UNIVERSITY OF EDUCATION, WINNEBA

THE PREVALENCE OF DIET RELATED HEALTH PROBLEMS AMONG THE ELDERLY IN BIRIM CENTRAL MUNICIPALITY

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DECLARATION

Student's Declaration

I, **Divina Emmanuelah Galley**, hereby declare that this thesis, 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 that 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 dissertation were done in accordance with the guidelines for supervision of thesis laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: MS. COMFORT KUTUM MADAH

SIGNATURE: ……

DATE:……..

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DEDICATION

To the Galley family.

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ABSTRACT

The basic needs of elderly people in society appears to be ignored or not sufficiently prioritized, Particularly, the elderly are not given adequate care in line with their nutritional needs due to food insecurity. This study was conducted in Birim Central Municipality. To investigate a prevalence of diet related health problems of the elderly, and the socio-economic determinants of these problems. The research methods used for the study were survey, and observation. The study employed the cross-sectional design. Two hundred (200) elderly people were purposively sampled from ten (10) conveniently selected settlements in the municipality. Questionnaire and observation checklist with calculated Cronbach's alpha reliability coefficient of 0.79 were used as research instruments to collect data. The quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) version 22 software. The study revealed that less than 23% of the elderly suffered nutritional and diet related health problems, such as hypertension, overweight/obesity, weight loss, and constipation. The study identified poor place of residence, food or diet restrictions, weak social support system, and food unavailability as the determinants of these nutrition and health problems of the elderly. All indications from this study shows that many elderly people in the society are not given adequate care in line with their nutritional and basic needs and that the basic needs appears to be ignored or not sufficiently prioritized.The study recommended that caretakers and families of the elderly in the municipality should always provide adequate food to the elderly people. They should improve the feeding practices and nutrient content of foods given to elderly by feeding them with the right amount of carbohydrate, protein, and vitamin-giving foods three times or more in a day; and giving them adequate fresh fruits, vegetable and water.

CHAPTER ONE

INTRODUCTION

1.1 Overview

The chapter discusses the background to the study, statement of the problem, purpose and objectives of the study and research questions. It also talks of the significance of the study, delimitations of the study, limitations of the study, and organization of the study.

1.2 Background of the Study

Ageing is the impact of time on our bodies. It is defined as the gradual irreversible biological changes that occur in all living things with the passage of time, eventually resulting in death (Biren & Woodruff, 2003). The changes that come with ageing are not only biological but also physical, psychological and social. Among humans, the effects of ageing vary from one individual to another. Stoltz, Udén and Willman (2012) observed that the physical, psychological and the social changes that an individual goes through would not be the same as what another individual would also pass through.

People who have advanced in age go through a lot of challenges, including diet-related or nutritional challenges. The diet of an individual is what they eat, which is largely determined by the availability, processing and palatability of foods. A healthy diet includes preparation of food and storage methods that preserve nutrients from oxidation, heat or leaching, and that reduce risk of food-borne illnesses. Nonetheless, a poor diet may have an injurious impact on health, causing deficiency diseases such as scurvy and kwashiorkor; health-threatening conditions like obesity and metabolic syndrome; and

such common chronic systemic diseases as cardiovascular diseases, diabetes, and osteoporosis (National Institutes of Health, 2001).

Nutrition is the science that interprets the interaction of nutrients and other substances in food, for instance phytonutrients, anthocyanins, tannins, and so on in relation to maintenance, growth, reproduction, health and disease of an organism. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion (National Institutes of Health, 2001).

Nutrition is an important determinant of health in the elderly. The normal aging process involves changes that can influence nutritional status. Taste sensitivity normally declines with age and can affect energy regulation (Shaffer &Tepper, 1994). If food does not taste good, people are less inclined to eat; this is a common problem in the elderly. Thirst mechanisms are also affected by aging. Dehydration is common in institutionalized populations and has also been found in free-living older adults (Phillips *et al*., 1984).

The immune function is altered with aging, and dysregulation of immune function contributes to infection and neoplastic and inflammatory diseases (WHO, 2002). Research has indicated that intake of foods rich in n-3 fatty acids is associated with an increase in anti-inflammatory eicosanoids, whereas consumption of n-6 fatty acids is linked to the increased production of pro-inflammatory eicosanoids (Ross, 1999); n-3 polyunsaturated fatty acids also increase T cell-mediated function in healthy older persons (Weksler, 1995), and vitamin B-6 supplements increase lymphocyte proliferation in response to T and B cell mitogens (Talbott *et al.*, 1987). These are just a few examples of the rapidly emerging research on how diet can influence immune function.

For many individuals, the cognitive changes that occur with aging are affected by micronutrient intake. Oxidative stress is one of the key factors that affect brain function in aging (Fukui *et al*., 2001); antioxidants appear to be important in slowing this process (Morris *et al*., 2002), as are the B vitamins folate, vitamin B-6, and vitamin B-12 (Selhub *et al*., 2000).

In the United States, for instance, the dual problems of overweight and obesity occur side by side with problems of malnutrition in the elderly. Despite the overweight and obesity crises in the United States, some under nutrition occurs as a result of unhealthy weight loss in older persons. Such unexplained, involuntary weight loss can lead to protein-energy malnutrition, which can precipitate sarcopenia, a loss of lean muscle mass. About 45% of older adults have some degree of sarcopenia (Janssen *et al*., 2004), and adequate dietary protein is needed to conserve lean muscle mass.

Over the past decade, the importance of nutritional status has been increasingly recognized in a variety of morbid conditions including cancer, heart disease, and dementia in persons over the age of 65 (Basran & Hogan, 2002; Keller *et al*., 2003). Although there is no uniformly accepted definition of malnutrition in the elderly, some common indicators include involuntary weight loss, abnormal body mass index (BMI), specific vitamin deficiencies, and decreased dietary intake (Reuben *et al*., 2004). Body Mass Index (BMI) is estimated according to the formula BMI = weight (kg)/height $(m)^2$. BMI results of less than 18.5 are classified as underweight, 18.5 - 24.9 as “normal”, 25.0 - 29.9 as overweight, and over 30.0 as obese (Health Canada, 2003).

Malnutrition in older patients is regularly under-diagnosed (Gariballa, 2000), and many physicians have expressed their need for more education regarding nutritional status in older patients (Mihalynuk *et al*., 2004). For example, health practitioners may not readily recognize weight loss in the elderly as a morbid symptom of malnutrition because some weight losses may be associated with age-related reductions in muscle mass (Kane *et al*., 1994).

Similarly, elderly patients with concurrent obesity often have protein under-nutrition that may be overlooked. The elderly also often have multiple comorbidities that contribute to overall nutritional compromise. Given these complex contributing factors, a careful nutritional assessment is necessary for both the successful diagnosis of malnutrition in the elderly and the development of appropriate and comprehensive treatment plans.

Nutritional problems in the elderly can cause a number of complications, including weakened immune systems, lowered energy levels and chronic health problems such as type 2 diabetes, high blood pressure, heart disease, stroke and osteoporosis. Making changes in their diet to match the changes in elders‟ changing caloric, energy, taste and access needs helps prevent malnutrition, which often goes undiagnosed. The following are some of the nutritional problems in the elderly:

Ageing is seen as a global challenge which will impact developing countries greatly; therefore investing in health during the life course will ensure that a good number of people reach old age in good health. Even though the proportion of aged in African population is much smaller as compared to those of the developed world, the number of

the aged in Africa is increasing rapidly. Research has shown that life expectancy has increased the world over, including Ghana. According to the World Health Organization (WHO) data published in 2013, life expectancy in Ghana is 61.5 in male, 64.1 in female which gives Ghana a world life expectancy ranking of 152 as a result of improved health care services to eradicate the childhood killer diseases. However, there is now increased mortality from diseases of the elderly as a result of food insecurity (Coleman-Jensen *et al.,* 2010) and poverty which makes it impossible for the elderly to make healthy food choices.

The most common eating disorder in the elderly in both in hospitals and in community setting is food refusal. This may lead to weight loss and malnutrition with all the adverse consequences on independence and function of the elderly (Macus, 2002). Older persons are particularly vulnerable to malnutrition. Moreover, attempts to provide them with adequate nutrition encounter many practical problems.

The process of ageing also affects other nutrient needs. For example, while requirements for some nutrients may be reduced, some data suggest that requirements for other essential nutrients may in fact rise in later life. There is thus an urgent need to review current recommended daily nutrient allowances for the elderly. Many of the diseases suffered by older persons are the result of dietary factors, some of which have been operating since infancy. These factors are then compounded by changes that naturally occur with the ageing process.

Education on nutrition is one major aim of the government and the stakeholders on health issues in Ghana in helping individuals to obtain knowledge, skills and

motivation needed to make the appropriate food choices for positive health throughout their lives for longevity. As a result, the government has established the Livelihood Empowerment Against Poverty thus the (LEAP program) to help poverty stricken households in selected regions in the country on pilot basis through the Ministry of Women and Children"s Affairs so that those who are in the poverty zone can have something doing in order to afford a nutritious meal which will be balanced to eat.

1.3 Statement of the Problem

Most of the elderly people in Birim Central Municipality in the Eastern Region of Ghana are at risk of diet related health problems because they are unable to make healthy food choices. This is because most of them lived alone and tend to eat what is available not considering the nutritive value of the food, that of their health status and how beneficial the food is to their health. The National Ageing Policy (2010) of Ghana reported that most often the elderly in our society complain of health problems such as dementia, heart diseases, bones and joints ailments. Studies have been conducted on the challenges the elderly in society face and the kind of support they need, however little has been done on diet-related health problems among the elderly in Birim Central Municipality. This study sought to delve into this area to find out the kinds of diet the elderly in Birim Central Municipality eat, their eating habits, and to check if the diet is really the cause of their health problems so that recommendations can be made to the elderly and the care givers on how best they can modify their eating habits to avoid some of the health problems.

1.4 Purpose of the Study

The main purpose of the study was to find out if there is a prevalence of diet related health problems of the elderly in Birim Central Municipality and to identify which of the health problems are more prevalent.

1.5 Objectives of the Study

The objectives of the study were to:

i. determine the demographic and socio-economic determinants of nutrition and health of the elderly in Birim Central Municipality,
ii. find out the dietary habit and lifestyle of the elderly in Birim Central Municipality,
iii. investigate diagnosed nutritional or diet related health problems among the elderly in Birim Central Municipality,
iv. find out how to improve the diet related health problems of the elderly in Birim Central Municipality.

1.6 Research Questions

The key research questions of this study were:

i. What are the demographic and socio-economic determinants of nutrition and health of the elderly in Birim Central Municipality?
ii. What are the dietary habit and lifestyle of the elderly in Birim Central Municipality?
iii. What are the nutritional related health problems diagnosed among the elderly in the municipality?

iv. In what ways can the diet related health problems of the elderly be improved?

1.7 Significance of the Study

This study would provide some basic information on the prevalence of diet related health problems of the elderly in the Birim Central Municipality for the Ministry of Health and other stakeholders in designing and implementation of policy interventions to improve the health conditions of the aged in the country. This study would also fill the knowledge gaps on the prevalence of diet related health problems among the aged population in the Birim Central Municipality.

1.8 Delimitations of the Study

This research is restricted to Birim Central Municipality. Therefore, it is inappropriate to generalize the findings of this study to other municipalities in the country. The involvement of Ministry of Health officials and other health care givers would have further enriched the work with their deep insights and wealth of information on health administration and disease control in Ghana. However, the study focused on the elderly because it was believed that the views of the Ministry of Health officials and other health care givers could not substantially change the views obtained from the elderly themselves. As such, the study was restricted to the elderly.

1.9 Limitations of the Study

The main limitation of the study was the limited time frame under which the research has to be carried out and submitted. As a result, a wider range of coverage has been retarded. The researcher has sacrificed enough time and financial resources for the study at the expense of normal academic work to come out with a satisfactory result. Another problem which could have effect on the study was the reluctance of some of the participants to give out information relating to their health.

The researcher encountered a number of difficulties during the conduct of the study. Some of the institutions, especially the Ministry of Health officials were reluctant as to who should answer the questionnaire. There was also a challenge of unwillingness on the part of some of the respondents to provide the information for fear of the outcome of the research.

1.10 Chapter Outline

This study is organized into five chapters. The first chapter is the introduction which comprises the research background, problem statement, objectives of the study, research questions, significance of the study, and limitation of the research.

Chapter two is the literature review and it focuses on the theoretical framework and review of relevant literature on dermographic, socio-economic and dietary habits that affect the health status of the elderly.

Chapter three deals with the research methodology; it shows the research design, area of study, study population, sample and sampling technique, instrumentation, data collection method, data processing and the mode of analysis.

Chapter four presents and discussion of the results of the analysis of data collected. Finally, chapter five comprises the summary, conclusions and recommendations. The list of references and appendices follow this chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

The main purpose of the study is to find out if there is a prevalence of diet related health problems of the elderly in Birim Central Municipality. This chapter reviews the existing literature by scholars concerning the subject of the study. This is done purposely to see how best the current study fits into or deviates from the schools of thoughts and findings. Specifically, the chapter is divided into three sections or themes:

a. Theoretical framework.
b. Conceptual framework.
c. Demographic and socio-economic determinants of nutrition and health of the elderly.
d. Dietary habit and lifestyle of the elderly.
e. Nutritional or diet related health problems among the elderly.
f. Improving the diet related health problems of the elderly.

2.2 Theoretical Framework

The theoretical framework adopted for this study is the Health Belief Model (HBM). The HBM was first developed in the 1950s by social psychologists, Hochbaum, Rosenstock and Kegels working in the U.S. Public Health Services. The HBM is a psychological model that attempts to explain and predict health behaviours. The underlying concept of the original HBM is that health behaviour is determined by

personal beliefs or perceptions about a disease and the strategies available to decrease its occurrence (Hochbaum, 1958).

The HBM has been applied to a broad range of health behaviours and subject populations. Three broad areas can be identified): 1) Preventive health behaviours, which include health-promoting (for example, diet, exercise) and health-risk (for example, smoking) behaviours as well as vaccination and contraceptive practices. 2) Sick role behaviours, which refer to compliance with recommended medical regimens, usually following professional diagnosis of illness. 3) Clinic use, which includes physician visits for a variety of reasons (Conner & Norman, 1996).

Specifically, the HBM consists of four major constructs as explained below.

Perceived susceptibility: The greater the perceived risk, the greater the likelihood of engaging in behaviours to decrease the risk. Perceived susceptibility motivates people to be motivated against influenza (Chen *et al.,* 2006) to use sunscreen to prevent skin cancer, and to floss their teeth to prevent gum disease and tooth loss. Unfortunately, the opposite also occurs. When people believed they are not at risk or have low risk of susceptibility, unhealthy behaviours tend to result. This is exactly what had been found with older adults and HIV prevention behaviour. This is because older adult generally do not perceive themselves to be at risk for HIV infection, many do not practice safer sex (Maes & Louis, 2003).

Perceived benefits: The construct of perceived benefits is the person‟s opinion of the value or usefulness of a new behaviour in decreasing the risk of developing a disease. People tend to adopt healthier behaviours when they believe the new behaviour will

decrease their chances of developing a disease. According to the New York Presbyterian Hospital (2006), perceived benefits place an important role in the adoption of secondary prevention behaviours such as screening. For example, 36% of people over age 50 (who are almost at risk) had undergone screening test for colonoscopy (colon cancer) regardless of the inconvenience.

Perceived barriers: This construct addresses the issues of perceived barriers to change. This is an individual‟s own evaluation of the obstacles in the way of him/her adopting a new behaviour. According to this construct, in other for a new behaviour to be adopted, a person needs to believe that the benefits of the new behaviour outweigh the consequences of continuing the old behaviour (Centre for Disease Control and Prevention, 2004). Some of these barriers include difficulty in adopting a new behaviour, fear of not being able to perform behaviour and embarrassments (Umeh & Rogan-Gibson, 2001). Among college women, fear of pain and embarrassments are the barriers to Pap test (Burak & Meyer, 1997).

Perceived severity: The construct of perceived severity speaks to an individual‟s belief about the seriousness of a disease. Even though the construct of perceived severity is often based on knowledge, it may also come from beliefs that a person has about the difficulties a disease will create or the effects it would have on his/her life in general (McCormick-Brown, 1999). For example, most of us view the flu as a relatively minor ailment. We get it, stay at home for few days and get better. However, if you have asthma, contracting the flu could land you in a hospital. In this case, your perception of the flu might be that it is a serious disease. Or if you are a self-employed, having the flu might mean a week or more of lost wages.

Modifying variables

The four major constructs of perception are modified by other variables such as culture, educational levels, skills, past experiences, to mention a few. These are individual characteristics that influence personal perception. For example, if someone is diagnosed of basal cell skin cancer and has been successfully treated, he or she may have a heightened perception of susceptibility because of this past experience. Conversely, this past experience could diminish the person perception of seriousness because the cancer was easily treated and cured.

Cues to action

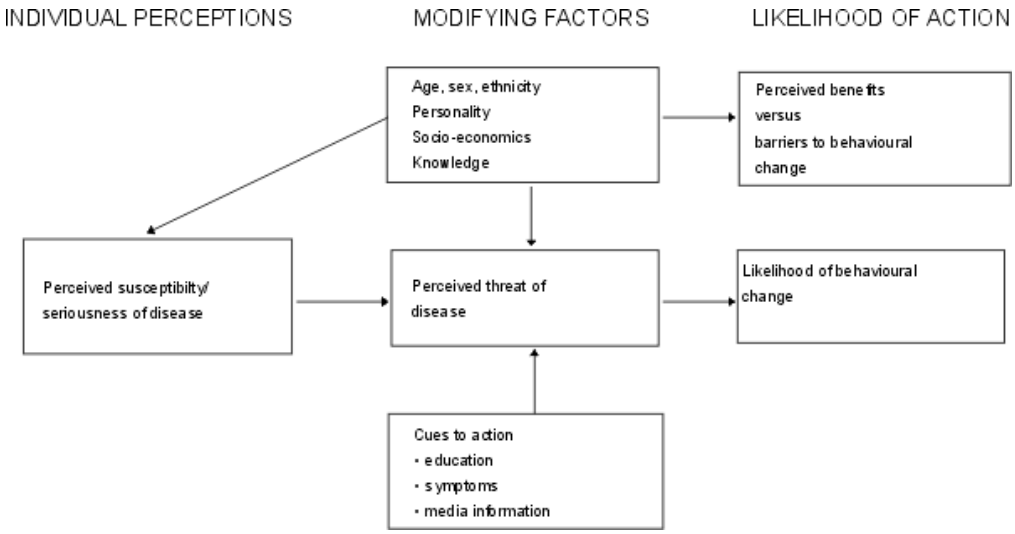
In addition to the four major beliefs or perception and modifying variables, the HBM suggests that behaviour is also influenced by cues to action. Cues to action are events, people or things that move people to change their behaviour. Examples include illness of a family member, media reports (Graham, 2002), reminder postcard from a health care provider (Ali, 2002), or health warning label on a product. Knowing a fellow church member with a prostate cancer is a significant cue to action for African American men to attend prostate cancer educational programmes (Weinrich *et al.,* 1998).

A recent addition to the HBM is the concept of self-efficacy or one's confidence in the ability to successfully perform an action. This concept was added by Rosenstock and others in 1988 to help the HBM better fit the challenges of changing habitual unhealthy behaviours, such as being sedentary, smoking, or overeating. According to Umeh and Rogan-Gibson (2001), unless a woman believes she is capable of performing

breast self-examination (BSE) that is, has a BSE efficacy, this barrier will not be overcome and BSE will not be practiced.

In summary, according to the HBM, modifying variables cues to action and self-efficacy affect our perception of susceptibility, seriousness, benefits and barriers and therefore our behaviour. This model is presented and illustrated as a conceptual framework in Figure 1 below.

2.3 Conceptual Framework



(1a) Source: Glanz *et al*. (2002, p. 52)

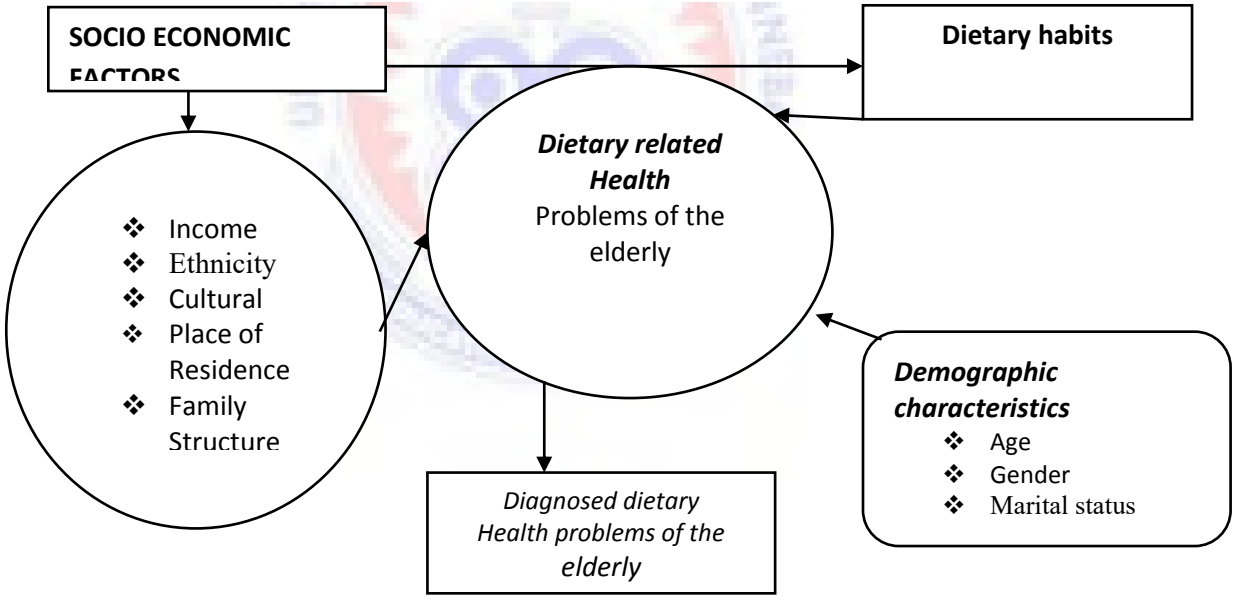


Figure (1b**)**.

Figures 1a and 1b show the conceptual framework for the current study.

Source: Author‟s construct

Demographic, Socio-economic Factors and Dietary Habits that Affect the Elderly

2.3.1 The Concept of Ageing

The definition of old age has varying connotations depending on the particular context in which it is used. United Nations experts of ageing prefer the term “ageing” to “elderly” since it provides a more adequate description of the continuing development and change during the later stages of the life span, rather than a fixed or static period of life. In this study, the researcher will be using these terms interchangeably. In conducting this study, the researcher kept in mind this term, that is, ageing, which best describes this segment of the population beyond their middle year of life and encompassing several stages of life span with a vast range of differences. Still for practical reasons, statistical definition of old age is usually used in demographic studies, analysis and social policies relating to ageing (Agyemang, 2014).

There is no United Nations standard numerical criterion for defining the elderly, but the UN‟s agreed cut off refers to the older population as people who are 60+ years (Personal correspondence, 2001). Most developed countries have accepted the chronological age of 65 years as a definition for the 'elderly' or older person, but like many westernized concepts, this does not adapt to the situation in Africa. Although there are commonly used definitions of old age, there is no general agreement on the age at which a person becomes old.

By one definition, ageing refers to a progressive loss of the ability to adapt so that the individual becomes increasingly less capable of coping with life challenges (WHO, 2008).

It is a continuous process from birth to death, encompassing physical, social, psychological and spiritual changes. These changes can be influenced by genetic, environmental and lifestyle factors (Lovell, 2006). The World Health Organization has no international consensus for the definition of elderly, other than stating that persons who are 65 years and older are classified as elderly.

By one definition, ageing refers to a progressive loss of the ability to adapt so that the individual becomes increasingly less capable of coping with life challenges (WHO, 2008). It is a continuous process from birth to death, encompassing physical, social, psychological and spiritual changes.

Gorman (2000) posits that, in contrast to the chronological milestones which mark life stages in the developed world, old age in many developing countries is seen to begin at the point when active contribution is no longer possible. Ageing itself is a combination of changes in our body and the impact of what we do with our bodies (Biren & Woodruff, 2003). Most often we try to do anything possible to retard the rate of ageing. However, whatever we do to the body which include the food we eat, the intensity of thinking or worry we go through, the body creams we smear on, the amount of sun rays exposed to the body and many more all affect the ageing process. Some people take medicine; others use body lotions on the body and still others eat well, exercise their bodies and do all sorts of things just to impede the processes of ageing yet the unavoidable sets in. The ageing process is a biological reality which has its own dynamics, largely beyond human control.

From 1950 to approximately 2010, the global population of individuals aged 65 and older increased by a range of 5-7 percent (Lee, 2009).

This percentage is expected to increase and will have a huge impact on the Dependency Ratio (Bartram & Roe, 2005). Wienclaw (2009) suggests that as health care improves and life expectancy increases across the world, elderly care will be an emerging issue.

The amount and type of elderly care varies from culture to culture. For example, in Asia the responsibility for elderly care lies firmly on the family (Yap, Thang & Traphagan, 2005). This is different from the approach in most Western countries, where the elderly is considered independent and are expected to tend to their own care. These differences are based on cultural attitudes toward ageing.

In Ghana, some people are more inclined to describe a person as old by his or her appearance, whiles others will simply go with the compulsory retirement age of 60 years (Apt, 1992). Others also allow the person concerned to describe himself, whether he is old/elderly or not. Others have a discriminatory categorization, arguing that a woman"s looks tell how old she is and men are as old as they think they are.

More importantly, as the meanings attached to the concept "age" change, so do the experiences. In traditional societies, old age and the elderly were conceptualized in terms of experiences and their role in the household, which sometimes extended beyond the family into the community (Agyemang, 2014). Thus, in traditional societies, old age and the elderly were conceptualized in terms of experiences and their role in the household, which sometimes extended beyond the family into the community (Agyemang, 2014). This is especially the case in African societies where the elderly are defined not only in terms of their chronological age but also of their experiences. Elderly people were respected for their wisdom and maturity. As such, they were often consulted to offer

guidance and to make critical decisions within the family. However, in industrialized societies, this attitude is changing; elderly people are no longer valued with a social and cultural status.

It is significant to note that, elderly people‟s lives are influenced by biological ageing as well as social factors. One social factor is poverty, which can result from their lack of involvement in the labour market compelling them to survive on minimum wages (Calasanti, Selvin & King, 2006; Krekula, 2007). While some elderly people may be forced to depend on others, such as the extended family members through remittances, as a result of their inability to earn money, for others the State pension becomes the only source of income. For others, this provision is complemented by the money they make through small projects.

Other problems and challenges associated with old age are only the result of the biological aspect of ageing. Biologically, the elderly may experience challenges that are reinforced and perpetuated through culture and institutions. Age segregation reinforces, in one way or the other, views of elderly people and old age as a stage at which people become slow, incapable of doing certain tasks and are dependents. This is despite the evidence that chronological age is a poor predicator of a person‟s intellectual capabilities, social behaviour and even ability to work (Calasanti *et al*., 2006).

It is therefore prudent that if nothing is done to reverse the current situation, younger men and women shall also suffer neglect as elderly people in the future, if they live long enough to grow older (Calasanti *et al*., 2006; Krekula, 2007). Thus, the fear of ageing may lead to younger people distancing themselves from issues surrounding old

age. This is due to the perception that old age has come to symbolize a loss of social power and authority, among other things, a position into which no one can be fully prepared to step (Agyemang, 2014). Whatever the possible reasons for the silence regarding elderly people‟s issues, it is clear that much could be drawn from both elderly males and females in terms of how to challenge the social construction of old age, as a result of their experiences with regard to the position of the elderly.

2.3.2 Ageing Situation in Ghana

Ageing is a broad concept that includes physical changes in our bodies over adult life, psychological changes in human minds and mental capacities, social psychological changes in what humans think and believe, and social changes in how humans are viewed, what we can expect, and what is expected of us (Atchley & Barusch, 2004).

The number of older people in Ghana has increased more than seven-fold from 213, 477 in the 1960 census to 1, 643, 381 in the 2010 census. In 2010, 6.7% of Ghana‟s population was aged 60 or over. A higher proportion of women than men are living to be age 70 and over, resulting in a larger population of older females. At the same time, the average number of children born to a woman over her lifetime has dropped from 6.4 in 1988 to 4.0 children in 2008 (Ghana Country Report on the implementation of the Madrid International Plan of Action on Ageing (UNFPA, 2012).

In Ghana, as in most Low- and Middle-Income Countries (LMICs), the growth in the ageing population is outpacing socioeconomic development. Unlike high-income countries, the populations of LMICs will age before they, or their countries, become rich.

In addition, the growth in the ageing population is progressing rapidly in Ghana at a time when it still has a large population of young people. Like other LMICs, Ghana will be unprepared to meet the needs of its growing number of older people if it does not plan for it now.

2.3.3 Effects of Ageing

The human body wears out as we grow older. Roth (2012) posited that the human body is like a machine, right from birth the organs in the body are used continually and as time passes the body becomes weak and is not able to work efficiently as it used to be.

Grady and Wallston (2008) outlined three major changes that occur as we humans age. First, the elderly experience biophysical decline that includes their loss of physical strength and functioning, reproductive capacity and become prone to attacks of various diseases. Second, at the psychological level the elderly at the prime of their maturity suddenly confront the inevitable shrinkage in their goals of life and diminishing self-esteem. Third, sociologically, we know as a person progresses through life, an individual has to perform diverse roles. They experience greater incidence of responsibility, their network of relationship gets wider, and thus, authority and decision taking power of the elderly is at its peak. This process takes an abrupt reverse turn for an elderly who after a „cut-off" age has to endure a decline in his/her position, and fails to adjust to such a change.

As we grow older some functional capacities increase as others diminish (Cutrona & Russell, 2009). When we age certain useful abilities are enhanced, for example,

intellectual abilities, experience, judgement, foresight, ability to handle issues maturely, are sharpened as compared to the functional abilities of the younger generation.

A gain can be defined as an expected change with age that is desirable, such as becoming more intelligent, whereas a loss is an expected change that is undesirable, such as becoming less healthy. As we age, the ratio of gains to losses is thought to decrease. That implies that as we age we gain some experiences, wisdom insight into some life phenomena and many more that the young ones usually lack. On the other hand, the aged also lack physical strength and vitality which are readily endowed with the young generation.

The following changes occur in the gastrointestinal system as we age according to Biren and Woodruff (2003). The tooth enamel thins, saliva production decreases, the taste buds diminish and it begins with those that perceive sweetness and saltiness. Gastric emptying slows, causing food to remain in the stomach longer. Peristalsis and nerve sensation slows in the large intestines, increasing the incidence of constipation. Ageing renders the gallbladder to empty less efficiently. Bile thickens, cholesterol content increases, incidence of gallstones increases. The immune system loses its ability to fight off infections as a person grows older.This increases the risk of getting sick and may make immunization less effective as a person ages. This is a natural occurrence and cannot be reversed and therefore it is necessary to remain calm and observe good lifestyle practices

Skin changes are among the most visible signs of ageing. Evidence of increasing age includes wrinkles and thinning of skin. Whitening or greying of the hair is another

obvious sign of ageing. Changes in the connective tissue reduce the skin‟s strength and elasticity. This is known as elastosis (solar elastosis). The blood vessels of the dermis become more fragile which in turn leads to bruising, bleeding under the skin (cherry angiomas) and similar conditions. Sebaceous glands produce less oil as you age which makes the skin dry. Women gradually produce less oil during menopause. The sweat glands produce less sweat, this makes it harder to keep cool and they stand at increased risk for becoming overheated. According to WebMD (2012), the skin changes as one advances in age. It becomes thinner and begins to sag, causing wrinkles. It injures more easily and heals more slowly. The skin also loses its ability to moisturize itself.

As noted by Morley (2001), aging has been associated with altered sensations of thirst, hunger, and satiety and with incomplete adjustments for day-to-day variations in food intake. The observed deficits in taste and smell may lead to a reduced sensory enjoyment of foods by elderly adults.

The onset of aging comes with certain chronic health conditions which often compromise nutritional status among the elderly as stated by the World Health Organization [WHO] (2004). In order to promote healthier eating habits and consequently improve health status of the elderly, it is first vital to understand what makes elderly people follow particular dietary patterns and equally which factors contribute to their choices.

Selivanova and Cramm (2014) have studied the relationship between the health of elderly people and the various behaviours or habits. They pointed out that health and longevity of elderly people is associated with the following: Adequate sleep (7-hours

long per day), a good breakfast, regular meals, weight control, not smoking "big cigarettes", moderate alcohol consumption and regular exercise.

The normal aging process involves changes that can influence nutritional status. People who have advanced in age go through a lot of challenges, including diet-related or nutritional challenges. The immune function is altered with aging, and dysregulation of immune function contributes to infection and neoplastic and inflammatory diseases (WHO, 2002). Although there is no uniformly accepted definition of malnutrition in the elderly, some common indicators include involuntary weight loss, abnormal body mass index (BMI), specific vitamin deficiencies, and decreased dietary intake (Reuben *et al.,* 2004).

The process of ageing affects other nutrient needs. For example, while requirements for some nutrients may be reduced, some data suggest that requirements for other essential nutrients may in fact rise in later life. According to Moses (2012), the aged are faced with numerous health related problems such as dementia, sleep disorder, gastrointestinal disorder, joint problems, cardiovascular diseases and many more. Studies in developed countries have shown that up to 40% of persons over the age of 65 suffer from a chronic illness or disability that limits their daily activities (Roth, 2012). Older people have limited regenerative capabilities and are more prone to diseases, syndromes, and sickness than other age groups.

Nutritional problems in the elderly can cause a number of complications, including weakened immune systems, lowered energy levels and chronic health problems such as type 2 diabetes, high blood pressure, heart disease, stroke and osteoporosis.

Making changes in their diet to match the changes in elders‟ changing caloric, energy, taste and access needs helps prevent malnutrition, which often goes undiagnosed. The following are some of the nutritional problems in the elderly:

Older persons are particularly vulnerable to malnutrition. The most common eating disorder in the is food refusal. This may lead to weight loss and malnutrition with all the adverse consequences on independence and function of the elderly (Macus, 2002). Moreover, attempts to provide them with adequate nutrition encounter many practical problems.

Poor nutrition is a serious challenge to the health of the elderly. The Jamaican New Zealand Ministry of Health (2013) adds that the major causes of poor nutrition among the elderly are lack of money, loneliness, bad practices such as poor handling and storage of food and unsatisfactory disposal of rubbish and human waste.

2.3.4 Challenges faced by the Elderly

In general, it is very difficult to separate the physiological, social and psychological effect of ageing from the effects of disease, since ageing and disease highly go together. Studies from most developing countries, show that when elderly people are in good health, they continue to work while those who are ill end up in poverty when support from household members is insufficient (Muruviwa, 2011). The elderly people‟s inability to access healthcare in Africa has been attributed to their low-income levels. In most cases, lack of access to healthcare in most developing countries has left the elderly vulnerable to sicknesses and diseases as they lack the means to pay for treatment that

they need (Agyemang, 2014). Due to this, they have resorted to traditional medicine and faith based healing and informal health.

According to Aquino, *et al*., (1998), the physical functioning of older adults usually weakens as they become older. It is the key factor in predicting the health outcome of older adults in their status at the time they retire. The body and immune system of older adults usually become fragile as they become older, therefore, they tend to depend more on assistance from family members. In most foreign countries, homes for the elderly or the aged have been provided to offer assistance to those who are very old and can do almost nothing by themselves. In such places, the aged have the opportunity to converse with their peers so that they will not feel lonely or rejected.

According to Moses (2012), the aged are faced with numerous health related problems such as dementia, sleep disorder, gastrointestinal disorder, joint problems, cardiovascular diseases and many more. Studies in developed countries have shown that up to 40% of persons over the age of 65 suffer from a chronic illness or disability that limits their daily activities (Roth, 2012). Older people have limited regenerative capabilities and are more prone to diseases, syndromes, and sickness than other age groups.

There is often a common physical decline, and people become less active. Good health is vital for economic growth and the development of societies. Older people‟s capacity to earn a living and participate in national development, and community and family life to a large extent depends on their state of health. Though older persons are

fully entitled to have access to preventive and curative care, including rehabilitation and general health care, they are often denied.

Ageing could be seen as a continuous process of change and that change comes with many problems and challenges. It exposes a person to increasing risk of diseases and disability, as the body becomes weak, frail, and not able to perform its tasks as it once did. Old age is feared in recent times; however, this was not always the case. In the good old days, life was not so complicated and family values were given more importance (Agyemang, 2014). According to the same report, the older generations used to hold very important position in the family tree and in society. They are the epitome of wisdom. Younger family members benefitted from the profound knowledge and experiences of their elders. The youth were thus, allowed to be seen in public gatherings but were not to be heard.

With the advent of the nuclear family system, the elderly tend to feel neglected when all the others remain busy with their own schedules (Agyemang, 2014). The experiences of the old are considered inappropriate in this advanced technology driven world and no one wants to pay attention to what they have to say. These challenges are seen in the areas of finance, health, social and physical among others. These challenges have been attributed to decreased birth rates and increased longevity, effective public health measures and advanced health care.

On the other hand, the projected increase in the absolute number of older persons is of greater importance, specifically in terms of changes in population structures and in

particular as a result of the expected demographic, economic and social impact of the HIV/AIDS epidemics (Ferreira, 2005).

In recent years, urbanization and industrialization of societies have led to the proliferation of the nuclear family structure which has further disintegrated the traditional extended family support system in Africa (Ferreira, 2004). Amosun and Reddy (1997) further argue that health care is often hindered in the elderly population by poor access to health services and limited use of preventive services. Thus, according to the WHO (2002), as we enter the 21st century, global ageing will put increased economic and social demands on all countries.

According to Amosun (1999), in Africa, urbanization, and migration have forced most young people to cities in search of jobs. In addition, education has made it possible for most females to enter the formal workforce. The implications of these mean that, fewer people are available to care for old people when they need assistance. According to Eeuwijk (2003), urban growth and the ageing societies show a strong correlation. Eeuwijk (2003), further states that, the adverse aspects of urbanization in developing countries such as poverty and lack of primary education, have a direct harmful effect on the health status of the elderly.

According to Ahn and Kim (2004), the elderly population has a high prevalence of chronic illness and has difficulties in taking care of themselves. In some countries, people with poor functional ability are more likely to become institutionalized, which in itself can lead to dependence, particularly for the small minority of elderly people who suffer from loss of mental function (Kalache & Keller, 2000). The increase in the number

of elderly people, therefore, provides a challenge for the African continent as a whole, as well as for individual countries (HelpAge, 2000) since the problem of elderly neglect differs in terms of culture and individual experiences. According to Ferreira (2004), the health care services in Africa are under-resourced and often inaccessible to older clients. In addition, the weak Societal Care Systems in most Africa countries compound the problem. Ferreira (2004) further suggests that indigenous solutions and strategies need to be developed in order to provide support and care of older Africans.

2. 4 Demographic and Socio-Economic Determinants of Nutrition and Health among the Elderly

It is significant to note that, elderly people‟s lives are influenced by biological ageing as well as social factors. One social factor is poverty, which can result from their lack of involvement in the labour market compelling them to survive on minimum wages (Calasanti, Selvin & King, 2006; Krekula, 2007). While some elderly people may be forced to depend on others, such as the extended family members through remittances, as a result of their inability to earn money, for others the State pension becomes the only source of income. For others, this provision is complemented by the money they make through small

Diet-quality measures (Ledikwe *et al*., 2006) have all been associated with higher socio-economic status (SES) which include education, income, and/or occupation. The same positive relation with SES was observed for dietary patterns (Huot *et al*., 2004). Similarly, studies of household food purchases, a proxy for food consumption, found a positive relation between household SES and the diet quality (Thiele & Weiss, 2003)

Factors influencing diet and their interactions become more complex with age (Payette & Shatenstein, 2005). These include physiological changes, poor dental status, increased prevalence of chronic health conditions, cognitive decline, age-related psychosocial factors, income constraints, poor social support, loss of interest in life, and mental health and mobility problems which could affect appetite, hunger and functional abilities, the capacity to obtain and prepare food, and eat independently which constrains the ability to select and consume an adequate diet (Elsner, 2002).

Factors contributing to nutritional inadequacy in the old are low income, physiological decline, age-related diseases, medications and insufficient food consumption. Moreover, several cross-sectional dietary surveys have noted that the consumption of different types of foods by adults was unevenly distributed by SES variables. The knowledge of how dietary patterns change with age is limited. Health and functioning of older adults are influenced by many factors other than biological senescence. Demographic, social, and environmental factors, including physical activity and dietary habits, play a major role. There is now increased mortality from diseases of the elderly as a result of food insecurity (Coleman-Jensen *et al.,* 2010) and poverty which makes it impossible for the elderly to make healthy food choices. Most dietary data are cross-sectional, thus people in one age group are compared with different people in another age group. Such studies do not permit the effects of age to be distinguished from those of a given cohort. Studies of the same cohort followed over time would provide better data on how food preferences and eating habits change with age.

Diet quality is affected not only by age and sex, but also by occupation, education, and income levels (Groth *et al.,* 2009) the conventional indexes of socio-

economic status (SES) or social class (Lallukka *et al.,* 2007). The different socio-economic indicators appear to have similar, although independent, effects on nutrition and diet (Ledikwe *et al.,* 2006). However, a causal relation between socio-economic indicators and diet quality still remains to be established. Given that socio-economic variables are likely to affect all aspects of energy balance, from access to healthy foods to opportunities for physical activity, there is a pressing need to address them.

It has been suggested, more than once, that dietary factors may help explain some of the observed social inequities in health (Drewnowski & Darmon, 2005). The more affluent population subgroups are not only healthier and thinner, but they also consume higher-quality diets than do the poor (Galobardes *et al.,* 2001).

2. 4.1 Gender

A study in Taiwan by Hui-Chan Hsu (2007) examined gender disparities in health-related quality of life and revealed that elderly women showed worse health outcomes than elderly men in health-related quality of life. Evidence shows that women are less vulnerable to most health issues in the world due to their exposure to economic, social, political and cultural factors which make them experience cumulative economic barriers since youth, making them short of resources thus contributing to deterioration of their health. Since elderly women scored lower than men after controlling for age, education and a number of chronic diseases, they concluded that due to the gender disparities across all dimensions of health-related quality of life, effort must be put in place in improving equal gender opportunities since health is a social necessity. Also, the proportion of ageing female is relatively higher than males in both rural and urban areas

and this disparity influences their health outcomes accordingly (Mutharayappa & Bhatt, 2008).

Orfilla *et al.* (2006) conducted a study on gender differences and health-related quality of life among the elderly. They sought to evaluate the extent to which gender differences in health-related quality of life among the elderly might be explained by differences in performance based functional capacity and chronic diseases. They adopted a cross sectional survey using the Nottingham Health Profile (NHP), a generic measure of health-related quality of life and a standardized list of self-reported chronic diseases. The study was based on the hypothesis that there is a gender difference in health-related quality of life as a result of the different ways of reporting or perceiving general health or otherwise. Their main finding was that elderly women showed worse NHP score than men and this is largely explained by the prevalence of reported chronic conditions and worse performance based on functional capacity of elderly women compared to the men (Orfilla *et al*., 2006).

2.4.2 Marital status

Marital status is one of factors influencing health status among the elderly. The married elderly will have more capability and good body function than the others who are single, divorce, and separated (Hemathorn & Sillapasuwan, 1983). Marital status is one factor affecting the health of the elderly especially mental health, feeling, health care and the concerning of health. It was found that the married elderly who still live with spouse will have lower morbidity and mortality rate than those who are single widow, divorce, and separated. Manzoli *et al*. (2007) argued that due to the fact that marriage offers some

form of social, environmental and psychological protection to the couples, being in marital union promotes more healthy life than being single or in non-marital relationships. Mortality however was found to have a significant effect only among widowed males, whiles the corresponding differential in women was much smaller. Manzoli *et al*. (2007) also studied the relationship between marital status, health and mortality among the elderly. Their study sought to find out the reasons why marriage has an association with mortality. They found that the mortality associated with marriage may not necessarily be as a result of the marriage but may have been a consequence of the selection of healthier persons as spouses into marriage, as well as, the socio-economic status of the persons in the marriage.

2. 4.3 Level of Education

Education is perhaps the most basic socio-economic component since it shapes future occupational opportunities and earning potential. It also provides knowledge and life skills that allow better-educated persons to gain more ready access to information and resources to promote health (Adler *et al.,* 2002). A study by Mutharayappa and Bhatt (2008), on the influence of lifestyle on morbidity among the elderly in India, found out that education plays very key role in determining who among the elderly sought health care for chronic diseases. Lack of education will increase more chance to contract the disease. The highly educated people will take care of themselves and they are hardly to be ill, while the low educated people will not understand how to take good care of themselves.

2. 4. 4 Ethnicity

A study by Balluz *et al.* (2008) revealed a strong association between BMI and the risk of chronic health conditions in the elderly in race or ethnic categories. They also recommended that culturally appropriate information should be used for health promotion purposes among ethnic groups. The study further revealed that some ethnic groups have a higher prevalence of chronic diseases than others due to their behavioural characteristics. That is to say ethnic groups that are smokeless have a lower risk of chronic diseases due to the low prevalence of the risk factors and vice versa.

2. 4. 5 Income

In addition to providing means for purchasing health care, higher incomes can provide better nutrition, housing, schooling, and recreation. Independent of actual income levels, the distribution of income within countries and states has been linked to rates of mortality (Adler *et al*., 2002). Herne (1995) found that low income may well be one of the main causes of inadequate and poor diets among the elderly. However, the elderly with higher income consume more healthy foods such as fruit, salad and vegetables, wholemeal bread and high fibre breakfast cereals and thus remain healthy and live longer. Garcia and Grande (2010) posit that because the income of the majority of the elderly is a pension which in many cases is not sufficient for subsistence, their food intake decreases resulting in the decline of their nutritional needs.

2. 4. 6 Place of Residence

Evidence from the study by Mutharayappa and Bhatt (2008) reveals that rural elderly are two times more likely to suffer chronic conditions than their urban counterparts. Evidence from a study by Minicuci *et al.* (2014) shows that stress, sedentary and affluent lifestyle and their related health conditions such as hypertension and diabetes are linked to the urban high income older adults in Ghana. Also, a report by WHO (2011) on the health risk behaviours of non-communicable diseases (NCDs) among persons aged 50 and above in Ghana revealed that urban residents have higher prevalence of low level physical activity as compared to rural residents. For arthritis, its prevalence is higher among rural lower income older persons than urban older persons as a lifetime manual work.

Furthermore, Bourne and McGrowder (2010) sought to examine the health status of the elderly in rural and urban Jamaica and proposed a model to predict the social determinants of poor health status among the elderly with at least one chronic condition. The study found out that there was a wide gap between the amount of money spent to access health care between the rural and urban residents justifying the fact that rural residents spend more on medical care for at least one chronic disease than urban residents. This was because the nature of the chronic conditions such as hypertension requires frequent visits to the health service providers but the rural residents have much greater travel time and cost in accessing health care and their health care needs are mostly uninsured (Bourne, 2007). Based on this, the study (Bourne, 2007) concluded that there was an association between good health status and place of residence on self-reported chronic diseases. The elderly who dwelled in rural areas had the lowest self-reported

good health score as compared to urban dwellers who scored highest in self-reported good health.

In a study conducted by Eberharolt and Pamuk (2004) to examine the disparities in health outcomes between urban and rural areas of the United States, it was established that most rural and urban areas are found to be disadvantaged as compared with suburban areas in terms of health outcomes of the citizens. Thus, place of residence has a relationship with health disparities. The studies found that the rural areas have high mortality rates and prevalence of chronic health conditions due to the existence of modifiable risk behaviours such as smoking. The disparities in health status of individuals may be as a result of their socio-economic and demographic differences across all levels of urbanization according to Eberharolt and Pamuk (2004). That is to say there may be geographic patterns in their diet preferences in both rural and urban areas which could easily increase one‟s risk of chronic diseases.

Much input has been made by so many researchers in an effort to contribute to knowledge on ageing and chronic conditions. However, since place of residence has been identified by Bourne (2007) as a major factor that determines chronic conditions among the elderly, this study aims to broaden the scope by concentrating on all major chronic diseases that cause morbidity and mortality among the elderly, as reported in the SAGE 2007/8 dataset.

2.5. Aging and nutrition

In the views of Adigbo and Maddah (2011), nutrition is the study of nutrients and their relationship with food and living things. On the other hand, Wardlaw and Smith

(2011) see nutrition as the science that links food to health and diseases; it includes the processes by which the human organism ingests, digests, absorbs, transports and excretes food substances. Food is critical to one‟s physiological well-being social, cultural and psychological quality of life (Center for Disease Control and Prevention, 2009). For this reason, nutrition is one of the major determinants of successful aging. So, older adults need quality diet for better health outcomes. The next section discusses the nutritional requirements of the elderly.

Older people in general need less staple foods, fats and sugar than younger adults but they should have their fair share of legumes, milk, eggs, vegetables and fruits. A study by the New Zealand Ministry of Health (2013) corroborates this assertion. According to the New Zealand Ministry of Health (2013) report, older people have special need for nourishing food and that food for the elderly has to be carefully chosen and properly prepared and must be balanced.

Culross (2008) maintains that the overall nutritional requirements of the older adult do not change. What does change is the caloric intake. As a result of the loss of lean muscle mass, the overall caloric intake requirements decrease while the need for other nutrients remains relatively unchanged. This makes eating nutrient dense food even more important for older people, stresses Culross (2008).

Culross (2008) dismisses the view that protein intake should be increased with ageing. She says unless the older adults require additional protein for healing and strength, this should not be the case. However, they still need plenty protein, minerals (especially calcium) vitamins and fibre.

According to Barasi (2003), there is still a lack of reliable data about the specific nutritional needs of the elderly. Notwithstanding, the nutrient requirement for older adults include increased intake of carbohydrates, protein, minerals and vitamins D, B12, and B6 and calcium.

Of the vitamin requirement, Culross (2008) recommends B12 exclusively to those over the age of 50 as a supplement because of the decreased absorption rate. Vitamin B12 deficiency can be responsible for depression, neurological disorder and macrocytic anaemia.

Culross (2008) refers to the Modified My Pyramid for older Adult developed by Tufts University and published in the January 2008 issue of the Journal of Nutrition, pointing out that the pyramid emphasizes eating nutrient dense foods, the importance of fluid intake and activities that may be typical of the older age group. The modified pyramid also suggests that supplements for nutrients such as calcium and vitamin D and B12 may help people meet their nutritional needs when food alone does not yield adequate amount.

As many as 10% of older men obtained only one fifth to one third of the recommendations for protein, zinc, calcium, vitamin E, thiamin, riboflavin, vitamin B6, and vitamin B12 (Wakimoto & Block, 2001). In contrast to the general decline in micronutrient intakes, estimated intakes of carotene, vitamin A, and vitamin C tended to increase with age, especially for women.

The Dundee City Council Directorate of Public Health (2002) makes it clear that it is not whatever the elderly takes or eats that is important for quality development.

Those who care for the elderly are cautioned to provide balanced diet for the proper upkeep of the elderly.

Breakfast is the most important meal of the day. Therefore, the elderly should not skip it. The diet quality of the elderly must therefore provide the needed nutrients to meet their nutritional requirements. Breakfast actually signifies breaking the fast observed through the previous night, that is after dinner; a person does not have any food till the next morning. As that is considered a period of fasting, the next meal is in the morning and that's called a breakfast (Subashini, 2012).

Eating a healthy breakfast is especially important for children and adults. Breakfasts must provide one-fourth of the Recommended Dietary Allowance for protein, calcium, iron, Vitamin A, Vitamin C and calories (School Nutrition Association, 2011). A breakfast comprising protein, fat, and sugar will prevent drops in blood sugar for several hours, whereas, as breakfast of just starch and sugar will sustain a child for only about two hours. Therefore, choosing healthy options for breakfast is important for achieving optimal health (Hernandez, 2010).

The 2005 Dietary Guidelines for Americans identify whole grains, fat-free and low fat milk and milk products, fruits and vegetables as foods to encourage. Popular breakfast foods help people meet recommendations for these food groups. Breakfast also contributes to whole grain intake (over 30% of the intake) which is known to reduce the risk of diabetes and coronary heart disease (Chaplin & Smith, 2011).

Breakfasts containing ready-to-eat-cereal may also improve the diet due to fortification with micronutrients and low fat levels. Indeed, a review of breakfast

and the diet of adults confirms that breakfast eaters consume better quality diets that include more fibre and nutrients and fewer calories than the diets of breakfast skippers.

Milk is the most commonly consumed breakfast food (consumed by over 50% of people who eat breakfast at home) and this, again, helps to meet dietary recommendations for this type of food. Similar results have been reported for fruit intake, with fruit or fruit juice consumption at breakfast being linked with greater total fruit intake over the day. (Chaplin & Smith, 2011).

Breakfast helps to refuel the body, gives energy and is a great opportunity to start daily activities with a boost of nutrients. Breakfast provides food to help during long stretch of time between leaving home and lunch. Eating breakfast can also improve health, nutrition, behaviour, and help prevent overweight (U.S. Department of Agriculture, 2013).

Frequency of breakfast food consumption (for example, cereal, dairy products, fruit and bread) is linked with a number of health benefits: better weight management; lower cholesterol; reduced risk of metabolic syndrome; better digestive functioning; fewer upper respiratory tract illnesses, and better mental health. Breakfast provides energy for the activities during the morning and helps to prevent that mid-morning slump (Ross, 2010). Regular breakfast consumption is associated with higher intake of key vitamins and mineral. This may increase the likelihood of meeting nutritional requirements (Zhang *et al.,* 2009).

People who skip breakfast are unlikely to make up their daily requirement for some vitamins and minerals. Breakfast skippers may not make up for missed nutrients at other meals. Skipping breakfast may consequently result in metabolic changes that interfere with aspects of cognitive functioning (Widenhorn-Muller, Hille, Klenk, & Weiland, (2008).

2.5.1. Diet Quality of the Elderly

Diet quality is a broad term that encapsulates both perceived and actual practices, personal preferences and cultural diversity. Diet quality may also be related to the type of food being ingested, snacking and other eating habits (Preedy *et al.,* 2006). Manufactured beverages and fast food may also be included as well as microbiological quality and attempts to improve single food items such as meats or vegetables. Measuring dietary quality can be problematic and includes investigating food types, the number or size of portions or their frequency.

Dietary energy density is one index of the overall quality of the diet (Andrieu e*t al.,* 2006). The elderly require diets high in whole grains, lean meats, fish, and fresh vegetables and fruit have a low energy density (defined as the available dietary energy per unit weight) and a high content of vitamins and minerals (Andrieu *et al.,* 2006).

The elderly require carbohydrates. Carbohydrates are commonly found in grains, fruits, and vegetables. Carbohydrates are broken down into glucose (sugar) which is where the brain gets its energy. Carbohydrates can be obtained from rice dishes. The Dundee City Council Directorate of Public Health (2005) suggests that it is a good source of energy, Vitamin B and NSP (fibre) and that it is best to use a variety of rice, both

white and brown, for savoury dishes for the elderly. Fluctuating levels of carbohydrates may cause dizziness and mental confusion, both of which can affect cognitive performance.

Eating a carbohydrate-heavy meal can cause one to feel more calm and relaxed because of a brain chemical called serotonin and its effect on mood. Serotonin is created within the brain through the absorption and conversion of tryptophan. Tryptophan is absorbed within the blood and this absorption is enhanced with carbohydrates (Ross, 2010).

With regard to protein requirements of the elderly, they need adequate intake of milk and dairy products, nuts, meat, meat products, poultry and fish. Milk and dairy products comprise cheese, yoghurt, custard, milk puddings and hot milky drinks. Milk and milk products are excellent resources of calcium and protein (Dundee City Council Directorate of Public Health, 2005). Meat is an excellent source of protein and iron (King & Burgess, 1996; Dundee City Council Directorate of Public Health, 2005; WHO, 2007). The sources encourage the use of wide range of meat to satisfy a variety of tastes.

The Dundee City Council Directorate of Public Health (2005) agrees that nuts are a good source of protein but they may not be suitable for consumption by some older people. Some older people may have an allergy to peanuts because they may become lodged in their denture and may cause problems for those with swallowing difficulties. Their use should be encouraged in the vegetarian diet with groundnut, peanut butter and other nut pastes being suitable alternative to meat and fish.

With regard to vitamins, minerals and trace elements requirements of the elderly, Erickson (2006) cited vitamins and minerals which are most important are the vitamins A, C, E, and B complex vitamins. Manganese and magnesium are two minerals essential for brain functioning; sodium, potassium and calcium play a role in message transmission and the thinking process.

According to the Dundee City Council Directorate of Public Health (2002), any investigation of the diet of the elderly cannot ignore causes of alternative diet because a sizeable proportion of the elderly may be on alternative diets. Alternative diet consists mainly of diet for the vegetarian and the vegan as well as therapeutic diets. The nutrient requirements of the elderly are shown in Tables 2.1 and 2.2, respectively.

Table 1. Guidelines for Food Preparation for the Elderly

Energy/calories	EAR	Women aged 75 and above 1.810kcal Men aged 75 and above 2,100kcal
Fat		35% of food energy Women aged 75 and over 70g Men aged 75 and over 82g
Starch and intrinsic and milk sugars		39% of food energy Women aged 75 and over 1.88g Men aged 75 and over 218g
NME sugars		11% of food energy Women aged 75 and over 53g Men aged 75 and over 62g
Fibre	DRV	18g
Protein	RNI	Women 46.5g Men 53.3g
B vitamins	Thiamin RNI	Women 0.8mg Men 0.9mg
	Riboflavin RNI	Women 1.1mg Men 1.3mg
	Niacin RNI	Women 12mg Men 16mg
Foliate	RNI	200 micrograms
Vitamin C	RNI	40mg
Vitamin A	RNI	Women 600 micrograms Men 700 micrograms
Calcium	RNI	750 mg
Iron	RNI	8.7mg
Zinc	RNI	Women 7mg Men 9.5mg
Potassium	RNI	350mg
Sodium		Not more than 2400mg

Source: Adapted after the Directorate of Public Health, Dundee (2002).

Key: E.A.R. : Estimated Average Requirement

D.R.V. : Dietary Reference Value

R.N.I. : Reference nutrient Intake

The Dundee Directorate of Public Health (2002) provides a table which directs the elderly to the right dietary sources of vitamins, minerals and trace elements.

Table 2. Sources of Vitamins, Minerals and Trace Elements

Vitamin	Uses	Dietary Sources
Vitamin A or Retinol	Essential for vision in dim light. Maintenance of healthy skin and surface tissues	Retinol is found only in animal foods but milk and some vegetable foods contain carotenes that the body converts to retinol
Vitamin B or Thiamin	Necessary for the steady release of energy from carbohydrates	Widely distributed in animal and vegetable food, milk, offal, pork, eggs and whole grain cereals
Vitamin B2 or Riboflavin	Essential for the utilization of energy from food	Widely distributed especially in animal foods as milk, cheese, yoghurt, eggs, livers
Vitamin B6 or Pyridoxine	Involved in the metabolism of amino acids including conversion of tryptophan to nicotinic acid. Necessary for the formation of hemoglobin	Occurs widely in food, liver, kidney, sardines, oysters, heart, rabbit, other meats and some vegetables
Vitamin K	Necessary for normal blood clotting	Dietary, source includes spinach
Iron	Involved with the use of oxygen. Hemoglobin (formed from iron) transports oxygen from the lungs to the tissues	Offal, red meat, cocoa powder, cereal (whole grain), potatoes, vegetables and pulses
Calcium	Essential for the growth and maintenance of bones and teeth, contraction of muscles, nerve function and the activity of several enzymes	Few foods except milk, yoghurt, cheese and good source of calcium. Also found in much small quantities in flour, vegetables, bones and canned sardines
Vitamin C	Necessary for the maintenance tissue. Absorption of some types of iron. Man is one of the few animals that cannot form its own vitamin C and must obtain it from food	Small amounts found in milk and liver. Virtually all vitamin C is derived from fruit and vegetables especially citrus fruits, green vegetables and potatoes.
Vitamin D or cholecalciferol	Necessary for maintaining the level of calcium and phosphorous in the blood	Obtained from the action of sunlight on a substance in the skin. Few foods contain Vitamin D, margarines, only fruits, fish liver, oils and eggs
Fluoride	Associated with the structure of bones and teeth. Increase resistance to tooth decay	Drinking water is an important source, but natural concentration varies. Other sources include most toothpastes and milk washes, sea foods and tea.
Zinc	Associated with the activity of a large number of enzymes. Found in bones and brain tissues	Found especially in protein, containing food. Low blood zinc concentrations are associated with a diet that is based on processed snack foods

Source: Adapted after the Directorate of Public Health, Dundee (2002).

In addition to providing the chart above which prescribes the sources of vital vitamins, minerals and trace elements that can enhance or maintain the health of the elderly, the Tayside group of experts cautions that:

1. Diets rich in processed and snack foods can be found in low quantities in several vitamins, minerals or trace elements except in the case of sodium (salt) which may be found in excessive quantities;
2. Inappropriate cooking methods can reduce the quantity of the water soluble Vitamin C and B group;
3. To minimize losses, food should be prepared and cooked very near to the time of serving, and minimum quantity of water should be used for cooking;
4. Milk should be kept away from light. Fewer processed and snack foods should be used.

After an extensive study of the elderly by the group of experts, the following recommendations were made for maintaining good nutritional status in elderly people: Elderly people should derive their dietary intake from a diet containing a variety of nutrient-dense foods; and by living an active lifestyle. A group of experts recommends that older people should be encouraged to undertake regular physical activity such as walking, as this strengthens and builds up muscle and bone and increases calorie requirement which increases appetite (Dundee Directorate of Public Health, 2002).

2.5.2. Nutritional Care for the Elderly in relation to Age Related Changes

According to Culross (2008), as people age multiple changes occur that affect their nutritional status. In her view sarcopenia or the loss of lean muscle mass which can lead to a gain in body fat may not be apparent by measuring body weight. It may be more noticeable by loss of strength or functional decline and poor endurance. She points out further that this loss leads to reduced total body water content. This view corroborates Tabloski‟s (2006) view that such losses can lead to changes in bone density which will increase the risk of osteoporosis.

Tabloski(2006) emphasizes that, ageing often goes with a decrease in saliva production referred to in medical terms as xerostomia, and changes in dentition alter the ability of people to chew which also leads to changes in food choices. Dundee Directorate of Public Health (2002) confirms all the points raised above. Dundee Directorate of Public Health (2002) suggests that as people get older physiological changes which affect the body can also affect food intake, digestion, absorption and utilization of nutrients.

Socio-economic factors, acute and chronic illness and drugs can also affect the body. Nutrient interaction can also affect nutritional intake and nutritional status. Dundee Directorate of Public Health (2002) provides the following catalogue of health and nutritional problems related to ageing. Older people are at particular risk from certain nutrient deficiencies. These are vitamins C, folic acid, iron and vitamin D Deficiency of vitamin C generally relates to a low intake of fruit and vegetables. Folic acid can also be found in liver, pulses, fortified breakfast cereals bread, green leafy vegetables and citrus

fruits. Vitamins D supplements should be considered for those who are housebound and in long term care (Sahay & Sahay, 2012).

Sharkey (2007) points out that health and longevity are associated with seven health habits, namely adequate sleep of 7-8 hours per day, a good breakfast, regular meals, weight control not smoking cigarettes, moderate alcohol consumption and regular exercise.

On nutritional needs of the elderly, King and Burgess (1996) assert that good food helps elderly people to stay healthy and active for longer periods and to resist infections. They explain that as people grow older they are usually less active and need less energy. All the same they still need plenty of protein, minerals especially calcium ,vitamins and fibre, and that elderly people should have their fair share of legumes, milk, eggs, vegetables and fruits and fibre to prevent constipation. In a handbook, Nutrition Handbook for Community Workers in the Tropics, the New Zealand Ministry of Health (2013) corroborates the assertion made by King and Burgess. The New Zealand Ministry of Health (2013) postulates that elderly people have special need for nourishing food explaining that since they are less active, they do not need as many calories as younger people. To cut down on calories they need to use less margarine, cooking oil, other fats, sugar, sweets and starchy foods. In Health Psychology, Taylor (2003) pleads for intervention measures for the elderly in America in view of the rapid rate at which they are ageing. She points out that intervention should focus on helping the elderly achieve the highest level of functioning possible through programmes that emphasize diet, exercise and other health habits.

The elderly have been characterized with chronic disease, but they require special consideration. Nutrition influences various body functions as people age. Also the role of nutrition in retarding or advancing development of chronic disabilities and disorders associated with ageing as well as ultimate good health cannot be overemphasized. The energy requirement of the elderly is assumed to decrease with age. There is little need for protein and micro-nutrients. The elderly must reduce caloric intake by 10% between fifty one (51) years and seventy five (75) years of age, plus additional 10% after seventy five (75) years unless physical activity necessitates a larger or smaller caloric intake. Restriction of energy giving foods if started early in life is the single most important factor for extending the life span. Fibre is needed in the elderly nutritional requirement because it provides bulk in the diet and aids in bowel movement .Thus, there is a potential risk of reduced absorption of minerals as a result of high intake of dietary fibre, and therefore it must be consumed moderately. Whereas fats serve as a carrier for fat soluble vitamins and provide the essential fatty acids, this need can be met by our daily intake of 15-25g of appropriate food fats. Presently there is no RDA for fats (Wardlaw & Smith, 2011).

For the protein requirement of the elderly it is recommended that an intake of 0.6g of high quality or 0.8g of protein of mixed quality per kilogram body weight be maintained throughout elderly life. Energy and protein intake must be adequate to allow protein to be used for wound healing and tissue repair rather than energy needs (Wardlaw & Smith, 2011).

Vitamins and mineral requirement of the elderly most of the time remain the same for young adults too. However, calcium intake must be increased between 800ml-1400ml

daily especially for post-menopausal women as a result of decreased absorption of calcium and to avoid possibility of calcium deficiency resulting in osteoporosis. Water requirement of the elderly is important because the number of nephrons is less in the aged. With this the solute lead per nephron is increased. Therefore adequate water must be consumed to facilitate the excretion of that solute lead. The elderly are encouraged to consume adequate quantity of fluid especially water to aid digestion and to control body temperature (Wardlaw & Smith, 2011).

2.5.3. Changing Diets

In what is known as the "nutritional transition", traditional plant-based diets including foods such as cereals and potatoes are increasingly being replaced by diets that are richer in added sugars and animal fats. This transition, combined with a general trend towards a more sedentary lifestyle, is an underlying factor in the risk of developing chronic diseases. The average food consumption (in terms of calories) appears to have increased steadily in countries around the world, particularly in developing countries, though not in sub-Saharan Africa (WHO, 2003).

The average fat content of the diet is also increasing throughout the world, and it is especially high in parts of North America and Europe. An increasingly large portion of this fat comes from animal products and vegetable oils. Factors such as rising incomes and population growth have raised the demand for animal products like meat, dairy products, and eggs. These products provide high-value protein and many essential nutrients, but excessive consumption can lead to excessive intakes of fat (WHO, 2003).

Fisheries are an important source of animal protein, employment and revenue in many countries. The average amount of fish and fishery products consumed per person has nearly doubled since 1957 (WHO, 2003). The future availability of this food source will depend on the sustainable use of marine fish stocks, many of which are already being fully exploited. WHO (2003) further indicated that a diet high in fruits and vegetable is recommended for good health, although average consumption has increased, only a small minority of the world‟s population eats an adequate amount.

Thus, in the future, the average food consumption (in calories) in developing countries is expected to increase. Diets previously based on cereal, roots and tubers will increasingly be replaced by diets that are rich in meat, dairy-products and oil. The consumption of fishery products will be more and more limited by environmental factors. In conclusion, changes in diets are needed to cope with the burgeoning epidemic of chronic diseases. The entire process, from food production to consumption, should be considered when determining the relationship between diet and the risk of developing chronic diseases.

2.5.4 Dietary Intakes

No specific dietary intakes are recommended for the prevention of chronic diseases. There is, however, a “safe range” of dietary intakes that is considered to be consistent with the maintenance of health of a population. Scientific evidence can be classified as convincing, probable, possible, or insufficient depending on the number and type of studies carried out and the consistency of the results. A balanced diet can help prevent chronic diseases.

The Joint WHO/FAO Expert Consultation proposes guidelines for the contribution of different food groups towards a typical balanced diet (WHO, 2003). These include:

i. Total fat intake should represent 15 to 30% of total dietary energy intake.

ii. Intake of free sugars, such as those found in soft drinks and many processed foods, should amount to less than 10% of total energy intake.

iii. An intake of at least 400g of fruits and vegetables per day is recommended. Combined with a consumption of wholegrain cereals this intake is likely to provide an adequate amount of fibre (WHO, 2003).

WHO (2003) also makes recommendations about body weight in terms of Body Mass Index (BMI) and physical activity. In order to maintain a good level of cardiovascular health, at least 30 minutes of moderate physical activity (such as brisk walking) every day is recommended for people of all ages. Engaging in a higher level of physical activity for a longer period of time (60 minutes) can provide even greater health benefits, particularly in terms of preventing of obesity. When determining an appropriate level of physical activity, potential benefits and risks should be considered on an individual basis.

2.5.5 Dietary Habit and Lifestyle of the Elderly

According to Barasi (2003), there is still a lack of reliable data about the specific nutritional needs of the elderly. In part, this is related to the heterogeneity of the group, which makes generalized recommendation difficult. The U.K‟s Department of Health

(2001) reiterates that it should be remembered that dietary references, values and comparable figures published refer to healthy individuals. The elderly have been characterized with chronic disease, but they require special consideration. Nutrition influences various body functions as people age. Also the role of nutrition in retarding or advancing development of chronic disabilities and disorders associated with ageing as well as ultimate good health cannot be overemphasized.

The energy requirement of the elderly is assumed to decrease with age. There is little need for protein and micro-nutrients. The elderly must reduce caloric intake by 10% between fifty one (51) years and seventy five (75) years of age, plus additional 10% after seventy five (75) years unless physical activity necessitates a larger or smaller caloric intake. Restriction of energy giving foods if started early in life is the single most important factor for extending the life span. Fibre is needed in the elderly nutritional requirement because it provides bulk in the diet and aids in bowel movement .Thus, there is a potential risk of reduced absorption of minerals as a result of high intake of dietary fibre, and therefore it must be consumed moderately. Whereas fats serve as a carrier for fat soluble vitamins and provide the essential fatty acids, this need can be met by our daily intake of 15-25g of appropriate food fats. Presently there is no RDA for fats (Wardlaw & Smith, 2011).

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Vitamins and mineral requirement of the elderly most of the time remain the same for young adults too. However, calcium intake must be increased between 800ml-1400ml daily especially for post-menopausal women as a result of decreased absorption of calcium and to avoid possibility of calcium deficiency resulting in osteoporosis. Water requirement of the elderly is important because the number of nephrons is less in the aged. With this the solute lead per nephron is increased. Therefore adequate water must be consumed to facilitate the excretion of that solute lead. The elderly are encouraged to consume adequate quantity of fluid especially water to aid digestion and to control body temperature (Wardlaw & Smith, 2011).

It is well documented that age is negatively associated with health status in the elderly. That is the very old elderly will have worse health status than the young old (Wardlaw & Smith, 2011). Therefore, it does not mean that longer life span can reflect the perfect well-being. Nevertheless, it reflects the chronic disease and illness caused by the degeneration of an increasing of the age. Health status of the elderly is also concerned with nutrition status. This is because the nutrition status reflects health status in term of nutrients from food consumption. It depends on economic status, culture and society of an individual.

The diet of an organism is what it eats, which is largely determined by the availability, processing and palatability of foods. A healthy diet includes preparation of food and storage methods that preserve nutrients from oxidation, heat or leaching, and that reduce risk of food-borne illnesses. Nonetheless, a poor diet may have an injurious impact on health, causing deficiency diseases such as scurvy and kwashiorkor; health-threatening conditions like obesity and metabolic syndrome; and such common chronic

systemic diseases as cardiovascular disease, diabetes, and osteoporosis (National Institutes of Health, 2010).

Nutrition is the science that interprets the interaction of nutrients and other substances in food, for instance phytonutrients, anthocyanins, tannins, and so on in relation to maintenance, growth, reproduction, health and disease of an organism. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion (National Institutes of Health, 2010).

Nutrition is an important determinant of health in the elderly. The normal aging process involves changes that can influence nutritional status. Taste sensitivity normally declines with age and can affect energy regulation (Shaffer & Tepper, 1994). If food does not taste good, people are less inclined to eat; this is a common problem in the elderly. Thirst mechanisms are also affected by aging. Dehydration is common in institutionalized populations and has also been found in free-living older adults (Phillips *et al*., 1984).

The immune function is altered with aging, and dysregulation of immune function contributes to infection and neoplastic and inflammatory diseases (WHO, 2002). There are clear triggers for inflammatory disease, and research is underway with respect to nutrition, inflammatory disease, and prevention of the cascading events in the pro-inflammatory stages. For example, research has indicated that intake of foods rich in n-3 fatty acids is associated with an increase in anti-inflammatory eicosanoids, whereas consumption of n-6 fatty acids is linked to the increased production of pro-inflammatory eicosanoids (Ross, 1999); n-3 polyunsaturated fatty acids also increase T cell-mediated function in healthy older persons (Weksler, 1995), and vitamin B-6 supplements increase

lymphocyte proliferation in response to T and B cell mitogens (Talbott *et al.*, 1987). These are just a few examples of the rapidly emerging research on how diet can influence immune function.

For many individuals, the cognitive changes that occur with aging are affected by micronutrient intake. Oxidative stress is one of the key factors that affect brain function in aging (Fukui *et al*., 2001); antioxidants appear to be important in slowing this process (Morris *et al*., 2002), as are the B vitamins folate, vitamin B-6, and vitamin B-12 (Selhub *et al*., 2000).

In the United States, for instance, the dual problem of overweight and obesity occurs side by side with problems of malnutrition in the elderly. Body fat tends to double during middle life; although, by 65-70 years of age, body fat generally decreases, even in healthy older persons who do not modify their diet or levels of physical activity (Roberts, 2000). Despite the overweight and obesity crises in the United States, some under nutrition occurs as a result of unhealthy weight loss in older persons. Such unexplained, involuntary weight loss can lead to protein-energy malnutrition, which can precipitate sarcopenia, a loss of lean muscle mass. About 45 percent of older adults have some degree of sarcopenia (Janssen *et al*., 2004), and adequate dietary protein is needed to conserve lean muscle mass.

Over the past decade, the importance of nutritional status has been increasingly recognized in a variety of morbid conditions including cancer, heart disease, and dementia in persons over the age of 65 (Basran & Hogan, 2002; Keller *et al*., 2003). Although there is no uniformly accepted definition of malnutrition in the elderly, some

common indicators include involuntary weight loss, abnormal body mass index (BMI), specific vitamin deficiencies, and decreased dietary intake (Reuben *et al.,* 2004). Body Mass Index (BMI) is estimated according to the formula BMI = weight (kg)/height $(m)^2$. BMI results of less than 18.5 are classified as underweight, 18.5 - 24.9 as "normal", 25.0 - 29.9 as overweight, and over 30.0 as obese (Health Canada, 2003).

Malnutrition in older patients is regularly under-diagnosed (Gariballa, 2000), and many physicians have expressed their need for more education regarding nutritional status in older patients (Mihalynuk *et al*., 2004). For example, health practitioners may not readily recognize weight loss in the elderly as a morbid symptom of malnutrition because some weight loss may be associated with age-related reductions in muscle mass (Kane *et al*., 1994).

Similarly, elderly patients with concurrent obesity often have protein under-nutrition that may be overlooked. The elderly also often have multiple comorbidities that contribute to overall nutritional compromise. Given these complex contributing factors, a careful nutritional assessment is necessary for both the successful diagnosis of malnutrition in the elderly and the development of appropriate and comprehensive treatment plans. This implies that a diet is what an organism eats, which is largely determined by the availability, processing and palatability of foods. For a diet to be healthy it must include preparation of food and the availability of the storage methods that preserve nutrients from oxidation, heat or leak, and as such reduce the risk of food-borne illnesses.

The nourishment from the diet/food substances provides maintenance, growth, reproduction, health and disease of an organism, for that matter humans. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion in the midst of others. Thus, nutrition has an impact on the immune system of patients over the age of 65. The elderly are more likely to die of infections than young adults, and malnutrition is related to an increased risk of obesity, weight loss, sepsis and so on in the elderly.

However, poor diet may have a harmful impact on health of the humans, causing deficiency diseases such as scurvy and kwashiorkor; health-threatening conditions like obesity and metabolic syndrome; and such common chronic systemic diseases as cardiovascular disease, diabetes, and osteoporosis.

2. 6 Nutrition and Diet Related Health Problems of the Elderly

Nutritional problems in the elderly can cause a number of complications, including weakened immune systems, lowered energy levels and chronic health problems such as type 2 diabetes, high blood pressure, heart disease, stroke and osteoporosis. Making changes in their diet to match the changes in elders‟ changing caloric, energy, taste and access needs helps prevent malnutrition, which often goes undiagnosed. The following are some of the nutritional problems in the elderly:

2. 6.1 Weight loss

Weight loss in the elderly is a worrisome clinical sign. Weight loss in the elderly due to voluntary or involuntary causes has been associated with mortality (Newman *et al.,* 2001; Baldwin *et al*., 2001). Age-related changes in body composition result in a slight decline

in lean body mass. This decline is usually more dramatic after the age of 60. Consequently, basal metabolism or energy requirements for the elderly diminish by about 100 kcal/day per decade. For some it may be difficult to meet daily micronutrient requirements with this reduced caloric intake (Morley, 1997; Compher *et al.,* 1998).

Although lean body mass may decline because of normal physiological changes associated with age (Lissner *et al*., 1991), a loss of more than 4 percent per year is an independent predictor of mortality. Rapid weight loss of 5 percent or more in one month is considered significant and needs to be immediately evaluated by a physician (Jensen *et al*., 2001; Dryden *et al.,* 2002). It has been shown that even moderate decline of 5 percent or more over three years is predictive of mortality in older adults (Newman *et al.,* 2001). However, early identification, assessment, and treatment of weight loss and nutritional deficiencies may prevent the morbid of malnutrition.

Both weight loss and weight gain are problems in the elderly related to nutrition. The elderly have reduced metabolisms, meaning they burn fewer calories than they did before age 40. Additionally, the elderly often have less energy, especially if they suffer from chronic medical conditions. A slowed metabolism coupled with reduced activity can lead to obesity, which is on the rise in the elderly. On the other side, limited access to food, decreased appetites, medication side effects and medical problems can cause weight loss. Poverty and fixed incomes keep some elderly people from purchasing foods rich in vitamins and minerals. Even a weight loss of 5 percent over three years can signal a health problem.

Cardiovascular, pulmonary, and neurological diseases, as well as osteoarthritis and osteoporosis, may alter energy requirements in the elderly either by increasing energy expenditure or reducing requirements through muscle loss related to inactivity. Actual energy needs may vary widely from calculated energy needs because of these factors (Houwing *et al.,* 2003). This makes the elderly a heterogeneous group and more difficult to assess nutritionally. To combat all the above, a multivitamin supplement for the elderly is recommended (Malouf & Grimley, 2003; Malouf *et al.,* 2003; Clarke *et al*., 2004), especially for those whose caloric intake is less than 1500 kcal/day (Compher *et al.,* 1998).

2.6.2 Loss of Taste and Smell Sensitivity

Alterations in taste and smell are associated with aging. It is unclear if these normal physiological changes contribute to decreased food intake (Westenhoefer, 2005). Appetite after an overnight fast is often lower in the elderly (Refai & Seidner 1999). When an elder over-salts his food, the problem more likely arises from a decreased sensitivity to salt than dissatisfaction with the cooking. The elderly often have trouble recognizing salty and bitter tastes, resulting in increased salt intake, which can lead to high blood pressure. This is because the elderly usually retain their ability to appreciate sweet tastes the longest, they may go overboard on the sugary snacks, desserts and beverages. Sugary foods can cause weight gain in anyone, but because of their slowed metabolisms, the elderly are more susceptible to it.

2.6.3 Dehydration

In addition to the physiological changes, renal function declines with age. This decreases responsiveness to antidiuretic hormone, which often results in an increased risk for dehydration in the elderly. This impaired thirst drive makes it difficult to replace fluid losses by oral intake alone. Renal impairment may also affect vitamin D metabolism and result in a reduction of vitamin D levels, which contributes to osteoporosis in the elderly (Compher *et al.,* 1998).

Dehydration is common in the elderly for a number of reasons. The elderly have a reduced ability to conserve water, are less attuned to their thirst, and may avoid drinking fluids because of overactive bladder problems. Additionally, the elderly are more likely to lack proper hydration in warm-weather months and during illness. Medications and chronic medical conditions often increase the risk of dehydration.

Mild to moderate complications from dehydration include constipation, headache, dizziness, low blood pressure, rapid heartbeat and loss of consciousness. Severe complications include seizures, kidney failure, swelling of the brain, heat injury and death. Infections of all kinds increase metabolic rate, making it more difficult for older persons to eat enough to keep up with elevated energy demands (Sullivan & Lipschultz, 1997).

2.6.4 Reduced Immunity

Nutrition has an impact on the immune system of patients over the age of 65. The elderly are more likely to die of infections than young adults (High, 2001), and malnutrition is related to an increased risk of sepsis in the elderly (Potter *et al*., 1995).

Impaired T-cell response, changes in phagocyte and macrophage function, and reduced delayed-hypersensitivity response contribute to an overall decline in age-related immune function (High, 2001; Chandra, 2005). Infections of all kinds increase metabolic rate, making it more difficult for older persons to eat enough to keep up with elevated energy demands (Sullivan & Lipschultz, 1997).

From the above related nutrition problems in the elderly, it can be inferred that the elderly should eat foods rich in vitamins, nutritional supplements and minerals. There is the need for the elderly to focus on high-fibre foods, leafy green vegetables, whole grains, and low-fat or non-fat milk and milk products. Rather than adding salt, the elderly should eat foods seasoned probably with herbs and olive oil. To satisfy sweet cravings, they should munch on foods that are naturally sweet, such as fruits, and cook with sweet peppers. To prevent dehydration, the elderly should drink small amounts of fluids throughout the day since research has shown that the consumption of at least 1.7 litres of fluid every 24 hours is ideal for the elderly.

Furthermore, unintentional weight loss among the elderly often have a very negative impact and is associated with impaired quality of life, increased burden of care and increased medical complications. The malnutrition in elderly people is a multifactorial problem that may be caused by disturbed hunger and regulatory mechanisms, loss of taste and smell, chewing and swallowing problems, social problems, diseases, use of different drugs as well as depression. With illness and increasing age, appetite-loss often exceeds the energy expenditure, resulting in a weight loss and other related nutrition problem in the elderly.

2.6.5 Diabetes

Diabetes is a disease that is linked to the hormone insulin which regulates levels of sugar in the blood. Type 1 diabetes occurs when the body fails to produce insulin. Type 2 diabetes, which is much more common, occurs when the body fails to respond to insulin in a normal way. Diabetes can lead to serious complications including blindness, kidney failure, heart disease, and strokes. In the case of type 2 diabetes, lifestyle changes are important in preventing and managing the disease. The number of cases of diabetes is currently estimated to be around 150 million worldwide, but that number is expected to double by 2025 (WHO, 2003).

Inactive lifestyles and excessive weight gain increase the risk of type 2 diabetes, especially when excess fat is stored in the abdomen. Excess fat in the abdomen can contribute to the development of insulin resistance, a condition that underlies most cases of type 2 diabetes. Children of mothers who are affected by diabetes during pregnancy are also at high risk of developing obesity and type 2 diabetes early in life. Consumption of saturated fats may increase the risk of developing type 2 diabetes (WHO, 2003).

Efforts to prevent excessive weight gain and cardiovascular disease can also reduce the risk of developing diabetes. Measures include maintaining a healthy weight, engaging in at least one hour of moderate physical activity (for instance walking) in the course of the day most days of the week, consuming sufficient fibre from fruits, vegetables and wholegrain cereals, and limiting consumption of saturated fats.

2.6.6 Cardiovascular Diseases

Ongoing lifestyle changes are contributing to the increase in the global burden of cardiovascular diseases. Currently, one third of all the deaths in the world are estimated to be due to diseases which affect the heart and blood vessels. Risk factors such as poor nutrition, insufficient physical activity, and tobacco use tend to accumulate over time, increasing the overall risk of developing cardiovascular disease (WHO, 2003).

Certain dietary fats, especially those that are commonly found in dairy products, meat and hardened oils (such as certain margarines) have been shown to increase the risk of cardiovascular disease. Other dietary fats, such as those found in soybean and sunflower oils, can lower the risk of cardiovascular disease. Fish oil (which is found in fatty fish) is also beneficial (WHO, 2003).

A high intake of salt can increase blood pressure and the risk of stroke and coronary heart disease, whereas eating a diet high in fibre and wholegrain cereals can reduce the risk of coronary heart disease. A high intake of fruits, vegetables, and fish can contribute to good cardiovascular health and reduce the risk of developing certain cardiovascular diseases. Alcohol consumption should be limited in view of cardiovascular and other health risks (WHO, 2003).

To prevent cardiovascular disease, intake of fat from dairy products, meat and certain cooking fats should be limited. Eating 400 to 500g of fruits and vegetables every day and fish once or twice per week is recommended. Restricting salt intake to less than 5

g per day and exercising for at least 30 minutes a day are also beneficial to cardiovascular health.

2.6.7 Cancer

As the population is aging, cancer is becoming a growing problem and a major cause of death. Apart from tobacco smoke, which is the most common proven cause of developing cancer, other identified and unidentified factors also play a role. Dietary factors are estimated to account for nearly a third of cancers in industrialized countries, making diet second only to tobacco as a theoretically preventable cause of cancer. The risk of developing cancer can increase due to factors such as obesity, high consumption of alcohol or preserved meat, and lack of physical activity (WHO, 2003).

Stomach cancer and liver cancer occur more frequently in certain developing regions. Excessive alcohol consumption is the main dietary risk factor for liver cancer and high intake of salty, preserved foods can increase the risk of stomach cancer. However, certain infections are also known to play a role. Aspects linked with the Western diet and obesity may be contributing to an increased risk of developing cancer, such as colorectal cancer, cancer of the pancreas, breast cancer, and prostate cancer. These types of cancers are more common in developed countries (WHO, 2003).

The risk of developing certain types of cancer may be reduced for instance by maintaining a healthy Body Mass Index (BMI), engaging in one hour of physical activity per day (for instance fast walking), limiting consumption of alcohol and salt, consuming sufficient fruits and vegetables and not eating foods when they are at a very high temperature.

2.6.8 Dental Diseases

Dental diseases, such as tooth decay and gum disease, are a costly burden to health care services. Although caries have become less frequent over the past 30 years, as people are living longer, the number of people developing dental diseases is likely to increase. This is a particular concern in countries where sugar consumption is increasing and where fluoride exposure may be inadequate (WHO, 2003).

2.6. 9 Osteoporosis

Osteoporosis is a disease affecting millions of people around the world that leads to bone fragility and a consequent increase in risk of bone fracture. The risk of osteoporosis increases with age and can lead to illness, disability, and even premature death. The risk of fractures of the hip and vertebrae increases exponentially with age. In countries where fractures are frequent, women are affected more often than men. Overall, approximately 1.66 million hip fractures occur each year, and that number is expected to rise in the future (WHO, 2003).

Much is known about osteoporosis and its links to dietary calcium, calcium reserves, and bone mass. Osteoporosis is characterized by an excessive decrease in bone mineral density with aging; in postmenopausal women, losses of skeletal calcium can reach ≥40 percent (Tucker, 2003). Prevention needs to start early, with attention to dietary calcium and vitamin D intake and interventions to build maximal bone density in childhood, as well as protect bone mass in adult women.

In addition, at least one study reported that bone health is influenced by other nutrients, such as vitamin K (Booth *et al.,* 2003); the results of that study indicated that low intakes of vitamin D and calcium correlated with low intakes of vitamin K. This type of association suggests that it may be healthy versus unhealthy dietary patterns and lifestyles, rather than a deficiency of a single nutrient that contributes to osteoporosis.

Women who are three to six years past menopause can help prevent bone loss by increasing their calcium intake in addition to getting plenty of exercise. While large amounts of calcium supplements are used by older women, the evidence shows that such supplements can prevent or stem the progress of osteoporosis in some people, but not all. Dietary calcium (calcium from foods) is much better absorbed and used by the body than supplements. However, no supplement can replace calcium already lost from bones; at best, it can slow down further deterioration.

Generally, life expectancy is increasing throughout the world. According to the World Health Organization, 605 million persons (20 percent) are currently aged ≥60 years. By 2025, it is estimated that this number will have grown to 1.2 billion (29 percent) (WHO, 2002). What is more, with increasing age the risk of disease, disability and malnutrition increases. Malnutrition is prevalent in 1-5 percent of the elderly population living at home, 10-35 percent of the population living in nursing homes and 20-40 percent of those that are in hospitalized care.

2.7 Improving the Diet related Health Problems of the Elderly

Several dietary counselling and nutrition intervention and education programmes are currently underway aimed at safeguarding and improving long-term health and promoting healthy aging. These initiatives are made of comprehensive set of objectives designed to identify the most significant preventable threats to health and to establish national goals to reduce these threats. The programmes have been developed as a collaborative process and it is built on scientific knowledge and is designed to measure progress over time (WHO, 2012). The two main all-embracing goals are:

i. To increase the length and quality of healthy life and

ii. To eliminate health problems (WHO, 2012).

WHO (2012) opined that in order to achieve these goals, there is the need to focus on some of the health problems that do occur. Not only do lower-income persons perceive that they have poorer health, income inequality has also increased over the years. Recent gains in health are due disproportionately to achievements by upper-income groups, while lower-income groups lag behind in health status. Other health problems noted include the longer life expectancy of women than of men, the lower life expectancy of ethnic minorities, the higher infant mortality rate, and the two-fold higher rate of diabetes.

WHO (2012) further pointed out that although severe disabilities in persons aged ≥60 years are declining, the occurrence of chronic disease, particularly of those diseases linked to diet and lifestyle, is increasing. Obviously, the older one becomes, the higher the probability of having one or more chronic diseases and the inherent health, economic,

and social consequences. Research institutions worldwide are now looking closely at nutrition and nutritional requirements, not only from the perspective of alleviating nutrient deficiencies but also from the perspective of preventing them. How we apply our growing understanding of programmes on the influence of nutrient on disease processes to effectively modify dietary patterns population wide to reduce and prevent the incidence of chronic disease is paramount.

At the individual level, it is imperative that nutrition education, dietary counselling, and intervention programmes to improve diet in the elderly be targeted specifically to the populations or population sub-groups of interest, taking into account factors such as demographic characteristics, psychosocial factors, environmental attributes, and literacy.

In addition, these programmes need to highlight culturally salient features and other factors that affect food preferences, and should be culturally adapted to the population of interest. Examples of such culturally appropriate features include adapting successful theoretical or behavioural frameworks to various racial/ethnic groups, providing information on healthy modifications of traditional meals, approaches to increase the palatability of "healthy" foods (to address the perception that "healthy" foods do not taste good), and hiring study staff that participants can identify with on a socio-cultural basis.

Programme delivery plays a critical role in its success. It is important to identify innovative and novel venues for delivering nutrition education and intervention programmes, such as churches, elementary and secondary schools, minority-serving

colleges and universities, and the Internet (UyBico *et al*., 2007). Also, recruitment and retention of study participants is vital. Approaches that have been found to enhance recruitment in research studies include identifying prospective participants through religious institutions, community networks, senior centres, and by door-to-door canvassing (Yancey & Ortega, 2006). Involving the participant‟s family and peer network into the programme, incorporating social support as a programme component, and hiring ethnically-matched study staff can bolster recruitment and enhance retention.

It is worth noting that Registered Dieticians (RDs) or (Registered Dietician or Registered Dietician Nutritionist (RDNs) are health professionals qualified to provide safe, evidence-based dietary advice which includes a review of what is eaten, a thorough review of nutritional health, and a personalized nutritional treatment plan (National Institutes of Health, 1998).

They also provide preventive and therapeutic programmes at work places, schools and similar institutions. Certified Clinical Nutritionists or CCNs, are trained health professionals who also offer dietary advice on the role of nutrition in chronic disease, including possible prevention or remediation by addressing nutritional deficiencies before resorting to drugs. However, government regulation especially in terms of licensing, is currently less universal for the CCN than that of registered dietician (RD) or registered dietician nutritionist (RDN).

2.7.1 Factors to Consider in Designing Elderly Support Programmes

In order to design effective dietary counselling and nutrition intervention and education programmes, it is important to identify the myriad of factors and characteristics

that may affect dietary intake and dietary behaviour. Factors that contribute to diet-related health problems in the elderly are multifaceted and complex, and include individual, environmental, social, cultural, and behavioural attributes.

2.7.1.1 Socioeconomic Factors

Demographic characteristics such as age, gender, employment status, education, income, and family structure/composition are associated with dietary intake, and consequently contribute to health problems as well. For example, younger age has been shown to be associated with higher fat intake (Kayrooz *et al.,* 1998), while older age is correlated with higher fruit and vegetable intakes (McClelland *et al.,* 1998). Other characteristics that have been found to be associated with high fat intake include being employed (Kayrooz *et al.,* 1998), lower education, low income, and having young children in the household (Eyler *et al.,* 2004). Nonetheless, it is important to note that results examining associations of demographic characteristics with dietary behaviour are not always consistent across studies.

Socioeconomic factors, particularly education and income, are key contributors to diet-related health problems; in fact, it has been suggested that the effects of socioeconomic status on health problems are stronger than those of race and ethnicity (Bahr, 2007; Adler & Rehkopf, 2008). Regardless of which characteristic might be a stronger contributor, the importance of socioeconomic factors cannot be overstated. For example, level of education impacts knowledge of dietary recommendations and which foods are healthy versus less healthy, while income affects whether a person can afford to purchase healthy foods.

Socio economic factors have been shown to be essential predictors of nutrient intake and diet quality (Kamau-Mbuthia & Elmadfa, 2007). Nutrient deficiencies are generally found in low-socio economic populations, where they are more likely to involve multiple rather than single deficiencies (Fall *et. al.,* 2003). The world has a crisis of high food prices, which affects access to nutritious food (WHO, 2008). Food choices are highly sensitive to price, and dietary diversity, including micronutrient and protein-rich healthy foods, is the first to be dropped from the diet, as these options are usually more expensive. The food crisis is thus a dual threat to the quality and quantity of the diet, resulting in malnutrition. This is particularly true among young children and among people with chronic diseases, such as heart disease, diabetes and some types of cancer. In addition, the food crisis is expected to further increase the burden of malnutrition, particularly among poor people. Women are especially vulnerable, with an increased risk of malnutrition during pregnancy.

2.7.1.2 Cultural Practices

Culture is the way a group of people live and do things together. Every culture is backed by norms and values. Out of these determines the kind of foods an individual will eat. Some communities may regard certain foods as taboos and hence though such foods may be nutritionally good, they will not be considered as food. Pelto (1997) completed an assessment of available studies targeting cultural issues in maternal and child health and nutrition. Her challenge for social scientists remains true today. We have yet to thoroughly and empirically examine cultural and behavioral adaptations to the changed energy and nutrient requirements during pregnancy.

It is widely acknowledged that cultural factors influence dietary preferences and behaviour. Studies have shown for instance that in general, African Americans accept or are comfortable with larger body sizes (Boyington *et al.,* 2008), which may limit the extent to which healthy eating efforts are sustained. Thus, they are less likely to practice unhealthy dietary behaviours, such as over-exercising or purging with the use of diet pills, exercising, purging (vomiting, laxatives, diuretics), and dieting.

Although the literature in anthropology and sociology contains numerous examples of the dietary cravings and food prescriptions attributed to pregnant women, these have almost always been discussed from a symbolic, psychological, or ethno-scientific perspective, rather than in a manner that would allow an assessment of their nutritional consequences (Boyington *et al.,* 2008).

2.7.1.3 Social Environment

Family, close friends and work can be sources of social support which is a key element in maintaining health and recovering from illness. Greater self-esteem, positive feelings about the future and a sense of control are characteristics of people with strong social support. Adults in stable long-term relationships such as marriage are less likely to have illness than are people devoid of strong social support. In addition, children of parents who are married are also likely to be healthier (McCarter, 2010). Individuals with support, they assert, are more likely to engage in preventive dental health, proper eating habit and the use of safety practices such as the use of seat belts.

2.7.1.4 Psychosocial Factors

There is increasing evidence that psychosocial factors may affect dietary intakes, and consequently chronic disease risk. In one study, high self-efficacy (defined as confidence in one‟s ability to do a certain behaviour) was associated with higher fruit and vegetable and lower fat consumption (Watters *et al.,* 2007; 2008). Belief in a relationship between diet and disease is correlated with healthy dietary intakes, as is high self-rated health, knowledge of dietary recommendations, strong social support (from family members and/or friends) and familiarity with nutritional guidelines (Van Duyn *et al.,* 2001; Satia *et al.,* 2004; 2005).

2.7.1.5 Environmental Factors

Our environment can have an appreciable effect on diet behaviour. Environmental influences on what and how we eat include the availability of healthy food choices, for instance, proximity to fast food restaurants; convenience of purchasing healthy foods for example, access to healthy shopping establishments; and costs of healthy foods, for example it is often less expensive to purchase unhealthy snack foods compared to fruits and vegetables. Learned behaviours, for example, childhood dietary patterns also influence current/adult behaviours. Finally, family members and peers can affect one‟s diet, for example, a person may choose to eat certain foods in order to “fit in” or so that they are not viewed as “different” (Vitolins *et al.,* 2002; Eyler *et al.,* 2004).

2.7.1.6 Other ways of Improving the Diet-related Health Problems of the Elderly

As a result of changes in the way we eat and live, some chronic diseases are increasingly affecting both developed and developing countries. Indeed, diet-related chronic diseases such as obesity, diabetes, cardiovascular disease, cancer, dental disease, and osteoporosis are the most common cause of death in the world and present a great burden for society. The question then is "how can improvements in terms of diet and physical activity help us reduce the risk of these chronic diseases?

2.7.1.7 Extent to which Diet plays a Role in Chronic Diseases

Chronic diseases are long-term diseases that are not contagious and largely preventable. They are the most common cause of death in the world and present a great burden for society, particularly diseases such as obesity, diabetes, cardiovascular disease, cancer, dental disease, and osteoporosis. Making improvements in terms of diet and physical activity can help reduce the risk of these chronic diseases (WHO, 2003).

Also, hunger and malnutrition are the most devastating problems facing the world‟s poorest nations, often leading to physical or mental disability, or even death. Simultaneously, because of rapid changes in the diets and lifestyles among certain population groups, many of these countries have seen an increase in chronic diseases, such as obesity and heart disease (WHO, 2003). This indicates therefore that safe and adequate food supplies are needed in order to combat both nutritional deficiencies and chronic diseases.

CHAPTER THREE

METHODOLOGY

3.1 Overview

This chapter deals with the methods and procedures that the researcher employed in carrying out the study. It includes the research design, the profile of the Birim Central Municipality, population, sample size and sampling techniques, instrumentation, procedures for data collection and analysis and ethical considerations.

3.2 Research Design

This study adopted the cross-sectional survey design. Cross-sectional surveys are studies in which a group of subjects is selected from a defined population and contacted at a single point in time. On the basis of the information obtained from the subjects at that point in time, they are then classified as having or not having the attribute of interest (Olsen & St. George, 2004). Mixed method research is formally defined as the class of research where the researcher combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study (Johnson & Onwuegbuzie, 2004. In this design, the researcher first collects and analyzes the quantitative (numeric) data. The qualitative (text) data are collected and analyzed second in the sequence and help explain, or elaborate on, the quantitative results obtained in the first phase. The second, qualitative, phase builds on the first, quantitative, phase, and the two phases are connected in the intermediate stage in the study. Its characteristics are well described in

the literature (Creswell, 2003, 2005; Creswell et al., 2003), and the design has found application in both social and behavioural sciences research (Klassen & Burnaby, 1993).

The rationale for this approach is that the quantitative data and their subsequent analysis provide a general understanding of the research problem. The qualitative data and their analysis refine and explain those statistical results by exploring participants‟ views in more depth (Creswell, 2003). The researcher dwells much on the quantitative part of the research than the qualitative. The qualitative part was used to collect qualitative information to enrich the data collection instrument.

The strengths and weaknesses of this mixed-methods design have been widely discussed in the literature (Creswell 2003, 2005; Moghaddam, Walker & Harre, 2003). Its advantages include straightforwardness and opportunities for the exploration of the quantitative results in more detail. This design can be especially useful when unexpected results arise from a quantitative study (Morse, 1991). The limitations of this design are lengthy time and feasibility of resources to collect and analyze both types of data.

3.3 Profile of Birim Central Municipality

The Birim Central Municipality is one of the 26 administrative districts in the Eastern Region of Ghana. It was carved out of the former Birim South District Assembly in 2007 under Legislative instrument (LI) 1863 as part of the government‟s decentralization programme. The municipal capital is Oda. It is linked up with many districts and this promotes commercial activities with the district capitals and other nearby communities. It is located in the south western corner of the Eastern Region.

The municipality shares boundaries with Akyemansa and Kwaebibirem to the north. Birim South to the West, Asikuma-Odoben-Brakwa and Agona East District to the south and west Akim to the East. It has a total land area of 1,090km as stated by the Ghana Statistical Service (GSS, 2010). The land is mostly undulating and hilly. The Municipality is classified as the home of Birim River. It has a number of tributaries including Fumso, Apetesu, Asileasu, Ahomfra, Akwasua, Nsutre, Tropea and Kasawere.

The Municipality falls within the wet semi-equitorial climatic zone and therefore experiences substantial amount of rainfall. The municipality experiences monthly mean temperature around 26^0C and ranges between 21^0C and 35^0C. Double maximum rainfall is experienced annually. The municipality falls within the semi-deciduous rain forest vegetation zone.This vegetation zone is characterized by tall trees with evergreen undergrowth. These trees serve as sources of raw materials to the timber industry creating employment avenues and income for some of the people in the municipality.

The population is dominated by Akans but has other ethnic groups. The municipality is therefore heterogeneous in terms of ethnicity. The municipality is predominantly Christians (83.9 percent) with other religions consisting about 16.1 percent (GSS, 2010). Traditionally, the municipality falls under the Akyem Kotoku traditional council. They celebrate the Odwira festival each year in December. The major economic activities are agriculture (50.9 percent), trade and commence (20.1percent), industry (13.1percent) and services (hotel, banking). Agriculture is the main stay of the District‟s economy employing about 60 percent of the active labour force (Birim Central, DMTDP, 2010). The major crops cultivated are staples like maize, cassava, rice, cocoyam, yam and plantain. The major cash crops produced are citrus, oil-palm and

cocoa. Cattle, sheep, goat, pig and poultry are the major animals reared in the municipality. Commercial activities in the municipality are mainly centered on wholesale and retail trading in primary commodities. Major industrial activities in the municipality include small-scale manufacturing, agro-processing, furniture works, construction, soap making and crafts, mining and quarrying.

The municipality has nine forest reserves endowed with various species of flora and fauna. The Big Tree is one of the major attractions in the municipality. According to the 2010 GSS, Birim Central has a total population of 144,869 representing about six percent of the total population of the Eastern Region. Males constitute almost 48 percent while female population is about 52%.

The municipality is predominantly urban with a population of 98,044 (67.7%) and46, 825(32.3%) leaving in rural areas. The population pyramid for Birim Central Municipality shows abroad base which gradually decreases with increasing gage and finally narrows to a cone-shaped likes structure at the top. The population of the 60 years and above a are about 9899 with more female than males according to GSS (2010) population and housing census.

3.4 Population

Frankel and Warren (2002) described population of a study as the set of individuals having similar characteristics in which the researcher is interested. The target population for this study comprises an estimated number of 26,740 aged or elderly persons in Birim Central Municipality.

3.4.1 Inclusion and Exclusion Criteria

All aged persons from age 60 and above were included in the study irrespective of their health status. This is to say that whether the person is sick or not he or she was part of the population because he/she was within the age range.

3.5 Sample Size and Sampling Techniques

Baron (2010) maintains that population sample should be small enough to provide a manageable volume of data but the sample must accurately represent the population if any valid inferences are to be drawn from the sample results. Out of about 95 settlements in the Birim Central Municipality, 25 settlements were conveniently selected for the study to ensure easy accessibility with respect to information, reduce time and to get as many respondents as required as the researcher resides in the community. Two hundred (200) elderly persons residing in the municipality were purposively selected for this study. The researcher purposively selected the study participants on the basis of proximity, age, attendance at hospitals or clinics, and whether they are „information rich." The hospitals and clinics involved in this study are the Oda Municipal Hospital located at Akim Oda, Community Hospital and Jubilee Hospital located in Akim Oda, The choice of the purposive sampling technique is supported by Creswell (2009) who indicates that purposive sample selection technique is used by researchers for a qualitative study of a population that contain specific characteristics that are rare or difficult to locate and recruit for a study. The purposive sampling procedure requires that a researcher identifies the characteristic and then finds sites or individuals that display different dimensions of the characteristics (Creswell, 2005 as cited in Kusi, 2012). The selection was done based

on the participants‟ attendance to the health facility and how ready they were to respond to the questions. The participants who cannot speak, their care givers will be allowed to answer on their behalf.

3.6 Instrumentation

O‟Leary (2004) stated that collecting credible data is a tough task and is worth remembering that one method of data collection is not inherently better than another. This study adopted a multi-approach data collection technique. This is because of the complementary effect of the strength and weakness in each technique. The techniques included administration of questionnaire and observation. Multiple instruments: questionnaire, observation guide (checklist) and interview guide were used for data collection. This was done to ensure triangulation of data as noted by (Punch, 2003) and cross-checking data from multiple sources to search for regularities in the research data (Berg, 2007). Phones, pens and note pads were used to ensure quicker and easier gathering of data. The researcher used questionnaire, observation guide and interview guide because these procedures give the researcher the opportunity to tap into the opinion, knowledge, ideas and experiences guide of the respondents. The observation will be used to guide the researcher to collect data on the dietary pattern of the elderly. The instruments were used to collect both qualitative and quantitative data.

Triangulation essentially means combining two or more views, approaches or methods in an investigation in order to get a more accurate picture of phenomena. It is the practice of employing several tools (instruments) within the same research design (Sarantakos, 2005). Triangulation also involves data triangulation which is the

combination of data drawn from different sources and at different times, in different places or from different people (Flick, 2008). That is, more than one data collecting method is used. Gaps in collected data are filled and false or misleading information can be detected (Greeff, 2002). Patton (2002) clarified the notion that the purpose of triangulation is to test for consistency rather than to achieve the same result using different data sources or inquiry approaches.

3.6.1 Administration of Questionnaire

A structured questionnaire was used to assess the nutritional knowledge, knowledge of diet related health problems, eating habits as well as the lifestyle of the elderly. A meal pattern and/or dietary/feeding practice questionnaire (food frequency questionnaire) containing close-ended questions were administered to the elderly or caretakers. An observation checklist using the 24 hour dietary recall were also used as dietary indicator to describe intake of foods by the aged persons. The questionnaire contains close ended and a few open ended items. The close ended items contain a Likert-scale type questions/statements which were built on a five-point scale rating. The questionnaire was designed for the respondents to reflect on the key themes raised in the research questions.

3.6.2 Observation Schedule/Checklist

A semi-structured observation guide was designed to collect data. The observation involved physical examination of the food quality, and feeding practices of the elderly.

3.6.3 Documentary Analysis

Documents such as health or medical records were obtained from the elderly for review. This is indicative of Rose and Grosvenor (2001) suggestion that documents are credible, authentic and have meaning to the issues of interest.

3.7 Validity and Reliability of Instruments

Validity refers to the extent to which the research instrument serves the use for which it is intended (Seidu, 2006). The instruments were scrutinized by colleague MPhil students of Home Economics. Again, it was given to the research supervisor and health experts (dietetics, nutritionists, doctors and nurses) for scrutiny. The researcher made necessary corrections based on their comments before pre-test. These was done to establish face and content validity of the instruments. Construct validity was ensured by critically developing it within established theoretical framework.

Reliability of a study instrument is the consistency of the instrument in producing the same or similar results given the same condition on different occasions (Seidu, 2007). To ensure reliability of the research instruments, they were pre-tested on 5 elderly persons in Akroso. In the following week, the test-retest technique was used to determine the reliability of the instrument. The same 5 elderly persons were asked to answer the same questions. The two results were subjected to Cronbach‟s alpha reliability analysis using Statistical Package for Social Sciences (SPSS) version 21.0. A reliability coefficient (r) of 0.79 was obtained which implies that the instrument was reliable; hence it was used for the actual study. This indicated that the instrument was reliable as noted

by Tavakol, Mohagheghi, and Dennick (2008) who stated that the acceptable values of alpha, ranges from 0.70 to 0.95.

3.8 Procedure for Data Collection

The researcher paid visits to the respondents in their various homes, especially those that allowed for it, or else the researcher met them at the various hospitals as and when they came for treatment. Care givers were only allowed to respond when the elderly could not speak.

The questionnaire was administered personally by the researcher. To obtain appropriate responses, the instructions and items were read and explained in Akan dialect to respondents who could not read and write. The respondents who are literates answered the questionnaire. This was done to ensure high coverage, response and return rates. The observation/inspection was done during administration of the questionnaire and other visits.

3.9 Data Analysis

Cohen and Manion (1994) explained data analysis as meticulous examination of the research data with the view to understanding their parts and relationships. It involves the isolation of the research data into its constituent parts so as to determine its important features and then try to establish any relationships that may exist between the constituent parts (Trochim, 2006). The appropriate methods of data analysis are determined by the data types and variables of interest, the actual distribution of the variables, and the

number of cases. Different analyses of the same data set may reflect or represent different aspects of the underlying data structure.

Responses made by the respondents to each set of items in the questionnaire were tallied in order to get the number of respondents who answer each set of items. The collected data were fed into the SPSS (Version 21) software and they were analyzed. Frequency counts and percentage distributions of responses were generated according to each research question raised, and this was presented in tables and figures or charts. For the interview data, responses by the respondents to each question were played back several times in order to identify the key opinions being expressed and how each relate to the research questions. Opinions expressed were categorized according to research questions. The content analysis was used with verbatim or narrative expression of views expressed by respondents. The observation data were presented as figures or charts and photographs which were discussed to support the quantitative data.

3.10 Ethical Considerations

In conducting a study, Creswell (2005) advised researchers to seek and obtain permission from the authorities in charge of the site of the study because it involves a prolonged and extensive data collection. Accordingly, an introductory letter was obtained from the Head of Department of Home Economics from the University of Education, Winneba. This was used to obtain permission from the Birim Central Municipal Assembly, and the Municipal Directorate of Health Services to conduct the study. Cohen and Manion (1994) observed how important it is for people to get prior knowledge about their involvement in a study. On that note, after permission had been granted to conduct the study, attention was drawn to each of the sampled participants. They were informed

of the impending administration of the questionnaire and observation. This was to seek for consent, and to prevent any suspicion about the purpose of the research. The purpose of the study was explained to sampled respondents. Participation in the study was voluntary when necessary. The respondents were assured of confidentiality and anonymity. The identity of the respondents was blinded. That is, identity of each respondent was numerically coded.

CHAPTER FOUR

RESULTS

4.1 Overview

This study found out if there is prevalence of diet related health problems of the elderly in Birim Central Municipality and to identify which of the health problems are more prevalent. This chapter presents the results of the data collected from the respondents. The quantitative data is presented in tables as frequency counts and frequencies, mean and standard deviation. Data have been organised, presented and discussed under the following themes:

i. Demographic information on the elderly in the Birim Central Municipality.
ii. Demographic and socio-economic determinants of nutrition and health of the elderly in the municipality.
iii. Dietary habit and lifestyle of the elderly in the municipality.
iv. Diagnosed nutritional and diet related health problems of the elderly in the municipality.
v. Ways of improving diet related health problems of the elderly in the municipality.

4.2 Demographic information on the elderly in the Birim Central Municipality

The demographic data of the respondents cover the following attributes: gender, age, marital status, level of education, post-retirement employment status, and source of income.

Table 3: Demographic information on the respondents

(n = 200)

Variable	Variable category	F	%
Gender	Male	86	43
	Female	114	57
Age (in yrs.)	60-69	85	43
	70-79	68	34
	80-89	35	18
	90 and above	12	6
Marital status	Single	0	0
	Married (intact family)	101	51
	Divorced/Separated	28	14
	Widowed	71	36
Level of education	Basic education	64	32
	Secondary education	70	35
	Tertiary education	30	15
	No formal education	36	18
	Any other	0	0
Post-retirement employment Status	Working in a formal sector	4	2
	Working in an informal/private sectors	80	40
	Self-employed	104	52
	Not employed and working	12	6
*Source of income/money for personal use and livelihood	Salary/Wage	64	18
	Income/Profit from business	80	23
	Pension income	91	26
	Remittance from children, family/relatives	104	29
	Any other	15	4

Source: Fieldwork data (2019)

Key: F = Frequency; **%** = Percentage; **n** – sample

*N= 200 < 1408 due to multiple response.

In Table 3, the gender distribution of the elderly is skewed towards respondents who were females (n= 114, 57%), and followed by males (n= 86, 43%). Similarly, the age distribution of the elderly is skewed towards respondents who were 60-69 years (n= 85, 43%), and followed by those who were 70-79 years (n= 68, 34%). The elderly who

were between 80 and 89 years (n= 35, 18%) and 90 years and above (n= 12, 6%) constituted the least number.

As indicated in Table 3, majority of the elderly were married and intact families (n= 101, 51%). A few were divorced (n= 28, 14%) and widowed (n= 71, 36%). The distribution of the respondents by their educational level revealed that elders who had basic education (n=94, 47%) and secondary education (n=70, 35%) were more than their counterparts who had no formal education (n= 36, 18%) and tertiary education (n=30, 15%).

As captured in Table 3, the information on post-retirement employment status disclosed that majority of the elderly were self-employed (n= 104, 52%), and followed by those who were employed in the informal sector (n= 80, 40%). A few were of them were not employed and working (n= 28, 14%), but 4 (2%) were employed (re-engaged) in the formal sector. The data indicated the sources of income to the elderly. These were remittance from children (29%), pension income (26%), income or profit from business (23%), salary/wages (18%), and cash gifts from friends, relatives and the Livelihood Empowerment Against Poverty [LEAP] (2%) programme.

From Table 3, it could be concluded from the result of this study that majority (67%) of the elderly in Birim Central Municipality have low level of education. The finding also showed that there were more female than male elderly people in the Birim Central Municipality.

4.3 Demographic and socio-economic determinants of nutrition and health of the elderly in the municipality

The data are presented and discussed on research question one: "*What are the demographic and socio-economic determinants of nutrition and health of the elderly in Birim Central Municipality?"* The data for this research question were obtained from responses to items 7 to 13 in the questionnaire. The data are depicted in Table 4.

Table 4: Demographic and socio-economic determinants of nutrition and health of the elderly

(n=200)

Determinant	A	U	D	M	SD.
Poor income status	182(91)	0(0)	18(9)	1.09	.286
Poor educational status	170(85)	0(0)	30(15)	1.15	..357
Poor post-retirement employment status	189(95)	0(0)	11(5)	1.06	.238
Cultural/food taboos & restrictions	106(53)	0(0)	84(42)	1.47	.500
Food unavailability	123(62)	0(0)	77(38)	1.27	.445
Weak social support system	146(73)	0(0)	54(27)	1.27	.445
Poor place of residence	73(37)	0(0)	127(63)	1.63	.482
Overall mean				**1.27**	**.307**

Source: Fieldwork data (2019).

Key: M- Mean; **SD.** - Standard Deviation; **A –** Agree**; U –** Uncertain; **D –** Disagree

Note: The figures in parentheses are in percentage

As indicated in Table 4, majority of the respondents agreed that poor income status was a demographic and socio-economic determinant of poor nutrition and health of the elderly (182, 91%, M=1.09, SD = .286). But 18 (9%) of them held divergent views. Poor educational status was identified as a determinant of poor nutrition and health of the elderly by many respondents (170, 85%, M=1.15, SD = .357). However, 30 (15%) respondents held opposing views.

As captured in Table 4, concerning poor post-retirement employment status as a determinant of poor nutrition and health of the elderly, majority of the respondents affirmed it (189, 95%, M=1.06, SD = .238). But 11 (5%) respondents disagreed to the statement. Similarly, cultural/food taboos and restrictions was found as a determinant of poor nutrition and health of the elderly (106, 53%, M=1.47, SD = .500). A few respondents (84) representing 42% of them disagreed with the statement.

As indicated in Table 4, with regard to food unavailability, majority of the respondents think that it is a determinant of poor nutrition and health of the elderly (123, 62%, M=1.27, SD = .445). But a few (77, 38%) held contrary views. Similarly, most of the respondents think that weak social support system is a determinant of poor nutrition and health of the elderly (146, 73%, M=1.27, SD = .445). But 54 (27%) disagreed with the statement. Rural and poor place of residence was found to be responsible for poor nutrition and as confirmed by a few respondents (73, 37%, M=1.63, SD = .482), but 127 (63%) respondents held opposing views.

From Table 4, the evidence gathered from this study identified four socio-demographic and economic determinants of nutrition and health of the elderly ($M \geq 1.27$). It emerged from the findings of this study that the most significant determinants were (in rank order): poor place of residence (1^{st}), food or diet restrictions (2^{nd}), weak social support system (3^{rd}), and food unavailability (4^{th}). The mean (M) and standard deviation (SD) values for these determinants were very high considering the overall mean (M= 1.27, SD= .307).

4.4 Dietary habit and lifestyle of the elderly in the municipality

The data presented and discussed under this theme bears on research question 2, which states *"What are the dietary habits and lifestyle of the elderly in Birim Central Municipality?"* To find answer to this research question, responses to items (questions) 14 - 26 in the questionnaire were analysed.

Table 5: Dietary habit and lifestyle of the elderly in the municipality

(n=200)

Statement	A	U	D	M	SD.
On the average, I eat three times a day	72(36)	0(0)	128(64)	2.28	.962
I eat different kinds of fruits in a day.	20(10)	0(0)	180(90)	2.80	.601
Medically, I am prevented from eating some food items.	38(19)	0(0)	162(81)	2.62	.786
I eat food prepared and served in my house only.	46(23)	0(0)	154(77)	2.54	.843
Additives are added to my food to make it tasty.	70(35)	0(0)	130(65)	2.30	.956
I prefer a lot of salt in my food to make it tasty.	26(13)	0(0)	173(87)	2.74	.674
I often prefer high sugar content in my beverage or porridge to make it taste sweet.	46(23)	0(0)	154(77)	2.54	.843
Vegetables are frequently used for my food.	28(14)	0(0)	172(86)	2.72	.695
I ever smoked during the prime age of my life	30(15)	0(0)	170(85)	2.70	.715
I still engage in smoking.	30(15)	0(0)	170(85)	2.70	.715
My doctor advised me to cease smoking for health reasons.	30(15)	0(0)	170(85)	2.70	.715
I also advised people to desist from smoking.	20(10)	0(0)	180(90)	2.80	.601
I drink alcoholic drinks including beer.	76(38)	0(0)	124(62)	2.24	.973
Overall mean				**2.59**	**.669**

Key: M- Mean; **SD.** - Standard Deviation; **A –** Agree**; U –** Uncertain; **D –** Disagree

Note: The figures in parentheses are in percentage

Table 5 shows the description of the responses of the sample respondents in relation to dietary habit and lifestyle of the elderly in the Birim Central Municipality. The table shows that a few respondents (72, 36%, M=2.28, SD = .962) confirmed that they have been eating three times in a day. However, majority of the respondents 128, 64%) disagreed.

In Table 5, when the elderly where asked whether they eat different kinds of fruits in a day, a few (20, 10%, M = 2.80, SD = .601) agreed to the statement but majority (180, 90%) of the respondents disagreed. Also, a few respondents admitted that they were medically fit, because they were prevented from eating some food items. But 162 (81%) respondents held opposing views.

As indicated in Table 5, concerning respondents‟ opinion on eating food prepared and served in their house only, a few respondents (46, 23%, M=2.54, SD = .843) agreed to the statement. However, 154 (77%) respondents held contrary views. In addition, a few respondents (70, 35%, M=2.30, SD = .956) confirmed that additives are added to their food to make it tasty. However, 130 (65%) respondents held opposing views.

Table 5 indicates, a few respondents preferred a lot of salt in their food to make it tasty (26, 13%, M=2.74, SD = .674), but 173 (87%) respondents held incongruent views. Some respondents often preferred high sugar content in their beverage or porridge to make it taste sweet (46, 23%, M=2.54, SD = .843), but 154 (77%) disclaimed.

With regard to whether vegetables are frequently used for the food of the elderly, a few respondents agreed (28, 14%, M=2.72, SD = .695). However, 172 (86%) respondents held opposing views. Also, a few respondents agreed that they ever smoked

during their prime age of life (30, 15%, M=2.70, SD = .715). But 170 (85%) respondents held contrary views.

In terms of doctor"s advice to cease smoking for health reasons, a few respondents agreed (30, 15%, M=2.70, SD = .715). However, 170 (85%) respondents disagreed. A few respondents affirmed that they also advised people to desist from smoking (30, 15%, M=2.70, SD = .715). However, 170 (85%) respondents held incongruent views. A few respondents confirmed that they drink alcoholic drinks including beer (20, 10%, M=2.80, SD = .601). But 180 (90%) respondents held opposing views.

From Table 5, it is evident from the findings of this that the elderly in Birim Central Municipality have poor dietary habit and lifestyle ($M \geq 2.59$). For instance, more than 80% of the elderly respondents disagreed that they have been eating different kinds of fresh fruits and vegetables. On the other hand, they mentioned the consumption of a lot of salt in their diet. Moreover, some of the elderly respondents still engaged in the consumption of alcohol and smoking of cigarette.

4.5 Nutritional or diet related health problems of the elderly in the Birim Central Municipality

The data presented and discussed under this theme bears on research question 1, which states *"What are the dietary related health problems among the elderly in the municipality?"* To find answer to this research question, responses to items (questions) 27 - 38 in the questionnaire were analysed.

Table 6: Nutritional or diet related health problems of the elderly

(n=200)

Item	A	U	D	M	SD.
Type 2 diabetes	55(28)	0(0)	155(78)	2.45	.895
Hypertension	20(10)	0(0)	180(90)	2.80	.601
Stroke	80(40)	0(0)	120(60)	2.20	.982
High cholesterol	80(40)	0(0)	120(60)	2.20	.982
Fatty liver	68(34)	0(0)	132(66)	2.32	.949
Osteoporosis	40(20)	0(0)	160(80)	2.60	.802
Weight loss	20(10)	0(0)	180(90)	2.80	.601
Overweight/obesity	20(10)	0(0)	180(90)	2.80	.601
Loss of appetite/ loss of taste and smell sensitivity	68(34)	0(0)	132(66)	2.32	.949
Constipation	46(23)	0(0)	154(77)	2.54	.843
Pile	46(23)	0(0)	154(77)	2.54	.843
Dental diseases	26(13)	0(0)	174(87)	2.74	.674
Overall mean				**2.53**	**.690**

Key: M- Mean; **SD.** - Standard Deviation; **A –** Agree**; U** – Uncertain; **D –** Disagree

Note: The figures in parentheses are in percentage

Table 6 shows responses on nutritional or diet related health problems of the elderly in Birim Central Municipality. With regard to type 2 diabetes, a few elderly respondents had it (55, 28%, M=2.45, SD = .895). However, 155 (78%) respondents did not suffer it. Also, a few elderly respondents (20, 10%, M=2.80, SD = .601) suffered from hypertension, but 180 (90%) respondents did not.

A few elderly respondents suffered mild stroke (80, 40%, M=2.20, SD = .982), but 120 (60%) did not. Similarly, a small number of elderly respondents agreed that they

were diagnosed to have high cholesterol in their bodies (80, 40%, M=2.20, SD = .982), but 120 (60%) did not. A few elderly respondents agreed that they were diagnosed to have a fatty liver (68, 34%, M=2.32, SD = .949), but 132 (66%) did not.

As indicated in Table 6, a few elderly respondents were also diagnosed to have osteoporosis (40, 20%, M=2.60, SD = .802), but 160 (80%) did not. A few elderly respondents also agreed that they experienced weight loss osteoporosis (20, 10%, M=2.80, SD = .601), but 180 (90%) did not. Similarly, a few elderly respondents experienced overweight and obesity (20, 10%, M=2.80, SD = .601), but 180 (90%) did not.

Moreover, a small number of the elderly respondents experienced loss of appetite, taste and smell sensitivity (68, 34%, M=2.32, SD = .949). But 132 (66%) did not. A few elderly respondents suffered constipation (46, 23%, M=2.54, SD = .843), but 154 (77%) did not. Similarly, a few elderly respondents were diagnosed with pile (46, 23%, M=2.54, SD = .843), but 154 (77%) did not. Furthermore, a few elderly respondents confirmed that they had dental diseases (26, 13%, M=2.74, SD = .674), but 174 (87%) did not.

It could be concluded from the results in Table 6 that a few elderly respondents (less than 23%) suffered chronic diseases or conditions ($M \geq 2.53$). These diseases or conditions include hypertension (M = 2.80), overweight/obesity (M = 2.80), weight loss (M = 2.80), dental diseases (M = 2.74), osteoporosis (M = 2.60), and constipation (M = 2.54).

4.6 Ways of improving Diagnosed diet related health problems of the elderly in the Birim Central Municipality

This theme is derived from research question 4, which states "*In what ways can we improve the diet related health problems of the elderly?"* The data for this research question was obtained from responses to items 28 to 50 in the questionnaire. The data are depicted in Table 7.

Table 7: Ways of improving diet related health problems of the elderly

(n=200)

Item	A	U	D	M	SD.
Dietary/nutrition counselling	192(96)	0(0)	8(4)	1.08	.392
Vitamin and mineral supplementation	150(75)	0(0)	50(25)	1.50	.868
Increased fish intake	102(51)	8(4)	90(45)	1.94	.980
Increased fresh fruit intake	116(58)	30(15)	54(27)	1.30	.715
Increased fresh vegetable intake	116(58)	30(15)	54(27)	1.30	.715
Increased water intake	150(75)	0(0)	50(25)	1.50	.868
Moderate exercise	170(85)	0(0)	30(15)	1.30	.715
Reduced salt in diet	174(87)	0(0)	26(13)	1.26	.674
Avoidance of very high fat diets	174(87)	0(0)	26(13)	1.26	.674
Cholesterol reduction	200(100)	0(0)	0(0)	1.00	.000
Dietary restriction	178(89)	0(0)	22(11)	1.22	.627
Nutritional therapy	184(92)	0(0)	16(8)	1.16	.543
Overall mean				**1.29**	**.453**

Key: M- Mean; **SD.** - Standard Deviation; **A** – Agree**; U** – Uncertain; **D** – Disagree

Note: The figures in parentheses are in percentage

Table 7 indicates the ways of improving diet related health problems of the elderly in the Birim Central Municipality. Majority of the elderly respondents viewed dietary/nutrition counselling as a way of improving diet and health of the elderly (192, 96%, M=1.08, SD = .870). But 8 (4%) of them held divergent views.

Majority of the respondents asserted that vitamin and mineral supplementation is an important approach to improving diet and health of the elderly (150, 75%, M=1.50, SD = .868). But 50 (25%) respondents disagreed to the statement. Majority of the respondents admitted that increased fish intake by the elderly is a surest way to improving their diet and health (102, 51%, M=1.94, SD = .980). But 90 (45%) respondents disagreed to the statement, whereas 8 (4%) were uncertain.

A substantial number of the respondents confirmed that increased fresh fruit intake by the elderly is key to improving their diet and health (116, 58%, M=1.30, SD = .715). But a few (54, 27%) respondents held contrary views while 30 (15%) were indecisive. Similarly, many respondents admitted that increased fresh vegetable intake by the elderly is key to improving their diet and health (116, 58%, M=1.30, SD = .715). But a few (54, 27%) respondents held divergent views, whereas 30 (15%) were undecided.

As indicated in Table 7, most respondents affirmed that increased water intake is important to improving the diet and health of the elderly (150, 75%, M=1.50, SD = .868), but 50 (25%) gave opposing views. Most of the respondents see moderate physical exercise by the elderly as an effective approach to improving the diet and health of the elderly (170, 85%, M=1.30, SD = .715). However, 30 (15%) respondents held opposing view. A reduction in the intake of salt in diet is seen as a means to improving the diet and

health of the elderly (174, 87%, M=1.30, SD = .715). But 26 (13%) respondents disagreed.

Also, avoiding the intake of very high fat diets by the elderly is seen as a key to improving their diet and health (174, 87%, M=1.26, SD = .674). But 26 (13%) respondents held opposing views. All the respondents affirmed that a reduction in cholesterol level in the body of the elderly is important to improving the diet and health of the elderly (200, 100%, M=1.00, SD = .000).

Dietary restriction is viewed as an important strategy to improving the diet and health of the elderly (178, 89%, M=1.22, SD = .627), but 22 (11%) respondents held opposing views. Similarly, nutritional therapy is seen as a strategy to improving the diet and health of the elderly (184, 92%, M=1.16, SD = .543). But 16 (8%) respondents held opposing views.

From Table 7, the findings reveal that majority (more than 50%) of the respondents cited a plethora of ways of improving diet related health problems of the elderly in the municipality. Evidence gathered from this study signify a very high opinion (M=1.29, SD = .453) on the following strategies as most appropriate (in rank order): increased fish intake by the elderly (1^{st}), vitamin and mineral supplementation (2^{nd}), and increased water intake (2^{nd}). These are followed by increasing fresh fruit intake (4^{th}), increasing fresh vegetable intake (4^{th}), and moderate physical exercise by the elderly (5^{th}). These measures can be classified as dietary and lifestyle modifications.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1. Overview

The study found out if there is prevalence of diet related health problems of the elderly in Birim Central Municipality and to identify which of the health problems are more prevalent. This chapter is devoted to the discussion of the findings of the study. It covers the following thematic areas: demographic data of the elderly, demographic and socio-economic determinants of nutrition and health of the elderly in the municipality, and dietary habit and lifestyle of the elderly in the municipality. Others include diagnosed nutritional and diet related health problems of the elderly in the municipality, and ways of improving diet related health problems of the elderly in the municipality.

5.2. Demographic data of the respondents

The demographic attributes of the respondents included the following: gender, age, marital status, level of education, post-retirement employment status, and source of income. Evidence gathered from this study indicate that majority (67%) of the elderly in Birim Central Municipality have low level of education. Indeed, this might have a direct negative effect on their health status. This observation affirms the views of Eeuwijk (2003) who identified the direct adverse effects of poverty and low level of education on the health status of the elderly.

The finding of this study showed that there were more female than male elderly people in the Birim Central Municipality. This observation validates the views of

Mutharayappa and Bhatt (2008) who opined that the proportion of ageing female is relatively higher than males in both rural and urban areas. It is likely that a disparity in gender differences of the elderly may influence their health outcomes.

5.3. Demographic and socio-economic determinants of nutrition and health of the elderly in the municipality

The first research question sought to gather data on demographic and socio-economic determinants of nutrition and health of the elderly in the municipality. It emerged from the result of this study that the most significant determinants were poor place of residence, food or diet restrictions, weak social support system, and food unavailability. It could be deduced from the findings of this study that there is an association between place of residence, nutrition and health status of the elderly. This observation validates the views of Bourne (2007) who also found an association between place of residence and health status. It could also be deduced from the findings of this study that a disparity in the place of residence of the elderly has implications on their health outcomes. This statement concurs with the views of Mutharayappa and Bhatt (2008) who opined that a disparity in rural and urban areas of residence influences health outcomes of the elderly.

Notwithstanding the adverse effects of place of residence, there is ample evidence from this study that food unavailability is a significant determinant of poor nutrition and health of the elderly. Food unavailability may be linked to the inability of the elderly to purchase food due to food shortage and poor or lack of income. In the opinion of Adler

et al. (2002), higher incomes can provide better nutrition while low income may well be one of the main causes of inadequate and poor diets among the elderly.

This also substantiates the views of Garcia and Grande (2010) that because the income of the majority of the elderly is a pension which in many cases is not sufficient for subsistence, their food intake decreases resulting in the decline of their nutritional needs. This observation concurs with the views of Eeuwijk (2003) who stated that poverty and lack of education have a direct harmful effect on the health status of the elderly. Other studies by Adler and Rehkopf (2008), and Bahr (2007) identified socioeconomic factors, particularly education and income, as key contributors to diet-related health problems of the elderly.

It unfolds from the findings of this study that weak social support system affect nutrition and health of the elderly in Birim Central Municipality. This observation buttresses the views of Agyemang (2014) who posited that with the advent of the nuclear family system, the elderly tend to feel neglected when all the others remain busy with their own schedules. Other studies by Vitolins *et al*. (2002) and Eyler *et al*. (2004) confirm that the weak support nentwork from family members and peers can affect one‟s diet. They cited, for example, that a person may choose to eat certain foods in order to "fit in" or so that they are not viewed as "different". In other words, food restriction and socio-cultural factors can influence dietary preferences. This behaviour may limit the extent to which healthy eating efforts are sustained by the elderly as noted by Boyington *et al*. (2008).

5.4. Dietary habit and lifestyle of the elderly in the municipality

The findings of this study revealed that majority of the elderly in the municipality engaged in poor dietary habits such as adding a lot of salt to their diet, inadequate intake of fresh fruits and vegetables. These poor eating habits are significant risk factors associated with diet related health problems of the elderly such as hypertension and type 2 diabetes. These findings corroborate the views of Amma *et al*. (2015) and Widjaja *et al*. (2013) who found that low fruit consumption are significant risk factors associated with hypertension. Other studies by the World Health Organisation (2011) and Virdis (2010) found a significant association between excessive salt intake and hypertension as well as high blood pressure. Gros *et al*. (2010) believe dietary salt intake is the most important factor contributing to hypertension.

It unfolds from the results of this study that some of the elderly respondents have been drinking alcoholic drinks and smoking cigarette. This lifestyle be is a risk factor for hypertension. This observation substantiates the views of Husain, Ansari and Ferder (2014), World Health Organisation (2011), and Virdis (2010) who found that excess consumption of alcohol leads to hypertension. Other studies by Abed and Abu-Haddaf (2013), the World Health Organisation (2011) and Virdis (2010) found a significant relationship between excessive alcohol intake and hypertension.

5.5. Diagnosed nutritional and diet related health problems of the elderly in the municipality

It is evident from the findings of this that a few elderly respondents (less than 23%) suffered nutritional and diet related health problems such as hypertension,

overweight/obesity, weight loss, dental diseases, osteoporosis, and constipation. This observation gives credence to the findings of Moses (2012) and Roth (2012) who indicated that the aged are faced with numerous health related problems such as cardiovascular diseases and many more, including a chronic illnesses. Other studies by Minicuci *et al*. (2014), Ahn and Kim (2004), Mutharayappa and Bhatt (2008) who mentioned the prevalence of diet related health conditions such as hypertension and diabetes among the elderly.

5.6. Ways of improving diet related health problems of the elderly in the municipality

Generally, the findings reveal that more than 50% of the respondents cited a plethora of dietary and lifestyle modifications strategies for improving their diet and health. The measures include increased fish intake by the elderly, vitamin and mineral supplementation, and increased water intake. Others include increased fresh fruit and vegetable intake, and moderate physical exercise. These findings are in line with the views of Reedy and Krebs-Smith (2008) who recommended the increased intake of fresh fruits and vegetables, and restriction of added sugar, salt and saturated fat to meals in order to control cardiovascular diseases. Other studies by John, Ziebland, Yudkin, Roe and Neil (2002) have both shown that a diet rich in fresh fruit, vegetables and low-fat dairy products and low in saturated fats can substantially lower both systolic and diastolic blood pressure.

The recommendation that eating a lot of fresh fruits and vegetables is a way of improving on the diet and health of the elderly is in line with the World Health

Organisation‟s (2003) report on the Joint FAO/WHO expert consultation on diet, nutrition and the prevention of chronic diseases, which recommends the intake of a minimum of 400g of fruit and vegetables per day (excluding potatoes and other starchy tubers) for the prevention of chronic diseases such as heart disease, cancer, diabetes and obesity as well as for the prevention and alleviation of several micronutrient deficiencies, especially in less developed countries.

CHAPTER SIX

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER STUDIES

6.1. Overview

This study found out if there is prevalence of diet related health problems of the elderly in Birim Central Municipality and to identify which of the health problems are more prevalent. To arrive at this objective, two hundred elderly respondents were sampled purposively for the study. The design adopted for this study was cross-sectional survey design. The main instrument used was questionnaire (Cronbach's alpha = 0.70). Data collected was analyzed using frequency and percentage which were presented in tables. This chapter highlights the summary of the study, conclusions and recommendations drawn from the study. Suggestions for further studies are also put forward.

6.2 Summary of key findings

Among the findings of this study were the following:

The first research question sought to find out the demographic and socio-economic determinants of nutrition and health of the elderly in Birim Central Municipality. The data showed that the most significant determinants were poor place of residence, food or diet restrictions, weak social support system, and food unavailability. It could be deduced from the findings of this study that there is an association between place of residence, nutrition and health status of the elderly.

The second research question looked at diagnosed dietary related health problems of the elderly. The findings revealed that less than 23% of the elderly suffered nutritional and diet related health problems such as hypertension, overweight/obesity, weight loss, dental diseases, osteoporosis, and constipation.

The third research question sought to find out the nutritional related health problems diagnosed among the elderly in the municipality. The findings of this study reveal that majority of the elderly in the municipality engaged in poor dietary habits such as adding a lot of salt to their diet, inadequate intake of fresh fruits and vegetables.

It unfolds from the results of this study that some of the elderly respondents have been drinking alcoholic drinks and smoking cigarette. This lifestyle can be a risk factor for hypertension.

The last objective of this study sought to find out ways to improve the diet related health problems of the elderly. The study identified dietary and lifestyle modifications strategies for improving their diet and health. The measures include increased fish intake by the elderly, vitamin and mineral supplementation, and increased water intake. Others include increased fresh fruit and vegetable intake, and moderate physical exercise.

6.3. Conclusions

All indications from this study shows that many elderly people in society are not given adequate care in line with their nutritional and basic needs, and that a basic need appears to be ignored or not sufficiently prioritized. The evidence gathered from this

study indicate that the elderly in Birim Central Municipality received less support from their families.

Food insecurity may be a crucial problem among the elderly in our society taking the elderly Birim Central Municipality as a reference point. These findings demonstrate the need to address the problem of food and nutrition insecurity among the elderly in developing countries.

Good nutritional status, diet quality, and sufficient protein and micronutrient intakes are essential for the health and well-being of older people. This study concluded that the elderly population experience inadequate intake of calories, macronutrients and micronutrients. Therefore, adherence to a healthy diet, even at advanced age, is crucial to the quality of health and life of the elderly. This is because the nutrition of older people is essential for maintaining their health and preventing malnutrition. Therefore, older people are at high risk of malnutrition and should be served high quality protein- and micronutrient-dense foods. This is because meeting the diet and nutrition needs of older people is crucial for the maintenance of health, functional independence and quality of life. The importance of a healthy diet among the elderly in the Birim Central Municipality is necessary in order to plan and implement efficient nutritional and health interventions to help them improve their lifestyle so as to live a healthy life devoid of some of the diet related health problems such as diabetes, hyperthension, stroke and the rest which will help to reduce the prevalence of diet related health problems in the Birim Central Municipality.

6.4 Recommendations

In the light of the findings of this study, the following recommendations are put forward:

i. It emerged from this study that weak social support system, and food unavailability are significant determinants of nutrition and health of the elderly in the Birim Central Municipality. Therefore, caretakers and families of the elderly in the municipality should always provide adequate food to the elderly people.

ii. Again, caretakers and families of the elderly in the municipality should improve the feeding and nutrient content of foods given to elderly people by feeding them with the right amount of carbohydrate, protein, and vitamin-giving foods three times or more in a day; and giving them large portions of protein foods.

iii. Again, the caretakers and families of the elderly in the municipality should provide adequate fluid maintenance in the care of elderly nutrition by giving and encouraging them to consume adequate potable water.

iv. The findings of this study indicate that less than 23% of the elderly suffered nutritional and diet related health problems such as hypertension, and overweight/obesity. In this regard, health workers such as nurses, doctors, nutritionists in the municipality should organise outreach programmes where they can screen the elderly with the view to educating them on unhealthy nutritional or dietary lifestyle. They also perform regular checking of urine and stool of the elderly. This can also mitigate the effect on their diet.

v. The findings of this study reveal that majority of the elderly in the municipality engaged in poor dietary habits such as adding a lot of salt to their diet, inadequate intake of fresh fruits and vegetables. It is also recommended that nurses, doctors,

nutritionists in the municipality should organise outreach programmes to sensitize the elderly on good dietary practices.

vi. The findings of this study revealed that some of the elderly respondents have been drinking alcoholic drinks and smoking cigarette which make them vulnerable to some of the health issues the elderly face especially hypertension and lungs problems.

vii. The Ghana Health Service in collaboration with health facilities in the Birim Central Municipality should carry out mass nutrition screening for older people to identify those with nutritional problems.

viii. The nutrition of older people requires further study, especially in association with protein intakes. Interventions for improving the nutrition of older people should be tailored according to their needs and abilities. In this regard, caretakers and families of the elderly in the municipality should ensure that the elderly are having regular exercises to promote proper functioning of the body.

6.5. Suggestion for further studies

Again, the area of coverage of the topic could be extended to the whole region. That means a study could be done on Nutrition and the health of the elderly in the Central Region to give it a broader perspective. In effect, this calls for the replication of the study in a larger geographical area with a larger sample.

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APPENDIX A

UNIVERSITY OF EDUCATION WINNEBA

QUESTIONNAIRE FOR DATA COLLECTION

THE PREVALENCE OF DIET RELATED HEALTH PROBLEMS AMONG THE ELDERLY IN THE BIRIM CENTRAL MUNICIPALITY

Introduction

The purpose of this questionnaire is to collect information for academic research work for Master of Philosophy Degree in Home Economics. The information collected will be treated as absolutely confidential and only used for academic purpose. Your cooperation in completing this questionnaire is very much appreciated.

Thanks

SECTION A

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Please answer the following questions by placing a tick (√) or filling in the blanks where necessary.

1. What is your gender? Male [ ] Female [ ]

2. What is your age group? 60-69 [ ] 70-79 [ ] 80- 89 [ ] above 90 [ ]

3. What is your marital status? Single [ ] Married [ ] Divorced [ ] Widowed [ ]

4. What is your highest level of education?

   Basic level [ ] Secondary level [ ] Higher/Tertiary level [ ] None [ ]

5. Are you currently working? Yes [ ] No [ ]

6. If No to Question 6, what work were you doing before retiring from active service?

   (Please specify) ……..

7. What is your current source of income? Salaried Worker [ ] Private business [ ]

   Pension[ ] Remittance[ ] Other (Please Specify) ……

SECTION B

This section seeks to know the eating habit of the respondents. Indicate by ticking whichever option you deem appropriate;

Statements	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
Eating habit of respondents. 8. On the average, I eat three times a day					
9. I eat different kinds of fruit in a day.					
10. Medically, I am prevented from eating some food items.					
11. I eat food prepared and served in my house only.					
12. Additives are added to my food to make it tasty.					
13. I prefer a lot of salt in my food to make it tasty.					
14. I often prefer high sugar content in my beverage or porridge to make it taste sweet.					
15. Vegetables are frequently used for my food.					
16. I ever smoked during the prime age of my life					
17. I still engage in smoking.					
18. My doctor advised me to cease smoking for health reasons.					
19. I also advised people to desist from smoking.					
20. I drink alcoholic drinks including beer.					

SECTION C

This section seeks information on diagnosed nutritional or diet related health problems of the respondents.

Statements I suffer from the following nutritional diseases, disorders or conditions	**Strongly Agree**	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**
21. Type 2 diabetes					
22. Hypertension					
23. Stroke					
24. High cholesterol					
25. Fatty liver					
24. Osteoporosis					
25. Weight loss					
26. Overweight/obesity					
27. Loss of appetite/ loss of taste and smell sensitivity					
28. Constipation					
29. Pile					
30. Some cancers					
31. Dental diseases					
32. Others (specify):					

SECTION D

This section seeks your views on ways of improving on diet related health problems.

Statements Ways of improving on diet	**Strongly Agree**	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**
33. Dietary/nutrition counselling					
34. Vitamin and mineral supplementation					
35. Increased fish intake					
36. Increased fresh fruit Intake					
37. Increased fresh vegetable intake					
38. Increased water Intake					
39. Weight reduction					
40. Moderate exercise					
41. No added salt to diet					
42. Avoidance of very high fat diets					
43. Cholesterol reduction					
44. Dietary restriction					
45. Nutritional therapy					
46. Nutrition education & counselling					

APPENDIX B

UNIVERSITY OF EDUCATION WINNEBA

OBSERVATION CHECKLIST

THE PREVALENCE OF DIET RELATED HEALTH PROBLEMS AMONG THE ELDERLY IN THE BIRIM CENTRAL MUNICIPALITY

Introduction

The purpose of this observation checklist is to collect information for academic research work for Master of Philosophy Degree in Home Economics. The information collected will be treated as absolutely confidential and only used for academic purpose. Participants co operation is very much appreciated.

SECTION A

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Just tick (√) where applicable.

1. What is your gender? Male [ ] Female [ ]

2. What is your age group? 60-69 [ ] 70-79 [ ] 80- 89 [ ] above 90 [ ]

5. What is your marital status? Single [ ] Married [ ] Divorced [ ] Widowed [ ]

6. What is your highest level of education?

Basic level [ ] Secondary level [ ] Higher/Tertiary level [ ] None [ ]

5. Are you currently working? Yes [ ] No [ ]

6.What is your current source of income? Salaried Worker [ ] Private business [ ]

Pension[ ] Remittance[ ] Other (Please Specify) ……

SECTION B

This section seeks to observe what participant do in their homes which shows their eating habits.

Statements	YES	NO
Eating habit of respondents. 7.On the average, I eat three times a day		
8. Participants use different kinds of fruit in their food.		
9.Participants use vegetables in their diets.		
10.Vegetables are cooked well.		
11. Additives are added to their food to make it tasty.		
12. Participants prefer a lot of salt in their food to make it tasty.		
13. Participants often prefer high sugar content in their beverage or porridge to make it taste sweet.		
14. Vegetables and fruits are eaten by participants as snack.		
15. Do participants still engage in smoking?		
16. Do participants still engage in drinking?		
17.Food prepared in the house are carefully selected.		
18.Is the quality of food eaten enough?		
19.Participants eat food full of oil.		
20.Participants engage in activities to exercise.		