters, resulting in a final sample of 12,323 selected households.

3.3.2 Instruments and methods of data collection

Three questionnaires were used for the GDHS 2008, namely the Household Questionnaire, the Women's Questionnaire and the Men's Questionnaire. The content of these questionnaires was based on model questionnaires developed by the MEASURE DHS programme and the 2003 GDHS Questionnaires.

The Household Questionnaire was mainly used to identify women and men eligible for the individual interviews. It also collected information on the characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for the floor and roof of the house and ownership and use of mosquito nets.

The Women's Questionnaire was used to collect information from all women aged 15–49 in 50% of the selected households. The data collected included reproductive history, knowledge and use of family planning methods, fertility preferences, antenatal and delivery care, breastfeeding and infant and young child feeding practices, marriage and sexual activity, awareness of tuberculosis (TB) and other health issues, domestic violence and their anthropometric measurements.

The Men's Questionnaire was administered to all men aged 15–59 living in half of the selected households in the GDHS sample. The Men's Questionnaire includes data collected on knowledge and use of family planning methods, fertility preferences, and other health issues. Face-to-face interviews were completed for 4,916 women and 4,568 men, while at the household level 11,778 households were successfully interviewed.

3.3.3 Study population

Based on the age of interest (15–34) a sample of 2,806 women and 2,771 men, respectively were extracted for the present study. This was done by filtering respondents whose ages were greater than 14 years, but less than 35 years. To ensure representativeness, and as well as correct for the issue of non-response; the data is weighted taking into consideration the complex survey design, using the 'svyset' (survey set) command in stata. The survey set is adjusting for complex survey, cluster, strata and weight variable. The parameters one typically need are:

- Strata: V023 - or alternatively create your strata variable from a combination of V024 and V025.
- Clusters: V021 - typically this is the same as V001, but for a few surveys the Primary Sampling Unit (PSU) is different from the final cluster, then the PSU should be used.

3.3.4 Measures of independent variables

3.3.4.1 Lifestyle Behaviours

- *Regular physical exercise*: In an effort to assess the prevalence of physical activity, women and men in the GDHS 2008 were asked: "*In the past 7 days, on how many days did you do vigorous physical activity that lasted for at least 15 minutes each time?"* Vigorous physical activities were broadly defined to the respondents as the "activities you do at work, as part of your house and yard work, to get from place to place in your spare time, exercise or sport, activities that make you breathe much harder than normal and may include heavy lifting, digging, jogging, or fast bicycling."
- *Adequate intake of water*: The Ministry of Health recommends drinking at least 8 glasses of water a day. All women and men in the 2008 GDHS were asked: *How many glasses of water do you drink on average in one day?*
- *Sufficient rest*: Because rest is considered to be medicinal, at least seven hours of sleep has been recommended to keep the body healthy (MOH, 2008). To assess the duration of rest, women and men in the 2008 GDHS were asked: "*How many hours do you rest a day, including naps and sleep both during the day and night?"*

- *Consumption of Fruit*: All women and men in the 2008 GDHS were asked: *In a typical week, on how many days do you eat fruits, for example mangoes, pawpaw, banana, orange, avocados, tomatoes, passion fruit, etc?* Those who provided an affirmative response were further asked: *On a day when you eat fruits, how many servings do you eat on average?*
- *Consumption of vegetables*: All women and men in GDHS were also asked about consumption of vegetables: *In a typical week, on how many days do you eat vegetables, for example carrots, cabbage, dark green leafy vegetables (e.g. kontomire), pumpkin, squash, etc?* Those who responded in the affirmative were further asked: *On a day when you eat vegetables, how many servings do you eat on average?*
- *Alcohol consumption*: All respondents were asked: *Do you consume alcoholic beverages? Yes (1)/ No (2)*
- *Smoking*: To measure the extent of smoking, respondents were asked: *If they currently smoke cigarettes or use other forms of tobacco? Yes (1)/ No (2)*

3.3.4.2 Socio-demographic information

- *Age:* respondents were asked to indicate their actual age in years: "*How old were you at your last birthday?*"
- *Sex:* interviewers were asked to indicate whether the respondents were male or female: *Is respondent male or female?*
- *Educational level:* respondents were asked: *Have you ever attended school?* Those who provided an affirmative response were further asked: "*what is the highest level of school you attended?"* Response categories ranged from *primary, middle/JSS (Junior Secondary School), SSS (Senior Secondary School) or higher*.
- *Place of residence:* interviewers were required to specify *the type of place of residence* (*urban or rural).*
- *Region of residence:* interviewers were expected to *indicate the region interview was conducted (Western, Central, Greater Accra, Volta, Eastern, Ashanti, Brong-Ahafo, Northern, Upper West and Upper East).*
- *Religious affiliation:* women and men were asked: "*What is your religion*?" Response options were: *Catholic, Anglican, Methodist, Presbyterian,*

Pentecostal/Charismatic, and Other Christian, Moslem, Traditional/Spiritualist, no religion, and other. This has been re-categorised into four groups namely Christians, Muslims, Traditional/Spiritualists and Other (no religion and other were grouped together because of the small cases).

- *Ethnicity:* respondents were asked: "*To which ethnic group do you belong?*" Response categories were: *Akan, Ga-Dangme, Ewe, Mole-Dagbani, Grussi, Gruma, Mande, and other*. The four major ethnic groups were maintained, while the smaller ones obviously with fewer cases were grouped together. Thus it has been re-categorised into five groups, namely Akan, Ga-Dangme, Ewe, Mole-Dagbani and Other (Grussi, Gruma, Mande and other).

3.3.4.3 Body Mass Index (BMI) (kg/m^2): The BMI status refers to the appropriate weight and height of an individual. Anthropometric data on height and weight were collected for women only. The BMI of each respondent was defined as her weight in kilograms divided by the square of her height in meters (W/H^2). These were then categorised based on the WHO cut-off points into normal (18.5–24.9), overweight/pre-obese (25.0–29.9) and obese (≥30). Female respondents without anthropometric measurements (77 cases) were excluded, reducing the sample size to 2783 non-pregnant women between the ages of 15–34 years.

3.4 Computation of variables

- *Dietary behaviour (total servings):* In computing dietary behaviour (fruit and vegetable intake), total_servings was defined from total_fruit and total_vegetable. Each of the latter was found as the product of N1=Number of days/week eating xxx and N2=Number of servings of xxx/day, where xxx=fruit or vegetable. Adjustment to the responses were made in the case of inconsistent responses (e.g. where N1>0 but N2=0 or where N1=0 but N2>0). Where the value of N2=8 (not sure of the number of servings), the median response for those who answered was used. This value is 1 for N1<=3 and 2 for N1>=4. The variable MET_WHO is an indicator variable for meeting the WHO standard of the total servings being 35 or more (5 servings of fruits and/or vegetable for 7 days). In line with the WHO guidelines, a person should have 5 servings of fruit and/or vegetables every day, i.e. 7 times in a week.

This corresponds to 7x5 = 35 servings per week. Domain analysis was used to identify variables associated with dietary behaviour.

- *Health risk behaviour:* the responses on alcohol use and smoking were reversed coded. Yes to alcohol use was given '0' and No was given '1'. The responses for smoking were treated likewise. An index was then created using these dichotomous responses. The score were '0, 1, and 2'. Those who indulge in both alcohol consumption and smoking score '0'; those who indulge in either one or the other score '1' and those who indulge in none of the two score '2'. Thus individuals with scores of '0' and '1' were grouped together and coded as '0' whilst those with the '2' were coded as '1'. The code '0' refers to health risk behaviours and'1' refers to non-health risk (no risk) behaviours a complementary log-log regression was used for analysis.
- *Physical activity*: The number of days of physical activity variable ranged from '0' day of physical activity to '7' days of physical activity. The Poisson regression was used to analyse physical activity.
- *Hours of rest*: The hours of rest ranged from '1–10 or more' hours and was analysed using the Poisson regression.
- *Water consumption*: Water consumption, reported by females ranged from '0' glass of water a day to '20' glasses, whilst males reported from '0' glass of water to '15' glasses of water and the multivariate analysis used was the Poisson regression.
- *Total lifestyle:* This variable was computed by summing up the responses to these questions:
    1. "*In a typical week, on how many days do you eat fruits, for example mangoes, pawpaw, banana, orange, avocados, tomatoes, passion fruit, etc?"* Those who provided an affirmative response were further asked: "*On a day when you eat fruits, how many servings do you eat on average?"*
    2. "*In a typical week, on how many days do you eat vegetables, for example carrots, cabbage, dark green leafy vegetables (e.g. kontomire), pumpkin, squash, etc?"* Those who responded in the affirmative were further asked: "*On a day when you eat vegetables, how many servings do you eat on average?"*

3. "*In the past 7 days, on how many days did you do vigorous physical activity that lasted for at least 15 minutes each time?"*
4. "*Do you consume alcoholic beverages? (yes/no)"*
5. "*Do you currently smoke cigarettes or use other forms of tobacco? (yes/no)"*
6. "*How many hours do you rest a day, including naps and sleep both during the day and night?"*
7. "*How many glasses of water do you drink in one day on average?"*

Responses to dietary behaviour (fruit and vegetable) was dichotomised using the mean score, the number of physical activity days (<7 days and 7+), hours of rest (<7 hours and 7 hours or more) and water consumption (<8 glasses and 8 or more glasses) were dichotomised based on the RHNP by the MOH. A sum of the lifestyle behaviours, namely dietary behaviour (fruit and vegetable), health risk behaviour (smoking and alcohol use), physical activity, hours of rest and water consumption were then used to create total lifestyle behaviour. Factor analysis command in stata was used in computing the sum of lifestyle (total lifestyle). An index score '0, 1, 2, 3, 4, 5' was divided into three quartiles. These are appropriately labelled as poor (0,1,2), good (3) and very good (4,5) lifestyles.

3.5 Qualitative data

3.5.1 Sampling

Merriam (2009) argued that, as generalisation is not an aim of qualitative research non-probability sampling is considered as the most appropriate. This is because purposeful sampling enables the selection of particular samples the researcher believed the most information can be gathered from. Thus, in selecting participants for the Focus Group Discussions (FGDs) a purposive sampling technique was used. The criterion for selection was for participants to be 15–34 years and be either a male or female (i.e. homogeneous on two characteristics namely age and sex). This is because the study sought to gather information among male and female youths regarding their lifestyles and BMI.

The FGDs were conducted between September 2015 and January 2016 within two urbanised towns in the Greater Accra and Volta regions of Ghana. Greater Accra contains the national capital hence the most developed of the regions. Within the

region, the James Town (British Accra) and Ussher Town (Dutch Accra) localities were selected for the discussions. James Town and Ussher Town form part of the central business district of Accra the capital city of the Greater Accra region therefore urbanised and thus their selection. Ho was selected in the Volta region as the most urbanised since it is the capital city of the region. Research assistants searched for available males and females residents of the communities within the specified age groups to participate in the FGDs.

3.5.2 Qualitative data collection

A day's training was organised for moderators and those taking notes. This was followed by pre-testing of the instrument (interview guide). Data collection took the form of FGDs conducted among four groups. Participants were divided into two groups 15–24 years and 25–34 years and each age group had two groups comprising males and females. For each age group and sex there were two FGDs giving a total of eight (8) interviews. They were structured around these themes: the perceptions regarding body sizes, lifestyle behaviour, the risk perception pertaining obesity and NCDs and perceived barriers to the practice of healthy lifestyle behaviours.

The male and female interviews were conducted by male and female moderators respectively, interviews were recorded and notes were taken as well. Interviews were conducted in the Ga, Ewe and English languages respectively. The consent of the respondent was verbally requested prior to the interview.

3.6 Methods of data analysis

3.6.1 Quantitative data analysis (Statistical Approach)

The nature of the present study suggests the triangulation of the methods of data analysis which was done at three levels, namely univariate, bivariate and multivariate. Each of the analyses for the substantive chapters was done at the three levels respectively.

3.6.1.1 Univariate analysis

At the univariate level, frequency distributions were used to examine the distribution of both the independent and dependent variables individually. For the count variables, the mean and standard deviation were used.

3.6.1.2 Bivariate analysis

- ***Pearson Chi-Square Test***

Consistent with the theoretical model of the study, this level of the analysis examined the relationships between the set of independent and intervening variables, the relationships between the set of independent variables and the dependent variable and finally the relationships between the set of intervening variables and the dependent variable. In each of these sets of analysis the Pearson Chi-Square Test was used to determine which variables are associated at an alpha level of 0.05. That is, any p-value obtained from the Chi-Square test was compared to the alpha level of 0.05 and any value obtained lower than this level (0.05) an association is said to exist between these two variables. However, any value greater than the p-value implies the non-existence of an association between these variables involved. The formula for the Chi-Square is:

$$X^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

Where:

O = the Observed frequency;

E = the Expected frequency; and

∑= the sum of every ***i.***

- ***Independent t-test***

  It was used to examine mean differences between groups. It was used to examine the mean differences of the variables age and place of residence.

$$t = \frac{\overline{X} - \mu}{S}\sqrt{n}$$

Where:

t = one sample t-test value; and

μ = population mean.

- ***ANOVA***

It is a statistical test that analyzes variation and useful in making comparison of two or more means. This was used to test the mean differences between a set of

independent variables and a dependent count variable at a significant level of 0.05. In this study, was used to test the mean differences of educational level, religion, ethnicity, marital status and region of residence. One-way ANOVA has the following test statistic:

$$F = \frac{MST}{MSE}$$

Where:

F= ANOVA coefficient;

MST = mean sum of squares due to exposure; and

MSE = mean sum of squares due to error.

Formula for MST is given as:

$$MST = \frac{SST}{p-1}$$

$$SST = \sum n(x - \bar{x})^2$$

Where:

SST = sum of squares due to exposure;

P = total number of populations; and

n = total number of samples in a population.

Formula for MSE is given below:

$$MSE = \frac{SSE}{N-p}$$

$$SSE = \sum(n-1)S^2$$

Where:

SSE = sum of squares due to error;

S = standard deviation of the samples; and

N = total number of observations

- **Tukey Post-Hoc test**

It is used to determine which means of the socio-demographic variables were significantly different following from the one-way ANOVA test.

3.6.1.3 Multivariate analysis

- ***Multinomial logistic regression***

To examine the relationship between the lifestyle variables and the BMI status, the study employed the Multinomial Logistic Regression technique. The multinomial logistic regression was employed because the dependent variable (BMI) has more than two categories. The basic principle of the multinomial logistic regression is based on the probability of membership to each category of the dependent variable. So, in the three categories of the dependent variable BMI status (normal, overweight and obese), the focus is on what the probability is of being normal, overweight or obese. In other words, this technique compares the probability of being in each of n-1 categories compared to a baseline or reference category. For this study, the normal BMI status is used as the reference category against which the other two categories (overweight and obesity) are compared. This level of the analysis is limited to only females since the BMI measurements were taken solely for the females. The formula for the multinomial logistic regression is:

$$\Pr (y_i = j) = \exp (x_i \beta_j) / \sum_{j=1}^{J} \exp(Xi\beta j)$$

Where:

$\Pr (y_i=j)$ is the probability of belonging to a group j;

X_i is a vector of the explanatory variables; and

β_j are the coefficients, which are estimated using maximum likelihood estimation.

A positive β coefficient, or log-odds ratio larger than 1, indicates that people in a particular category have a higher probability of belonging to the particular category than people in the reference category.

- ***Domain analysis***

It is used when examining sub-groups. Since the primary concern is with the age group 15–34, subjects were classified as 'youth' (i.e. 15–34) or not (35+ years old) and domain analysis was used with age group as a domain variable (ages 15–34→variable Youth=1 and ages 35+ →variable Youth=0). It was used to analyse dietary (fruit and vegetable) behaviour.

- ***Complementary log-log***

The Complementary log-log (clog-log) is an alternative to binary response variables. It is asymmetrical and usually is used when the probability of an event is

very small or very large. In the cases where the dependent variable is skewed, this option of the binary logistic regression is opted for. It was used to analyse health risk behaviour because it is dichotomous and asymmetrical. The complementary log-log regression has this as the formula:

$$\text{In } (-\text{In}[1-\Pr(y=1|x)]) = x\beta$$

- **Poisson regression**

Where the outcome variable is a count the Poisson regression is most appropriate. Therefore in analysing physical activity, water intake and hours of rest this analytical method was employed. The typical Poisson regression model expresses the log outcome rate as a linear function of a set of predictors.

$$\log_e (Y) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \ldots$$

Where:

$Y = (e^{\beta 0}) (e^{\beta 1 X1}) (e^{\beta 2 X2})$ .. etc.

3.6.2 Qualitative data analysis

All interviews in English, Ga and Ewe were transcribed and well read in order to familiarise with the data. Coding was then carried out on the textual data with the use of ATLAS Ti to develop descriptive codes as well as analytical themes. The ATLAS Ti software (tool) captured the responses to questions from the transcribed notes. To obtain views collectively, perceptions were looked at across the whole data set and in order to substantiate claims in the study, quotations from the interviews were used.

3.7 Ethical considerations

The GDHS 2008 assured respondents of confidentiality, voluntary participation and the right to withdraw. In terms of the qualitative data, ethical approval was granted by the Research Ethics Committee of the North-West University (Mafikeng campus). In addition, the verbal consent of participants was requested prior to their interview. This consent assured them of anonymity of responses, voluntary participation and the right to withdraw from the study.

3.8 Study's Limitation

The major shortcoming of this study is that the data is cross-sectional. Information regarding individuals (that is their lifestyle behaviours) was collected at only a single point in time and this is used to study their present BMI status which is the accumulative effect of lifestyle behaviours over time. Also, no anthropometric measurements were collected for men in the GDHS. Due to this, they were excluded from the multinomial analysis (the BMI analysis). The lifestyle behaviours were based on self reports of respondents. As such they could be affected by misreporting and recall bias. Additionally, the use of the HBM is a limitation since the GDHS does not have the data on the dimensions of the model except for the socio-demographic variables for an empirical assessment in the current study despite its relevance for a health-related behaviour like lifestyle behaviours and BMI. The socio-demographic factors affecting lifestyle behaviours of the youth in Ghana are discussed in the subsequent chapter.

CHAPTER 4

STATISTICAL ANALYSES OF THE SOCIO-DEMOGRAPHIC FACTORS AFFECTING LIFESTYLE BEHAVIOURS OF THE YOUTH IN GHANA

4.1 Introduction

This chapter entails two main sections. The first section examines the description of the socio-demographic characteristics of respondents such as age, educational level, religion, ethnicity, marital status, place of residence and region of residence of the respondents in the sample. The section also looks at such lifestyle behaviours of the respondents as dietary behaviour (fruit and vegetable intake), health risk behaviours (smoking and alcohol consumption), regular physical exercise, water consumption and hours of rest. To do this, the total lifestyle of female respondents was coded and categorized as poor, good and very good lifestyle behaviours. The BMI categories studied were categorized as normal weight, overweight and obese.

The second section examines the relationships between the selected socio-demographic characteristics and lifestyle behaviours (fruit and vegetable intake, health risk behaviours, physical activity, hours of rest and water intake) of the youth in Ghana. To accomplish this, means, cross tabulations and regressions were employed to examine the relationships between the background socio-demographic factors and lifestyle behaviours. For each of the behaviours examined, the general approach was to compare the estimates for males and females. This approach applied to both the bivariate and multivariate analyses.

4.2 Univariate Analyses of Sample Characteristics

4.2.1 Socio-demographic characteristics of respondents

Table 4.1 shows the percentage distribution of resTpondents' socio-demographic variables. Age is an important demographic factor that often determines a person's behaviour and in fact, it is expected that age will affect the respondents' lifestyle in the present study. Due to this, the age of a population is considered basic to the study of population problems (Kpedekpo, 1982). The table shows that most respondents in the sample are in the age group 15–24 years. Specifically, among females the age group 15–24 years comprises 55% of females and amongst male youths most (58%) belong to the age group 15–24. Thus, the distribution shows the youthful nature of the sample for the study.

Table 4.1: Percentage distribution of respondents' socio-demographic variables.

Variables	Female		Male	
Age	No.	Percentage (%)	No.	Percentage (%)
15–24	1553	55.33	1615	58.27
25–34	1253	44.67	1156	41.73
Educational level				
No education	450	15.35	276	9.97
Primary	541	19.30	460	16.62
Secondary	1708	60.86	1806	65.15
Higher	126	4.49	229	8.26
Religion				
Christians	2215	78.95	2062	74.41
Muslims	424	15.13	452	16.29
Traditional/spiritualists	86	3.05	127	4.60
Other	81	2.87	130	4.69
Ethnicity				
Akan	1424	50.76	1320	47.64
Ga/Dangme	206	7.37	166	6.00
Ewe	349	12.45	401	14.48
Mole-Dagbani	428	15.25	456	16.47
Other	397	14.17	427	15.41
Marital status				
Never married	1349	48.07	1875	67.67
Married/living together	1308	46.62	821	29.61
Formerly married	149	5.31	75	2.73
Place of residence				
Urban	1463	52.12	1326	47.87
Rural	1343	47.88	1445	52.13
Region of residence				
Western	237	8.47	251	9.05
Central	225	8.04	227	8.20
Greater Accra	534	19.04	446	16.09
Volta	227	8.11	256	9.25
Eastern	281	10.04	264	9.53
Ashanti	590	21.03	554	20.00
Brong-Ahafo	262	9.35	252	9.09
Northern	249	8.90	292	10.54
Upper East	126	4.50	146	5.26
Upper West	70	2.51	83	3.01
Total	**2806**	**100.00**	**2771**	**100.00**

Source: Computed from the GDHS 2008 data file.

From the distribution, female youth with secondary education are the largest with a proportion of 61%, while only 4% reported higher level of education. Close to two-thirds (65%) of males also attained secondary level of education, while fewer males

reported the attainment of a higher level of education (8%). The modal educational attainment of the youth is a secondary level of education.

More than three-quarters (79%) of female youths are Christians, whilst about 3% belong to the traditional/spiritualist or 'Other' religion. Among male youth, majority (74%) are Christians, followed by Muslims (16%). In terms of ethnicity, two-quarters (50%) of females are Akans and the Ga-Dangmes constitute the least proportion (7%). A higher proportion of male youth are Akans (47%), followed by the Mole-Dagbani group; the least proportion of males is the Ga-Dangme. More than two-fifth (48%) of females are single, while only 5% were formerly married. Male youth have about two-thirds (67%) singles, followed by those who are married/living together; the formerly married males constitute the least proportion in the male sample.

Place and region of residence are likely to affect lifestyle behaviours of the youth and BMI because of such contextual factors as education and other socio-economic factors. As Table 4.1 shows, half of the female respondents are urban dwellers. Males resident in the rural areas constitute a higher proportion (52%) of male youth. As far as region of residence goes, most females reside in the Ashanti region followed by the Greater Accra region (21% and 19% respectively. One-fifth (20%) of male youth live in the Ashanti region. This is followed by the Greater Accra region with 16 percent of male respondents. In general, the Upper East and Upper West regions have the least proportions of youths in the sample.

4.2.2 Lifestyle Behaviours

The lifestyles behaviours under examination are dietary behaviour (fruit and vegetable intake), health risk behaviours (smoking and alcohol consumption), physical activity, hours of sleep and water intake. Dietary behaviour is measured by the number of days and number of servings in relation to the intake of fruits and vegetables. Daily consumption of five (5) servings of fruits and vegetables are recommended and thus youths are expected to eat fruits and vegetables for seven days (MOH, 2008). Figure 4.1 shows results which give estimated mean total_servings of fruits, vegetables for males and females. The graph shows that the estimated mean fruit servings per week is 8.2 for females and 6.2 for males respectively (the proportions meeting WHO standards are 6.8% and 3.5% for females and males respectively). All differences are highly significant ($p<0.0001$) with females having

higher totals except for total_Veg where the difference is not significant with p=0.43 (means) and 0.12 (medians).

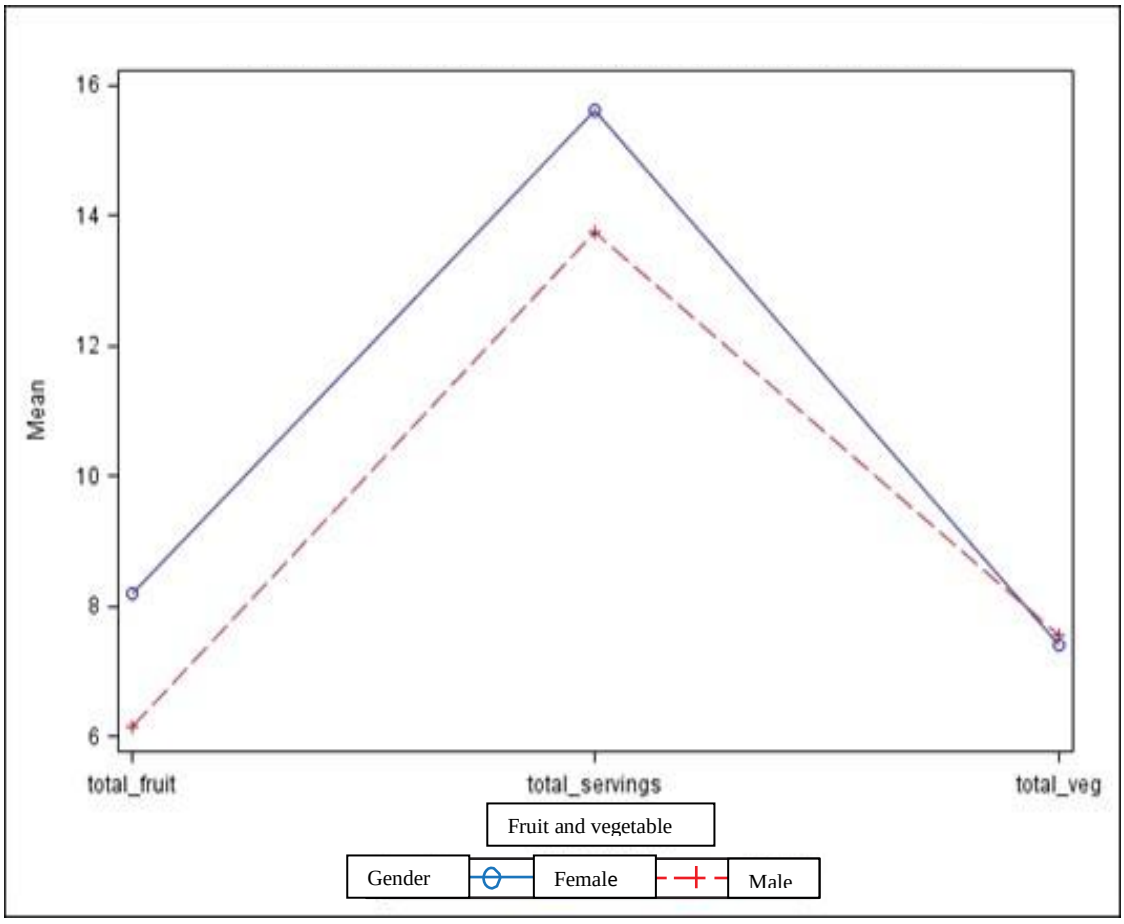

Figure 4.1: Mean values for weekly servings of fruits and vegetables for each Gender. Source: Computed from GDHS 2008 data file.

Health risk behaviours in the present study include smoking and alcohol consumption habits among respondents. Table 4.2 shows the percentage distribution of males and females by health risk behaviour. The majority of the respondents do not consume alcohol or smoke cigarette. For example, 85% of females reported that they do not drink alcoholic beverages. Likewise among male youth, a higher percentage (72%) reported no use of alcoholic beverages. In terms of smoking, almost all (99.89%) of females said they do not smoke and also (96%) of the male sample indicated they do not smoke.

Table 4.2 shows the percent distribution of hours of rest of the respondents. The table shows that majority of the female youth (58%) take at least seven to nine hours of rest as against females who take 1–3 hours of rest (2.53%). Most males

(54%) also reported seven to nine hours of rest compared to their counterparts who take between 1–3 hours of rest.

Table 4.2: Percentage distribution of respondents' health risk behaviours and hours of rest.

Variable	Female		Male	
Alcohol consumption	No.	Percentage (%)	No.	Percentage (%)
Yes	409	14.59	763	27.47
No	2397	85.41	2008	72.47
Smoking				
Yes	3	0.11	105	3.78
No	2803	99.89	2666	96.22
Hours of rest				
1–3	71	2.53	65	2.36
4–6	282	10.06	428	15.46
7–9	1644	58.58	1490	53.75
10 and more	809	28.84	788	28.43
Total	2806	100.00	2771	100.00

Source: Computed from GDHS 2008 data file.

Table 4.3 shows the estimated mean and standard deviation (SD) of physical activity and water intake. The estimated mean number of physical activity days per week is 1.63 (SD = 2.2996) for female youth and 3.00 (SD = 2.520) for male youth respectively.

Water is very important for the body system to function appropriately. The required daily intake of eight or more glasses of water a day is recommended (MOH, 2008). The mean water intake estimated in females is 4.99 (SD = 2.202) and 5.76932 (SD = 2.248) amongst male youth. On average, females and males consume approximately five (5) and six (6) glasses of water, respectively.

Table 4.3: Mean distribution of respondents' physical activity and water intake.

Variable	Female		Male	
	Mean	SD	Mean	SD
Physical activity (ranging from 0–7 days)	1.630878	2.2996	3.001431	2.520168
Water intake (ranging from 0–20 glasses for females and 0–15 for males)	4.99602	2.202203	5.76932	2.248927

Source: Computed from GDHS 2008 data file.

4.2.3 Total lifestyle

Considering that anthropometric measurements are not available for males and this variable (total lifestyle) ultimately links to the outcome variable (BMI), it (total lifestyle) was created for only females. Shown in Table 4.4 is the percentage distribution of total lifestyle for female youths 15–34 years. From the table, a little more than half (55%) of female youth practice poor lifestyle, while approximately one-tenth (9.8%) have a very good lifestyle.

Table 4.4: Percentage distribution of female respondents' total lifestyle

Total lifestyle	Number	Percentage
Poor lifestyle	1542	54.97
Good lifestyle	988	35.20
Very good lifestyle	276	9.82
Total	2806	100.00

Source: Computed from the GDHS 2008 women data file.

4.2.4 Body Mass Index (BMI) of Females

The BMI is calculated using weight (kg) per height (m^2) measurement of female youth with the cut-off based on the WHO classification. Table 4.5 shows the percentage distribution of youth by BMI. The table shows that majority of female youth are of a normal BMI. About one-fifth (19.88%) belongs to the overweight category and a lesser proportion are considered obese.

Table 4.5: Percentage distribution of female respondents' by BMI.

BMI	Number	Percentage
Normal	2030	72.35
Overweight	558	19.88
Obese	218	7.77
Total	2806	100.00

Source: Computed from GDHS 2008 women data file.

4.3 The Relationship between Socio-Demographic Variables and Lifestyle Behaviours

4.3.1 Dietary Behaviour

4.3.1.1 Socio-Demographic Differentials and the Consumption of Fruit and vegetable

In this section of the chapter, the relationship between the socio-demographic factors and fruit and vegetable consumption is examined. The consumption of fruit and vegetable helps in the prevention of lifestyle diseases such as stroke, ischemic heart diseases, gastrointestinal cancers and guarding against obesity, which functions as a risk factor to some NCDs. Due to the health benefits of fruits and vegetables; the MOH in Ghana recommends in the RHNP that there be five servings of fruits and vegetables daily, which is consistent with the WHO recommendations. Since the primary concern is with the age group 15–34, subjects are classified as 'youth' (i.e. 15–34) or not (35+ years old) and domain analysis is used with age group as a domain variable (ages 15–34→variable Youth=1 and ages 35+ →variable Youth=0).

Figures 4.2 to 4.6 show results for region, ethnicity, religion, location, and education (Urban-Rural). Tukey's method is used to adjust p-values for multiple comparisons. Adjusted p-values <0.05 are considered significant. To make it easier to find pairs that differ significantly, only significant differences are reported. The outcome variable for all of these factors is Total_Servings. Figure 4.2 shows the results for region. For Females, Ashanti and Brong-Ahafo regions are significantly different (adjusted $p<0.0001$). For example, for females in Ashanti, the estimated mean is 16.6 compared to estimated mean of 22.5 for females in Brong-Ahafo; for males in Ashanti, the estimated mean is 13.8.

Figure 4.3 shows the mean total servings of fruits and vegetables for ethnicity. On the whole, the Mande ethnic group has the highest mean score followed by the Grussi and the Akan ethnic groups in that order. Consistent with the general trend so far, females have higher mean total servings among most ethnic groups except for the Mande and Ga/Dangme groups among whom males have slightly higher mean scores than their female counterparts.

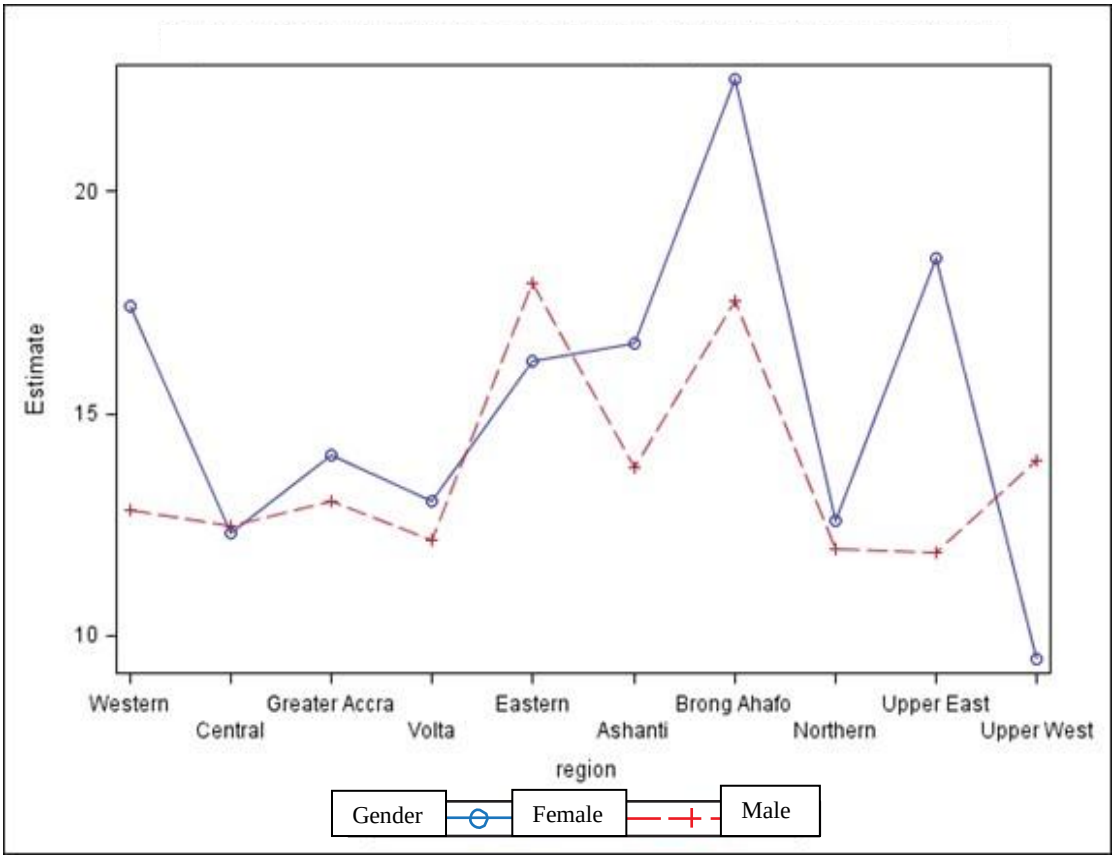

Figure 4.2: Estimated mean total servings of fruits and vegetables by Region for each Gender. Source: Computed from GDHS 2008 data file.

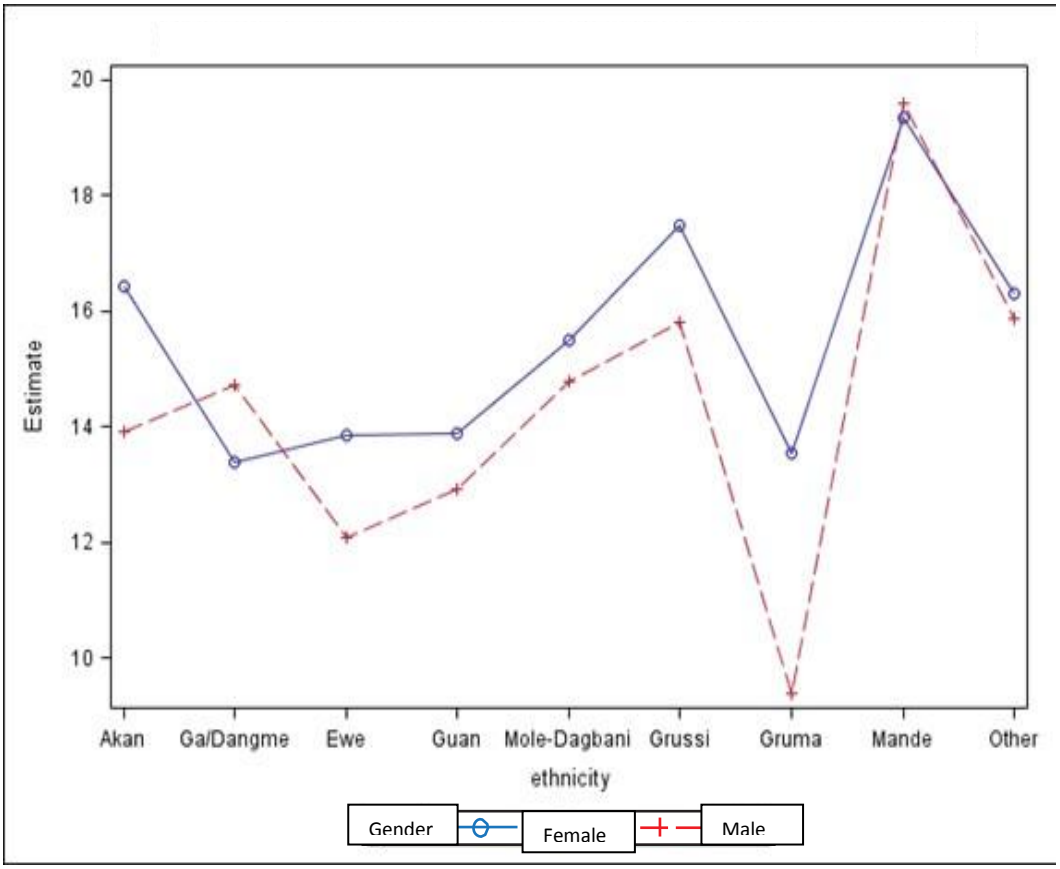

Figure 4.3: Estimated Mean Total Servings of Fruits and Vegetables by Ethnicity for each Gender. Source: Computed from GDHS 2008 data file.

As far as religion is concerned, Figure 4.4 shows that females on average have higher mean total_servings than their males counterparts, while Moslem and Catholic females have the highest mean total_servings, followed by Moslem and Catholic males in that order. On the other hand, females and males who profess the Traditionalist/Spiritualist faith have the lowest mean total_servings followed by Anglican men.

On the effect of residence, Figure 4.5 shows that rural residents are much more likely than their urban counterparts to consume more fruits and vegetables even though within location, females consume more fruits and vegetables than their male counterparts. For example, the mean total_servings score for females in rural areas is 16.38 compared to a mean score of 14.84 for their urban counterparts. Moreover, while the mean total_servings score of rural females is 16.38, the score for rural males is 14.14.

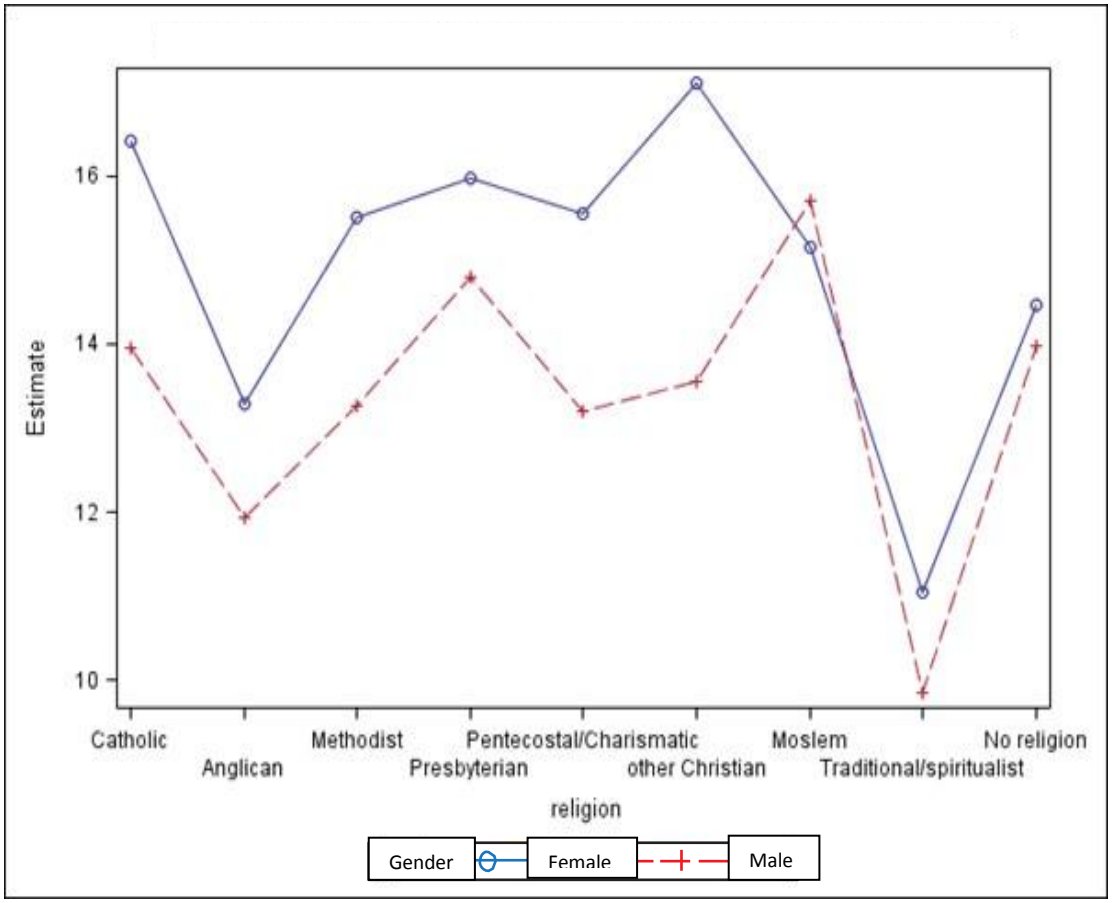

Figure 4.4: Estimated Mean Total Servings of Fruits and Vegetables by Religion for each Gender. Source: Computed from the GDHS 2008 data file

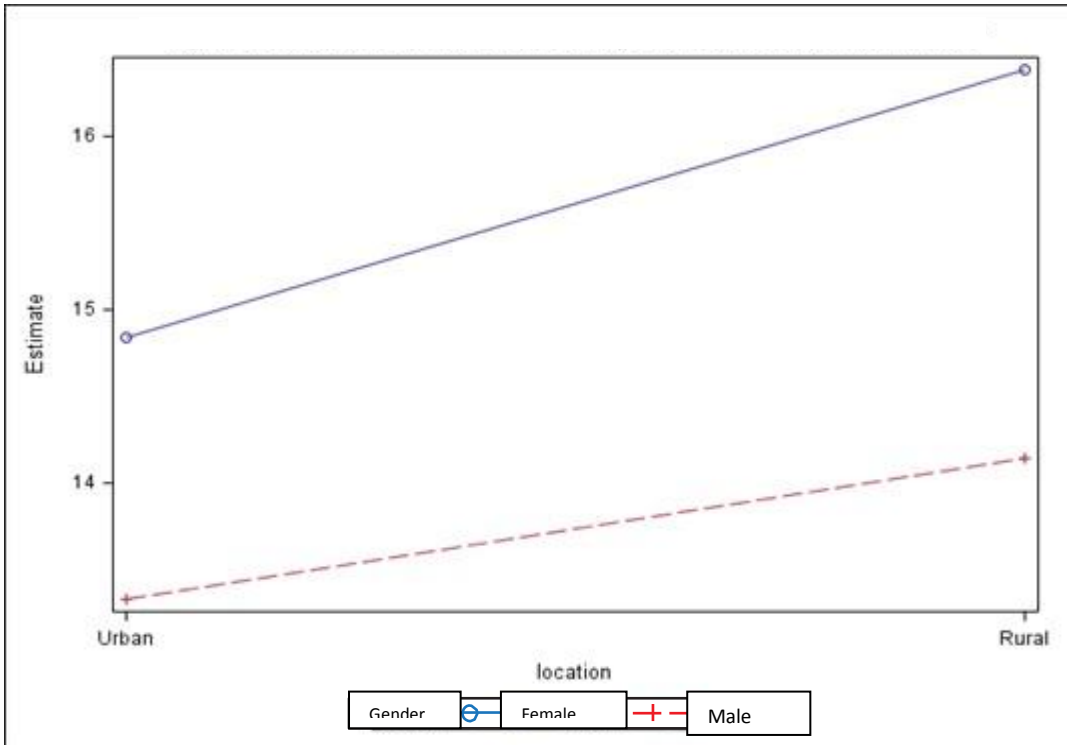

Figure 4.5: Estimated Mean Total Servings of Fruits and Vegetables by Location for each Gender. Source: Computed from GDHS 2008 data file.

Figure 4.6 shows that while there is virtually a linear relationship between education and the consumption of fruits and vegetables among females in general, this relationship holds for males up to secondary level of education; the consumption of fruits and vegetables amongst males declines after secondary education. Among females, those with higher education have a mean total_servings of 16.54 compared to scores of 15.93, 15.63 and 14.05 for females with secondary, primary and no education respectively. On the other hand, among males the mean total_servings are 13.57, 14.00, 13.22 and 13.10 for those with higher, secondary, primary and no education respectively.

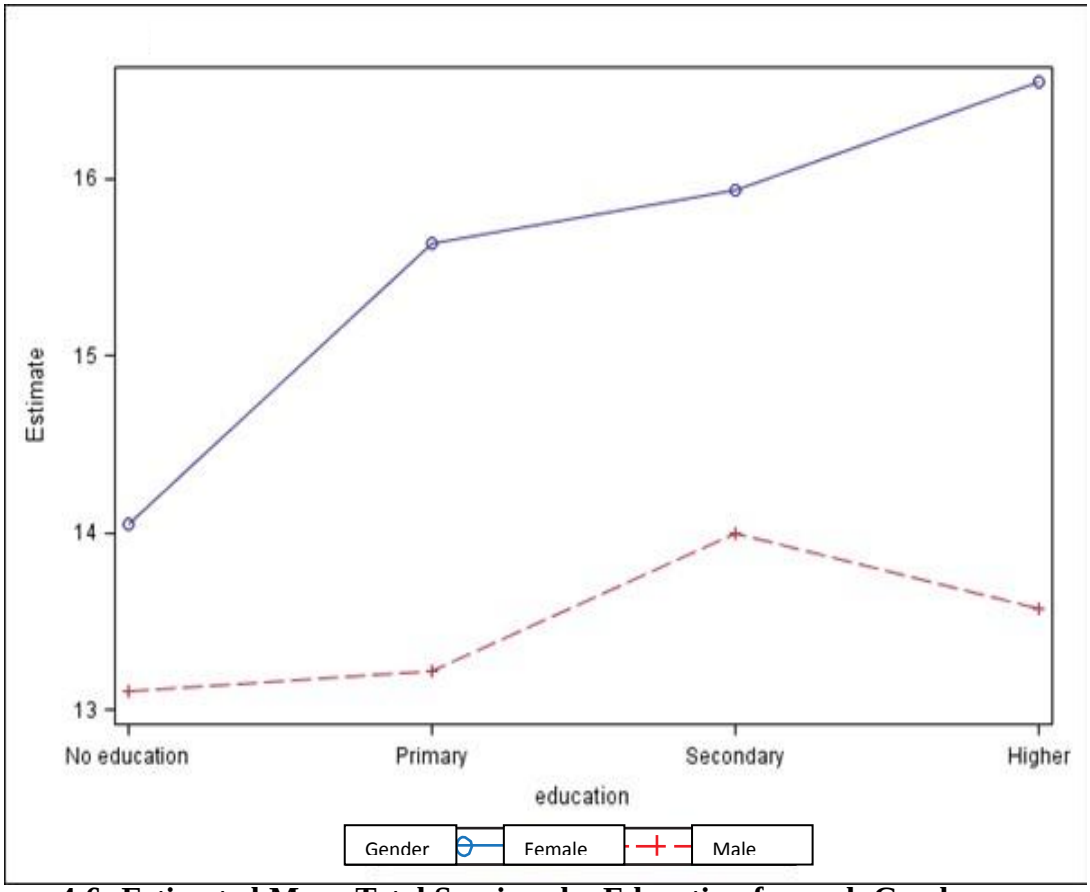

Figure 4.6: Estimated Mean Total Servings by Education for each Gender.
Source: Computed from GDHS 2008 data file

As far as age is concerned, it is used as a continuous variable to examine the regression relationship. Figure 4.7 shows the results for the estimated mean total servings for each year of age plotted against age for each gender. A few things are apparent with regards to the effect of age. Firstly, females generally have higher mean servings than males. Secondly, there is a great deal of scatter (variability) for both genders, and finally, there is a slight tendency for increase with age. The results of the analysis show that for males there is a weak and marginally significant relationship with total servings (p=0.0247). Further, the amount of variability explained as measured by R-Square is very small (0.0021). For females the relationship is even weaker (p=0.092; R-Square=0.0010).

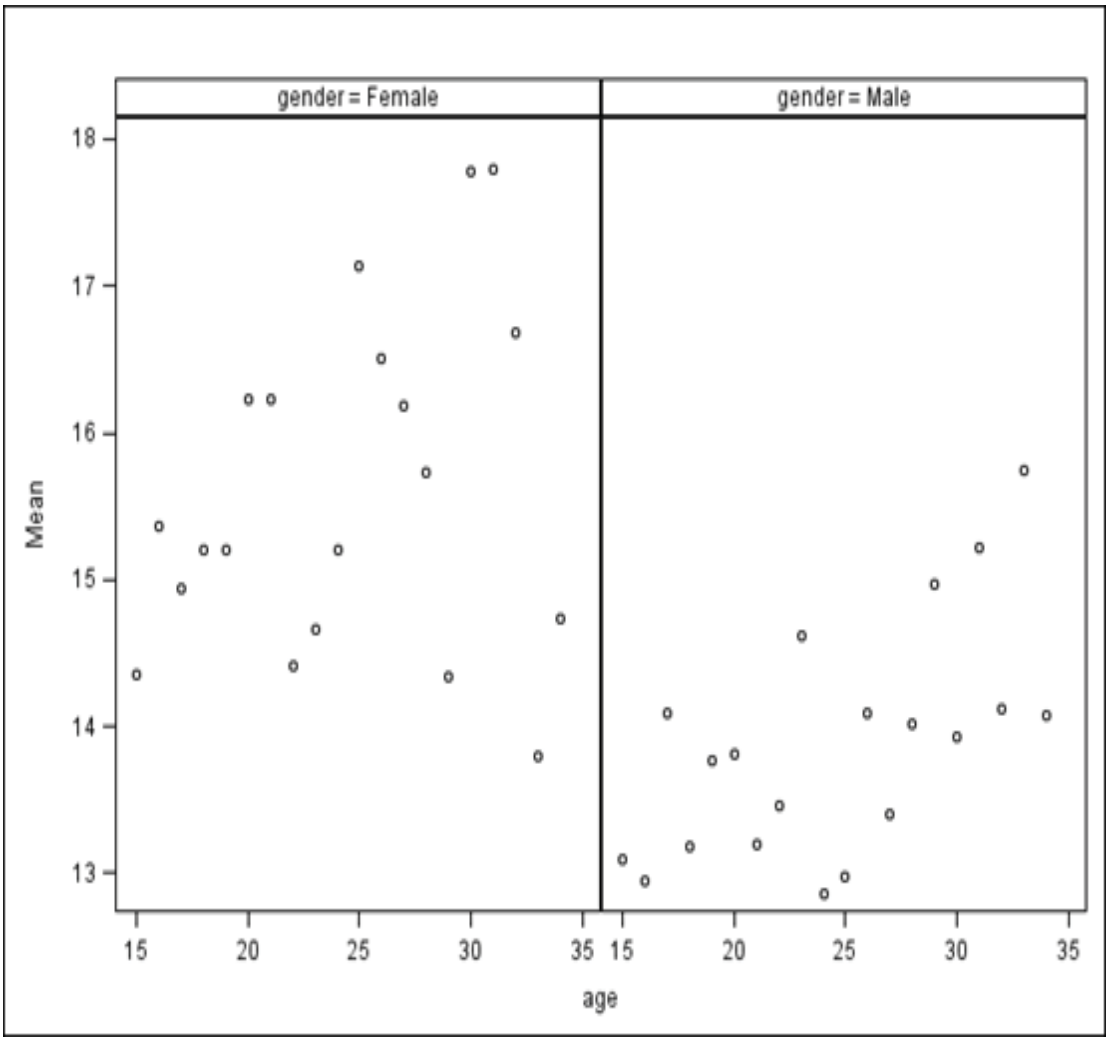

Figure 4.7: Estimated Mean Total Servings of Fruits and Vegetables by Year of Age for each Gender. Source: Computed from GDHS 2008 data file

4.3.1.2 Multivariate Analysis

For the multivariate analysis, the approach is to look at the socio-demographic predictors of dietary behaviour of the youth (weekly servings of fruits and vegetables) two at a time. It is significant to note, for example, that in Ghana, region and ethnicity are closely related so to simplify matters only one of these two variables, region, is used. For most factors (e.g. region, religion, education) there are a large number of levels and therefore the interpretation of the factor effects becomes rather complicated when interactions exist. Since there are a large number of pairwise comparisons, it is important to adjust for multiple testing. Because of this we control for the false discovery rate (FDR) and look only at differences where the adjusted p-value is <0.05 (The FDR method of adjustment is similar to a Bonferroni adjustment but not as conservative) (see Benjamini & Hochberg, 1995).

Table 4.6 shows the results of the analysis for the pairwise comparisons of the effects of the socio-demographic predictors of fruit and vegetable consumption. The

first pair of factors is region and location and interaction term. As the table shows, the interaction term is highly significant for both males and females ($p<0.0001$). Figure 4.8 shows for which region(s) there are location differences. For example, for females there are significant differences for four regions (Ashanti, Central, Eastern, Upper East regions). Specifically, in all these regions, females who reside in rural areas are more likely than their urban counterparts to consume more fruits and vegetables. For males, there are differences for six regions (Ashanti, Eastern, Greater Accra, Northern, Upper East, and Western). With the exception of the Greater/Accra region, males resident in rural areas are more likely than those in urban areas to consume more fruits and vegetables.

Table 4.6: Pairwise Results of Socio-Demographic Factors.

Gender	Effect	Df	F-value	p-value
Female	Region	9	31.78	<.0001
	Location	1	4.40	0.0360
	Region*Location	9	5.04	<.0001
Male	Region	9	14.23	<.0001
	Location	1	3.60	0.0579
	Region*Location	9	4.10	<.0001
Female	Region	9	30.51	<.0001
	Education	2	4.33	0.0132
	Region*Education	18	1.55	0.0638
Male	Region	9	7.09	<.0001
	Education	2	1.54	0.2139
	Region*Education	18	1.94	0.0098
Female	Region	9	17.93	<.0001
	Religion	5	1.47	0.1964
	Region*Religion	45	1.96	0.0001
Male	Region	9	13.70	<.0001
	Religion	5	2.72	0.0183
	Region*Religion	45	3.42	<.0001
Female	Religion	5	1.99	0.0773
	Education	2	5.09	0.0062
	Religion*Education	10	1.00	0.0553
Male	Religion	5	5.52	<.0001
	Education	2	0.84	0.4304
	Religion*Education	10	2.12	0.0197
Female	Education	3	6.53	0.0002
	Location	1	21.25	<.0001
Male	Education	3	1.79	0.1462
	Location	1		
Female	Religion	8	5.63	<.0001
	Location	1	16.69	<.0001

Male	Religion	8	6.04	<.0001
	Location	1	9.32	0.0023

Source: Computed from GDHS 2008 data file

On the other hand, Figure 4.8 shows regional differences for fixed location. For example, the mean for Ashanti is very high and for females Ashanti is significantly higher than for seven other regions for rural and is significantly higher for four other regions for urban. In other words, the rural-urban difference in fruit and vegetable consumption for females is higher in the Ashanti region than in any other region. Finally, Figure 4.8 shows gender differences at each of the 10*2=20 Region-Location combinations (only significant differences are shown; FDR-adjusted $p<0.05$). For example, males in the Upper West region are more likely than their female counterparts to consume more fruits and vegetables regardless of location or residence (the last entry on the two panels).

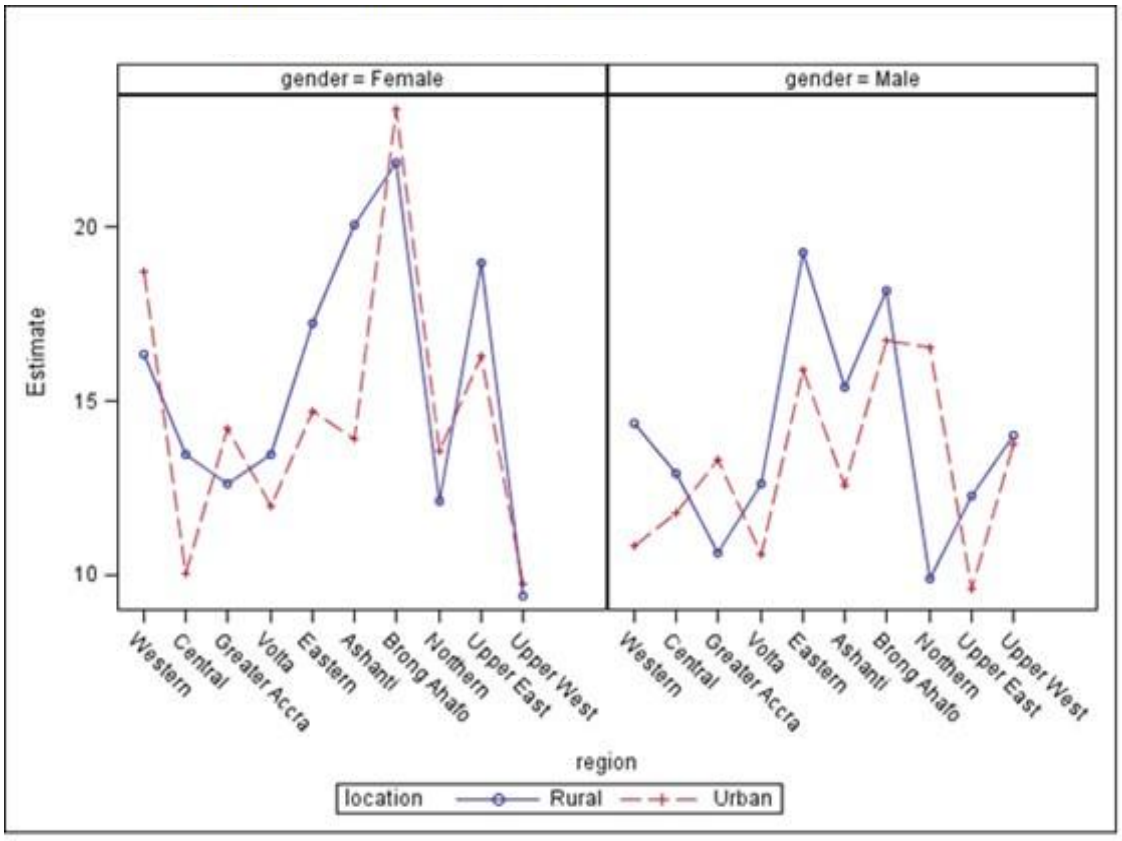

Figure 4.8: Region-Location comparison of total servings of fruit and vegetable.
Source: Computed from GDHS 2008 data file.

Table 4.6 and Figure 4.9 show the results for the region and education pairwise comparison. Because of the small cell numbers after breaking down education by region, for this analysis higher Education was combined with Secondary. As Table 4.6 shows, there is a marginally significant interaction term for females and a significant interaction term for males. While there are no significant differences in education level within regions for either gender, there are many significant region differences for fixed education for both genders. For example, for females, the Ashanti region differs from two regions (Northern and Upper West) for those with no education; the Ashanti region also differs from four regions for those with Primary education and differs from six regions for those with Secondary or Higher education. For the Upper East and the Upper West regions, there are gender differences at all three education levels.

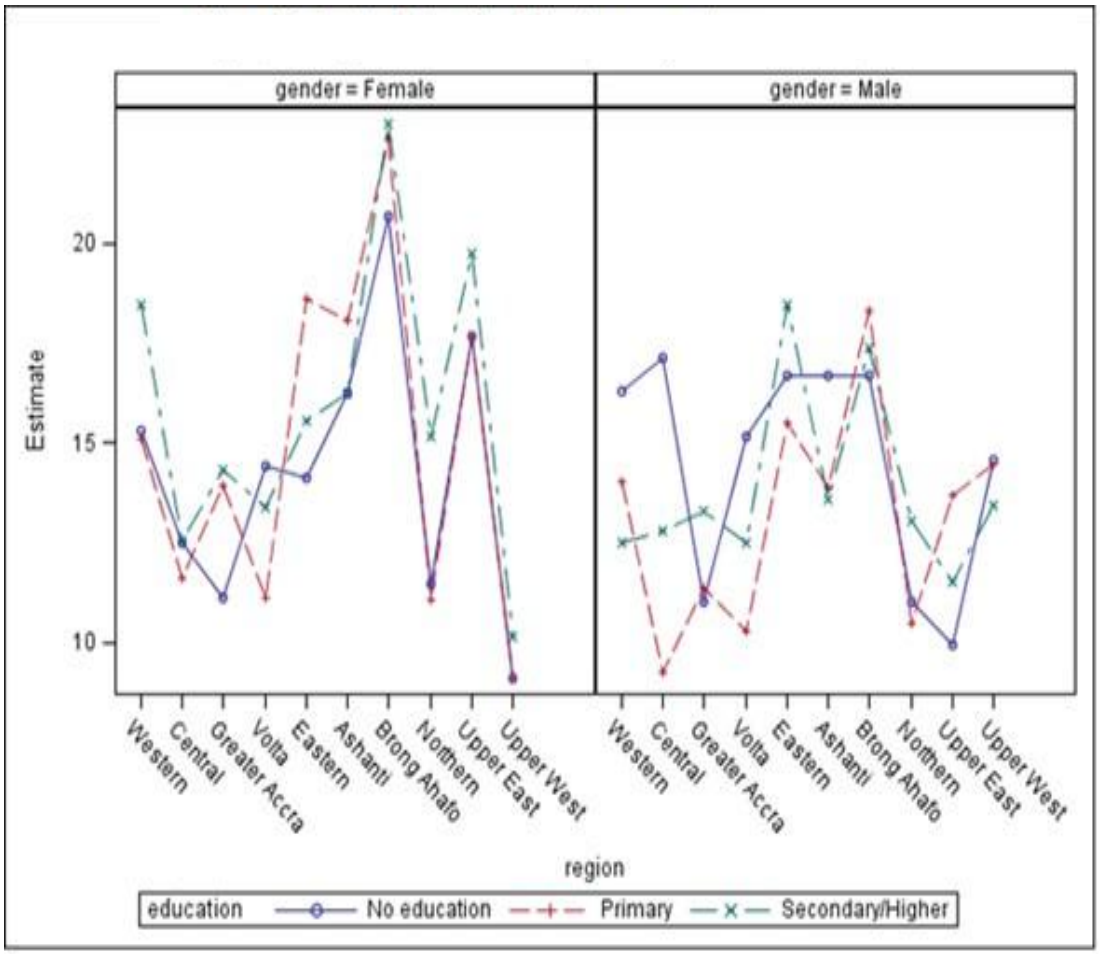

Figure 4.9: Region-Education Pairwise comparison of total servings of fruit and vegetable. Source: Computed from GDHS 2008 data file

Table 4.6 and Figure 4.10 show the region-religion pairwise comparison. Again, due to small numbers in some gender-region-religion categories, two more religion groups were combined: 'Traditional/Spiritualist' and 'No Religion'. This is in addition to combining Methodist and Presbyterian and also Catholic and Anglican. As the table shows, there is a significant interaction term for both males and females. There are 12 religion differences for fixed region for females (mostly in Upper East and Volta) and 14 such differences for males (in Ashanti, Northern, Upper East and Upper West). For female Moslem there are region differences among 15 pairs of regions, but among male Moslem there are region differences among only two pairs of regions.

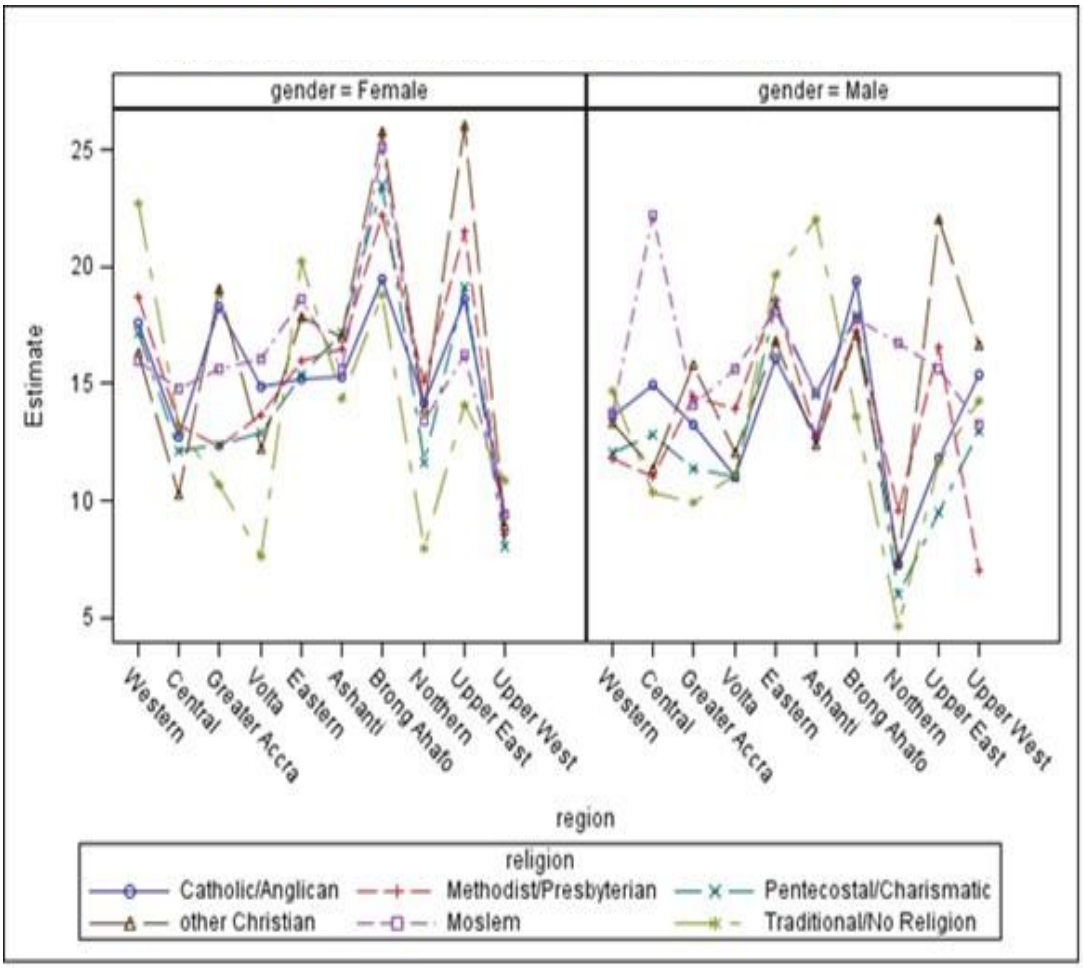

Figure 4.10: Pairwise comparison of Region and Religion of total servings of fruit and vegetable. Source: Computed from GDHS 2008 data file

Table 4.6 (bottom panel) also shows the demographic predictors of fruit and vegetable consumption two at a time, but where the interaction term is not significant.

The two pairs of factors with no significant interaction are education and location (place of residence) as well as religion and location and for these we ran the analysis using the main effects models using all levels of the factors (i.e. we did not combine levels). Since there were still a large number of pairwise comparisons, it was still important to adjust for multiple testing.

In this case the false discovery rate (FDR) is controlled and for the examination of differences where the adjusted p-value is <0.05., If there were significant main effects within each gender for either factor considered, then pairwise differences were examined. Gender differences for each factor were examined at any level of the factors. As Table 4.6 shows, the initial regression analysis shows that the main effect of education is not significant for males (p=0.1462). However, the other main effects are significant. For each factor the estimated means for each level of the factor was examined (Table for "Estimated Mean Total Servings for each level of education and location" not shown). Next, for those effects that had significant pairwise differences were examined. For example, for the factor of religion, the Traditional/spiritualist group was lowest for both males and females (Correspondingly, many (most) of the pairwise differences involved this group).

4.3.1.3 Discussion

Education is one of the socio-demographic modifying factors that constitute an important dimension of the HBM. Formal education in general is expected to make people more knowledgeable about both the benefits of and barriers to good nutrition in general and healthy dietary behaviour in particular which includes the intake of fruits and vegetables. The current study's finding about the positive effect of education on the consumption of fruits and vegetables among females corroborates those of existing studies in different contexts (Azagba & Sharaf, 2011; Yen et al., 2011; Li et al., 2012; Hong et al., 2012). For instance, in a study in the U.K. which sought to examine the reasons why a sample of women did or did not attend a class to teach them about breast self-examination (BSE), a health behaviour, Calnan & Moss (1984) found that women who stayed at school until they were at least 16 years old were more likely to attend class more than those who left school early.

But while many of the existing studies on healthy dietary behaviour identified higher consumption of fruits and vegetables with respondents who have attained higher levels of education, in Ghana, Amo-Adjei & Kumi-Kyereme (2014) found an

inverse association between education and fruit and vegetable consumption. The fact that in the current study there was no main effect of education among males to some extent supports this finding by Amo-Adjei & Kumi-Kyereme. Moreover, in a study to examine factors that affected the acceptance of functional foods, Verbeke (2005) found that contrary to the expectations based on findings in other countries, socio-demographic factors like education, gender, age and the presence of children were not confirmed as significant determinants of functional food acceptance.

As far as religion is concerned, many religious doctrines and teachings entail prescriptions with regards to healthy dietary behaviours, while at the same time such doctrines and teachings simultaneously proscribe such unhealthy dietary behaviours as the drinking of alcoholic beverages, coffee, smoking etc. For instance, Moslems and Jews are known to prescribe healthy dietary behaviours as evidenced by the compulsory fasting (Ramadan) among Moslems during which they are encouraged to eat lots of fruits to break the fast (Qur'an, 2007). This practice may become habitual for most adherents of the faith and thus ensure healthier dietary behaviours later in life amongst them. Also members of the Church of Jesus Christ of Latter-Day Saints (Mormons) are encouraged to refrain from drinking coffee or any drink that has caffeine in it (Bushman, 2008). These doctrinal differences and teachings probably explain why other Christian and Moslem youths were more likely than their Traditionalist/Spiritualist counterparts to consume more fruits and vegetables.

In terms of ethnicity, youth who belonged to the Mande ethnic group were more likely than the other ethnic groups to consume more fruits and vegetables compared to their other counterparts, while in terms of region youth who resided in the Brong-Ahafo, Ashanti and Eastern regions were more likely to consume more fruits and vegetables. To the extent that ethnicity reflects cultural preferences, including food, it does affect dietary behaviour of members of these groups. For example, in Ghana, the different ethnic groups have different staple foods and locally grown vegetables which serve as an accompaniment to the main food which is usually carbohydrate based.

Similarly, the finding about the relationship between region of residence and consumption of fruits and vegetables corroborates some existing studies in other contexts. Azagba & Sharaf (2011) observed a significant relationship between respondents' province of residence in Canada and the consumption of fruits and

vegetables. Within the Ghanaian context, the low consumption of fruits and vegetables in the Volta and the three Northern regions compared to the Brong-Ahafo region shows the differences in dietary behaviours in the different regions which are virtually co-terminus with the ecological zones studied by Amo-Adjei & Kumi-Kyereme (2014).

While in general, like most developing countries, the production of fruits and vegetables in Ghana is seasonal, some regions are better off than others as a result of the differences in vegetation. This situation explains the relative absence of fruits and vegetables in the diet of the inhabitants in general regardless of geographical location. The Brong-Ahafo, Ashanti and Eastern regions are predominantly agricultural regions located in the forest belt and therefore they produce more fruits and might not be affected much by seasonality compared to such regions as the Volta and the three Northern regions which are located in the semi-arid and arid parts of the country respectively. Besides the seasonal nature of the production of fruits and vegetables, as Amo-Adjei & Kumi-Kyereme (2014) aptly noted, culturally most Ghanaians eat fruits not because of its health benefits but rather as a means of filling their stomachs, while vegetable consumption is seen as an alien cultural practice.

4.3.2 Health Risk Behaviours

4.3.2.1 Socio-Demographic Differentials and Health risk Behaviour

This sub-section of the chapter looks at the relationship between the socio-demographic factors and health risk behaviours such as alcohol consumption and cigarette smoking. The MOH of Ghana recommends the avoidance of such behaviours due to the danger they pose to the health of individuals in terms of morbidity and mortality.

Table 4.7 shows the percentage distribution of health risk behaviour by selected background characteristics. As the table shows, generally more male youths engaged in health risk behaviours than females. Health risk behaviour increased with age of respondents. For instance, among male respondents 15–24 and 25–34 a little above one-tenth (16.44%) and close to three out of ten (46.82%) reported health risk behaviour respectively.

In terms of education, the results show that among male youths there is a positive relationship between education and health risk behaviours. For example,

whereas 38% of males with no formal education report health risk behaviours, the same is true of 41% of youth with higher educational attainment. The relationship between education and health risk behaviour was not statistically significant among females.

Table 4.7 shows that there is a statistically significant relationship between religious affiliation and health risk behaviour. Males who belong to the 'Other' religious category (no religion and other) were the most likely to report health risk behaviour, while Muslim youth were the least likely to report such behaviours regardless of gender. However, among females, Traditional/Spiritualists are the most likely to report health risk behaviour. In terms of ethnicity, Ga-Dangme females have the highest proportion of respondents reporting health risk behaviour. Likewise, Ewe respondents irrespective of gender reported high proportions of respondents with health risk behaviour. However the relationship between ethnicity and health risk behaviour among males was hardly significant. With regard to marital status, Table 4.7 shows that more than half (54.91%) and about one-quarter (24.58%) of formerly married males or females respectively report health risk behaviour. Generally, the never married males (20.71%) and females (10.99%) have the least proportions with health risk behaviour.

Table 4.7 showed region of residence statistically and significantly associated with health risk behaviour among the youth in Ghana. From Table 4.7, male or female youth residing within the Greater Accra and Upper West regions have the highest proportions of respondents who reported health risk behaviours. Conversely, male youth in the Northern region and females within Brong-Ahafo region were the least likely to report health risk behaviour.

Table 4.7: Percentage distribution of respondents' health risk behaviours.

Variable	**Male**		Total		**Female**		Total	
Age	Health risk	No risk	No.	%	Health risk	No risk	No.	%
15-24	16.44	83.56	1615	100	11.31	88.69	1553	100
25-34	46.82	53.18	1156	100	18.98	81.02	1254	100
χ^2 value	302.3791				32.2606			
P value	0.0000				0.0000			
Educational level								
No education	37.82	62.18	276	100	16.85	83.15	431	100
Primary	26.66	73.34	460	100	14.78	85.22	542	100
Secondary	26.92	73.08	1806	100	13.91	86.09	1708	100

Higher	40.86	59.14	228	100	18.62	81.62	126	100
χ^2 value	31.1118				3.9461			
P value	0.0000				0.4042			
Religion								
Christians	31.26	68.74	2062	100	15.50	84.50	2216	100
Muslims	11.33	88.67	452	100	02.30	97.70	425	100
Traditional/spiritualist	41.55	58.45	127	100	47.08	52.92	86	100
Other	44.59	55.41	130	100	25.07	74.93	80	100
χ^2 value	98.7585				130.3070			
P value	0.0000				0.0000			
Ethnicity								
Akan	29.86	70.14	1320	100	13.25	86.75	1425	100
Ga-Dangme	29.22	70.78	166	100	27.9	72.1	206	100
Ewe	34.45	65.55	401	100	20.18	79.82	349	100
Mole-Dagbani	24.44	75.56	456	100	1311	86.89	428	100
Other	26.74	73.26	427	100	10.18	89.82	397	100
χ^2 value	11.9325				46.3061			
P value	0.0551				0.0002			
Marital status								
Never married	20.71	79.29	1875	100	10.99	89.01	1349	100
Married/living together	45.94	54.06	820	100	17.48	82.52	1309	100
Formerly married	54.91	45.09	75	100	24.58	75.42	149	100
χ^2 value	201.6482				34.0725			
P value	0.0000				0.0000			
Place of residence								
Urban	30.58	69.42	1327	100	14.4	85.6	1463	100
Rural	27.77	72.23	1445	100	15.1	84.9	1344	100
χ^2 value	2.6464				0.2676			
P value	0.1897				0.7196			
Region of residence								
Western	26.28	73.72	251	100	09.24	90.76	238	100
Central	30.32	69.68	227	100	13.50	86.50	226	100
Greater Accra	37.63	62.37	446	100	22.00	78.00	534	100
Volta	29.68	70.32	256	100	19.14	80.86	228	100
Eastern	28.42	71.58	264	100	11.53	88.47	282	100
Ashanti	27.77	72.23	554	100	12.14	87.86	590	100
Brong-Ahafo	29.97	70.03	252	100	05.95	94.05	262	100
Northern	16.57	83.43	292	100	12.41	87.59	250	100
Upper East	32.34	67.66	146	100	20.36	79.54	126	100
Upper West	33.96	66.04	83	100	33.37	66.63	71	100
Total No.	806	1965	2771		414	2393	2807	
%	29.11	70.89		100	14.74	83.26		100

Significant at p <0.05

Source: Computed from the GDHS 2008 data file

4.3.2.2 Multivariate analysis

To examine the predictors of health risk behaviour (smoking and alcohol use), the complementary regression was fitted with the socio-demographic characteristics as the independent variables. Table 4.8 shows the result of the model. The p-value (0.000) of the F-statistic shows a significant model and a well specified model is indicated by the _hatsq value of 0.778 and 0.464 for the male and female models respectively. The variables that correlated with male health risk behaviour are age, level of education, religion, marital status, place and region of residence. Being married/living together (OR = 0.611) and place of residence (OR = 0.745) have the largest impact on health risk behaviour. The female model shows that age, religion, ethnicity, marital status and region of residence are significantly associated with health risk behaviour. Specifically, residence in the Upper West (OR = 0.159), age (OR = 0.661), and being formerly married (OR = 0.395) have the largest impact on health risk behaviour as far as female youth are concerned. Older youths are less likely to report non-health risk behaviour. For example, males and females aged 25–34 often engage in smoking and the use of alcohol or behaviours risky to their health compared to the 15–24 year group.

Education is protective of male youth in terms of health risk behaviour. Males with secondary level of education are 1.569 times more likely to report that they neither smoke and or drink alcohol compared to males with no formal education.

Also, Table 4.8 shows that religious affiliation is significantly associated with health risk behaviour. For example, compared to Christian youth, Muslim males and females are more likely to report that they neither smoke and or drink alcohol (non-health risk behaviour) (5.635 and 10.745 respectively). The probability of male or female traditional/spiritualists to report they do not smoke or drink (non-health risk behaviour) are 37% and 77% lower respectively in contrast with Christian respondents. Likewise, male or female youths who profess 'Other' religion are 42% and 46% less likely to report non-health risk behaviour in comparison with Christian youths.

All ethnic groups in contrast with Ga-Dangme are more likely to report non-health risk behaviour. Females belonging to the Akan, Ewe, Mole-Dagbani and 'Other' ethnic groups are 2.130, 1.782, 2.968, and 4.094 times more likely

respectively to report that they neither smoke and or drink alcohol (non-health risk behaviour).

Marital status is significantly associated with health risk behaviour since married and formerly married youth smoke and or use alcohol than the never married. For example, youth who are married/living together compared to the never married are 39% and 30% less likely to report non-health risk behaviour respectively. Also, formerly married males and females are 63% and 65% less likely respectively to report non-health risk behaviour compared to their never married counterparts. Place of residence is associated with health risk behaviour. Males who reside in urban areas reported smoking and or alcohol use behaviours (26% less likely to report non-health risk behaviour) as against dwellers in the rural areas.

Respondents' region of residence is significantly related to health risk behaviour. Males resident in Western and Northern regions are approximately two times more likely to report neither smoking and or alcohol use in comparison to male youths in the Greater Accra region. On the other hand, males and females living in the Upper West region (0.462 and 0.841 lower respectively) engage in smoking and or the use of alcohol as against their counterparts in the Greater Accra region. Female youths in Western, Central, Eastern, Ashanti, Brong Ahafo regions are 2.643, 1.744, 2.590, 1.788 and 3.845 times more likely respectively to report that they neither engage in smoking and or the use of alcohol (non-health risk behaviour) compared to females in the Greater Accra region.

Table 4.8: Complementary log-log regression model showing the association between socio-demographic characteristics and health risk behaviour (smoking and alcohol consumption).

	Male				Female			
Variable	OR	S.E	95%	CI	OR	S.E	95%	CI
Age								
15-24(RC)	1.000				1.000			
25-34	0.282*	0.396	0.214	0.372	0.661*	0.095	0.498	0.878
Level of education								
No education(RC)	1.000				1.000			
Primary	1.366	0.275	0.920	2.028	1.033	0.200	0.705	1.512
Secondary	1.569*	0.300	1.077	2.286	0.942	0.189	0.635	1.398
Higher	1.385	0.330	0.867	2.212	0.941	0.341	0.461	1.920
Religion								
Christian(RC)	1.000				1.000			
Moslems	5.635*	1.357	3.510	9.048	10.745*	4.340	4.857	23.770
Traditional/spiritualists	0.633**	0.175	0.368	1.090	0.227*	0.588	0.136	0.378
Other	0.577*	0.129	0.372	0.894	0.544**	0.180	0.283	1.044
Ethnicity								
Akan	0.924	0.182	0.628	1.361	2.130*	0.645	1.175	3.864
Ga-Dangme(RC)	1.000				1.000			
Ewe	0.735	0.167	0.470	1.150	1.782**	0.598	0.922	3.445
Mole-Dagbani	0.743	0.198	0.440	1.254	2.968*	1.462	1.127	7.817
Other	0.776	0.203	0.463	1.299	4.094*	1.644	1.859	9.015
Marital status								
Never married(RC)	1.000				1.000			
Married/living together	0.611*	0.081	0.472	0.791	0.698*	0.116	0.504	0.967
Formerly married	0.366*	0.103	0.211	0.635	0.395*	0.099	0.241	0.646
Place of residence								
Urban	0.745*	0.098	0.575	0.965	0.935	0.160	0.669	1.308
Rural(RC)	1.000				1.000			
Region of residence								
Western	1.534*	0.315	1.024	2.298	2.643*	1.175	1.103	6.335
Central	1.332	0.314	0.839	2.116	1.744**	0.567	0.921	3.305
Greater Accra(RC)	1.000				1.000			
Volta	1.417	0.328	0.899	2.234	1.380	0.440	0.738	2.582
Eastern	1.183	0.221	0.819	1.707	2.590*	0.625	1.611	4.163
Ashanti	1.380	0.271	0.938	2.032	1.788*	0.399	1.153	2.775
Brong Ahafo	1.348	0.276	0.901	2.017	3.845*	1.467	1.816	8.141
Northern	2.064*	0.537	1.238	3.442	0.669	0.275	0.299	1.501
Upper East	1.396	0.424	0.769	2.534	0.830	0.396	0.325	2.120
Upper West	0.538**	0.172	0.287	1.008	0.159*	0.072	0.065	0.387
*<0.05, **<0.10	_hatsq = 0.778				hatsq = 0.464			

Source: Computed from GDHS 2008 data file

4.3.2.3 Discussion

The socio-demographic factors that were found to be associated with health risk behaviour for males are age, level of education, religion, marital status, place and region of residence. Among females, age, religion, ethnicity, marital status and region of residence were the significant factors that affected health risk behaviour. Age was significantly associated with health risk behaviour among both males and females. In general, non-use of alcoholic beverages and smoking (non-health risk behaviour) tended to decrease with an increase in age of respondents. In other words, smoking and or alcohol use increased with increasing age. This finding is corroborated by those of Seo, Torabi, Kim, Lee, & Choe (2013); Singh & Ladusingh (2014) who similarly found that older aged respondents smoked more than younger respondents. However, younger respondents were reported to smoke and use alcohol than older respondents by Manimunda et al., (2012); (Lee et al., 2013); (Khanal et al., 2013); Doku, Koivusilta, Raisamo, & Rimpelä (2013b); Singh & Ladusingh (2014); Tampah-Naah & Amoah (2015); Berg et al., (2015) and Lakew & Haile (2015). Plausibly, as respondents' age, they tend to exercise the independence associated with their age and thus practice such health risk behaviours. The different findings observed between the present study and others may be explained by the different designs of the studies.

The relationship between higher education and non-health risk behaviour is that, it serves as a protective factor in the present study for males. These results are similar to findings from Manimunda et al., (2012); Doku, Darteh, et al., (2013); Singh & Ladusingh (2014); Sreeramareddy et al., (2014) and Berg et al., (2015) who found respondents in different contexts with no formal or primary education to indulge more in all forms of risk behaviours like smoking and drinking than respondents who have attained a secondary or a higher level of education. Formal education generally is expected to make people more knowledgeable about health implications concerning behaviours such as smoking and alcohol use. Conforming to religious doctrines that explicitly forbid smoking and drinking is a protective factor in terms of non-health risk behaviour. Islam forbids risky health behaviours thus Muslim males and females are more likely to practice non-health risk behaviours. In other words, they are less likely to smoke and use alcohol. Respondents who are Traditionalists/Spiritualists are more likely to smoke and use alcohol compared to other religious groups. This is

probably due to the fact that Traditionalists/Spiritualists are known to use alcoholic beverages in their rituals. Youth who belong to 'Other' religion probably have doctrines that are liberal and hence accommodating of smoking or alcohol use. However, some studies observed no relationship between religion and smoking and or alcohol use (e.g. Doku, et al., 2013a; Lakew & Haile, 2015; Hodge et al., 2011; Mamudu et al., 2013). Traditional Ghanaian ceremonies such as naming ceremonies, traditional marriages and funerals are known for the availability of alcoholic beverages, especially, among the Ga-Dangme ethnic group and thus riddled with health risk behaviours. This explains the high prevalence of health risk behaviours among Ga-Dangme youth. This finding corroborates the findings by Manimunda et al., (2012) and Tampah-Naah & Amoah (2015) where smoking and or alcohol use was observed among some ethnic groups than others in India and Ghana respectively.

Marriage and cohabitation do not act as protective factors with regards to health risk behaviours. This finding is collaborated by findings from Manimunda et al., (2012); Khanal et al., (2013); Mamudu et al., (2013); Sreeramareddy et al, (2014) and Lakew & Haile (2015). The present study observed that married and formerly married men and women smoked and drank alcohol more than their unmarried counterparts. Since divorce in the Ghanaian society is seen as lowering of a person's social status, married people may engage in such health risk behaviours as smoking and drinking as a coping measure with regards to challenges in marriage. On the other hand, plausibly dealing with loneliness, lowering in income and responsibilities of child care may be reasons why the formerly married may smoke and or use alcohol. However, Mamudu et al., (2013) failed to find any relationship between marital status and smoking among their female subjects.

In terms of place of residence, urban youth were more likely than their rural counterparts to engage in health risk behaviours. This may be due to the prevalence of liberal values and individualistic ethos that characterise urban settings as compared to rural areas. Such values and ethos have negative implications as far as parental and community supervision are concerned. This finding of the study is consistent with those by Peer et al., (2013) and Mamudu et al., (2013) in South Africa and Madagascar, respectively, who found that youth in urban centres smoked and drank more than their rural counterparts. However other studies have observed rural

residents engage in more health risk behaviours than urban residents (Singh & Ladusingh, 2014; Sreeramareddy et al., 2014).

The current study found that region of residence affected health risk behaviours of the youth. This is consistent with existing studies that have shown variations in health risk behaviours based on region (Khanal et al., 2013; Singh & Ladusingh, 2014; Lakew & Haile, 2015; Berg et al., 2015; Tampah-Naah & Amoah, 2015). Regional effect could be reflecting contextual effects of factors such as education, urbanism etc. and may explain why some regions have a high likelihood of practicing non-health risk behaviour compared to others. However, in the current study we found that youth in the Upper West region had a higher probability of engaging in health risk behaviours. That is a region noted for the brewing of local alcoholic beverages. The availability of such beverages may influence respondents' consumption patterns.

In conclusion, these findings about health risk behaviours have highlighted the importance of the socio-demographic dimension of the HBM. Muslims (males and females), females in the various ethnic groups, females residing in Western, Central, Eastern, Ashanti and Brong-Ahafo regions were found to be more likely to engage in behaviours that do not pose a risk to their health.

4.3.3 Physical Activity

Physical inactivity has been found to be a leading risk factor of mortality globally (WHO, 2010) and individuals are thus encouraged to engage in physical activity as a means to reduce their risk to NCDs. Based on this, the MOH recommends any form of physical activity of at least 15 minutes daily. In the present study, physical activity was measured as the number of days the respondent engaged in physical activity per week from '0' days of physical activity to '7' seven days of physical activity.

4.3.3.1 Socio-demographic Differentials and Physical Activity

Table 4.9a shows the result of the independent t-test, one-way ANOVA and Tukey post-hoc test for females and males. The t-test results for females and males show statistically significant differences in the means of place of residence (p=0.000 and p= 0.0030 respectively) while no statistically significant differences in the means for age is observed from the p-values of respondents. The one-way ANOVA results

for female and male youth, shows statistically significant differences between the groups for educational level, religion, ethnicity and region of residence but not for marital status.

Since the one-way ANOVA test showed that the means were not all equal for educational group, religion, ethnicity and region of residence, a Tukey post-hoc test was conducted to determine which means were significantly different. A Tukey post-hoc test (see Table 4.9b below) for females shows more number of physical activity days in female youth with secondary education than for those without education (p = 0.000). Regarding religion, Table 4.9b shows that youth who profess Traditional/spiritualist religion and Other religions engage in more physical activity than Christians (p = 0.008 and p = 0.017 respectively). Physical activity is significantly higher among females who belong to the Mole-Dagbani group than the Akan group (p= -0.000); females belonging to the Mole-Dagbani group report more days of physical activity compared to those belonging to the Ga-Dangme group (p = 0.000); also, more days of physical activity is reported among females belonging to the Mole-Dagbani group as against those in the Ewe group (p = -0.000) and females who belong to the 'Other' group report more days of physical activity than their Mole-Dagbani counterparts (p = -0.000). Additionally, statistically significant differences are observed in the means of region of residence and amount of physical activity among several regions. For example, more days of physical activity is significantly associated with females in the Central region than for those in the Western region (p = 0.017); females residing in the Greater Accra region engage in more days of physical activity than their counterparts in the Western region (p = 0.026); also, females in the Volta region compared to those in the Western region have more days of physical activity (p = 0.006); and more days of physical activity are associated with females resident in the Ashanti region than in females in the Western region (p = 0.034).

As far as males are concerned, the post-hoc test (see Table 4.9c) shows that male youth with primary education have significantly higher days of physical activity than those without education (p = 0.022); males with secondary education report more days of physical activity than males with no education (p = 0.000) and more days of physical activity is reported in males with higher education compared to males with no education (p = 0.010). Muslims engaged in more physical activity compared to

Christians (p = 0.000). In terms of ethnicity, Mole-Dagbani males engage in more physical activity than Akan males (p = -0.000); males who belong to the Mole-Dagbani group have more days of physical activity than Ga-Dangme males (p = 0.000); also, Mole-Dagbani males as against Ewe males engage in more days of physical activity (p = -0.000) and more days of physical activity is associated with males belonging to the 'Other' group than the Mole-Dagbani group (p = -0.000). With regards to region of residence, males in the Volta region engage in physical activity more than males in the Western region (p = 0.035); males resident in the Ashanti region report more days of physical activity than those within the Western region (p = 0.023); males in the Upper East region compared to those in the Western region report more days of physical activity (p = 0.011) and more days of physical activity is significant among males in the Upper West region compared to their counterparts in the Western region (p = 0.002).

Table 4.9a: Mean Differences between Respondents' Socio-Demographic Variables.

Independent t-test results						
Variables (Groups)	**Males**			**Females**		
Age	Mean	SD	p-value	Mean	SD	p-value
15-24	3.075243	0.0609121	0.1716	1.703065	0.0580579	0.1695
25-34	3.209364	0.0783601		1.827445	0.0704253	
Place of residence			0.0030			0.0000
Urban	2.96686	0.075578		1.477307	0.061976	
Rural	3.254927	0.0622198		2.010951	0.0638857	

ANOVA results for females					
Educational level					
	SS	df	MS	F	0.0012
Between groups	89.0288449	3	29.6762816	5.31	
Within groups	15522. 2539	2779	5.58555378		
Religion					
Between groups	128.106252	3	42.702084	7.66	0.0000
Within groups	15483.1765	2779	5.5714921		
Ethnicity					
Between groups	468.711175	4	117.177794	21.50	0.0000
Within groups	15142.5716	2778	5.45088971		
Marital status					
Between groups	17.8473049	2	8.92365247	1.59	0.2039
Within groups	15593.4355	2780	5.60914945		
Region					

Between groups	894.988384	9	99.4431538	18.74	0.0000
Within groups	14716.2944	2773	5.30699402		
ANOVA results for males					
Educational level					
	SS	df	MS	F	0.0000
Between groups	157.978014	3	52.659338	8.22	
Within groups	17786.1439	2776	6.40711237		
Religion					
Between groups	74.1821525	3	24.7273842	3.84	0.0093
Within groups	17869.9398	2776	6.4372982		
Ethnicity					
Between groups	628.374674	4	157.093668	25.18	0.0000
Within groups	17315.7473	2775	6.23990893		
Marital status					
Between groups	34.0572123	2	17.0286061	2.64	0.0715
Within groups	17910.0647	2777	6.44942914		
Region					
Between groups	798.227067	9	88.6918964	14.33	0.0000
Within groups	17145.8949	2770	6.18985375		

P-value significant at <0.05

Source: Computed from GDHS 2008 data file

Table 4.9b: Pairwise Results of Respondents' Socio-demographic Factors by Physical Activity.

Tukey Post-Hoc Test for females			
Physical activity	Contrast (mean)	Standard error	p-value
Educational level			
Secondary vs education	-0.5219087	0.1234041	<0.05
Religion			
Traditional/spiritualists vs Christians	0.7523617	0.2352915	<0.05
Other vs Christians	0.7769231	0.2633765	<0.05
Ethnicity			
Mole-Dagbani vs Akan	1.06947	0.1222135	<0.05
Mole-Dagbani vs Ga-Dangme	0.911565	0.2067313	<0.05
Mole-Dagbani vs Ewe	1.161758	0.1640234	<0.05
Other vs Mole-Dagbani	-1.113463	0.1506115	<0.05
Region of residence			
Central vs Western	-0.8311205	0.2379237	<0.05
Greater Accra vs Western	-0.6566558	0.1947543	<0.05
Volta vs Western	-0.8546192	0.2243095	<0.05
Ashanti vs Western	-0.6310757	0.1917245	<0.05
Brong-Ahafo vs Western	-0.752388	0.2186944	<0.05
Upper East vs Western	1.450783	0.2336747	<0.05
Eastern vs Central	0.8882883	0.2291365	<0.05
Upper East vs Central	2.281904	0.2485627	<0.05
Eastern vs Greater Accra	0.7138237	0.183916	<0.05

Upper East vs Greater Accra	2.107439	0.2076174	<0.05
Eastern vs Volta	0.9117871	0.2149666	<0.05
Northern vs Volta	0.7212477	0.215846	<0.05
Upper East vs Volta	2.305402	0.2355642	<0.05
Ashanti vs Eastern	-0.6882435	0.1807046	<0.05
Brong-Ahafo vs Eastern	-0.8095558	0.2091007	<0.05
Upper East vs Eastern	1.393615	0.2247215	<0.05
Upper East vs Ashanti	2.081859	0.204778	<0.05
Upper East vs Brong-Ahafo	2.203171	0.2302237	<0.05
Upper East vs Northern	1.584155	0.2255629	<0.05
Upper West vs Upper East	-1.706093	0.2282622	<0.05

Only significant pairings are shown in the table
Source: Computed from GDHS 2008 data file

Table 4.9c: Pairwise Results of Respondents' Socio-demographic Factors by Physical Activity.

Tukey Post-Hoc test for males			
Physical activity	Contrast (mean)	Standard error	p-value
Educational level			
Primary vs no education	-0.507252	0.1776333	<0.05
Secondary vs no education	-0.7800301	0.1504399	<0.05
Higher vs no education	-0.6965682	0.2224629	<0.05
Religion			
Muslims vs Christians	0.499621	0.1250855	<0.05
Ethnicity			
Mole-Dagbani vs Akan	1.178243	0.1219898	<0.05
Mole-Dagbani vs Ga-Dangme	0.9287572	0.2256409	<0.05
Mole-Dagbani vs Ewe	1.375999	0.159473	<0.05
Other vs Mole-Dagbani	-1.083381	0.1525033	<0.05
Region			
Volta vs Western	-0.7467532	0.2278254	<0.05
Ashanti vs Western	-0.6952658	0.2038429	<0.05
Upper East vs Western	0.8669908	0.2386261	<0.05
Upper West vs Western	0.9017616	0.2188756	<0.05
Upper East vs Central	1.228687	0.2566071	<0.05
Upper West vs Central	1.263457	0.2383512	<0.05
Upper East vs Greater Accra	1.1767558	0.2167094	<0.05
Upper West vs Greater Accra	1.211529	0.1947487	<0.05
Brong-Ahafo vs Volta	0.8390558	0.2273127	<0.05
Northern vs Volta	0.9683544	0.2111695	<0.05
Upper East vs Volta	1.613744	0.2334116	<0.05
Upper West vs Volta	1.648515	0.2131786	<0.05
Upper East vs Eastern	1.031713	0.2329975	<0.05
Upper West vs Eastern	1.066484	0.2127251	<0.05
Brong-Ahafo vs Ashanti	0.7875684	0.2032698	<0.05
Northern vs Ashanti	0.916867	0.1850407	<0.05
Upper East vs Ashanti	1.562257	0.2100679	<0.05
Upper West vs Ashanti	1.597027	0.1873303	<0.05
Upper East vs Brong-Ahafo	0.7746883	0.2381367	<0.05

Upper West vs Brong-Ahafo	0.8094591	0.218342	<0.05
Upper West vs Northern	0.6801604	0.2014812	<0.05

Only significant pairings are shown in the table
Source: Computed from GDHS 2008 data file

4.3.3.2 Multivariate analysis

Poisson regression is used to identify the determinants of physical activity which ranged from '0' days of physical activity to '7' days of physical activity. A _hatsq value of 0.726 and 0.231 for males and females respectively indicate well fitted models. The p value (0.000) of the F-statistic shows the two models to be significant. The results of the incidence rate ratios (IRR) are shown in Table 4.10. As far as males are concerned, the only significant variables as far as physical activity is concerned are marital status and region of residence, while for females the significant variables are religion, marital status, place and region of residence.

Religion is predictive of physical activity. Females, who belong to the 'Other' religion compared to Christian females, while holding the other variables constant in the model, are expected to have 39% more physical activity days.

As shown in Table 4.10, marital status of male and female youth is predictive of physical activity. For instance, male youth who were formerly married compared to the never married, would be expected to have 23% less number of physical activity days. Whilst formerly married females are expected to have 26% more number of physical activity days than their never married counterparts.

Also, Table 4.10 shows that place of residence is predictive of physical activity. For example, female urban residents would be expected to have 26% less number of physical activity days compared to their rural counterparts.

Physical activity is determined by respondents' region of residence. For instance, comparing to males living in the Greater Accra region, males in Upper East and Upper West regions are expected to have 31% and 25% more number of physical activity days respectively, while holding all other variables in the model constant. On the other hand, females in the Central region compared to females in the Greater Accra region given the other variables are held constant in the model, would be expected to have 35% less number of physical activity days, whilst females in Eastern and Upper East regions compared to Greater Accra females, while holding the other variables constant in the model, are expected to have 33% and 66% more number of physical activity days accordingly.

Table 4.10: Poisson Regression Analysis of the Association between Socio-Demographic Characteristics and Physical Activity.

	Male				Female			
Variable	IRR	S.E	95% CI		IRR	S.E	95%	CI
Age								
15-24(RC)	1.000				1.000			
25-34	1.080	0.051	0.994	1.185	1.107	0.076	0.967	1.268
Level of education								
No education(RC)	1.000				1.000			
Primary	0.946	0.073	0.813	1.102	0.936	0.087	0.780	1.122
Secondary	0.928	0.066	0.807	1.067	0.984	0.087	0.826	1.171
Higher	0.912	0.097	0.740	1.125	1.071	0.190	0.755	1.520
Religion								
Christian(RC)	1.000				1.000			
Muslims	0.983	0.056	0.879	1.099	1.167	0.121	0.952	1.431
Traditional/spiritualists	0.912	0.071	0.783	1.062	1.174	0.145	0.921	1.496
Other	0.989	0.081	0.841	1.163	1.392*	0.178	1.083	1.789
Ethnicity								
Akan	0.972	0.082	0.823	1.147	1.051	0.153	0.790	1.399
Ga-Dangme(RC)	1.000				1.000			
Ewe	0.949	0.088	0.791	1.139	0.923	0.174	0.637	1.338
Mole-Dagbani	1.122	0.117	0.914	1.378	1.229	0.205	0.885	1.706
Other	0.959	0.093	0.792	1.162	0.016	0.168	0.734	1.405
Marital status								
Never married(RC)	1.000				1.000			
Married/living together	0.935	0.051	0.840	1.042	0.881	0.071	0.752	1.034
Formerly married	0.774**	0.101	0.598	1.002	1.256**	0.146	1.000	1.577
Place of residence								
Urban	0.989	0.046	0.903	1.084	0.741*	0.069	0.617	0.891
Rural(RC)	1.000				1.000			
Region of residence								
Western	1.104	0.112	0.903	1.348	1.144	0.230	0.770	1.699
Central	0.967	0.096	0.795	1.176	0.655*	0.111	0.469	0.915
Greater Accra(RC)	1.000				1.000			
Volta	0.897	0.089	0.738	1.090	0.755	0.205	0.443	1.287
Eastern	1.038	0.081	0.890	1.210	1.330**	0.208	0.977	1.810
Ashanti	0.883	0.075	0.747	1.045	0.926	0.133	0.699	1.228
Brong-Ahafo	1.078	0.099	0.899	1.293	0.757	0.134	0.535	1.073
Northern	1.029	0.104	0.843	1.256	0.856	0.153	0.603	1.216
Upper East	1.308*	0.132	1.072	1.595	1.658*	0.311	1.146	2.397
Upper West	1.250*	0.123	1.031	1.516	0.905	0.171	0.624	1.314
*<0.05, **<0.10	_hatsq = 0.726				_hatsq= 0.231			

Source: Computed from GDHS 2008 data file

4.3.3.3 Discussion

Marital status and region of residence were found to be significant predictors of physical activity among males, while religion, marital status, place and region of residence were the main significant factors affecting physical activity among females. Regarding religious affiliation, females who profess 'Other' religious faiths were more likely to report more physical activity. Traditional/Spiritualist religions are selective of rural residents whose lifestyles usually involve such physical activities like walking long distances, farming and other similar occupations than their counterparts in the cities and towns where adherents of "modern" religions like Christianity largely reside. However, some studies have failed to observe any relationship between religion and physical activity (e.g. Adegoke & Oyeyemi, 2011; Akarolo-Anthony & Adebamowo, 2014; Seo et al., 2011).

Male youth who were formerly married males were less likely to engage in physical activity, while formerly married women were more likely to engage in physical activity than their other counterparts. Less physical activity among formerly married males may probably be due to the absence of their spouse. In that, female spouses tend to motivate their male partners towards healthy lifestyles such as engaging in physical activities. Formerly married females on the other hand are more physically active probably because they are less burdened with household chores and child care and therefore they have more time to engage in physical activities such as going to the gym or running.

Urban residence was associated with physical activity. Though urban centres are known for the availability of facilities for physical activity as well as availability of knowledge of the benefits of physical activity, in the current study, females in urban areas were less likely to engage in physical activity. Probably between busy sedentary lifestyles such as careers, social activities and household chores that are less physically involving, urban dwelling females are left with little or no time for physical activity. This finding is contrary to those of Wallmann-Sperlich & Froboese (2014) and Teh et al., (2014) who did not find any significant differences between urban and rural residents with regards to physical activity.

Region of residence was significantly related to physical activity among both males and females, a finding which is consistent with findings by (Mesters et al., 2014) in the Netherlands. The relationship between region of residence and frequency

of physical activity among males in the Upper East and Upper West regions as well as females in the Eastern and Upper East regions may be a function of their respective locations. These regions are located in rural areas where physically demanding occupations tend to predominate.

4.3.4 Hours of Rest

Rest is considered medicinal and every human needs rest. It refreshes the body for day to day activities (MOH, 2008). Inadequate rest therefore could have repercussions for an individual in terms of mental or physical health. Due to this, the MOH in its RHNP recommends at least seven (7) hours of rest as a way of regenerating the human body. In the current study, hours of rest reported ranged from '1-10 or more' hours.

4.3.4.1 Socio-demographic Differentials and Hours of Rest

Table 4.11a shows the mean differences regarding the association between socio-demographic characteristics and hours of rest. The table shows statistically significant differences in the means for age and place of residence respectively for males ($p = 0.0343$ and 0.0058) as well as for females ($p = 0.0000$ and 0.0000 respectively). The ANOVA results for male or female youth, show that there are statistically significant differences between all socio-demographic groups (educational level, religion, ethnicity, marital status and region of residence) as indicated by the p-values. Since the one-way ANOVA test showed differences in the means for educational group, religion, ethnicity, marital status group and region of residence for males as well as females, a Tukey post-hoc test was conducted to determine which means were significantly different.

The Tukey post-test results in Table 4.11b for males show at least seven or more hours of rest statistically significant for those with higher education than those with no education ($p = 0.004$) and in the higher educational group compared to the primary education group ($p = 0.005$). Muslim males have at least seven or more hours of rest compared to Christians ($p = 0.000$); Also, male Traditionalists/spiritualists have more hours of rest than the Christians ($p = 0.013$) and males who profess 'Other' religion have more hours of rest compared to the Muslims ($p = 0.026$).

More hours of rest is significant among males who belong to the Ewe than the Akan group ($p= 0.000$); Mole-Dagbani males have at least seven or more hours of rest

compared to the Akan group (p = -0.000); also, Mole-Dagbani males as against the Ga-Dangme males have more hours of rest (p = 0.000); similarly, Mole-Dagbani males have more hours of rest compared to Ewe males (-0.000) and males who belong to the 'Other' group have more hours of rest than the Mole-Dagbani group (p = -0.000). Regarding marital status, table 4.11b shows that married and formerly married males have more hours of rest than never married males (p = 0.006 and p = 0.001 respectively) and formerly married males compared to those married have more hours of rest (p = 0.034). Additionally, statistically significant differences were observed in the means of region of residence and hours of rest among several regions. For instance, males in the Volta region have more hours of rest than those in the Western region (p = 0.000); also males within the Eastern region than Western region have more hours of rest (p = 0.000); and more hours of rest is significantly associated with males in the Upper West region compared to those in the Western region (p = -0.000) among others.

Table 4.11c shows the Tukey post-hoc test results for female youth. As the table shows, education is positively associated with more hours of rest. Example, youth with primary education have more hours of rest than those without education (p = -0.000); those with secondary education have more hours of sleep than those with no education (p = -0.000). Finally, females with higher education have more hours of rest compared to those with primary and secondary education (p = 0.004 and p = 0.024 respectively).

As far as females are concerned, the post-hoc test (see table 5.6c) shows that female youth who profess the Islamic religion have significantly higher hours of rest than their Christian counterparts (0.000); more hours of rest is significantly associated with Traditional/spiritualists females than with Christian females (0.000); also, females who profess other religions have more hours of rest compared to their Muslim counterparts (0.015) and more hours of rest in females who belong to other religions as against those who are traditionalist/spiritualists (0.001). In terms of ethnicity, Mole-Dagbani females reported more hours of rest than Akan females (p = 0.000); more hours of rest is associated with those in 'Other' group than the Akan group (p = 0.006); Mole-Dagbani females have more hours of rest as against the Ga-Dangme females (p = 0.006) and females in the 'Other' group than the Ga-Dangme females have more hours of rest (p = 0.016). In terms of marital status, married

females report more hours of rest than the never married counterparts (p = 0.001). With regards to region of residence, females in the Greater Accra region report more hours of rest than females in the Western region (p = 0.008); also, females in the Brong-Ahafo region have more hours of rest than those in the Western region (p = 0.000) and females in the Northern region compared to females in the Western region report more hours of rest (p = -0.000).

Table 4.11a: Mean Differences between Respondents' Socio-Demographic Variables.

Independent t-test result						
Variable (Group)	**Males**			**Females**		
Age	Mean	SD	0.0343	Mean	SD	0.0000
15-24	3.14199	0.0180955		3.185824	0.6459138	
25-34	3.081272	0.022437		3.06327	0.7232785	
Place of residence			0.0058			0.0000
Urban	3.072908	0.7015643		3.076399	0.6690314	
Rural	3.151303	0.7724543		3.182752	0.6925263	

One-way ANOVA results for males					
Educational level					
	SS	df	MS	F	0.0008
Between groups	9.22858359	3	3.07619453	5.59	
Within groups	1526.54264	2776	0.549907291		
Religion					
Between groups	18.7789895	3	6.25966316	11.45	0.0000
Within groups	1516.99223	2776	0.546466943		
Ethnicity					
Between groups	78.5482667	4	19.6370667	37.40	0.0000
Within groups	1457.22296	2775	0.52512539		
Marital status					
Between groups	11.1673632	2	5.58368159	10.17	0.0000
Within groups	1524.60386	2777	0.549011113		
Region					
Between groups	133.639304	9	14.8488116	29.33	0.0000
Within groups	1402.13192	2770	0.506184808		

One-way ANOVA results for females					
Educational level					
	SS	df	MS	F	0.0008
Between groups	26.6073032	3	8.86910106		
Within groups	1272.73154	2779	0.457981842	19.37	
Religion					
Between groups	23.3759776	3	7.79199253	16.97	0.0000
Within groups	1275.96287	2779	0.459144608		

Ethnicity					
Between groups	12.8228189	4	3.20570473	6.92	0.0000
Within groups	1286.51602	2778	0.46310872		
Marital status					
Between groups	6.13302739	2	3.06651369	6.59	0.0014
Within groups	1293.20582	2780	0.465181948		
Region					
Between groups	66.4085946	9	7.37873274	16.60	0.0000
Within groups	1232.93025	2773	0.444619635		

P-value significant at <0.05

Source: Computed from GDHS 2008 data file

Table 4.11b: Pairwise Results of Respondents' Socio-Demographic Characteristics by Hours of Rest.

Tukey Post-Hoc test for males			
Hours of rest	Contrast (mean)	Standard error	p-value
Educational level			
Higher vs no education	-0.2188679	0.0647135	<0.05
Higher vs primary	-0.202821	0.0605809	<0.05
Religion			
Muslims vs Christian	0.1921108	0.0362092	<0.05
Traditional/spiritualist vs Christian	0.177467	0.0585029	<0.05
Other vs Muslisms	-0.1960768	0.0708374	<0.05
Ethnicity			
Ewe vs Akan	-0.2045573	0.0427476	<0.05
Mole-Dagbani vs Akan	0.2957061	0.0352214	<0.05
Mole-Dagbani vs Ga-Dangme	0.3934838	0.065148	<0.05
Mole-Dagbani vs Ewe	0.5002634	0.0460437	<0.05
Other vs Mole-Dagbani	-0.3757006	0.0440314	<0.05
Marital status			
Married vs never married	-0.0948401	0.0308682	<0.05
Formerly married vs never married	-0.3252338	0.0901953	<0.05
Formerly married vs married	-0.2303937	0.0922154	<0.05
Region			
Volta vs Western	-0.3298735	0.0646848	<0.05
Eastern vs Western	-0.2344934	0.0645644	<0.05
Upper West vs Western	0.4563456	0.0621438	<0.05
Greater Accra vs Central	-0.3421508	0.0655432	<0.05
Volta vs Central	-0.4960177	0.070014	<0.05
Eastern vs Central	-0.4006376	0.0699027	<0.05
Ashanti vs Central	-0.2530314	0.0637764	<0.05
Upper West vs Central	0.2902014	0.0676734	<0.05
Northern vs Greater Accra	0.3206173	0.0546686	<0.05
Upper East vs Greater Accra	0.2917613	0.0615288	<0.05
Upper West vs Greater Accra	0.6323523	0.0552936	<0.05
Ashanti vs Volta	0.2429864	0.0561353	<0.05

Brong-Ahafo vs Volta	0.3202494	0.0645393	<0.05
Northern vs Volta	0.4744842	0.0599559	<0.05
Upper East vs Volta	0.4456282	0.0662709	<0.05
Upper West vs Volta	0.7862192	0.0605263	<0.05
Brong-Ahafo vs Eastern	0.2248692	0.0644186	<0.05
Northern vs Eastern	0.379104	0.0598259	<0.05
Upper East vs Eastern	0.3502481	0.0661533	<0.05
Upper West vs Eastern	0.690839	0.0603975	<0.05
Northern vs Ashanti	0.2314978	0.0525373	<0.05
Upper East vs Ashanti	0.2026419	0.0596431	<0.05
Upper West vs Ashanti	0.5432328	0.0531874	<0.05
Upper West vs Brong-Ahafo	0.4659698	0.0619923	<0.05
Upper West vs Northern	0.311735	0.0572051	<0.05
Upper West vs Upper East	0.3405909	0.0637931	<0.05

Only significant pairings are shown in the table
Source: Computed from GDHS 2008 data file.

Table 4.11c: Pairwise Results of Respondents' Socio-Demographic Characteristics by Hours of Rest.

Tukey Post-Hoc test results for females			
Hours of rest	Contrast (mean)	Standard error	p-value
Educational level			
Primary vs no education	0.2710315	0.041244	<0.05
Secondary vs no education	0.2209683	0.0341247	<0.05
Higher vs primary	-0.2394048	0.07062	<0.05
Higher vs secondary	-0.1893417	0.0667129	<0.05
Religion			
Muslims vs Christians	-0.1862593	0.0344779	<0.05
Traditional/spiritualists vs Christians	-0.3248113	0.0651583	<0.05
Other vs Muslims	0.232793	0.0779251	<0.05
Other vs Traditional/spiritualists	0.371345	0.0955468	<0.05
Ethnicity			
Mole-Dagbani vs Akan	-0.1385802	0.0344263	<0.05
Other vs Akan	-0.1264835	0.0371092	<0.05
Mole-Dagbani vs Ga-Dangme	-0.1985568	0.0582341	<0.05
Other vs Ga-Dangme	-0.18646	0.0598593	<0.05
Marital status			
Married vs never married	-0.0940503	0.026514	<0.05
Region of residence			
Greater Accra vs Western	-0.2791907	0.0543505	<0.05
Brong-Ahafo vs Western	-0.3139317	0.0610315	<0.05
Northern vs Western	-0.5852909	0.0596606	<0.05
Upper East vs Western	-0.2416083	0.0652121	<0.05
Upper West vs Western	-0.2062425	0.0604549	<0.05
Greater Accra vs Central	-0.2848257	0.0592716	<0.05
Brong-Ahafo vs Central	-0.3195666	0.0654522	<0.05
Northern vs Central	-0.5909259	0.0641758	<0.05
Upper East vs Central	-0.2472433	0.0693669	<0.05
Upper West vs Central	-0.2118775	0.0649149	<0.05

Ashanti vs Greater Accra	0.1543894	0.0443534	<0.05
Northern vs Greater Accra	-0.3061002	0.0516124	<0.05
Northern vs Volta	-0.4407643	0.0602365	<0.05
Northern vs Eastern	-0.4086457	0.0569189	<0.05
Brong-Ahafo vs Ashanti	-0.1891303	0.0523268	<0.05
Northern vs Ashanti	-0.4604896	0.0507213	<0.05
Northern vs Brong-Ahafo	-0.2713593	0.0586064	<0.05
Upper East vs Northern	0.3436826	0.0629483	<0.05
Upper West vs Northern	0.3790484	0.058005	<0.05

Only significant pairings are shown in the table
Source: Computed from GDHS 2008 data file.

4.3.4.2 Multivariate Analysis

To examine the relationship between the selected socio-demographic characteristics and respondents' hours of rest following from the t-test and one-way ANOVA analyses, a Poisson regression was fitted. Hours of rest, the dependent variable, ranged from '1–10 or more' hours. The p-value (0.000) of the F-statistic indicates significant models for both males and females. The _hatsq values of 0.626 and 0.264 for males and females respectively indicate well specified models. Table 4.12 shows that ethnicity, marital status and region of residence are the most significant variables for male youth, while age, level of education, religion, ethnicity, place and region of residence are significant for female youth. There is a negative association between age and hours of rest. For example, females aged 25–34 have 2.6% less hours of sleep compared to those aged 15–24 years while holding all other variables in the model constant.

Level of education in females is related to hours of rest. Specifically, females with a primary or secondary level of education are expected to have 5.1% and 4.3% more hours of rest respectively compared to those with no education.

There is a significant association between religion and hours of rest among females. Females who profess the Traditionalist/Spiritualist religion have 6.8% less hours of rest than their Christian counterparts, while holding all other variables in the model constant. Also, Table 4.12 shows that ethnicity is significantly associated with hours of rest. Males who belong to the 'other' ethnic group would be expected to have 5.3% less hours of rest than their Ga-Dangme counterparts. Among females on the other hand, Akan and Ewe females would be expected to have 4.1% and 5.1% less hours of rest than Ga-Dangme females.

Males who are married and formerly been married would be expected to have 4.2% and 8.7% less hours of rest accordingly as against their never married counterparts. Place of residence is significantly associated with hours of rest. Specifically, females who reside in urban areas would be expected to have 4.6% less hours of rest than their rural counterparts.

Respondent's region of residence is statistically associated with hours of rest. Males resident in Central, Brong-Ahafo, Northern, Upper East, Upper West regions as against those living in the Greater Accra region would be expected to have 10.5%, 7.5%, 14.9%, 9.9%, 20.7% more hours of rest respectively. Males in the Volta region would be expected to have 5.4% less hours of rest compared to males in the Greater Accra region. Among females those in the Western and Central regions compared to females in the Greater Accra region, would be expected to have 5.4% and 7.2% more hours of rest respectively. However, females resident in the Northern region would be expected to have 12.7% less hours of rest compared to their counterparts in the Greater Accra region.

Table 4.12: Poisson Regression Analysis of the Association between Socio-Demographic Characteristics and Hours of rest.

	Male				Female			
Variable	IRR	S.E	95% CI		IRR	S.E	95% CI	
Age								
15-24(RC)	1.000	0.013	0.986	1.037	1.000	0.010	0.954	0.993
25-34	1.011				0.974*			
Level of education								
No education(RC)	1.000	0.023	0.981	1.073	1.000	0.017	1.017	1.086
Primary	1.026	0.023	0.969	1.060	1.051*	0.017	1.010	1.077
Secondary	1.013	0.029	0.910	1.023	1.043*	0.027	0.946	1.051
Higher	0.965				0.997			
Religion								
Christian(RC)	1.000	0.022	0.956	1.042	1.000	0.017	0.952	1.021
Moslems	0.998	0.223	0.983	1.071	0.986	0.021	0.891	0.975
Traditional/spiritualists	1.026	0.023	0.955	1.047	0.932*	0.025	0.968	1.068
Other	1.000				1.017			
Ethnicity								
Akan	1.004	0.027	0.953	1.058	0.959*	0.201	0.920	0.999
Ga-Dangme(RC)	1.000				1.000			
Ewe	0.994	0.027	0.942	1.048	0.949*	0.024	0.902	0.998
Mole-Dagbani	1.000	0.032	0.938	1.066	0.963	0.025	0.914	1.014
Other	0.947**	0.030	0.890	1.007	0.987	0.024	0.940	1.037
Marital status								
Never married(RC)	1.000	0.013	0.932	0.985	1.000	0.012	0.971	1.019
Married/living together	0.958*	0.035	0.846	0.984	0.995	0.019	0.966	1.040

Formerly married	0.913*				1.002			
Place of residence								
Urban	1.003	0.014	0.975	1.032	0.954*	0.013	0.929	0.979
Rural(RC)	1.000				1.000			
Region of residence								
Western	1.036	0.025	0.988	1.086	1.054*	0.026	1.005	1.107
Central	1.105*	0.036	1.035	1.179	1.072*	0.025	1.024	1.123
Greater Accra(RC)	1.000				1.000			
Volta	0.946**	0.030	0.889	1.007	1.020	0.027	0.969	1.075
Eastern	0.971	0.028	0.917	1.028	1.000	0.021	0.959	1.043
Ashanti	1.024	0.024	0.978	1.071	1.036	0.022	0.993	1.080
Brong Ahafo	1.075*	0.035	1.008	1.146	0.973	0.024	0.927	1.022
Northern	1.149*	0.040	1.072	1.231	0.873*	0.028	0.818	0.931
Upper East	1.099**	0.055	0.995	1.214	0.981	0.027	0.930	1.035
Upper West	1.207*	0.041	1.130	1.291	0.997	0.026	0.947	1.051
*<0.05, **<0.10	_hatsq = 0.626				_hatsq = 0.264			

Source: Computed from GDHS 2008 data file.

4.3.4.3 Discussion

Hours of rest among males are affected by ethnicity, marital status and region of residence, while among females hours of sleep are affected by age, level of education, religion, ethnicity, place and region of residence.

Age was negatively associated with hours of rest among female youth. This finding is consistent with findings of existing studies (e.g. Kachikis & Breitkopf, 2012; Ryu et al., 2011; Tu et al., 2012) who found shorter hours of sleep amongst older respondents. A contrary finding was reported by Laberge et al., (2014) who found no association between age and hours of sleep among respondents. Old age serves as a platform in attaining certain social statuses such as marriage, work, etc. Females therefore are expected to fulfil the responsibilities attached to these attained statuses such as balancing work, family commitments, and religious activities among others. They are thus likely to have inadequate rest than those younger in age.

The present study also found a statistically significant relationship between primary or secondary level of education and hours of rest. Level of education was negatively correlated with hours of rest. A finding from Kachikis & Breitkopf (2012) showed that individuals with low education reported shorter duration of sleep; Whinnery et al., 2014 observed a shorter sleep duration among individuals with less than a college education. Level of education attained may correspond with an occupation that may or may not deprive a person of sleep. Individuals with primary or

secondary education are usually engaged in work in the informal sector which may afford them the opportunity to have extra hours of rest.

Religion was significantly associated with hours of sleep in the current study. Specifically, females who professed Traditionalist/Spiritualist religions reported less hours of sleep than members of other faiths.

Males in the 'other' ethnic group as well as females belonging to the Akan and Ewe ethnic groups reported less hours of rest in comparison to all other ethnic groups. Whinnery et al., (2014) found ethnicity to be related to respondents sleep duration. On the other hand, Kachikis & Breitkopf (2012) established no relationship between ethnicity and hours of rest. The influence of ethnicity on hours of rest may be explained by social activities such as funerals, which notably keep societal members awake depriving them or adequate hours of rest.

Married and formerly married males reported less hours of rest than their never married counterparts. This finding corroborates the findings by Tu et al., (2012) who observed short hours of sleep among married respondents. However, Ryu et al., (2011) found divorced/widowed individuals to have long hours of sleep; Yoon et al., (2015) reported short hours of sleep in single people. On the other hand, no association was observed in terms of marital status and hours of sleep by Kachikis & Breitkopf (2012). Married male youth in the Ghanaian culture usually have inadequate hours of rest due to responsibilities to their immediate (parenting) and external families (e.g. funerals), as well as the work related roles they are faced with on a daily basis. On the other hand, the formerly married have less hours of rest perhaps due to the emotional and or psychological problems they are faced with on a daily basis arising from lack of companionship.

Females resident in urban areas were less likely than their rural counterparts to report adequate hours of rest. This finding is consistent with results from Lallukka et al., (2012) who found that rural dwellers had longer hours of sleep compared to urban residents. The fact that urban residents in Ghana have less hours of rest is perhaps a function of a multiplicity of factors such as lack of adequate public transportation, traffic congestion and the performance of multiple tasks like driving children to and from school.

In terms of region of residence and hours of rest, males in the Central, Brong-Ahafo, Northern, Upper East and West regions reported more hours of rest than males

in the Greater Accra region. These regions are less urbanised compared to the Greater Accra region thus, more hours of rest perhaps may be attributed to their engagement in less social activities such as clubbing and partying which tend to deprive males resident in urban regions of adequate rest. Females in the Northern region reported less hours of rest than females in the Greater Accra region. This is perhaps due to the cultural expectations of the majority ethnic group resident in this region. This ethnic group is mainly patrilineal and upon marriage women are absorbed into the patrilineal clan of the husband where the expectation is for the wife to discharge various responsibilities to the broader clan. These cultural obligations are likely to deprive these women of adequate sleep compared to their counterparts in the Greater Accra region which is more cosmopolitan and has more liberal ethos.

4.3.5 Portable Water Consumption

The human body is composed of about 60% water (Water Science for Schools', n.d.). Water is calorie free and therefore poses no danger to health. As such its consumption is expected to protect individuals from obesity and NCDs. It is very vital in hydrating the body, aids in digestion and for the removal of toxic substances and therefore considered medicinal. On the basis of these facts, and the fact that Ghana is situated in a tropical region, the Ministry of Health (MOH) in its RHNP recommends a daily consumption of at least eight (8) glasses of portable water.

4.3.5.1 Socio-demographic Differentials and water consumption

Table 4.13a shows the results of the independent t-test, one-way ANOVA and Tukey post-hoc test. The t-test results for females show statistically significant differences in the means for age ($p = 0.000$) but not for place of residence ($p = 0.0650$) as indicated by the p-values. The ANOVA results for female youth show statistically significant differences between the groups, ethnicity, marital status and region of residence while no differences are observed for education and religion. On the other hand, the t-test results for males show statistically significant differences in the means for age ($p = 0.000$) as well as place of residence ($p = 0.000$). Also for males, statistically significant differences are observed for educational level, ethnicity, marital status and region of residence, but no statistically significant differences in the means are observed for religion.

Following the ANOVA test which showed that the means were not all equal for ethnicity group, marital status and region of residence, the Tukey post-hoc test to determine which means were different was done. As Table 4.13b shows, a Tukey post-hoc test for females shows differences in water consumption in female youth are statistically significant among the Mole-Dagbani ethnic group compared to the Ewe group ($p = 0.046$) and females belonging to the 'Other' ethnic group consume more water than Ewe females ($p = 0.000$). Regarding marital status, more water consumption is significantly associated with the married group than the never married group ($p = 0.000$). Also, water consumption is significantly different between females residing in the Upper East region and those residing in the Western region ($p = 0.000$); and females in the Upper East region compared to females in the Central region consume more water ($p = 0.000$). The post-hoc test (see table 4.13c) for male youth also shows significant differences in water consumption between the higher education group and the no education group ($p = 0.037$); males with higher education consume more water compared to those with primary education ($p = 0.001$) and males with higher education take in more water than males with secondary level of education ($p = 0.038$). In terms of ethnicity, there are significant differences in water consumption between males in the Ewe group and males in the Akan group ($p = 0.026$); males belonging to the Mole-Dagbani group compared to those in the Akan group drink more water ($p = 0.015$) and more water consumption is significantly associated with males in the Mole-Dagbani group compared to their Ewe counterparts ($p = 0.000$). In terms of marital status, more water consumption is significantly observed in married males as against their never married counterparts ($p = 0.000$). With regards to region of residence, differences in water consumption are observed between several comparisons example, males residing in the Greater Accra region drink more water than males in the Western region ($p = 0.000$); also, males in the Volta region than those in the Western region consume more water ($p = 0.001$) and males resident in the Brong-Ahafo region drink more water compared to their counterparts in the Central region ($p = 0.004$).

Table 4.13a: Mean Differences between Respondents' Socio-Demographic Variables.

Independent t-test result						
Variable (Group)	**Males**			**Females**		
Age	Mean	SD	0.0000	Mean	SD	0.0000
15-24	5.429612	2.222018		4.673052	2.113792	
25-34	6.110424	2.25226		5.318817	2.254071	
Place of residence			0.0000			0.0650
Urban	5.917978	2.238825		5.036309	2.161226	
Rural	5.544819	2.26154		4.882272	2.23143	
One-way ANOVA results of females						
Educational level						
	SS	df	MS	F		
Between groups	24.3146076	3	8.10486919	1.68	0.1698	
Within groups	13432.1604	2779	4.83345103			
Religion						
Between groups	22.1531784	3	7.38439281	1.53	0.2053	
Within groups	13434.3218	2779	4.8342288			
Ethnicity						
Between groups	88.6201007	4	22.1550252	4.60	0.0010	
Within groups	13367.8549	2778	4.81204281			
Marital status						
Between groups	149.618994	2	74.8094969	15.63	0.0000	
Within groups	13306.856	2780	4.78663886			
Region						
Between groups	421.360972	9	46.8178858	9.96	0.0000	
Within groups	13035.1141	2773	4.70072631			
One-way ANOVA results of males						
Educational level						
	SS	df	MS	F	0.0012	
Between groups	80.689389	3	26.896463	5.30		
Within groups	14099.3808	2776	5.07902765			
Religion						
Between groups	39.6559646	3	13.2186549	2.60	0.0509	
Within groups	14140.4142	2776	5.09380914			
Ethnicity						
Between groups	140.26961	4	35.0674024	6.93	0.0000	
Within groups	14039.8005	2775	5.05938758			
Marital status						
Between groups	151.142894	2	75.5714472	14.96	0.0000	
Within groups	14028.9272	2777	5.05182832			
Region						
Between group	599.51824	9	66.6131378	13.59	0.0000	

Within group	13580.5519	2770	4.90272632		

P-value significant at <0.05

Source: Computed from GDHS 2008 data file

Table 4.13b: Pairwise Results of Respondents' Socio-Demographic Characteristics by Water Consumption.

Tukey Post-Hoc test results of females			
Water consumption	**Contrast (mean)**	**Standard error**	p-value
Ethnicity			
Mole-Dagbani vs Ewe	-0.4110991	0.1489361	<0.05
Other vs Ewe	-0.6350575	0.1554869	<0.05
Marital status			
Married vs never married	0.4737177	0.085051	<0.05
Region			
Upper East vs Western	1.115569	0.2120391	<0.05
Northern vs Central	-0.138987	0.2086699	<0.05
Eastern vs Greater Accra	-0.1392733	0.1668875	<0.05
Northern vs Greater Accra	-0.3846678	0.1678195	<0.05
Upper East vs Greater Accra	0.7525936	0.1883944	<0.05
Eastern vs Volta	-0.3709831	0.1950631	<0.05
Ashanti vs Volta	-0.7400901	0.1760586	<0.05
Upper East vs Volta	0.5208837	0.2137536	<0.05
Northern vs Eastern	-0.2453945	0.1850735	<0.05
Upper East vs Eastern	0.8918669	0.2039148	<0.05
Upper West vs Eastern	-0.7275843	0.1877788	<0.05
Upper East vs Ashanti	1.260974	0.1858179	<0.05
Upper East vs Brong Ahafo	1.209615	0.2089077	<0.05
Upper East vs Northern	1.137261	0.2046783	<0.05
Upper West vs Upper East	-1.619451	0.2071277	<0.05

Only significant pairings are shown in the table

Source: Computed from GDHS 2008 data file

Table 4.13c: Pairwise Results of Respondents' Socio-Demographic Characteristics by Water Consumption.

Tukey Post-Hoc test for males			
Water consumption	Contrast (mean)	Standard error	p-value
Educational level			
Higher vs no education	0.5281515	0.196671	<0.05
Higher vs primary	0.7166027	0.1841116	<0.05
Higher vs secondary	0.4391311	0.1640866	<0.05
Ethnicity			
Ewe vs Akan	0.3926644	0.1326872	<0.05
Mole-Dagbani vs Akan	-0.3427258	0.1093261	<0.05
Mole-Dagbani vs Ewe	-0.7353902	0.1429182	<0.05
Marital status			
Married vs never married	0.4930049	0.0936365	<0.05
Region			
Greater Accra vs Western	0.9992054	0.1861614	<0.05

Volta vs Western	0.8639772	0.2013107	<0.05
Brong-Ahafo vs Central	-0.8578511	0.221852	<0.05
Upper West vs Central	-0.7571981	0.2106115	<0.05
Eastern vs Greater Accra	-0.8724636	0.1805087	<0.05
Ashanti vs Greater Accra	-0.8125827	0.1570069	<0.05
Brong-Ahafo vs Greater Accra	-1.479911	0.1856714	<0.05
Northern vs Greater Accra	-1.089977	0.1701384	<0.05
Upper East vs Greater Accra	-0.7099007	0.1914884	<0.05
Upper West vs Greater Accra	-1.379258	0.1720835	<0.05
Eastern vs Volta	-0.7372355	0.1960952	<0.05
Ashanti vs Volta	-0.6773545	0.174703	<0.05
Brong-Ahafo vs Volta	-1.344683	0.2008577	<0.05
Northern vs Volta	-0.9547493	0.1865932	<0.05
Upper West vs Volta	-1.24403	0.1883685	<0.05
Brong-Ahafo vs Ashanti	-0.667328	0.1796129	<0.05
Upper West vs Ashanti	-0.566675	0.1655285	<0.05
Upper East vs Brong-Ahafo	0.77001	0.210422	<0.05
Upper West vs Upper East	-0.669357	0.1985353	<0.05

Only significant pairings are shown in the table
Source: Computed from GDHS 2008 data file

4.3.5.2 Multivariate Analysis

To examine the predictors of water consumption the Poisson regression technique is employed. The dependent variable, water consumption, reported by females ranged from '0' glasses of water a day to '20' glasses whilst males reported from '0' glasses of water to '15' glasses of water. Well fitted models are indicated by the _hatsq value of 0.551 for the male model and 0.424 for the female model respectively. Table 4.14 shows that age and region of residence are significantly associated with water intake among male youth, while age, ethnicity, marital status and region of residence are associated with water intake among females.

There is a significant association between age and water intake. Specifically, male and female youth aged 25–34 would be expected to consume 11.2% and 10.3% more glasses of water respectively compared to their counterparts aged 15–24 years.

Ethnicity is predictive of water intake among the youth in Ghana. For example, females in the 'Other' ethnic category compared to Ga-Dangme females, would be expected to consume 8.1% less glasses of water. Marital status in females is associated with water intake. Females who are married/living together are expected to consume 5.1% more glasses of water compared to those never married.

Youth in most regions consume less glasses of water compared to youth in the Greater Accra region. Males residing in the Western, Central, Eastern, Ashanti,

Brong-Ahafo, Northern and Upper West regions, would be expected to consume 14.5%, 9%, 10.8%, 11%, 22.7%, 14.9%, 17.7% respectively less glasses of water compared to their counterparts in the Greater Accra region. And for female youth, the water consumption of those in the Ashanti region would be expected to decrease by 9.3% glasses of water compared to those in the Greater Accra region. However, females residing in the Upper East region would be expected to consume 25.8% more glasses of water than their counterparts in the Greater Accra region.

Table 4.14: Poisson Regression Analysis of the Association between Socio-Demographic Characteristics and Water intake.

	Male				Female			
Variable	IRR	S.E	95% CI		IRR	S.E	95% CI	
Age								
15-24(RC)	1.000				1.000			
25-34	1.112*	0.022	1.070	1.156	1.103*	0.025	1.054	1.153
Level of education								
No education(RC)	1.000				1.000			
Primary	0.974	0.030	0.917	1.035	0.982	0.033	0.919	1.051
Secondary	1.008	0.028	0.954	1.064	1.023	0.031	0.964	1.085
Higher	1.021	0.039	0.948	1.100	1.027	0.049	0.934	1.129
Religion								
Christian(RC)	1.000				1.000			
Moslems	1.016	0.028	0.961	1.073	1.011	0.038	0.940	1.088
Traditional/spiritualists	1.053	0.045	0.968	1.147	1.038	0.052	0.941	1.145
Other	1.062	0.042	0.982	1.149	0.995	0.054	0.894	1.106
Ethnicity								
Akan	1.052	0.042	0.972	1.139	1.022	0.041	0.943	1.107
Ga-Dangme(RC)	1.000				1.000			
Ewe	1.022	0.044	0.938	1.114	1.027	0.049	0.934	1.129
Mole-Dagbani	1.024	0.054	0.922	1.136	0.927	0.053	0.828	1.038
Other	1.051	0.048	0.960	1.149	0.919**	0.045	0.834	1.013
Marital status								
Never married(RC)	1.000				1.000			
Married/living	1.024	0.020	0.984	1.065	1.051**	0.027	0.999	1.106
together	0.985	0.053	0.886	1.095	1.017	0.047	0.929	1.115
Formerly married								
Place of residence								
Urban	1.028				1.044			
Rural(RC)	1.000	0.023	0.983	1.075	1.000	0.030	0.986	1.106
Region of residence								
Western	0.855*	0.040	0.780	0.937	0.962	0.049	0.869	1.064
Central	0.910*	0.040	0.834	0.993	0.971	0.050	0.877	1.075
Greater Accra(RC)	1.000				1.000			
Volta	1.019	0.041	0.941	1.103	1.053	0.053	0.954	1.162
Eastern	0.892*	0.040	0.816	0.974	0.988	0.039	0.914	1.069

Ashanti	0.890*	0.029	0.835	0.949	0.907*	0.033	0.844	0.975
Brong Ahafo	0.773*	0.029	0.719	0.832	0.956	0.056	0.852	1.073
Northern	0.851*	0.035	0.785	0.922	0.985	0.062	0.871	1.114
Upper East	0.922	0.045	0.837	1.016	1.258*	0.069	1.130	1.400
Upper West	0.823*	0.038	0.751	0.902	0.923	0.051	0.828	1.029
*<0.05, **<0.10	_hatsq = 0.551				_hatsq = 0.584			

Source: Computed from GDHS 2008 data file.

4.3.5.3 Discussion

The analysis of water intake among the youth in Ghana showed that among males, age and region of residence were the significant factors, while age, ethnicity, marital status and region of residence were found to be the most significant among females. For age, the study showed that water consumption improved with increasing age. A similar finding was reported by Park et al., (2012) who found younger respondents (≤ 15years) consumed less water. However, other studies found that older age individuals consumed less water than younger people (e.g. Drewnowski et al., 2013; Goodman et al., 2013). As far as the present study is concerned, the finding in Ghana is that the older youth consume more water probably because of the type of activities in which they are engaged. That is water intake may depend on the physical nature of their work.

The present study has shown that water consumption among the youth in Ghana differs by ethnic identification. In that, females belonging to the "other" ethnic group consume less water than youth in all other ethnic groups. This finding is corroborated by Goodman et al., (2013) in the US who found a low probability for subjects belonging to "other" ethnic group in drinking adequate amount of water compared to whites, although other studies e.g. Drewnowski et al., (2013); Park et al., (2012) found no association between ethnicity and water intake. As far as the finding of the association between ethnicity and water consumption in Ghana is concerned, the variation in water consumption is probably due to the relative access to and or availability of water to members of the 'other' ethnic group due to the commercialization of portable water.

The present study found that married and youth who live together with a partner consumed more water than youth in all other marital statuses. This may be part of the general advantages marriage entails as opposed to be single, divorced or widowed. Because marriage couples tend to encourage each other towards such

healthy behaviour as adequate water consumption due to its health benefits. Regions vary in terms of water consumption although Ghana is generally a warm country. This is consistent with (Goodman et al., 2013) who found among Americans that there was an association between region of residence and the consumption of water. Regions in the northern part are considerably warmer than the Greater Accra region. However, the consumption of water depends largely on the availability of and access to portable water which also differs between and within regions.

4.4 Summary

The first section of this chapter employed such descriptive statistics as frequencies, percentages, means and standard deviations to examine the distribution of the socio-demographic characteristics of both females and males, while it also examined total lifestyle and BMI.

The second section sought to analyse the relationship between selected socio-demographic factors and lifestyle behaviours among males and females 15–34 years. The selected socio-demographic variables (independent variables) considered were age, education, religion, ethnicity, marital status, place and region of residence. The lifestyle behaviours (dependent variables) were dietary behaviour (consumption of fruit and vegetables), health risk behaviour (smoking and alcohol use), physical activity, hours of rest and water intake.

In terms of the socio-demographic impact on dietary behaviour (consumption of fruit and vegetables), analyses showed that, level of education, religion, ethnicity and region of residence were significant amongst both males and females. On the issue of health risk behaviours, the present study showed that smoking and alcohol use (health risk behaviour) among both males and females were significantly associated with age, religion, marital status and region of residence. On the other hand, level of education and place of residence were peculiar with males whiles ethnicity was peculiar with females.

As far as physical activity was concerned, the study showed that the significant socio-demographic factors among males and females were marital status and region of residence. Religion and place of residence of females significantly correlate with physical activity. With regard to hours of rest, ethnicity and region of residence were important amongst both male and female youth. However, for females, age, level of education, religion and place of residence were shown to be significantly

associated with hours of rest, while marital status was peculiar with males. Finally, age and region of residence were shown as predictors of water consumption in males and females, while ethnicity and marital status were shown to be peculiar with male youth with regards to water intake.

Overall, the results of the present study have shown that unhealthy lifestyle behaviours are prevalent among the youth in Ghana. The study was guided by the HBM, although only variables related to the social and demographic dimension of the HBM were available in the DHS which was not designed for the empirical assessment of the model. The findings about lifestyle behaviours have highlighted the importance of the socio-demographic dimension of the HBM as various socio-demographic characteristics have been identified to determine lifestyle behaviours among the youth.

Based on the significant predictors identified with the various lifestyle behaviours it is imperative on the part of government and stakeholders to consider these variables in the design and implementation of policies and programmes that are designed to promote healthy lifestyle behaviours. The following chapter addresses the relationship between total lifestyle practice (poor, good and very good) and BMI status in females.

CHAPTER 5

THE RELATIONSHIP BETWEEN TOTAL LIFESTYLE BEHAVIOUR AND BMI

5.1 Introduction

Individuals are advised to practice healthy lifestyles in all totality. As proposed under the regenerative health policy, individuals are advised to consume fruits, vegetables, refrain from smoking and alcohol, have regular physical activity, have adequate rest and drink eight or more glasses of water daily. These practices of healthy lifestyles are expected to influence BMI of respondents. Since BMI is a function of many lifestyle behaviours, an index summing all lifestyle behaviours was computed. It was categorised into poor, good and very good lifestyles. This is to provide knowledge on BMI status of respondents depending on how comprehensive the lifestyle they practice. The first section of this chapter presents the results of the Chi-Square which explored the association between background characteristics and BMI, background characteristics and total lifestyle and finally total lifestyle and BMI. In the second section, results of the multinomial logistic regression which investigated the relationship between total lifestyle and BMI while controlling for background characteristics are presented. However, due to the unavailability of anthropometric data for male youth this chapter focuses on data from females only.

5.2 Socio-demographic differentials and BMI

In this sub-section the effect of the socio-demographic characteristics of individuals on BMI were examined. Table 5.1 shows the percentage distribution of BMI by socio-demographic characteristics. Generally, most females report a normal BMI, whilst approximately 8% are obese. Results in Table 5.1 show majority of younger (15–24) females have a normal BMI (81.80%), while those 25–34 years report the highest percent of both overweight and obese females.

As far as education is concerned, respondents with no formal education are more likely to report a normal BMI status. Specifically, females with higher level of education are the most likely to be overweight and obese. Thus, generally, the proportion of overweight and obese respondents increases as the level of education increases.

Table 5.1: Percentage distribution of respondents BMI status by socio-demographic characteristics.

	BMI			Total	
Age	Normal	Overweight	Obese	No.	%
15–24	81.80	13.21	04.98	1553	100
25–34	60.64	28.13	11.23	1254	100
χ^2 value= 154.1364					
p-value = 0.0000					
Educational level					
No education	81.39	12.76	05.85	431	100
Primary	72.77	19.87	07.36	542	100
Secondary	71.23	20.53	08.24	1708	100
Higher	54.84	35.34	09.82	126	100
χ^2 value= 40.0219					
p-value = 0.0000					
Religion					
Christians	71.29	21.13	07.58	2216	100
Muslims	75.77	16.02	08.21	425	100
Traditional/spiritualists	78.43	10.48	11.09	86	100
Other	76.91	15.84	07.25	80	100
χ^2= 12.4190					
p-value = 0.1175					
Ethnicity					
Akan	71.09	22.05	06.86	1425	100
Ga-Dangme	62.45	24.02	13.54	207	100
Ewe	69.92	20.20	09.88	349	100
Mole-Dagbani	79.15	13.90	06.95	428	100
Other	76.82	16.10	07.08	398	100
χ^2= 35.6291					
p-value = 0.0021					
Marital status					
Never married	77.35	16.59	06.05	1349	100
Married/living together	68.04	22.93	09.03	1309	100
Formerly married	64.86	22.84	12.30	149	100
χ2= 34.6974					
p-value = 0.0000					
Place of residence					
Urban	63.92	25.93	10.15	1463	100
Rural	81.52	13.29	05.19	1344	100
χ^2= 107.4898					
p-value = 0.0000					
Region of residence					
Western	71.64	23.74	04.62	238	100
Central	73.12	21.38	05.50	226	100
Greater Accra	60.53	25.59	13.87	534	100
Volta	70.99	19.79	09.21	228	100
Eastern	69.39	19.96	10.65	282	100

Ashanti		71.99	22.26	05.75	590	100
Brong Ahafo		80.45	16.11	03.44	263	100
Northern		89.11	07.95	02.94	250	100
Upper East		76.26	10.54	13.20	126	100
Upper West		84.49	11.77	03.74	70	100
Total	No.	2031	558	218	2807	
	%	72.35	19.88	07.77		100
χ^2= 120.5815						
p-value = 0.0000						

Source: Computed from the GDHS 2008 data file.

In terms of religion, as Table 5.1 shows, the relationship between religion and BMI is statistically insignificant. Mole-Dagbani women are most likely to report normal BMI, while Ga-Dangme women report the largest proportion of overweight and obese women.

From the table, the never married respondents report a little above three-quarters (77%) of females with normal BMI status whilst, the married/living together and the formerly married have over one-fifth (23% and 23%) of overweight females respectively. Generally, the formerly married females report the highest percent of obese respondents.

As can be observed from the table, a greater majority of residents in the rural areas have a normal BMI, whilst female respondents in the urban areas have a higher percent of overweight and obese females.

The table shows that, the Northern region has the majority of females with a normal BMI. The Greater Accra region on the other hand, has the highest respondents of one-quarter (25%) who are overweight and about 14% of the obese.

5.3 Socio-demographic differentials and total lifestyle behaviour

This sub-section discusses the findings regarding the relationship between background characteristics and total lifestyle behaviour. Table 5.2 shows the percentage distribution of total lifestyle behaviour by the selected socio-demographic factors. Results showed the relationships between age, educational level, ethnicity, marital status, place of residence and total lifestyle behaviour statistically not significant. The table shows that about three-quarters (77%) of traditional/spiritualist female youths practice poor lifestyle while approximately one-third (36%) of Christians and Muslims practice poor lifestyles respectively. Muslims have the highest proportion (one-tenth) of female youths with very good lifestyle.

As far as region of residence is concerned, Table 5.2 shows that residents of the Upper West region are the most likely to report poor lifestyle (78%), and the least likely to report good and very good lifestyle behaviour respectively (17% and 4%). Central region has the second highest of about two-thirds (69%) of females practicing poor lifestyle and Northern region has the second lowest proportion (23%) with regards to good lifestyle.

Table 5.2: Percentage distribution of respondents' total lifestyle behaviour by socio-demographic characteristics.

Variable	**Lifestyle behaviour**			**Total**	
Age	Poor	Good	Very good	No.	%
15–24	55.27	35.62	09.11	1553	100
25–34	54.61	34.69	10.70	1254	100
$\chi^2 = 1.9998$					
p-value = 0.4498					
Educational level					
No education	62.63	29.18	08.20	431	100
Primary	54.94	35.20	09.86	542	100
Secondary	53.27	36.42	10.31	1708	100
Higher	52.02	39.36	08.62	126	100
$\chi^2 = 13.1210$					
p-value = 0.1029					
Religion					
Christians	54.23	35.92	09.85	2216	100
Muslims	53.73	35.89	10.38	425	100
Traditional/spiritualists	76.78	15.88	07.35	86	100
Other	58.79	32.34	08.87	80	100
$\chi^2 = 18.2008$					
p-value = 0.0174					
Ethnicity					
Akan	53.67	36.64	09.68	1425	100
Ga-Dangme	61.00	31.07	07.93	207	100
Ewe	59.32	31.56	09.12	349	100
Mole-Dagbani	57.22	31.58	11.20	428	100
Other	50.25	39.30	10.45	398	100
$\chi^2 = 13.4811$					
p-value = 0.3153					
Marital status					
Never married	54.48	35.30	10.22	1349	100
Married/living together	55.17	35.11	09.72	1309	100
Formerly married	57.70	35.11	07.20	149	100
$\chi^2 = 1.5414$					
p-value = 0.8625					
Place of residence					
Urban	57.40	33.58	09.02	1463	100

Rural		52.33	36.97	10.70	1344	100
χ^2 = 7.5214						
p-value = 0.1170						
Region of residence						
Western		48.35	37.25	14.41	238	100
Central		69.43	24.10	06.47	226	100
Greater Accra		60.12	29.78	10.10	534	100
Volta		54.89	35.68	09.43	228	100
Eastern		55.57	38.58	05.85	282	100
Ashanti		51.00	39.25	09.75	590	100
Brong Ahafo		36.19	53.99	09.82	262	100
Northern		68.14	23.55	08.31	250	100
Upper East		37.11	40.97	21.92	126	100
Upper West		78.53	17.04	04.43	70	100
Total	No.	1543	988	276	2807	
	%	54.97	35.20	09.82		100
χ^2 = 146.5555						
p-value = 0.0000						

Source: Computed from the GDHS 2008 data file.

5.4 Total lifestyle differentials and BMI

Table 5.3 shows the percentage distribution of BMI by total lifestyle. Results in the table, shows the relationship between total lifestyle and BMI is not statistically significant.

Table 5.3: Percentage distribution of respondents BMI status by total lifestyle behaviours.

Variable	**BMI**			**Total**	
Lifestyle behaviour	Normal	Overweight	Obese	No.	%
Poor lifestyle	72.11	20.37	07.52	1543	100
Good lifestyle	73.16	19.05	07.8	988	100
Very good lifestyle	70.79	20.07	09.12	276	100
Total No.	2031	558	218	2807	
%	72.35	19.88	07.77		100
χ^2= 1.4982	p-value = 0.8726				

Source: Computed from the GDHS 2008 data file.

5.5 Multinomial logistic regressions

Following from the bivariate analyses in which confounding variables are uncontrolled, there is the need for a multinomial logistic regression in order to ascertain how well a total lifestyle may determine BMI status.

5.5.1 Total lifestyle and BMI

In this sub-section, we seek to answer the question as to whether a person's total lifestyle behaviour affects their BMI status. To achieve this goal, the multinomial logistic regression was fitted. This was done in two stages. Firstly, only total lifestyle as a predictor variable was fitted. Secondly, the socio-demographic factors were included in the model. Table 5.4 shows the relative risk ratio (RRR) comparing female youths with poor and good lifestyles to those with very good lifestyle. In terms of the BMI, overweight or obese was compared to normal weight given that, all other variables in the model are held constant. The relationship between total lifestyle and BMI is not statistically significant.

Table 5.4: Multinomial logistic regression model showing the association between total lifestyle behaviour and BMI.

Variable	BMI					
	Overweight			Obese		
	RRR	95%	CI	RRR	95%	CI
Total lifestyle behaviour						
Poor	0.996	0.684	1.448	0.809	0.496	1.320
Good	0.917	0.620	1.357	0.827	0.497	1.339
Very good (RC)	1.000			1.000	0.082	0.201
constant	0.284*	0.203	0.397	0.129*		

*<0.05; **<0.10; normal weight is the base outcome or the reference category.
Source: Computed from the GDHS 2008 data file.

5.5.2 Total lifestyle, socio-demographic factors and BMI

As already indicated, whilst the first model had only total lifestyle as a predictor, the second model, introduces the socio-demographic factors as control variables. The result in Table 5.5 shows the RRR of the multinomial logistic regression. The relationships between age, educational level, religion, marital status, place of residence and region of residence on one hand and BMI status on the other, are statistically significant.

Age of respondents predict their BMI status. Older females (25–34 years) are more likely than younger (15–24 years) females to be either overweight or obese to normal weight. That is, the relative risk for females aged 25–34 years relative to those 15–24 years of being overweight or obese relative to being of a normal weight increases by a factor of 3.052 and 3.058 respectively after accounting for all the socio-demographic factors in the model. The level of education attain by females is related

to their BMI status. Females with a primary, secondary or higher level of education are more likely than those with no formal education to be overweight than have a normal weight. Likewise, respondents with a secondary level of education are more likely than those with no formal education to be obese than have a normal weight. For instance, the relative risk of being overweight relative to having a normal weight for females with a primary, secondary or higher level of education relative to those with no education would be expected to increase by a factor of 1.633, 1.618 and 2.232 respectively after controlling for the other variables in the model.

A respondent's religious affiliation is significantly associated with BMI status. Table 5.5 shows that females who profess Traditionalist/spiritualist beliefs are more likely than their Christian counterparts to be obese than have a normal weight. In other words, the relative risk of Traditional/spiritualist females relative to Christians of being obese relative to normal weight would be expected to increase by a factor of 2.262 holding the other variables in the model constant. The relative risk of being obese, relative to having a normal weight, is 77.3% higher for females who have formerly been married than for those never married, holding all other variables in the model constant. Place of residence is related to respondent's BMI. The relative risk of being overweight or obese, relative to having a normal weight, is 138.9% and 135.9% higher respectively for urban dwelling females than for those in the rural areas, holding all other variables constant.

In terms of region, the relative risk of being overweight, versus having a normal weight, decreases by 61.1% for females in the Northern region compared to females in the Greater Accra region, holding all other variables in the model constant. Furthermore, the relative risk of being obese, relative to a normal weight, decreases by 56.7%, 51.7%, 74.5%, 79.2%, 63.5% for females in the Western, Ashanti, Brong-Ahafo, Northern and Upper West regions respectively than for those residing in the Greater Accra region.

Table 5.5: Multinomial logistic regression model showing the association between total lifestyle behaviour, socio-demographic characteristics and BMI.

Variables	BMI					
	Overweight			Obese		
	RRR	95% CI		RRR	95% CI	
Total lifestyle behaviour						
Poor	0.983	0.665	1.452	0.823	0.497	1.365
Good	0.924	0.621	1.375	0.905	0.559	1.465
Very good (RC)	1.000			1.000		
Age						
15–24 (RC)	1.000			1.000		
25–34	3.052*	2.249	4.142	3.058*	2.095	4.462
Level of education						
No education (RC)	1.000			1.000		
Primary	1.633*	1.068	2.498	1.455	0.771	2.744
Secondary	1.618*	1.110	2.358	1.749*	1.013	3.022
Higher	2.232*	1.231	4.046	1.525	0.643	3.618
Religion						
Christianity (RC)	1.000			1.000		
Muslims	0.956	0.644	1.420	1.598	0.854	2.990
Traditional/spiritualists	0.885	0.413	1.893	2.262**	0.949	5.388
Other	0.858	0.435	1.692	1.170	0.508	2.695
Ethnicity						
Akan	0.822	0.490	1.380	0.689	0.362	1.309
Ga-Dangme (RC)	1.000			1.000		
Ewe	0.831	0.456	1.514	0.790	0.397	1.568
Mole-Dagbani	0.894	0.449	1.777	0.661	0.266	1.642
Other	0.904	0.486	1.678	0.645	0.297	1.400
Marital status						
Never married (RC)	1.000			1.000		
Married/living together	1.136	0.826	1.562	1.276	0.859	1.896
Formerly married	1.026	0.614	1.716	1.773**	0.917	3.429
Place of residence						
Urban	2.389*	1.843	3.096	2.359*	1.601	3.474
Rural (RC)	1.000			1.000		
Region of residence						
Western	1.196	0.756	1.893	0.433*	0.203	0.926
Central	1.265	0.743	2.151	0.628	0.285	1.386
Greater Accra	1.000			1.000		
Volta	1.231	0.739	2.051	0.905	0.439	1.864
Eastern	1.052	0.708	1.564	1.005	0.588	1.718
Ashanti	0.991	0.698	1.409	0.483*	0.293	0.798
Brong-Ahafo	0.698	0.454	1.073	0.255*	0.126	0.516
Northern	0.389*	0.206	0.734	0.208*	0.084	0.516
Upper East	0.663	0.316	1.394	1.567	0.701	3.506
Upper West	0.679	0.386	1.196	0.365*	0.138	0.964
constant	0.075*	0.034	0.165	0.045*	0.017	0.116

*<0.05; **<0.10; normal weight is the base outcome or the reference category
Source: Computed from the GDHS 2008 data file.

Discussion

An obesity prevalence of 7.77% was observed among females (15–34). This implies the risk to NCDs is present amongst female youth. It has also been found that one in five (20%) of female youth is overweight. Thus considering the prevalence of obesity and overweight it can be concluded that obesity, a risk factor for NCDs, is present amongst female youth.

The various categories of total lifestyle do not determine BMI status in the present study. This finding is consistent with findings by (Nikolaou et al., 2015; Valery et al., 2012) who failed to find a relationship between some of the components of total lifestyle and BMI. This finding is in contrast with findings from other studies that found that lifestyles of individuals predicted BMI (Di Milia et al., 2013; Martinez et al., 2014; Musaiger et al., 2014; Charlton et al., 2014; Grosso et al., 2014; Rivas-Marino et al., 2015). The present study created a sum of lifestyle behaviours to know how poor, good or very good lifestyles are related to BMI status whilst the cited studies used the various lifestyle behaviours separately in relation to BMI. Additionally, cited studies used age groups broader compared to the present study. These may explain the differences in findings.

The current study's results showed that age of females determines BMI. This finding about age's effect on BMI are corroborated by those of Letamo (2011); Moreno et al., (2013); Di Milia et al., (2013); Musaiger et al., (2014); Berg et al., (2015) who similarly found that older females were more likely to be overweight and obese than younger females. However, lower odds of obesity amongst older respondents were reported by Garza et al., (2011) and Rivas-Marino et al., (2015).

The level of education attained by females predicted their BMI status in the current study. Females with primary, secondary, or higher levels of education were more likely to be overweight, whilst obesity was observed amongst only females with a secondary level of education. Even though on one hand, education is expected to make people knowledgeable about benefits of healthy lifestyle, on the other hand, it also affords people a higher purchasing power through better jobs. Higher income propels people usually into unhealthy lifestyles. Findings from Letamo (2011); Memish et al., (2014) supports this finding although other studies observed a decline in overweight/obesity as educational level of females' increased (Atella & Kopinska, 2014; Al-Haqwi et al., 2015), while still others found no relationship between

education and BMI of respondents (Al Nsour, M. et al., 2013; Guerra et al., 2015). Variations in findings may be attributable to the various pathways education influences behaviour.

As far as the findings with regard to religion, doctrinal differences may explain the relationship between religion and BMI. The present study found that obesity was associated with Traditionalist/spiritualists. This finding corroborates the findings by Bharmal et al., (2013) among Indian immigrants. Adherents to this religion for instance, though consume local fruits and vegetables may not consume the imported types when the latter are out of season. Similarly, they are more inclined to consume alcohol and smoke among others. They are thus prone towards unhealthy lifestyles and this may plausibly explain why they are more likely to be obese than have a normal weight.

Formerly married females were more likely than their married counterparts to be obese, a finding which is consistent with Memish et al., (2014) among females in the Kingdom of Saudi Arabia. This may be explained by the absence of a partner. Due to this absenteeism, a reduction in income may occur thus formerly married females are likely to find healthy lifestyle unaffordable and this may contribute to their obesity.

The present study also found a statistically significant relationship between urban residence and BMI. Consistent findings are reported by Letamo (2011); De Moraes, Adami, & Falcão (2012); Rivas-Marino et al., (2015) who identified overweight or obesity among urban dwelling females; whilst Al Nsour et al., (2013) observed no association between rural or urban place of residence and overweight or obesity. The sedentary lifestyle in urban areas is likely to explain why urban resident females are more likely than females in rural areas to be overweight and obese. The difference in the finding of the present study and that of Al Nsour et al., (2013) may be explained by how modernisation is rapidly affecting rural areas within the respective contexts of the studies.

Females in all other regions are less likely to be overweight and obese compared to females in the Greater Accra region. Variations in BMI status by region of stay have been reported by Al Nsour et al., (2013) amongst Jordan women. Greater/Accra contains the national capital which is highly urbanised. Thus females in this region may be more sedentary compared to the other regions that are less

urbanised and therefore have people that are more mobile as a result of their daily physical lifestyles on small subsistence farms.

Summary

This chapter sought to examine the relationship between the practice of total lifestyle and BMI. Results showed rather that practice of total lifestyle do not predict BMI status; it was such socio-demographic characteristics as age, education, religion, place of residence and region of residence that predicted BMI status of female youth in Ghana.

On the whole, the findings of the current study are consistent with the epidemiological transition theory which posits a shift in the cause of mortality from infectious to NCDs. The growing prevalence of obesity among the youth in Ghana thus provides a strong support for the theory. Perceptions of youth (males and females) regarding lifestyles, BMI and barriers are discussed in the subsequent chapter.

CHAPTER 6

PERCEPTIONS ON BMI AND LIFESTYLE BEHAVIOURS

6.1 Introduction

This chapter explores the perceptions regarding body sizes, lifestyle behaviours and barriers to the practice of healthy lifestyle behaviours by the youth in the Ghanaian context. The quantitative analyses from chapter four to chapter six have shown that overall Ghanaian youth do not engage in healthy lifestyle behaviours. This situation of unhealthy lifestyles of the youth formed the context for the use of qualitative methods (focus group discussions) in this chapter. The reason for the use of the qualitative methods is because to understand lifestyle choices in relation to body sizes and NCDs requires embedding oneself in the deeper meaning of action by individuals and their groups. The chapter has two main sections. The first section discusses perceptions in relation to BMI, while the second section examines the perceptions of and barriers to healthy lifestyle behaviours.

6.2 Perceptions of BMI

The perceptions of people influence their attitudes and sometimes even the attitudes of others with which they interact. It is therefore important to know the perceptions of the Ghanaian youth with regard to BMI. This could greatly have an influence on healthy lifestyle behaviours of the youth. To answer the question as to how perceptions affect BMI, three related questions are posed:

(1) What are societal perceptions of body size in Ghana?
(2) Why do the youth in Ghana prefer particular body sizes?
(3) What are the means the Ghanaian youth use to acquire particular body sizes?

6.2.1 Societal perceptions on BMI

Perceptions of the Ghanaian society on the various body sizes could create normative expectations for the youth to desire specific body sizes. As pointed out in the introductory chapter, BMI serves as a risk factor to some NCDs and lifestyle behaviours such as unhealthy dietary behaviour, smoking, alcohol use, physical inactivity etc. These factors have been identified as risk factors for overweight, obesity and NCDs. This sub-section presents how communities perceive or think about people's body sizes when they see them.

Eating behaviour

Body Sizes of people tends to portray the socio-economic status of society members. In Ghana, big body sizes are associated with those who can afford to eat well, the normal body sizes with average income earners, whilst the slim or thin body size with the poor. This may prevent the youth from accepting diets of fruits and vegetables as they eat to gain weight to reflect their socio-economic position to the society. This perception of body size as a measure of a person's social status in society is illustrated by the following quotes:

"You think about the food the person eats. You think the person eats too much if the person is fat. If you are thin you are under feeding yourself." (Female, 15–24 years, English).

"Someone who eats food a lot, who does not exercise the body and also eats late in the evening. All these constitute to body weight or gain weight." (Female, 15–24 years, Ga).

"What they think about the person is when they see someone who is slim you think the person is not on good diet, that the person does not eat good food. Then on the other hand when the person is fat they think the person is eating good food." (Female, 25–34 years, English).

"Precisely, if you are fat everybody thinks you eat too much." (Male, 25–34 years, English).

Financial status

Also, individuals are observed to explain their increasing body sizes to mean they are wealthy since they are now able to afford a certain lifestyle. Within the Ghanaian society acquisition of wealth demands lifestyle change usually from healthy to unhealthy and such wealthy individuals are expected to engage in lifestyles such as unhealthy diet, alcohol use and physical inactivity among others as indicators of their status as illustrated by the following quotes:

"They say now you have money so you are able to eat some kinds of food and that is why you are putting on weight." (Female, 15–24 years, Ewe).

"If you observe fat people are sometimes well to do because when you look at classmates you see that the very fat ones are those who are rich so it is like they are well to do, yeah." (Male, 15–24 years, English).

Laziness

Ghanaian society is characterised by traditional occupations such as farming, fishing, trading and hunting and they symbolise ethic of hard work within the society.

Because these occupations are physically demanding, they are associated with particular body sizes. Due to their physically demanding nature, they are considered as adequate physical activity by those who engage in them. Therefore individuals who do engage in these traditional occupations get particular body sizes as opposed to those who do not engage in any such activities and are therefore considered as lazy. The quotes below illustrate these beliefs in the broader Ghanaian society:

"It is like those who are fat, they sleep a lot." (Male, 15–24 years, English).

"I think in my community what people think when people are fat is that they think they are lazy because they are over eating and they cannot work so they are lazy that's their perception. If the person is slim they take the person to be active." (Male, 25–34 years, English).

Chronically ill

Ghanaian society associates particular body sizes with ill health. The emergence of certain illnesses especially HIV/AIDS and their impact on the physical appearance has influenced the perception of society with regards to body sizes. In this regard, popular societal notions about slim/thin body sizes resulting from eating behaviour in terms of slim/thin individuals not eating well are overshadowed with such exogenous factors of symptoms of ill health. This tends to affect the choice of lifestyle behaviours with regard to body size as people strive to attain bigger body sizes as an attestation to society regarding their health status as shown in the following quotes:

"Well at times when some people see some people very lean they think the person might have got some diseases like HIV/AIDS that is the perception of some people in the community." (Male, 25–34 years, English).

"If you are slim in this area, you are not a normal person."

(Female, 25–34 years, Ga)

"If you are a slim person in this area, they see you as someone who is sick."

(Female, 25–34 years, Ga).

Well-being

Moreover, Ghanaian society perceives body size as a measure of the physical and or psychological well-being of its members. This measure is applied especially in the case with married women or those in an intimate relationship as this symbolises their male partners' socio-economic position to provide. For instance, within the Ghanaian society, females especially are expected to appear plump upon getting

married as this shows how well her spouse is maintaining her thus making her husband and in-laws proud. Such perceptions do not promote healthy lifestyles as individuals tend to choose all the unhealthy lifestyles in order to gain weight. This for instance is evidenced by the quotes below:

"For this place, when someone is slim they say that the person cannot take care of him/her self." (Female, 15–24 years, English)

"Gaining weight or having the body is now all about getting drugs because if you are slim means you don't take care of yourself and if you are big means you do take care of yourself."

(Female, 15–24 years, Ga).

"Ok, so if the person is slim they think that maybe she is thinking about something or something is worrying her that is why she is growing lean but if the person is fat and is married they think the husband is taking care of her well and everything is going on well with her that is why she is growing fat." (Female, 25–34 years, English).

"If you are a slim person in this area, they see you as … your husband is not taking care of you well or cheating on. That is people's perception about those who are slim in this area."

(Female, 25–34 years, Ga).

Biological factors

Ghanaian society sometimes views a person's body size as an attribute of their biological genes. Thus people are as they are due to their inherited genes. This may compel the youth to engage in unhealthy lifestyle choices since the cause of their BMI is attributable to factors they cannot control as illustrated by the quotes below:

"At times people look at the heredity like your mother is fat so you pick the fatness of your mother." (Male, 15–25 years, English).

"For mine [community] some think inheritance from the family because if you take a look at it you will see that it is something that is in the family." (Male, 25–34 years, English).

6.2.2 Perceptions on Why People Prefer Particular Body Sizes

In order to address the risk posed by body sizes to health, as well as the opportunity they present in terms of lifestyle choices, it is vital to know the reasons why individuals prefer particular body sizes over others.

The slimmer the smarter

People prefer a slim body size because to be slim is to be smart as in being fast in terms of movement. Slim body size has become an indicator of a modern, Westernized view of what smartness is in the Ghanaian context, in contrast to the

conventional traditional notion of a beautiful body size which preferred big body sizes. This, in fact, shows how the perception of beauty is gradually changing in the society. Individuals who perceive their body sizes as not conforming to this societal notion of beauty are likely to slim down through engagement in healthy lifestyle practices. This is illustrated in the quotes below:

"Also if you are slim you will be smart in everything you do especially climbing of stairs and everything so people wish to be slim and be smart in everything they do." (Female, 15–24 years, English).

"The church too if you use 6 yards to sew a dress and the church is going to do something like evangelism; they will not take you along because you will get tired on the way. So they will select the slim person so that things will be quick and doing things will be interesting. But if you are fat things become boring because everything of yours will be slow."

(Female, 15-24 years, Ga)

"A slim person does everything without getting tired whiles when you are fat, the little thing you do then you get tired. But the slim person walks up and down without getting tired, while the fat person works small then she gets tired."

(Female, 15–24 years, Ga)

Physical Attractiveness

The thought of looking physically attractive makes people prefer one body size over another. The Ghanaian society generally defines beauty as females who are physically endowed and usually referred to as 'African woman' and such individuals are also considered attractive in terms of their apparel as it shows off their bodily curves. Consequently, people with slim body sizes may decide to grow fat to be considered as attractive and or beautiful thus creating room for unhealthy lifestyle behaviours. For instance as illustrated in the following quotes:

"Some people think that when they are a little bit fat some dresses look nice on them so they wish to add on more weight so that when they wear some styles it will look nice on them."

(Female, 15–24 years, Ewe).

"Please concerning this issue, some people are slim so when they see people with big body and how their dress fit them, they also take interest in that." (Female, 15–24 years, Ga).

Avoiding Public ridicule

Society usually expresses their feelings regarding body sizes to the embarrassment of people. To avoid such public ridicule and raise self esteem, an individual may decide to favour one body size over another as a means of avoiding

public ridicule. This may create room for either healthy or unhealthy lifestyles as well as a risk for NCDs depending on the individual's choice of body size as illustrated by the statements below:

"Some also think if you are fat normally people talk a lot some may laugh so they want to be normal so that they will be free wherever they go." (Female, 15–24 years, English).

"Also if all my friends have gained weight and I am the only person who is slim and we are going to some place. As we reach a place, people will ask you why all your friends have body and you are the only slim person like that. They may think you have been worried. There was a time they said a women in our area who was slim has HIV. So if these things all happen like that, you will like to prove them wrong." (Female, 15–24 years, Ga).

Partner Preference

In marriage or intimate relationships partners attempt to please one another and in this regard females try to attain body sizes acceptable to their partners. Married females are also respected in the society as a result females strive to attain body sizes desired by men in order to get married. Society is seen to admire big body sizes and frowns upon thinness indicating their preference for a normal body size. That is a body size that is neither fat nor thin but of medium size. Consequently, the type of body size will influence lifestyle choices. This for instance is shown in the following quotes:

"Somebody thinks today I have heard that men prefer slim ladies so I have to work on my body so that I can become slim." (Female, 15–24 years, English).

"If a fat person walks with his boyfriend, he will tell her that you are too big so do something about it or I will end it with you and the same with slim people too" (Female, 15–24 years, Ga).

"As for my community it is because of their partner preference. Maybe the person's partner prefers slim or want her to be slim or fat so the person will try to become what the partner wants." (Female, 25–34 years, Ga).

Employment Opportunities

Companies or work places have images they project to the public. Based on this public image they employ people with body sizes that project their work image. Thus to ensure employability individuals will attain particular body sizes to ensure they get employed. This influences choices regarding lifestyle behaviours as illustrated by these quotes:

"Some also get up without thinking, look for work that says that they are interested in only slim people and here is the case may be you have a degree at school. When you

were at school, you had a normal body then you come and sit at home for a long period of time. You associate with friends and then you gain weight through their influence. When you then get a job offer, at the interview they will say that you are too fat but the degree that you are holding is what they also need." (Female, 15–24 years, Ga).

"Sometimes too the job or where the person works sometimes you see people going to the military or the police service and they try to reduce their weights." (Female, 25–34 years, English).

"Ok, some people may want to be athletes and athletes you don't have to be obese. Because if you are obese let's say the running for instance you can't run so some people may prefer the medium body size will help them to do their athlete work or whatever work they want to do that they think if you are obese you can't feel fine or feel free to do whatever you want to do."

(Male, 25–34 years, English).

Social Status

People attain certain body sizes as an indication of their wealth status through lifestyle choices, a situation which affects their body sizes. An indication of what society uses as a criteria for the wealthy and the poor. For instance:

"Others also think that fatness show that you are well to do so people struggle to become fat just to show to the world that they have money they are rich they eat good and they live good." (Female, 15–24 years, English).

Adverse Effect

This means Ghanaian youth attain certain body sizes not out of preference, but due to the negative medical implications for particular body sizes. The socio-economic status of people prevents them from accessing health care that prompt them to self medicate as it saves cost and time without knowing the implications on their body. Lifestyle choices of individuals may be affected negatively since they perceive the factors influencing their body size external to them. This is illustrated in the following quotes:

"… some of the medicines that we take do have effect on us. some are good for some kinds of body types, but under normal circumstances in our kind of setting we just self medicate so you go buy some drugs that they are selling and you are taking the medicine you feel dizzy, you sleep, you eat before you realise you are fat and others also slim you down." (Female, 15–24 years, English).

"Others own concern is family planning which makes them gain weight" (Female, 15–24 years, Ga).

Biological Factors

Due to inherited genes people have attained body sizes which may not be a preferred choice. Attributing their body size to biological reasons serves as a barrier in terms of healthy lifestyle choices as individuals perceive no control over the cause of their body size. For instance as illustrated from the following:

"As for me gaining weight that is in the families is such that when one is born slim and her other siblings are all fat, she will ask herself the reason why she is the only slim person." (Female, 15–24 years, Ga).

"Others own are heredity from their mother or father." (Male, 15–24 years, Ga).

"…because we have different types of body stature, but rather we'll say look at the person's heredity." (Female, 15–24 years, English).

6.2.3 Perceived Means to Acquire Different Body Sizes

Knowing how to acquire the different body sizes that people prefer also comes with the knowledge of how to deal with problems of being overweight and or obesity, especially for risk factors that are modifiable. The perceived means mentioned were broadly classified under personal factors (dietary behaviour and physical in/activity) and external factors (medications, psychological well-being and therapeutic effect).

Eating Behaviour

Eating behaviour has been identified as a means to attain certain body sizes based on knowledge acquired through their eating behaviour and consequent body size realised. A carbohydrate based food full of energy is dominant in most Ghanaian dishes. So, depending on the quantity eaten certain body sizes can be attained. Individuals are therefore seen to be in control of this behaviour depending on what body size they want to achieve. This is illustrated below in the quotes:

"…to them if you eating and sleeping you can grow fat…" (Female, 15–24 years, English).

"At times you must if you are fat if you want to grow slim you must reduce your food [voice not audible] instead of eating in the night is not good so people may advise you not to eat heavy food in the night[voice not audible] reduce the quantity." (Male, 25–34 years, English).

Physical Activity

The knowledge regarding benefits of physical activity on body size presents the youth with an opportunity to obtain their desired body sizes as illustrated in the following quotes:

"…if you are exercising your body doing vigorous work can slim you down." (Female, 15–24 years, English).

"Others do exercise to reduce the fatness." (Female, 25–34 years, English).

"Ok some people think if you are fat and you want to be slim or reduce your weight you have to engage yourself in a lot of exercises." (Male, 25–34 years, English).

Medications

The availability of external means such as medicines for weight gain within the Ghanaian society provides some youth the means to attain preferred body size, while the effects of certain prescribed medicines such as iron tablets for reasons of ill health may also leave people with certain body sizes. This as a means in attaining a preferred body size may have influence on choice of lifestyles by the youth as illustrated in the quotes below:

"Gaining weight or having the body is now all about getting drugs because if you are slim means you don't take care of yourself and if you are big means you do take care of yourself." (Female, 15–24 years, Ga).

"Maybe when someone like you lose appetite and so when you go for medicals then they will give you some drugs that will make you to eat and then you may grow or increase in size." (Female, 25–34 years, English).

Stress-free Life

A stress-free life has also been perceived generally by Ghanaians as a means to be overweight or obese. Due to this, the youth also use it in attaining one body size or the other and consequently influence choice of lifestyle behaviours. As indicated in the following quote:

"Sometimes when you want to grow fat the doctors they advised that you have peace of mind though it is not easy but they counsel for you to have a peace of mind." (Female, 25–34 years, English)

Medical Benefits

Societal perception of the medical benefits of certain fruits makes its members use them, especially to attain preferred body size. A common drink in the Ghanaian community is the use of fresh lemon or the bottled lemon juice, a particularly popular drink among females for weight reduction. This as a means for attaining body size means individuals may choose unhealthy lifestyles and depend on lemon juice as a means of weight reduction thus preventing the practice of healthy lifestyle among the youth. This for instance is illustrated below:

"Yes, and if you are fat and you want to reduce your weight some people they take lemon to reduce their weight." (Female, 25–34 years, English).

6.3 Perceptions about Lifestyles

The choices of lifestyles, such as dietary behaviour (fruits and vegetables), smoking, alcohol use, physical activity, are influenced by how society perceives such lifestyles.

6.3.1 Fruit consumption

As a result of its low calories, daily fruit consumption of five servings is recommended by the WHO and MOH of Ghana, with the objective of reducing the risk to obesity and NCDs. Ghana has a range of locally produced fruits as well as imported ones for consumption. As a result, the youth were asked about the values attached to their intake.

6.3.1.1 Importance attached to fruit consumption

People are most likely to consume fruits if they perceive it as important. These reasons then serve as a means to promote healthy lifestyle behaviours. The following value labels were derived from the discussions.

Therapeutic Effect

The consumption of fruit is valued on the basis of the healing effects people know can be derived from eating them. This means Ghanaians do not consider them as part of their lifestyle and so do not eat fruits as a matter of preference, but generally eat them for health benefits promoted by professionals such as doctors. . For instance, Amo-Adjei & Kumi-Kyereme (2014) in their study attested to this where Ghanaians considered the intake of fruits and vegetables as "alien" to them. This tends to influence the intake of fruits as they will only consume based on a doctor's or a health worker's recommendation. For example as illustrated from the quotes:

"..and others take it because of health reasons. They went to the hospital and the doctor says they should eat a lot of fruits and it is not a habit for him or her, but because the doctor says he should eat a lot of fruits." (Female, 15–24 years, English).

"*It makes the body fresh, active and energetic. It also makes your voice soft, fights diseases and prevents constipation."* (Female, 15–24 years, Ga).

"…so if you realise that your digestion is not that right and later on you see that there is a change you begin to add it [fruits] to your diet." (Male, 15–24 years, English).

"Taking orange for instance, orange contains fibber and the fibber helps digestion. It prevents constipation. So with that a lot of people will like to eat oranges." (Male, 25–34 years, English).

Poverty

In Ghana, people consume fruits because of the status it seemingly confers on a person. Society views the nature of fruit to be less satisfying in comparison to the staple foods and its intake is associated with Western culture (Amo-Adjei & Kumi-Kyereme, 2014). Therefore the perception seems to be that fruits are consumed by the educated elite and the rich in the society. This perception is captured in the quote below:

"Yes, not available to them and sometimes very expensive. Yes it is not close to them and it is expensive that is why they don't take them." (Female, 25–34 years, English).

Seasonality

Also, fruit is not readily available to Ghanaians due to seasonality (Amo-Adjei & Kumi-Kyereme, 2014) and the inclusion of fruits is a costly expense in addition to their staple food. Due to this, people attached no value to fruit and are not likely to eat it. As noted in the following quotes:

"The money that will be used to buy the fruits will rather be used for food that will satisfy the person." (Female, 15–24 years, Ga).

"The problem is that there is no money for even food, not the extent of buying fruits." (Male, 15–24 years, Ga).

"Most of them don't take fruits because they would rather use the money to buy food to eat." (Female, 25–34 years, Ga).

"Looking at our side of the country things are a little bit expensive, so if you don't have enough money you don't see the reason why you should use your money to buy it when you can actually use it to buy food and eat to get whatever you want. You can satisfy yourself by eating the food instead of buying the fruit. After eating the fruit you will still feel hungry so people instead of using their money to buy the fruit they will over look it and go and buy the food." (Female, 15–24 years, English).

Dislike

People prefer their staples while they develop dislike for fruits based on the inadequate or lack of education on the nutritional benefits associated with fruits. Thus they attach no importance to its intake as indicated in the quote below:

"If you come to this Ga community, they don't like fruits. They don't eat fruits. You only see this fruits at market and roadside." (Female, 15–24 years, Ga).

"Some they don't just like it. People like me I don't like taking fruits." (Female, 25–34 years, English).

Sexual and Singing Benefits

Attached to the use of certain fruits is their value in helping to boost the sexual performance of men. Such values are likely to promote the consumption of certain fruits by males because of the medical value attached to them. For instance, the youth perceive banana as having properties to boosts the sexual performance of men. Additionally, individuals who sing tend to attach particular importance to fruits because they believe it contributes to them having a smooth singing voice. Since singing have become a source of fame and income in the society through the many organised talent searches for music icons and the daily emergence of musicians. The commonly used fruit is the banana. These values are illustrated by the statements below:

" and to add to that banana as is concerned it has advantage for the men. A man who takes banana a lot you are likely to see your penis heavy. It contains some enzymes that contains a hormone that increases the size of a penis." (Male, 25–34 years, English).

"Ok, let's take banana for instance. Some people think if you want to have a smooth voice you have to take in a lot of bananas. So people go in for it to get smooth voice." (Male, 25–34 years, English).

Due to the importance attached to fruit intake, participants were asked how common fruit consumption was among youth between the ages of 15 and 34 years, the data showed various attitudes in terms of its consumption. Fruit intake is considered not common because of its seasonality as it becomes costly. They are then commonly consumed when they are in abundance, physically accessible and cheap. This tends to influence consumption as seen from the quantitative findings where some youths are not consuming. This is illustrated in the quotes below:

"No, it is seasonal so it is not an everyday thing." (Female, 15–24 years, English).

"It is not common and we don't talk about fruits. Not because the fruits are not common here, it can be found around but does not eat them." (Female, 15–24 years, Ga).

"Most of them don't take fruits because they would rather use the money to buy food to eat" (Female, 25–34 years, Ga).

6.3.1.2 Relationship between fruit intake and body size

Participants were asked about their perception of the relationship between fruit intake and body sizes. This is because the perception of any such relationship may influence the intake of fruits among the youth. On the whole, participants did not see any relationship between fruit intake and body sizes. This may be because of the fact that many youth are ignorant of the benefits fruits have on body size. However, the data showed that the youth mostly know about the curative effects of fruits. Based on these issues some youth see no link between eating fruit and body size. Thus your body size is as it is not because of the absence of fruits in your diet. This is illustrated from the quotes below:

"I don't agree with the fact that fruits are linked with body size. It does not reduce weight, but just checking the body system." (Female, 25–34 years, Ga).

"They don't know that is why the consumption is low." (Male, 25–34 years, English).

"I know it gives us vitamins, but I don't know whether it causes body changes." (Male, 15–24 years, Ga).

"No. the reason being that we do not see the importance of it. We are not exposed to…we don't value it. I am plump because I don't eat fruits? I don't think so." (Male, 15–24 years, English).

"I don't think so. Ok, in our community here they don't think you have to eat fruit unless it is prescribed by a doctor or maybe you attempt to have enough money to buy fruit. Others are seasonal so whether you eat fruits or not if you become fat you become fat. But that is the mind set of our society." (Female, 15–24 years, English).

However, some youths consume fruits because of the knowledge that it would reduce their body size. This means that not all youth are ignorant of the benefits associated with fruit intake. Thus, being equipped with the knowledge regarding its low calories compared to the staple foods, they are encouraged to take it to achieve their desired body size. For instance:

"It helps the fat people so I would say they are linked. They relate in the sense that if you gain weight, doctors can advise you on fruits." (Female, 15–24 years, Ga).

"Oh, because they want to reduce weight they change their eating habits as in they don't eat a lot of carbohydrates, cholesterol foods. They rather prefer vegetables and fruits because they believe that they[vegetables and fruits] won't give them a lot of weight but it will just give them the vitamins and minerals they need for their body." (Female, 25–34 years, English).

6.3.2 Vegetable Consumption

Like fruits, vegetables are also noted to be low in calories. Based on this, its daily intake of five servings is recommended by WHO and MOH of Ghana with the objective of reducing the risk to obesity and NCDs.

6.3.2.1 Importance attached to vegetable consumption

Ghana has a range of locally produced vegetables, but also relies on importation. In this section, the focus is to ascertain the youth's perception of the importance of vegetable consumption.

Food Recipe

Ghanaians attach an importance to vegetables due to its usage in food preparation. Thus they use them not for the matter of preference for health, but for the purpose of the process of food preparation. The Ghanaian meals (sauces and soups) are prepared with tomatoes, pepper, garden eggs, green vegetables among others thus integrating some vegetables daily in the meal preparation. The youth, learn to develop the love and liking for such vegetables as an integral part of the cooking process and thus consuming them. In an effort to improve consumption one means is to teach or introduce youth to vegetable consumption. This is shown in the following quote:

"In our setting here there is so much importance attached to the eating of vegetables because we have been taught. Majority of the people have pre-knowledge about the nutrients that they get… but for the green leafy vegetables they think oh doctor says it is good and I can grow some just behind my backyard so let me just eat it and others also think without it they can't eat the food so they just have to use it." (Female, 15–24 years, English).

"It adds taste to the food." (Male, 15–24 years, English).

Healing Effect

Some vegetables are also consumed due to the curative effect associated with it. Ghana has a variety of vegetables and most are perceived to have medicinal benefits, thus individuals consume them for the specific ailments they are perceived to cure. Some members of the society prefer the use of self-prepared medicines from vegetables they know would cure their ailments compared to accessing Western medicine at a clinic or hospital. This then creates room to promote vegetable intake making their healing potency known. As noted from the following:

"Well, I will say the garden eggs we have the smaller ones [known locally as ghost garden eggs] my mum used to say that it gives blood." (Female, 25–34 years, English).

"Taking cabbage, cabbage is a fibre on its own so it helps in digestion."
(Male, 25-34 years, English)

"You see some of these green vegetables they contain iron and iron you know helps in the building of the blood cells or haemoglobin." Male, 25–34 years, English).

Spiritual Protection

The broader Ghanaian society is very religious and people perceive their world as being influenced by both good and bad spiritual forces. In this worldview, people perceive misfortunes as the result evil spiritual forces. Individuals therefore tend to protect themselves against such means by using various herbal medicines. Individuals then are likely to utilise such herbs or vegetables because of these spiritual and healing properties they are believed to contain. This belief and perception are illustrated by the quote below:

"It is also said that when you take garlic witches and wizards can't attack you so people have make a point any time they are going out to take garlic." (Male, 15–24 years, English).

The data showed that vegetables are commonly accepted amongst the youth as part of meal preparation. This means since some vegetables are not eaten for their known benefit, but for the fact that they commonly form part of the staple food preparation, ensuring daily consumption. As indicated from the quotes below:

"… I've grown to see my mother using it, so it is normal that in preparing okro[okra] soup I've to add spinach to it so I get spinach. Without spinach I just can't have my okro[okra] soup so I just have to add it." (Female, 15–24 years, Ewe).

"I'll say yes because we eat soup every day," (Male, 15–24 years, English).

"Yes, they commonly take green leafy vegetables, garden eggs, okro, cabbage, carrot, green pepper, the cucumber." (Female, 25–34 years, Ga).

6.3.2.2. Relationship between fruit, vegetable consumption and body size

In order to know whether the youth have any perceptions about any form of relationship between their vegetable intake and body size, the following relationships are derived from the focus groups. Ignorance about the relationship of vegetable intake to body size, the benefits of daily vegetable intake amongst the youth prevents them from knowing the influence on body size. The youth consume such vegetables

daily and they perceived them as part of the meal preparation to give it taste or make the recipe complete and not for any other reason. As illustrated from the quotes:

"But looking at it from the general point they will only say the normal thing go you are eating good so you are becoming fat but as for linking it to the point of vegetables no." (Female, 15–24 years, English).

"Because it is usual when you take meals with pepper, it is sweet and it is just normal. It is not anything that you will be hoping to acquire something." (Male, 15–24 years, English).

"Just like fruits, vegetables don't add up or reduce your weight. When you take vegetables it also keeps you fit, but has nothing to do with body size." (Female, 25–34 years, Ga).

"In relation to the body size, no." (Male, 25–34 years, English).

However, other youth perceive a link between some vegetables they eat and the influence on the body size based on self arrived knowledge. They tend to patronise such vegetables to gain the said benefit they perceive as shown in the following:

"Because like the garlic I said earlier, if you take a drug to get body and realize that garlic helps the body and I need something to make me lose weight, and realize garlic does this then I will eat more garlic so that I get solution to my problems." (Female, 15–24 years, Ga).

Still other youths have a mixed perception with regards to the nature of relationship between vegetables and fruits on body sizes. As a result of these positive or negative relationships they have observed they are likely to consume more vegetables or less. This also indicates the need to consider other lifestyle behaviours since consuming fruits and vegetables in addition to unhealthy lifestyles may not bring out the expected results. For instance:

"I'll say yes and no because I know a friend who eats a lot of vegetables and fruit, but he is still very very fat. But some too they do take it and their body size is moderate. So for the fat guy he doesn't believe fruits and vegetables are related to his body size, but for the others it is working for them so they believe in it." (Female, 25–34 years, English).

6.3.3 Perceived Barriers to Healthy Dietary Behaviour (fruit and vegetable consumption)

Participants indicated healthy dietary behaviour (fruit and vegetable consumption) as not common among the youth as some youths were not consuming

vegetables in spite of the importance attached to them. Barriers to healthy dietary behaviour (fruit and vegetable consumption) perceived by the youth fall under these broad themes, namely external factors (upbringing, poverty, seasonality and absence of education), logistical factors (cost and physical access), quality and adverse effects.

Absence of Education

The lack of education on the benefits of intake of fruits and vegetables in the upbringing of the youth is a barrier to healthy dietary behaviour. This is because they do not have knowledge on its benefits and thus not familiar to their consumption. Thus the inability of the youth to consume fruits and vegetables has been attributed to this. For example as shown in the quotes below:

"Some of us it is due to the upbringing. In my house I was not train to eat fruits so even though I know the importance I don't feel like eating it because it is not a habit." (Female, 15–24 years, English).

"Here lies the case, I'm in a house where no one likes fruits or don't see the importance of it. I think for younger ones the obstacle could be our parents." (Male, 15–24 years, English).

"At times some also say they are not brought up that way. My mum didn't teach me that I should always eat vegetables, so I just don't know the reason why I should take it now. I'll not take it at all." (Female, 15–24 years, English).

"I think it applies to the value and the culture to eat. Because you go outside the country you see it like it is compulsory to take it. Even their meals are vegetable based. They eat it with rice, bread, and if you don't like vegetables you can't eat any of them." (Male, 15–24 years, English).

Upbringing

The lack of education on the benefits of fruits and proper preparation of vegetables serves as an obstacle to healthy dietary behaviour. This indicates an upbringing devoid of such knowledge as indicated in following quotes:

"[Voice not audible]… if they educate us and tell us the importance of taking fruits… will take it serious." (Male, 15–24 years, English).

"We lack the knowledge using to prepare food [vegetables]." (Female, 25–34 years, Ga).

"…the lack of education among the majority of us on the essence of eating it [fruits]." (Female, 25–34 years, Ga).

Poverty

Another barrier identified is poverty. Since fruits especially are perceived as not filling compared to staple foods that are carbohydrate based making their purchase a drain on finances as illustrated by the following quotes:

"The money someone is having will not reach the level of buying fruits. If someone is given money and he use it to buy fruits, where will he get money to buy food?" (Female, 15–24 years, Ga).

"They will rather use the money to buy foods like rice, banku and kenkey than fruits. The money I will use to buy fruits, I will add more money to it and buy food to eat is what they say" (Female, 15–24 years, Ga).

"Most of them don't have money to buy. They also don't buy it because it will not satisfy them" (Female, 25–34 years, Ga).

Seasonality

Agriculture in Ghana depends on erratic rainfall and in times of failed or inadequate rainfall, fruits and vegetables become scarce and expensive. The rainfall pattern serves as an obstacle to healthy dietary behaviour as illustrated in the following quotes:

"Also I think it's seasonal, someone likes watermelon and watermelon has a season, so if it is not the time for watermelon they don't take it." (Female, 15–24 years, English).

"They like eating fruits during their season. When it is not a particular fruit season, it is expensive so they don't buy." (Female, 15–24 years, Ga).

Physical and Financial Access

Additionally, logistical factors of accessibility (physical and financial) to fruits and vegetables prevent its intake. The youth perceived physical and financial inaccessibility to fruits and vegetables within the society as a barrier to practicing healthy dietary behaviour as shown in the quotes:

"Our climatic region there are some fruits you can't grow we need in our body so if they import can we afford it?" (Male, 25–34 years, English).

"...some people too because it is expensive they don't buy." (Female, 25–34 years, English).

"It is not available to them. Fruits like apples are not even common over here." (Male, 15–24 years, Ga).

"We take in about 90% of vegetables every day because vegetables like pepper and tomatoes are being used for food every day. But there are some that we don't likely

use them like cabbage and green pepper. They see these ones as expensive and classify it as rich people's own." (Female, 25–34 years, Ga).

Quality

One other barrier affecting healthy dietary behaviour results from the quality of the fruits and vegetables purchased and consumed in the society. This relates to poor farming and post harvest practices that affect the quality of fruits and vegetables as illustrated from the quotes below:

"Some fruits when you take them they are not nice. Especially those that are bought outside let's say the market and those fruits have their seasons and then when the season is not due they do induce ripping for most of them and if you eat them they are not nice. Also when you take some fruits you may see these micro-organisms in them which when some people see in them they feel like it will be in all of them like I am afraid I'll see it in." (Female, 15–24 years, English).

"The fertilizers used in the vegetable farms are some of the reasons why people don't like eating vegetables." (Female, 15–24 years, Ga).

"Also some people if the okro [okra] is not cultivated by themselves they wouldn't take it. Because most vegetables are not well taken care of in the market." (Female, 15–24 years, English).

Adverse Effects

The negative outcome (adverse effects) that some youth or other members of the society may have associated with certain fruits and vegetables through self-established causal effect based on observations or hearsay are preventing healthy dietary behaviour amongst them as indicated below in the quote:

"I'll say health wise they said taking okro [okra] will make your waist pain you or you get 'koko' [piles] so to prevent waist pains or piles you don't take okro [okra]." (Female, 15–24 years, Ewe).

6.3.4 Smoking Behaviour

Society associates smoking with improper upbringing or deviance behaviour. Because of this societal attitude towards smoking (e.g. hard drugs, tobacco and cigarettes), individuals who indulge in this behaviour are perceived as social misfits. This is because smoking in turn is associated with other anti-social behaviours such as stealing to sustain such habits and acts of disrespect associated with it. This has further been illustrated from the following quotes:

"*No, smoking has led to junkies and street boys. When they start smoking then they behave like adults like disrespecting people. Smoking is disturbing our health, socially and economically."* (Female, 25-34 years, Ga).

"Our tradition frowns against smoking. Our tradition or culture frowns on it and you are considered as a bad person so that's the perception we have." (Male, 25-34 years, English).

The data showed that the youth associate negativity with smoking which may serve as a means to prevent such behaviour. Some of these dangers associated with smoking mentioned were in regards to the effect on health such as:

"You will get cancer throat [voice not audible], and if you are pregnant it can have an effect on the baby." (Female, 15–25 years, English).

"It will give you kidney problem and cancer." (Female, 15–24 years, Ga).

"A lot. They have even written on it that smoking kills. It affects the lungs. Sometimes it gives you heart cancer or hole in heart. It also makes people's mouth to change which tells people that something is wrong with you. It gives them a different smell. It also makes you deform in size, you become weak and can be seen that you not feeling well." (Male, 15–24 years, Ga).

"It destroys the heart and those that smoke weeds mouths become black." (Female, 25–34 years, Ga).

Despite the fact that the youth perceive smoking as a social vice and therefore frown upon it, participants acknowledged its popularity among their peers. This is an indication of conflict between societal expectation and what actually is happening amongst the youth. This explains why in most cases youth who smoke do so by hiding their behaviour as illustrated by the following statements by some of the participants:

"Looking at the type you want to smoke for the sniffing of the cocaine and the other hard drugs they are expensive, so it is stem for certain high class of people who do it. But for the normal one's like the cheap cigarette I've talked about you see now a day you go about and you see all small boys holding stick in their hand and smoking." (Female, 15–24 years, English).

"It is very common and some of them also go to the sea side to smoke. When the situation gets worse, you cannot even control them. Even when visiting the KVIP too. It makes them high when they are walking around and they see big things very small." (Female, 15–24 years, Ga).

"Just that here people are afraid of smoking in public. Don't think people are not smoking." (Male, 15–24 years, English).

6.3.4.1 Importance attached to smoking

The youth give a variety of reasons for smoking. While some youth justify the use of cigarettes, others do not see the value of it. Some of the reasons cited by the

youth include the following: external factors (societal status, academic excellence, financial status and therapeutic effect) and internal factor (public confidence).

Peer Influence

Some youth indulge in smoking in order to live up to their sub-culture.. This is as a means of fitting in, in relation to their peers with the aim to achieve and have a sense of belonging as shown in the following quote:

"Others also do it because oh I'm in this class and I know this class of people do smoke so let me also do it to show people that I'm there." (Female, 15–24 years, English).

Academic Excellence

Within the Ghanaian society, youth who engage in the act of smoking usually are irregular with school attendance. They perceive the dependence on such substances will consequently aid them academically to study with the aim to make up for absenteeism and skipping classes. For instance according to the quote below:

"High school, those who smoke said that if you smoke you are able to learn." (Female, 15–24 years, English).

Financial Status

Smoking can be an expensive habit to maintain usually depending on what is being smoked. Youth who indulge in such behaviour are perceived as thieves who steal to be able to afford the habit, particularly hard drugs. Consequently, one's ability to afford is viewed as a sign of wealth:

"As for weed itself, it is not expensive. Cocaine, when they hear that you've bought cocaine then you are the baron." (Male 15–24 years, English).

Therapeutic Effect

Youth smoking behaviour is a result of association with other peers or from its perception as having healing properties. Thus some youth smoke not out of preference but as an escape mechanism in relation to circumstances around them. For instance as a means for individuals to escape or cope with their mental health state as shown in the following quote:

"I heard it takes depression away." (Female, 25–34 years, English).

Confidence

As part of the growing process and skills required in the work environment, individuals are expected to acquire or develop their public confidence and self esteem.

Despite the societal norm with regards to smoking, some have seen it as a source of confidence booster and thus engage in it. This is illustrated in the quote below:

"Well, some people say when you smoke you will be able to work well. If you are the shy type, assuming you are a teacher going to school and you are the shy type, if you smoke and you come to class you will be able to face the class very well and teach well so it takes the shyness away." (Female, 25–34 years, English).

Despite the discrepancy between societal expectation in terms of smoking and actual behaviour among the youth, some youth still conform to the societal expectation based on the evidence presented by those who smoke for the reason that the behaviour disintegrates the societal fabric. For example as shown below:

"No, smoking has led to junkies and street boys. When they start smoking then they behave like adults like disrespecting people. Smoking is disturbing our health, socially and economically." (Female, 25–34 years, Ga).

"Our tradition frowns against smoking. Our tradition or culture frowns– on it and you are considered as a bad person, so that's the perception we have." (Male, 25–34 years, English).

6.3.4.2 Relationship between smoking and body size

Youth perception of the relationship between smoking and body size is explored in this section. Data on this relationship will serve as a means of addressing the problem of youth smoking since society perceives it as an anti-social behaviour. On the whole, some youth are ignorant about the relationship between smoking and body size. Whilst some are not because, smoking entails financial cost and individuals have to choose between buying a cigarette/hard drugs or spending money on a meal. This tends to affect their body size in that, when they choose the cigarette or hard drugs over food they go without food probably for days and this consequently affects their body size. Thus based on an individual's financial capability the impact of smoking may either be evident or not. The relationships between smoking and body size are illustrated in the following statements by some of the participants:

"It does not, because it destroys our body. It makes them look disturbed and destroys the intestines. It makes their mouth dark and also makes you not to know your left or right which will be obvious to everybody that you are a wee smoker. It makes them look like someone who is sick" (Female, 15–24 years, Ga).

"Body size? I'll not agree, but when you are smoking you have a black mouth." (Male, 15–24 years, English).

"No no, because those who smoke just smoke." (Female, 25–34 years, English).

"I'll agree on one condition, that people who smoke that I have studied, some of them at the beginning they have nice body size so when they begin to smoke they are plump. They are very nice anytime they enter into smoking because they are not so well to do. They don't have money to buy food that will maintain that body structure. They reduce and the people in the society begin to say it is because of the smoking that is why because that is not how they used to be." (Male, 15–24 years, English).

"It reduces your weight. Give someone my type just two weeks and he will be very slim that you can count his ribs. It reduces the weight alongside killing you." (Female, 25–34 years, Ga).

6.3.5 Alcohol Use

Like smoking, alcohol use by the youth is considered as an anti-social behaviour. Therefore this behaviour is frowned upon by the broader society. However, many traditional religious rituals within the Ghanaian society are alcohol based. This situation makes the use of the beverage acceptable for such purposes. This appears to be a contradiction in the society as alcohol is accepted for religious rituals, but society views individuals who use it as social misfits. Nevertheless, the youth are aware of the dangers associated with alcohol use as evidenced by the statements below:

"Some people develop lung and kidney problems." (Female, 25–34 years, English).

"It makes them look old and weak. Their body will be deteriorating and they know their life is getting over." (Female, 15–24 years, Ga).

"Alcohol destroys your lungs." (Male, 15–24 years, English).

"It reduces the thinking ability. Things that can be solved amicably would be hard for a drunkard. They also can't see well." (Male, 15–24 years, Ga).

In relation to alcohol use among the youth, most participants were of the view that the use of alcohol is common among the youth. The popularity of alcohol use among the youth is attributed to availability of such beverages within their environment in the form of drinking spots and bars that sell mainly cheap locally brewed alcohol. This point is illustrated by the following quotes from some of the participants:

"It is common they will tell you the percentage of alcohol in the drink is not much so they can take two bottles." (Female, 15–24 years, English).

"Our age group loves to drink alcohol a lot. They inherited it from their mothers because their mothers do send them to go and buy the alcohol." (Female, 15–24 years, Ga).

"It is very common." (Male, 15–24 years, English).

"It is very common around." (Female, 25–34 years, Ga).

6.3.5.1 Importance attached to alcohol use

Despite the negative societal tag and dangers associated with the use of alcoholic beverages, its use is observed to be common and thus necessary to know the importance attached to its usage. This is because the importance attached to its use becomes a motivating factor for usage.

Coping Mechanism

The youth attach coping measure as a reason for its use. Alcohol is used by people to deal or cope with issues around them and also gain public confidence. As people usually say they are burying their problem in the bottle showing preference over the bottle than trusting people. An indication of how people literally hide behind alcohol use to engage in manner of activities. The negative outcomes are attributed to the alcohol and individuals take credit for positive outcomes:

"One reason is that when they are in some kind of problem and they take the alcohol they forget the problems. And then I have some nurses who take it because they work in the theatre and they feel like the things that go on there are filthy and then when they take the alcohol they can be able to withstand it, yeah." (Female, 25–34 years, English).

"Others too, it is because of shyness. If they take it they can talk in public anyhow they want to talk but if they don't take the alcohol they can't stand in public and talk but if you take it you can stand in public and talk and do whatever you want to do." (Female, 25–34 years, English).

Therapeutic Effect

Some individuals take alcohol not because they like it, but simply because of their perception of the healing properties associated with it. Some locally or traditionally brewed alcoholic beverages are noted to be effective cure for certain ailments. Alcoholic beverages are considered as the activating potent for most of these concoctions as people mix it with traditionally prepared concoctions or herbs. Thus though society frowns upon alcohol use by the youth they are accepted under such conditions creating room for those who want to consume to do so justifiably. This is illustrated in the following:

"Sometimes they use alcohol to mix local medicines." (Female, 15–24 years, English).

"You know when you are saying the thing when you go to our traditional communities they will tell you that you add a little alcohol to the medicine it will make you good…" (Male, 15–24 years, English).

"Yea, I was having a problem and a nurse advised me to try gin, you mix it. But I told her I can't. But they said it is good for low B.P." (Female, 25–34 years, English).

"Sometimes some medicines are prescribed with alcohol, especially our local medicines. They'll tell you to mix it with these gins." (Male, 25–34 years, English).

Appetite

Alcohol has been associated with food consumption. Thus, though society frowns on it, modernity has found a means to lure people to use alcohol because it gives them the appetite to eat. Thus people use alcohol to aid them in eating. For the love of a well prepared food, Ghanaians will consume alcoholic beverages prior to eating. This for example is illustrated by the following:

"Some people think if they want to eat much then they will have to drink." (Male, 25–34 years, English).

For Academic Purpose

To prevent failure and to avoid a tag of being an intellectually dumb person, individuals sometimes rely on substances such as alcohol as a stimulant to enable them to study effectively. Pocket size sachets are now common in the society for easy carrying thus promoting alcohol use among the youth. For instance,

"Yes, it boosts their morale as to learning. Some people think that when you take alcohol you will be able to learn well." (Female, 25–34 years, English).

For Fun

However, some youth engage in alcohol use without any importance attached, but for entertainment purposes. The lack of re-creative activities among a gathering of young people tends to promote alcohol use, especially as for entertaining during festive periods. Its use usually makes them loose and most tend to engage in immoral activities and they consequently deny responsibility of their action. Evidence for this is illustrated in the following:

"Sometimes people take it for fun. In my area like this when it is getting to these festive like yam festival and Christmas, Easter, people will come and sit down in groups and they put alcohol down if you are able to drink an amount they will give you some money…" (Male, 25–34 years, English).

6.3.5.2 Relationship between alcohol use and body size

It is important to explore the relationships the youth perceive between alcohol use and their body sizes as its usage was valued among them. The nature of relationship they perceive exist between the use of alcohol and body size may provide

a means to address alcohol use among them. From the discussions some groups mentioned the existence of a relationship between alcohol use and body size, whilst others too admitted their age mates view no link between alcohol use and body size. A relationship between alcohol use and body size is seen from the link between alcohol and eating. In that, people consume it prior to eating in order not to waste food. For example, on the relationship between alcohol intake and body size the following quotes illustrate how some youth perceive this relation:

"Others also say, oh taking the hard liquors check your body weight. It makes you not too fat if you eat well it will help you have a very good body size so they prefer the hard liquor." (Female, 15–24 years, English).

"Ok, I'll say something. Sometimes when you prepare excessive fufu [a staple food] you can't take you can take small quantity of alcohol to enable you take all the fufu and by taking that I think it may improve our body size." (Male, 15–24 years, English).

"Some people have to drink before sleeping and others too have to drink before they can eat. Most of them are addicted. It makes people to become slim or lose weight." (Male, 15–24 years, Ga).

"Yes, because when they see the adults the alcohol addicts they are very very slim with flaccid bodies so they know that when you become an alcohol addict this is what will happen to you. That one is clear." (Male, 25–34 years, English).

Some youth do not see any relationship between alcohol use and body size as they think people take it for the purposes of its therapeutic or healing properties without awareness of its link to body size as clearly illustrated by the following quotes:

"It is not good at all and most of them die out of it. If you are infected with measles, you will be asked to drink alcohol for them to leave your body. But it just have to be something small and not for a long period of time just three days or so. There is no link between our body size and alcohol." (Female, 15–24 years, Ga).

6.3.6 Perceived Barriers to Alcohol and Smoking Cessation (Health Risk Behaviour)

Due to the importance attached to these health risk behaviours and growing popularity in relation to smoking and alcohol use, obstacles perceived as means preventing the youth in stopping these behaviours are discussed here. Perceived barriers the youth have regarding the inability to stop smoking or alcohol use is the motivating reasons why they engage in such behaviours. The barriers are: social

factors (fun, peers, academic and religion), defence mechanism (coping, confidence), dietary behaviour and logistical factor (access).

For Fun

For the reason of entertainment with friends the youth engage in health risk behaviour for the reasons of making merry indicating the lack of recreational activities for the youth in the society and this tend to serve as a barrier in terms of stopping these health risk behaviours as shown in the following quotes:

"…some just for fun they also want to try it [smoking]." (Female, 25–34 years, English).

"Most of us think it's fun. My friend, a party is on going here bring some cup…". (Male, 15–24 years, English).

Peers

Youths who engage in these behaviours get encouragement from peers as the society frowns upon it. Thus those who smoke or use alcohol have their kind of crowd that tend to promote such behaviour among them serving as a barrier to stopping smoking or alcohol use and this is indicated in the following:

"Some it is their peers, as my sister said, due to peer pressure. And when they get into it they try to influence other friends and then the chain continues." (Female, 25–34 years, English).

"Peer pressure and because people are doing it." (Female, 25–34 years, Ga).

Religion

The Ghanaian society is largely a religious society and people's behaviour is explained by their religious doctrines. Religion has been identified as a barrier by participants in terms of stopping health risk behaviour. This is because religious doctrines or practices can create the atmosphere to promote such practices irrespective of the general societal norm as shown in the following:

"It depends on the cultural and religious aspect. Largely, it is the traditional religion that likes to drink. Muslims do not like drinking. The Christians too, some don't like it. And the traditional people take them because of their cultural rites." (Male, 15–24 years, Ga).

Coping Mechanism

Participants were of the view that for purposes of coping or adapting to adverse consequences, the youth do smoke and drink alcohol. Due to the presence of social support, especially from external families, people confide and depend on them

in times of need. However, the social support system of the traditional extended family is crumbling due to modernisation and urbanisation. As a result, the youth now tend to depend on substances as a means to cope in dire times of need. This means that as long as the extended family system is unsupportive, the youth will engage in such health risk behaviours thus preventing them in stopping these behaviours. Evidence is illustrated in the quotes below:

"Some too their parents are dead they don't have anybody to take care of them so they are involved in that [smoking]." (Female, 25–34 years, English).

"To remove stress and they try to forget about their problems." (Male, 25–34 years, English).

"They also drink to forget about certain things that have happen to them" (Female, 15–24 years, Ga).

"To me, I think it is timidity. You think that when you smoke it will give the courage [voice not audible]." (Male, 15–24 years, English).

Appetite

Most food joints have drinking bars attached to them as people associate the ability to eat more with alcohol intake. Due to this, the youth engage in the use of alcohol to enable them eat a lot of food. This creates the urge among young people to engage in the use of alcoholic beverages with their meal. This consequently serves as a barrier in stopping alcohol use amongst the youth as illustrated in the following:

"Appetisers, starters, I want appetite to eat so I have to drink." (Female, 15–24 years, English).

"For appetite, yes, most of them believe it is for appetite." (Female, 25–34 years, English).

Access

Further, the availability or physical access to alcoholic beverages and or cigarettes/cocaine/marijuana within the community or the home setting serves as an obstacle in terms of stopping these health risk behaviour amongst the youth as shown below:

"…also I think exposure is a factor because it is there you just take it and drink." (Male, 15–24 years, English).

6.3.7 Physical Activity Behaviour

Physical activity has been recommended as healthy for the body as it is known to reduce the risk to obesity and NCDs. Consequently, the WHO and MOH recommends

daily physical activity for all. Due to this, physical activity behaviour among the youth was explored.

6.3.7.1 Importance attached to physical activity

Due to the importance attached to physical activity, the values attached to it are discussed as this may serve as an internal motivation to engage in physically involving activities. These have been identified as the therapeutic effect and for physical appearance and weight management.

Therapeutic Effect

Individuals engage in physical activities for reasons of its health benefits generally in reducing risk to illnesses or sicknesses. This means some individuals are equipped with knowledge on health benefits and this knowledge is compelling them into being physically active as illustrated in the following:

"Also they think doing these physical activities jogging, running makes them fit and not be always sick and those stuffs." (Female, 15–24 years, English).

"It also helps to burn excess fat in the body." (Female, 15–24 years, English).

Physical Appearance and Weight Management

To appear physically attractive or appealing as well as manage their weight or body size, the youth are motivated to engage in physical activities. This becomes their motivation rather than the health benefits of engaging in such activities. This is shown in quotes below:

"They think that when they go they will reduce their weight." (Female, 15–24 years, English).

"I'll say they do. My sister like this used to go to the gym because she is fat, so she is trying to reduce her weight. So she use it a lot." (Female, 25–34 years, English).

"Some also take it to be prestigious, to have six packs. When you lift your shirt people see it like 'macho' [strong] man and people will appreciate you." (Male, 15–24 years, English).

On the contrary, others attached no importance to physical activities as a result of their busy schedules. The youth do not want to be burdened with physical activities. This is an indication of the lack of knowledge of the benefit of physical activity among the youth. The following quotes showed this:

"For me, no, because most of my friends are busy with their studies and social media and stuff so they don't really have time for jogging and exercise. Unless of course it is

an excursion or a games programme being organised, they don't exercise." (Female, 25–34 years, English).

"For some Sundays or Saturdays are for climbing the mountain and just to have fun." (Male, 25–34 years, English).

The data showed that physical activities are popular among the youth, probably based on the importance attached to it. The awareness of the merits concerning physical activity showed some youth taking up physical activity, whilst others do not because of the lack of knowledge of it. On how common or uncommon physical activity is among the youth, is illustrated in the following comments:

"It is very common because in our age group our parents do send us a lot. So while you are walking you may think like you are just running an errand, but little do you know that you are helping your body." (Female, 15–24 years, English).

"The people in the community do exercise, like jogging or keeping fit." (Female, 25–34 years, Ga).

However, one group thought otherwise:

"Once before you see someone dressed that he or she is going to do a physical activity." (Female, 25–34 years, English).

6.3.7.2 Relationship between physical activity and body size

Despite the different views on the importance of physical activity and how common it is among the youth, the data showed a consensus regarding the relationship between being physically active and body size. All groups acknowledged the existence of a relationship between being physically active and the body size. On the relationship between physical activity and body size, although the youth acknowledged such a relationship some did not translate the knowledge into practice. Even for those who did acknowledge it, they do so only on health grounds. Still others understand it to signify one's socio-economic status in that the wealthy have huge body sizes due to accessible transport system, while the poor are thin on the basis of cost. The relationship with body size is clearly illustrated in the following statements:

"Yes. Normally when you see somebody who is fat, society sometimes talks as if oh the person is rich. The person only eats and sleeps without doing any exercise that is why the person is fat. And when they see you very slim, they term it as oh there is no money, you are suffering, walking up and down. How can you become fat?" (Female, 15–24 years, English).

"And some of them they are fat, they don't go for any exercise or anything. But they will be telling you that if I were to go to the gym or something I wouldn't have been

like this. It means that they have the knowledge of it and they know that if they exercise it regulates their body size." (Female, 25–34 years, English).

"I agree with him because most people that I see that are fat they suffer from hypertension, so they try to jog and do these exercises to reduce weight. It is the weight that leads to their hypertension, so most of them do that." (Male, 25–34 years, English).

6.3.8 Perceived Barriers to Physical Activity

Participants in the focus groups identified barriers perceived in relation to being physically active. This is important since not all youth engage in physical activity in spite of the values attached to it and its perceived relationship with body size. Specifically, they mentioned intrinsic factors (laziness, upbringing and chastity) and extrinsic factors (modern means of transportation, safety, ill health and busy schedules).

Laziness

The youth are lazy about physical activity generally because of the lack of knowledge about its benefits. This is because we are not brought up to value physical activity within our immediate surroundings. This is illustrated in the following:

"Some people are lazy to exercise and complain of not getting any important thing from it." (Female, 15–24 years, Ga).

"Exercising is discipline that especially going to the gym, going for jogging especially when you are working or schooling you have to wake up early to the gym or go for a walk …the time to wake up and go for exercise or even to go after work to the gym I think is discipline." (Male, 15–24 years, English).

Upbringing

The lack of knowledge about the benefits of physical activity due to the nature of upbringing has been identified as a barrier to physical activity. As the youth grow up without observing such behaviours they are not likely to engage in physical activity. As illustrated for instance in the following quote:

"And if you are not used to it, you just can't get up every morning and say you are going for jogging, but if you've done it before then you are used to it even with that your working thing you can still do it and go to work." (Female, 25–34 years, English).

Chastity

A barrier to physical activity is seen in the societal values in relation to chastity. Sex is expected to happen within marriage to prevent promiscuity and for

that reason the youth are encouraged to avoid premarital sex. Consequently, the youth strive to prove their virginity at marriage. Because of this, female youth who are virgins are reluctant to engage in physical activity since physical activity is wrongly perceived as threat to maintaining a girl's virginity. This is illustrated below:

"Some ladies they have the perception that when you engage in exercises your hymen will be broken and then if they marry the man ask if they are virgins and they say yes and they go on the bed and after the first sexual intercourse and there is no blood the man will say you are not a virgin meanwhile it was because of the exercises they have done your hymen is broken. So they are with fear that if they go into marriage their husbands may not trust them because they think they are not virgins." (Male, 25–34 years, English).

Modern Means of Transportation

Barriers external in preventing the youth from physical activity are discussed here. The availability, physical access and financial access to transportation within the society serve as an obstacle to physical activity among the youth as shown below in the quote:

"I have a friend who always says I wasn't brought up walking, my daddy always picks me wherever I want to go whenever so even if the car is not available I have money to pick taxis." (Female, 15–24 years, English).

Safety

Since physical activity is not common in the society, individuals who go for a walk or a jog at dawn or at other odd times entertain the thought of been attacked. This fear poses as a barrier to the youth as illustrated in the following quotes:

"Because they don't like exercising alone, with the fear of being attacked on the way." (Female, 15–24 years, Ga).

"They won't allow you if you want to, they are just afraid." (Male, 15–24 years, English).

Ill Health

Some people are not physically active because of choice but due to health issues. Thus the health condition of a youth could prevent him/her from partaking in physical activities as shown in the quote below:

"Sometimes complicated health issues. May be you are sick and you wish to walk, but because of your health status you either have to go in a cab." (Female, 15–24 years, English).

Busy Schedules

Some youth are physically inactive due to the lack of education on the benefits of physical activity and the lack of importance placed on it. These factors together prevent physical activity. This is illustrated in the following quotes:

"Some are lazy and others don't have or get the time for it." (Male, 15–24 years, Ga).

"Sometimes too it is due to the work you are doing. Sometimes you go to work a nurse like this you go to work in the morning then come back late so waking up early to go for jogging before going back to work again become a problem." (Female, 25–34 years, English).

"People are not physically active sometimes because of their work and schedules." (Male, 25–34 years, English).

6.3.9 Hours of Rest

From earlier chapters (4 and 5) rest has been noted to be medicinal and at least 7 hours of rest is recommended in RHNP by MOH. The data showed the understanding of rest from the perception of participants and this is illustrated by the following quotes:

"Just relaxing. You are tired and you want to lie down." (Female, 15–24 years, English).

"I think generally lying down in bed." (Male, 15–24 years, English).

"Among my friends when you sleep for like thirty minutes they will tell you I was resting or I just went to relax, but for sleep you see that the person will sleep for some number of hours and rest very well." (Female, 25–34 years, English).

"They see it as sleeping and getting up at 10 o'clock in the morning. They walk throughout the streets and back to bed. They only rest in the afternoon when they have somewhere to go in the evening." (Female, 25–34 years, Ga).

6.3.9.1 Importance attached to hours of rest

The youth's perception of the importance of rest is discussed in this section. Since people practice what they place value on, it becomes necessary to know what value youths associate with hours of rest.

Therapeutic Effect

The youth value rest because of their perception of its medicinal benefits for the body. Though society perceives "too much rest" as a sign of laziness, adequate rest is taken by youth who are aware of its benefits for human functioning. The following quotes illustrate the therapeutic effects of rest for the body:

"If you sleep you reduce stress. Let's say you've worked the whole day very tired sleeping too is a medicine if you sleep your body is relaxed and everything and the worn out tissues are being replaced." (Female, 15–24 years, English).

"Sometimes when you sleep and gets up the way you want, it makes you active" (female 1524 years, Ga)

"It is very important. When I get up after getting a good rest, I feel healthy but when I don't get a good rest I feel weak" (Male, 15–24 years, Ga).

"Because when you don't have enough rest and you are doing machinery work you might doze off, if you are really feeling sleepy and you might end up hurting yourself. And drivers on the other hand, when you are driving and you are feeling sleepy you can doze off and have an accident. So sleeping is very important for the body." (Female, 25–34 years, English).

For Weight Gain

Some youth rest for the purpose of weight gain. Sleeping to gain weight is also a sign of idleness as the individual virtually does nothing. Since the body is physically inactive an increase in body size is expected. The following quote illustrate this:

"For me, I'm not fat. So I want to be fat, that's why I sleep." (Female, 15–24 years, English).

Laziness

Others do not attach any importance to adequate hours of rest since the Ghanaian society labels those who rest much as being lazy. They are tagged by society as individuals with no vision or purpose wasting away their life and usually insulted or ridiculed by society. It also indicates the lack of awareness of the benefits of seven or more hours of rest as evidenced by the quote below:

"For sleep, in our cultural setting, somebody who sleeps a lot is termed as a lazy person. So for them if you don't sleep too much and they see you going around they think you are hard working, not caring about what you are actually doing whether you are just loitering about. For them once you are not sleeping, you are hard working." (Female, 15–24 years, English).

Busy Lifestyles

Due to the lack or inadequate knowledge among some of the youth in relation to adequate hours of rest for the body, they deny themselves sufficient sleep claiming their lifestyles are too busy. Whilst on the other hand, availability of time due to unemployment and being out of school provides an opportunity for the youth to take adequate rest as shown in the following statement:

"Then for people in my age group who attempt to be the bad ones stay out late at the drinking spots, the pubs, night clubs, so when they come home some even don't have any sleep at all because you just have to wake up on time to do whatever you want." (Female, 15–24 years, English).

"Some people are working and at the same time schooling after coming back from work they will just bath and then start learning." (Female, 25–34 years, English).

"The youth in this area rest a lot." (Male, 25–34 years, Ga).

6.3.9.2 Relationship between hours of rest and body size

It is vital to explore the youth's perception of the relationships between hours of rest and their body sizes as it could identify the way to motivate them to have adequate hours of rest. Some groups mentioned the existence of a relationship between hours' of rest and their body sizes. This perceived relationship is based on knowledge acquired from their personal experiences, from the experiences of others and from observations of other community members. This is evidenced from the quotes below:

"They normally tell you if you sleep too much you become fat. So in order not to become fat you don't have to sleep too much. You have to sleep less, go about and maintain your body size." (Female, 15–24 years, English).

"Oh yes, there is. Because when you mostly over sleep usually when you are on vacation you put on a little bit because you are not utilising the fat in the body." (Male, 15–24 years, English).

"Yes my sister, like this we are twins. My twin sister came the other time during the Christmas and I was telling her she's grown very fat and I asked her, May why are you growing fat like this? She said she sleeps a lot after school or after lectures she will just go and sleep. She will just take some food and after that she will watch some movies and sleep again so that is the reason why she is putting on weight." (Female, 25–34 years, English).

Some youth pointed out the non-existence of a relationship and still others pointed out a mixed relationship with body size. This could be an indication that it takes more than hours of rest to influence body size and that the presence of other lifestyle factors may also contribute to body size. The youth's ambivalence about relationship between rest and body size is illustrated in the following statements:

"Some people eat and sleep, but do not gain weight." (Female, 15–24 years, Ga).

"Some relate and others do not. Everybody and the way he/she was created. Because someone will sleep without gaining weight, while others too sleep for a while and they gain weight." (Female, 15–24 years, Ga).

6.3.10 Barriers to Adequate Rest

In this section, we discuss the youth's perception of the barriers to adequate hours of rest. This perception of barriers to rest among the youth is crucial because we have learned from previous discussions that the youth do not have adequate rest. The data indicate that among the challenges the youth face in regard to adequate rest are lack of knowledge about the benefits of rest, busy lifestyles (work, studies), social activities (partying, clubbing etc.), avoiding societal tag (laziness) and technology (social media).

Busy Lifestyles

Lack of knowledge about the benefits of rest appears to be a major barrier since people would make time to rest regardless of how busy they are if they knew the benefits of adequate rest for the body. The excuse of busy lifestyles as a result of work or other lifestyles are articulated in the following statements by some youth:

"I'll say work. You are busy working so there is no way you'll have time to rest." (Female, 15–24 years, English).

"I think work, studies, these two things are basic. Work and studies or if you are a pastor praying." (Male, 15–24 years, English).

"Because of work and the question is would you give me money or take care of me if I rest? All depends on the economy. Most are saying they don't have money and they can't rest. I cannot rest without money, because when I rest where would I get money?" (Female, 25–34 years, Ga).

Social Activities

Youth, especially in urban areas, tend to be distracted by such activities as partying, clubbing, funerals and weddings. Such urban lifestyles act as barriers as far as getting adequate rest is concerned. The following statements attest to this lifestyle:

"Some people's own concern is not about work, but to sit with friends and they will chat till the next morning. They don't sleep in this area and they are helping the sellers a lot. Others also play games for fun and to gamble." (Female, 25–34 years, Ga).

"Some also use the time for rest to enjoy themselves in clubs and other things." (Female, 15–24 years, Ga).

Technology

In addition to the modernising processes of urbanisation impacting the youth's lifestyles, their access to modern means of technology also act as barriers to them having adequate rest. This barrier for instance is illustrated in the following:

"I think it is because of technology. Because even when we come back from work some of us now lie on our beds, and what about supper, some of us will be browsing, some people will be watching movies, some will go out to watch these leagues with their friends. That is the main thing not making us sleep and to have enough rest." (Female, 25–34 years, English).

"I'll say we are being exposed to a lot of social media and foreign cultures. Right now after here I'm going to face book. Maybe after face booking I'm going to learn so I don't have time. So most a times I realise I sleep 1.00 am and wake up at 5.00 am to prepare for school. So how many hours have I slept?" (Male, 25–34 years, English).

To Avoid Stigma

In order to do away with societal stigmatization some youth avoid adequate hours of rest, but not out of preference. Meaning that society expects everyone to be engaged in some activity or the other and not be idle. This is for instance depicted in the following quote:

"Society may say you are very lazy and that is why you are sleeping too much. So in order to prevent those comments I have to keep myself busy doing one thing or the other or at least let me just move out of the house loitering about like for them to say I'm also doing something." (Female, 15–24 years, English).

6.3.11 Water Consumption

The quantitative analysis of water consumption in chapters four (4) and five (5) showed that some youth do not take in eight or more glasses of water (85% and 72% in females and males respectively) as recommended in the RHNP by the MOH of Ghana. Due to this, focus groups were asked the importance the youth attach to the consumption of water.

6.3.11.1 Importance attached to water consumption

Knowing the importance the youth attached to water consumption provides knowledge about why they may or may not consume the recommended levels.

Therapeutic Effect

The participants agreed that drinking water has a therapeutic effect on the human body. In fact, almost all of the participants agreed that we consume water for the health benefits they want or know they will obtain among others such as reducing risk to obesity and NCDs as illustrated by the following quotes:

"A few of my age mates know that health wise it is good to drink a lot of water because now a days when you go to the net [internet] you will see all kind of therapies that are talking of water, how it helps clean the body, prevent heart attack and all those things." (Female, 15–24 years, English).

"Water is life. Water is important and you need it. I like taking water because it clears your system and makes the blood flow well. It does not make you to dehydrate." (Female, 15–24 years, Ga).

"Yes, people see the importance because people say that when you drink water and you have constipation you drink more water and if you have headache too drink more water that is what people say." (Female, 25–34 years, English).

Social Status

But the youth may consume water because of the status it appears to confer on such a behaviour and concerns about its safety. There appears to be increasing concern in the Ghanaian society about the cleanliness of water, especially drinking water outside the home. This concern has led to the commercialisation of drinking water in the form of bottled and sachet water in the society, especially in urban areas. Thus though the properties of water does not change the brand of water consumed signifies ones' economic standing, especially buying bottled water brands Many brands of bottled water are now on the market in the country and people who consume tap water and even some types of branded water are perceived as poor as illustrated by the following quote:

"I think if you can afford brand name bottled water or let's say you have a dispenser at home, like you are considered rich. Though generally water is water, but the brand of water you take that is what gives you the status." (Male, 15–24 years, English).

Some youth seek to drink water more often than not because of its prestige, rather than hydrating the body, especially after rigorous physical activity as illustrated by the following statements:

"They have the habit because they love to play football and you will need a lot of water then. During the dry season also people drink a lot of water." (Male, 15–24 years, English).

"Yes, because we have taps all over." (Female, 25–34 years, English).

On the other hand, adequate water intake was noted to be uncommon amongst the youth because, of the availability of fizzy drinks, tea, etc as a result of the modernisation process. This explains why adequate water intake is uncommon among the youth as shown in the following quote:

"No, mineral drinks are now in the system and not expensive so people buying them. This place has turned out to be a place for selling tea and people buy it. Someone said to me that coke is his water after eating food for him to be satisfied." (Female, 15–24 years, Ga).

6.3.11.2 Relationship between water consumption and body size

In view of the fact that water intake among the youth was found to be inadequate, we explored the youth's perception of the relationship between water intake and body size. In terms of no relationship with body size, the data showed that the youth consumed water for physiological reasons as well as therapeutic reasons without thought to its probable effect on the body size. This relationship is illustrated in the following quotes:

"Looking at it, drinking of water is a normal thing for every human being. Once you are thirsty you have to drink water. For there is no special reason for taking water unless you go to the hospital as usual the doctor say your body needs a lot of water, so drink a lot of water. Even that, you still can't just get up take water and start drinking unless you are thirsty." (Female, 15–24 years, English).

"They don't relate because drinking water does not make you lose weight or gain weight. You would be exactly the way you are. If you don't drink water you will be like an empty milk container blown away by air. Even if you are not hungry and you take water, you feel fine." (Female, 15–24 years, Ga).

"When you take in water, I don't like know whether it changes your body size but I know it cleans your system." (Female, 25–34 years, Ga).

Some youth also pointed out a link between water intake and body size on the acquisition of knowledge attained through their upbringing. This knowledge about the relationship between adequate consumption of water and body size is illustrated by the following quotes:

"I'll say yes. Because it comes to a point in my house when you wake up everybody is supposed to drink the big bottle of water [1.5liter] every morning or twice a week. So I was doing that even though it was difficult. You look slim too, it doesn't make you fat." (Male, 25–34 years, English).

"It makes you gain weight when you drink water by opening your system." (Female, 25–34 years, Ga).

"Yea, they believe that it [water intake] will reduce their size." (Female, 25–34 years, English).

6.3.12 Perceived Barriers to Water Consumption

Even though the youth know the importance of water consumption, the data clearly shows that they do not consume adequate amount of water. The informants mentioned as barriers associated with inadequate water consumption physiological (thirst, urination and hunger), accessibility and external factors.

Physiological Factors

The physiological barriers relate to the body functioning. In that, water intake is controlled by the need to satisfy thirst, others also are only able to consume water when they have eaten and still others due to the frequency of urination resulting from adequate water intake. Thus the ability to consume water adequately depends on these physiological demands of the body as illustrated from the following quotes:

"Also it is not frequent that you feel thirsty, and then if you don't feel thirsty you won't take water." (Female, 15–24 years, English).

"They are not thirsty and I don't take water that much because I will be urinating a lot." (Female, 25–34 years, Ga).

"You know mostly when you eat that is when you take in water. Me when I eat I'm able to take in more water but if I don't eat I'm not able to take water" (Female, 25–34 years, English).

"You see you usually take water when you are eating." (Male, 25–34 years, English).

Accessibility

Issues of physical access and cost associated with the commercialization of water in the society have been identified as barriers preventing adequate water intake among the youth. This is illustrated in the following quotes:

"For me, what will prevent me from taking water is that maybe the water is not there." (Male, 15–24 years, English).

"Also our choice of water. Some of us prefer our water cold so, if where I am I don't have any fridge and I don't have money to get a cold water, I'll wait when I get to the house where there is water in the fridge I'll drink water." (Female, 15–24 years, English).

"Then it is not advisable to drink any public water anywhere. So we prefer the sachet and the bottled water. So if you don't have the money to afford, you are not taking the water at all." (Female, 15–24 years, English).

Weather

Ghana is geographically located in a tropical climate, which requires adequate intake of water to hydrate the body. However, according to the youth the intake of water depends on the prevailing weather as well as accessibility of portable water as shown in the following quote:

"Sometimes it depends on the weather. When the weather is dry you take much but if the weather is cold the amount of water you take will reduce…" (Male, 15–24 years, English).

Weight Maintenance

As a perceived means of preventing a huge body size some youth are reluctant to drink adequate amount of water indicating the lack of education on the health benefits of adequate water intake as illustrated below:

"Some also have the perception that when they take in more water, they grow fat. Because of that they reduce the water intake. And that has been their reason for doing that." (Female, 25–34 years, Ga).

6.4 Discussion

There is a scarcity of studies on the lifestyles and BMI of youth aged between 15 and 34 years. The aim of this chapter therefore was to use qualitative methods to explore the youth's perceptions about BMI, lifestyle behaviours and barriers to the practice of healthy lifestyle behaviours. The rationale for this effort was to provide information on contextual factors surrounding body sizes, lifestyle and barriers among the youth in Ghana.

The data presented so far have shown that the youth's perceptions about their bodies and lifestyle behaviours cannot be divorced from the perceptions of the broader Ghanaian society in which they live. Generally, traditional Ghanaian society views big body sizes as a standard of beauty and therefore approves of slim people gaining weight. A contradiction is reflected in regard to society's standard of beauty through the desire of societal members to be slim. This is seen as a result of changes attributed to modernisation.

As far as the preference for particular body sizes is concerned, the reasons given by the youth (males and females) in our focus group discussions were mainly female related. These included physical attractiveness, defence mechanism, partner preference and employment opportunities. This shows how females in the Ghanaian society for one reason or the other subject themselves or allow others to subject them to body size slavery. Thus the body size of females may be influenced by these factors.

The data also indicated that dietary behaviour, physical in/activity, medications etc. are some of the means the youth use to acquire preferred body sizes. These perceived means signify the control measures individuals equally perceive they have over their body sizes. On the whole, such perceptions on body sizes may compel the youth towards particular body sizes which may be risky to their health.

Findings on importance attached to fruit and vegetable were mainly for therapeutic reasons, whilst vegetable consumption in addition to therapeutic reason is also for recipe purpose. Thus individuals may only be willing to consume fruits and vegetables mostly if they perceive it to have healing or curative properties or such produce are a conventionally part of the Ghanaian food preparation process. Since staple foods are consumed daily it would be a useful intervention strategy to integrate more vegetables in their recipes to encourage healthy dietary behaviour among the youth.

On the issue of barriers to dietary behaviour, the perceived barriers from the youth's standpoint are consistent with findings from Ashton et al., (2015) who found lack of knowledge, access and cost as barriers to healthy dietary behaviour among young male university students. Also consistent with the findings of the present study are Nago, Verstraeten, Lachat, Dossa, & Kolsteren (2012) who identified quality and cost of fruits and vegetables as barriers to its consumption in Cotonou, Benin. Poverty as a barrier to healthy dietary behaviour among Ghanaian youth is consistent with findings by Sedibe et al., (2014) who identified poverty among rural South African females as an obstacle to healthy dietary behaviour. Amo-Adjei & Kumi-Kyereme (2014) also identified seasonality as an obstacle to healthy dietary behaviour among Ghanaian adults. Moreover, upbringing has further been identified in the present study to prevent healthy dietary behaviour among Ghanaian youth. The barriers to healthy dietary practices have much to do with a culture of too much reliance on carbohydrate based foods, a situation which makes it difficult for the youth in Ghana to appreciate the health benefits of other foods.

On health risk behaviours, academic excellence, public confidence, and appetite among others were the importance attached to smoking and alcohol use. For these same reasons, the youth are unable to stop smoking and the use of alcoholic beverages. Despite the fact that these health risk behaviours are discouraged by the Ghanaian society, it is increasing slowly and the youth are being caught in this web for the very reasons they have to indulge in it.

The data showed that the youth are aware of the therapeutic importance of physical activity as well as its importance with regard to physical appearance and weight management. However, some internal factors (laziness, chastity etc.) and external factors (modern means of transport, safety, busy schedules etc.) were found

to be equally important by the youth in preventing them from being physically active. This finding is consistent with Ashton et al., (2015) who also identified busy lifestyles/schedules as a barrier to physical activity in their study similar to the present finding. Moreover, Mohamed, Hassan, Weis, Sia, & Wieland (2014) identified fear of harassment or safety among Somali men in Minnesota as a barrier to physical activity. Furthermore, intrinsic factors such as laziness, chastity, upbringing and other extrinsic factors namely, modern means of transportation, ill health, were additionally mentioned as obstacles to physical activity.

Physical appearance is important to Ghanaian youth. Consequently they appreciate anything that will give them a good physical appearance. Alternatives to the perceived physical activity barriers are offered in the form of body slimming medicines and surgeries. These are currently invading through advertising to the Ghanaian culture to reduce weight. Because youth who generally engage in physical activities do so for their physical appearances and not for therapeutic reasons, such means (medicines and surgeries) have come as a relief.

Among the reasons youth cited for them needing rest were therapeutic reasons and weight gain. Because of their busy schedules, social activities and access to technology the youth are unable to take adequate hours of rest as recommended. The use of technology for social interactions and fraudulent activities commonly referred to as "419" (internet fraud) among Ghanaian youth mostly deprive them of rest (Anecdotal).

Water is important for its therapeutic effect and the economic status it confers on a person. However, factors such as thirst, frequent urination and hunger and physical access and cost act as barriers to its frequent intake by the youth.

Summary

The aim of this chapter was to explore youth's perceptions about BMI, lifestyle behaviours and barriers to healthy lifestyle choices. From the quantitative findings, in terms of health risk behaviours about 14% and 0.11% of females reported alcohol use and smoking respectively, whilst 27% and 4% of the males reported alcohol use and smoking accordingly. The values youth attached to alcohol use or smoking serve as the motivating reasons for which they engage in these behaviours. Due to the presence of the health risk behaviours, the youth identified perceived barriers regarding the inability to stop smoking or alcohol use. As far as physical

activity is concerned about half (55%) of females and about one-quarter (24%) of males reported no physical activity despite the youth's perceived importance of physical activity.

Among the perceived obstacles to engagement in frequent physical activity were intrinsic factors (laziness, upbringing, chastity etc) and extrinsic factors (modern means of transportation, safety, etc). With regards to hours of rest, in spite of the importance of adequate hours of rest identified, about 13% of females and 18% of males respectively reported less than seven (7) hours of rest. However participants identified their perceived obstacles in relation to seven (7) or more hours of rest such as busy lifestyles (work and studies), social activities, technology etc. The reasons youth mentioned in regard to inadequate intake of water included physiological factors (thirst, urination and hunger), weather, etc. In fact, about 85% and 72% of females and males, respectively consume less than eight (8) glasses of water although water consumption was identified to be important.

Policy Implications

The findings of this chapter have several policy implications for the prevention of obesity as a risk factor to some NCDs. Firstly, the findings on the whole show the importance of addressing perceptions in the broader Ghanaian culture as a means of encouraging the youth to engage in healthy lifestyle behaviours.

As a transition in nutrition promoting unhealthy lifestyle behaviour, evidenced by the prevalence of obesity and pre-obese among the youth as discussed in chapter 5, the prevailing perceptions about BMI in the society need to be addressed.

Chapter 7 addresses the summary, conclusions and recommendations of the study.

CHAPTER 7

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

7.1 Introduction

The present study examined the relationship between lifestyle behaviours and BMI among Ghanaian youths between the ages of 15 and 34 years. The study specifically examined the relationship between selected socio-demographic characteristics and lifestyle behaviours, the relationship between total lifestyle behaviours and BMI and perceptions regarding BMI, lifestyles and barriers to healthy lifestyle behaviours.

The preceding seven (6) chapters have examined relationships between selected socio-demographic variables and lifestyle behaviours; relationship between total lifestyle behaviour and BMI; and explored perceptions of BMI, lifestyle behaviours and barriers to healthy lifestyle practice. Analytical methods such as descriptive analysis (e.g. frequencies, mean), t-test, one-way ANOVA, Tukey post-hoc test and multivariate analysis (domain, Poisson, complementary log-log, multinomial) were used for the quantitative data, whilst thematic analysis was used in analysing the qualitative data. In this final chapter, we present the main findings of the study and suggested policy recommendations and directions for further research. The chapter consists of five (5) sections. The first section (7.2) presents and discusses the major findings. The theoretical framework, conclusion, implications of the findings and future research areas are presented in the subsequent sections 7.3 through to 7.6 respectively.

7.2 Summary of findings

In general, the results of the present study have shown a prevalence of obesity rate of 7.7% among Ghanaian female youth. Also noteworthy is the finding of the prevalence of overweight or pre-obese of 20% among female youth. The current prevalence could be attributed to reason that the Ghanaian culture is undergoing change. As a result, the beams supporting the traditional lifestyles are being disabled by factors such as modernization, education among others (Steyn & Damasceno, 2006). The socio-demographic or background factors such as age, education, religion, ethnicity, marital status, place and region of residence known to impact lifestyle behaviours in different contexts were also identified in this study to be significantly

related to lifestyle behaviours. Overall, the study failed to support the evidence that total lifestyle behaviour (poor, good and very good lifestyles) influence BMI of female youth aged 15 to 34 years. Further, the study found that society has varied perceptions regarding body sizes in the Ghanaian context and these perceptions tend to influence the choice of lifestyle behaviours. Additionally, the data identified youth's perceptions with regards to lifestyle behaviours and barriers to the practice of healthy lifestyles. Specific findings are presented in sub-sections 7.2.1 through to 7.2.3.

7.2.1 Relationship between Socio-Demographic Characteristics and Lifestyle Behaviours

The present study found education, religion, ethnicity and region of residence to determine dietary behaviour. Education was found to positively influence dietary behaviour in females but not males. Belonging to Islamic religion and other Christian denominations increases the intake of fruits and vegetable, youth from Mande ethnic group consumes more fruit and vegetables and more fruit and vegetable consumption was noted among youth within the Brong-Ahafo region. Differences could be attributed to factors such as these socio-cultural factors of education, religion, ethnicity and region of residence.

The higher intake of fruits and vegetables among Muslims and other Christian youths could be attributed to their doctrines. This therefore indicates how powerful religion is as a means in promoting healthy dietary behaviour. The increase fruit and vegetable consumption among youths within the Brong-Ahafo region may be explained by the type of vegetation in the region.

. In terms of health risk behaviour (smoking and alcohol use), results of the present study identified some background factors consistent with health risk behaviour from previous studies. The present study found youth aged between 25–34 years, with secondary education, being affiliated to Islam, traditional/spiritualists and other religion, being Ewe, Mole-Dagbani and Other ethnic group as determinates of smoking and or alcohol use. Additionally, being married and formerly married, residing in an urban area, residing within Western, Central, Eastern, Ashanti, Brong-Ahafo, Northern and Upper West regions were also found to significantly influence health risk behaviour. Both male and female youth affiliated to Islam were more likely not to smoke and drink alcohol compared to their Christian counterparts.

With respect to physical activity, the study showed that affiliation to other religion, being formerly married, urban dwelling and staying in Central, Eastern, Upper East and Upper West regions as significantly related to physical activity. Less physical activity was observed among urban dwelling females.

Regarding hours of rest, results showed that youth aged between 25–34 years, with primary and secondary education, being affiliated to the traditional/spiritualist religion, belonging to the Akan, Ewe and other ethnic group, correlate with hours of rest. Furthermore, being married and formerly married, living in an urban area, residing in Western, Central, Volta, Brong-Ahafo, Northern, Upper East and Upper West regions were also found to significantly influence hours of rest. The present study found older age (25–34), belonging to the other ethnic group, being married/living together, residing in the Western, Central, Eastern, Ashanti, Brong-Ahafo, Northern, Upper East and Upper West regions to influence water consumption.

7.2.2 Relationship between Total Lifestyle Behaviours and BMI

The present study also sought to examine the relationship between total lifestyle behaviours and BMI among females. From the bivariate analysis, results found age, education, ethnicity, marital status, place and region of residence significantly associated with BMI. On the relationship between socio-demographic factors and total lifestyle behaviour (poor, good and very good), the bivariate analysis identified religion and region of residence as significantly related to total lifestyle behaviour whilst no association was observed between total lifestyle behaviour and BMI status. The multivariate analysis showed that age, education, religion, marital status, place and region of residence were identified to significantly determine BMI status of females.

The present study however failed to find any significant association between the lifestyle behaviours of female youth and BMI.

7.2.3 Perceptions on BMI, lifestyle behaviours and barriers

With regards to societal perceptions on BMI, the analysis of the qualitative data showed that the broader Ghanaian society perceives body sizes as an outcome of eating behaviour, financial status, physical/psychological well-being, laziness, being chronically ill and due to biological factors. The perception of body size mainly as a

result of eating behaviour is an indication of the important role of food (carbohydrate-based food) in the lives of Ghanaians.

Findings on the perception of why people prefer one body size over another revealed personal reasons (slimmer the smarter, physical attractiveness), external reasons (defence mechanism, partner preference, employment opportunities, financial status, medical side effect) and biological factor. All these reasons may create an atmosphere for either healthy or unhealthy lifestyle depending on preferred body size.

Among the means the youth use to acquire preferred body sizes were personal means (dietary behaviour, physically in/active) and external (medications, psychological well-being, therapeutic effect). The perceived means the youth identified in attaining preferred body sizes depicts the control they perceived to have over their body sizes.

The youth gave several reasons for the dislike of fruit intake. One reason is the cost of fruits because of seasonality of its production. Secondly, the youth perceive fruits as not stomach filling compared to many of their staple foods which are rich in carbohydrates. This may be attributed to the nature of Ghanaian upbringing that focus on staple foods and lack education on the benefits of fruit and vegetable intake.

In spite of the fact that the broader Ghanaian society disapproves of smoking and alcohol use by the youth, we found that the youth are increasingly engaging in such behaviours. This is because the youth attach value to these two behaviours. However, their perceived barriers regarding the inability to stop these two behaviours are the very reasons why they engage in them. This may perhaps be due to the negative impact of the modernisation process of urbanisation on the traditional societal values and norms in regards to smoking and alcohol use.

On physical activity, although focus group participants noted importance of being physically active for therapeutic and physical appearance or weight management reasons as well as indicated the existence of a relationship between it and their body size, physical activity is not common across board. This may be attributed to the influx of medications and surgeries for weight reduction within the Ghanaian society.

In terms of hours of rest, even though the youth recognise the importance of it for body size, the data showed that this behaviour is not popular among the youth. The modern Ghanaian society, compared to the traditional Ghanaian society is seen to

be involved in organizing huge marriage, funeral and parties/anniversary celebrations including access to the internet via mobile phones may be preventing the required hours of rest.

Though the youth perceive the importance of consuming water and its effect on body size, yet this behaviour too is not popular among them. Among the reasons cited by the youth for not consuming adequate amounts of water include the frequent emptying of the bladder and its attendant lack of public places of convenience.

7.3 Theoretical Framework

This study was based partly on the epidemiological transition theory and the HBM. According to the epidemiological transition theory, over time the causes of mortality changes from infectious causes to man-made causes or "chronic" diseases (Omran, 1971). Obesity has been identified as a risk factor for NCDs. By implication, youths who are obese are exposed to NCDs by virtue of their BMI status.

According to the HBM, an individual's action or behaviour is directed by beliefs which depend on perceived susceptibility to an ailment or health problem, perceived severity/consequences of the ailment, benefits of the preventive health practice(s) (perceived benefits), obstacles concerning the preventive health practices (perceived barriers) and the nature of the illness symptoms, and interventions such as campaigns (cues to action) which prompt a person to take action (Hochbaum, Rosenstock & Kegels, 1950s). These beliefs and health motivation however are conditioned by socio-demographic factors and psychological characteristics of the individual. This implies, according to the model, that individuals will engage in lifestyle behaviours depending on particular socio-demographic characteristics. The results of the current study have shown how various socio-demographic characteristics affect the lifestyle behaviours of the youth in the Ghanaian context.

The study employed quantitative and qualitative methodologies in addressing study objectives. Quantitative methods such as percentages, frequencies, means, independent t-test, one-way ANOVA, Tukey post-hoc test, Pearson Chi-Square test, Poisson regression among others were used to obtain results and the qualitative method used the thematic analysis.

7.4 Conclusion

The findings of the present study have shown that socio-demographic characteristics of individuals are associated with different lifestyle behaviours. However, the study has also shown that not all youth engage in healthy lifestyle behaviours due to perceived barriers they encounter. There was no evidence that the practice of total lifestyle (poor, good and very good lifestyles) influence BMI. Instead the study found that the youth have perceived notions regarding body sizes, preference for particular body sizes and means of acquiring preferred body sizes which in turn influence their choice of lifestyle behaviours. The findings of the study suggest that future interventions which seek to promote healthy lifestyle behaviours could be achieved by addressing perceived notions about BMI and the identified barriers to engaging in healthy behaviours.

7.5 Policy Implications

The RHNP 2008 is the context for the present study which aims at promoting healthy lifestyle practices among Ghanaians (MOH, 2008). Evidence from the study has shown that not all youth practice healthy lifestyle behaviours, hence the programme needs to embark on more health education to address societal perceptions about BMI, lifestyle behaviours and barriers identified in regard to the practice of these lifestyles and make healthy lifestyle behaviours a part of the Ghanaian culture. The efforts to encourage healthy dietary behaviour should include education that teaches the youth especially about the health benefits of regular consumption of fruits and vegetables as part of their daily eating habits. In addition, based on the finding that Muslim youth (males and females) were less likely to smoke or drink alcohol, religious doctrines can be used as a tool to curtail such behaviours of smoking and alcohol use. Obesity and overweight prevalence of 8% and 20% respectively among the youth stress the need to encourage and promote a normal BMI amongst them. It can be done by alerting the youth in relation to the health dangers associated especially with obesity. This is in order to curtail the risk to NCDs among them and to ensure quality of life.

7.6 Future research

The present study used the HBM as a guide. Since the other dimensions of the HBM are absent from the GDHS data, any empirical assessment of the model is prevented in the present study. Future primary research would benefit the exiting literature if it did include the other dimensions of the HBM. Moreover, the GDHS 2008 did not include anthropometric data for males. This is a limitation in terms of theory building, so future research would do well by collecting such anthropometric data for males to ensure comparison with their female counterparts.

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APPENDIX I: Ethics Approval

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ETHICS APPROVAL CERTIFICATE OF PROJECT

Based on approval by the **Human Resource Research Ethics Committee, Mafikeng Campus**, the North-West University Institutional Research Ethics Regulatory Committee (NWU-IRERC) hereby approves your project as indicated below. This implies that the NWU-IRERC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title: The relationship between lifestyle behaviours and body mass index (BMI): The case of youth in Ghana.

Project Leader: Prof AY Amoateng

Student: PT Doegah

Ethics number: **N W U - 0 0 2 2 4 - 1 5 - A 9**

Institution Project Number Year Status

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Approval date: 2015-06-03 **Expiry date**: 2020-06-02 **Category** **N/A**

Special conditions of the approval (if any): None

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

 The project leader (principle investigator) must report in the prescribed format to the NWU-IRERC:

- *annually (or as otherwise requested) on the progress of the project,*
- *without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.*

 The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the NWU-RERC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.

 The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-IRERC and new approval received before or on the expiry date.

 In the interest of ethical responsibility the NWU-IRERC retains the right to:

- *request access to any information or data at any time during the course or after completion of the project;*
- *withdraw or postpone approval if:*

· *any unethical principles or practices of the project are revealed or suspected,*
· *it becomes apparent that any relevant information was withheld from the NWU-IRERC or that information has been false or*
misrepresented,
· *the required annual report and reporting of adverse events was not done timely and accurately,*
· *new institutional rules, national legislation or international conventions deem it necessary.*

The IRERC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the IRERC for any further enquiries or requests for assistance.

Yours sincerely

Prof Linda du Plessis

Chair NWU Institutional Research Ethics Regulatory Committee (IRERC)

APPENDIX II: FGDs Interview Guide

Hello everyone. My name is _____.

Thank you for sparing time for these discussions. Miss Phidelia Theresa Doegah, a student at North West University, is conducting this study to examine the relationship between lifestyle behaviours and body mass index. While the study is for academic purposes, it is hoped that the information will also be important in improving healthy lifestyle behaviours among the youth and reduce obesity a risk factor to non-communicable diseases (NCDs).

It is also important that you give honest answers even if you feel that some people in this group may not agree with them. I ask you to feel free to say whatever you think about the issues under discussions because there is no right or wrong answers. I also want to assure you that whatever you say here will be kept confidential.

I will be guiding the conversation and my colleague here will be writing down what is said but will not write your names down. Everything you say will be anonymous. As it may not be possible to write everything down on paper, my colleague would like to tape this discussion with your permission. No one except me and the research team will listen to the tape. Our discussions are expected to last for about one hour.

Let me stop for a moment to respond to any question you may have [**Please Pause – Answer Any Questions].**

May I turn on the tape recorder? [**Turn On Tape Recorder)**

Let us begin by getting to know a little about each other. Please introduce yourself (first names only) and tell us:

- How long you have lived in this community?

<u>Perceptions</u>

1. What do members of this community think about a person's weight? (normal, overweight, obese)
   (Probe: culturally, health, economic status)

2. What do you think are the reason(s) why some members in this community prefer different body weights? i.e. normal, overweight, obese (fat) (Probe: health, biological, economic, religion)

3. What do people in this community understand to be ways in having a normal, overweight and obese/fat weight? (Probe: medically, culturally, religiously)

4. How do people your age in this community view:

   a. Fruit consumption

      What importance do they attach to fruit consumption?

      (Probe: cultural, health, economic status)
      i. Is fruit consumption common among people your age? (If Yes explain and If No explain)
      ii. Is fruit consumption a healthy eating? (Probe: for reasons)
      iii. Do the people your age in this community believe a relationship exists between fruit eating and body size? (if yes why and if no why)

   b. Vegetable intake
      i. What do they see to be the importance of vegetable consumption?
         i. (Probe: cultural, health, economic status)
      ii. Is vegetable consumption common among people your age? (If Yes explain and If No explain)
      iii. Is vegetable consumption a healthy eating? (Probe: for reasons)
      iv. Do the people your age in this community believe a relationship exists between vegetable eating and body size? (if yes why and if no why)

   c. Regular physical activity
      i. What importance do people your age attach to regular physical activity? (Probe: cultural, health, economic status)
      ii. What do they do that is considered as physical activity? (Probe: for activities)
      iii. How common is it to see them doing physical activity? (Probe: for explanations)
      iv. Is physical activity good for health? (Probe: for reasons why it is or why it is not)
      v. Do the people your age in this community believe a relationship exists between physical activity and body size? (if yes why and if no why)

   d. Smoking
      i. Are there dangers associated with smoking? (Probe: health, economic)
      ii. How common is it among people your age? (Probe: for explanations)
      iii. What importance do people attach to smoking?
      (Probe: cultural, health, economic status)
      iv. Do the people your age in this community believe a relationship exists between smoking and body size? (if yes why and if no why)

   e. Alcohol consumption
      i. Are there dangers associated with alcohol use? (Probe: health, economic)
      ii. How common is alcohol use among people your age? (Probe: for explanations)

iii. What importance do people attach to the drinking of alcohol? (Probe: cultural, health, economic status, religion)
iv. Do the people your age in this community believe a relationship exist between alcohol use and body size? (if yes why and if no why)

f. Hours of rest
   i. What is sleep/rest to people your age? (Probe: for the reasons)
   ii. What do people see to be the importance of sleep/rest? (Probe: cultural, health, economic status)
   iii. Is it common for them getting sleep/rest (seven hours and more)? (Probe: for reasons why they do or don not)
   iv. Do the people your age in this community believe a relationship exists between rest and body size? (if yes why and if no why)

g. Intake of portable drinking water
   i. What do people your age understand to be drinking water? (Probe: for reasons)
   ii. What do people your age see to be the importance of drinking portable water? (Probe: health, economic status)
   iii. How common do they take in portable drinking water?
   iv. Do the people your age in this community believe a relationship exists between drinking water and body size? (if yes why and if no why)

5. Do the people your age in this community believe they are at risk of

   i. Having big body sizes (overweight/obesity)? (Probe: for reasons)
   ii. NCDs (e.g. high blood pressure, diabetes, stroke, etc) (if yes why and if no why)

6. What do you think are the reason(s) why people your age in this community do not do the following:

   a. Eating fruits
   b. Eating vegetables
   c. Not smoking
   d. Not drinking alcohol
   e. Being physically activity
   f. Taking sufficient rest
   g. Adequate drinking of portable water

   (Probe: for permanent and temporary barriers separately)

This marks the end of our conversation. Thank you very much for sparing your time.

APPENDIX III: Publication

Vrywaringsklousule / Disclaimer: http://www.nwu.ac.za/it/gov-man/disclaimer.html
>>> Caroline Gallimore <cmg26@cam.ac.uk> 2016/04/22 11:58 AM >>>
>
Dear Dr Amoateng,

The Editor has asked me to inform you that he is pleased to accept the revised version of your paper entitled 'Socio-demographic factors associated with dietary behaviour among Ghanaian youth' (MS 3954) for publication in the *Journal of Biosocial Science.*

I will need high-resolution files for the figures, but I suggest you prepare these after I have copy-edited the paper in case changes need to be made.

Your paper will receive the customary editing for house style and we shall be in touch if any queries arise when the paper comes to be prepared for press. Proofs will be emailed to you for checking on this email address within the next few weeks. **In the meantime, please complete and return the copyright declaration form (see below for details).**

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Kind regards,

Caroline Gallimore