UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

EXAMINING THE EATING HABITS OF SOME SENIOR HIGH SCHOOL STUDENTS AND ITS IMPACT ON THEIR HEALTH: CASE STUDY AT BREMAN ASIKUMA SENIOR HIGH SCHOOL IN THE CENTRAL REGION OF GHANA

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AUGUST, 2017

DECLARATION

STUDENT'S DECLARATION

I, CYNTHIA ABOAGYEWAA WIREKO, declare that this dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE:……………….....................…………….

DATE:…………………….....................……….…….

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of dissertations as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: **MR. STEPHEN K. AMOAKOHENE**

SIGNATURE:……………….....................………….

DATE:………………………………….......................….

ACKNOWLEDGEMENT

DEDICATION

I dedicate this work to my husband, Mr. Benjamin Nartey Addo, and children

Naateiko Addo, Nartey Addo and Adjowa Yeboah Addo.

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ABSTRACT

This study was conducted at the Asikuma Odoben Brakwa District of the Central Region of Ghana to assess the eating habits of Senior High Schools in the District. Research asserts that poor eating habits is a major public health concern among young adolescents who experience transition into adulthood. To this effect, the objectives of the study were to determine the general eating habits of SHS students, assess the factors influencing such eating habits and find out the effects of such eating habits on students' health. The study employed the descriptive survey framework which collected quantitative data for the purposes of the study. The population for the study consisted of all Senior High School students both male and females in the Asikuma Odoben Brakwa District out of which a total of 200 participants were selected using stratified and random sampling techniques. The sample was made up of 125 students from Breman Asikuma Senior High School and 75 students from Best Brain Senior High School. The main instrument used for data collection was questionnaire which allowed for large scale data collection. The data was analyzed using descriptive statistics and with the help of SPSS software version 20. The study found that students mostly have poor eating habits such as eating little or no fruits and vegetables, skipping breakfast, and drinking carbonated drinks instead of fruit juices. Factors such as availability of certain foods, students eating certain foods to show social status among peers, cost and finances influencing food eaten, and skipping meals to lose weight influenced the eating habits of students.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

People eat because the food may smell good, taste good and look good. They may eat because it is at the right time of the day, they might be celebrating, or might be trying to overcome the blues. To produce good health, one needs to take some positive steps to improve current eating habits that would help prevent later problems. One should also recognize and accept full responsibilities for one's good health through adopted eating habits. Good food is for healthy living, growth as well as a source of energy (Clarke & Herbert, 1992). Students' choice of food could improve if they have nutritional knowledge of the food they eat in terms of quality and how the body uses the food eaten for good value. For young adolescents, managing school life and personal life can result in conflicting demands especially for students at the Senior High School.

Poor eating habits is a major public health concern among young adolescents who experience transition into adulthood (Nelson, Story, Larson & Neumark-Sztainer, 2008), during which they are exposed to stress and lack of time (Rubina, Shoukat, Raza, Siddique, Panju 2009; Webb, Ashton and Kamah, 1998). These factors pose a barrier against adoption of healthy behaviors such as poor eating habits and substance abuse (Nelson, Story, Larson & Neumark-Sztainer, 2008). Although these behviours of students are considered temporary, as part of student life, unhealthy habits picked up at this age generally persist in older adult life (Silliman, Rodas & Neyman, 2004). Rapid changes in physical growth and psychological development have placed these young adults as nutritionally vulnerable groups with poor eating habits that fail to

meet dietary requirements (Chin & Mohd, 2009). Some common unhealthy eating patterns among adolescents include meal skipping, eating outside from school, snacking and high cholesterol consumption.

There are always a group of Senior High School students who do not want to eat their dining hall breakfast, lunch or supper. These students feel they could feed themselves better by sneaking out of campus to eat from 'chop bars', and from their chop boxes', though most of their alternative foods may be nutritionally unsatisfactory. Thus their feeding tends to be unsatisfactory (Ashigbie, 2015). At Breman Asikuma Senior High School which is one of the researcher's selected school for the current study, some students have been sneaking out to buy 'chop bar' food, such as salads, noodles, fried yam, meat and chicken with plain boiled rice. Some of the 'chop bar' stews have small amount of thickeners, such as tomatoes to thicken them, with lots of saturated oil.

The food eaten by students who eat foods from their 'chop boxes' is mainly soaked "Gari" with a lot of sugar. Apart from these special treats, the students also eat sugar pops, corn flakes, ice creams and turnovers in between their meals. Only a few students buy fruits, since most students have the idea that fruits do not satisfy their appetites.

Some students starve themselves out of fear of growing fat; they do not eat breakfast, sometimes lunch as well which lead to taking one meal a day (Panju, 2009). The school meals patronized by students had sufficient carbohydrates for breakfast but little milk, about one tablespoon full per student. Lunches contain enough carbohydrates and oils and a few vegetables with little or no protein foods.

Few students indulged in the habit of sneaking out of campus to drink alcohol which is prohibited by school authorities. However, whether students eat school meals, chop bar food or food from outside campus they have to be energetic to be productive in their academic work. Breman Asikuma Senior High School students relish the taste and aroma of their favorite foods.

Human senses respond to food by stimulating the appetite. Appetite is a student's psychological desire to eat as a result of sight, aroma or taste of food. Sometimes, just seeing a favorite food makes one feel hungry. At times, the sight of how certain foods are prepared such as fried foods can also stimulate appetite. A good appetite is a sign of good health which helps one to stay well nourished. Good eating habit formed through appreciating food, helps to bring good health. Good eating habit does not mean one will have an absolute perfect body or be absolutely free from ill health. Duyff (2000) explains that it reduces the chance of one falling sick, and when one gets sick one gets well faster. According to Davies (1998) diet is one of the several lifestyle factors which can contribute to good health. Bad eating habits have adverse effects, such as coronary artery disease. Furthermore, when one eats in excess one can fall sick. Food must be enjoyed but in moderation at all meal times and in between the meals with snacking. People like different food for their flavor. Again, the tongue has papillae and each papilla has hundreds of taste buds which distinguish sweet, sour, salty and bitter taste. Other nerve endings in the mouth, sense, the texture and temperature of food. Many people experience hunger when their empty stomach contracts calling for the need to eat food. All these sensations of hunger pangs signal that the body needs fresh supply of nutrients.

Eating in pleasant surroundings always contribute to positive eating habits for good health, as one is able to eat his or her fill before getting up. Furthermore, a cuisine differs with different cultures and is a reflection in the eating habit formation. Culture includes behavioral values and beliefs shared by a group of people. Water is essential for human survival and it should be part of good eating habits. One function of water according to Clarke & Hebert (1992) is that it is the body's fluid transporter of nutrients around the body. According to Insel & Roth (2004) the key to keeping a healthy, fat-free mass is to maintain an energy balance. The energy food intake will be used by the body to maintain vital body functions (resting metabolism) to digest and to fuel physical activity. So when energy intake equals energy output one can maintain current weight as part of a good eating habit formation. If one takes in· more calories than the body needs, the excess calories will be stored as fat and there would be weight gain with time. If Senior High School students are eating fewer calories than they lose each day, they will lose some of the stored fat and lose weight.

1.2 Statement of the Problem

According to Wardlaw & Kessel (2002) among the more common eating habits of Senior High School students include skipping meals, routine fast food consumption, frequent snacking and dieting. Clay (1991) stated that in many parts of the world people are dying younger than they did 100 years ago.

Senior High School students are concerned about their stature, skin appearance, and hair appearance and strength. But the question is, do they really know that their food intake has any role to play in their health concerns? They do not know that what they regard as rich food, such as saturated oil rich foods, fatty meat on food, salad with lots

of mayonnaise on them, are doing them more harm than good. They prefer drinking bottles of carbonated drinks with fat-rich pastries as snacks to eating fruits ignorant of the fact that these drinks and pastries are all calories.

Most Senior High school students forgo school meals or skip meals, when they find that, their dining hall meals are beans or leafy green vegetable stews than their preferred oil rich foods.

Senior High School students have tremendous appetites and they should channel these appetites to eat a variety of fruits, vegetables, cracker or digestive biscuits, milkshakes, cocoa drinks, bread sandwich, bean cakes, mashed "kenkey" with milk as snacks as directed by Duyff (2000). Many of their food and snack choices are not balanced which can cause nutritional related diseases such as diabetes and hypertension later on in life.

According to Wardlaw & Kessel (2002) a survey of high school students showed that only a little of over 25% of the students had eaten five serving of fruits and vegetables the previous week. Senior High School students in Breman Asikuma are no exception to this and they give the few vegetable stews provided in the school meals names such as chicken faeces and others to show their dislike. In this regards, the study sought to examine their eating habits and how it impacts their general health.

1.3 Justification for the Study

Improved quality health care is one of the objectives of every government. This demands a tactful programmed implementation. With this nutritionists and dieticians are always strongly involved in the advisory implementations thereby justifying this

study. The study is to bring to focus the food eating habits of Senior High School students of Breman Asikuma. It is to warn students of bad food eating habits that could cause them ill health in later life. It is also to encourage good food eating habits of Senior High students there should be emphasis on benefits of good eating habits.

Deficiencies of some nutrients are due to poor or bad food eating habits. Excess food nutrient intake as a result of bad eating habit should be examined and be known to students. The Ghanaian society as a whole will benefit from good habits, which helps to avoid many health hazards such as diabetes, coronary diseases, stroke and cancer. The study will also throw more light on some food eating habits, causing many degenerative diseases such as constipation, diarrhea, osteomalacia, osteoporosis and many others. It will help improve health, with less dependence on pharmaceuticals and promote food therapy in disease prevention through good food eating habits and good dieting.

1.4 Objectives of the Study

The main objectives of the study are to:

1. Determine the general eating habits of Senior High School students in Breman Asikuma.

2. Assess the factors influencing the eating habits of Senior High School students in Breman Asikuma.

3. Find out the effects of students' eating habits on their general health.

1.5 Research Questions

Questions arising from the problem are:

1. What are the general eating habits of Senior High School students in Breman Asikuma?

2. What are the factors influencing the eating habits of Senior High School students in Breman Asikuma?

3. What are the perceived effects of students' eating habits on their general health?

1.6 Delimitations

The two selected senior high schools for the study are based in Breman Asikuma, Breman Asikuma senior high school and Best Brain senior high school are boarding schools. The research will be delimited to the two campuses and immediate surroundings. However, since they have been sneaking out to eat outside campus, the researcher will have to follow students to their eating places for valid information.

1.7 Definition of Unfamiliar Terms

Balanced Diet: Intake of adequate nutrients.

Big Letters: Bigger crushed whole grain maize for breakfast

Chicken Feces: Leafy green vegetable stew

Cholesterol Free: Less than 2mg cholesterol and 2g or less of saturated fat.

Fast Food: Fast foods are normally convenience foods which are usually prepared for sale.

Fibre: Fibre consists of plant materials that are not digested but moves through the digestive tract and out of the body. Cereals, fruits and vegetables all provide dietary fiber.

Food Intolerance: A condition in which the body has trouble digesting or handling a compound in food.

Gatekeepers: Parents and care takers of children and adolescence.

Lean Meat: Cooked seafood, meat or poultry with less than l0g of fat, 4.5g or less saturated fat and less than 9.5mg of cholesterol per serving.

Part-Time Vegetarians: Eating vegetarian meals several times in a week, but enjoys poultry, meat and fish.

Small Letters: Smaller coarse whole grain maize for breakfast.

Smart eating: Eating balanced diet

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter of the study examines previous studies conducted by other researchers in the field and reviews them. The literature is reviewed with respect to the objectives of the study.

Thematically, the literature is reviewed around eating habits, meal patterns, adolescent eating habits, obesity/overweight, factors influencing eating habits and health effects of eating habits.

2.2 Eating Habits

Although good eating habits cannot be substituted or physical training and genetic endowment, proper diet choices are actually crucial to top-notch performances, which contribute to endurance and helps speed up the repair of tissues as argued by Wardlaw & Kessel (2002). Duyff (2000) explains that the best eating plan for active living should follow a balanced diet which can supply all needed nutrients.

According to the Findlay *et al.,* (2004) habit is something a person learns to do over and over again without thinking about how to do it. Many everyday actions are habits. However, some peoples eating habits make them overweight and it subjects their bodies to strain, as put across by (Feinstein *et al*., 2008). They stressed that faulty food intake is connected with many of the illness that are common today, some of which are diabetes, anemia, heart disorders, dental decay, stroke, raised blood cholesterol, obesity, high blood pressure and constipation.

2.3 Meal Patterns

Foskett *et al.,* (2003) claim that eating as a necessity has become a means of developing social relationships. So the need and preference of people eating together should be considered. Wright (1979) is of the view that meal pattern with breakfast as the first meal of the day should be nourishing and digestible and should include fruits, cereals, fish or meat, vegetables, carbohydrate foods, fat and oil with a drink.

According to Anika (2008) to stay healthy, breakfast eaten daily should make the body feel full; promote proper metabolic function and a key for managing proper weight. The American Dietetic Association (2002) states that, starting the day by eating breakfast can actually help people lose weight or maintain their weight better. Tul1 (1996) is of the view that, lunch or midday meal is a meal pattern which should include meat, fish, legumes, vegetables, fats and oils, fruits, animal products, cereals and grains. The last meal of the day or supper may take the form of a full meal or as a hot drink with biscuit. In addition to this, an appetizer is a small portion of food served at the start of eating. It could be an easy soup or veggies (Duyff, 2000). Tull (1996) lists the following as preferable snacks in between the main three meal pattern of the day: · fresh fruits, raw vegetables, example carrots, yogurt, sandwiches, milk shakes, fruit juice and water. Brunch is a meal eaten around 10am to 12 noon as a late breakfast or early lunch (Brew *et al.,* 1993). According to Duyff (2000) the main dish is the protein food in a meal and side dishes are complements that are added to main dishes such as vegetable salad, bread or pasta. Again Brew *et al,* (1993) view carbohydrate dishes added to main dishes as accompaniments.

2.4 Quality Eating Habits

An eating habit of adhering to a low fat, low sugar diet and exercising regularly help prevent diseases (Mader, 2005) and is a quality eating habit. Insel *et al.,* (2004) stated that a sensible eating habit with regular exercise would promote long term good health and fitness which would enable people enjoy and· feel their best in life.

Foods cooked with soya bean oil, cotton seed oil, containing nuts and seeds with strawberries are healthy and vegetarians who avoid eggs, diary food and meat should rely on fortified breakfast cereals and fortified soy products as good eating habit (Sizer & Whitney, 2000). Egg yolk and lettuce intake are also healthy as was suggested by Tull (1996) and (Davies, 1998). Many foods are excellent source of folate, including fruits and vegetables, whole grain, beans and cereal products (Payne & Hahn, 2002). Eating animal products and cereals would provide Vitamin B which helps prevent pernicious anemia (Institute of Medicine, 2000). Good eating habits include eating foods containing mango, cauliflower, broccoli, water melon, spinach, pineapple, mustard, greens, carrots, beef, liver, sweet potatoes and banana (Bonci, 2007). Eating food containing sardines, anchovies eaten with bones are also healthy (Peltzer & Pengpid, 2011).

According to Wardlaw & Kessel (2002) food is a symbol of comfort, but eating could stimulate the release of certain neurotransmitters. Food produces a sense of calm and euphoria in the human body which answers why some people turn to food as a drug with calming effect in times of stress. Bonci (2007) a pioneer and leading authority on eating disorder wrote, ('Socrates danced each morning after eating to stay slim'). A good eating habit should include a combination of all food groups. This is a principle

of great importance and it is a preventive measure in the management of sickness (Nelson, 2000).

Foskett *et al* (2003) argued that fruits and vegetables should also form a third of total food intake as a habit with five portions of a variety of fruits and vegetables each day. They added that, while a portion should be a whole apple, an orange or banana, for a bowl of salad or a glass of fruit juice not more than one glass or bowl should be eaten per day. They are also of the view that a starchy food should form a third of total food intake. According to Johns *et al* (1999), which does not have enough fiber would not make one feel full up and may tend to over eating.

According to Wardlaw and Kessel (2002) variety in a diet means choosing a number of different foods within any given food groups rather than eating daily from the same old group. Variety thus contributes to diet adequacy. Tohill, (2005) ascertains that eating of dark leafy green vegetables helps in good blood clotting.

Furthermore, Foskett *et al*., (2003) discusses that milk and dairy foods should be eaten once a day for adults. Sizer and Whitney, (2000) said that eating fatty foods promotes satiety, which suppresses hunger quickly. Food containing enough fiber as in vegetables would also make one feel full up to prevent one over eating, (Johns *et al.,* 1999). Food intake of more non-milk sugars is associated with diseases (Davies, 1998).

Sizer and Whitney (2002) stated that water can act as a lubricant and a cushion for the joints. It also aids in regulating the body's temperature and so its intake cannot be forgotten as part of a good eating habit. The body's water balance is maintained by

the intake of water and the output of urine and perspiration (Meeks & Helt, 1990). Right eating habit is choosing a variety of foods in their right combinations, right proportions and moderately consumed (Diet therapy Unit of Ghana Health Service, 2006).

Sizer and Whitney (2000) have stated that the body renews its structure continuously and builds each day a little muscle bone, skin and blood and replacing old tissues with new ones. The best food for humans then is the kind that supports the growth and maintenance of muscle, healthy bone, healthy skin and sufficient blood and sufficient "nutrients" and enough water, carbohydrate, fat vitamins and minerals. Wardlaw and Kessel (2002) stated that if the food one eats provides too little or too much nutrients, then by the time one is old one may well suffer from some severe diseases.

High dietary lipid intake is associated with obesity. Most saturated fatty food (triglycerides) raise blood cholesterol which is a risk for cardiovascular diseases, heart attack or stroke (Sizer & Whitney, 2000). Davies (2003) writes that fat deficiency is no problem. Sizer and Whitney (2002) are of the view that fat rich foods help' manual workers consume large amounts of food energy in a small bulk to do much difficult tasks to survive but Davies (1998) is of the view that high fat diet is associated with the risk of many diseases.

The intake of animal products and legumes providing protein promotes growth and maintains body tissues (Payne & Hahn, 2002). The proteins actin and myosin account for the movement of cells and have the ability of letting our muscles to contract. Enough protein food intakes would help maintain fluid balance to prevent edema

(Insel *et al.,* 2003). Deficiency of protein causes kwashiorkor and marasmus· (Davies, 2002). Mullen *et al*., (1998) are of the view that extra protein intake would be broken down to be used for calories or is converted into body fat and stored. Many diseases are associated with excessive protein food intake such as increased calcium loss in urine, colon cancer and many more (Wardlaw & Kessel, 2002).

There are numerous minerals from both animal and plant foods. Soluble salts which help to control the composition of body fluids and many trace elements are concerned with enzyme systems in the body (Gaman & Sherrington, 1996). Deficiency of mineral could cause diseases such as osteoporosis, from calcium deficiency, anemia from iron, goiter and cretinism from iodine deficiency, rickets from phosphorus and poor wound healing from copper and zinc deficiencies (Sizer & Whitney, 2000). Water quenches thirst; the body's water fluid is the transport for food through the digestive system and for the body's nutrients traffic and waste products (Sizer & Kessel, 2000). Foskett *et al*., (2000) is of the view that water is the cheapest of all drinks which varies from place to place. Caffeine and alcohol intake causes rapid water loss and dehydration (Insel *et al.,* 2003) whiles too much water intake cannot be excreted by the kidney and start some diseases and mental disorders (Wardlaw & Kessel, 2002).

2.4.1 Frequency of Eating

Hales (1994), writes that people are indeed what they eat, and that a good eating habit helps people to live well and look well. Variety of choice in eating remains not just the spice of life, but the secret of a healthy diet. People should avoid excess drinking of water while eating a meal as it unfavorably speeds up the rate of digestion, which could be very unhelpful (Nelson, 2000). One injurious consumption practice in

connection with eating and drinking is the frequent intake of narcotics, depressants or alcoholic liquors, tobacco and the caffeine beverages (Nelson, 2000). Citrus fruits eaten regularly would be a powerful antioxidant which would neutralize free radicals and helps make collagen, a tissue needed for healthy bones, teeth, gum and blood vessels (Institute of Medicine, 2000). Again a massive number of studies provide that high consumption of fruits and vegetables reduces the risk of many cancers (Amo, 2008). Lawrenz (2001) proposes a. list of six powerful lung protector foods including cauliflower, broccoli, pomegranate juice, white grapefruit and onions to prevent lung cancer.

Lawrenz (2001) further suggests that, drinking cherry juice three times a day may have inflammatory and anti-pain properties also omega-3 fatty acids, cinnamon pineapples, green tea, ginger blackstrap molasses cayenne pepper, turmeric and garlic. Frequent eating of large and heavy meals could trigger angina (chest pain caused by lack of oxygen to the heart) a warning symptom of heart attack in coronary artery disease. On the other hand, a good eating habit such as eating less fat and salty food could help modify risk factors leading to coronary diseases (Cahill, 1996). Regular intake of foods containing sunflower oil, almonds, sunflower seeds, peanut butter, and dark leafy greens would provide the body with vitamin E, wrote (Douglas *et al*., 2007).

2.4.2 Quantity Eating Habits

Wardlaw and Kessel (2002), are of the view that moderation in eating refers to the size of the portions dished out size. Ideally the cereal should have at least 3g of dietary fiber per serving. According to Wardlaw and Kessel (2002), high starch and sugary foods consumption habit makes better use of the world's resources as they are

a cheaper source of six compared to animal foods and their products for the same work. An eating habit of skipping food intake is not the best way to lose weight and change body composition, but controlling the amount of food intake is considered by most experts to be an important component of a sound and fat-loss program (Mullen *et al,* 1998). Wardlaw and Kessel (2002) have stated that excessive red meat intake was linked to risk of many diseases and that foods cooked in alkaline destroys food nutrients. According to Sizer and Whitney (2000), common salt intake should be 750 milligram per day which is the maximum requirement for adults. Also during pregnancy, a woman needs to drink more fluids, at least eight to twelve cups a day, and milk is a good choice with a variety of food from the vitamin B sources (Duyff, 2000).

2.4.3 When and Where Eating Habits Are Formed

Duyff (2000) has shown that eating together at home helps family members to follow more healthful eating patterns. He also thought that eating together is more enjoyable when people make the surroundings pleasant and when their actions show consideration for others. People eat with friends at parties, school dining hall times, dances and snacking at mini malls, for taste, appeal, nutrition and fun. Good manners and courtesy help one to feel comfortable and more confident when one eats out.

According to Insel *et al.,* (2004) social factors exert a powerful influence on food choice. By observing parents, children learn what combination of foods is appropriate to consume and under what circumstances. He also suggested that one's eating and cooking habits are likely to reflect what have been learnt from parents.

Johns, *et al.,* (1999) ascertains that the attractive nature of the Hospitality industry such as the food, alcoholic drinks and games attract people to learn habits from there. Payne & Hahn (2002) said that new and valuable friendship begin in residence hall dining rooms, on outdoor benches, shared on a pleasant autumn day, at a restaurant, when someone is invited to join a group at their table and at the home of a co-worker. Without food these opportunities might not exist.

2.4.4 Snacking as Part of Eating Habit

Studies link the rising prevalence of obesity in adolescents to consumption of sugar sweetened drinks (Insel *et al.,* 2004). Good choices of snacks are fruits, veggies, yogurt, milk, pretzels, popcorn and lean deli meat. Time between snacks should be two or three hours before meals, but not to skip lunch or dinner (Duyff, 2000).

According to Lawrenz (2001) yam balls are a popular snack in many African countries. Over-ripped plantain is never thrown away and in Ghana they are often used to make a well-loved snack, "Tatale". Teenagers in general are apt to adopt fad diets, eat away from home or miss meals completely and snack a lot. Teens often obtain one-fourth to one-third of all their energy and major nutrients from snacks (Wardlaw & Kessel, 2002). However according to Holbrook (1994) bad eating habit, happen when one snack in place of eating real meals that one is more likely to lose track of how much one eats. One has to allow two snacks a day of 100 to 300 calorie each. Furthermore, a teen might pass snack on dairy food for calcium, meat and sandwiches for iron; low fat bran muffins, or tortillas spicy spread along with a glass of orange juice to help maximize the iron's absorption (Sizer & Whitney, 2000).

2.4.5 Food Supplements

Older people take more ·medicines than younger people (Sizer & Whitney, 2000) and drug and nutrient interactions are common. Aging alters vitamins and mineral needs. Some vitamin supplements contain unnecessary substances. Bioflavonoids are wrongly labeled vitamin P or H and they include rutting and hesperidins. These or related compounds are not recognized as nutritional requirements (Insel *et al.,* 2004). Some more pseudo vitamins include, para-amino benzioc acid (PABA), laetrile (Vitamin B 17), bioflavonoid and pangamic acid (Wardlaw & Kessel, 20002). Vitamin and mineral supplements should generally be taken with or just after meals to maximize absorption. Excess of vitamin B as a result of taking supplements can cause depression, fatigue, impaired memory, irritability, headache, numbness, and damaged nerves, difficulty meals walking, loss of reflexes, weakness and restlessness (Sizer & Whitney, 2000).

Insel *et al.*, (2004) listed pangamic acid, as bogus compound wrongly labeled vitaminB-15 has no link whatsoever with nutrition. Rectin, Vitamin A and accutane some "close cousins" (or analogue) of Vitamin A are widely used for treatment of acne can cause birth defects continuous usage before pregnancy.

2.5 Adolescents' Eating Habits

An adolescent is a person aged 10 – 19 years whiles the youth are between 10 – 24 years (WHO, 2014). Adolescents are in the process of establishing responsibility for their own health-related behaviour, including diets, and are usually open to new ideas, whilst expressing interest and curiosity (Delisle, 2005). Many habits acquired during adolescence will last a lifetime. Moreover, with growing, adolescents' personal choices and preferences gain importance over eating habits acquired in the family,

and they have increasingly more control over what they eat, when to eat and where these foods will be eaten (Shepherd and Dennison, 1996). Changes in lifestyle, including food habits, are often more obvious among urban adolescents, (Ahmed *et al*., 1998)*,* as they are usually the „early adopters" owing, among other things to their attraction for uniqueness and high exposure to commercial marketing in cities.

The life stage of childhood and adolescence is important for the establishment of eating behaviours which are often carried into adulthood (El-Gilany and Elkhawaga, 2012). Therefore, diet in the early stage of life influences health, not only during the physical development, but also later in life (Kittler & Sucher, 1998; Spear, 1996 cited in El-Gilany & Elkhawaga, 2012). Information on dietary patterns reflects the overall nutritional behaviour better than information on single foods or nutrients. Therefore, the analysis of dietary patterns gives a more comprehensive impression of the food consumption habits within a population.

In Ghana, as in most parts of the world, most people structure their diets around a relatively small number of starchy or carbohydrate-rich foods. Grains such as millet, sorghum, rice, and maize (corn) and tubers such as yams and cassava (manioc), for example, form the central ingredients of the most common meals in Africa and provide the bulk of the daily caloric intake. These starchy staples are traditionally accompanied by protein-rich foods, such as peas, beans, or peanuts, and by smaller quantities of foods that add both flavour and nutrition, such as vegetables, oils, spices, and meat or fish. These latter foods are often referred to as relishes, condiments, or sauces. This pattern of food consumption predominates in Ghana, except in the grassland north, where milk and meat play more central roles (Arthur, 2001).

Dietary patterns are frameworks that people tend to follow when making choices about what to eat. A number of factors can dictate what people eat and many of these factors overlap in various ways. These factors include nationality, culture, economic class, religion, geographical location and social norms.

The prevalence of overweight and obesity is commonly assessed by using body mass index (BMI), defined as the weight in kilograms divided by the square of the height in metres (kg/m^2) (Hearty and Gibney, 2013). A BMI over $25kg/m^2$ is defined as overweight, and a BMI of over $30 \ kg/m^2$ as obese (WHO, 2007b). Overweight and obesity are likely to have adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance. Coronary heart disease, ischaemic stroke and Type II diabetes rise gradually with increasing body mass index (WHO, 2014). Therefore, increase in BMI should be prevented early in life. The distribution of BMI is shifting upwards in many populations, and recent studies have shown that people who were undernourished in early life and then become obese in adulthood, tend to develop conditions such as high blood pressure, heart disease and diabetes at an earlier age and in more severe form than those who were never undernourished (Bosch *et al.,* 2008).

For healthful adolescent food habits, small portions of fatty foods could complement larger portions of nonfat and low-fat dairy products for example lean meat, vegetable proteins, fruits, vegetables and grain products such as plain hamburger with garden salad and a small order of French fries or chili is smart (Wardlaw & Kessel, 2002). Bruch (2002) explained that, the importance of nutrition, physical activity for physical development, fitness, vigor and health should be stressed for teen boys. For teen girls

it would be more necessary to help them focus on the benefits of nutritious or healthful foods and regular physical activity for healthful life now and in their later lives

Adolescence according to Insel *et al.,* (2004) is a period of experimentation. Many adolescents smoke tobacco, marijuana and drink alcohol and are at a greater risk of harming themselves and others through violence, accident s and injury and replacing nutritious foods with· empty alcoholic calories. Teenagers want to make their own food choices where possible as parental influence become weaker. Their food selection is influenced by their desire to look healthy. He also added that, adolescents often become preoccupied with weight, appearance and these lead to eating habits and disorders which affect more girls than boys. Since the prevalence in males is increasing they should not be ignored or dismissed as only girls' problem.

Adolescents with low socioeconomic status and boys of 16 – 17 years develop unhealthier dietary patterns; higher consumption of "take away foods", meat, confectionary and soft drinks, higher energy density, higher percent of energy from unsaturated fatty acids, lower percent of energy from carbohydrates and lower nutrient densities of several vitamins and minerals Dapi *et al*., (2005). Nutritional problems of adolescents, whether under nutrition or related to chronic diseases, are mainly the result of dietary inadequacies. These may be linked to a number of physiological, socio-economic and psychosocial factors. Furthermore, patterns of overweight status and nutrient and food intake were significant among adolescents" girls of low socioeconomic status (Neumark-Sztainer *et al*., 2002).

Psychologically, adolescents aged 13-18 years were prone to influences from peers, greater social network, family mealtime routine, media, heightened awareness of body image, eating outside the home, quality of school food/vending and coping with stress which can affect their dietary habit resulting in obesity (Esposito *et al*., 2009). Also, the search for identity, the struggle for independence and acceptance, and concern about appearance, tend to have a great impact on lifestyle, eating patterns among adolescents (Quatromoni, 2002 cited in Onyiriuka & Ibeawuchi, 2013). Adolescents will also use their resources to buy clothing, make-up and other accessories to enhance their physique at the expense of their nutrition so that they can be accepted by their peers (unpublished).

Obesity varies among racial/ethnic groups. The prevalence was higher among African Americans and lowest among Asian Americans (Neumark-Sztainer *et al*., 2002). China has some of the lowest reported prevalence rates of obesity (BMI ≥ 27) with 1.7 - 2.9% for men and 4.3% for women in the population aged 20-45 years. In Saudi Arabia, 44.0% of women in a nationally representative survey of adults over 30 years in (1995-2000) were found to be obese. Men (9.3%) and 30.1% of women (more than 15 years of age) were reported obese in 1998 in South Africa, and the prevalence of overweight among women (BMI ≥ 25) aged 15-49 was found to be 16.1% reaching 21.7% in the group aged 35-39 years old in Ghana (WHO, 2012). Good physical and mental development and long term health is influenced by adequate provision of nutrient at the early stage of life. Poor foetal development, increased risk of complication in pregnancy, and assisted deliveries are associated with women with low BMI and short body stature. Malnourished and stunted adolescents are prone to obstetric risk; intrauterine growth restriction which leads to low birth weight (LBW),

stunted and malnourished babies. More than 20% of the women in sub-Saharan Africa, south-central and south-eastern Asia have BMI less than 18.5kg/m^2 but conversely, an increase in the proportion of the women start pregnancy with BMI greater than 30kg/m^2 leading to increased risk in pregnancy as well as heavier birth weight and increased risk of obesity in children (WHO, 2012).

Despite the importance of nutrition for adolescents" current and future health, many adolescents consume diets that were not consistent with dietary guidelines. There was low consumption of fruits and vegetables among adolescents in southern Brazil (Rieth et al., 2012), less desirable intakes of fruits, vegetables, dairy products, and whole grains, but higher than desirable intakes of soft drinks, confectionery, and fast foods among adolescents in the US, Europe, and Australia (Feinstein *et al*., 2008). Consequently, many adolescents fall short of achieving optimal nutrient intakes for good health and development.

2.5.1 Eating Habits and Health Development among Adolescents

Despite the importance of nutrition for adolescents' current and future health, many adolescents consume diets that are not consistent with dietary guidelines. For instance, in one study, there was low consumption of fruits and vegetables among adolescents in southern Brazil (Rieth *et al*., 2012), less desirable intakes of fruits, vegetables, dairy products, and whole grains, but higher than desirable intakes of soft drinks, confectionery, and fast foods among adolescents in the US, Europe, and Australia (Feinstein *et al*., 2008). Consequently, many adolescents fall short of achieving optimal nutrient intakes for good health and development.

Many adolescents feel that healthy eating is not a primary concern during the teenage years. In general, the quality of the adolescent diet is a reflection of this lack of concern. Adolescents say that in order to improve their eating, healthy foods should be appealing and taste good, and be more widely available (Story & Stang, 2012).

Moore *et al.,* (2012) suggested that adolescent girls fail to meet the dietary recommendation in all major food groups; fruits, vegetables, diary, other meats except grains, they also have inadequacy of important micronutrients (Moore et al., 2012). These might be due to over consumption of nutrients-poor foods and excessive intake of calories from solid fats and added sugars. Adolescents in Breman Asikuma like other adolescents who are unable to develop and conform to healthy dietary pattern may develop unhealthy weight and related chronic diseases in adulthood as discussed earlier.

There is increasing evidence that many communities in low and middle income countries are exposed to risk factors which overtime will result in a rise in prevalence and incidence of non-communicable diseases such as diabetes, cardiovascular diseases, and cancer (Bygbjerg, 2012). This is likely to put a strain on the health system which has to cope with those diseases while they still have to address infectious diseases. It was therefore projected that non-communicable diseases will contribute to half of the disease burden in low-income countries (WHO, 2005)

2.5.2 Nutritional Needs of Adolescents

Carbohydrates

Carbohydrates are made up of Carbon, Hydrogen and Oxygen and can be abbreviated as CHO (CDC, 2012a). They are polyhydroxy aldehydes, ketones, alcohols, acids, their simple derivatives and their polymers having linkages of the acetyl types (FAO/WHO, 1998). Carbohydrates can be categorised either as simple sugar (monosaccharide and disaccharides) or complex (starch, glycogen and fibre). Monosaccharide carbohydrates are made up of single sugar units which are glucose, galactose and fructose while disaccharides are combination of two simple sugars; sucrose, maltose and lactose. Simple carbohydrates are found in foods such as fruits, milk, vegetables, cakes, candy etc. which provides energy but lack vitamins, minerals and fibre (FAO/WHO, 1998, Rickman and Jakicic, 2014).

Complex carbohydrates constitute numerous chains of sugar units in the form of glycogen, starch and fibre. Glycogen is made up of highly branched chains of glucose in humans and animals. Starches and fibres consist of either branched or straight chains of glucose stored in plants. Fibre escapes digestion and absorption. Soluble fibres are easily digested by bacteria in the colon; it is associated with protecting heart diseases, preventing diabetes, and lowers cholesterol and glucose levels. Complex carbohydrates provide energy and are obtained from foods such as breads, legumes, rice, pasta, and starchy vegetables e.g. carrots. One gram of carbohydrates produces 4kcal of energy (FAO/WHO, 1998, Pope, 2014, Rickman and Jakicic, 2014).

The major sources of carbohydrates in the human diets are cereals, root crops, sugar crops, pulses, vegetable, fruits and milk products which represent over 50% of all carbohydrates consumed in the developed and developing world (FAO/WHO, 1998). But in some developing countries much of the carbohydrates are derived from a single source such as rice, cassava, plantain or maize.

High carbohydrates diets obtained from variety of sources are not associated with adverse health effects but the composition of the diet affect the proportion of excess energy that will be stored as body fat. The body's capacity to store carbohydrate is limited unlike fat, excess carbohydrates tends to be oxidized to be stored as fat in the body (WHO, 2012).

During pregnancy and lactation, there is increase demand for energy and nutrients, this enable the pregnant women to meet the increase energy needs in order to ensure a healthy offspring. Dietary Reference Intake (DRI) for protein among females between 14-18 years is 2368kcal/day which increases in pregnancy. Additional 340kcal/day in the second trimester and 452kcal to the third trimester (Whitney and Rolfes, 2008).

Proteins

Protein is a main functional and basic component of all cells in the body; it is the building block of life (CDC, 2012c). The protein molecules in the diet and the body are complex and are of variation than carbohydrate and fats and contain a more variation of elements (CDC, 2012b). Meat, poultry, seafood and fish, legumes (beans and peas), tofu/soya, eggs, nuts, seeds, milk and milk products are the main sources of protein while grains, some vegetables, and some fruits also provide minute amount of protein (CDC, 2012b).

Amino acids are derived from protein after digestion and absorption and function as the building block of proteins. There are twenty (20) types of the amino acid which are further classified as essential and non-essential (CDC, 2012b). Essential amino acids are the amino acids which can be manufactured by the body, non-essential amino acids cannot be manufactured by the body and conditional amino acids are not essential, except during illness and stress which they become essential, it includes Arginine, Cysteine, Glutamine, Ornithine, Proline, Servine, and Tyrosine. Protein diets are classified according to the number of amino acid it contains. A protein is considered complete if it has all the amino acids. Some complete proteins are meat, fish, poultry, milk, egg, soy and cheese which are basically of animal origin except soy which is the only plant source. Incomplete proteins do not contain all the essential amino acids. Such foods include legumes, nut butters, grain and originate from plant source (CDC, 2012b). It is however suggested by Zieve *et al.,* (2011) that the quality of protein is measured by its amino acid content, digestibility and ability to support growth. Animal proteins are 90 -99% absorbable, plant protein are 70 -90% absorbable, and that of soy and legumes are 90%.

Dietary Reference Intake of protein for females aged 14-30 years is 0.8g/kg/day thus averagely 46g/day, also 10-35% of kcal/day (Whitney and Rolfes, 2008). One gram of protein produces 4kcal of energy (CDC, 2012c; Pope, 2014).

Excess or deficient protein intake can be harmful to health. High protein intake, especially animal based proteins have been related to several chronic diseases and condition such as high blood cholesterol, gout, heart diseases, some cancers, increase calcium excretions leading to osteoporosis, weight gain and stresses the kidney

(Rickman and Jakicic, 2014). It is believed that animal proteins have high contents of saturated fats, and must be consumed in moderations. Low intake leads to acute and chronic malnutrition especially in children.

Lipids (Fats and Oils)

Lipid is a family of components that includes triglycerides (fats and oils), phospholipids and sterols (cholesterols). Fats are lipids that are solid at room temperature while oils are lipids that are liquid at room temperature. Triglyceride makes up 95% of dietary lipid and is the major form of lipid in food and in the human body. Triglycerides are found in the form of glycerol, fatty acids; saturated, monounsaturated (MUFA), polyunsaturated (PUFA; omega 3 and omega 6) (Rickman and Jakicic, 2014). Saturated fatty acids are found in animal foods such as meat, poultry, and dairy products and topical oils such as palm oil, palm kernel oil and coconut oil. Cheese and butter are also high in cholesterol. Unsaturated fatty acids are found in foods of both plants and animal sources. Sources of MUFA includes olive oil, canola oil and peanut while sunflower oil, safflower oil, soybeans oil and fatty fish (salmon) are very rich in (PUFA). Linoleic acid (omega 3) and linolenic acid (omega 6) are the only essential fatty acids (WHO/FAO, 1993).

Phospholipids have hydrophobic phosphate head and hydrophobic fat soluble tail e.g. lecithin. Sterols are manufactured and stored in the body for a variety of purposes. Sterols are found in only animal products. Sterols include vitamin D, cholesterol, bile and sex hormone. Sterols are deposited in artery wall which leads into plague building up and heart disease. The components of cholesterol in some selected food are egg yolk – 42%, meat-36%, milk and milk products-15% and fat 5% (Rickman and

Jakicic, 2014). Trans-fatty acids are created by hydrogenation which causes some of the double bond to become saturated. Hydrogenated fats are found in margarine, shortening, and baked goods (pastries/groceries). Trans-fatty acids increase blood cholesterol level and increases cardiovascular disease.

Vitamins

Vitamins are organic compounds essential in the diet. Vitamins are micronutrients which cannot be synthetized by the body and failure to consume causes specific diseases. Vitamins do not provide energy. They serve as components of body tissues and magic bullets of all diseases (CDC, 2011). The classification of vitamins is; Fat soluble- vitamins A, D, E and K; Water soluble includes the B vitamins: thiamine B1, riboflavin B2, Niacin B3, Pyridoxine B6, folate, vitamin B12, Biotin, Pantothenic acid.

The importance of vitamins according to Rickman and Jakicic, (2014) are;

1. Acts as regulators in the metabolism of proteins, carbohydrates and fats into energy

2. Acts to build and maintain bones, muscles, and red blood cells

3. Cure diseases caused by the lack of these vitamins

2.6 Obesity/overweight and Undernutrition in Adolescents

Obesity occurs as a result of imbalance between energy intake and energy expenditure, that is when energy intake exceeds energy used (Hall *et al*., 2011). Overweight and obesity are attributed to increased consumption of energy dense, nutrient poor foods with high levels of sugar and saturated fats combined with reduced physical activity (WHO, 2003). Energy intake, especially among adolescents increase with increased age and then peaks between 12-15 years to approximately

1992kcal (8325kJ), then decline slightly between 16-19 years of age. In a study by Troiano *et al.,* (2000) it was observed that energy intake was higher in males than females. According to D'Addesa *et al.,* (2010), adolescents' whose weight were normal consumed high amount of calories compared to those who were overweight (D'Addesa et al., 2010; Garaulet *et al*., 2000). Carbohydrate and fat consumption were also higher in overweight/obese adolescents compared to their counterparts. There are more than 1 billon overweight adults globally of whom at least 300 million of them are obese (WHO, 2003). The prevalence of obesity in adolescent girls and women was increasing particularly in persons living in low income countries, and countries with economies revolving rapidly, such as China, Brazil and Egypt where there was increased access to inexpensive, tasty and convenient foods which were energy dense, high in salt, fat, sugar and contained no or little micronutrient (WHO, 2012b).

Frequency of overweight and obesity was high among South African children and adolescents which were dependent on age, gender and population (Onyiriuka *et al*., 2013). Findings from studies carried out in Nigeria and other countries vary; the prevalence of overweight was 20.3% among adolescent school girls of 9-16years in Benue State (Musa *et al*., 2012), 24.5% and 2.5% prevalent rate of overweight and obesity among adolescent students in Benin city of Nigeria and higher among girls who skipped meals compared to their counterparts (Onyiriuka *et al*., 2013) but lower values of 1.8% and 6.3% of obesity were recorded in Port Harcourt, Nigeria (Adesina *et al*., 2012). Meanwhile, 12% and 6% of overweight and obesity were found among Palestinian adolescents with a prevalence rate of 7% each for stunting and underweight (Massad *et al*., 2012). A high prevalent rate 24.7% of overweight and

11.1% of obesity was also found in Bongonese children (Gualdi-Russo *et al*., 2007). Comparing adolescent boys and girls in relation to overweight and obesity, Italian male adolescents were more overweight/obese (37%) than their female (31%) counterpart (D'Addesa *et al.,* 2010), 48.2% and 30.7% overweight was recorded among adolescent males and females respectively in Torre Pacheo (Murcia) Spain (Garaulet *et al.,* 2000). Moreover, the prevalence of obesity in Ghana in people aged 18years and above was 5.5% which varied across regions and socio-demographic characteristics. By ethnicity, obesity was highest among the Ga-Adangbe, Ewes and Akans representing 14.6%, 6.6% and 6.0% respectively (Biritwum *et al*., 2005).

Undernutrition in adolescent was high; 9% in rural Bangladesh and more prevalent in early and late adolescents thus 31% at age 13, 20% at 15 years and 33% at 18 years (Alam *et al*., 2010). Underweight is more prevalent in girls and overweight in males. In Uganda, even though the prevalence of obesity was 10.4 % among the adolescents, underweight was more common (Christoph *et al*., 2014).

Results of many research conducted between adolescents" obesity and associated risk factors were inconsistent. The energy density of fruits and vegetables is low because of its high water and low energy contents, when fruits and vegetables are added to foods, they increase the amount of the food thereby decreasing the overall energy density of the food (Tohill, 2005). According to Musaiger *et al.,* (2003), association among fruits intake, size of burger, sweets intake, hours spent watching TV and obesity among adolescents was significant in males and not females in Bahram (Musaiger *et al*., 2014). Most adolescents consumed less than three servings of fruits and vegetables a day but consumed about five servings of rice and beans in a day

(Reith et al., 2012). In India, almost 80% of the adolescents consumed foods like rice, chapatti and vegetables which included green leafy vegetables on regular basis (Kotecha *et al*., 2013) whereas Ortiz-Hernandez and Gómez-Tello (2008) stated that only one-third each of Mexican adolescents consumed fruits and vegetables daily, drinks soft drink daily and one-fifth eats salty and sweet snacks daily (Ortiz-Hernández and Gómez-Tello, 2008). Intake of diary and grains as well as combination of fruits and vegetables were associated with lower levels of central body fat among children (5-11 years) particularly in the adolescents (12-16 years) in the United States (Bradlee *et al*., 2009). Nevertheless, according to Peltzer and Pengpid (2011) and Tohill (2005), consumption of fruits and vegetables may have no or no influence on body weight (Peltzer and Pengpid, 2011; Tohill, 2005).

However, smoking cigarette and feeling lonely were associated with overweight and obesity among adolescent girls (13-15 years) in Ghana and Uganda (Peltzer and Pengpid, 2011).

Studies revealed that adolescents who took regular breakfast had significantly lower body weight and waist circumference compared to those who take infrequent breakfast (Nurul-Fadhilah *et al*., 2013). However, approximately 60% of Indian adolescents eat daily while 13% ate breakfast 3 to 4 times in a week. In addition, 16% had their breakfast once or twice a week and 12% never had breakfast (Kotecha *et al*., 2013). Kosti *et al.,* (2008) also suggested that female adolescents who ate breakfast more than five times per week especially cereal contents had lower BMI compared to their counterparts, it was therefore concluded that, half of overweight adolescents consumed breakfast on daily basis (Kosti et al., 2008).

Obese adolescent males and females were less active, had unfavourable dietary habits such as lower intake of breakfast, fruits and milk but consumption of sugar-sweetened drinks and sweets/chocolates were lower compared to the non-obese counterparts in Saudi Arabia (Al-Hazzaa et al., 2012). Louie *et al* (2011) reported from a systematic review of cohort studies of relationship between diary consumption and overweight/obesity among children and adolescents age 2-14 years were inconsistent which revealed no significant association, protective association and increased risk between diary consumption and overweight/obesity (Louie *et al*., 2011). Meanwhile, Portuguese adolescents who took high amount of milk had lower proportion of abdominal obesity compared with those who took low amount, notwithstanding their activity level either high or low, adolescents whose milk/diary intake were high had high levels of energy, total calcium and protein level. Furthermore, adolescents who were active physically had lower proportion of abdominal obesity (Abreu *et al*., 2014).

The onset of puberty in adolescents result in physical changes primarily growth in height for both sexes; genital development in boys and breast development in girls. Physical growth also affects social and psychological make-up of the adolescents which becomes sources of worries to them (Rosen, 2004). As part of the psychosocial development, adolescents are concerned of how they appear to others and are accepted by their peers (Sanders, 2013). In view of this, adolescents do everything to keep up with the standards of their peers and this is dependent on how adolescents perceived their body image/weight. Alwan *et al.,* (2011) stated that weight perception was associated with weight loosing behaviours (Alwan *et al*., 2011). Inaccurate perception of body image/weight by adolescents may result in undue stress which

may be harmful to their health. Studies revealed that both overweight and obese adolescent boys and girls underestimate their body weight; to be within normal weight (Alwan *et al.,* 2011; Kurth and Ellert, 2010), those who were underweight overestimated themselves (Kurth and Ellert, 2010) and a proportion of those within normal weight perceived themselves too thin (Alwan *et al*., 2011). Contrarily, according to Gualdi-Russo *et al* (2007) adolescents adequately perceived their body image; accurately perceived by girls because girls were more conscious of their body image. In fact, only 5.7% and 8.8% of girls overweight boys and girls did not adequately classify their body image/weight (Gualdi-Russo *et al*., 2007). Therefore, females tried to reduce weight compared to their male counterparts whether they perceived themselves overweight/obese or normal or were actually normal weight or obese (Alwan *et al.*, 2011).

Physical activity has great impact on the body weight. It is an important behaviour that can have an independent effect on health. Physical activity and nutrition may interact to maximize the health benefits of individuals including the adolescents. Adolescent boys (12-19 years) in Malaysia were more active than their female counterpart, they indulge in higher daily physical activities which was related to low body fat therefore reducing their risk for developing overweight and obesity compared to the female who had less daily physical activities (Teo *et al*., 2014).

2.6.1 Health Effects of Obesity/Overweight and Undernutrition in Adolescents

Overweight and obesity pose major risk for serious diet related chronic disease including Type II diabetes, cardiovascular diseases, hypertension, stroke and certain forms of cancers, especially hormonally related, large bowel cancers, gall bladder

diseases, high cholesterol and triglycerides which reduces the quality of life and can cause premature death (WHO, 2003). Other health problems associated with overweight and obesity which are nonfatal include respiratory difficulties, chronic musculoskeletal problems, skin problems and infertility (WHO, 2003). When overweight and obese adolescents become adults, they are twice likely to develop cardiovascular diseases and the risk for developing atherosclerosis increases seven times (PAHO, 2012).

Growth and development is generally slower in the undernourished compared to the well-nourished, as well as delayed menarche (FAO/WHO, 1998). Stunting is an indicator of chronic malnutrition; mainly caused by infection and inadequate dietary intake, especially during foetal life and preschool years. Undernutrition increases the risk of obstructed labour as a result of immature pelvis. Anaemia, the main nutritional problem in the adolescent is estimated to be 27% and 6% in the developing and industrialised countries, respectively (WHO, 2012a).

Adolescents who were retarded at birth tend to put on more weight during the adolescence growth spurt. Adolescents normally entered pregnancy with reduced nutritional stores which increases their risk for nutritional deficiency with a higher risk in under malnourished (FAO/WHO, 1998).

2.6.2 Methods used to Reduce Weight in Adolescents

Mostly, adolescents who were not satisfied with their body image/weight normally experience low self-esteem, additionally, they diet to enhance body image or and to reduce body weight (Findlay *et al*., 2004), but those who diet were at increased risk of gaining excess weight over a time period. A cohort study among Brazilian adolescents

born in Pelotas, Rio Grande de Sul State in 1993 revealed losing weight through dieting was more common in girls than boys but found no association between type of food consumed by these adolescents and weight loss dieting (Madruga *et al*., 2010). Also, according to Baker *et al* (2012), disordered eating such as dieting and purging were not influenced by developmental process (puberty) in adolescents in Sweden. However, there was a significant relationship between dieting in late adolescent and disordered eating. Cultural and biological factors such as genetic and high reproductive hormones were linked to disordered eating during the developmental stages (Baker *et al*., 2012).

The prevalence of unhealthy weight control behaviour among the adolescents remain constant and through to early young adulthood. More adolescent girls" diet compared to boys. Beige eating increased in both boys and girls, but the prevalence is higher in girls. Older adolescents aged 12-15 years were more accurate in perceiving their body weights compared to the younger ones (8-11years) and those who perceived themselves as overweight/obese were more likely to engage in unhealthy weight reduction processes such as dieting (cutting on food quantity or omitting food intake (Chung *et al*., 2013).

2.7 Eating Habits of Adults

To build a healthy base in adulthood, make sure variety is part of the diet as no one food category can provide all needed nutrients for the body (Wardlaw & Kessel, 2002). Choose a variety of grains, especially whole grains and a variety of fruits and vegetables daily. Keep food safe to eat. Choose a diet low in cholesterol moderate in total fat consumption. Choose beverage foods with moderate intake of sugar and prepare foods with less salt. If one takes in alcoholic beverages do so in moderation.

During pregnancy, a woman needs to drink more fluids at least 8 to 12 cups a day and milk is a good choice. According to Duyff (2002) eating a variety of food from the vitamins sources such as green leafy vegetables is also a good source. Bonci (2007) proposed that, a bad food eating habit is a speed eating, which can gulp in excess air, which can lead to bloating and other stomach troubles.

Insel *et al.,* (2004) advised that fats, oils and sweets should be eaten sparingly. Milk and dairy products should be three serving a day. Vegetable group foods should be eaten three or more servings· a day. Meat, poultry, fish, dry beans, eggs and nuts group should be taken in two servings daily. Bread, fortified cereals, rice and pasta should be taken in six or more servings. He argued that, a wise eating for people living alone is reliance on convenience foods, fast foods and to eat out.

According to Sizer & Whitney (2000) generous starchy and sugary foods intake are recommended for older adults, including fiber in the diet and also, three factors that makes people younger or older than their age are abstinence from or moderation in alcohol intake, regular meals and weight control. He also said adults of all ages need six to eight glasses of water each day.

2.8 Factors Influencing Eating Habits of Adolescents

Food selection and eating habits are important consumer behaviors with many long-term consequences to the individual in the form of health and longevity and to society in the form of health costs. Some research has shown that the most important factors predicting food selection among adults are: taste, cost, nutrition, convenience, pleasure, and weight control, in that order (Glanz, Basil, Maibach, Goldberg, &

Snyder 1998). A study studies have shown that people often establish these tastes and habits while they are relatively young (Birch, 1999). Evidence suggests early establishment of habits and preferences occurs for a variety of behaviors including media use (Basil, 1990) and music listening (Holbrook & Schindler, 1994), as well as food choice (Birch, 1999). Therefore, it is advisable to begin establishing good eating habits when people are as young as possible. Importantly, however, for the very young many food decisions are controlled by parents and preschools (Nicklas et al., 2001). Therefore, food choice for the youngest age groups may be constrained by a number of factors. An especially important time of life for food choice is when people step out independently for the first time and begin to make all of their own food decisions. For many people, this is the transition to college life. The transition to college or university is a critical period for young adults, who are often facing their first opportunity to make their own food decisions (Baker, 1991 & Marquis, 2005) and this could have a negative impact on students' eating behaviors (Marquis, 2005; Rappoport, 2003). Previous literature has extensively discussed factors that influence eating behaviors among college students. However, application of a behavioural model such as the health belief model (HBM) has received less attention. Only three studies were found that applied HBM in the college eating context (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004; Wdowik, Kendall, Harris, & Auld, 2001). These studies examined avoiding dieting, a combination of eating and exercise, and diabetic students, respectively.

2.8.1 Religious Beliefs

According to Foskett *et al.,* (2003) races and nations of the world represent a variety of cultures each with its own ways of choosing meals and knowledge of essentials in food habit analysis. In this respect religion has always affected people's eating habits

at fasts, special occasions, feasts, anniversaries and celebrations. Christianity, Judaism, Hinduism, Buddhism and Islam have distinct dietary laws with variations in each religion. Jewish dietary, specifies foods that are fit and proper or "kosher".

To eat koshers is eating meat from animals that chew their cud and have cloven hoofs, fish without fins and scales, pork, crustaceans and birds of prey are unacceptable. Orthodox law of Judaism prohibits intake of milk and meat at the same meal or even prepared or served in the same utensil.

On Good Fridays, hot cross buns are often eaten as a reminder of Christ's crucifixion; Christmas days are often celebrated with feasting with roasted turkey. Today, the roasted turkey has been replaced by the traditional roasted beef and boar's head, followed by Christmas pudding and mince pies. Muslims in celebrating the death of Mohammed only eat meat that has been prepared according to Muslim customs by halat butcher. Again during Ramadan which lasts for one month Muslims do not eat nor drink anything from dawn to sunset and at the end of the Ramadan they celebrate a feast called, Idd-ul-fitr, with special foods. Muslims from Middle Eastern countries would flavor a dish like lamb, sheep with okra, those from the Far East, curry and rice.

According to Insel *et al.,* (2004) Islam's identify acceptable eating habits as "halat", not eating pork flesh, alcohol and slaughtered animals. Again, the Church of Jesus Christ of Latter-day Saints disapproves of alcohol and caffeinated beverages. Insel *et al.,* (2004) further indicates that, religious rules also define when and how often to eat so that during holy months of Ramadan, Muslims eat only at dawn and fast from

dawn to sunset. He also said culture and diet affect each other. Each contributes to the others identity to define values, as cultural cuisine. He also wrote that, Buddhists prohibited intoxicating beverages.

In addition, most Hindus do not consume meat, (strict Hindus are vegetarians) and none of them eats beef. Sikhs do not have strict rules regarding food but many are vegetarians but strict Buddhists are vegetarians whose dishes vary since most of them live in India and China where the foods available are different.

Furthermore, Glanz *et al.,* (1998) explained another trend in eating habit called the macrobiotic (a restricted vegetarian diet) of whole- grain cereals, vegetables and small fish only. No animal products and fruits are associated with yin and yang Yin cold includes passive and downward flowing, including milk, honey, and vegetables. Yang is hot and it includes sea food, eggs and cheese. These authors are hitting on latest trends in food consumption habits and in most cases these are for treating cancerous diseases.

2.8.2 Cultures and Taboos Affecting Food Availability

Adow (1990), some children are not given meat or eggs because it is believed that worms will grow in them or they will grow to be thieves. In Ghana, Ga Adangbes do not eat snails. The sharing of food can be symbolic; people offering foods that reflect their heritage are expressing a willingness to share cherished values with others. People accepting those foods are symbolically accepting not only the person doing the offering but the person's culture (Sizer & Whitney, 2000). Duyff (2000) ascertains that ethnic food traditions are often passed through many generations. Children learn

to enjoy ethnic foods prepared by their families. The foods of many different' ethnic groups have many cuisines today. Diet and culture affect each other. Both help to define our values, preferences and practices for eating habits (Insel *et al*., 2004), Sizer & Whitney (2000) stated that one of the most enjoyable ways to sample other cultures is to try some of the ethnic food they have to offer.

According to Insel *et al*., (2004) one of the strongest influences on food preferences is tradition or cultural background. To a large extent culture defines our attitudes. "One man's food is another man's poison. In many cultures food has symbolic meanings related to family traditions, social status and even health. The races and nations of the world represent a great variety of cultures each with its own ways of cooking. The development of air -cargo means perishable foods from distant places are readily available (Foskett *et al.,* 2003).

Insel *et al.,* (2004) are of the view that ethnic groups may vary in their traditional diets, their patterns of family and interpersonal relationships, and their attitudes toward food for their eating habits.

2.8.3 Food Availability Affecting Eating Habits

According to Duyff (2000) the food one buys or grows where one lives, foods available in local markets, grocery stores, restaurant and personal farms or garden makes possible availability food supply affecting eating habits. Wise gate keepers should set the example to follow and provide easy access to Nutritious food that is low in sugar and fat for their teenagers (Sizer & Whitney, 2000). Improvement in quality and quantity of food intake will bring about less disease prevalence, low rate

of infant mortality, longer life expectancy and also general improvement on hair, skin, and teeth with good physical activity (Clarke & Herbet, 1992). According to Duyff (2000) commercial preservation methods increase the shelf life of many foods and allow one to enjoy them at any time of the year. Today people could still enjoy locally grown foods but an abundant variety of foods available all year long offers one choice for nutrition and good eating habit.

According to Adow *et al.,* (1990) in Ghana, eating patterns may differ from region to region, depending on a member's income and the type of work he or she does, to eat two or three meals a day. In most African countries the head of the family gets more food, especially protein-rich food and children get the least. People in Ashanti and Brong-Ahafo regions of Ghana select their staple foods around starchy roots and plantain, staple foods, into "fufu" served with soup and "ampesi" and vegetables. The people along the coast, in Southern Ghana such as Fantes and Gas eat "kenkey" and "banku", Frafras and Dagombas from Northern Ghana eat "tuo-zaafi" from their cereal staple foods and cassava. The Volta Region of Ghana have starchy roots and plantain, grains and rice as their staple foods, giving them foods such as "akple", a favorite of the Anlo Ewes.

People with the status of being able to go on holiday celebrate with foods unique to keeps their family and traditions. Food traditions play an important part in life's celebrations. Politics and trade policies affect commerce and the piece of imported food. Many people find comfort in old food, people often continue to enjoy the foods or preparation methods of their family and culture. People often try to enjoy them back home (Duyff, 2000). According to Adow (1990) a family on limited income

tends to eat fewer varieties of food. People tend to eat more animal foods such as meat, fish and eggs as they earn more money. Contact with European culture through education has led to tea drinking and bread eating in Ghana.

2.9 Social Status and Education Affecting Food Availability

Insel *et al.,* (2004) state that people in lower social positions have diets of inferior quality. Duyff (2000) is of the view that education on foods arid nutrition affects the food one buys, prepares and eats to form good eating habits that promote wellness. Polities and trade policies affect commerce and the price of imported food (Duyff, 2000). Clark & Herbet (1992) contributes that eating well becomes a comfortable habit, soothing inner tensions and anxieties. Where there is little food available, people could suffer from poor growth rate, prevalence of many diseases· and short life expectancy.

Insel *et al.,* (2004) writes that inequalities in income and education underline many of eating habits and health disparities among people. Where people are short of money they could eat less expensive food which are equally nutritious to help form good eating habit (Duyff, 200).

The view that, "we are indeed what we eat" contributes to good eating habit formation. A good eating habit helps people to live well and look well and that variety of choice in eating remains not just as the spice of life, but the secret of a healthy diet (Hales, 1994).

2.10 Summary

This chapter set out to examine the eating habits of Senior High Students, the meal patterns, frequency of eating, their health and developments amongst Adolescents. Based on this review, the next chapter involves the presentation of the research methodology and a component of the literature review of the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This study is aimed at assessing the eating habits of SHS students in Breman Asikuma Odoben Brakwa District and determining its impact on their health. This chapter deals with the research approach used for the study, the population and sampling, data collection instruments and ethical considerations.

3.2 Research Design

Research design is a framework or blueprint used for conducting a research project. It specifies the details of the procedures necessary for obtaining the information needed to solve the problem identified in a study (Bickman & Rog 1998). The nature of the research suggests an inquiry into a way of life hence the mixed method approach was adopted. Due to this, the descriptive survey method was employed for the collection of quantitative data which made possible gathering of large-scale data upon which a basis for interpretation and generalizations could be drawn. The study was also cross-sectional in nature, taking into cognizance the fact that the research was conducted for academic purposes only and was not likely to be replicated over time.

3.3 Scope of the Study

The research focuses on students from two Senior High Schools in the Asikuma Odoben Brakwa District of the Central Region. Breman Asikuma Senior High and Best Brain Senior High schools all located in the District were purposively selected for this study.

3.4 Population

The accessible population for the study consisted of all Senior High Students, both males and females, in the Breman Asikuma Odoben Brakwa District of the Central Region of Ghana.

3.5 Sample and Sampling Technique

The sample selected for the study was two hundred (200). There were 50 female and 75 male students from Breman Asikuma Senior High forming a total of one hundred and twenty-five (125) students. Also, 40 males and 35 females were selected from Best Brain Senior High which formed a total of 75 students. In all, the sample from the two schools totaled 200.

The stratified and random sampling techniques were used to select the students for the study. Breman Asikuma Senior High and Best Brain formed the two strata from which students were selected. Within each stratum, random sampling was used to select the students from the different classes. Random sampling was used in order to have both sexes and classes represented in an unbiased manner within the strata. The lottery technique was used in each class for student to pick YES and NO pieces from a bowl which enabled researcher to select male and female student from all classes as required.

3.6 Data Collection Instruments

The research instrument used in collecting the much needed data for the study was questionnaire (See Appendix). The questionnaire was designed to comprise of four sections. The first section dealt with demographic information and the second dealt

with information on general eating habits of the senior high school students in the district. The third and fourth sections talked about the factors affecting students' eating habits and the health implications of such habits respectively.

3.7 Data Collection Procedure

In the collection of the data, the institutions were visited and the staff and head teachers briefed on the purpose of the study and its educational implications. This was done after permission was sought and granted by the Heads of the institutions involved. The students were allowed some time to raise questions about the areas they were finding difficult to understand. After the discussion, the questionnaires were distributed to them to respond to at their own convenience. On the whole, about three weeks was spent for the collection of the data. All the respondents completed the questionnaires for collection.

3.8 Validity and Reliability of Instruments

Validity and reliability in research is the degree of stability exhibited when measurement is repeated under identical conditions (Burns & Grove, 1997). Research validity refers to the researcher's objectivity in actually measuring what was supposed to be measured and not something else. Reliability means responses to the questionnaire were consistent (Steiner & Norman, 1989). The following steps were taken in order to ensure the validity of the data. The questionnaire was based on information obtained from literature review. This was to ensure that it was from a representation of elements from the topic under discussion (Polit & Hunger, 1993).

Again, an initial draft of the questionnaire was pre-tested on a limited sample of 20 students from Breman Asikuma Senior High students who were not part of the sample population to help improve the instrument in the final study. This is done for the purpose of removing any ambiguity or misunderstanding in the questionnaires to fine tune of the questions. Based on their feedback, few items were revised to improve better comprehension, content validity, wording format and question flow. This pilot exercise was carried out in accordance with what Hendricks (2009) described as getting the bugs out of the instrument so that respondents in the main study will experience no difficulties in completing them. This was also to enable the researcher carry out a preliminary analysis to see whether the wording and format of questions will present any difficulties when the main data is analyzed.

3.9 Data Analysis Procedure

Data analysis is the process of evaluating data using analytical and logical reasoning to examine each component of the data provided (Burns & Grove 1997). Information gathered during data collection may lack uniformity and some information given may need reconstruction. After collecting the data, they were first edited. During editing, relevant and appropriate errors were found and modified. The edited questionnaires were then organized and coded. Coding involves assigning numbers or symbols to each response category in order to translate the raw data into a form that could be counted, tabulated or fed directly into a computer (Agyedu, Obeng & Donkor, 2011). Frequency distribution tables and percentages were used in analyzing the data. The representation of data in a table form is referred to as tabular representation. The organized and coded data was then fed into the Statistical Package for Social Sciences (SPSS Software) for analysis and interpretation. The analysis and interpretation are presented under Chapter Four of this study.

3.10 Ethical Considerations

Ethical issues are of a great relevance in any credible research. According to Saunders *et al*., (2011), ethics imply demonstrating critical sense of respect in relation to the rights of individuals who become the subject of your work or are affected by it. In view of this, this research was conducted in a moral and responsible manner so as to protect all those who provided data for the study. To conform to the ethical principle of informed consent, written permission was sought from Breman Asikuma senior high and Best Brain Senior High Headmasters and senior house mistresses and masters who in turn briefed the students on the importance of the research. The researcher ensured that the information provided was used only for the purposes of the study. The anonymity of the study participants was protected. No names were mentioned in the study. There was nothing that could give anybody the slightest idea as to who gave what information. This was deliberately done to protect the identity of the individuals who contributed to the study. Finally, plagiarism has become a very hot issue in research these days. As a result, the researcher made references to works that are not the original work of the researcher. Such works were acknowledged for easy reference and also to make the study more credible.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1 Introduction

This study was conducted in the Breman Asikuma Odoben Brakwa District of the Central Region of Ghana to examine the eating habits of senior high school students and its impact on their health. This chapter presents the results emanating from the data collected from the field survey which also served as a basis for discussion. This chapter is structured into four parts. The first part contains the presentation and discussion of demographic characteristics of the respondents. The second talks about the general eating habits of SHS students whilst the third part presents the factors influencing the eating habits of SHS students. The final and fourth part talks about the effects of students' eating habits on their general health.

4.2 Socio-Demographic Data of Respondents

To get a clear understanding of the respondents' background and suitability for the study, the researcher collected their demographic data. The questionnaire presented to respondents collected details about their gender, age group, level in school and religious affiliation for analytical purposes. This is presented in Table 4.1 and discussed accordingly.

Table 4.1: Demography of respondents

Variables	Frequency (f)	Percentage (%)
Gender		
Male	72	36%
Female	128	64%
Total	200	100%
Age (in years)		
13 – 16 years	83	41.5%
17 – 20 years	107	53.5%
21 – 24 years	10	5%
25 years and above	-	-
Total	200	100%
Class		
SHS One	61	30.5%
SHS Two	90	45%
SHS Three	49	24.5%
Total	200	100%
Religious Affiliation		
Christianity	154	77%
Muslim	37	18.5%
Traditionalist	9	4.5%
Hindu	-	-
Total	200	100%

Source: Field survey, 2017.

In Table 4.1, respondents' demographic data is presented which shows that 36% of the students which represents a frequency of 72 out of 200 respondents were males whilst the remaining 64% representing 128 out of 200 were females. This is a general indication that there were more females than males in the two schools from which the sample was selected.

On the other hand, the age distribution of respondents in the table shows that 83 respondents representing 41.5% were aged between 13 and 16 years whilst 107 representing 53.5% were in the age bracket of 17 – 20 years. The remaining 10 respondents representing 5% were found to be in the age group of 21 – 24 years

whilst no respondent fell within the age bracket of 25 years and above. This shows that all the respondents surveyed for the study were in their adolescent age with majority of them falling between 17 – 20 years. According to WHO (2014) and El-Gilany and Elkhawaga, (2012), an adolescent is a person aged between 10 – 19 years whilst the youth are between 10 – 24 years. The adolescent stage is important for the establishment of eating behaviours which are often carried into adulthood.

The researcher sought information on the class or level of students in their various schools which showed that 30.5% were in SHS One, 45% in SHS Two and 24.5% in SHS Three. On religious affiliation, it was seen that 154(77%) of respondents were Christians whilst 37(18.5%) were Muslims with the remaining 9(4.5%) being Traditionalists. No respondent belonged to the Hindu religion or any other religion for that matter. This is in line with the Ghana Statistical Service (2010) report which indicates that majority of citizens in the nation 75% are Christians while Islam take about 20% with the remaining 5% belonging to various other religions.

4.3 General Eating Habits of Senior High School Students in Breman Asikuma SHS

Senior High School students who are adolescents are in the process of establishing responsibility for their own health-related behavior including dietary or eating behaviours. They are usually open to new ideas, whilst expressing interest and curiosity (Delisle, 2005). According to Feldman, (2011), the adolescence period is a developmental stage between childhood and adulthood which is a very crucial period. It often comes with profound changes and occasionally heightened emotions. Adolescents in educational settings like high school and colleges experience stress,

lack of time and academic pressure which pose as barriers against adoption of healthy behaviours. Although these behaviours of students are considered temporary, unhealthy habits picked at this stage generally persist in older and adult life (Siliman, Rodas-Fortier, & Neyman, 2004). This part of the study sought to know the eating habits of respondents which are presented in Tables 4.2 and 4.3.

Table 4.2: Eating habits of students

Variables	Frequency (f)	Percentage (%)
Patronise all school meals		
Always	125	62.5%
Sometimes	60	30%
Not at all	15	7.5%
Total	200	100%
Reason for skipping school meals		
School meal is not satisfying	38	19%
School meal is not balanced/nutritious	60	30%
School meal is not tasty	102	51%
Total	200	100%
Meal of day usually skipped		
Breakfast	128	64%
Lunch	42	21%
Supper	30	15%
Total	200	100%
Special Diet		
Yes	28	14%
No	172	86%
Total	200	100%

Source: Field survey, 2017.

The data in Table 4.2 presents the eating habits of respondents. From the table, when students were asked whether they patronized all school meals, 125(62.5%) of them indicated that they always do whilst 60(30%) responded that they do so sometimes. However, a small number 15(7.5%) answered that they do not at all patronize school meals. This suggests that a majority of 92.5% of respondents patronize school meals with 62.5% patronizing all the meals.

As a follow up to the above statement, respondents were asked their reasons for skipping school meals if they do. From the responses presented in the table, 19% opined that the school meals were not satisfying with 30% saying that the school meals were not balanced or were not nutritious. Further, a majority of 51% of students responded that the school meals were not tasty or delicious. This indicates that the general reason for students skipping school meals is mostly, as they put it, the unpalatable nature of the school meals. Students were further asked the meal of day they usually skip from school. To this, most students 128 (64%) indicated that they mostly skipped breakfast whilst 42 (21%) skipped lunch with the remaining 30 (15%) skipping supper. In consonance with literature, Story and Stang (2012) report that meal skipping is common among adolescents, especially during middle and late adolescence. Breakfast is the most commonly skipped meal and is attributed to lack of time, desire to sleep longer in the morning, lack of appetite, and dieting to lose weight. Skipping breakfast may affect concentration, learning, and school performance.

In a similar vein, respondents were asked whether they were on special diets which made them skip school meals. In response to this, only 14% of respondents said they were on special diets whilst the remaining 85% were not on any special diet and hence were free to enjoy all the meals provided by the school.

The foregoing shows that respondents do not patronize all school meals with their major reason being that the school meals are not tasty. However, they disregard the nutritious nature of the foods served them by the school because it doesn't contain the fats and oils that they consider to be 'nutritionally rich food'. Ashigbie (2015) in her

study observed that there are always a group of students who do not want to eat their dining hall breakfast, lunch or supper, with breakfast being the most prevalent. These students feel they could feed themselves better by sneaking out of campus to eat from fast food joints and 'chop bars'. Some students starve themselves out of fear of growing fat; they do not eat breakfast, sometimes lunch as well which lead to taking one meal a day (Panju, 2009).

As students have sometimes been skipping school meals, especially breakfast and lunch to eat from outside, it became imperative for the researcher to seek the kinds of food these students consume outside and their dietary composition. This is presented in Table 4.3.

Table 4.3: Dietary composition and pattern of respondents

Variables	Agree		Disagree		Mean
	f	%	f	%	($\bar{x}$)
I include fruits and vegetables in my meals	58	29%	142	71%	1.71
I sometimes take alcohol	3	1.5%	197	98.5	1.94
I take three meals in a day	154	77%	46	23%	1.23
I avoid certain types of food because of my culture and religion	63	31.5%	137	68.5%	1.69
I sometimes smoke	2	1%	198	99%	1.94
I drink fruit juice regularly	62	31%	138	69%	1.69
I prefer carbonated drinks to fruit juice	136	68%	64	32%	1.32
I take snacks in-between meals	125	62.5%	75	37.5%	1.38
I make up for skipped meals by eating big at the next meal	42	21%	158	79%	1.79

Source: Field survey, 2017.

The data as presented in Table 4.3 shows that only 29% of respondents said that they include fruits and vegetables in their meals with the remaining 71% disagreeing. This shows that majority of students in the senior high schools do not include fruits and vegetables regularly in their diets. Consistent with literature, numerous studies have

shown that high school and college students often have poor eating habits. Students tend to eat fewer fruits and vegetables on a daily basis and report high intake of high-fat, high-calorie foods (Brevard & Ricketts, 1996). Also, according to the American College Health Association (2006), a 2004 study revealed that only 7.3% of students ate five or more servings of fruits and vegetables daily.

On the issue of taking alcohol, only a small number 3, representing 1.5% admitted to sometimes taking alcohol whilst the remaining 197(98.5%) responded that they do not take alcohol or have not taken alcohol before. This is in line with outcomes of a similar study conducted by Ashigbie (2015), who reported that few students indulged in the habit of sneaking out of campus to drink alcohol which is prohibited by school authorities.

Further, when students were asked whether they take three meals per day, only 77% agreed whilst the remaining 23% disagreed. This goes to affirm the earlier result that some students skip school meals due to various reasons.

Respondents were asked whether they avoid certain types of food due to their culture and religion to which 31.5% responded in the affirmative with the remaining 68.5% responding otherwise. This is in line with Foskett *et al.,* (2003) observation that races and nations of the world represent a variety of cultures with its own ways of choosing meals. In Ghana, the two predominant religions and their sub-sects places restrictions on the food members should eat and those that should be avoided. According to Ashigbie, (2015), 23% of students avoided certain foods due to culture, religion and or other family held customs.

Again on the issue of smoking, two respondents representing 1% intimated that they sometimes smoke with the remaining 198 respondents representing 99% responding otherwise. This is an indication that the percentage of students who actually engage in the negative activity of smoking is very minimal or negligible.

On whether students drank fruit juices as part of their diet, only 31% responded affirmatively indicating that they drank fruit juice regularly with the majority of 69% responding in the negative. Panju (2009) observed that as students mostly do not include fruits and vegetables in their meals, it will be prudent for them to at least substitute with fruit juices. However, that is not the case. Students rather prefer carbonated and sweetened drinks.

In consonance with the above, when students were asked whether they preferred carbonated soft drinks such as Coca Cola, Fanta, Pepsi, etc to fruit juices, 68% agreed whilst 32% disagreed.

Similarly, 62.5% of respondents indicated that they take snacks in-between meals whilst 37.5% did not. Also, 21% respondents responded affirmatively to the assertion that they make up for skipped meals by eating big at the next meal with the remaining 79% responding otherwise. This is consistent with other studies as Kagan and Squires, (1994) stated that students lack knowledge on healthy food choices that affects their eating habits and nutritional status negatively. Previous studies revealed that college and senior high school students failed to meet the recommended intakes of fruits and vegetables (Huang, et al., 2003). Also, college and high school students had frequent snacking habits, Kagan and Squires (1994) and had a higher frequency of fast food consumption.

4.4 Factors Influencing the Eating Habits of Senior High School Students

Poor nutrition and obesity are among the most important public health issues facing society today, not in terms of health but also in health care expenses. Some research has shown that the most important factors predicting food selection among adults are; taste, cost, nutrition, convenience, pleasure and weight control, in that order (Ghanz, Basil, Maibach, Goldberg & Snyder, 1998). Similarly, other studies have shown that people establish these eating habits while they are relatively young, particularly at adolescence (Birch, 1999). The factors influencing the eating habits of senior high schools in the Asikuma Odoben Brakwa District as collected is presented in Table 4.4.

For the purpose of easy analysis, the scaling values for the questionnaire data as presented in Table 4.4 is given as, Strongly Disagree (SD) = 1, Disagree (D) = 2, Not Sure (N) = 3, Not sure, Agree (A) = 4 and Strongly Agree (SA) = 5. Again, for brevity and conciseness the researcher condensed the 'strongly disagree' and 'disagree' categories to mean Disagree; and 'strongly agree' + 'agree' to mean Agree. Based on the five-point Likert scale used, a computed mid-point mean value of 3.0 was used (Cohen, Manion & Morrison, 2007). The mean values range from 1.0 to 5.0. Any variable whose responses record a mean value less than 3.0 ($\bar{x} < 3.0$) is considered rejected or disagreed to whilst a mean value above 3.0 ($\bar{x} > 3.0$) signifies general agreement or acceptance of the statement and a mean value of 3.0 indicate neutrality.

Table 4.4: Factors that influence eating habits of senior high school students

Variables	SD		D		N		A		SA		Mean
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*	($\bar{x}$)
I am vegetarian so I am selective about the food I eat	105	52.5%	47	23.5%	20	10%	23	11.5%	5	2.5%	1.88
My finances determine the food I eat	7	3.5%	14	7%	25	12.5%	112	56%	42	21%	3.84
I am on special diet so I do not eat certain kinds of food	34	17%	141	70.5%	11	5.5%	14	7%	-	-	2.03
I sometimes skip meals because I want to lose weight	9	4.5%	7	38.5%	12	6%	62	31%	40	20%	3.24
I eat less food at meals because I am overweight	114	57%	44	22%	15	7.5%	27	13.5%	-	-	1.78
Availability of certain foods determine whether they are included in the diet	8	4%	14	7%	33	16.5%	53	26.5%	92	46%	4.04
I eat certain foods to show my social status among my peers	17	8.5%	25	12.5%	44	22%	66	33%	48	24%	3.52

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
Source: Field survey, 2017.

The data in Table 4.4 shows that, with a mean value of 1.88, respondents generally disregarded the assertion that vegetarian status influenced their eating habit or selection of food. To this assertion, a combined percentage of 76% disagreed whilst only 14% agreed with the remaining 10% opting for neutrality.

On the statement whether finances determine the kind of food eaten, 77% of respondents agreed whilst 10.5% disagreed and 12.5% disagreed. This is an indication that finances, which refer to the cost of food and the money available on students is one of the factors influencing choice of food and eating habits of students in the senior high schools.

Again, most students, 87.5% rejected the notion that their special diet status restricts them in the selection of foods to eat. To this, only 14% agreed whilst 5.5% were not sure. This suggests that since most of the students were not vegetarians and/or on

special diets, it did not influence their eating habits in school. However, the very few who were on diets responded in that direction accordingly.

When students were asked whether they sometimes skip meals because they want to lose weight, majority of 51% agreed whereas only 43% disagreed with only 6% staying neutral. Similarly, on the issue of eating less food at meals due to overweight, 79% disagreed whilst 13.5% agreed and the remaining 7.5% were unsure.

Availability of certain foods determining whether they are included in diet was accepted by respondents as a factor influencing their eating habits. This statement recorded a mean value of 4.04 and individual percentage values of 72.5% agreement and 11% and 16% disagreement and neutrality percentages respectively. Students also accepted that they eat certain foods to show their social status among their peers. This statement was agreed by 57% of respondents, disagreed by 21% whilst 22% remained neutral.

The above discussion gives a clear indication that, with mean values of 4.04, 3.84, 3.52, and 3.24 in the respective order, respondents agreed that factors influencing their eating habits are; availability of food, finances (cost), eating to show social status, and skipping meals due to weight problems. This is consistent with literature since Story and Stang (2012) are of the view that eating patterns and behaviors of adolescents are influenced by many factors, including peer influences, parental modeling, food availability, food preferences, cost, convenience, personal and cultural beliefs, mass media, and body image. Other studies, (Ghanz, Basil, Maibach, Goldberg & Snyder, 1998) showed that the most important factors predicting food

selection among adults are; taste, cost, nutrition, convenience, pleasure and weight control, in that order. Chin & Nasir (2009) revealed that meal skipping, particularly breakfast, snacking and various weight loss dietary behaviours were some of the unhealthy eating behaviours depicted by Malaysian adolescent girls.

Vegetarian diet and special diet were not given as affecting eating habits due to the very few number of students who were categorized in that group. Other factors associated with poor eating habits among college students include a higher perception of stress (Cartwright, Wardle, Steggles, Simon, Croker, & Jarvis, 2003), and low self-esteem (Huntsinger & Luecken, 2004).

4.5 Effects of Eating Habits on Students' Health

Despite the importance of healthy eating during adolescence, many adolescents' diets do not meet health requirements and nutritional guidelines such as the recommended dietary intakes or the good guide pyramid. This section of the chapter presents respondents' views on their perception of how bad eating habits can affect their health especially in the education setting.

Table 4.5: Effects of eating habits on students' health

Variables	SD		D		N		A		SA		Mean
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*	($\bar{x}$)
Too much carbohydrates in food lead to dullness and loss of attention	4	2%	13	6.5%	30	15%	95	47.5%	58	29%	3.95
Eating unhealthy foods result in complications like obesity and malnutrition	14	7%	10	5%	26	13%	80	40%	70	35%	3.91
Inadequate supply of nutrients lead to anemia and long recovery times during illness	5	2.5%	12	6%	25	12.5%	97	48.5%	61	30.5%	3.99
Excessive intake of high-fat, oil and sugar diets may lead to cardiovascular problems and diabetes later in life	-	-	15	7.5%	15	7.5%	110	55%	60	30%	4.08
Eating big at meals result in digestion problems and chest problems	22	11%	30	15%	32	16%	54	27%	62	31%	3.52
Skipping breakfast may lead to headaches, dizziness, lack of concentration and stomach ulcers	10	5%	17	8.5%	23	11.5%	63	31.5%	87	43.5%	4.00

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
Source: Field survey, 2017.

The data in Table 4.5 show that respondents were mostly aware of some of the negative health effects of unhealthy eating behaviours. From the table, 76.5% agreed that eating too much carbohydrates in food lead to dullness and loss of attention in the classroom. This was however disagreed by 8.5% and 15% were not sure receiving a mean value of 3.94 indicating general acceptance of this assertion.

Similarly, with a mean value of 3.91, students accepted that eating of unhealthy foods or junk foods result in complications like obesity and malnutrition. This statement received 75% agreement from respondents and 12% disagreement from respondents. Only 13% of respondents were not sure and consequently remained neutral.

Further, on the issue of inadequate supply of nutrients leading to anemia and long recovery during illness, a majority of 79% of respondents agreed whereas only 8.5% disagreed with 12.5% remaining neutral. This is in line with literature as the World Health Organisation (WHO, 2012) posits that anemia, the main nutritional problem in the adolescent is estimated to be 27% and 6% in the developing and industrialized countries, respectively (WHO, 2012a). This is testament to the fact that, students have nutritional knowledge and knew the adverse effects of unhealthy eating behaviours. When students were asked whether excessive intake of high-fat, oil and sugar diets may lead to cardiovascular problems and diabetes later in life, an overwhelming majority of 85% agreed with 7.5% disagreeing and the remaining 7.5% being neutral. This statement received a mean value of 4.08 which indicates high acceptance.

Also, on the issue of eating big at meals resulting in indigestion and chest problems, respondents agreed. From the table, this statement received a mean of 3.52 which is above the accepted value of 3.0. The individual agreement responses were 58% for agreement and 26% for disagreement with 16% being unsure. Eating big at meals sometimes arise as a result of binge eating sessions, a sudden availability of plenty amounts of food and/or having too little food for a past period of time.

The unhealthy habit of skipping breakfast was also presented to students and asked whether they were aware that it may lead to headaches, dizziness, lack of concentration and stomach ulcers. This statement with a mean value of 4.0 was accepted by majority of respondents. In fact, 75% of respondents agreed whereas 13.5% disagreed and 11.5% were unsure. This goes to cement earlier notion that students/adolescents are aware of unhealthy eating habits and their health effects but were however not practicing good eating habits.

The above discussion supports the views of Rieth *et al.,* (2012), Feinstein et al., (2008) and Neumark-Sztainer *et al*., (2002) who indicated that in general, adolescents know what they should and should not be eating. They also knew the adverse health effects of their unhealthy eating habits. However, due to certain barriers most students do not practice good eating behaviours. This is because many adolescents feel that healthy eating is not a primary concern during the teenage years. In general, the quality of the adolescent diet is a reflection of this lack of concern. Adolescents say that in order to improve their eating, healthy foods should be appealing and taste good, and be more widely available (Story & Stang, 2012). Also, the major barriers to adolescents practicing good eating behaviours were lack of time, inconvenience of healthy eating, lack of self-discipline and a lack of a sense of urgency about their health.

These and others are evidence showing that many communities in low and middle income countries are exposed to risk factors such as unhealthy eating habits in early life, which overtime will result in a rise in prevalence and incidence of non-communicable diseases such as diabetes, cardiovascular diseases, and cancer (Bygbjerg, 2012).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study was conducted in the Breman Asikuma Odoben Brakwa District of the Central Region of Ghana to assess the eating habits of some senior high school students and its impact on their health. This section of the study presents the summary of the key findings from the results of the study, concludes on the findings and provides recommendations and suggestions for future researchers.

5.2 Summary of Findings

From the analysis of the data collected through questionnaire administration, several findings were arrived at. These findings are presented in a summarized form in accordance with the research objectives.

5.2.1 General Eating Habits of Senior High School Students in the Breman Asikuma District

From the analysis of data and discussion provided, it came to the fore that students do not patronize all school meals with their major reason being that the school meals are not tasty. It was further seen that, majority (71%) of students in the senior high schools do not include fruits and vegetables regularly in their diets. Alcohol consumption and smoking was very minimal i.e. 1.5% and 1% respectively. Students mostly skipped breakfast, drank carbonated drinks instead of fruit juices and took snacks in-between meals.

5.2.2 Factors Influencing the Eating Habits of Senior High School Students in

Breman Asikuma

Studies have shown that people establish eating habits while they are relatively young, particularly at adolescence. However, there were several factors affecting the eating habits of senior high school students. From the analysis, it was revealed that availability of foods, finances or cost of food, eating to show social status and skipping meals for weight loss were the factors that influenced the eating habits of senior high school students most.

5.2.3 Perceived Effects of Students' Eating Habits on their General Health

It was seen that, many adolescents' diets do not meet health requirements and were perceived to have effects on their health. The health effects seen from the study were; excessive intake of high-fat, oil and sugar diets leading to cardiovascular problems and diabetes, skipping breakfast may lead to headaches, dizziness, lack of concentration and stomach ulcers, too much carbohydrates leading to dullness, loss of attention and obesity.

5.3 Conclusion

An eating habit of adhering to a low fat, low sugar diet and exercising regularly help prevent diseases (Mader, 2005). Insel *et al.,* (2004) stated that a sensible eating habit with regular exercise would promote long term good health and fitness which would enable people enjoy and· feel their best in life. Senior High School students who are adolescents are in the process of establishing responsibility for their own health-related behavior including dietary or eating behaviours. Based on the findings from the study, the following conclusions were made; students mostly have poor eating

habits, tend to eat fewer fruits and vegetables, skipped breakfast, and drank carbonated drinks instead of fruit juices. Factors such as availability of certain foods, students eating certain foods to show social status among peers, cost and finances influencing food eaten, and skipping meals to lose weight influenced the eating habits of students. Unhealthy eating habits were found to have effects such as dizziness, loss of concentration, stomach ulcers and cardiovascular problems and diabetes later in life.

5.4 Recommendations

The researcher wishes to make the following recommendations based on the findings of the study:

1. Conscious efforts should be made to educate students on the benefits of healthful eating habits and its impact on their health especially in their late adult life. This will instil a sense of urgency in them to adhere to recommended healthy eating practices and enjoy good quality lifestyles.

2. Students should endeavour to include more fruits and vegetables in their diet if and when they eat from outside since this will reduce their fat and oil intakes and make them healthy individuals overall.

3. The attitude of skipping breakfast should be discouraged since research asserts that breakfast is the most important meal of the day.

4. Students should be advised by their teachers and parents to eat the breakfast served at their school's dining since they are mostly cereals with essential dietary fibre most suitable for breakfast and healthy living.

5.5 Suggestions for Further Study

It is recommended that the scope of future research should be broadened to include a larger representative sample size of students by including students from other institutions in the Central Region. Also, it is recommended that since boarding house students are usually fed a uniform meal, future studies can assess the nutritional intakes of day students and how it impacts on their health.

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APPENDIX

QUESTIONNAIRE FOR SHS STUDENTS AT BREMAN ASIKUMA

This questionnaire intends to collect information about the food eating habits of Senior high students in Breman Asikuma. This is to aid a student pursuing the Masters programme of the above University to undertake of the above University to write her research work. You have been randomly selected to participate in this research. Confidentiality to all information is assured. I shall be grateful if you could spare a moment of your time to answer the following questions. Please tick (√) the response that best reflects the extent to which you agree or disagree with each of the following statements. Thank you.

SECTION I: DEMOGRAPHIC INFORMATION

1. Gender

   Male [   ]   Female [   ]

2. Age (in years)

   13 – 16 years   [   ]

   17 – 20 years   [   ]

   21 – 24 years   [   ]

   25 years and above   [   ]

3. Class

   SHS One   [   ]

   SHS Two   [   ]

   SHS Three   [   ]

4. Religious affiliation

Christianity   [ ]

Muslim   [ ]

Traditionalist [ ]

Hindu   [ ]

Others   [ ]

SECTION II: GENERAL EATING HABITS OF SHS STUDENTS

5. Do you patronize all school meals?

Always   [ ]

Sometimes   [ ]

Not at all   [ ]

6. What is your reason for skipping school meals at dining?

The school meal is not satisfying   [ ]

The school meal is not balanced   [ ]

The school meal is not tasty   [ ]

7. Which meal of the day do you normally skip?

Breakfast   [ ]

Lunch   [ ]

Supper   [ ]

8. Are you on a special diet?

Yes [ ]   No [ ]

Please tick (✓) in the appropriate box to indicate your answer to the following statements

No.	Statement	Agree	Disagree
9	I include fruits and vegetables in my meals		
10	I sometimes take alcohol		
11	I take three meals in a day		
12	I avoid certain types of food because of culture and religion		
13	I sometimes smoke		
14	I drink fruit juice regularly		
15	I prefer carbonated drinks to fruit juice		
16	I take snacks in between meals		
17	When I skip a meal, I make up by eating big in the next meal.		
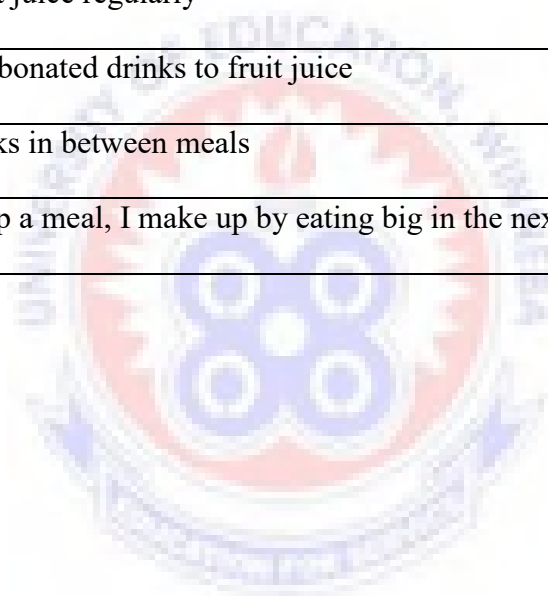
SECTION III: FACTORS INFLUENCING THE EATING HABITS OF SHS STUDENTS

Please tick (✓) in the appropriate box to indicate the extent to which you agree or disagree to the following as factors associated with eating habits of students

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.

No.	Statement	SD	D	N	A	SA
18	I am a vegetarian so I am selective about the food I eat					
19	My finances dictate the kind of food I can eat					
20	I am on a special diet due to health problems so I do not eat certain kinds of food					
21	I sometimes skip meals because I want to lose weight					
22	I try to eat less food at meals because I am overweight					
23	Availability of certain foods determine whether they are included in the diet					
24	I eat certain foods to show my social status among my peers					

SECTION IV: PERCEIVED EFFECTS OF STUDENTS' EATING HABITS ON THEIR GENERAL HEALTH

Please tick (✓) in the appropriate box to indicate the extent to which you agree or disagree to the following as effects of eating habits on students' health.

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.

No.	Statement	SD	D	N	A	SA
25	Too much carbohydrates in food lead to dullness and loss of attention in class					
26	Eating of unhealthy foods result in health complications like obesity and malnutrition.					
27	Inadequate supply of some nutrients lead to deficiencies like anaemia and long recovery times during illness.					
28	Excessive intake of high-fat, oil and sugar diets may lead to cardiovascular problems and diabetes later in life					
29	Eating big at meals result in indigestion and chest problems					
30	Skipping breakfast may lead to headaches, faintness, lack of concentration and stomach ulcers.					