

UNIVERSITY OF CAPE COAST

ASSESSING DIETARY DIVERSITY OF FATHERS IN MANKESSIM IN
THE MFANTSEMAN MUNICIPALITY

BY

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for the award of Master of Philosophy Degree in Home Economics

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DECLARATION

Candidates' Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature Date

Name: Patricia Glago

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

The evidence of nutritional problems in Ghana can be seen in the numerous Diet Related Non-Communicable Diseases in the Ghanaian population. Authors have deliberated on nutritional adequacies and the importance of supplying a varied diet. A lot has been done on single nutrient deficiencies, as well as child and maternal malnutrition. Women Dietary Diversity Projects have also been carried out in other parts of the world. In much the same way, we can study men's diet and provide potential intervention strategies needed to improve their health. Thus, using the descriptive design mainly through questionnaire and interview, this study set out to assess dietary diversity of fathers and find out which factors influence dietary diversities of fathers. Two hundred and seventy-eight fathers in Mankessim were sampled using the multi-staged sampling technique. The study pointed out a low dietary diversity of fathers and their families as well as positive perception of fathers on the importance of dietary diversity. However the Families' dietary diversity significantly contributed to fathers' dietary diversity but not fathers' perception. The money available, food prepared by wives or homemakers, appetite for food, available food at home, nutritional information in the media and fathers' understanding of healthy diet, tend to influence the dietary diversity of fathers to a large extent. Fathers' dietary needs are met by homemakers of fathers' families, food vendors and fathers themselves. Nutrition interventions that target fathers should include their homemakers as well as food vendors.

KEY WORDS

Dietary Diversity

Father

Family

Homemaker

Out of Home Meals

Perception

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DEDICATION

To my son, Osborne

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LIST OF ACRONYMS

CVDs	-	Cardiovascular Diseases
DDS	-	Dietary Diversity Score
DDSP	-	Dietary diversity score with portions
DESA	-	Department of Economic and Social Affairs
DRI	-	Dietary Reference Intake
DRNCD	-	Diet Related Non Communicable Diseases
FANTA	-	Food and Nutrition Technical Assistance
FAO	-	Food and Agriculture Organization
FHI 360	-	Family Health Internationals
FSEF	-	Food Security and Environmental Facility project
FVS	-	Food Variety Score
GLOPAN	-	Global Panel on Agriculture and Food Systems for Nutrition
HDDS	-	Household Dietary Diversity Score
HDL	-	High Density Lipoprotein
MDD-W	-	Minimum Dietary Diversity for Women
MDGs	-	Millennium Development Goals
UNICEF	-	United Nations Children's Fund
WDDP	-	Women Dietary Diversity Project
WHO	-	World Health Organization

CHAPTER ONE

INTRODUCTION

Background to the Study

Dietary patterns reflect adequate nutrition thereby making it a key component in the socio-economic development of any nation that seeks to achieve the Millennium Development Goals (MDGS) and primary healthcare (Parr & Orr, 2013; Johnston, 2015). Adequate nutrition means stronger immune system, fewer diseases, improved health and a more productive population (Burchi, Fanzo & Frison, 2011). According to Maslow's hierarchy of needs, food is a basic requirement for humans to eat in order to live (Maslow, 1943). In view of this assertion, Herbert and Subak-Sharpe (1995), proposed three key words: moderation, variety and balance as vital ingredients in every food plan which, could form part of the dietary guidelines indicated by the science of nutrition to prevent diet related diseases.

Authors have argued that poor nutrition influences the development of certain chronic diseases such as diabetes, hypertension, heart disease, stroke, cancer, osteoporosis and Alzheimer's disease (Brown, Isaacs, Krinke, Lechtenberg, Murtaugh, Sharbaugh, Splett, Stang, & Wooldridge, 2011). According to the literature majority of developed countries suffer from over-nutrition while developing countries such as Ghana have challenges with both under-nutrition and over-nutrition (Government of Ghana, 2013; Ghana Statistical Service & Ghana Health Service, 2015). It is therefore clear that

poor nutritional status in notwithstanding the situation would lead to malnutrition.

Malnutrition is known to have devastating effects on the human populace as stated by UNICEF (2006). Conditions that might explain the prevalence of malnutrition include iron deficiency anemia, stunted growth particularly in children, low birth weight, obesity and underweight, cardiovascular diseases and inadequacies in food supply (World Health Organization, 2013). All forms of malnutrition are associated with significant morbidity, mortality and economic costs, particularly where both under and over nutrition co-exist as happens in developing countries undergoing nutrition transition (UNICEF, 2006).

Invariably, malnutrition in adults tends to occur from either over nutrition and / or under nutrition. Over nutrition more likely would result from decreased metabolic rate and activity levels not correlating positively with the caloric intake, (Brown et al, 2011); this situation often leads to Diet Related Non-Communicable Diseases (DRNCD), such as diabetes, hypertension, heart attacks and stroke (Krause & Mahan, 1979). There are indications that these diseases are on the increase in Ghana and accounts for lots of deaths in adults, which after ranking showed hypertension as the highest cause of deaths at the Saltpond Hospital, (Edusei-Boateng, 2014)

It is however, argued that cardiovascular diseases (CVDS) occur more in males than in females (Calasanti, 2010). According to Harvard Medical School (2014), men of all ages have more heart attacks than women and generally experience heart related diseases 10 years earlier than women due to hormonal changes (testosterone in the male sex hormone) which

simultaneously raises the total cholesterol and lowers the protective HDL cholesterol. The literature asserts that CVDs have their roots in the diets consumed by individuals, (Brown et al, 2011; Ferrell & Cherne, 2009; Herbert & Subak-Sharpe, 1995; Pamplona-Roger, 2011), and many challenges created in part by nutrition such as cardiac disease, obesity, and diabetes, are common to both men and women (Casey, 2004).

Generally, the absolute nutritional requirements in men are greater than in women, simply because men as a population are larger and have more muscle mass than women, (Tsang, 2013). The author continues that although the biological demands of women at certain periods in life requires special nutritional needs than men; the latter need more calories, protein and calcium than women. Additionally, men need more calories and protein than women because they have more weight, more lean muscle mass as well as more circulating blood cells (Casey, 2004). In view of their possible eating habits which do not offer them the required levels of fibre, they need to be supplied in their diets in order to offset incidents of heart diseases (Tsang, 2013). The importance of taking a critical look at the diet of individuals, particularly, men as a means to achieving the required nutritional status therefore cannot be overlooked. This is because the diet tends to be the basic medium, through which the human body can receive its nutritional benefits for optimal health. Ferrell & Cherne, (2009 p.29) highlights that,

Ninety percent of all conditions other than acute infections, contagious diseases, and traumatism are traceable to diet. The food question is infinitely the most important problem of the present day, and if properly dealt with must result in the disappearance of the vast bulk of the disease, misery and deaths

According to Mortimer and Rockson (2014), all states of ill-health tend to have a common cause; faulty nutrition that comes with or without infection. The authors observed that of all the medicines created out of the earth, food has the potential to act as a viable source of medication. To this effect, sufferings that come about as a result of diseases are largely the result of habitual diet related negligence (White, 2014). The basic scientific knowledge of human nutrition is often not adhered to in the everyday feeding of children, adolescents and adults (Marzola, Nasser, Hashim, Shih, & Kaye, 2013).

In most cases the increasing levels of hypertension, diabetes, stroke, cancers, kidney and other non-communicable diseases that occur in Ghana are overlooked (Jafaru, 2016) because the trends are attributed to poor eating habits that could be referred to as one of the major factors which Ghanaians require to address appropriately. Bosu (2013) however argued that to be able to address such health challenges, there was the need to acknowledge that obesity reduces the overall mortality by two to four years among persons with a body mass index of 30–35 kg/m² and by eight to 10 years at 40–45 kg/m².

This is because of the premise that the increasing prevalence among Ghanaians puts both men and women at risk of Diet, related Non-Communicable Diseases, (Ghana Statistical Service & Ghana Health Service, 2015). On the causes of prostate cancer, Obu (2015) found chemicalized / denatured / non-nutritious toxic foods, lack of vitamin D, too much carbohydrate foods, late eating, less fruits and vegetable, and too much sugar in foods among Ghanaian men. Western diets, which are high in energy, meat, and fat, were also associated with higher incidence of prostate cancer whereas

traditional Asian diets rich in vegetables and legumes were associated with lower prostate cancer (Grant as cited in Mróz, Chapman, Oliffe, & Bottorff, 2011). This gives the implication that diets have a greater influence when it comes to health issues.

It is known that diet comprises a number of nutrient and non-nutrient constituents that are often interacting (FAO & Agriculture and Consumer Protection Department, 2010). This explains why nutrition research has recently shifted towards studying inclusive food-based approaches that focus on dietary patterns, (Ashigbie, 2015; Jayawardena, Byrne, Soares, Katulanda, Yadav, & Hills, 2013; Arimond, Wiesmann, Becquey, Carriquiry, Daniels, Deitchler, Fanou-Fogny, Joseph, Kennedy, Martin-Prevel & Torheim, 2010). Diet refers to the food usually eaten by a person. For instance, the diets of some people tend to be vegetarian while others eat to slim down.

According to Ashigbie (2015), information on dietary patterns reflects the overall nutritional behaviour better than the information on single foods or nutrients. Also, the analysis of dietary patterns gives a more comprehensive quality impression of food consumption habits within a population (Kettler, Kennedy, McNamara, Oberdörfer, O'Mahony, Schnabel, Smith, Sprong, & Roland, 2015). Furthermore, the literature argues that varied diets or diversified diet tend to be the healthiest ones (Mirmiran, Azadbakht, Esmailzadeh and Azizi (2004).

Dietary Diversity

Dietary diversity means the consumption of adequate amounts of a variety of food groups or a number of biologically distinct foods eaten over a given period of time (Mirmiran et al, 2004). Dietary patterns are frameworks

that people adopt when choosing what to eat. It is therefore necessary to understand the level of influence various factors exert on the individuals' dietary practice when attempting to provide nutrition education for a particular group of people (Ball, Timperio & Crawford, 2006). In other words, diversity means that we choose to eat a mixture (variety) of foods across the range of food groups such as the six food groups as outlined:

- i. Animal foods and its products
- ii. Starchy roots and plantain
- iii. Fruits and vegetables
- iv. Cereals and grains
- v. Legumes, Nuts and oily seeds
- vi. Fats and oils

Mirmiran et al (2004), assert that the provision of varied meals contains all the nutrients that have the potential to support the dimensions of human health like encouraging biodiversity and sustainability, allowing for nutritional adequacy, minimizing the adverse consequences of food on health, providing the interest in food for it to be eaten, and reducing the prevalence of cancer, cardiovascular and other chronic diseases. The importance of increasing dietary diversity as a way of improving health and preventing diseases, however, is multidimensional and shaped by various factors, including physiological, agricultural, historical, religious, socio-economic and psychological ones (Gedrich as cited in Naska, Fouskakis, Oikonomou, Almeida, Berg, Gedrich, Moreiras, Nelson, Trigg, Turrini, Remaut, Volatier & Trichopoulou, 2006).

Family traditions, geographical locations, religious beliefs, economic, technological advancement, foreign influence, education, peer influence and mass media are also highlighted in the literature as factors that influence dietary patterns of people (World Health Organization, 2015). In some parts of the world, gender was found to influence food choices of people (Vabo & Hansen, 2014). Some foods were labeled as masculine while some were seen as feminine (McNelly, 2016). Consumption of meat for instance symbolized masculine diet, while the consumption of vegetables and fruits represented feminine diet, (Prattala, Paalanen, Grinberg, Helasoja, Kasmel & Petkeviciene, 2006). This is because in most cases, the frequency of fruit and vegetable intake was higher among women than men (Statistics Canada, 2016).

Additionally, women were identified with higher awareness, better knowledge of nutrition, more concerns about their healthy eating habits than men, (Kiefer, Rathmanner & Kunze, 2005; Prattala et al. 2006; Turrell, 1997; Missagia, Oliveira & Rezende, 2012). Although gender is a key determinant of food choice, it has been shown that globally, the majority of men consume diets that are different and often poorer than their women counterparts (Pan American Health Organisation & World Health Organisation, 2012). This argument was confirmed in studies conducted in other areas: in United States, (Oakes & Slotterback, 2001; Rappoport, Peters, Downey, Mccann, & Huffcorzine, 1993), Finland (Roos et al., 1998) and in Australia (Turrell, 1997; Dumbrell & Mathai, 2008).

In the United Kingdom, Gough & Conner (2006) found that masculinity was associated with consumption of convenience foods, meat and beer, whereas healthier behaviors such as vegetarianism and domestic

cooking, increased consumption of fruits and vegetables formed the eating pattern of females.

To this end, Mróz et al (2011) proposed that the interactions between men and the women in their lives could have some impacts on the consumption patterns and / or dietary choices of men. The authors argued that because North American women tend to control family food provisions, this contributed more to family dietary quality. However, they observed the opposite in most cases and attributed it to traditional feminine ideals where, women provide with their husbands their preferred choices of meals than healthy foods (Calansati, 2010; Mróz et al. 2011). In support, Carlson & Neuberger (2017) also argued that because women generally control family food provisions, it enhances the dietary quality of the family.

For Mróz et al (2011) the concepts of masculine dominance and female subordination influence women to allow to their husbands' wishes and preferences when planning the family menu. Several studies have been conducted on single nutrient deficiencies among children, and women including expectant mothers and lactating mothers (Allen, 2000). In spite of the nutritional challenges within our population, people continue to overlook the principle of variety when it comes to diet.

Notwithstanding this, a variety of biologically unique foods for the human wellbeing are available for every part of the body: several foods for the eye, others for the heart, respiratory system, reproductive system whiles some food groups work on the arteries, and the blood (Pamplona-Roger, 2011). This means that individuals cannot achieve health and wellness when certain food groups are not included in the various diets.

Additionally, the need for varied foods cannot be for just some groups of people because all individuals have several organs in the body that needs proper functioning for the sustenance of the body, (Insel & Roth, 2010). The situation is not different in Ghana. Ashigbie (2015) conducted a study in Hohoe in the Volta Region and found out that nearly two-thirds (62.6%) of the female adolescents exceeds the DRI of calories/day while, 67.6% of the sample's protein intake was below the DRI/day. The intake of fruits and vegetables was very low as no daily consumption of fruits was recorded among the respondents and this is critical to health since it gives the implication of loss of vitamins and minerals which are required for the prevention protection against diseases.

A study by Agriculture and Consumer Protection Department (FAO & Agriculture and Consumer Protection Department, 2010), concluded that the Ghanaian diet largely relies on starchy roots (cassava, yam), fruits (plantain) and cereals (maize, rice), making almost three quarters of the dietary energy and diversity of the diet remains low. The lower the dietary diversity of a population, the more compromised the health of the population will be, (FAO & FHI 360, 2016).

Globally, poor diets pose a greater risk to our health than a combination of alcohol, tobacco, drugs and unsafe sex, (Global Panel on Agriculture and Food Systems for Nutrition (Glopan, 2016). It is further stated that major risks factors driving the global burden of diseases are related to diet (WHO, 2009; WHO, 2011). However, policy makers seem more concern about reducing hunger and starvation other than ensuring people have a more diversified diet. (Haddad as cited in Glopan, 2016). The Department of Health

& Department for Children, Schools and Families (2008) therefore suggested a critical need for individual members of the family to live healthy lives that could affect the health and well-being of the entire family.

Mostly, the consequences of poor diet of any member of the family affect the whole family and eventually the society at large (Irons, 2009). There is the possibility that fathers in the family, due to family responsibilities and workload, might overlook the importance of consuming healthy diets, (Hill, Hawkins, Martinson & Ferris, 2003; World Health Organization, 2003). The management of diet related diseases have the potential to cause financial burden to families and the state as a whole, (Gatt, Jan, Mondraty, Horsfield, Hart, Russell, Laba & Beverley, 2014), and further cause loss of working days and for that matter, economic losses to the nation.

Generally, men form a significant portion of the productive part of the population (World Health Organization, 2003) and when they suffer ill-health, have higher death rates for most major illnesses, and have shorter life expectancies than women, it could affect the productive sector of countries (WHO, 2011; WHO, 2017). It is known that, “worldwide, men live an average of 3.9 years less than women ... and are more likely to suffer and die from the 12 leading causes of mortality” (Mróz et al, 2011, p, 179). The authors argued that, in men’s health, masculinity is associated with reluctance to seek help, and this is demonstrated by evidence that men are generally poorer consumers of health care services and less likely to acknowledge symptoms of illness than are women, as was seen in the health facilities within Mfantseman Municipality.

According to the oral history and available hospital records in the Saltpond Hospital and the Mfantseman Health Directorate more men die from diet related non-communicable diseases such as hypertension, in their outfit than women, because they (men) do not report to the health facility early for treatment. The need to investigate men's diet to promote healthy principles such as variety, moderation and balance in order to prevent the emergence of disease cannot be overemphasized.

Governments and other agencies often put measures in place to ensure that new born babies and children are not malnourished, but healthy and live longer. This study therefore asks whether same or similar measures are possible for men to support their health and make them live healthier longer lives in order to take care of their families.

Statement of the Problem

The socioeconomic development of every nation is closely linked to the nutrition of its citizens, (Government of Ghana, 2013). The National Nutrition Policy of Ghana from 2014 to 2017 highlighted extensively on nutritional challenges facing the country particularly among children and women, and the need for stakeholders to support the eradication of the challenge. With all the efforts being made towards finding solutions, it seems that men have been left out and much is not said about their nutritional requirements or needs. Oral history from the Saltpond Hospital and the Mfantseman Health Directorate indicated the number one cause of death at the hospital as diet related non-communicable diseases, particularly hypertension. It was revealed that more men die from the disease than women. It is argued that cardiovascular diseases (CVDS) occur more in males than in females (Calasanti, 2010; Harvard

Medical School, 2014). Since CVDs originate from the diet, studying the diet of men to promote healthy principles that will prevent CVDs cannot be overemphasized.

There is little evidence to show whether or not foods individuals eat both at home and outside the home are diverse enough to provide the nutritional requirements of individuals. Again, there is not much known about homes making provisions for variety of meals than outside foods. Specifically, in Ghana dietary diversity has received little attention which augments the need for further research, (Saaka, 2012). Comparatively, literature reviewed so far on dietary diversity has highlighted women as the most researched than men (Arimond et al, 2010; FAO and FHI 360, 2016; Aguayo & Menon, 2016; Chauhan, 2015).

This research therefore sought to assess the dietary diversity of fathers and that of their families, and find out whether the dietary diversity of the family has any influence on that of the fathers

Purpose of the Study

The main purpose of this study was to assess the dietary diversity of fathers in Mankessim. Specifically, the study sought to achieve the following objectives:

1. Identify factors which contribute to dietary diversity of fathers.
2. Assess dietary diversity of fathers and their families
3. Evaluate the perception of fathers on the importance of diversified diets.

4. Investigate to what extent dietary diversity of families and / or perception of fathers on the importance of dietary diversity, contribute to dietary diversity of the fathers

Research Questions

1. What factors contribute to dietary diversity of fathers in Mankessim?
2. What is the dietary diversity of fathers and their families in Mankessim?
3. What is the perception of fathers on the importance of dietary diversity in Mankessim?
4. To what extent does dietary diversity of families and /or perception of fathers on the importance of dietary diversity, contribute to dietary diversity of fathers in Mankessim?

Significance of the Study

The result of the study is expected to help fathers and men understand the implications of their eating habits and choices. The knowledge on their nutritional needs has the potential to support a change in their eating habits by following the principles of healthy eating/ nutrition: balance and variety in their diet. Due to family responsibilities, the likelihood of fathers not paying much attention to their health and feeding is high. Findings of the study will be helpful to the fathers and their families living in Mankessim, in the Central Region of Ghana. It will also be beneficial to homemakers to help provide nutritional requirements for individuals in their meals.

Organizations that regulate the Food Service Industry will find this study useful in introducing policies that will help them provide healthy nutritious meals for consumers. It will help to create awareness to the general

public about the importance of eating diversified diet that can supply required nutrients for the basic needs of the body.

Delimitation

The study was carried out in Mankessim. It considered only Mankessim town in the Mfantseman Municipality. The study involved one suburb (Edumadze-Nananom) of Mankessim.

The study looked at the diversity of diets of fathers between age ranges 25 to 45 in the family because of their vitality at that stage. It considered their perception of dietary diversity, their meal patterns and the diversity of meals cooked at home for their family members.

Limitations

Dietary diversity was assessed based on responses obtained from participants (e.g. dietary recall) and this depended on memory and their ability to recall accurately. Recall bias could not be ruled out completely. However, methods used in assessing dietary diversity are useful for ranking individuals but do not necessarily permit exact assessments of absolute nutrient intake. Measuring dietary diversity by using the last 24 hours might not be a correct reflection of the usual habits of fathers. Some respondents could not fill the questionnaire on their own because they were not literate. They were however assisted with a structured interview technique.

The study could not compare the diversity of married fathers with those of the divorced and widowed fathers to ascertain the impact of marital status on their dietary diversity and also could not compare the diversity of meals cooked at home with that cooked outside. The population size of fathers

between the ages of 25 to 45 was unknown in the study area, since they were not made available at the Municipal Office.

Definition of Terms

Dietary diversity:	available amounts of varied foods from the six food groups
Dietary diversity score (DDS):	count of number of food groups consumed.
Dietary diversity score with portions (DDSP):	count of food groups eaten and amount (portion sizes) estimated.
Monotonous diet:	keeping to or repeating a particular kind of food (not varied) over a long period of time.
Food variety score (FVS):	count of different individual food items consumed, (not food groups).
Father:	male head of the family who has a child or children he is taking care of.
Family:	parents and their children living together.
Household:	group of people who eat from the same pot. It used here to also mean family.
24hr dietary recall:	recall of all meals and snacks eaten within the previous day.
Food frequency questionnaire:	dietary assessment where information on usual intake or food intake patterns of previous months or year is collected.
Women dietary diversity project (WDDP):	initiative to assess dietary diversity of women in resource poor areas
Minimum dietary diversity for women (MDD-W):	dichotomous indicator of whether or not women 15–49 years of age have consumed at least five out of ten defined food groups the previous day or night.
Dichotomous indicator:	indicator with just two options, of ‘yes’ or ‘no’
Food groups:	biologically distinct foods

Chronic degenerative disease:	disease that causes body cells to break down or deteriorate over time.
Food security:	ability to acquire enough, safe, nutritious food in a socially acceptable way, without having to scavenge for it.
Food security and environmental facility project (FSEF):	project to enhance the capacity of agricultural sectors to cope with climate change and other challenges.
Policy / Policies:	plan of government, embracing its general goals or procedures.
Out of home meals:	meals prepared outside home and sold to people such as on the street, chop bars, restaurants and fast food joints to buy and eat.

Organization of the Study

This study was divided into five chapters:

Chapter one highlights the introduction and background of the study, the statement of the problem, purpose of the study, research questions and objectives, significance of the study, the scope and limitations of the study as well as the definition of terms.

Chapter two presents the conceptual framework of the study and discusses the review of related literature.

Chapter three is on the methodology that was adopted for the study.

Chapter four shows the results and discussions of the data collected.

Finally, Chapter five provides the summary of the study as well as conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This section presents a review of related literature for the study, and highlights the conceptual framework. It briefly looks at varied diet and empirical review on diversification of diets. It examines the concepts “dietary diversity” and “balanced diet” and further discusses the possible factors imparting on dietary diversity.

Conceptual Framework

This study adapted the conceptual framework of Kemunto (2013) on factors affecting dietary diversity. Invariably, the diversity of diets consumed by fathers is largely influenced by their perception of what a diet should be and the available meal patterns of their families. The pattern of meals or menus often determines nutritionally balanced or deficiencies and / or nutrient toxicities which could lead to diet related diseases, or otherwise.

The interrelationship and conditions which influence the dietary diversity of fathers and families could be based on the understanding that these factors contributing to food habits choices or dietary practices of families and for that matter, fathers influence their meal patterns and perception of dietary diversity.

In this respect, political, economic, socio-cultural and technological factors, involving the availability and access to amount of food and score of foods

eaten tends to form important factors to consider in achieving fathers' dietary diversity as depicted in Figure 1.

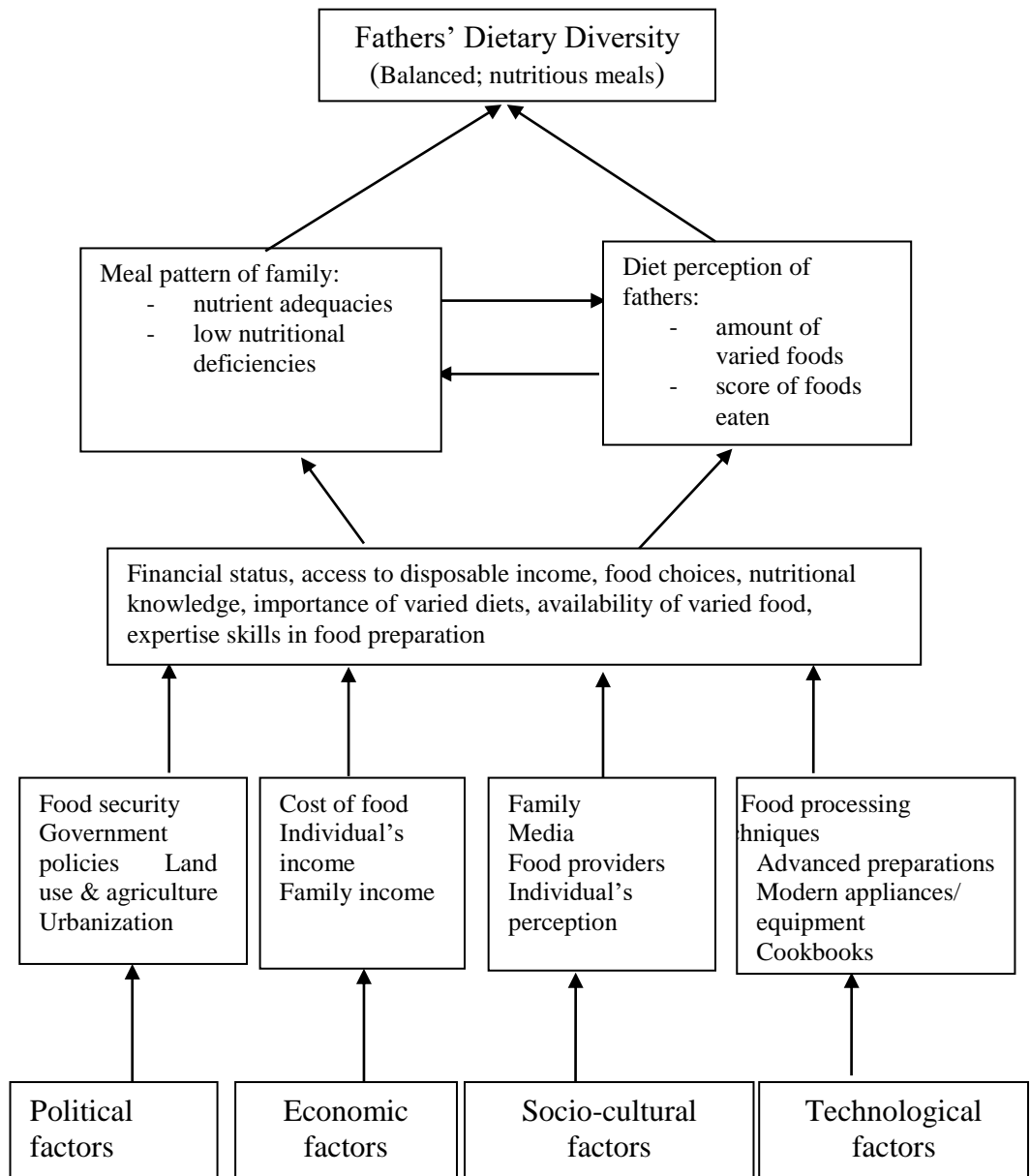


Figure 1: Conceptual Framework on Relationship of Fathers' Dietary

Diversity and Meal Patterns of Families

Source: Adapted from an idea of Kemunto (2013).

Importance of Dietary Diversity

The one best investment anyone can possibly make is investing in his or her health, (Mitchell, 2014). There are several things that affect our health

but one of the key influences on our health is diet or the food we eat frequently, (Ferrell & Cherne, 2009; Pamplona-Roger, 2011; Mitchell, 2014). Ferrell & Cherne, (2009) assert that, a wrong diet greatly hinders mental and physical efficiency. Mitchell, (2014), argues on the need to invest in health earlier in life in order to achieve greater benefits because having access to healthy or nutritious diet from the early years often achieve better health in later years.

Consuming a varied diet is an asset to human life and for that matter the nation, in terms of promoting longevity as scientific evidence has shown (Brown et al, 2011; Ferrell & Cherne, 2009). Overall varied diet can slow down the aging process as well as reduce the risk of non-communicable diseases such as cancer, type II diabetes, cardiovascular diseases and obesity, (Finley & Landless, 2014). The direct impact of nutrition on health status and morbidity makes longer life, without chronic diseases, achievable, (Mitchell, 2014; Finley & Landless, 2014). Diverse diet rather than a single food item is necessary to achieve the best health status and longevity, (Finley & Landless, 2014; Brown et al, 2011; Herbert & Subak-Sharpe, 1995).

One of the ten principles of the science of nutrition states that “adequacy, variety and balance are key characteristics of healthy diets”, (Brown et al, 2011 p. 33). The authors explained that healthy diets contain a variety of foods that together provides calories, nutrients and other beneficial substances to promote optimal functioning of cells and health. They continued that no one food contains all the nutrients and substances needed for optimal health, (Herbert & Subak-Sharpe, 1995).

The role of individual single nutrients in preventing various diseases has been studied well enough, but there is little emphasis on overall diet characteristics. Single nutrient deficiencies have been identified in several studies among children, women, expectant mothers and lactating mothers. (Bhan, Sommerfelt, & Strand, 2001; Rivera, Hotz, Ilez-Cossi, Neufeld & Garcí'a-Guerra, 2003; Gernand, Schulze, Stewart, West & Christian, 2016). Daniels (2006), suggested that increasing dietary variety in developing countries is a promising potential long-term solution to malnutrition and single nutrient deficiencies because it is food-based and possess the ability to combat multiple micronutrient deficiencies simultaneously.

Furthermore, diets with higher variety score could increase intakes of fibre, vitamin C and calcium, all of which protect against CVD, (Daniels, 2006). In view of the aforementioned, increasing the data on the meal patterns which reveals the diversity of the diet of families and or fathers may be a potential to achieve the well-being of individuals in the family and the society at large (Wilson, 2013; Sharma, 2013).

Meal Patterns

Macmillan Education, (2002), defines meal as an eating occasion as well as the food that is served and eaten at one time. It could therefore be said that a meal is an eating occasion that takes place at a certain time and includes specific, prepared food or the food eaten on that occasion. Other authors have defined meals as the largest eating occasions of the day that provides substantial amount of energy and nutrients for the body, (Leech, Worsley, Timperio & McNaughton, 2015).

Narciso (2005) explained that meal patterns include the accepted elements of a meal, the order in which these elements are served, how many meals are eaten per day as well as the times eaten. The author further identified the terms “dietary patterns”, “food habits”, “food ways”, and “food culture” as used interchangeably with “meal patterns”. Associated with meal patterns are the specific foods that comprise certain meals, (Narciso, 2005). A meal pattern can therefore be simply explained as meals and the times they are eaten, such as breakfast, snack, lunch or supper. In schools for instance, meal patterns are used to create menus for students.

The type of meal served or eaten at any given time varies from one individual to another, one family to another and by custom. The various factors identified in this study and elsewhere to influence food choices of people equally influence the type of meals people consume and the times in which they are consumed.

Most people consume three meals a day; breakfast, lunch and supper (Wan Abdul Manan, Nur Firdaus, Safiah, Siti Haslinda Poh, Norimah, Azmi, Tahir, Mirnalini, Zalilah, Fatimah, Siti Norazlin & Fasihah, 2012) with some people skipping some of the meals within the day, (Pendergast, Livingstone, Worsley & McNaughton, 2016; Wan Abdul Manan et al, 2012; Nti, 2008). Meal pattern changes that occur in individual level are affected by their attitudes, beliefs, behaviours and values, whereas meal pattern changes that occur in populations are affected by their physical, biological, political, economic and cultural environment, (Satia-Abouta, Patterson, Neuhouser, & Elder, 2002).

Several studies have reported shifts in eating patterns of people from home prepared meals to convenience out of home meals (Bridal, 2010), claiming more and more people are increasingly relying on the out of home meals day by day. Bridal (2010) further explained that the accessibility of a variety of technologies, both in industry and home, is making foods more convenient to obtain and consume, as well as widely available and inexpensive.

Studies suggest a possible involvement and contribution of meal consumption patterns in the development of various diseases, (Wan Abdul Manan et al, 2012; Hu, Rimm, Stampfer, Ascherio, Spiegelman, & Willett, 2000; Ludwig, Peterson & Gortmaker, 2001). Hu, Rimm, Stampfer, Ascherio, Spiegelman, & Willett (2000), found positive association between western diet patterns of processed meat, refined cereals, sweets, high fat, and fatal Cardiovascular diseases, and negative association between prudent diet of vegetables, legumes, fish, poultry whole cereals, and Cardiovascular diseases. Other studies which found breakfast skipping as an unhealthy meal pattern, was common among men than women, (Pendergast, Livingstone, Worsley & McNaughton, 2016). In another study, adolescents who reported more frequent family meals, high priority for family meals, a positive atmosphere at family meals, and a more structured family meal environment were less likely to engage in disordered eating, (Neumarker-Sztaianer, Wall, Story & Fulkerson, 2004).

Carruth, Skinner, Houck, Moran, Coletta and Ott (1998), found children who were “picky eaters” to have lower dietary diversity than “non-picky eaters”. He further encouraged parents to develop sound feeding plans to

include variety of foods served to their children. Frempong and Annim (2017) also suggested that dietary patterns built on dietary diversity may cause improvement in children's health in Ghana. This is because age, income and education have been reported to be among positive predictors of more healthful dietary patterns, (Kant, 2004). The literature strongly recommends educational campaigns in favour of dietary diversity for children (Frempong & Annim, 2017), since a prudent dietary pattern built around vegetables, and legumes, could provide for healthier lives for adults, (Hu et al, 2000)

Diversification of Diet

According to Ruel (2006), dietary diversity is the number of different foods or food groups consumed over a given reference period. In the view of Hepburn (2014), dietary diversity is a qualitative measure that reflects the variety of food items and food groups accessible to and consumed by households or individuals.

Two measures commonly used in assessing dietary diversity are household dietary diversity score (HDDS) and individual dietary diversity scores (IDDS) (Hepburn, 2014). According to Tandoh (2015), household dietary diversity includes the number of individual food items or food groups consumed by members of the household usually in the previous 24 hours or past week.

Continuing, the author argued that dietary diversity at the household level is not only indicative of the quality of diet but also reflects the economic ability to access variety of foods. Dietary diversity could therefore apply to the consumption of adequate amounts of variety of food groups or a number of biologically distinct foods eaten over a given period of time. It could also be

said as what individuals choose to eat in terms of a mixture (variety) of foods across the range of food types such as; meat, fish, dairy, eggs, and / or fruits, vegetables, legumes, cereals and starchy roots, as well as a mixture from within food types (rice, corn, millet, wheat; carrot, kontomire, lettuce, dandelion, and okro).

Household dietary diversity measures are associated with energy availability which may reflect household food security and their socioeconomic status, and access to disposable income (Hepburn, 2014). Individual dietary diversity measures have been used to reflect nutrient adequacy and diet quality, (FAO, 2011). Dietary diversity has been measured through a range of dietary assessment procedures, and by summing the number of food items and / or food groups consumed over a period of time, (Mirmiran et al, 2004; Ruel, 2006; Hepburn, 2014).

With the exception of breast milk for new born babies, there is not a single food item or food group that provides all the necessary nutrients for health, (Hatløy, Torheim & Oshaug, 1998; Labadarios, Steyn & Nel, 2011). Subsequently, it is imperative to eat variety of foods in order to meet the nutritional requirements for optimal health, since foods from the same food group may provide fewer nutrients. Consuming a wide variety of food in moderate amounts not only reduces the risk of nutrient deficiencies, but tends to prevent nutrient toxicities (Hunt, as cited in Hepburn, 2014).

Measuring dietary diversity, as stated earlier, usually involves a simple count of number of food items or food groups consumed over a period. However, due to differences in food classification of various countries, a range of dietary diversity measures have been used by different researchers as shown

by Ruel (2006). Notwithstanding the differences, Ruel (2006) observed a stronger relationship between dietary diversity score (DDS) and nutrient adequacy than food variety score (FVS) and nutrient adequacy. Jayawardena et al. (2013, looked at DDS as a total count of different food groups consumed and FVS as a number of individual food items consumed. To add up, Ruel (2006) stated that the reference period for measuring dietary diversity usually ranges from one to three days, but seven days are equally good to use. Although most dietary diversity measures are made up of a simple count of individual food items or food groups, some measurement scales developed take into consideration the number of servings of different food groups in conformity with dietary guidelines. Examples of this latter approach include the “Dietary diversity score with portions (DDSP)” used by Jayawardena et al (2013), which took into account the minimum consumption of one portion for respective food groups.

In a study to find out dietary diversity and its relationship with socio-economic and nutritional characteristics of women in an urban Burkina Faso, a list of nine food groups with other subgroups of 22 foods were used to find the association between DDS and anthropometric status of the women, (Savy, Martin-Pre´vel, Danel, Traissac, Dabire, & Delpuch, 2007). The food items ranked from the following food groups. cereals; roots/tubers; beans/pulses; vitamin-A-rich fruits/vegetables; other fruits (including fresh fruit juices); other vegetables; non-fatty meat (beef, mutton, game, horsemeat) and poultry; liver; fresh fish; dried fish; milk/dairy products; and consumption of energy-rich foods and/or unhealthy foods – nuts/seeds; fatty meat (pork, cooked meats); animal fats; vegetable fats; frying oil (used for fried foods); red palm

oil; cheese; eggs; sugar/sweetened products; sweetened drinks (sodas, traditional and industrial juices); alcohol.

The codes for the items on the list of 22 food groups were then aggregated in the classification system which included nine food groups: cereals/roots/tubers; pulses/nuts; vitamin-A rich fruits / vegetables; other vegetables; other fruits; meat/poultry/fish; eggs; milk/dairy products; oils/fats, (Savy et al, 2007). The women's diet almost always included the group of cereals/roots/tubers and the meat/fish group. Most often, the diet also included vegetables (other than vitamin-A-rich vegetables) and fats, especially vegetable fats and frying oil. Milk and dairy products (mainly milk and yoghurts) were less consumed. The consumption of eggs was very rare. DDS (using the 22 food groups) was associated with several socio-demographic and economic variables. Findings showed higher scores for better economic conditions with the women who lived in the richer district, the younger ones, those in school, both single and or married more than the widowed and divorced. The score was also higher for the women who consumed dishes outside the home or ate snacks. However, there were no significant differences based on religion and occupation.

In another study, the qualitative questionnaire was based on a list of 32 food items that were designed according to what was known of the distinctive characteristics of food consumption in the area, (Martin-Prevel, Becquey, & Arimond, 2010). The study was performed within the framework of the Women's Dietary Diversity Project, which sought to analyze the relationships between various food group diversity indicators (quantitative and qualitative) and the mean probability of micronutrient adequacy of women's diets across

11 micronutrients. There was evidence of over reporting in the qualitative list-based questionnaires (of 32 food items) resulting in weaker performance in predicting the micronutrient adequacy. Other studies however recorded 6, 9, 13, and 21 food groups, (Becquey, Capon & Martin-Prével, 2009), and used 5 main food groups which were divided into 23 subgroups, (Azadbakht, Mirmiran, Esmailzadeh & Azizi, 2005).

Saaka (2012) conducted a study in the Northern Region of Ghana, precisely Tamale on maternal dietary diversity and infant outcome of pregnant women. In his study, he used the modified version of the FAO dietary diversity questionnaire in a 12-item scale made up of cereals, tubers, vegetables, fruits, meat, fish, eggs, legumes, milk and milk products, fats and oils, sugar and sweets, beverages. However, he excluded beverages because this food group was not commonly consumed in the population of his study. The study showed that maternal dietary diversity was a significant independent predictor for mean birth weight and low birth weight, claiming that maternal IDDS was negatively associated with the incidence of low birth weight. He concluded by stating that in nutritionally deprived populations, maternal diet in the third trimester of pregnancy appears to be an important determinant of low birth weight and that DDS can serve as useful predictive indicator of maternal nutrition during pregnancy and the likelihood of delivering low birth weight babies. Although there seems to be no international universal consensus on which food groups to include in assessing dietary diversity, probably due to the fact that various countries or locations have their unique staple foods, there are several dietary assessment methods that are commonly used.

Hepburn (2014) classified the dietary assessment methods based on their characteristics which included time frame that measurement occurs (whether retrospective or prospective), the period of time being assessed (whether short or long term), and the type of data gathered (whether quantitative or qualitative). Retrospective dietary assessment methods measured diet in the past, where participants were required to use their memory to recall foods consumed in the past days, weeks or months. Examples of such methods included 24 hours dietary recall, food frequency questionnaire and diet history, (Hepburn, 2014).

The only prospective assessment method is the available food records, where the subject is required to record foods consumed at the time of consumption (Lee & Nieman, 2003). Methods that measured diet over a number of days, such as 24hr dietary recall, were classified as short-term methods, while long term methods were used to collect information on the usual intake and food intake patterns over previous months or years, (Hepburn, 2014). Examples of long term methods given by Hepburn (2014) are the dietary history or food frequency questionnaire (FFQ). Methods that measure the quantity of food consumed were classified as quantitative whereas methods that did not measure the quantity of food consumed were classified as qualitative. (Hepburn, 2014)

In assessing the diet of a group of people or individual to determine its variability, one can use any of the above dietary assessment procedures. The 24hr dietary recall for example, has been used in several studies on dietary diversity (Daniels, 2006; Savy et al, 2007; Giskes, Turrell, Patterson & Newman, 2001; Jayawardena et al, 2013). Food frequency questionnaire

(FFQ) has also been used in other studies to collect dietary data. (Azadbakht, Mirmiran, Esmailzadeh & Azizi, 2005; Giskes, Turrell, Lenthe, Brug & Mackenbach, 2005; Alkerwi, Donneau, Sauvageot, Marie-Lise, Adelin & Guillaume, 2011.)

Ongoing research has not yet defined any international consensus on which food groups as well as data collection tool to use in dietary diversity measurement. The Women's Dietary Diversity Project, (WDDP), which was initiated in 2005 by Food and Nutrition Technical Assistance (FANTA) (Arimond et al, 2010), from 2005 to 2010 and 2012 to 2016 respectively led to the development of a questionnaire and indicator guide on the measurement of dietary diversity, (FAO & FHI 360, 2016). The first standardized questionnaire of universal applicability from which various dietary diversity scores could be calculated was provided by FAO (2011), to help in the WDDP. This questionnaire was made up 16 food groups: cereals, white roots and tubers, vitamin A rich vegetables and tubers, dark green leafy vegetables, other vegetables, vitamin A rich fruits, other fruits, organ meat, fresh meats, eggs, fish and seafood, legumes, nuts and seeds, milk and milk products, oils and fats, sweets, and spices, condiments, and beverages. It was not culture, population, or location specific and therefore, prior to using it in the field, it was necessary to adapt it to the local context.

Minimum Dietary Diversity for Women (MDD-W) indicator guide was later developed in 2016, by the researchers involved in the WDDP, and published by FAO and FHI 360. MDD-W is a dichotomous indicator of whether or not women 15–49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women

15–49 years of age who reached this minimum in a population were used as a proxy indicator for higher micronutrient adequacy, which helps one important dimension of diet quality, (FAO & FHI 360, 2016). The ten food groups proposed by the MDD-W indicator guide included;

1. Grains, white roots and tubers, and plantains.
2. Pulses, (beans, peas and lentils).
3. Nuts and seeds.
4. Dairy (milk and milk products).
5. Meat, poultry and fish.
6. Eggs.
7. Dark green leafy vegetables.
8. Vitamin A-rich fruits and vegetables;
9. Other vegetables.
10. Other fruits.

The authors proposed that groups of women of reproductive age who consumed food items from at least five of the ten food groups were likely to have higher micronutrient adequacy than those who consumed lower amounts of food groups.

Another attempt at standardizing dietary diversity questionnaire was by Hepburn (2014), who designed a questionnaire applicable to developed countries only and indicated that such methods should be simple and inexpensive in order to make them more practical for use in developing countries. Waijers, Feskens & Ocke (2007), added that due to the beneficial dietary component of whole grains as compared to refined ones, whole grain products could be separated from refined ones in a dietary score.

Dietary Diversity and Balanced Diet

Miller and Cassady (2015) explained that all nutrients depend on each other to work effectively and this makes it mandatory to eat food that are nutritionally balanced to supply the body with its requirements.

This is because, “nutrition is best balanced by eating the right amounts of a large variety of foods” (Intellectual Reserve, Inc., p.1). According to Kumar (2012) balanced diet is a diet that has all the six classes of nutrients in their correct proportions relating to the needs of the body. For Krans (2016), balanced diet provides the body with nutrients to enable it function correctly. Various authors point to the fact that a balanced diet must provide nutrients needed by the body, (Hatløy, Torheim & Oshaug, 1998; Labadarios et al, 2011), but these nutrients cannot be found in one kind of food, which suggests that varied diets with the proper nutritive component are balanced.

Children and adults, males and females, young and old, all need varied diets so that all body organs can be well nourished. As outlined by Pamplona-Roger (2011), everyone has the need for a varied diet since all have several organs in the body that needs specific food nutrients to function properly. Alcock, Maley and Aktipis (2014), argue that eating must not be just a matter of filling the stomach to satisfy hunger, because balanced diets help prevent malnutrition (under and over nutrition) as well as deficiency diseases. Mitchell (2014) also affirms that good diets prevent chronic degenerative diseases or in the least delay their occurrence. To this end, the importance of food and eating extends well beyond the need of covering physiological needs. (Arganini, Saba, Comitato, Virgili & Turrini, 2012)

Factors Imparting on Diversification of Diets

The Department of Economic and Social Affairs (DESA) (2013) in the World Economic and Social Survey, affirmed the achievement of the global goal in 2010 with various dimensions: poverty reduction by half, access to improved sources of water, the fight against malaria and tuberculosis, improved conditions for slum dwellers in cities, enrolment in primary education and the advancement of women. DESA (2013) although recognized the need to ensure access to enough nutritious food, the current conditions, was not feasible towards the target of an additional halving the proportion of people suffering from hunger by 2015 in sub-Saharan Africa and South Asia. The reasons were because of low quality and low diversity of available food. The author was of the view that the challenge of malnutrition was broader than the issue of hunger or undernourishment, because individuals may take in enough calories for daily subsistence, but still suffer from “hidden hunger” with low levels of micronutrients due to the lack of diversification of diets. Continuing DESA (2013) asserts that an estimated 30 per cent of the world’s population face the challenge of excesses in calories at the expense of micronutrients as an additional rising major global public-health concern. Although various factors may impinge upon the diversification of diets, this research considered the political, economic, socio-cultural and technological factors.

Political factors

Politically food security has been an ongoing concern in many spaces. This considers the policies put in place by government, the use of available land and issues bordering on agriculture, as well as urbanization. These have

increasingly become concerns because of the complexities of malnutrition. The global food situation is redefined by many driving forces such as population growth, availability of arable lands, water resources, climate change and availability of food, its accessibility and loss.

The combined effect of these factors has undeniably impacted global food production and its security (Premanandh, 2011). Food Security and Environment Facility (FSEF) project was launched in Ghana in 2008. Although the project helped an increased yield of maize in the operational zones (Naatogmah, 2014), there is the likelihood that policies on food security in Ghana have not yet recognized the importance of diversified diet.

Most political administrations abandon supply controls and use the policy tools at their disposal to boost farm production by subsidizing, and encouraging, the industrialization and consolidation of commodity agriculture just as Nixon Administration of the USA did in the past. (Bittman, Pollan, Salvador, & De Schutter, 2015). The need for agricultural policies that promote cultivation of diversified food crops for diversified diet and health, other than focusing on production of cash crops only, has the potency of increasing dietary diversity within the population because food security is a policy issue of importance in almost every country (Ericksen, 2007).

The challenge of food security in some countries or communities is not as a result of absence of adequate food but rather absence of varied nutritious food. Most countries have promoted the cultivation of cash crops and abundant cheap calories, believing that it will boost farm production and raise productivity, (Ceesay, 2004; Gimenez, 2008; Thornton, 2010; Taheri, Azadi & D'Haese, 2017) This is done at the expense of the health of the population.

Most farmlands that could be used to boost cultivation of vegetables and crops for feeding the population are being converted to growing crops for exportation. If a small number of crops are grown in monoculture, it would not be feasible to make diversified diets accessible to all in the population.

Premanandh (2011) explains that out of 14 billion hectares of land, only three billion is arable on the planet, and this area continues to dwindle. Rapid population growth has been suggested as the major cause of reduced land area. Continuing population and consumption growth poses a major threat to global food security that is likely to increase over the next 40 years. For instance, Premanandh (2011), states that there were about 12 acres per person worldwide in 1959, reducing to about 6 acres per person in 2006. A further reduction to as low as 2.8 acres per person be estimated by 2040.

According to Welch and Graham (1999), the “agriculture – nutrition gap” is partly due to agriculture not having nutrient output as an explicit goal on the agenda. Nutrition and health communities have also never considered using agriculture as a primary tool in their nutrition programmes. Maximising the nutrient output of the farming systems has therefore not been an objective of agriculture but rather to maximise production while minimising costs (Keding & Cogill, 2013). The authors further assert that the change in agricultural production from more varied cropping systems to more monoculture cereal systems seems to be contributing to micronutrient deficiencies by limiting food-crop diversity.

In spite of this threat populations are allowing land degradation to also consume parts of the already reduced land available (Nuhu, 2013). Illegal mining activities, popularly known in Ghana as “galamsey”, is destroying

parts of our land meant for agricultural purpose. Government, individuals and community leaders need to get involve to help stop the practice. If agricultural activities will provide enough nutritious food then we need our arable lands for that purpose.

Land degradation in all its forms is a threat to food production and rural livelihoods, especially in the poorest areas of the developing world (Premanandh, 2011). The literature has argued in various ways on the importance of agricultural activities in feeding the population with diversity of diets: Micklesfield, Lambert, Hume, Chantler, Pienaar, Dickie, Puoane & Goedecke (2013), reported that rural Kenyan women access to land was associated with a higher nutrient mean adequacy ratio, dietary diversity score and food variety score. Again, having a vegetable garden was found to be positively correlated with diverse healthy diets, (Kamphuis, Giskes, Bruijn, Wendel-Vos & Brug, 2006). Also, farm production diversity was highlighted as positively associated with dietary diversity (Sibhatu, Krishna, & Qaim, 2015).

Authors have found urbanization as a factor that makes people shift from some more nutritious diverse diets to processed foods which are energy dense (Steyn, Nel, Parker, Ayah, & Mbithe, 2012; Micklesfield et al. 2013; Ekpenyong, 2015). For Ekpenyong (2015) the various factors that contribute to the change in dietary pattern in urban areas include larger numbers of women in the work force with less time to prepare meals for the family, commuting great distances, substantial amount of time spent on commuting to and from work and living spaces are smaller and often not equipped with kitchens or outdoor cooking spaces. He concluded that the fast-paced urban

lifestyle makes many urban consumers rely on pre- prepared or street foods and convenient foods. The author continued with a study in Accra, which highlighted 32% of the household budget as going towards the purchase of street foods.

Ruel, Haddad, & Garrett (1999) argued that the cost of traditional staple foods is often higher in urban areas, while the cost of processed food is lower, contributing to the shift in dietary pattern observed in urban areas. According to them, diets in urban areas that are mostly based on processed food and pre-prepared foods tend to contain more fat, sugar, salt and preservation content. Reasons for the shift toward processed foods in urban areas include convenience, availability and price. Substantial food losses and waste at distribution affects global food security, because at that level, less than half of the calories produced by farmers ever make it onto the dinner, due to the higher percentages in post-harvest losses in developing countries than the developed nations (Guyomard, Darcy-Vrillon, Esnouf, Marin, Momot, Russel & Guillou, 2012). This situation could be said to have impacts on traditional staple foods in the urban areas, and render them more expensive.

Economic factors

Economic status is another important factor that influences dietary quality and food choices. Individuals and families always have certain demands to meet. These demands are stimuli received from the system's environment as inputs for economic factors which centre on individual's income and cost of food. Invariably, individuals with less income might not afford diverse diets as compared to those with higher income. According to the literature, people living in a neighbourhood with a higher median income,

tend to consume more fruits among other food substances, (Kamphuis, Giskes, Bruijn, Wendel-Vos & Brug, 2006). Higher food prices, are also known to affect the most economically disadvantaged. Increased wealth and disposable income however may contribute to food choices and could be the push factor to consume more meat products, bigger portion sizes, and a more frequent intake of fast foods. At the same time, low household food security could lead to poor dietary quality, characterised by low food variety and diversity scores, (Keding, Msuya, Maass & Krawinkel, 2012).

A study showed household income to be the strongest and most robust independent predictor of food purchasing behaviour when compared with education and occupation. (Turrell, Hewitt, Patterson & Oldenburg, 2002). A study showed that the previously observed relation between socioeconomic position and diet quality may be significantly mediated by diet cost. The literature further confirmed that lower socioeconomic position groups consumed more energy dense and nutrient poor diets, (Darmon & Drewnowski, 2015; Ranjit, Wilkinson, Lytle, Evans, Saxton & Hoelscher, 2015). Furthermore, lower socioeconomic groups had lower diet costs which were more likely to be energy dense and nutritionally limited (Aggarwal, Monsivais, Cook, & Drewnowski, 2011). Literature states that income gives people the ability to buy diverse, nutritious foods instead of eating only their own crops which may not be diverse (Mor & Sethia, 2015).

Socio-cultural factors

Food service providers, the family, individuals' perception and the media are socio-cultural factors and issues require in dietary issues / challenges. Studies have shown relationships between social status and

consumption of healthy diverse diet, (Mayen, Vidal, Paccaud, Bovet & Stringhini, 2014; Darmon & Drewnowski, 2008). Studies in developed countries have shown an inverse relationship between social status and poor diets, (Dinsa, Goryakin, Fumagali & Suhrcke, 2012). However, studies in South Africa, as well as other African countries show a consistent positive association between consumption of excess calories and social status leading to obesity in majority of those women, (Micklesfield et al. 2013). The study further reported that women in South Africa with no education and women with a tertiary education had a lower body mass index (BMI) indicating absence of obesity than those with just basic education. This indicates that without proper education, people with extra income will consume excess calories at the expense of their health.

Studies examining social factors showed that married people had a higher fruits and vegetable intakes than singles, whereas having children showed a mixed association, (Kamphuis, Giskes, Bruijn, Wendel-Vos & Brug, 2006). Cultural and religious restrictions as well as family traditions at certain points in time have influence on dietary consumption of people. A study reported vegetarianism, prohibition of pork and meat, periods of fasting as a way of retaining the culture and spirituality of people have effects on children to follow in the culture of the elders. (Green, Waters, Haikerwal, O'Neill, Raman, Booth, & Gibbons, 2003).

Amoako-Kwakye (2010), states that a person's culture, family and marriage, as well as peer group can influence a person's diet because the family influences on food are very strong. She further stated that since the mother usually set the pattern of diet for the family as her duty to provide

meals for the family, food habits learnt from the home environment (family) that did not include the principle of variety will eventually affect the health of its members. Australian Government Department of Veterans' Affairs (2015) also made the assertion that those who live with families or other groups will have primary access to those foods that are purchased and / or prepared by the person delegated with this responsibility.

Although the primary food purchasers and preparers have more control over what foods are purchased and how they are prepared, they may still be greatly influenced by preferences of household members. The author (Australian Government Department of Veterans' Affairs, 2015)) highlighted women as gatekeepers in the flow of food into the home, and this was based on the social psychologist Kurt Lewin's idea that food gets onto the table through 'channels' such as the grocery store, the garden and the refrigerator. It could therefore be argued that the selection of channels and the food which flows through them is under the control of the "gatekeeper" and for that matter the woman of the home, (Australian Government, Department of Veterans' Affairs, 2015).

It has also been observed that the lifestyle of some people is such that they depend on restaurant foods or foods cooked at chop bars, fast foods, and other food service providers, (Abdulai, 2016; Ababio & Adi, 2012). They have too busy schedules to make time for cooking for themselves. This however means that whatever is made available by the food vender is what they are likely to eat. Street foods and the emergence of fast food chains is an issue to be looked at when looking into dietary diversity of people. Take-away meals from street food vendors are also becoming very popular in urban areas. A

study in Nigeria found that men from low-income groups account for 70 percent of all consumers of street foods (Olayiwola, Soyibo & Atinmo, 2004).

Other studies further claimed that persons in the higher socio-economic groups tend to eat out in western-type fast food restaurants, and made the observation that all these foods, whether from street vendors or fast food restaurants, have high proportions of oil, salt and sugar and are therefore higher in calories than other foods, (Oaklander, 2015; Cohen & Bhatia, 2012). Literature states that social changes such as the increased participation of women in the workforce lead to reduced time available for food selection and meal preparation, (Arganini, Saba, Comitato, Virgili & Turrini, 2012). Australian Government Department of Veterans' Affairs, (2015), further reported factors such as imitation and frequency of exposure to food-related customs and traditions, parental and peer influence, media advertisement, merchandising / marketing displays, and knowledge about diet-health relationships, to influence what one chooses to eat and how it is consumed.

In some parts of the world, gender was found to influence food choices of people. Some foods were labeled as masculine while some were seen as feminine. Consumption of meat for instance symbolized masculine diet, while the consumption of vegetables and fruits represented feminine diet (Prattala et al, 2006). Frequency of fruit and vegetable intake was higher among women than men. Authors indicated that women had a higher awareness and better knowledge of nutrition, and were more concerned about healthy eating habits than men, (Kiefer et al. 2005; Prattala et al. 2006; Turrell, 1997; Missagia, Oliveira & Rezende, 2012). The results of a study conducted in Tanzania, also showed sex differences in food preferences, with males preferring meat more

than their female counterparts who preferred berries, (Arganini, Saba, Comitato, Virgili & Turrini, 2012).

Technological factors

In the discussion of dietary diversity, the use of advance technology cannot be left out as a medium of complex innovations / food processing techniques made available numerous processed foods which are calorie dense. FAO (2004) states that the food processing industry as well as urban consumption patterns are highly skewed towards cereal and sugar based products and not towards meat, fish, poultry, milk and vegetables. Technological advancements are taking over the food industries, so as a matter of urgency, it needs to consider nutrition principles that will support the health and well-being of the population (FAO, 2004).

The rate at which people rely on these foods due to their convenience tends to raise concerns. Strong habits formed around the consumption of these foods, lead to lack of naturally diversified nutritious foods in the diet. A typical example is the milling of wheat to separate the bran and germ from the starchy endosperm so that the endosperm can be ground into flour for bread. The aleurone layer, which is rich in protein, minerals and vitamins, usually breaks away with the outer layer of the bran in the milling process, (Dewettinck, Van Bockstaele, Kuhne, Van, Courtens, & Gellynck, 2008.) What is left after the milling process can therefore be argued as not as nutritious as the whole wheat used in meals. Although food systems are very important in the bid to achieve dietary diversity, they are yet to deliver healthy diets, (FAO, 2004; Capone, Bilali, Debs, Cardone & Driouech, 2014). In Ghana, there is little evidence on policy and adherence to food guidelines

among stakeholders of the food industry, (Agyei-Baffour, Sekyere, & Addy, 2013). Subsequently, the majority of Ghana's population tends to consume processed foods, leading to a shift towards 'energy-dense foods' and away from 'micronutrient rich foods, (Ministry of Health, 2010).

Dewettinck et al (2008) suggested that the nutritive value of bread for instance could be increased with the addition of rye (*Secalecereale*), barley (*Hordeumvulgare*) and oats (*Avena sativa*). Apart from that it has been tested and found workable to include whole meal soybean flour to enrich bread. The literature identified the need to bring on board all stakeholders in the food systems in order to refocus on agriculture research investments globally to support healthy diets and varied diet for all, (Keding & Cogill, 2013; Global Panel on Agriculture and Food Systems for Nutrition. 2016). It has therefore become important for Governments and decision-makers to make investments to create food systems that could deliver quality diets to promote the health of individuals such as fathers, (Global Panel on Agriculture and Food Systems for Nutrition, 2016)

Chapter Summary

From the literature review, it is clear that dietary diversity improves dietary quality and the likelihood that individuals will meet their daily nutrient requirements, especially essential micronutrients, for good health. Certain factors deemed to impact on dietary diversity identified in the literature included government policies focusing on cash crop cultivation at the expense of food crops, urbanization leading people to rely on out of home meals for their daily sustenance, and degradation of agricultural land meant for mining activities. It was also found in the literature that, the economic ability of the

individual, food cost, the family and food processing procedures have influence on the diet.

Literature reviewed showed that most studies conducted on dietary practices focused on women, particularly, pregnant women and children, (Becquey, Capon, & Martin-Prével, 2009; Daniels, 2006; Government of Ghana; 2013; Hepburn, 2014; Kiboi, Kimiywe, & Chege. 2016; Micklesfield et al, 2013; Saaka, 2012; Savy et al, 2007; Tandoh, 2015; Steyn et al, 2012; Ghana Statistical Service & Ghana Health Service, 2015; Lumole, 2013; UNICEF, 2006). There were also few studies on adolescents (Ashigbie, 2015; Giskes, Turrell, Patterson, & Newman; 2001), however literature is almost silent on how men are faring with regards to diet. A search into the relevant literature revealed that fathers who tend to be part of the family have not been well investigated in terms of diet and nutrition. This study therefore focuses on the fathers in order to find out the amount of diversity in their diet as well as the contributing factors.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter describes the methods and procedures used in conducting the study. It covers the study area, research design, the study population, sample and sampling procedure, data types and sources. It also includes data collection instrument, data validation, data collection technique and procedure, and data processing and analysis.

Study Area

The study was conducted in Mfantseman Municipality of the Central Region of Ghana as shown (arrowed) in the map.

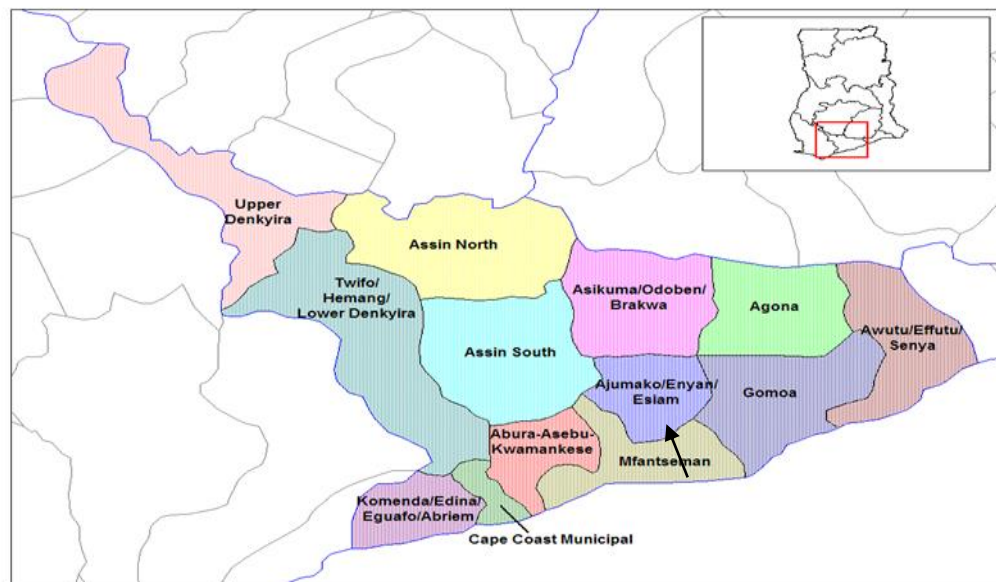


Figure 2: Map of Central Region showing Mfantseman Municipality

Source: Wikipedia, the free encyclopedia

Mfantseman Municipal is sited along the Atlantic coastline of the Central Region of Ghana. It stretches approximately 21 kilometres along the coastline and about 13 kilometres inland, constituting an area of 300.662 square kilometres. The proportion of land area of the municipality to that of the region is 3.1 percent. The administrative capital of Mfantseman is Saltpond. Mfantseman is bounded on the West by Abura-Asebu-Kwamankese District, on the North-East by Ajumako-Enyan-Essiam District, on the East by Ekumfi District and on the South by the Gulf of Guinea (Atlantic Ocean). It stretches from Eguase (the most western point) to Mankessim (the most Eastern point). The map of Mfantseman showing its boundaries and some towns in addition to Mankessim, the study area (arrowed) is show in figure 2.

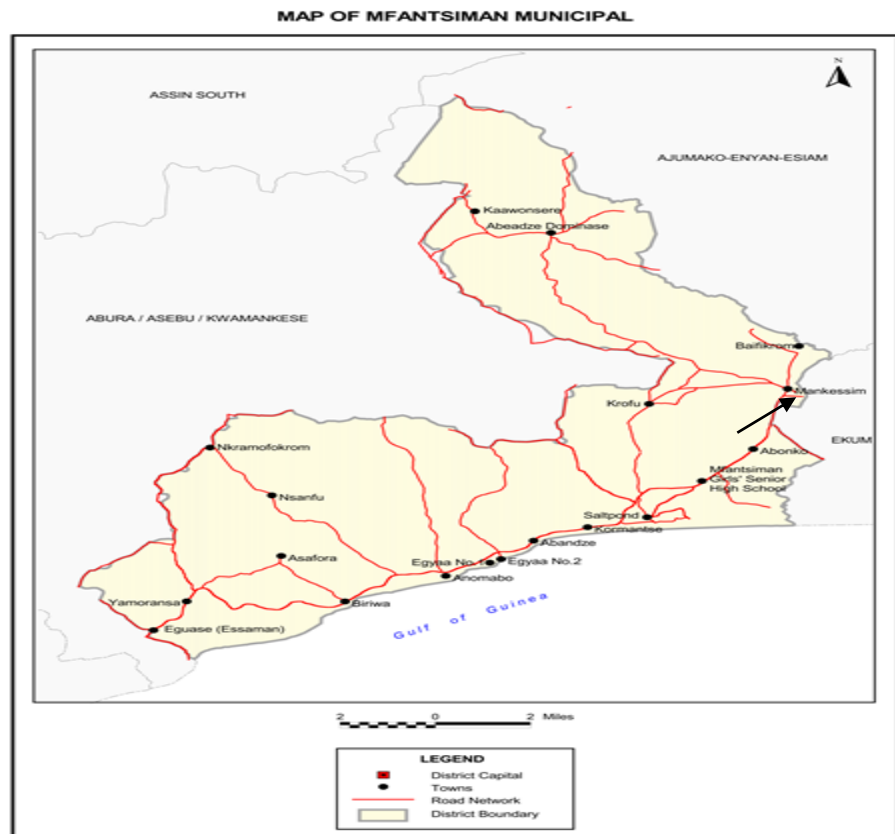


Figure 3: Map of Mfantseman Municipality Showing the Study Area (arrowed)

Source: Ghana Statistical Service, GIS

Mankessim is located approximately 85 km west of Accra on the main road to Sekondi-Takoradi and is a thirty minutes' drive from Cape Coast, the capital city of the Central Region of Ghana. Although Mankessim is the traditional headquarters of the Fante community, (wikipedia.org/wiki/Mankessim) but migration has also brought other ethnic groups such as the Gas, the Ewes, Ashantis, Akwapems, Northerners and settlers from other parts of the continent. It is the biggest urban town in the Mfantseman municipality, among the other centres: Saltpond, Anomabo and Yamoransa. Mankessim is the major trading centre of the Mfantseman Municipality with a big market which sells food crops of all kinds and fish. Mankessim has six main suburbs or electoral areas; Anaafo-Estate, Ahenbrom-School Kessim, Twafo, Edumadze-Nananom, New Nkusukum and Nkusukum, and the residents from these areas as well as from distant areas engage in trading activities at the market.

On the way to Accra from Cape Coast, Mankessim is entered through Nananom, the first suburb, and then New Nkusukum before the centre of Mankessim (Nkusukum) where the lorry stations and market area are situated. Twafo is situated opposite the market area whereas Edumadze follows on the road to Accra from Mankessim. These two suburbs (Twafo and Edumadze) have majority of the indigenous people of Mankessim. Anaafo and Ahenbrom are on the road from Mankessim to Ejumako, whereas Estate is on the road from Mankessim to Foso. These suburbs form the six main electoral areas stated above.

Research Design

The choice of research design for a particular study is based on the purpose of the study (Cohen, Manion & Morrison, 2007). The purpose of this study lends itself to the exploratory and descriptive survey design. As explained by Sanders, Lewis and Thornhill (1997), exploratory study is a means of finding out what is happening, to seek insights, to ask questions and to assess phenomena in a new light. Barbbie (2007) also asserted that, exploratory studies are essential in yielding new insights into a topic and breaking new grounds into an unstudied area of research. These methods were chosen because this study, seeks to collect data to answer research questions regarding the dietary diversity situation of fathers.

The descriptive design specifies the nature of a given phenomenon. It determines and reports the way things are. Gay (1992) describes descriptive research as involving collecting data in order to test hypothesis or answer research questions concerning the current status of the subject of the study. Fraenkel and Wallen (2000) were of the also of the view that, the descriptive research design describes a given state of affair fully and as carefully as possible. The exploratory and descriptive design fits this study because it aims at finding out what is happening about fathers' dietary diversity and reporting the situation in Mankessim Township.

Population

The population of Mfantseman Municipality, according to the 2010 Population and Housing Census, can be described as youthful because there are relatively more children than elderly persons, (Ghana Statistical Service, 2014). This implies that the population of Mankessim would be youthful as

well. Fathers between the ages of 25 to 45 were chosen for this study because men in general have not been studied much in terms of issues relating to their diet. Dietary practices of the younger generation of fathers will eventually affect their old age as well as their families, (Jansen, Roza, Jaddoe, Mackenbach, Raat, Hofman, Verhuist & Tiemeier, 2012; Pruett, 1997; World Health Organization, 2015). Therefore, talking about the diet of fathers within the age range given is timely and geared towards preventing diet related diseases and morbidity in later years. An attempt at acquiring the specific population size and distribution of fathers between the ages of 25 to 45, proved futile because, such record was not made available from the Municipal office.

Sampling Technique

The ever-increasing population has created a need for an efficient method of determining the sample size needed to be representative of a given population, (Nutsugah, 2013). Cohen, Manion & Morrison (2007), were of the view that there is no clear cut answer for sample size and that sample size depends on the purpose of the study and the nature of the population under scrutiny. The nature of the population under scrutiny did not make it possible to compile a sampling frame to select from. The Multi-stage cluster sampling was however employed to arrive at the sample for the study. In the first stage, one cluster / suburb (Edumadze-Nananom) in Mankessim was selected by simple random for the study. The next stage was a purposive sampling of households that had fathers between the ages of 25 to 45, in the suburb. All fathers in the suburb within the age range given above were contacted for the

study. Selected fathers were consulted on the purpose of the study and their consent sought before proceeding with the study

Sample

A total of 307 fathers were contacted for the study. However, eleven fathers in all refused to continue and requested to be excluded from the study. Eighteen fathers could not return the questionnaire given to them. At the end, 278 fathers participated in the study. Majority of the fathers within this age group were workers and did not stay at home most of the time during the period of study. About 72% of participants were selected on Sundays and contacted the following Sunday for the interview or administration of the questionnaire, since that was the only day of the week that they stayed at home during the day time.

Demographic Data of Respondents

The personal details of respondents were obtained from the Part I of the questionnaire. The data basically covered the distribution of respondents' age, level of education, religion, marital status, years of marriage and number of children. Data obtained from the 278 respondents are presented in Appendix F.

From the table (Appendix F) in terms of ages of respondents, the majority 41% of participants were between the age range of 40-45 years, about 22% were in age range of 35-39 years, while 19% and 18% of the participants were in age ranges of 30- 34 years and 25- 29 years respectively to give an indication of having majority of fathers in the study over 40 years.

With regard to the level of education of fathers involved in the study, it was revealed that the majority (67%) of fathers had basic school qualification,

28% had secondary, technical and or university education, with a few of them (5%) as uneducated or without formal education. The religious inclinations of the fathers sampled showed (80%) as Christians while the rest belonged to the Islamic and African Traditional Religion respectively. Data on marital status of the fathers highlighted 83% as married and living with their families, 6% divorced, 8% in consensual unions and 2% widowed.

In terms of years of marriage of participants, the data revealed that out of the 278 fathers, 91 had been married for 2-5 years, 85 fathers, for more than 10 years, 59 for 5-10 years while 39 were married for under two years. On the issue of number of children catered by respondents, it was revealed that 64% of the fathers had children within the ranges of 1-3; an estimated 26% of fathers had 4-6 children, 4% of the fathers catered for children within the ranges of 7-10, and about 1% of the fathers also catered for over 10 children

Sources of Data

The study used both primary and secondary data. The primary data was obtained from the interviews with 133 (47.84%) fathers as well as questionnaires that were administered to 145 (52.16%) of the fathers. Secondary data was obtained from the main library and Department of Social Sciences Education library of the University of Cape Coast. Books, journals, articles and the internet were used extensively for information retrieval and literature review.

Ethical Considerations

An introductory letter was obtained from the Department of Vocational and Technical Education for ethical clearance from Institutional Review Board, UCC to conduct the study. Approval was sought from the

Assemblyman in the electoral area before participants were selected for the study. Participants were each visited with the Informed Consent Form which was used to educate them on the purpose of the study and to also seek their consent before including them in the study.

Research Instruments

For the nature of this study, two data collection instruments were used. Questionnaires and interviews were used to collect data on the objectives of the study. The Dietary Diversity Questionnaire of FAO, 2011 and the new indicator guide for measuring Women Dietary Diversity developed in 2016, (FAO & FHI 360, 2016) was adapted for use in this study. The Questionnaire was closed ended or a restricted form where respondents were made to give a “yes” or “no” response, or select from available responses in a set of alternatives provided. A structured interview was used in place of the questionnaire to interview those respondents who could not fill the questionnaire on their own and those who found the interview more convenient. The items in the questionnaire were used for the interview.

The questionnaire used for the study had part I to V. Part I to IV were answered by the fathers themselves while part V was answered by their wives or home makers. Part I had items that required information on demographic characteristics of fathers. Part II had items on eating habits of fathers as well as items on factors that influenced what fathers ate. Part III measured what fathers ate within the last 24hrs. Fathers were made to record all meals taken, whether at home or outside home, as well as ingredients used in preparing the meals. They were also made to provide a yes or no response using 1 for ‘yes’ and 0 for ‘no’ against food groups consumed within the last 24hrs. Although

using 24-hour recall period does not provide an indication of an individual's habitual diet, but it does provide an assessment of the diet at the population level and can be useful to monitor progress or target interventions (Savy et al., as cited in Lumole, 2013).

Part IV of the instrument had items that measured the perception of fathers on dietary diversity. The final part of the instrument, measured the amount of diversity in the meals prepared at home by the home makers or wives of the fathers. They were made to record all meals prepared at home within the last 24hrs and details of ingredients used in preparing the meals.

Validity of Instruments

Validity of questionnaire and interview schedule was ensured by matching the objectives of the study with the items on the questionnaire and interview schedule. The Dietary Diversity Questionnaire used for the Women Dietary Diversity Project (WDDP) I and II, which span from 2005 to 2010 and 2012 to 2016 respectively were further developed by experts in the field and recommended for use in assessing dietary diversity of different sexes and age groups. To ensure face validity of the measurement tool the survey instrument was forwarded to the research supervisor for her professional opinion. After using the constructive suggestions of the study supervisor to improve the instrument a further validation was carried out. The modified questionnaire was pilot-tested using 46 fathers in Mankessim S.D.A. Church. The internal consistency of the instrument was Cronbach's Alpha coefficient of 0.65, which indicated a strong internal consistency in the responses.

Data Collection Procedure

Ethical and comprehensive procedures were employed to get the facts, or information that was used to make decisions. Ethical clearance and letter of introduction was obtained from Institutional Review Board and Department of Vocational and Technical Education respectively, to seek permission from the assembly member and the sample for the study.

Three research assistants were recruited and trained for 4 hours each for 2 days to assist in the study. After their training, they had a practical demonstration that showed their preparedness to undertake the study. They were trained on the objectives and data collection procedures of the study. They were taken through the questionnaire by reading through question by question, and ensuring familiarization and clarity of the responses. Demonstrations were done to teach interview techniques that helped elicit the right responses. Research assistants were thought to employ techniques of prompting fathers to help them remember all they ate especially the snacks, which they might forget to mention. The research assistants were supervised to collect data from 46 fathers for pilot test before the main study.

Due to the comprehensive nature of the study, research assistants were taken through equally comprehensive training which helped to collect data that was accurate as much as possible. The data collection process took an average period of one month. Selected fathers were visited in their homes to collect data on the purposes of the study. Researcher together with research assistants collected data in two suburbs at a time. Participants were first visited with the informed consent form, educated on the purpose of the study and their consent sought to be included in the study. Times deemed convenient to the

participants were scheduled for interview or questionnaire administration. Questionnaires were administered and collected on the spot. Most of the few participants that requested to submit the questionnaires at a later time could not return it.

On the average, it took 20 to 25 minutes to interview one participant. Participants who took the questionnaire to answer them had each item on the questionnaire explained to them before and during the process of giving their responses. Some participants found the study quite interesting while few of them withdrew from the study when they were required to provide record of meals consumed together with ingredients used in preparing the meals. Sometimes fathers were unavailable at their scheduled time for the interview. Researcher or research assistants had to visit a second or even third time before they were met for the interview. Accessing the population for data collection was however challenging.

Data Analysis

The data collected was processed by cleaning, that is editing and coding, before entry. Data analysis and interpretation were carried out using the Statistical Product for Service Solutions (SPSS) software application version 22. Data for research objectives one, two, and three, with their corresponding research questions one, two, and three were analyzed using descriptive statistics that is, tables, frequencies, percentages, means and standard deviations. Data for research objective four with its corresponding research question four was analyzed using multiple linear regression analysis. Multiple linear regression was used to determine the influence of demographic characteristics on fathers' dietary diversity. A test of difference using the one

sample t-test was used to determine if fathers in Mankessim have a high dietary diversity and paired sample t-test was used to determine whether there is significant difference in the total dietary diversity score (DDS) of fathers and that of the total dietary diversity score (DDS) of fathers' family.

Chapter Summary

The study was conducted among fathers in Mankessim in the Mfantseman Municipality. It was descriptive in nature mainly through one-on-one interview and questionnaires administration. Fathers and their home makers were interviewed together. It was difficult getting most fathers upon first contact with the homes. A single 24hr dietary recall was used which might not reflect the usual dietary intake of the respondents. It depended on their recall ability and recall bias cannot be completely ruled out.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the analysis of data and the discussion of the findings in relation to the specific objectives which have been grouped into the following thematic areas:

1. Factors contributing to dietary diversity of fathers;
2. Dietary diversity of fathers; and their families;
3. Perception of fathers on importance of diversified diets; and
4. The extent to which dietary diversity of families and / or perception of fathers on dietary diversity influence the dietary diversity of fathers.

Factors Contributing to Dietary Diversity of Fathers

The study examined factors in the area of demographic characteristics of fathers in the study, eating habits of the fathers and other factors that fathers may or may not agree to have a bearing on their dietary consumption.

Fathers' Demographic Characteristics and Dietary Diversity

Fathers' dietary diversity is contingent of a number of various factors. Given this, this aspect of the study sought to find out the factors that contribute to dietary diversity of fathers. A statistical relationship between fathers' demographic characteristics and their dietary diversity scores was determined using multiple regression analysis. Fathers again responded to the questions on item 7-18 on the questionnaire. A result of analysis on fathers' demographic characteristics and fathers' responses to items showing

influences on their dietary consumption is presented in Tables 1 and 2 respectively.

Table 1: Multiple Regression Results for the Contribution of Fathers' Demographic and their Dietary Diversity

	B	SE	B	P	5% CI	Remark
Age	.117	.096	.097	.226	(-0.073, 0.306)	Rejected
Level of Education	-.302	.072	-.271	<.000	(-0.443, -0.162)	Accepted
Religion	.225	.188	.078	.231	(-0.144, 0.595)	Rejected
Marital status	-.152	.140	-.069	.277	(-0.428, 0.123)	Rejected
Years of Marriage	-.115	.105	-.088	.272	(-0.322, 0.091)	Rejected
Nos. of Children	-.021	.161	-.009	.896	(-0.338, 0.296)	Rejected
Eating situation	-.015	.086	-.011	.862	(-0.185, 0.155)	Rejected
Eating habits	.183	.095	.119	.056	(-0.005, 0.371)	Rejected
Decision-maker on Family's meal	-.135	.110	-.081	.221	(-0.351, 0.082)	Rejected

** (**P**) Significance level .05, B (not standardized Coefficient Beta), SE(Std. Error), b(standardized Coefficient Beta), CI(Confidence Interval)

a. Predictors: (Constant), age, level of education, religion, marital status, years of marriage, nos. of children, eating situation, eating habits, decision-maker on family's meal

b. Dependent variable:), Dietary diversity of fathers

Source: Field data 2017

Table 1 shows the statistical relationship between fathers' demographic characteristics and their dietary diversity scores. The regression equation explained 9.9% of the total variation in fathers' dietary diversity. The regression ANOVA was significant, $F(9, 244) = 2.263$, $p < 0.05$. Parameter estimation results indicated that fathers' demographic characteristic in the area of education was the only significant predictor of their dietary diversity. Notwithstanding the prediction of fathers' education level on their dietary diversity, the relationship of fathers' education level on their dietary diversity was negative, $b = -.271$, $SE = (.072)$, $t = -4.227$, $p < 0.000$, 95%CI: [0.443, -0.162]. This implies that as fathers' educational level increased their dietary diversity scores tend to go down, to make it arguable that attaining higher levels of education would not mandate better nutrition habits of people.

The findings of this study however, did not identify any factor as contributing positively to dietary diversity of fathers among the demographic characteristics presented. Results presented showed that a father's age, marital status and religious inclinations had little or no influence on his dietary diversity. Additionally, the number of years of marriage and the number of children a father has could similarly not affect his diet.

The findings of the study however were in contrast with other studies on dietary diversity conducted in different spaces. A study on diet diversity found that nutrition habits were positively related with educational level and specifically, the graduates from the university education had healthier diets than

those at the lower levels, (Grabauskas, Petkevičienė, Kriaučionienė & Klumbienė, 2004).

Furthermore, a study in Mauritius, highlighted socio demographic factors as contributory factors to eating practices with age and educational levels standing out for the consumption of out of home meals, vegetables, sweetened drinks, cakes/pastries and oily foods (Krige, Mahomoodally, Subratty & Ramasawmy, 2012). Comparatively, younger people were found to have higher frequency of eating out of home meals with higher consumption of sweetened drinks, and pastries, (Bezerra, Curioni, & Sichieri, 2012; Dave, An, Jeffery & Ahluwalia, 2009; van der Horst, Brunner & Siegrist, 2011).

Again, Savy et al, (2007)'s study by the WDDP in an urban area in Burkina Faso contradicted this study's result as it found DDS to be associated with several socio-demographic and economic variables, such as education and marital status. However, they did not find any association between DDS, religion and occupation.

Factors that Inform the Dietary Consumption of Fathers

This aspect of the study sought to find out from fathers in Mankessim their knowledge on the factors that inform their dietary consumption. Fathers in Mankessim responded to the questions on item 7-18 on the questionnaire. The responses of the fathers are shown in Tables 2 and 3.

Table 2: Eating habits of fathers

Statement	Category	Respondents (N= 278)	
		N	%
Which best describe your eating situation?	I buy most of my meals outside home.	41	14.7
	I prepare my meals most of the time.	48	17.3
	My meals are normally prepared by a family member.	110	39.6
	I sometime buy meals outside or other times I eat meals prepared at home	79	28.4
What best describes your eating habits?	Omnivorous	204	73.4
	Semi-vegetarian	62	22.3
	Lacto-vegetarian	4	1.4
	Ovo-vegetarian	1	0.4
	Lacto-ovo-vegetarian	1	0.4
Who makes decision about your family's meal?	You (Father)	126	45.3
	Your wife	79	28.4
	Family members decide.	72	25.8

Note: n =Response, %= Response rate
Source: Field data 2017

Table 2 reveals the eating habits of fathers; precisely, fathers were asked to describe their eating patterns and or habits. Generally, a good number (110) of fathers would eat from the “meals normally prepared by a family member”, while others (79) were of the opinion that they will either “buy meals form outside or eat meals prepared at home.” At the same time, 48 of the fathers remarked that they “prepare their meals most of the time”, with 41 of them stating that they “buy most of their meals outside home” which supports assertions made that out of home meals are becoming increasing phenomenon in urban and peri-urban areas, (Olayiwola, Soyibo & Atinmo, 2004; Ekpenyong, 2015; Kinabo, 2004). In confirmation, of the results of this study, Bezerra, Curioni, & Sichieri, (2012) reported that 7 out of 8 cohort studies found a positive association between the frequency of eating away from home and body weight (Seguin, Aggarwal, Vermeulen, & Drewnowski, 2016).

With regards to what best describes fathers’ eating habits, participants gave varied responses: 73% of the fathers tend to be omnivorous while 22% were Semi-vegetarian, 2% and 1% Vegan and Lacto-vegetarian respectively. This finding confirms a study which indicated that globally, the consumption of meat appears to be on the ascendancy as the practice of vegetarianism declines, (Key, Appleby & Rosell, 2006).

On who makes decision about their family’s meal, almost half (45.3%) of the participants remarked that they [fathers] make the decision concerning what to eat with a total of about 54% eating whatever their wives and any other family members decided on respectively to support a study highlighting North American

women. However, the results were in contrast to a study which showed traditional feminine ideals that made women to provide their husbands with their preferred choices of food rather what the women preferred, (Schofield, Connell, Walker, Wood & Butland, 2000).

To further find out more on the factors that influence the daily dietary consumption of fathers, they were made to respond to a list of factors to ascertain how much they think those factors determined their daily dietary consumption as shown in Table 3.

Table 3: Factors that Determine what Fathers eat on Daily Basis

Statement	Strongly Disagree N (%)	Disagree N (%)	Uncertain N (%)	Agree N (%)	Strongly Agree N (%)	Mean	SD	Remark
The money I have	19 (6.8)	55 (19.8)	11 (4.0)	121 (43.5)	70 (25.2)	3.61	1.25	Accepted
The food my wife prepares or the one prepared at home	13 (4.7)	30 (10.8)	4 (1.4)	145 (52.2)	85 (30.6)	3.94	1.08	Accepted
The food I have appetite for.	5 (1.8)	39 (14.0)	13 (4.7)	119 (42.8)	100(36.0)	3.98	1.07	Accepted
The work I do	70 (25.2)	69 (24.8)	33 (11.9)	85 (30.6)	14 (5.0)	2.65	1.30	Not Accepted
The availability of the food	15 (5.4)	54 (19.4)	18 (6.5)	122 (43.9)	66 (23.7)	3.62	1.20	Accepted
My friends	156 (56.1)	72 (25.9)	12 (4.3)	26 (9.4)	12 (4.3)	1.80	1.15	Not Accepted
Nutritional advice from a doctor	81 (29.1)	50 (18.0)	27 (9.7)	76 (27.3)	43 (15.5)	2.82	1.49	Not Accepted
Nutritional advice I saw in book or newspaper	49 (17.6)	50 (18.0)	40 (14.4)	91 (32.7)	46 (16.5)	3.13	1.37	Accepted
My understanding of healthy diet	16 (5.8)	24 (8.6)	15 (5.4)	143 (51.4)	78 (28.1)	3.88	1.09	Accepted

Mean ranges: SD (00-1.0), D (1.1-2.0), U (2.1-3.0), A (3.1-4.0), SA. (4.1- 5.0), Mean of means: 3.27, Mean of SD: 1.22.

Source: Field data 2017

Considering the factors that influenced what people eat, various authors have enumerated factors such as personal issues, family traditions, geographical locations, religious beliefs, economic, technological advancement, foreign influence, education, peer influence and mass media as among factors that influence dietary patterns of people (Amoako-Kwakye, 2010; Bargiota, Delizona, Tsitouras & Koukoulis, 2013). The findings of this study however disagreed with suggestions by Bargiota, et al, (2013)'s study on adolescents in Greece, that their choices were influenced by their peers. This could possibly result from the fact that fathers being adults are not easily influenced as the adolescents who are easily swayed by peer pressures as suggested by authors, (Brown & James, 2008; Sussman, Pokhrel, Ashmore, & Brown, 2007; Prinstein, & Dodge, 2008).

The results further showed that fathers would under a normal situation be influenced to eat what they eat, from both internal and external factors. On the internal side, fathers' available money was a determinant on the kinds of foods eaten. Additionally, the spouses decided on the kinds of meals prepared and eaten which supports the findings of Mróz et al, 2011; Australian Government, 2015) that invariably, wives determined the meals to be consumed by families and for that matter, fathers. On the external side, the education received by fathers from the media or newspapers was a contributory factor to their eating habits which agreed with the assertions made by Nestle, Wing, Birch, Di Sogra, Drewnowski, Arbor, Middleton, Procter, Gamble, Cincinnati, Sigman-Grant, Sobal, Winston, & Economos, (1998) on the media's influence on what fathers eat.

Other authors similarly argued on the media are a principal source of information about food and nutrition for many people because of its capacity to persuade the public, (Borra & Bouchoux, 2009). Another view was indicative that consumers normally obtain most of their health and nutrition information from the media because it exerts significant impact of nutritional information on consumers' food choices which makes it an effective communication approach that affects consumers' health (Shiratori & Kinsey, 2011). This study finds the impact of the media on consumers as very strong, which could be used as a channel through which the health benefits of diversified diet could be promoted among the population.

The findings of this study were in support of other findings which stated that economic status is an important factor that influences dietary quality and food choices (Kamphuis, Giskes, Bruijn, Wendel-Vos & Brug, 2006; Turrell, Hewitt, Patterson & Oldenburg, 2002; Micklesfield et al, 2013). It was highlighted in the study that fathers from lower socioeconomic position groups consumed more energy dense and nutrient poor diets which were of lower costs as shown in the study of Aggarwal, Monsivais, Cook & Drewnowski (2011). The reason being that access to disposable income often offers the opportunity to purchase or consume diverse, nutritious foods instead of eating only their own crops which may not be diverse, (Mor & Sethia, 2015). It is also possible that fathers with less income might not be in a position to purchase or consume diverse diets compared to those living in households with a higher income (Kamphuis, et al, 2006).

Fathers ‘understanding of healthy diet’ and standards of living or ‘the money they have’ were major factors on their access to dietary diversity since the ‘poor’ tend to suffer from lack of adequate meals as highlighted in the study of Labadarios et al. (2011).

Dietary Diversity of Fathers

This section of the study sought to assess the dietary diversity of fathers in regards to the food groups they ate within the last twenty-four hours and the total diversity score range(s) of fathers. Given this, respondents answered items 19-28 on the questionnaire. The responses of the fathers are seen in Tables 4 and 5

. Table 4: Dietary Diversity of Fathers

Food groups	Yes	No
	n (%)	n (%)
Grains, white roots and tubers, and plantains	275 (98.9)	3 (1.1)
Pulses (beans, peas and lentils)	51 (18.3)	227 (81.7)
Nuts & Seeds	62 (22.3)	215 (77.3)
Diary (milk and milk products)	75 (27.0)	202 (72.7)
Meat, poultry and fish	254 (91.4)	24 (8.6)
Eggs	39(14.0)	238 (85.6)
Dark green leafy vegetables	68 (24.5)	209 (75.2)
Other vegetables	192 (69.1)	85 (30.6)
Vitamin A rich fruits and vegetables	177 (63.7)	101 (36.3)
Other fruits	60 (21.6)	218 (78.4)

Source: Field data, 2017

Table 4 provides brief information of the food groups eaten by participants as at the time of the study. In the chronological pattern, the findings revealed that 14%, 18.3%, 21.6%, 22.3%, 24.5% and 27% of the fathers had eaten eggs, pulses, other fruits, nuts & seeds, dark green leafy vegetables and dairy products respectively. Also, it was established from the findings that almost all of the fathers, (275: 99%) had eaten ‘grains, white roots and tubers, and plantain. This gives the indication that grains, starchy roots and plantain still form the major food commodities in the diets of families which fathers are included. This finding is consistent with studies conducted globally exemplified by the Agriculture and Consumer Protection Department (2010), which concluded that the Ghanaian diet largely relies on starchy roots (cassava, yam), fruits (plantain) and cereals (maize, rice), for the supply of almost three quarters of the dietary energy. Lumole (2013), and Vakili, Abedi, Sharifi, & Hosseini (2013), also revealed similar trend of higher consumption of starchy roots and cereals as forming a major component of diets.

Additional findings on the women dietary diversity project in Mali and other developing countries have revealed a high consumption of cereals as standard foods in diets of families, (Kennedy, Fanou-Fogny, Seghieri, Arimond, Koreissi, Dossa, Kok & Brouwe, 2010). This could be due to the fact that starchy roots and cereals are staple foods in most parts of the world that are cheaper among the food commodities and readily available. Aside the carbohydrate foods, the study further indicated that 64%, 69% and 91% of the fathers engaged in the eating of ‘vitamin A rich fruits and vegetables’, ‘other vegetable’ and ‘meat,

poultry and fish' respectively. Generally, the study found out that the majority of the fathers appeared to be interested in consuming more carbohydrate and protein foods which agrees with authors' assertion that higher intakes of organ meat, flesh foods, vitamin A- and vitamin C-rich fruits and vegetables, and legumes and nuts were significantly associated with lower risk of micronutrient inadequacy, (Becquey, & Martin-Prevel, 2010).

The results of this study indicated low consumption of eggs(14%), pulses (18.3%), nuts and seeds (22.3%), dark green leafy vegetables (24.5%) and other fruits (21.6%) which supports other studies argument of being associated with micronutrient adequacy (Kennedy, Fanou-Fogny, Seghieri, Arimond, Koreissi, Dossa, Kok & Brouwe, 2010). In another finding diets low in fruits, vegetables and meat were associated with iron, folate, zinc, thiamin, riboflavin, niacin, vitamin B-6, and vitamin B-12 inadequacies, (Torheim, Ferguson, Penrose & Arimond, 2010). The study also looked at the total diversity range scores of fathers is shown in Table 5

Table 5: Total Diversity Scores of Fathers

Actual scores (No. of food groups)	n (%)
1	2 (0.7)
2	7 (2.5)
3	55 (19.8)
4	91 (32.7)
5	67 (24.1)
6	27 (9.7)
7	23 (8.3)
8	4 (1.4)
9	2 (0.7)
Total Scores in ranges	
1- 4 scores	155 (55.8)
5- 9 score	123 (44.2)

Source: Field data, 2017

From Table 5, 56% of the fathers in the study could be argued as having a total diversity score ranging from 1-4 while 44% attained a diversity of 5-9. Interpreting this result in relation to the Minimum Dietary Diversity for Women (MDD-W) indicator guide (FAO and FHI 360, 2016), it could be said that, the majority of fathers involved in the study have low dietary diversity score (1- 4). This was followed up with a test of difference using one sample t test to find out whether fathers in the study have a high dietary diversity.

Table 6: One Sample T-Test on the Issue as to Whether Fathers in Mankessim have a high Dietary Diversity

	N	M	SD	t	df	Sig.
Fathers	278	4.5072	1.37734	-5.966	277	.000

** Significance level .05(n) Sample, (M) Mean, (SD) Standard deviation (df) degree of freedom

Source: Field data, 2017

A test of difference using the one sample t-test with a test value of five (test value = 5) as indicated by the Minimum Dietary Diversity for Women (MDD-W) indicator guide (FAO and FHI 360), was used to determine if fathers in the study have a high dietary diversity. The results from Table 6, show that the mean of fathers' dietary diversity score (M= .5072, SD = 1.37734) is not higher than the yardstick for high diversity (value of 5 and above); $t(277) = -5.966$, $p = .00$ (two-tailed). These results tend to confirm previous studies findings where there was adequate evidence on the association of dietary diversity with nutrient adequacy, (Torheim, Ferguson, Penrose & Arimond, 2010; FAO & FHI 360., 2016; Becquey, Capon & Martin-Prével, 2009; Arimond, et al, 2010) specifically, the authors found that monotonous diets are associated with nutrient inadequacies, (Torheim, Ferguson, Penrose & Arimond, 2010; Becquey, Capon & Martin-Prével, 2009; Arimond, et al, 2010; Lumole, 2013), which attracted the attention of various international bodies exemplified by FAO (2011).

Dietary Diversity of Father's Family

This questionnaire sought to ascertain the dietary diversity of father's family. Given this, item 40-49 on the questionnaire provided questions probing the dietary diversity of father's family within the past twenty-four hours as at the time of the study. The responses of the home makers are seen in Tables 7 and 8.

Table 7: Dietary Diversity of Father's Family

Food groups	Yes n (%)	No n (%)
Grains, white roots, tubers, and plantains	242 (87.1)	36 (12.9)
Pulses (beans, peas and lentils)	42 (15.1)	235 (84.5)
Nuts & Seeds	45 (16.2)	232 (83.5)
Diary (milk and milk products)	63 (22.7)	215 (77.3)
Meat, poultry and fish	229 (82.4)	49 (17.6)
Eggs	30 (10.8)	248 (89.2)
Dark green leafy vegetables	57 (20.5)	221 (79.5)
Other vegetables	173 (62.2)	105 (37.8)
Vitamin A rich fruits and vegetables	157 (56.5)	121 (43.5)
Other fruits	51 (18.3)	227 (81.7)

Source: Field data, 2017

Regarding the food groups cooked by father's family as at the time of the study, it was revealed in a chronological way that 11%, 15%, 16% and 18% of father's family engaged in the cooking of eggs, nuts & seed, pulses, and other fruits respectively. The consumption of these food groups amongst the fathers was however very low. The majority of fathers had not consumed these food groups as at the time for study.

Data from the study also indicated that 21%, 23%, 57% and 62% of the father's family as at the time of the study had cooked 'dark green leafy

vegetable’, ‘diary products’ and ‘vitamin A rich fruits and vegetables, and other vegetables respectively. Finally, 82% of the father’s family were engaged in the cooking of meat, poultry and fish’ while 87% were involved in the cooking of ‘grains, white roots, tubers, and plantains’.

Table 8: Total Dietary Diversity of Father’s Family

Scores range (No. of food groups)	n (%)
00	30 (10.8)
1	1 (0.4)
2	4 (1.4)
3	69 (24.8)
4	85 (30.6)
5	37 (13.3)
6	25 (9.0)
7	21 (7.6)
8	3 (1.1)
9	3 (1.1)
Total Scores in ranges	
1-4 scores	189(67.9)
5- 10 scores	89 (32.1)

Source: Field data, 2017

Table 8 reveals the total diversity range scores of father’s families. From the table, 68% of the father’s families have a total diversity scores ranging from 1-4 while 32.1%% have diversity of 5-9. In all, the majority of father’s families involved in the study have low dietary diversity score, using the Minimum Dietary Diversity for Women (MDD-W) indicator guide (FAO & FHI 360, 2016). It was also found out that some homemakers did not cook any meal at home for their family members throughout the whole day.

A test of difference using the paired sample t test was used to determine whether there is difference in the total dietary diversity score of fathers (DDS) and that of the total dietary diversity score of father’s family.

Table 9: Paired Sample t test on the Difference in Dietary Diversity of Father’s Families and that of Dietary Diversity of Fathers

	N	M	SD	t	df	Sig.
Fathers total dietary diversity	278	4.5072	1.37734	6.337	227	.000
Families total dietary diversity	278	3.9173	1.9197			

** Significance level .05(**n**) Sample, (**M**) Mean, (**SD**) Standard deviation

(**df**)degree of freedom

Source: Field data, 2017.

A test of difference using the paired sample t test was used to determine whether the total dietary diversity score of fathers was higher than that of their family. Table 10 shows that mean of fathers’ scores (M= 4.5072, SD = 1.37734) is significantly higher than the mean of father’s family dietary diversity t= 6.337, df = 227, sig < 0.05). There is evidence indicating a statistically significant difference in the scores of fathers’ dietary diversity and father’s family dietary diversity. The results in Table 10 imply that father’s dietary diversity is higher than that of the dietary diversity of families which deviates from assumptions that women often have access to more healthy foods as well as eating guidelines, (Oakes & Slotterback, 2001; Rappoport, Peters, Downey, Mccann, &

Huffcorzine, 1993). The results further show that although fathers' dietary as at the time of the study was lower, it was far higher than that of the dietary diversity of father's family. Hence, it can be said that fathers in the study dietary diversity is far higher than that of their immediate families. These findings contrast with findings from other studies highlighting men's diet to be poorer than that of women, (Mróz et al, 2011; Roos et al. 1998; Turrell, 1997; Dumbrell & Mathai, 2008).

The only explanation to this effect gears towards the fact that majority of the homemakers in Mankessim engage in buying and selling activities in the market or shops. There was the possibility of getting to the market early on market days to procure goods for sale, or meet customers early for trading activities and not coming home early enough to have ample time for evening meals as highlighted in the findings of Ekpenyong (2015) who stated, that larger numbers of women in the work force with less time to prepare meals for the family, were among the various factors that contributed to the changes in dietary patterns in urban area. Thus, this study could argue that homemakers generally are often not able to prepare meals for their families throughout the whole day which could run through weeks, months. In support, Arganini et al, (2012) reiterated that social changes such as the increased participation of women in the workforce had led to reduced time available for food selection and meal preparations. This situation meant that fathers had to rely on meals sold outside home for the day to support their need for foods.

In the United Kingdom Gough & Conner (2006) found that masculinity was associated with consumption of convenience foods, meat and beer, whereas healthier behaviors such as vegetarianism and domestic cooking, increased consumption of fruits and vegetables were described as feminine, and discordant with masculine culture. However, this study had different findings as the women's consumption of more healthy options was not evident. Further to this Mróz et al, (2011) argued that because women tend to control family food provisions, it contributes more to family dietary quality and therefore considerations must be geared towards the interactions between men and the women in men's food choice behaviours.

Perceptions of Fathers on Dietary Diversity

This section of the study sought to examine the perception of fathers regarding their dietary diversity. Specifically, it sought to examine whether fathers have a positive or negative perception towards their dietary diversity. Given this prelude, respondents were asked to provide their response to items 30-39 on the questionnaire. The responses of the fathers are shown in Table 10.

Table 10: Perceptions of Fathers on Dietary Diversity

Statement	Strongly Disagree n (%)	Disagree n (%)	Uncertain n (%)	Agree n (%)	Strongly Agree n (%)	Mean	SD	Remark
The concept of dietary diversity is the same as that of balanced diet.	14 (5.0)	51 (18.3)	19 (6.8)	115 (41.4)	77 (27.7)	3.69	1.20	Accepted
Dietary diversity allows one to get all the nutrients needed for the body to function properly.	9 (3.2)	20 (7.2)	14 (5.0)	124 (44.6)	109 (39.2)	4.10	1.01	Accepted
Dietary diversity prevents diet related diseases such as anaemia, diabetes, hypertension, stroke,	9 (3.2)	23 (8.3)	20 (7.2)	108 (38.8)	117 (42.1)	4.09	1.06	Accepted
Dietary diversity increases your interest in food and arouse your appetite	13(4.7)	29 (10.4)	44 (15.8)	118 (42.4)	73 (26.3)	3.75	1.10	Accepted
Men will not be healthy if they omit certain food groups from their diet completely	43 (15.5)	38 (13.7)	28 (10.1)	113 (40.6)	54 (19.4)	3.47	1.39	Accepted

Mean ranges: SD (00-1.0), D (1.1-2.0), U (2.1-3.0), A (3.1-4.0), SA. (4.1- 5.0), Mean of means: 3.82, Mean of SD: 1.52.

Table 10 cont'd

Statement	Strongly Disagree N (%)	Disagree N (%)	Uncertain N (%)	Agree N (%)	Strongly Agree N (%)	Mean	SD	Remark
Women and children need more diversified diet than men or fathers.	39 (14.0)	83 (29.9)	20 (7.2)	70 (25.2)	63 (22.7)	3.13	1.43	Rejected
Men need more starchy foods than the other food groups due to their masculinity	21 (7.6)	73 (26.3)	34 (12.2)	52 (18.7)	96 (34.5)	3.47	1.39	Rejected
It is more important to reduce hunger and starvation than to encourage the consumption of diversified diet.	73 (26.3)	80 (28.8)	25 (9.0)	60 (21.6)	37 (13.3)	2.67	1.42	Don't Know
Lack of diversified diet is not a big deal if you take vitamin supplements to make up for nutrients that might be lacking in your body.	16 (5.8)	77 (27.7)	49 (17.6)	69 (24.8)	65 (23.4)	3.33	1.27	Rejected
Few food groups can equally provide essential nutrients needed for the body to function well.	27 (9.7)	86 (30.9)	41 (14.7)	47 (16.9)	76 (27.3)	3.21	1.39	Rejected

Mean ranges in reverse coding: SD (4.1-5.0), D (3.1-4.0), U (2.1-3.0), A (1.1-2.0), SA. (00- 1.0), Mean of means: 3.162, Mean of

Source: Field data, 2017

The result in Table 10 reveals the perceptions of fathers on dietary diversity. The sixth to tenth statements were inversely coded from the first to fifth statements because they were negative statements or untrue statements. Thus, a score of agreeing to a positive statement correlates with the score of disagreeing to a negative statement or an untrue statement. The majority of the fathers consented to all the first five statements reflecting perception on dietary diversity and this was indicated with a grand mean score of 3.49, and disagreed to the sixth to tenth statement and this was shown with a grand mean score of 3.16.

Of all the statements on perception of fathers, it appears from the findings that fathers were uncertain on the statement that “it is more important to reduce hunger and starvation than to encourage the consumption of diversified diet” and this was indicated with a mean score of 1.42. As to what could have been the position of fathers on this remark, the data was silent.

Aside the uncertainty on the perception of fathers on the latter statement, fathers have strong perceptions on the notions that “dietary diversity allows one to get all the nutrients needed for the body to function properly” and also, dietary diversity prevents diet related diseases such as anemia, diabetes, hypertension, stroke, and all these were indicated with mean scores of 4.10 and 4.09 respectively. The position of the fathers in this case clearly tells that they are well informed on the utility on embarking on more diversified diets, which to these could deter them from inflicting on themselves certain diet related non-communicable diseases in the area of anemia, diabetes, hypertension and stroke.

On the dietary diversity, the perception of the fathers was that; “dietary diversity is the same as that of balanced diet”, “dietary diversity increases your interest in food and arouse your appetite” and “men will not be healthy if they omit certain food groups from their diet completely” and all these were shown with mean scores of 3.69, 3.75 and 3.47 respectively. The results of the fathers in this section implies that fathers involved in the study aside the fact of being educative that the concept of dietary diversity is synonymous to balanced diet, are also aware that every component of the balanced diet is necessary and for that cannot be omitted.

Notwithstanding the positive perceptual position of fathers on dietary diversity, data from Table 11 further shows that fathers largely do not have patriarchal perceptions on dietary diversity. This is clearly shown in the area whereby fathers disagreed to the statement that “women and children need more diversified diet than men or fathers” and also “men need more starchy foods than the other food groups due to their masculinity”. Although, the perceptions of fathers on this statement was right, they, also disagreed to the statement that “lack of diversified diet is not all that important once vitamin supplements are taken to make up for nutrients that might be lacking in your body” and also “few food groups can equally provide essential nutrients needed for the body to function well” and these were indicated with mean scores of 3.33 and 3.21 respectively. These findings presuppose that fathers have positive insight on issues relating to dietary diversity.

In sum, the results on the perception of fathers on dietary diversity indicate that fathers have positive perception on issues relating to dietary diversity which confirms other findings, (Sobal, 2005; Arganini, Saba, Comitato, Virgili & Turrini, 2012). Precisely, fathers were adequately aware that the concept of dietary diversity is the same as balanced diets, and will not be healthy if they omitted certain food groups from their diets completely. The fathers were of the opinion that, dietary diversity allows one to get all the nutrients needed for the body to function properly and also added that dietary diversity prevents diet related diseases such as anaemia, diabetes, hypertension, and stroke. Fathers indicated that their thoughts had not been abused on the erroneous perceptions that women and children needed more diversified diet than men or fathers and also men needed more starchy foods than the other food groups due to their masculinity as suggested by (Mróz et al, 2011). To summarize the overall perception of fathers on dietary diversity, a total score on perception was calculated, and the results presented in Table 11.

Table 11: Total Scores of The Perception of Fathers on Dietary Diversity

Raw Scores	N (%)	Raw Scores(cont'd)	N (%)
00	1 (0.4)	36	35 (12.6)
18	1 (0.4)	37	13 (4.7)
23	2 (0.7)	38	27 (9.7)
24	4 (1.4)	39	10 (3.6)
25	4 (1.4)	40	10 (3.6)
26	4 (1.4)	41	4 (1.4)
27	7 (2.5)	42	8 (2.9)
28	8 (2.9)	43	6 (2.2)
29	7 (2.5)	44	2 (0.7)
30	17 (6.5)	45	2 (0.7)
31	7 (2.5)	46	2 (0.7)
32	19 (6.8)	47	3 (1.1)
33	23 (8.3)	49	1 (0.4)
34	29 (10.4)		
35	22 (7.9)		
Total Scores			
in ranges			
00-24 scores	8 (2.9)		
25 score	4 (1.4)		
26-49 scores	266 (96.1)		

Source: Field data, 2017

The result reveals the total perceptions scores of fathers on dietary diversity. From Table 11, it is evident that 7 out of the 278 fathers had perception diversity scores of 2.5% while the rest (96.1%) scored a perception diversity ranging from 26- 49. With the average scores being 25, it was clear that the majority (266) of fathers involved the study had a positive perception towards dietary diversity. Studies on perception of men on healthy dietary practices in some develop countries found out that men's perceptions of healthy eating differed from those of women (Mróz et al, 2011), and women had more positive opinions on healthy eating guidelines than men, (Gough & Conner, 2006; Courtenay, 1998, 2000; Kandrack, Grant, & Segall, 1991; Lonquist, Weiss, & Larsen, 1992; Roos, Prattala & Koski, 2001). The study probed further to assess the extent to which the diversity of families affects that of the fathers as presented.

The Extent to Which Dietary Diversity of Families and / or Perception of Fathers on Dietary Diversity Predicts the Dietary Diversity of Fathers

To investigate the extent to which dietary diversity of families and / or perception of fathers on dietary diversity predict the dietary diversity of fathers, a multiple linear regression analysis was used to compare the variables which is shown in Table 12.

Table 12: Comparison of the Extent to Which Dietary Diversity of Families or Perception of Fathers on Dietary Diversity Predicts the Dietary Diversity of Fathers

	B	SE	b	P	95% CI	Remark
Dietary diversity of father's family	1.814	.144	.605	<.000	(1.531, 2.097)	Accepted
Fathers' perception of on dietary diversity	-.020	.012	-.078	.105	(-0.045, 0.004)	Rejected

** Significance level .05

- a. Predictors: (Constant), Dietary diversity of fathers' families, Perception of fathers on dietary diversity
- b. Dependent variable:), Dietary diversity of fathers

Source: Field data, 2017

The statistical relation between dietary diversity of fathers' families and perception of fathers on dietary diversity as against the dietary diversity of fathers' is shown in Table 12. The regression equation described 36.6% of the total variation in fathers' dietary diversity. The regression ANOVA was significant, $F(2, 274) = 80.798, p < 0.05$. Parameter estimation results indicated that dietary diversity of father's family is a positive predictor of the fathers' dietary diversity, $b = .605, SE = .144, t = 12.616, p < .000, 95\% CI: [1.531, 2.097]$. This implies that as fathers' family dietary diversity increases that of the fathers also increases.

The results from Table 12 indicate that the dietary diversity of fathers' families is a positive contributor towards the dietary diversity of fathers possibly because women often plan and prepare the diets as found in the study of Mróz et al, (2011), that women control the diets of their husbands and as such when investigating dietary practices of men, the women in their lives should also be considered. Although, as shown in Tables 11 and 12 that fathers have a high perception regarding dietary diversity; this does not trickle or contribute towards their dietary diversity. Thus, it can be argued from the findings that the dietary diversities of fathers to an extent is contingent on the dietary diversity of fathers' families and not that of their perceptions on dietary diversity to support the findings of (Sobal, 2005). This could be due to an assertion made by Lennenäs, Fjellström, Becker, Giachetti, Schmitt, Remaut de Winter and Kearney (1997) that the taste of the food tend to affect the food choice of males more than their perception. An exception was found by Worsley (2002), that nutrition knowledge related to food behaviours has the potential to modify food behaviours, (Vakili, Abedi, Sharifi, & Hosseini, 2013). A major, influential study performed by Wardle, Parmenter and Waller (2000) in England, found that nutrition knowledge was significantly associated with healthy eating habits such as fruit and vegetable intakes.

Chapter Summary

Field data collected from 278 fathers in Mankessim revealed that their demographic characteristics had no positive relationship with their dietary diversity. A negative relationship between education and dietary diversity was identified. Fathers consented to the fact that ‘the money they have’, ‘the food prepared by their wives’, ‘the food they have appetite for’, ‘the available food at home’, ‘nutritional advice they saw or heard from the media’ and ‘their understanding of healthy diet’ influenced what they ate. The data revealed a low dietary diversity within the fathers selected for the study, and even a lower dietary diversity of the fathers’ family. Positive perception of fathers on dietary diversity was identified but this did not influence their dietary diversity. It was found that, the dietary diversity of the fathers’ family contributes to some amount of dietary diversity of fathers themselves. And studies confirmed that women adopting healthier dietary practices affected the diets of their husbands, (Shattuck, White & Kristal, 1992). Homemakers therefore needed to make it a matter of importance to learn and incorporate healthy principles governing diet into meals provided for family members. Generally, the findings highlight that increases in the amount of diversity in the meals provided at home by homemakers tend to increase the DDS of fathers.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary of the study as well as conclusions based on the findings. It provides recommendations on how best dietary diversity can be encouraged amongst fathers, and the population as a whole as well as strategies homemakers can employ to provide diversified diet for their families. It concludes with areas for further study.

Summary

The study generally sought to assess dietary diversity of fathers, comparing it with that of their families and finding out whether the perception of fathers on dietary diversity or fathers families' dietary diversity influence fathers dietary diversity. A multi stage sampling procedure was used to select 300 fathers from all suburbs of Mankessim, of which 278 willingly took part in the study. Data was collected using questionnaires and interview schedule. Data was organized into percentages and frequency distribution tables. Multiple linear regression analyses were conducted to determine whether the demographic characteristics of the fathers, families' dietary diversity or perception of fathers on dietary diversity contribute to the dietary diversity of the fathers. In all, the result reflecting the determinants of what father eat are revolved in the areas of 'the money they have', 'the food prepared by their wives', 'the food they have appetite

for’, ‘the available food at home’, ‘nutritional advice they saw in book or newspaper’ and finally their ‘understanding of healthy diet’.

Key findings

Research Objectives 1

Identify factors which contribute to dietary diversity of fathers.

- i. Demographic characteristics do not contribute to fathers’ dietary diversity.
- ii. Negative relationship between father’s educational level and their dietary diversity was identified.
- iii. The determinants of what fathers eat were found to revolve around areas of ‘the money they have, ‘the food prepared by their wives’, ‘the food they have appetite for’, ‘the available food at home’, ‘nutritional advice they saw in book or newspaper’ and finally their ‘understanding of healthy diet.
- iv. The findings reveal that fathers’ do not dictate their meal patterns and their meals are prepared either by their wives or family members, food vendor or prepared by fathers themselves

Research Objective 2

Assess dietary diversity of fathers and their families

- i. Fathers have a low dietary diversity.
- ii. The dietary diversity of their families is even lower than that of the fathers themselves.
- iii. Food groups that were found to be least consumed amongst the fathers were eggs, pulses, other fruits, nuts & seeds, dark green leafy vegetables

and dairy products while those that were more consumed were ‘grains, white roots, tubers, and plantains’ and ‘meat, poultry and fish.

- iv. There were some homemakers who did not cook anything for their households they whole day. Members of their family ate meals prepared by food vendors throughout the day

Research Objective 3

Evaluate the perception of fathers on the importance of diversified diets.

- i. The study revealed that fathers have positive perception on the importance of dietary diversity.

Research Objective 4

Investigate to what extent dietary diversity of families and / or perception of fathers on the importance of dietary diversity, contribute to dietary diversity of the fathers

- i. The positive perception of fathers on the importance of dietary diversity did not influence them to consume diversified diet.
- ii. What contributed significantly to fathers’ dietary diversity was the dietary diversity of their families

Conclusions

From the literature review, it is clear that dietary diversity improves dietary quality and the likelihood that individuals will meet their daily nutrient requirements, especially essential micronutrients, for good health. Certain factors contributing to fathers’ dietary diversity were identified, their perception on the

importance of diversified diets was evaluated and to what extent dietary diversity of families and / or perception of fathers contribute to dietary diversity of the fathers was also investigated.

It is concluded that, the money available, the food prepared by wives or homemakers, appetite for food, available food at home, nutritional information in the media and fathers understanding of healthy diet, influence the dietary diversity of fathers to a large extent. In the population of fathers, nutritional needs are met by homemakers of fathers' families, food vendors and fathers themselves. Therefore, home makers, food vendors and the media can be manipulated to influence fathers to consume diversified diet.

Demographic characteristics were highlighted as negative issues that do not influence the dietary diversity of fathers. The study however, found that as fathers' educational level goes higher, their dietary diversity reduces. This could result from the lifestyle of most educated fathers. Some may not make time for meals due to busy schedules, and some possibly feed more on beverages and convenience foods other than fresh or raw foodstuffs for preparing meals since most convenience foods in our market are basically cereals, fish and milk. Higher consumption of variety of fruits, vegetables, pulses and nuts is more likely to raise the dietary diversity of the individual than the consumption of convenience foods. Fathers are refusing to eat eggs probably due to certain myths around it. Cereals and starchy roots form the major parts of fathers diet probably because they are cheaper and abundant food commodity.

The study reveals that fathers equally have dietary issues that need to be addressed. It makes clearer the inability of homes to provide diverse diets for its members, contributing to the low dietary diversity of fathers. Economic situations today have influenced a lot of home makers to work outside home, even to the extent that they do not have time to make meals for their family members the whole day. The individuals' perception on dietary diversity does not necessarily determine the amount of diversity in ones' diet.

Recommendations

Based on the findings of the study, the following recommendations were made.

1. Current practices regarding food safety and hygiene by food vendors should include key nutrition principles of balance and variety to support the nutritional needs of their customers. This is because it was found out that some fathers eat meals from food vendors throughout the day. This is possible because studies have revealed the possibility of food vendors and restaurants successfully implementing nutrition intervention strategies, (FAO, 2004; Choi et al, 2011; Lee & Kim, 2003; Tarro et al, 2017).
2. More education is needed in the media to make people understand the importance of having a diversified menu.
3. Mothers should plan family meals such that each day's meals provide variety. They should incorporate variety of food commodities found in the Ghanaian market in feeding their families.

4. There should be efforts at stabilizing food prices so that they are not affected by inflation since an individual's income and cost of food affects his dietary diversity.

Suggestion for Further Study

1. Another study will be useful to investigate the reasons the negative relationship between Fathers' perception on dietary diversity and their low dietary diversity.
2. It will also be useful to find out the relationship between the lower dietary diversity of the families in comparison with that of the fathers.
3. Studies could be conducted in other spaces or regions to find the situation which exists there.

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APPENDICES

APPENDIX A

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

Direct 03320-91097 : 0332091194
Telegrams & Cables: University, Cape Coast



University Post Office
Cape Coast, Ghana

Our Ref: VTE/IAL/V.2/75

3rd April, 2017

The Chairman
Institutional Review Board
U.C.C.

Dear Sir,

INTRODUCTORY LETTER

We have the pleasure of introducing to you Ms Patricia Glago who is an M.Phil student of this Department.

We would be very grateful if you could grant her ethical clearance to enable her obtain data for her thesis on the topic: "Assessing Dietary Diversity of Fathers in Mankessim".

We are counting on your usually cooperation.

Thank you.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'Christina Boateng'.

Dr. (Mrs.) Christina Boateng
HEAD OF DEPARTMENT

APPENDIX B

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 03321-33172/3 / 0207355653/ 0244207814

C/O Directorate of Research, Innovation and Consultancy

E-MAIL: irb@ucc.edu.gh

OUR REF: UCC/IRB/A/2016/147

YOUR REF:

OMB NO: 0990-0279

IORG #: IORG0009096



19TH JUNE, 2017

Ms. Patricia Glago
Department of Vocational and Technical Education
University of Cape Coast

Dear Ms Glago,

ETHICAL CLEARANCE –ID :(UCCIRB/CES/2017/18)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted **Provisional Approval** for the implementation of your research protocol titled ‘ **Assessing Dietary Diversity of Fathers in Mankessim.**’

This approval requires that you submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

Please note that any modification of the project must be submitted to the UCCIRB for review and approval before its implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,
.....
ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST
Date:.....
Samuel Asiedu Owusu
Administrator

APPENDIX C

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD INFORMED CONSENT FORM

Title of Study: Assessing Dietary Diversity of Fathers in Mankessim

Investigator: Patricia Glago

Mobile number: 0247428147 /0208582527 E-mail: patricia.glago@stu.ucc.edu.gh

Introduction

The purpose of this study is to assess the diversity of diets of fathers in Mankessim. Specifically, the researcher wants to know if fathers in the family consume diversified diets for healthy living. This study is purely a research for academic purpose only. You are being invited to participate in this study because you are a father. The findings of this study will help men to learn more about dietary practices that will promote their health for the good of the whole family.

Description of Procedure

If you agree to participate, you will be required to fill out a survey questionnaire which will be provided by Ms. Patricia Glago and three (3) other assistants bearing the identity card of Ms. Glago. The questionnaire will be filled at the time of visit to your home and should take a maximum duration of 25 minutes. You will be required to allow your wife or the person responsible for preparing your family's meal fill part of the questionnaire. Your personal information will be protected before, during and after the study.

Confidentiality

Your identity as a participant in this study will remain anonymous. Your personal information will be protected to the best of my ability. You will not be named in any report.

Voluntary Participation

Your participation in this study is voluntary. If you decide to refuse or discontinue participation during this study, I will honour it quickly and unconditionally.

Your rights as a Participant

This research has been reviewed and approved by the Institutional Review Board of University of Cape Coast (UCCIRB). If you have any questions about your rights as a research participant you can contact the Administrator at the IRB Office between the hours of 8:00 am and 4:30 p.m. through the phones lines 0332133172 and 0244207814 or email address: irb@ucc.edu.gh.

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title **Assessing Dietary Diversity of Fathers in Mankessim** has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

.....

.....

Date

Name and signature or mark of volunteer

APPENDIX D

Mankessim Senior High Tech. School.

P.O. Box 50,

Mankessim.

3rd April, 2017

Traditional rulers,

Assembly Members and Opinion Leaders.

Mankessim

Dear Sir / Madam,

**APPLICATION FOR APPROVAL TO CONDUCT A STUDY IN
MANKESSIM**

I am Patricia Glago, a level 850MPhil (Home Economics) student with registration number ED/HEP/15/0012. I want to conduct a study on the topic **Assessing Dietary Diversity of Fathers in Mankessim**. This study requires participants to provide information concerning their dietary consumption pattern. I am seeking your approval to visit your community to select participants for the study. After selection, I will come a second time to administer survey questionnaires.

I hope my application will be considered.

Thank you.

Yours faithfully

Patricia Glago

(0247428147)

NOTE: Please sign below to signify your approval

.....
NAME	POSITION IN THE COMMUNITY	SIGNATURE

APPENDIX E
UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
QUESTIONNAIRE FOR FATHERS IN MANKESSIM IN THE
MFANTSEMAN MUNICIPALITY

I am a student from the University of Cape Coast offering M.Phil. (Home Economics). I am conducting a study on the topic: Assessing Dietary Diversity of Fathers in Mankessim in the Mfantseman Municipality. I am very much aware of your busy schedule but your involvement in this study is very vital. I therefore entreat you to kindly respond to the following items appropriately to help me find answers to the study. The confidentiality and anonymity of your responses are fully assured. Thank you. Patricia. Glago.

Please answer questions in each section to the best of your knowledge. Try to be as truthful as possible.

Part I to IV of this questionnaire is to be completed by the father.

Kindly tick [] the option that best suits your response in each section, (one best response).

Part I

Personal details

1. How old are you? 25 – 29 [] 30 – 34 [] 35 – 39 [] 40 – 45 []
2. What is your current educational level?
 - University or college or equivalent []

- Intermediate between secondary level and university (e.g. technical training) []
 - Secondary school []
 - Basic school/Middle School only (or less) []
 - Not schooled []
3. Which category best describes your religion?
- Christianity []
 - Islam []
 - Traditional []
 - Other, specify [] _____
4. Marital status: Married [] Divorce [] Consensual union []
Widowed []
5. How long have you been married or been together? Less than 2 years [] 2-5 years [] 5 – 10 years [] above 10 years []
6. How many children do you have? (Those you are currently caring for) 1- 3 [], 4 – 6 [] 7 – 10 [] above 10 []

Part II

Eating Habit.

7. Which best describes your eating situation? Please select one.
- I buy most of my meals from outside home. []
 - I prepare my meals most of the time. []
 - My meals are normally prepared by a family member, (wife, mother, sister, etc) []

- Sometimes I buy meals outside and at other times I eat meals prepared at home. []

8. What category best describes your eating habits? Please select one.

- Omnivorous (consumes all types of food) []
- Semi-vegetarian (avoids all red meat but consume poultry and fish) []
- Lacto-vegetarian (avoids all flesh food and eggs but consume dairy products) []
- Ovo-vegetarian (avoids all flesh food and dairy but consume egg) []
- Lacto-ovo-vegetarian (avoids all flesh food but consume dairy products and eggs) []
- Vegan (avoid all animal products) []
- Other, specify _____

9. Who makes decision about your family's meal?

- You (father) []
- Your wife []
- Any other member of the family can decide at any time []

Kindly tick [✓] your opinion on the factors that determine what you eat on daily basis?

Choose one response that best matches with each statement.

Statement	Scale of Agreement				
	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
10. The money I have					
11. The food my wife prepares / the food prepared at home					
12. The food I have appetite for					
13. The work I do.					
14. The availability of the food					
15. My friends					
16. The nutritional advice given to me by my Doctor or Dietician					
17. The nutrition					

information that I have heard read or seen in newspapers, books, television, radio, experts, etc.					
18. My understanding of healthy diet.					

Part III. Dietary Diversity of Father.

Please describe the foods (meals and snacks) that you ate or drank yesterday during the day and night, whether at home or outside the home. Start with the first food or drink of the morning.

	Breakfast	Snack	Lunch	Snack	Dinner	Snack
Meal						
Ingredients						

Within the last 24hrs, did you eat from any of the food groups below? Yes /

No

Food Group	Examples	Yes = 1 No= 0
19. Grains, white roots and tubers, and plantains	Corn/ maize, rice, wheat, sorghum, millet, or any other grains or foods made from these e.g. Bread, macaroni, indomie, porridge, “etew”, “hausakooko”, banku”, rice balls (omotuo), boiled corn “waakye”, “kenkey”, “TZ”, “Brobe/ Ntwebu”, yam, white potatoes, (Santwum), white, cassava, cocoyam, sweet potato, etc or foods made from roots mpotompoto, fufu, gari, ,etc	
20. Pulses (beans, peas and lentils)	White beans, red beans, bambara beans, soya beans, etc	
21. Nuts & seeds	Groundnut paste, almond nut, groundnut, Agushie, “neri”, etc	
20. Dairy (milk and milk products)	Milk, cheese, fan milk, yogurt, cowbell etc	
23. Meat, poultry and fish	Beef, goat, chicken, offal, (liver, kidney), Fresh, dried, smoked or can fish, etc.	
24. Eggs	Egg from hen or duck.	

25. Dark green leafy vegetables	Kontonmire, dandelum, spinach, cassava leaves, “Ayoyo” lettuce, etc	
26. Other vegetables	Onion, garden eggs, pepper, green pepper, green beans, cucumber, okra, broccoli, etc	
27. Vitamin A rich fruits and vegetables	Ripe mango, ripe pawpaw, apricot, cantaloupe, dried peach etc. also 100% fruit juice made from these. Carrot, palm nut, tomatoes, cabbage, beetroot, etc.	
28. Other fruits	Watermelon, orange, banana, sour sop (aluguntugwin), cherimya, pear, pineapple, guava, apple, grapes etc.	

29. Total score of diversity: 0 – 4 [], 5 – 10 []

Part IV

Perception of father on dietary diversity

Statement	Scale of Agreement				
	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
<p>30.</p> <p>The concept of dietary diversity is the same as that of balanced diet.</p>					
<p>31.</p> <p>Dietary diversity allows one to get all the nutrients needed for the body to function properly.</p>					
<p>32.</p> <p>Dietary diversity prevents diet related diseases such as anemia, diabetes, hypertension, stroke, etc</p>					

<p>33.</p> <p>Dietary diversity increases your interest in food and arouse your appetite</p>					
<p>34.</p> <p>Men will not be healthy if they omit certain food groups from their diet completely</p>					
<p>35.</p> <p>Women and children need more diversified diet than men or fathers.</p>					
<p>36.</p> <p>Men need more starchy foods than the other food groups due to their masculinity</p>					
<p>37.</p> <p>It is more important to</p>					

<p>reduce hunger and starvation than to encourage the consumption of diversified diet.</p>					
<p>38. Lack of diversified diet is not a big deal if you take vitamin supplements to make up for nutrients that might be lacking in your body.</p>					
<p>39. Few food groups can equally provide essential nutrients needed for the body to function well.</p>					

Part V

Dietary Diversity of Father’s family (to be answered by wife or the one responsible for preparing the family’s meal)

Please describe the foods (meals and snacks) that you prepared at home yesterday during the day and night. Start with the first meal or drink of the morning.

	Breakfast	Snack	Lunch	Snack	Dinner	Snack
Meal						
Ingredients						

Within the last 24hrs, did you cook from any of the food groups below? Yes /

No

Food Group	Examples	Yes = 1 No= 0
40. Grains, white roots and tubers, and plantains	Corn/ maize, rice, wheat, sorghum, millet, or any other grains or foods made from these eg. Bread, macaroni, indomie, porridge, “etew“TZ”, “hausakooko”,”, banku”, rice balls (omotuo), boiled corn “waakye”, “kenkey”, “Brobe/ Ntwebu”, white potatoes, (Santwum), white	

	yam, cassava, cocoyam, sweet potato, etc or foods made from roots mpotompoto, gari,fufu,etc	
41.Pulses (beans, peas and lentils)	White beans, red beans, bambara beans, soya beans, etc	
42. Nuts & seeds	Groundnut paste, almond nut, groundnut, Agushie, “neri”, etc	
43.Diary (milk and milk products)	Milk, cheese, fan milk, yogurt, cowbell etc.	
44.Meat, poultry and fish	Beef, goat, chicken, offal, (liver, kidney), Fresh, dried, smoked or can fish, etc	
45.Eggs	Egg from hen or duck	
46. Dark green leafy vegetables	Kontonmire, dandelum, spinach, cassava leaves, “Ayoyo” lettuce, etc	
47.Other vegetables	Onion, garden eggs, pepper, green pepper, green beans, cucumber, okra, broccoli, etc	
48.Vitamin A rich fruits and vegetables	Ripe mango, ripe pawpaw, apricot, cantaloupe, dried peach etc. also 100% fruit juice made from these. Carrot, palm nut, tomatoes, cabbage, beetroot, etc.	
49. Other fruits	Watermelon, orange, banana, sour sop (aluguntugwin), cherimya, pear, pineapple, guava, apple, grapes etc.	

50. Total score of diversity: 0 – 4 [], 5 – 10 []

APPENDIX F

Summary of sample composition by demographic characteristics

Demography	Category	Respondents (n= 278)	
		n	%
Age	25- 29 years	49	17.6
	30- 34 years	53	19.1
	35- 39 years	61	21.9
	40- 45 years	114	41.0
Level of Education	University Education	60	21.6
	Sec or Tech School	16	5.8
	Basic School/MSLC	68	24.5
	Primary Sch.	117	42.1
	Not schooled	16	5.8
Religion	Christianity	222	79.9
	Islam	45	16.2
	Traditional	6	2.2
Marital status	Married	231	83.1
	Divorce	17	6.1
	Consensual union	22	7.9
	Widowed	6	2.2
Years of marriage	< 2 years	39	14
	2- 5years	91	32.7
	5- 10 years	59	21.2
	> 10 years	85	30.6
Nos. of children	1-3 children	178	64
	4-6 children	73	26.3
	7-10 children	10	3.6
	>10 children	4	1.4

Note: n =Response, %= Response rate