

**UNIVERSITY OF CAPE COAST**

**ASSESSING MOTHER-RELATED FACTORS THAT AFFECT THE NUTRITIONAL STATUS OF  
CHILDREN (0-6 YEARS) IN JAMES TOWN IN THE ACCRA METROPOLIS**

**GLORIA NYANTAKYI**

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College of Education Studies, University of Cape Coast, in partial fulfilment of the  
requirements for the award of Master of Philosophy Degree in Home Economics**

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## DECLARATION

### Candidate's 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: Gloria Nyantakyi

### 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.*

Principal Supervisor's Signature:..... Date:.....

Name: Dr. Faustina Yaa Amoako-Kwakye

Co-Supervisor's Signature:..... Date:.....

Name: Dr. (Mrs.) Augusta Adjei-Frempong

## ABSTRACT

The utilisation of the Millennium Development Goal (MDG) 4 as a measure to reduce child mortality rate to two-thirds by 2015 continues to be a major concern to stakeholders including the Government of Ghana. In Ghana, several intervention programmes have been employed mostly by Government through the Ministry of Health and the Ghana Health Service. Stakeholders believe that nutrition of children is a key component in this effort. In the pursuance of this goal, the nutritional knowledge of mothers as well as the status of their children becomes prominent. For this reason, this study evolved to identify the mother-related factors that influenced the nutritional status of children (0-6 years). It involved residents of James Town, under the administration of Accra Metropolitan Assembly of the Greater Accra Region.

A cross-sectional descriptive survey was adopted and 172 mothers selected through the use of the simple random sampling technique. These mothers whose children were between 0-6 years responded to questionnaires. Data were analysed using both descriptive and inferential statistical tools including frequencies, percentages, and the Chi-square test.

The results showed demographic and socio-cultural factors as significant determinants of mothers' nutritional knowledge, which in turn, has a significant influence on the nutritional status of their children. It was also found that there was a significant association between mothers' nutritional knowledge and children nutritional status. It is therefore recommended that in order to achieve the MDG 4, improved maternal nutritional literacy and good child nutrition should be stressed by all stakeholders.

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**DEDICATION**

To my husband, Enoch and our children, Adom and Nhyria Mintah

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## CHAPTER ONE

## INTRODUCTION

### Background to the Study

Invariably, the birth of the first baby has not differed since inception or the creation of the world as women have always been the ones to feed and support the growth of children (Abbi, Christian, Gujaral & Gopaddas, 1998). According to the United Nations Children's Fund [UNICEF] (2013), well-nourished children are more likely to be healthy, productive and intelligent. It is argued that good nutrition benefits families, their communities and the world as a whole.

Several factors including the ignorance concerning the provisions of adequate nutritious meals affect the nutritional growth and development of children (Food & Agriculture Organisation [FAO], 2008). Sims and Morris (as cited in Sodiya, 2010) found out that socio-economic status and the ability of women to provide food and primary care have potential relationships with children's nutrition. The nutritional status of children, and the immediate environment, and parents' socio-economic status were highlighted in related studies as affecting children's nutritional levels (Amegah, 2009). FAO (2008) suggested that a serious dietary deficiency tends to damage a child's health and inhibits its growth which could further impair the mental development. FAO argued that significant contributors to children's health such as quality care and feeding largely depends on women's educational level, social status and the kind of work they do. It could be said that the educational level of women and their basic understanding of health care and nutritional needs of children support the growth of a child.

As improved levels of women education relate to reduced child mortality so do low levels of education relate to malnourished children (Veneman, 2007). The nutritional status of children which are linked to the quantity of nutrients consumed, affects the body's ability to utilise the nutrient to meet its metabolic requirement (UNICEF, 2013). The United Nations Children's Fund [UNICEF] (cited in Smith & Haddad, 2000) developed a conceptual framework of the determinants of the nutritional status of children indicating that the quality of these determinants, in turn, is determined by the underlying food security status of the household in which a child resides. However, of equal importance is the availability of health services and a healthy environment and the quality of care the child receives that is whether the available dietary resources for good nutrition are used effectively through appropriate caring practices. Sustained healthy and active life is only possible when these underlying determinants – food, health, and care – are each maximised. None of these is sufficient in itself, but all are necessary for good child growth.

According to Nikoi (2011), a good nutritional status among children in a given society is reflective of the people's prospects as they are the future leaders. Improved nutrition and health enhances the healthy living ability of children, which is believed to have influence on their cognitive abilities. This is because good nutrition requires a certain amount of macro-nutrients such as energy, protein, fats and micro-nutrients. In this light, a lack of one or more of the above factors could cause problems for children, a situation known as malnutrition.

In the third world countries such as Ghana, under-nutrition is the most common phenomenon found largely among pre-school age range. According to the Ghana Statistical Service [GSS] (2009) and Nikoi (2011), out of the three anthropometric indicators of malnutrition (stunting, wasting and underweight), stunting is the most prevalent among children aged 0-4 years in Ghana. About 28% are stunted (height-for-age below 2 SD) compared to 9% wasted (weight-for-height below 2 SD) and 14% underweight (low weight-for-age). The authors continued that stunting is higher among rural (32%) than urban children (21%), and children of the poor in both rural and urban areas are worse off relative to the national average. Furthermore, the literature included Ghana in the list of classified countries in the medium-to-high range of malnutrition (Aheto, Keegan, Taylor & Diggle, 2015).

There are possible factors such as the shortage of calories and/or protein referenced for the normal growth and body maintenance of children: a condition that is technically referred to as the Protein Energy Malnutrition (PEM). Again, under-nutrition accounts for a number of adverse impacts on individuals and families, which affects the society in the long-run. Additionally, under-nutrition is a contributory factor and a high cost to the society as it reduces labour productivity and increases morbidity and mortality. At the same time, economic factors like low level of income tends to influence the type and amount of food consumed by individual and for that matter children. The high cost of protein food commodities has the potential of affecting the nutritional requirement of those who cannot afford to buy.



Nutritional status of children is an indication of a host of factors: access to food, distribution of food within the household, quantity of food intake by the children and decision making on food expenditure, since low purchasing power in many cases disallows the acquisition of sufficient food. There is the possibility of the high cost of foods affecting the nutritive value of commodities such as meat, fish and eggs. This is because women of low financial status may be prevented from purchasing such food items.

Nutritional status of children is an indication of the host of factors. Of these factors, access to food, distribution of food within the household, quantity of food intake by the child and decision making on food expenditure can be considered to be highly influencing the level of malnutrition. In a traditional male dominated society, most of the women are housewives rather than earners for the family, however, this situation has changed over the years.

Majority of women currently play a dual role by working to earn a living, work full-time and work to support the family. Generally, women have the responsibility of ensuring that children particularly, pre-school pupils are not only well fed, but obtain their nutritional requirements.

According to the literature, maternal education has emerged as a key element of addressing child malnutrition (e.g., UNICEF, 2013; Sodiya, 2010; Amegah, 2009; Senbanjo, Adeodu & Adejuyigbe, 2007; FAO, 2008). However, the studies done to discover the role of mothers in improving nutritional conditions of their children are limited. In view of this gap, this study investigated the role of mothers in alleviating child malnutrition in Ghana.

James Town is considered as the birthplace of Accra, the capital city of Ghana (Accra Metropolitan Assembly [AMA], 2014). Together with Ushertown, they are both located directly at the east of the Korle Lagoon in the Accra Metropolis. James Town is made of indigenous Ga people who are mainly into fishing. It is located in the midst of strategic and important national institutions such as the Supreme Court of Ghana, Makola Market and many financial institutions. James Town with its rich and interesting colonial and slaving history and vibrant Ga culture, lacks several important infrastructural facilities like toilets, bathrooms, kitchens, stores, water and electricity.

According to the 2010 Population and Housing Census, there were 1,848,614 people in AMA with over 250,000 residing in James Town alone resulting in pressure upon the existing infrastructural facilities. In view of their fishing activities, education is largely not considered as a priority by parents and children, which has caused teenage pregnancy cases to be on the ascendency.

### **Statement of the Problem**

Malnutrition (under-nutrition) has for a long time been recognised as a consequence of poverty since most world's malnourished children live in the developing nations of Asia, Africa and Latin America (Babar, Muzaffar, Khan & Imdad, 2010). According to several researchers including Beaton and Swiss (1983), calories are usually more limiting than protein in the first six years of the life of a child as a result of low income of families.

According to Benson and Shekar (2006), child under-nutrition is as a result of the lack of time and limited capacities of caregivers. This could result in

a substantial proportion of them not able to access and effectively use at all times the food and health services they need for a healthy life. FAO (2008) also estimated that 200 million people on the continent, both children and adults, are under-nourished. Malnutrition underlies 55% percent of all deaths of children under five years of age globally (Pelletier, Frongillo, Schroeder & Habicht, 1994), and under-nutrition is the major risk factor for over 28 percent of all deaths in Africa – some 2.9 million deaths annually (Ezzati, Lopez, Rodgers, Vander-Hoorn & Murray, 2003). The United Nations (2000), therefore, formulated the MDGs specifically Goal 4 to reduce child mortality by two-thirds, between 1990 and 2015.

Available data from the Ghana Demographic and Health Survey (GDHS, 2011) showed that peri-urban area like James Town has underweight, stunting and wasting too prevalent among children as 16%, 29.5% and 7.6%, respectively. James Town, as described earlier, is deprived of several critical infrastructural facilities with several cases of teenage and unplanned pregnancies. According to the Ghana Health Service (2014), there were 266, 335 and 532 teenage pregnancies recorded in James Town in years 2012, 2013 and 2014, respectively. These girls eventually dropped out of school and engaged in petty trading and in some cases prostitution (Henry & Fayorsey, 2004). It is argued that underweight, stunting and wasting among children decrease with an increase in mother's level of education (Nikoi, 2011) and wealth quintile (GSS, 2009). It, therefore, stands to reason that mothers with little or no education and sound economic status as in the cases of mothers in James Town are likely to have children with these

nutritional challenges. This motivated me to investigate the above assertions and also identify other multiplicities of factors that may be responsible for such conditions for well-informed child health programmes in the area.

### **Purpose of the Study**

The purpose of the study was to assess mother-related factors affecting the nutritional status of children (0-6 years) in James Town in Accra, Ghana.

Specifically, the study sought to:

1. find out the background characteristics such as age, level of education, and marital status of mothers in James Town.
2. identify the sources of mothers' nutritional knowledge.
3. investigate the nutritional knowledge of mothers of the children.
4. examine the social-cultural factors that affect level of nutritional knowledge of the selected mothers in the study.
5. assess the nutritional status of the children of the selected women.
6. identify the relationship between mothers' nutritional knowledge and nutritional status of their children.

### **Research Questions**

The study sought to address the following research questions:

1. What are the background characteristics such as age, level of education, and marital status of the selected mothers in James Town?

2. What are the sources of mothers' nutritional knowledge?
3. What is the level of nutritional knowledge of the respondents?
4. What are the socio-cultural factors that affect the level of nutritional knowledge of the selected mothers in the study?
5. What are the nutritional statuses of the children of the selected women?  
and
6. Are there any relationships between mothers' nutritional knowledge and nutritional status of their children?

### **Significance of the Study**

The attainment of the Millennium Development Goal (MDG) 4 by 2020 is critical to every country including Ghana. All stakeholders have embarked on pursuing this agenda by investing in maternal and child health. The findings would reveal the militating factors against the achievement of this goal for possible actions to be taken by stakeholders.

Specifically, the Ministry of Health and Ministry of Women, Children and Social Protection through its implementation agencies like the Ghana Health Service (GHS) would find these findings important in their health policies formulation endeavours. The Accra Metropolitan Assembly could also use findings to target the community for education and sensitisation taking into account the main factors affecting child nutrition.

This study is also expected to create some awareness among the mothers on the need to know and practice good hygiene and nutrition for their children. This would be done through stakeholder education programmes within the

community. It would also identify the socio-cultural practices affecting child nutrition in the area. Lastly, the research would add to the few existing stock of literature on child nutrition in Ghana. It is expected to serve as a baseline survey on nutrition and dietetic among mothers in James Town in the Accra Metropolis for future researchers.

### **Delimitation of the Study**

The study involved only women with children aged 0-6 years within James Town in Accra. It examined their knowledge level on nutrition, socio-economic status, cultural and religious beliefs, health education programmes on the child, and the challenges faced in giving their children nutritious diets. It would therefore be difficult to generalise the findings to the whole of Accra and the whole of the country, especially the coastal strip.

### **Limitations of the Study**

Like any other study, this work also had its own limitations. The area is predominately a typical Ga community with majority being fishermen and fishmongers who could hardly read or write. I engaged the services of three research assistants who translated the questionnaire items to the sample in Ga.

With the foreknowledge of the challenges involved in the possible loss of vital information provided by the mothers during the translation into English, the research assistants were graduates with training in Ga Language Studies. This was to minimise the risk of information lost.

### **Definition of Terms and Acronyms**

#### **Definition of Terms**

Anthropometry – The use of human body measurements for the purpose of obtaining information about nutritional status

Body-Mass-Index – An index that relates body weight to height. The body mass index (BMI) is obtained by dividing a person's weight in kilograms (kg) by their height in meters squared (m<sup>2</sup>). Mathematically,

$$BMI = \frac{\text{Weight (kg)}}{\text{Height (m}^2\text{)}}$$

Height-for-Age (HFA) or Stunting – Is when the proportion of under-five falls below - 2 and - 3 standard deviations from the median height-for-age of the WHO/NCHS.

Kwashiorkor – A disease occurring primarily in young children who have an existing disease and consume a marginal amount of energy and considerably insufficient protein despite high needs. A child with Kwashiorkor generally suffers from infections and exhibits edema, poor growth, weakness and an increased susceptibility to future illness (Williams, 1935 as cited <http://en.wikipedia.org/wiki/Kwashiorkor>).

Malnutrition – Generally refers to both under-nutrition and over-nutrition, but in this study, the term was used solely for under-nutrition.

Severe Stunting – Moderate and severe height-for-age below minus three standard deviations (-3SD) from median height-for-age of the reference population.

Severe Underweight – Moderate and severe weight-for-age below minus three standard deviations (-3SD) from median weight-for-age of the reference population.

Underweight or Weight-for-Age – Is when the proportion of under-five falls below - 2 and - 3 standard deviations from the median weight-for-age of the WHO/NCHS.

Weight-for-Height (WFH) or Wasting – is the proportion of under-five falling below - 2 and - 3 standard deviations from the median weight-for-height of the WHO/NCHS.

### **Definition of Acronyms**

FAO – Food and Agriculture Organisation

GHS – Ghana Health Service

GSS – Ghana Statistical Service

IFPRI – International Food Policy Research Institute

MDGs – Millennium Development Goals

SPSS – Statistical Product and Service Solutions

UN – United Nations

UNICEF – United Nations Children’s Fund

WFA – Weight-for-Age

WFH – Weight-for-Height

WHO – World Health Organisation

### **Organisation of the Rest of the Study**

The rest of the study was organised into four chapters. Chapter two deals with the review of related literature on child nutrition. It had the theoretical framework, conceptual framework and the empirical review. The theoretical framework examines the views of other authors on the concept and definition of



nutrition, whilst the conceptual framework looked at the nutritional model adapted from Salah (2004).

Chapter three presents the methodologies employed in the study. It described the research design, population, sample and sampling procedure, research instrument, pilot-testing of the research instrument, the data collection procedure used and how the data were analysed. Chapter four is devoted to the results and discussion. The analysis starts with the background characteristics of the respondents. It further looks at addressing the various research questions set out in the study. Chapter five contains the summary, conclusions and recommendations of the entire work. The recommendations also include suggestions for further research.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

This chapter provides a review of the concepts and the definitions of nutrition, nutrition and child health, knowledge of mothers in nutrition and its impacts on the growth and development of children, and children anthropometric measurements. It also looks at the barriers to knowledge acquisition by caregivers and the impact of these barriers to the growth and development of children, socio-economic factors that influence the choice of food and feeding of children by their mothers. These sub-headings are grouped into theoretical framework (including the concept and definition of nutrition, nutrition and child health, anthropometric measurement of nutritional status of children), the conceptual framework and empirical reviews.

## **Theoretical Framework**

### **Definition and Concept of Nutrition**

#### **Definition of Nutrition**

Stedman's Medical Dictionary (2000) defined nutrition as a function of living plants and animals consisting of the taking in and the metabolism of food materials whereby tissue is built up and energy liberated. Nutrition is the process of making use of food for maintenance of life, growth, the normal functioning of the body's organs and tissues, and the production of energy (Nikoi, 2011). Human nutrition, therefore, encompasses food composition, food habits, the nutritive value of foods, nutritional requirements, the relationship between diet and health, and research (Geissler, 2005).

It is the science that is concerned with the interaction between the body and its food supply with the utmost aim of providing fully adequate food supply

for any type of internal and external uses (Mitchell, 2004). It involves the ingestion, digestion, transportation, absorption and assimilation of the various nutrients and their transportation to all body cells as well as the removal of unusable elements/end-products and waste products of metabolism (Sobayo, 2012).

### **Types of Nutrients**

According to Townsend (1994), eating well is key to maintaining strength, energy, a healthy immune system and general lung health. The key to a healthy balanced diet is not to ban or omit any foods or food groups, but to balance what is eaten by consuming a variety of foods in the right proportions. Balanced nutrition is therefore the result of consuming the right amounts of nutrients (Mitchell, 2004). Nutrients are chemical substances found in food that are essential to the various processes to sustain life. Nutrition is divided into six: carbohydrates, fats, proteins, vitamins, minerals and water (Townsend, 1994).

### **Carbohydrates**

According to the United States' Department of Agriculture [USDA] (2000), carbohydrates are crucial sources of energy in food. Carbohydrates provide the body with glucose, which is converted to energy required to support bodily functions and physical activity (Mozaffarian, Hao, Rimm, Willet & Hu, 2011).

USDA (2000) classified carbohydrates into simple and complex. The complex ones are bread, cereals, pasta, rice and starchy vegetables such as potatoes, green beans, corn and lima beans, which take much longer time to digest

in the body. The simple carbohydrates are sugar, honey, syrup, candy, soft drinks, icings and fruits which are easy to digest. Other nutrients such as proteins are converted into carbohydrates for the body's metabolic processes in the absence of carbohydrates.

### **Protein**

Mitchell (2004) asserted that protein is an important building material for cells, tissues, organs, and enzymes that are important for digestion, daily bodily functions, hormones, regulators of fluid and electrolyte balance, acid-base regulators to keep the body working at the proper power of hydrogen (pH). It also helps to transport nutrients such as oxygen, vitamins and minerals, and antibodies to protect the body against diseases. Protein can be derived from two sources: animal and plant. Some of the animal sources of protein include poultry, meat, fish and milk. Cereals and legumes are of vegetable origin which provides a substantial amount of protein for the body (Ghana Home Economics Association [GHEA], 1990).

### **Fat and Oils**

According to Wardlaw (2003), fat are our storehouses of energy. When we have excess nutrients in our body, some of it is stored as fat. Fat and oils perform essential functions such as delaying hunger, insulating the body, providing energy for use by the body, carrying of dissolved fat soluble vitamins for important functions in the body, improving immune system, and vision. Fats and oils can be derived from both plant and animal sources. Some of the animal sources include

whole milk, cream, cheese, poultry, and fish. Groundnut, palm and coconut oil are some of the plant sources.

### **Vitamins**

Vitamins and minerals are also important for growth and development, especially in children. Vitamins transport energy from the food we eat to the body system, help the body derive the best from food and also help regulate the body to function in order to resist infections (Fosu, 2008). Some of the vitamins needed by the human body are A, B, C, D, E and K. Vitamin A helps keep teeth, tissue, membranes, and skin healthy which is directly involved in the production of retina pigments. Vitamin A is extremely important for eye sight, especially in poor lighting. Studies have indicated that it may be very important for breast-feeding mothers to let their foods contain some good amount of vitamins and minerals (e.g., UNSCN, 2010a; Disabled World, 2007).

Foods with vitamin A include meat, eggs, cheese, and cream. The body can also use fruits and vegetables to produce Vitamin A from beta-carotene. Carrots, sweet potato, cantaloupe, broccoli and many green vegetables such as spinach are good choices for vitamin A. Disabled World (2007) argues that deeper and richer colours indicate higher quantities of beta-carotene. The Vitamin “B” vitamins, for instance, come from a variety of food and they promote healthy growth in a variety of ways (Boecker, 2006). There are actually eight separate vitamins in the B family, namely, thiamin (Vitamin B1), riboflavin (Vitamin B2), niacin, Vitamin B6, folate, Vitamin B12, biotin, and pantothenic. These types of vitamins increase energy levels, regulate metabolism, and help create new red blood cells. Foods with high B

levels include meats, fish, liver, dark/leafy vegetables, whole-grains, and fortified products (Disabled World, 2007).

According to Boecker (2006), Vitamin C which is also referred to as ascorbic acid serves as an excellent antioxidant. It has the ability to prevent the harmful oxidation of cells. Vitamin C helps the body build and maintain healthy bones, teeth, gums, red blood cells, and blood vessels, heal wounds, bruises, and fractures and protect from infection by keeping the immune system healthy. It plays an important role in absorbing other important substances, such as iron, calcium, and folacin, and it may help reduce cataracts, cancer, and heart disease. Vitamin C is particularly connected with the strengthening of the immune system. Many fruits and vegetables provide good sources of Vitamin C. These include citrus fruits, peppers, tomatoes, broccoli, and dark green vegetables (Disabled World, 2007).

Vitamin D can be produced in the body as well as from the diet. While foods such as salmon, sardines, mackerel, and fortified products contain Vitamin D, the body largely produces this substance from sun rays absorbed through the skin. Ten to 20 minutes of sun exposure three times a week is all that is needed (Disabled World, 2007). Vitamin D is necessary element of bones and teeth formation in children (Tull, 1996). As children begin to grow, their primary teeth begin to fall out at about age six and are replaced by adults and permanent teeth at the rate of about four teeth per year and the process continues for the subsequent five years. Vitamin D is needed to perform these functions (Papalia, Olds & Feldman, 2003).

According to Disabled World (2007), Vitamin K significantly helps blood to clot after an injury, and it is involved in protection against osteoporosis, skin wounds and possibly, cancer. This vitamin is also found in a variety of foods especially, vegetables; however, most often forms from intestine bacteria in the body. Various circumstances such as cholestases can prevent the body from receiving the proper amount. Collards, kale, broccoli, cauliflower, brussels, sprouts, egg yolk, liver, cheese, and milk are some sources of Vitamin K.

### **Minerals**

Fosu (2008) said that minerals are important nutrients derived from sources such as table salt, green leafy vegetables and animal products. The major minerals needed by the body include phosphorous, sodium, iron and iodine. According to Boecker (2006), iron, which is one of the major minerals, is a necessary part of brain tissue. Iron deficiency can cause nerve impulses to move slower. Sutchchiff (2006) also indicated that iron deficiency can lead to disruption of basic developmental processes and brain deficiencies, even if they get early treatment.

Whether a mother will be able to provide good nutrition for the family or not depends on the variety of foods that are available in the household. The variety of food available also depends on mothers' or family's economic status. When the family earns a high income, all other things being equal, they will have the option of providing the child with better food which will improve the nutrition status. Rizkallah (1991) explained how family income can deeply affect the food

quality and nutritional status of children. She reported that poor nutrition (malnutrition) is high among families with low income.

### **Mother's Attitude and Knowledge on Nutrition**

Mother's attitude and knowledge on nutrition have a direct bearing on the choice of food for feeding the child and the child's nutritional status that might place the child at risk, especially during the weaning period (Al-Saifi, 1994). Education affords girls the opportunity to become more empowered and self-confident as they acquire knowledge, skills, attitudes and values critical for negotiating an equal place in society.

World Health Organisation (1998) reported that improvements in female secondary school enrolment rates are estimated to be responsible for 43% of the total of 15.5% reduction in child underweight rates in developing countries during the 1970-1995 period. A comparative assessment of a nutritional education in growth programme in India showed that counselling of mothers on feeding practices showed improved feeding practices even in areas where females are discriminated against (Ghosh, Kularn & Genapathy, 2002).

Certain feeding practices by the mothers tend to affect their choice of food for their children which affect the nutritional status of their children. LINKAGES (2004) studies conducted on infant and child feeding practices in the Northern Ghana reported that the food often offered to 6 years or less children is unfortified, plant-based and bulky. These foods fail to meet the needs of growing children for certain micro nutrients particularly, iron, zinc, calcium and vitamins. Also, it is a practice in some societies that children in school should not be given

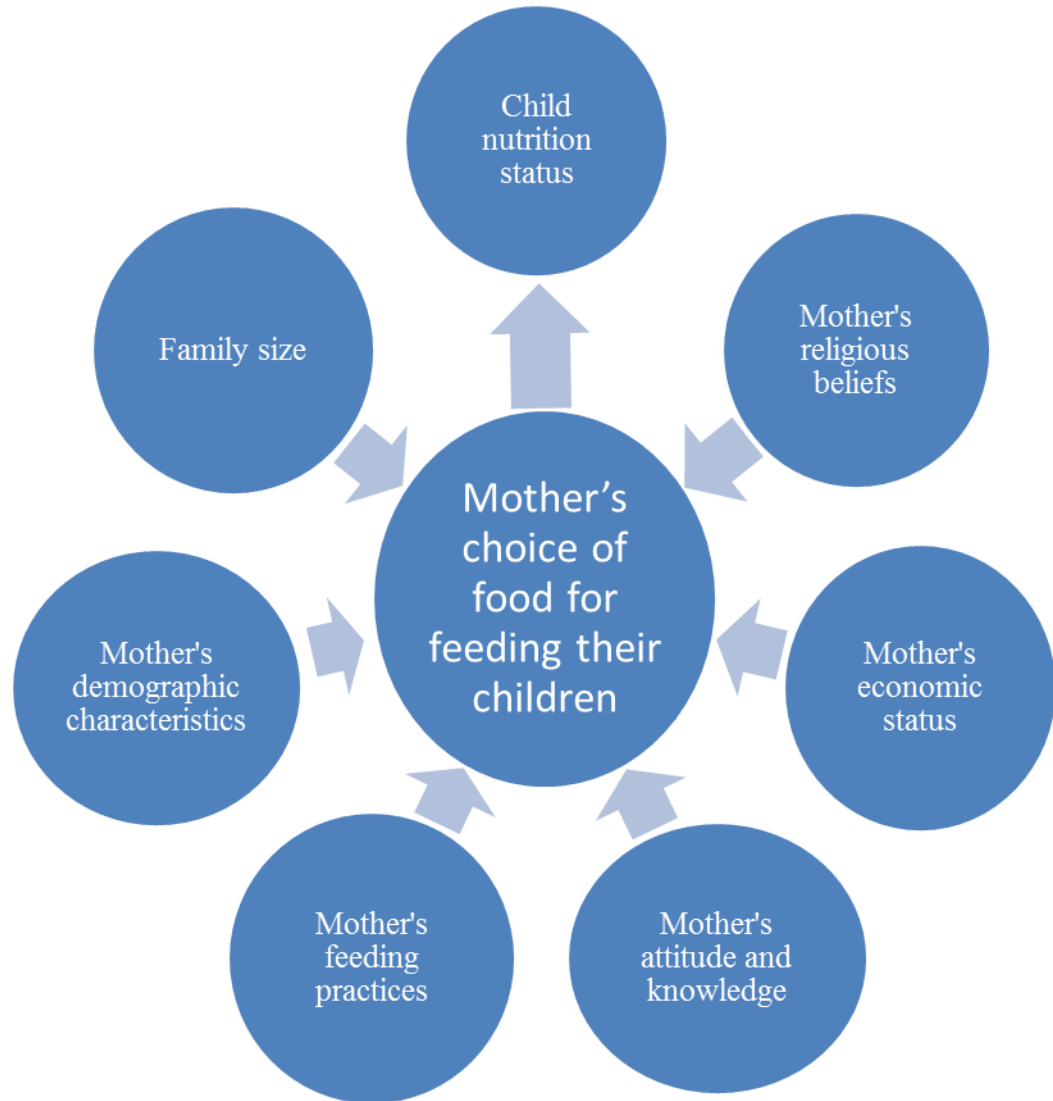


breakfast at all (Grantham-McGregor, Fernald & Sethuranman, 1999). The nutrition status of children in such communities will automatically diminish breakfast tends to an important meal required to provide some amounts of energy for the day's work.

### **Conceptual Framework**

Food is considered to be an important requirement for any functioning in the process of growth and development, especially in the critical stages of infancy and young children (Salah, 2004). There is documented evidences indicating that the factors that might affect nutrition status in children are numerous and complex (Nikoi, 2011). The conceptual framework for this study hinges on the fact that the demographic and socio-economic statuses have strong effect on children's nutritional status, especially in developing countries as well as deprived area such as James Town in Accra. According to Munz and Leitazman (as cited in Salah, 2004), the increase in family size raises the percentage of malnutrition. They identified that the percentage of children with poor nutritional status tends to increase in families with three or more children.

This study included all the key variables of mothers identified in Figure 1 as they are considered to be the determinants of their children's nutritional status. The data collection instrument (questionnaire) used in this study had constructs on these variables.



**Figure 1.** Factors influencing child's nutritional status

**Source:** Adapted from Salah (2004)

Gyasi (2008) supported the view that the feeding practices of mothers and caretakers have a lot of implication for the nutritional status of the child.

Mothers' choice of food for feeding their children, as depicted in the conceptual framework, is influenced by factors such as, mother's demographic characteristics, mother's religious beliefs, mother's attitude and knowledge,

mothers' economic status, and mother's feeding practices. The literature identified demographic characteristics as a factor influencing a mother's choice of foods for feeding her children (Niloi, 2011). Ojofeitimi, Owolabi, Aderonmu, Esimai and Olasanmi (2003) assessed the determinants of nutrition status among children less than five years in rural Nigeria in 2003. They found that there was a strong association between age of the mother, occupational status and employment and the risk of under nutrition among the children (Ojofeitimi et al., 2003). Family size have been identified by some researchers as a factor affecting the food choices of mothers and for that matter the nutritional status of children.

Religious belief is a strong conviction in a supernatural power or powers that control human destiny. Religious belief of mothers, sometimes, determines the kind of foods they give to their children. Some communities may regard certain foods as taboos and though such foods may be nutritionally good, they will not be considered as good for feeding children (Bentum, 2011). Alhassan (2008) did a comparative study of two communities in Savelugu-Nanton District in the Northern Region of Ghana on the nutritional status of pre-school children. She reported that some mothers perceive it as taboo for children to be given eggs, meat and fish because they will grow to become thieves.

### **Nutrition and Child Healthcare**

The World Health Organisation [WHO] (1998) defined health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The Wordweb Dictionary (2013) defined healthcare as the preservation of mental and physical health by preventing or treating illness

through services offered by the health profession. Nutrition is very critical for child health and survival. Proper nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. A child who has adequate nutrition performs better in school, grows into a healthy adult and in turn gives his/her children a better start in life.

Malnutrition is a risk factor for life-threatening, chronic disease, and death (WHO, 2008). According to NHS Choices (2015), poor nutrition is pervasive in both developing and developed countries such as in the UK. Wood and Harper (2008) revealed that children do not eat the recommended amounts of fruit and vegetables, for example, one in seven children never eat fruit. They tend to prefer foods high in sugar and fat rather than fruit and vegetables as the former are considered to be more 'satisfying' and filling (Wood & Harper, 2008). Also, 75% of the children in UK exceed the recommended target of energy derived from fat (Buttris, 1995). In the USA, Nicklas, O'Neil and Berenson (1998) asserts that majority of children exceed the American Heart Association dietary recommendations for total fat, saturated fat and dietary cholesterol.

According to WHO (1998), the proportion of children under five in the developing world who are malnourished to the point of stunting fell from 39% in 1990 to 30% in 2000. The UN's Food and Agriculture Organisation (FAO, 2004) estimated that 17% of people in the developing world were under-nourished in 1999-2001, a slight drop from 18% in the mid-1990s. The absolute number of under-nourished people, however, rose slightly over that period from 780 to 798 million (World Bank, 2009).

Such poor feeding pattern has a profound effect on the health of children now and in the future. Poor nutrition is a multi-system disorder when severe, immunity is impaired, wound healing is delayed and operative morbidity and mortality increased. Malnutrition worsens the outcome of illness (Clayden & Lissaurer, 2005).

Listernick, Christoffel, Pace and Chiamonte (1985) found that one of the health problems of children due to malnutrition is bone Kwashiorkor. Kwashiorkor is the form of protein-energy malnutrition and is distinguished from marasmus by the presence of oedema, hypo-albuminemia, and dermatosis. The mortality of kwashiorkor remains high, because of complications such as infection and electrolyte imbalances with ongoing diarrhea (Carvalho, Kenney, Carrington & Hall, 2000).

Anaemia indicates poor nutrition and poor health (De Benoist, McLean, Egli & Cogswell, 2008). Several studies have documented the most dramatic health effects of anaemia particularly the severe type, which increases the risk of child mortality (Scholl & Hediger, 1994). Iron deficiency has serious consequences for human health and child development. Anaemic infants are at greater risk of dying during the prenatal period (World Health Organisation/ Centre for Disease Control and Prevention, 2007). Anaemia is common among children in Ghana and it is as a result of inadequate amount of haemoglobin in the blood which is caused by iron and folates deficiencies. Some of the most prevalent conditions related to anaemia are vitamin B12 and protein deficiencies (Noguchi Memorial Institute for Medical Research [NMIMR], 2003)

Another health problem associated with poor nutrition is dental caries, which is defined as an infection, bacterial in origin that causes demineralisation and destruction of the hard tissues of the teeth (enamel, dentin and cementum) (Budenz, 2014). When children consume a lot of gummy sticky sugary food, the food sticks to the teeth. This is because the sugar provides a fertile ground for bacterium with a steady source of carbohydrate which creates acid to attack the teeth (Wardlaw, 2003).

In addition, Vitamin A deficiency leads to night blindness (Tull, 1996) particularly among children in developing countries. For example, 250,000 children from Asia become blind each year because of Vitamin A deficiency (Wardlaw, 2003). Likewise, high salt consumption is linked with high blood pressure and increases the risk of cardiovascular disease (Fosu, 2008).

### **Anthropometric Measurement of Nutritional Status of Children**

Beaton, Kelly, Kevany, Martorell and Mason (1990), stated that anthropometry is widely used to measure the general nutritional status of an individual or a population group. Anthropometrics means the measurement of the physical aspects and composition of the body. Four major ingredients are unavoidable in anthropometric measurement: sex, age, weight and height. The indices are derived by computing weight-for-age; Length-for-age or height-for-age; weight-for-length or weight-for-height (WHO, 1993).

#### **Height-for-Age**

Nikoi (2011) indicated height-for-age as a measure of long-term (or chronic) adequacy of consumption of nutrients, especially protein. Although the

individual child's short stature may result from either genetic characteristics, low birth weight, and/or infectious disease, it is always important to conduct an assessment of nutritional and overall health status with respect to height (UNICEF, 2013). When a child's stature is incommensurately short for his/her age in a group of children within a population, it is interpreted as a manifestation of poor nutritional status. The length of a prostrate child is measured from birth to twenty four months of age. Height of a standing child is measured commencing at twenty four months of age to check whether it relates to the weight (Nikoi, 2011).

### **Weight-for-Height**

Another anthropometric measurement of nutritional status is Weight-for-height index. This index helps to identify children's current nutritional status. When a child has a condition of lower weight as compared to the height, it is termed as wasting (Cogill, 2001; Fosu, 2008). It is also known as acute malnutrition. This condition carries an immediate increased risk of morbidity and mortality. Wasted children have a 5-20 times higher risk of dying from common diseases like diarrhoea or pneumonia than normal nourished children (The Mother and Child Health and Education Trust, 2014).

### **Weight-for-Age**

This is a complex index of height-for-age and weight-for-height. Since these two indices are highly corresponded, interpretation of weight-for-age in a research is difficult (Heltberg, 2009; Nikoi, 2011). It is used to assess changes in the magnitude of nutritional status over time. An underweight indicates low weight-for-age index over a specific age. On the other hand, Tull (1996) and Fosu

(2008) revealed that overweight signals a condition of weight gained over a specific age.

### **Body Mass Index**

Body mass index (BMI) is often recommended and used for assessment of body fat for children, adolescents, and adult (Wang, Moreno, Caballero & Cole 2006). The World Health Organisation (WHO) developed a classification of BMI for international use, based on its association with mortality and morbidity and linked to health consequences at different cut-offs (WHO, 2004).

In 2007, WHO Department of Nutrition and Health released growth reference data for height, weight, and BMI for children's age ranged 5-19 years to be used internationally. These reference values were based on cross sectional data collected from six countries – Ghana, India, Norway, Brazil, Oman, and North America and were intended to monitor child growth in addition to providing percentile chart data which could be used to define overweight and obesity in children. BMI is determined both by weight and height, and calculated using the formula weight in kilograms divided by the square of height in meters ( $\text{kg/m}^2$ ) (Cole, Bellizzi, Dietz & Flegal, 2000; Must & Anderson, 2006). For this thesis, obesity and overweight will be defined as  $\text{BMI} \geq 95^{\text{th}}$  and  $\geq 85^{\text{th}}$  percentile respectively, using the WHO's International classification of weight status according to BMI for height and obesity in children as discussed in Table 1.



**Table 1: Weight Classification of BMI**

<b>Weight Status Category</b>	<b>Percentile Range</b>
Underweight	less than the 5 <sup>th</sup> percentile
Normal weight	5 <sup>th</sup> percentile to less than the 85 <sup>th</sup> percentile
Overweight	85 <sup>th</sup> percentile to less than the 95 <sup>th</sup> percentile
Obese	Equal to or greater than 95 <sup>th</sup> percentile

**Source:** Ministry of Health (2007)

Overweight and obesity are major public health problems in many parts of the world and is associated with significant impact on both physical and psychosocial health, affecting all ages and socio-economic groups (Summerbell, Waters, Edmunds, Kelly, Brown & Campbell, 2009). The prevalence of obesity is increasing worldwide including developing and developed countries. Obesity is described by the World Health Organisation (WHO) as global epidemic (WHO, 2000). Obesity is associated with many chronic diseases such as coronary heart disease, hypertension, diabetes mellitus and hyperlipidemia, and some forms of cancer (Dehghan, Khtar-Danesh & Merchant, 2005).

The prevalence of obesity is increasing rapidly in all age groups including adult, adolescent, and childhood groups in the developed and developing countries. In developed countries such as the United States of America, United Kingdom, and Australia and in Europe, the prevalence is high and increasing. In some developing countries both obesity and under-nutrition co- exist (Summebell et al., 2009). Obese and overweight children and adolescents are more likely to be

obese in adulthood and they are more prone to have higher morbidity and mortality, compared to the general adult population. Studies have shown that about half of obese children become obese as adults, and the risk of adult obesity are twice for obese children compared to non-obese children (Al-Muraikhi, 2012)

The World Health Organisation (2008) reported that in 2007 globally, an estimated 22 million children under the age of five years were overweight. The prevalence of this worldwide epidemic continues to increase at disturbing rates. There are numerous reasons linked to the increasing prevalence. The most commonly discussed reasons are unhealthy diet and inadequate levels of physical activity (WHO, 2008). Children and adolescents are often too young to understand that these negative health behaviours can have both short and long-term health consequences. Most children and adolescents rely on their families and society to assist them with food choices and improvement of the environment in which they behave and live. There is presently a global epidemic of obesity in all age groups and in both developed and developing countries. In 1995, there were an estimated 200 million obese adults worldwide. As of 2000, the number of obese adults had increased to over 300 million (WHO, 2008).

According to Drohan and Samantha (2002), obesity is the most prevalent nutritional disease of children and adolescents in the United States, affecting nearly one in five children. In Finland overweight has increased 3- to 4- fold in adolescents in the past 30 years (Kautinen, Koivistu, Koivusilta, Lintonen, Virtanen & Rimpelä, 2009). According to a survey carried out in the United States of America (USA) between 2005 and 2006, overweight in children was fast

approaching a pandemic status affecting all races. Sixteen per cent (16%) of children in the USA between the ages of six (6) to 11 were overweight. Globally, there were approximately 22 million overweight children under the age of five. It has been predicted that if this situation is left unchecked it could become the leading cause of death, surpassing tobacco (Cornette, 2008). In an effort to combat this alarming rate, nutrition education was encouraged at health centres and also during health supervision visits. Cornette further indicated that despite this effort, the rate continues to increase. In determining the prevalence of overweight and obesity in children, several surveys were carried out, showing that the prevalence has rapidly increased over the last 15 years (O'Neill, McCarthy, Burke, Hannon, Kiely, Flynn, Flynn & Gibney, 2007).

In the United Kingdom, London Health Observatory reported that both adults and children in Britain are less active and less fit than previously. The Allied Dunbar National Fitness Survey (1999) identified UK adult population groups who were sedentary as women aged 16-24 years, middle-aged men and people aged 50 years and over. In the Health Survey in England 2007, 22% boys and 30% girls between age 10 and 15 were reported as being physically inactive. In the 16-24 year age group, 39% of the males were reported as inactive and 62% of the females were reported as inactive (Allied Dunbar National Fitness Survey, 1999).

In Africa, prevalence of physical inactivity has been recorded. A study in South Africa on children from birth to twenty, BTT (2002) indicated that more than 40% of young people did not participate in regular physical activity. The

BTT Study found that physical activity was less common among girls than boys and among those with lower income and less education.

In developing countries, it was estimated that over 115 million people suffer from obesity-related problems (WHO, 2002). The study by Berber, Gomez-S, Fanghanel and Sanche (as cited in Gyamfi, 2010), on anthropometric indexes in the prediction of Type 2 diabetes mellitus, hypertension and dyslipidemia in a Mexican population indicated an adjusted prevalence of being overweight in men and women (BMI>25) and obesity in men (BMI>30) to be 25.1% in men and 14.9% in women. Similarly, the Mexican National Chronic Conditions Survey disclosed a higher prevalence of DM to be 7.2 % in both gender. In the study, there was a higher prevalence of being overweight than a lower prevalence of obesity with regard to the presence of chronic conditions.

The increasing prevalence of obesity places a large burden on health care use and costs. A few studies show that 2-7 % of total health care expenditure in a country may be directly attributable to obesity, with the costs of hypertension representing 53-60% of the total direct costs of obesity (WHO, 2000). On the other hand, weight loss in obese individuals is associated with both clinical and economic benefits (WHO, 2000).

According to the WHO African Regional Consultation Meeting Report on Global Strategy on Diet, Physical Activity and Health (Harare, as cited in Gyamfi, 2010, “the risk for Non-Communicable Diseases” [NCDs]) including overweight and obesity” is gaining importance in Africa with a prevalence of high blood pressure estimated at 30-40 % although prevalence data from national surveys are

generally inadequate. The World Health Organisation's (2000) report indicated that NCDs, in 1998, accounted for almost 60% of all deaths and 43% of global burden of diseases. Seventy-five per cent of total deaths resulting from NCDs occurred in the developing countries such as Ghana. The treatment of NCDs is known to be expensive, labour-intensive and needs technological sophistication which most countries were lacking. Identification of major risk factors, their prevention and control form the basis of the prevention of NCDs including prevention of overweight and obesity from onset

In Ghana, the 2003 Ghana Demographic and Health Survey [GDHS] revealed that prevalence of obesity or overweight among adult (non-pregnant) women across the country increased 2.5 fold in ten years from 10% in 1993 to 25.3% in 2003 (GSS/NMIMR/ORC Macro, 2004). Crucially, the 2003 GDHS data showed that there are more obese women (25.3%) than malnourished women (9%). The GDHS data were supported by a 2003 WHO sponsored national obesity survey which showed higher obesity rates in southern compared to northern regions, among women compared to men, among married individuals compared to unmarried and among older compared to young individuals (Biritwum, Gyapong & Mensah, 2005). In national studies, Greater Accra Region had the highest overweight and obesity rates and women constituted a high-risk group. In a Health Examination Survey in the US, overweight recorded 39.4% in men and 24.7% in women; obesity 19.9% in men and 24.9% in women) (Flegal, Carroll, Ogden & Johnson, 2002). Obesity among Ghanaian adults is common, particularly among the elderly, females and urban dwellers. A survey involving

two urban and one rural community in the Greater Accra Region showed an overall crude prevalence of obesity ( $BMI \geq 30 \text{ kg/m}^2$ ) of 20.2% and 4.6% for females and males, respectively. The age-standardized prevalence of adult obesity was 13.6%. Obesity increased with age, peaking in the 55 to 64-year age group (Amoah, 2003).

## **Empirical Literature Review**

### **Factors Affecting Nutritional Levels of Children**

Several studies have identified factors influencing the nutritional status of children under 6 years (Gyasi, 2008; UNICEF, 2009). Factors such as breastfeeding and infection (MoH, 2005), poor feeding practices, poverty, family size, short birth intervals, maternal time availability and child rearing practice are identified to influence nutritional status of children (FAO, 2009).

### **Feeding Practices**

Feeding practices have a lot of implication for the nutritional status of a child. Mothers' knowledge about nutritious meals for the children influences how the child is fed. About 31% of mothers with babies 0-2 years consider cow's milk as best for growth of children. Some mothers consider breast milk as harmful when they get pregnant (Girma & Genebo, 2002). Breastfeeding plays a critical role in the nutrition of babies and toddlers. For a host of reasons, from fashion to lack of understanding, opportunity or support, the proportion of babies who are exclusively breastfed (i.e., receive no other food or drink, not even water) for the first six months, as recommended by health and nutrition professionals, WHO and the United Nations Children's Fund (UNICEF), rarely reaches 50% and is

extremely low in some of the poorest countries (UNICEF, 2009). Knowledge of exclusive breastfeeding by mothers often leads to an improvement in complementary feeding practices (Lisa & Haddad, 2000).

In Ghana, the Ghana Health Service (GHS) and teaching hospitals acting within the policy frame work of the Ministry of Health (MOH) is implementing a strategy called High Impact and Rapid Delivery (HIRD) of intervention. The interventions include strategies of improving exclusive breastfeeding, complementary feeding, de-worming among others for children less than five years in particular (GHS, 2007). This initiative which begun in 2005 is aimed at preventing avoidable deaths due to ill-health resulting from infection and more importantly malnutrition among children less than five years. Consequently, UNICEF and the Ministry of Health, Ghana recommended exclusive breastfeeding for the first six months of the infant's life. More than 95% of children less than five years in Africa are currently breastfed but this is often inadequate because many people feed their infants with water and other liquids alongside the breast milk. As a result, the rate of exclusive breastfeeding is particularly low in West Africa (LINKAGES, 2004).

An interventional study in India where nutritional education was given to mothers to improve awareness about infant feeding in the variety, quantity, quality and consistency of complementary feeding showed that, 80% initiates breastfeeding after 3 days of birth, 54.3% absence of exclusive breastfeeding, 86% delayed complementary feeding practices which were inadequate in quality, quantity, frequency and consistency (Sethi, Kashyap & Seth, 2003). In a similar

study in south India, mothers were counselled about the choice of appropriate complementary foods and feeding frequency. The intervention group had improved feeding practices such as avoiding feeding bottle and increased various type of complementary food improvement (Hague, Hussain, Sarkar, Hogue & Sultan, 2004). Time of introduction and type of complementary food given to an infant are very important for the child's nutritional status.

Castle, Yonder and Konaté (2001) observed a strong association between age of introduction of complementary feeding and child nutritional status. Significantly more mothers of malnourished children (34%) introduced complementary feeding before 6 months of age than mothers of well-nourished children (5%). A scientific review on complementary feeding has revealed that porridge (Koko), and other forms of food given to children less than five are inadequate (Brown, 1998).

The world through the MDG framework, have consented to the objective of halving the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015. In Ghana, the Government of Ghana has passed the Millennium Development Act, ACT 702 that sets out the framework and also provides the political commitment for ensuring the achievement of the MDGs including issues relating to access to water and improved sanitation. The Ministry of Works and Housing in collaboration with the Ministry of Local Government is implementing a rural water and sanitation policy to ensure that people in rural settings achieve this feat by 2015 (WHO/UNICEF, 2014). As at 2006, an estimated number of 50-75% people in rural settings in developing



nations, including Ghana were using improved drinking water sources (WHO/ UNICEF, 2014). Investments in sanitation and other social sectors especially with an emphasis on access to women and girls to these services and resources are among the most important policy tools for improving nutrition. Evidence from Zimbabwe indicated that explicit policies were being followed to re-address the lack of access of many communities to basic services after independence in 1980 (World Bank, 2007).

Several studies have tried to link nutritional status of children to diet. A prospective cohort study to assess the relationship between high levels of stunting and wasting (accompanied by serum deficiency of iron, foliate and vitamin B12) and diet concluded that the situation was due to the low consumption of bio available micronutrient-rich foods. The implication here is that children who do not consume adequate amounts of bio available multivitamins in their home diet or supplementary feeding rations may still be stunted and wasted even though they consume adequate amounts of macronutrients (Mamabolo, Alberts, Steyn, Delemarre-van de Waal & Levitt, 2005).

A study conducted among 10,000 infants in rural Ghana in 2006 revealed that neonatal mortality could be reduced by 24% if 99% of infants initiated breastfeeding on day one of life and 31% if 99% of infants initiated breastfeeding within the first hour, saving 867,000 and 1,117,000 (Edmond, Quigley, Amenga-Etego, Owusu-Agyei & Kirkwood, 2006). In 38 out of 60 high mortality countries, the average proportion initiating breastfeeding within the first hour was

36%, which suggested that 1 million neonatal lives could have been saved worldwide out of 4 million neonatal deaths (Edmond et al., 2006).

A study carried out on childhood feeding practices in Ethiopia revealed that 99.8% of the children were initially breastfed. Thus, the initiation of breastfeeding is not a problem (ANON, 2003). However, in Anganwari areas of urban Allahabad, delayed initiation of breastfeeding and deprivation from colostrum were found among the mothers of children under 5 (Kumar, Goel, Mittal & Misra, 2006).

The United Nations Children's Fund (UNICEF) and the Ministry of Health (MOH), recommend exclusive breastfeeding for the first six months of the infant's life. Children between the ages of six months and four years who do not get enough of the right types of food to eat easily become malnourished. More than one third of child deaths occur during the first fragile month of life while early breastfeeding provides critical nutrients, protects infants against deadly diseases and fosters growth and development.

In 2003, WHO and UNICEF introduced the Global Strategy on Infant and Young Child Feeding to help promote good practice in this area. Besides exclusive breastfeeding for the first six months, the strategy recommends that, for maximum benefit, even when complementary foods are introduced at six months, children should continue to be breastfed until they are 2 years old. During the period when children are making the transition from exclusive breastfeeding to sharing the family meals, they have special requirements. The strategy also gives advice on how to ensure that complementary feeding is timely, adequate,

appropriate and safe. A 1-year-old, for example, needs two to four times the quantity of calories, fat and protein per kilogram of body weight as the average adult (Wood & Harper, 2008).

Exclusive breastfeeding is crucial to preventing the deaths of newborns and infants. This practice can prevent an estimated 1.3 million death each year by protecting against diarrhea, pneumonia and hastens recovery during illness. Breastfeeding is not only beneficial to the infant but also to the mother (WHO, 2008). Unfortunately, many people are unaware of breast milk benefits and in many of the world's poorest countries, water and other liquids are added to the baby's diet for the first months of life risking infection from harmful bacteria and other pathogens (MoH, 2005).

In Ghana, water and glucose solutions are widely given to infants, beginning in the first few months of life. Mothers and grandmothers explained that water may be given to infants immediately after birth, because they are thirsty after the exhaustion of the birth process or as a cultural gesture to welcome the child into the world. Water also is used to cleanse the mouth of a baby after breastfeeding. In addition, grandmothers believed that "breast food" and water are different and that a baby needs both, just as adults do (Dewey, Brown & Rivera, 2003).

WHO (2008) explained that breast milk is free of contaminants from outside food and water and has immunoglobulin A, macrophages and antioxidants which protect the baby from diseases such as diarrhea. The infant should be introduced to the breast within half an hour after normal delivery and within four

hours after caesarian section. During the first two or three days, the watery and yellowish fluid that comes from the mammary gland differs from the regular milk and is called colostrum which is the first immunization of the infant since it contains antibodies against viral diseases such as small pox, polio measles and influenza. It is very rich in protein and is secreted in a small quantity of about 10-40ml. Enzymes like lysozyme, peroxidase, and xanthine oxidase that promote cell maturation are found to be more in colostrum.

Current guidelines for infant feeding developed jointly by the World Health Organisation and the United Nations Children's Fund in 2003, emphasises exclusive breastfeeding for the first six months of life and the subsequent addition of appropriate complementary foods to meet the increasing energy requirements for infant growth (WHO/UNICEF, 2003). Continuous breastfeeding is recommended for the first two years and beyond. These guidelines also emphasize the importance of continued feeding during illness in order to maintain the infant's immune and nutritional status (WHO/UNICEF, 2003). Breast milk provides all the energy and nutrients that an infant needs during the first six months yet barely one in three infants is exclusively breastfed during the first four months of life (WHO, 2008).

It has been estimated that improved breastfeeding practices could save some 1.5 million children a year. Yet few of the 129 million babies born each year receive optimal breastfeeding and some are not breastfed at all (Oddy, 2001). The association between breastfeeding, nutritional status and survival was investigated in a cohort of 1087 children aged 12-35 months from rural

Bangladesh followed monthly during 2 years. Mean weight-for-age of breastfed children was 69.6% compared to 70.6% for non-breast fed children. Despite this difference in nutritional status, risk of dying, after adjusting for age, was six times higher in non-breastfed malnourished children than in similarly malnourished breastfed children. This revealed that breastfeeding beyond a year has positive impact on the nutritional status of children. Therefore, breastfeeding could be encouraged in communities with a high prevalence of malnutrition, despite the frequently observed association between prolonged breastfeeding and malnutrition (WHO, 2008).

Nguyen and Kam (2008) concluded that maternal, socio-economic and environmental factors, such as weight of the child at birth and duration of exclusive breastfeeding, were found to be significant factors for malnutrition among children under five. With a structured questionnaire, they aimed to assess the nutritional status and characteristics related to malnutrition in children less than five years of age in Nghean, Vietnam. Anthropometric measurement, weight-for-age (underweight), weight-for-height (wasting) height-for-age(stunting) of the children were determined based on reference data from the National Centre for Health Statistics (NCHS)/(WHO, 2008). Hierarchical logistic regression analysis indicated that the mean z-scores for weight-for-age, height-for-age and weight-or-height were -1.46 (95% CI=-1.57, -1.35), -1.44 (95% CI=-1.56, -1.32) and -.71 (95% CI=-0.82, -0.60), respectively. One hundred and ninety three (31.8%), 269 (44.3%) and 72 (11.9%) were underweight, stunting and wasting, respectively. Furthermore, the mother's level of education and occupation, household size,

number of children in the family, weight at birth and duration of exclusive breastfeeding were found to be significantly related to malnutrition. Exclusive breastfeeding was independently and significant positively related to underweight, stunting and wasting.

Similarly, Kumar et al. (2006) concluded that delayed initiation of breast feeding, and deprivation from colostrum are significantly risk factors for under-nutrition among children under five years. Kumar et al. (2006) aimed to determine the prevalence of nutritional status of under-five children and to assess whether infant feeding practices are associated with the under-nutrition in Anganwadi (AW) areas of urban Allahabad, Delhi. They revealed that 36.4% were underweight (<2SD weight-for-age), 51.6% were stunted (<2SD height-for-age), and 10.6% were wasted (<2SD weight-for-height). Proportions of underweight (45.5%) and stunting (81.8%) were found to be high among children aged 13-24 months. Wasting was most prevalent (18.2%) among children aged 37-48 months. Initiation of breast milk after six hours of birth and deprivation from colostrum were found to be significant risk factors for underweight in children. Wasting was not significantly associated with any infant feeding practice studied.

Complementary food is the additional nutrient-rich food and drink that is recommended for children from six months of life. The transition from exclusive breastfeeding to complementary feeding (which includes continued breastfeeding) typically covers the period 18-24 months of age. This is a very vulnerable period as it is the time when malnutrition starts in many children. Thus it is essential that

infants receive appropriate, adequate and safe complementary foods to ensure the right transition from breastfeeding to the full use of family foods. Most nutritionists agree that children need solid food in addition to breast milk when they are age 4-6 months in order to reach their full growth potential (Dewey, Cohen, Brown & Vera, 1999). Improper feeding practices can account for poor nutrition which contributes to 1 out of 2 deaths (53%) associated with infectious diseases. Recent studies have recognised the link between malnutrition and child feeding practices (Kumar et al., 2006).

Proper complementary feeding reduces mortality by 6%. However, in most developing countries, the complementary foods given to these infants and young children are usually contaminated and inadequate in nutrients (WHO, 2008). For the reduction by two-thirds of under-five mortality to be achieved, there is the need for a rapid improvement of feeding of these children. These feeding practices constitute one of the most neglected determinants of young child malnutrition in spite of their important role in growth pattern of children.

### **Mother's Educational Level**

Education provides the opportunity for girls to become more empowered and self-confident as they acquire knowledge, skills, attitudes and values critical for negotiating an equal place in society. Across the developing world, women play key roles in maintaining household food security, and in caring for children on a day-to-day basis, both of which are extremely important factors influencing a 'Child's' nutritional status. Women, depending on the region of residence, are highly involved in food production and acquisition, thus boosting food security

(Smith & Haddad, 2000). Women's disempowerment as a result of exclusion from education therefore results in limited access and that of their children to basic health services and information. Women's education relative to men's has been found to be strongly associated with child malnutrition in developing countries. Improvements in female secondary school enrolment rates are estimated to be responsible for 43% of the total of 15.5% reduction in child underweight rates in developing countries during the 1970-1995 periods (WHO, 1993). Maternal knowledge and level of education impact on the human and economic empowerment of women (WHO, 2005). Maternal education is also supposed to improve the health seeking and child caring practices of the mother. Maternal education and maternal nutritional knowledge are significantly but independently associated with child nutrition outcomes (Saaka, 2014).

Women are naturally the primary caregivers at the beginning of a child's life, carrying out such functions as breastfeeding. Women are most often the people who feed and bath children, seek health care for the children when they are sick, protect them from exposure to danger, and support their cognitive and social development. Given these roles, women's knowledge and abilities and their own physical well-being and decision-making power are crucial to children's health (Smith & Haddad, 2000). Their finding was that women's education and status relative to men's are strongly associated with child malnutrition in developing countries. It is estimated that improvements in female secondary school enrolment rates are responsible for 43% of the total 15.5% reduction in the child underweight rate of developing countries during the period 1970 to 1995.



Furthermore, most mothers in general do not seem to be adequately aware of the amounts of food that children should eat or should be eating. According to Smith and Haddad (2000), while the frequency of feeding is low, the quality and amount of meals also tend to be low, so that the diet of most children across the country is inadequate in every respect to maintain health and growth.

In India, it was discovered that they have the largest population of non-school-going working girls. Women and girls receive far less education than men, due both to social norms and fear of violence. Constitution guarantees free primary school education for both boys and girls up to age 14. This goal has been repeatedly reconfirmed, but primary education in India is not universal. Overall, the knowledge rate for women is 39 percent versus 64 percent for men. According to Mapping Progress, educational funds were cut by 801.3 million rupees in the 1991-1992 budgets. Funds for the mass knowledge movement, in which women participate enthusiastically, have been reduced by 5% from the previous year. Budgetary provisions for non-formal education have been cut by 17%, leading to closure of many night schools and adult education programmes in which working-class women participate. Reduction in government expenditures on higher education and encouragement to private colleges reduce women's opportunities for higher education since privatisation in education promotes only male-dominated professional and technical courses, as they are lucrative (Ghosh et al., 2002).

Furthermore, education can lead women to greater exposure and better understanding of health messages and recommendations through mass media or

other sources. Maternal years of schooling have little if any direct effect on child micronutrient status (though may contribute indirectly through an impact on earnings), and nutrition knowledge derives from several sources among which schooling is not the most important (Block, 2002).

### **Nutritional Knowledge of the Mothers**

A comparative assessment on a nutritional education in a growth programme in India showed that counselling of mothers on feeding practices showed improved feeding practices even in areas where females are discriminated against (Ghosh et al., 2002). A cross-sectional study was conducted at the Lefaragatha village of Bophuthatswana, South Africa to document the prevalence and risk factors for malnutrition in children aged 0-5 years in June 1991. In the age group of 2 years and less, this figure was 28.6%, while in children older than 2 years the corresponding figure was 71.4%. Malnutrition was associated with a mother's lack of resources such as water and inappropriate staple diet. Education and income were significant variables (Ghosh et al., 2002).

In a study carried out in Nepal, Sanjay (2002) concluded that a traditional food made by mothers has been shown to be very nutritious by scientists. The porridge is made from a finely ground flour of roasted cereal grains and pulses. The mixture is known as super flour or 'Sarbotam pitho ko lito' (Sanjay, 2002). Some of the advantages of the super flour include its convenience and adaptable food storage. The flour can be used for baking bread and biscuits. Mashed vegetables and fruits can be added to porridge to improve the nutritional value

and vary the flavour. This is highly recommended for severely malnourished children.

In Nigeria, ten variables that influence children under-five years nutritional status at Oranfe, a semi-rural community in Ife East Local Government Area of Ogun State, Nigeria were assessed. The two types of protein-energy malnutrition (PEM) that are prevalent in the community are stunting and wasting. Of the 230 children assessed using Waterlow's technique, 23% and 22% were stunted and wasted, respectively. The results confirmed that mother's educational level, age, parity; types of family and children's immunisation status and age of child are some of the key determinants of the nutritional status under five. The intensification of exclusive breastfeeding, female education, compulsory food demonstration unit in all health centres, use of complementary feeds from 7 months upward, growth monitoring and promotion are some of the strategies to reduce the high prevalence of PEM in both rural and urban areas of developing countries (Ojeifeitimi, Owolabi, Aderonmu, Esimai & Olasanmi, 2003).

Studies on infant and child feeding practices conducted by LINKAGES (2004) in Northern Ghana showed that the food often offered to this category of children is unfortified, plant based and bulky. These foods often, fail to meet their needs for certain micro nutrients, particularly, iron, zinc, calcium and vitamins.

In a comparative study carried out on children's nutritional and growth differences in Southern New Jersey, United States of America, there was little difference in growth between Hispanic and white youths. Children were assessed on the use of the Centre for Disease Control's nutritional surveillance cut points;

less than 5% of each ethnic group fell below the fifth percentile, according to the National Centre for Health Statistics' weight-for-height standards. White and Hispanic youths were twice as likely as blacks that fall below the 5<sup>th</sup> for stature or to be overweight (above the 95<sup>th</sup> percentile for weight-for-height). Compared with black girls, White and Hispanic girls were three to four times more likely to fall below the 5<sup>th</sup> percentile for nutritional status.

On the sources of nutritional knowledge among mothers, Defo (1997) explored and found that the link between knowledge and children's health implies that mental understanding of the health process directly impacts behaviours focused on improved health. If this is true, acquired knowledge "should lead to greater protection against infection through improved hygiene, reduced susceptibility to infection through nutrition, and enhanced recovery from infection through more effective domestic and external health care" (p. 1029). Newspapers and magazines, followed by the subject's social networks circle, were the main sources of nutritional information.

Chew, Palmer and Kim (1995) also identified magazines, television, newspapers and doctor/clinic/hospital as key sources of nutritional knowledge among mothers. They found that knowledge levels consistently increased among all groups after programme viewing and also across time ( $p < 0.001$ ). In general, the authors continued that media users showed higher levels of knowledge than their non-user counterparts; however, only magazine users showed higher and significant differences in knowledge. Programme viewing led to an increased selection of television and newspapers as sources of nutritional information.

Magazine use and the use of doctors as health information sources remained the same after programme viewing.

Abdollahi, Amini, Kianfar, Dadkhah-Piraghag, Eslami-Amirabadi, Zoghi, Assasi and Kalantari (2008) found in their study that all sampled mothers obtained their knowledge from their parents and TV programmes such as children's programmes, family programmes, advertisements, news and educational programmes. Other sources of knowledge were books, teachers, friends, newspapers, doctors, and nutritionists. They further reported that in the mothers' opinion, the factors that had the greatest effect on children's nutritional behaviour were TV advertisements, parents and family environment.

### **Family size**

Family sizes have been identified by some researchers as a factor affecting the food choices of mothers and for that matter the nutrition status of children. Munz and Leitazman (1982) explicated how the increase in family size raises the percentage of malnutrition. They discovered that the percentage of children with poor nutritional status blatantly increased in families with three or more children.

### **Healthy Eating Habit of Parents**

According to Lindsay, Sussner and Gortmaker (2006), healthy eating habit can be encouraged by parents at home by increasing the number of times the family eats together and making healthy food available to children. Similarly parents also deprive children from eating a particular kind of food as a way of influencing food choice of the children. In some communities in Ghana, children are not allowed to eat meat, eggs and fish because of their cultural beliefs (GHEA,

1990). Ironically, these are the categories of people who mostly need these foods. It is also a practice in some societies that school children should not be given breakfast at all (Grantham-McGregor, et al., 1999). Children from these communities tend to be malnourished because they cannot make up for the lost nutrients omitted at breakfast. Clearly, parents positively or negatively influence the feeding habits of their wards.

### **Economic Status of Parents**

Economic status and the possibility of having adequate food needed for improving infant's nutritional status has been determined by Rizkallah (1991). She explained that family income can be one of the most important determinants of nutritional status of children that deeply affect the food quality and preparation. She reported that malnutrition increases with increasing poverty.

Lipton and de-Kadt (1998) reported that the level of income is by far the greatest single cause of variability in food intake although income is not the only measure of poverty. Many other social and environmental factors contribute to malnutrition and are closely linked to the poverty levels of individuals and countries. In low income countries, income from home-produced food and payment received in kind are generally more important than cash income in the determination of food availability in a rural household. However, food availability is determined primarily by cash income (Lipton & de-Kadt, 1998). According to De Boer (2000), meals in most northern communities (Northern, Upper East and Upper West) are known to be either monotonous with hardly any variety or are low in terms of protein and micronutrient contents.

## **Genetic and Family Influences**

Obesity is a feature of a number of rare medical (genetic) problems in childhood, such as Prader-Willi syndrome, Bardet-Biedl syndrome, and Leptin receptor mutation (Ebbeling, Feldman, Osganian, Chomitz, Ellenbogen, & Ludwig, 2006). Genetic factors can also have an influence on individual susceptibility to obesity. However, the rapidity of rising epidemic of obesity suggests a genetic cause is unlikely. Other factors like behavioural, environmental, life style and cultural environment seem to play important roles in childhood obesity epidemic worldwide (Ebbeling et al., 2006). Family influence is an important factor in children's susceptibility to weight gain.

Parental overweight has been shown to be the most important risk factor for childhood obesity in several studies (Lake, Power & Cole (as cited in Al-Muraikhi, 2012). Whitaker and Dietz found that maternal obesity and birth weight had a direct relation and effect on the risk of obesity later in life (Whitaker & Dietz (as cited Al-Muraikhi, 2012). In another study conducted by Danielzik, Czerwinski-Mast, Langnäse, Dilba and Müller (2004), it was found that the major determinants of overweight and obesity of 5-7 years old children were parental overweight, a low socio-economic status and high birth weight.

De Moira, Power and Lil (2010), examined the 7 years old members of the British birth cohort 1958 (n=8552) and offspring aged 4-9 years (n=1889) born to mothers under 30 years, to evaluate risk factors for childhood obesity (1991-1999). They found that the prevalence of overweight and obesity increased by more than 50% between generations. Higher parental obesity and maternal

employment may have contributed to this trend over time (De Moira, Power & Lil, 2010). Consistent with existing evidence from Australia (Mamun, O'Callaghan, Alati, O'Callaghan, Najman, Williams & Bor, 2006), a study from the UK (Lake, Power & Cole, 1999), also found that higher parental overweight is important and a strong factor associated with increased childhood risk of overweight and obesity in later life (Gunnell, Frankel, Nanchahal, Peters & Davey Smith, 1998). Most overweight children have multiple environmental risk factors (Lobstein, Bau, & Uaur, 2004). Correlations between parent and child habits may reflect family patterns of food intake and exercise (Bogaert, Strinbeck, Baur, Brock & Bermingham, 2003), selection of leisure activity (duration of television watching or viewing), and family and cultural patterns of food selection has important effect on childhood obesity (Benton, 2004).

### **Physical Activity**

Goran, Reynolds and Lindquist (1999) described physical activity as any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above the basal level. This means that physical activities can provide the balance between energy intake and energy expenditure.

In a research conducted in an elementary and middle public school in America, school nurses were surveyed concerning their perceptions on the cause of childhood obesity (Moyers, Bugle & Jackson 2005). The result of the survey showed that poor eating behaviour and excessive caloric consumption contributed to obesity at 94.3% while sedentary lifestyle (95.3%) had a major impact in the development of childhood obesity. Results from a survey conducted by the



Centres for Disease Control and Prevention (CDCP) indicated that 70% of students in the United States do not attend daily physical education classes (Moyers, Bugle & Jackson 2005). There is substantial evidence that physical activities are sufficient to help decrease the risk of obesity from childhood into adulthood. It is recommended that at least 50% of school children should participate in physical education every day in school, of which 50% of the class period is devoted to physical activity. WHO (2004) also recommended environmental modifications that facilitate daily activities, such as walking and biking, rather than vigorous activity. Likewise, the Centre for Disease Control recommended several levels of physical activity promotion for children, including policy, environment, physical education, health education, extracurricular activities, parental involvement, personnel training, health services, community programmes and evaluation (Goran, Reynolds & Lindquist, 1999).

Several determinants have been identified as barriers towards the above recommendations, including seasonal factors. The National Children and Youth Fitness Study (NCYFS) suggested that children record a higher activity level in the summer than in the fall and winter (Goran, Reynolds & Lindquist, 1999). Another barrier was parents or role models. Children whose parents are inactive physically tended to follow the path of their parents; in the same way, children whose parents are physically active have been shown to be significantly active. The environment is another factor, such as the availability of facilities for activity, physical safety and climate. The psychological factor cannot be overlooked, such as attitudes, enjoyment of physical activity, motivation to exercise, personal

control, perceived benefits of exercise, health beliefs, and self-efficacy (Goran, Reynolds & Lindquist, 1999).

According to Mason, Crabtree, Caudill and Toop (2008), interventions for weight loss in children should be focused on modifying eating and physical activity habits to allow for a formation of a new behaviour that could result in lifelong changes. The approach of calories consumed to the amount of calories expended seems to work for the adult, while this is different for children because they are still growing. Therefore, weight loss for children should be at a slow rate leaving an opportunity to grow in height as well for a corresponding decrease in BMI and formation of healthy behaviour.

Physical inactivity is known to be a major public health problem of concern in 2000 as physical activity levels of people of all ages tended to decrease. CDCP (2007) reported that among the youth in America aged 12 and 13 years, 69% were regularly active. However, the number dropped to 38% for young people between the ages of 18-21 years. A physically inactive child is more likely to become a physically inactive adult, which could lead to chronic diseases of lifestyle (Frantz, Phillips & Amosum, 2003). Patterns of inactivity, also known as sedentism, begin early in life, making the promotion of physical activity among children imperative (Summerfield, 1999). The prevalence of physical inactivity among youth worldwide has increased. At the international level, 67% of young children in Canada did not meet the average physical activity guidelines to achieve optimal growth and development. In the United States of America, Guo, Roche, Chumlea, Gardner & Siervogel (1999) reported that nearly 50% of

American young people aged between 12 and 21 years did not engage in vigorous physically active lifestyles on a daily basis.

In a survey conducted in South Africa, self-reported physical inactivity was a major risk factor for overweight and obesity, along with lower levels of education, ethnicity and having at least one overweight parent (Asumadu-Sarkodie, 2012). The protective effect of physical activity for obesity indications from the inverse association between activity levels and fat mass is measured by television viewing time, as reported in South Africa (McVeigh et al., 2004, as cited in Asumadu-Sarkodie, 2012). In a regional cross-sectional survey, current levels of obesity were associated with inactivity as measured by television time, lower fitness levels, and a low reported daily intake of fruit and vegetables. Most people spent less time devoted to exercise as a result of longer working hours and sedentary jobs, a decline in physical education programmes in schools, and heightened participation in sedentary recreational activities such as surfing the web, playing video games, and watching television (Asumadu-Sarkodie, 2012). In addition, many of the labour saving devices of modern lifestyle, such as cars, motors, elevators, personal computers, remote controls promote a sedentary lifestyle. This lack of physical activity has reduced the overall amount of energy expended in the course of a day, contributing to the development of obesity and overweight (Asumadu-Sarkodie, 2012).

In Ghana, evidence of physical inactivity is seen from the growing problem of overweight and obesity. The Demographic and Health Survey (GDHS, 2003) in Ghana show an increase of overweight or obesity from 12.7% to 25.3%

in non-pregnant women aged 15-49 years (GDHS, 2003). A study conducted in Accra showed that overweight or obese persons were less likely to self-report job-related moderate or heavy physical activity than persons with normal weight (GDHS, 2003). On the other hand, persons of normal weight were also more likely to report sedentary job-related physical activity than those who were overweight or obese (Ministry of Health, 2010; Asumadu-Sarkodie, 2012).

There is a debate about the importance of physical activity as an important contributor to obesity and whether interventions can increase overall activity levels (Davison & Birch, 2001). Studies have shown that reduced physical activity, and increased sedentary time such as watching television and playing computer games are associated with increased BMI and the prevalence of overweight and obesity in children (Summerbell et al., 2009). In addition it was found that inactivity was also associated with unhealthy eating practices.

Muller, Grund, Koertzin, Langnase and Mast (1999) found that low levels of activity (which was assessed by television viewing time) were associated with higher prevalence of overweight. In children watching television more than 1 hour per day, there was a higher consumption of fast food and sweets. A limited opportunity for physical activity was also highlighted by the Foresight Report as one of the key contributors to obesity (Aylott, Brown, Copeland & Johnson, 2008). The design of the city environment, safety, availability and access, local knowledge and supportiveness of neighborhoods play an important role in the decline in walking and cycling over the last 30 years.

Changes worldwide in lifestyle have contributed to altered dietary patterns and physical activity levels which include adopting a western diet, especially high in fat, increase in availability and consumption of fast foods, and increases in sedentary lifestyles in recent years (Aylott et al., 2008). Physical activity has reduced with increased demand on cars or motorised transport, shifting work patterns from predominantly agricultural to more office based, high technology devices at home, and leisure time that is predominately shifted to sedentary behaviour (like watching television and playing computer games). Children living in large cities have less access to parks and play grounds where it is unsafe to go outside. They spend more time with computers, video games and television for activity (Dehghan, Khtar-Danesh & Merchant, 2005; Aylott et al., 2008).

### **Impact of Mothers' Knowledge on the Growth and Development of Children**

The importance of mother's education on child health and nutrition has been well demonstrated, with a strong linkage between maternal education and children's growth and development. Children born to educated women suffer less from poor nutrition which manifests as underweight, wasting and stunting in children (Kabubo-Mariara, Ndenge & Mwabu, 2009). Abuya, Ciera and Kimani-Murage (2012) said that maternal education is associated with nutritional outcomes among children in various studies across the world.

For Desai and Alva (1998), maternal knowledge affects the health, growth and development of children in many ways. First, maternal knowledge affects children's health and development through its effect on improving women's socio-economic status. This is because educated women are more likely to get

steadier, higher paying jobs; to get married to men with higher education and higher income; and to live in better neighbourhoods, which have influence on child health and survival. Mothers' knowledge is usually acquired through education and it affords women the opportunity to become more empowered and self-confident as they acquire knowledge, skill, attitudes and values critical for negotiating an equal place in society (LeVine & Rowe, 2009). On the other hand, women's dis-empowerment resulting from expulsion from education results in their limited access to basic health services and information (Abugil, 2007).

Furthermore, maternal education promotes positive attitudes toward health-seeking behaviour for their children, including awareness of the importance of immunisation (Ruel, Habicht, Pinstrup-Andersen & Grohn, 1992). Some researchers including Defo (1997) and LeVine and Rowe (2009) opined that the acquisition of health knowledge through formal education explains mothers' subsequent use of health services. They posit that formal education increases women's health knowledge in two ways: First, formal education may directly expose women to school curriculum about biology, germ theory and disease classification (Nayga, 2001). Second, formal education may indirectly increase knowledge through the knowledge skills women acquire in school (LeVine & Rowe, 2009). Learned mothers can read newspapers, banners, brochures and billboards and can better understand health messages (LeVine, Rowe & Schnell-Anzola, 2004).

Furthermore, increased health knowledge of mothers due to number of years in school makes women more receptive to modern medicine. A research

conducted by Fosu (1981) revealed that while education does not agree with one particular framework of disease causation, women with more formal schooling are more likely to attribute various illnesses to natural causes while uneducated women commonly attribute illnesses to supernatural causes. According to Fosu (1981), less educated women who hold only traditional beliefs about diseases are less likely to be confident in the preventive and curative advice that modern health care workers provide, but formally educated women's biomedical beliefs about natural causes of illness are likely to increase their confidence in services offered by the health care workers in the medical system (Fosu, 1981).

Moreover the knowledge and numeracy skills that women acquire in school enhance their ability to recognise illness and seek treatment for their children. Additionally, they are better able to read medical instructions for treatment of childhood illness and apply the treatment. Furthermore, Inungu, Emina, Kandala and Ye (2009) observed that children whose mothers are educated or have health knowledge tend to live in more hygienic environments. Women with knowledge on health care know the effects of unhygienic conditions and diseases on their children, children of educated women live in more hygienic environment, have higher prevalence of vaccination than their counterparts, receive appropriate care in case of disease, and therefore, have better nutritional status than others (Inungu et al., 2009).

### **Overweight and Obesity**

Etiology of overweight and obesity in children is a result of the combination of several factors. Among the factors that influence increased weight gain are genetic, metabolic, behavioural, environment and socio-economic. And

among these influences, dietary behaviour, physical activity and environmental factors have the most potential to impact the incidence of overweight and obesity (Kelly & Patterson, 2006).

Obesity is usually defined as a medical condition where excess of body fat is associated with impaired health (Haslam & James, 2005; WHO, 2000). The concepts of overweight and obesity are labels for ranges of weight that are greater than what is generally considered healthy for a given height. Obesity is a weight that has shown to increase the likelihood of certain diseases and other health related problems. Obesity is usually defined as a medical condition where excess of body fat is associated with impaired health (WHO, 2000). International Obesity Task Force (IOTF) defined overweight as children with BMI value between 85<sup>th</sup> and 95<sup>th</sup> percentile for a specific age and sex. Similarly, obesity (OB) was defined as children with BMI value above 95<sup>th</sup> percentile for a specific age and sex (Reilly, Kelly & Wilson, 2010). In this study, both terms overweight and obesity will be used interchangeably.

### **Causes of Overweight and Obesity in Children**

There are several factors that contribute to children being overweight and obese. Review of the causes of children overweight and obesity was based on genetic, physical activity, socio-economic, nutritional values, and environmental factors among others. Inevitably obesity occurs due to an imbalance between energy intake (dietary habits) and energy expenditure (physical activity).

In addition, personal lifestyle preferences and the cultural environment play important roles (Swinburne & Egger, 2002). It is difficult to reverse the



obesity trend and help individuals to change their diet and increase exercise. Over the last decades, life style has changed significantly. There are many labor-saving devices in our homes and at work. Individuals drive more and eat more takeaway meals, and in larger portions. The Foresight Report in the UK adds to the scientific evidence available on obesity to help inform government strategy in combating the problem. In the report, it was argued that multiple factors contribute to the obesogenic environment (Swinburne & Egger, 2002).

Obesogenic environment referred to the role environmental factors may play in determining both nutrition (over consumption of energy dense foods) and physical activity. (Swinburne & Egger, 2002) The obesogenicity of an environment has been defined by Swinburne and Egger as ‘the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations (Swinburne & Egger, 2002).

### **Consequences of Overweight and Obesity**

The latest WHO (2008) projections indicate that at least one in three, of the world’s adult is overweight and almost one in 10 is obese. Additionally, there are over 40 million children under age five who are overweight. Being overweight or obese can have a serious impact on health. Carrying extra fat leads to serious health consequences such as cardiovascular diseases (mainly heart diseases and stroke), Type 2 diabetes, musculoskeletal disorder like osteoarthritis, and some cancers. These conditions cause premature death and substantial disability (WHO, 2008).

What is not widely known is that the risk of health problems starts when someone is only very slightly overweight, and that the likelihood of problems increases as someone becomes more and more overweight (WHO, 2008). Overweight and obesity cause long term suffering for individuals and families. In addition, the costs for the health care system can be extremely high (WHO, 2008).

In an analysis of four Chicago epidemiological studies, weight gain was associated with an increase in pulse pressure (Vasan, Larson, Leip, & Evans, 2001). In the Framingham Heart Study, a 5% weight gain was associated with a 20% to 30% increase in hypertension incidence (Vasan, Larson, Leip & Evans, 2001).

Agyemang and Owusu-Dabo (as cited in Gyamfi, 2010) revealed that on pre-hypertension in Ashanti Region of Ghana, West Africa and Africa have an opportunity for early prevention of hypertension than clinical diagnosis as the region recorded 29% to 40% prevalence rates for pre-hypertension and hypertension, respectively. Also, they stated that the numbers of females who suffer from hypertension are more than males. The more people become older (35 years and above), the higher they get hypertension (Agyemang and Owusu-Dabo, 2008). Social implication of childhood overweight and obesity plays a significant negative role in the social and psychological aspect of a child's life. There is lower self-esteem, poor relationships with peers, stigmatisation, isolation, low academic performance, victims and likewise perpetrators of bullying behaviours than for normal weight children (Judge & Jahns, 2007).

## Summary of Literature Review

The chapter highlighted the concept of nutrition and the factors that influence mothers' knowledge about nutrition as well as how they feed their children aged 6 years and below. Nutrition is a process whereby living organisms use food for the maintenance of life, health, growth, development and survival. Under-nutrition that occurs during childhood, adolescence, and pregnancy has an additive negative impact on the birth weight of infants. This study identified several types of nutrition, namely; carbohydrates, protein, fat and oils, vitamin and minerals. In fact, lack or inadequacies of these nutrients may manifest in disease conditions such as Kwashiorkor and anemia. Childhood malnutrition is a major health problem especially in developing countries. Protein-energy malnutrition (PEM) is the most widespread and serious nutritional problem among children.

Salah (2004) nutrition model was adapted and used as a conceptual framework for this study as shown in Figure 1. Based on the research questions, the review of literature suggests that not much has been done with respect to identifying the sources of mothers' nutritional knowledge, and the social-cultural factors that affect the level of nutritional knowledge of the selected mothers in the country. This study is, therefore, poised to fill this gap in research.

## **CHAPTER THREE**

### **METHODOLOGY**

This chapter describes the methods that were employed for the study. It explains how the investigations were carried out; why particular methods and techniques were employed. It also provides the materials, size of sample and procedures that were used for the study. Additionally, the chapter discusses the analysis used for the data collected.

#### **Research Design**

The study employed the cross-sectional descriptive survey. This was because the study sought to solicit responses from the mothers of children between 0 and 6 years in order to understand their knowledge about child nutrition and the challenges confronting them. According to Fraenkel and Wallen (2000), the descriptive survey is often directed towards determining the nature of a situation as it exists at the time of the study. Cresswell (2008) added that the descriptive survey design is used to determine individual opinion about a policy issue or programme. Polit and Hungler (2003) added that descriptive survey has an advantage of producing a good amount of responses from a wide range of people. The design is, therefore, appropriate when a researcher attempts to describe some population or aspect of a population by selecting unbiased samples

of individuals who are asked to complete questionnaire and interviewed (Fraenkel & Wallen, 2000).

Similarly, Best and Khan (1998) stated that descriptive design is concerned with the conditions or relationships that exist, such as determining the nature of prevailing conditions, practices and attitudes; opinions that are held; processes that are going on; per trends that are developed. Amedahe (2002) asserted that objectivity is the focus in descriptive research where accurate description of activities, objects, processes and persons are involved. Descriptive research design could be said as dealing with interpreting the relationship among variables and describing the relationships. Again, this study chose the descriptive study design recognising that the sources of data collection is less expensive and offers the opportunity to gain an insight into basic concepts of human behaviour. This design was the suitable for this work because it had an advantage over the others in investigating the underlying factors that influence mothers' choices of food and the feeding effect on the nutritional status of their children.

### **Population**

The population for the study had a total of 327 mothers with children aged 0-6 years in James Town who attended the James Town (with 219 mothers) and Ussher Fort Clinics (with 108 mothers) between October to November, 2014 (James Town/ Ussher Fort Clinics, Records Department, 2014). These mothers received antenatal care (ANC) services at the clinic, and therefore, the most appropriate for this study.

### **Sample and Sampling Techniques**

The sample size for the study was 175 mothers and their children aged 0-6 years. This was arrived at using a sample size determination table devised by Krejcie and Morgan (as cited in Cohen, Manion & Morrison, 2005) who gave the representative sample for a population of 327 as 175.

On how the sample was selected, a probability sampling technique called the simple random sampling, table of random numbers, was employed. Here, the names of all 327 mothers were compiled and fed into the Statistical Package for the Social Sciences (SPSS) version 20.0, then the Random Number Generator function in the software was commanded to choose 175 names. The selected names then formed the sample to whom questionnaires were administered.

### **Research Instrument**

The instrument used in the study was the questionnaire. According to Fink (1995), the questionnaire, as a tool, is preferred because it is less time consuming than other methods such as interviews and observation. Also, the use of questionnaire promises a wider coverage since the researcher can approach respondents more easily than the other methods. It is stable, consistent and uniform, without variation and can be completed at a faster rate as compared to the others. Due to the numerous advantages of the use of questionnaire in surveys, this study also used questionnaire.

All items were generated from the research questions. The items in the questionnaire were both open and closed-ended. The open-ended items were to allow respondents to freely express their views on some key issues. The closed-

ended items were rather aimed at ensuring uniformity in the responses and thereby preventing subjectivity of any kind. According to Sarantakos (2005), closed-ended items require less effort to respond to, easy scoring and promotes objectivity on the part of the respondent. There were 26 items running through all the five sections of the questionnaire that required the respondents to provide their own responses. Notwithstanding the lapse of close-ended items in restricting the responses of respondents, its adoption enabled effective editing and analysis of the data collected.

In addition, the 4-point Likert scale was used to measure the nutrition knowledge of the respondents. Under this section, there were 12 items, which were measured on the Likert scale.

The questionnaire (see Appendix A) had five sections. Section A sought to solicit information on the demographic characteristics of the mothers. This section had 17 items. Sections B contained nine items that sought to assess the respondents' knowledge on nutrition, while Section C had four items on the health care practices that influenced the nutritional status of children. Section D provided items on the factors affecting children's feeding. This section also had 17 items. The final section, with a question, solicited information from the respondents on the impact of health education on their nutritional knowledge.

### **Pre-Testing of Instrument**

Polit and Hungler (2003) regarded pre-testing as a small-scale version or trial run done in preparation for the actual study. The purpose of a pre-testing is to ensure the level of validity and reliability of the data collection instrument. One of

the advantages of conducting a pre-testing is that it might give advance warning about where the main research project could fail, where research protocols may not be followed or whether proposed methods or instrument are inappropriate or too complicated. According to De Vaus (1993), pre-testing is important because it helps in developing and testing adequacy of research instruments, identifying logistical problems which might occur using proposed methods, determining what resources are needed for a planned study, and estimating variability in outcomes to help in determining sample size. This was the basis for this study to also undertake pre-testing of the instrument in order to establish its validity and reliability.

To establish the reliability level of the questionnaire, 30 mothers were randomly selected at the University Hospital in Cape Coast. Although this number appeared to be relatively small, Fraenkel and Wallen (2000) asserted that in a pre-study, only few similar sample should be used. The Cronbach's Alpha reliability test was conducted and measured against the acceptable range of .600 or above as stated by Cohen (as cited in Leech, Barrett & Morgan, 2005). Using the SPSS, the reliability coefficient obtained for the questionnaire was .815; indicating that it was reliable and had 'adequate' internal consistency.

Validity, according to Fraenkel and Wallen (2000), revolves around the defensibility of the inferences researchers make from data collection through the use of an instrument. The validity of the instrument used was established by the face of the instrument. That is, I made the instrument available to my two supervisors and colleagues from the Department of Vocational and Technical



Education, University of Cape Coast for their critique, and several changes in the forms of revisions and in some instances, complete deletions of items were done.

For example,

### **Data Collection Procedure**

Before going to the field to collect the data, an introductory letter was requested from the Head of Department of the Vocational and Technical Education (VOTEC), University of Cape Coast, which formally introduced me to the respondents and the Nurses-In-Charge at the James Town and Ussher Fort Clinics. Discussions were held with the sampled mothers with respect to the appropriate time to come and administer the questionnaire. In order to encourage respondents to frankly respond to the items, confidentiality was assured them to enable them feel-free to express their views. The establishment of good rapport with both the respondents enabled me to administer and retrieve the questionnaires on the same day. Dates were subsequently given me for the administration of the questionnaires and data were collected over a two-month period from November to December, 2014 due to the amount of work involved in measuring, for instance, anthropometric variables.

Since I was not very fluent in the Ga language, I engaged the services of two well-trained research assistants. The research assistants were indigenes of the area and virtually knew the houses of each of the selected mothers for the study.

A three-day training session was organised for the research assistants. Issues discussed during the training were as follows:

1. the ethical issues in conducting scientific research of this kind;

2. importance of each item on the questionnaire;
3. the anthropometric index measurement of children;
4. the recording of figures; and

In addition to the introductory letter from the Head of Department, an ethical approval was obtained from the Institutional Review Board of University of Cape Coast (IRBUCC), which helped in securing permission from the Greater Accra Regional Health Directorate and the AMA Health Directorate. Consent was also sought from the chiefs and opinion leaders of the community. Also, participants were informed that their participation in the research was entirely voluntary and they had the right to opt out if they were not comfortable.

The research assistants in some few instances gave out the questionnaires to the respondents who were literate. However, for those who could neither read nor write, the items were translated for them in Ga and the research assistants wrote their responses in English on the questionnaire. Only anthropometric data were collected from the children.

The main problem encountered was that the respondents were requesting for money/gifts before participating in the study with the reason that they had to be working at the seashore, but for the study. They said without working that day, they would not get anything to feed themselves and their children. Also, some of the children were afraid when their anthropometric measurements were being taken.

Although in the study, a 100% retrieval rate was recorded, after editing and cleaning, three copies of questionnaire were discarded because of their

incompleteness. This meant that in the study, 172 mothers were used instead of the initial 175 representing a 98.3% retrieval rate. In view of the three discarded questionnaires being a minority, there would not be any substantial effects in view of its insignificance on the total percentage.

### **Data Analysis**

To Ary, Jacobs and Razavieh (1990), data analysis is the ordering and breaking down of data into constituent parts and performing of statistical calculations with the raw data to provide answers to the research questions which guided the research. This is crucial if any meaningful analyses were to be done.

The retrieved questionnaires were serially numbered, coded and captured in a template designed in the Statistical Product and Service Solutions (SPSS version 20.0). Basically, data gathered in this research were mainly quantitatively (descriptively and inferentially) analysed.

Cross-tabulations, graphs, frequencies and percentages were part of the descriptive statistical tools used. In measuring the level of nutritional knowledge among the respondents using a 4-point Likert scale, an indexing was done and the scores ranged between 12 and 48. A 75% cut-off point translating into 36 was determined for having adequate knowledge, otherwise the respondents was considered to have poor knowledge. The Chi-square test was used to test for significant association between nutritional knowledge of the mothers and the demographic and socio-economic variables were also employed. Table 2 is the statistical tools used to analyse data collected to answer each research question. There were six research questions in the study.

**Table 2: Data Analysis**

No.	Research Questions	Statistical tools employed
1.	What are the background characteristics such as age, level of education, and marital status of the selected mothers in James Town?	Frequencies and percentages
2.	What are the sources of mothers' nutritional knowledge?	Frequencies and percentages
3.	What is the level of nutritional knowledge of the respondents?	Frequencies and percentages,
4.	What are the social-cultural factors that affect the level of nutritional knowledge of the selected mothers in the study?	Frequencies and percentages
5.	What are the nutritional statuses of the children of the selected women?	Frequencies and percentages
6.	Are there any relationships between mothers' nutritional knowledge and nutritional status of their children?	Frequencies, percentages, Chi-square test

The study adopted the descriptive research design and the relevant statistical tools enabled the researcher to obtain the relevant data for the analysis. The cleansing of the data collected before analysis guaranteed sound conclusions and recommendations. This is because this helped in cross-checking and validating the responses provided by the respondents.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

This chapter deals with the results and discussion of the data gathered from the respondents. The purpose of the study was to assess the factors affecting the nutritional status of children (0-6 years) in James Town in Accra, Ghana. It specifically sought to find out the background characteristics such as age, level of education, and marital status of mothers, investigate the nutritional literacy of mothers of the children, identify the sources of mothers' nutritional literacy, examine the socio-cultural factors that affect the level of nutritional literacy of the selected mothers, assess the nutritional status of the children of the selected women, and establish a relationship between mothers' nutritional literacy and nutritional status of their children.

**Research Question 1: What are the background characteristics such as age, level of education, and marital status of the selected mothers in James Town?**

The study sought to profile the respondents indicating their background characteristics since these characteristics and attributes could influence their knowledge and practices of child nutrition (Gyasi, 2008). These included age, marital status, religion, ethnic group, educational attainment, employment status and type, occupation, spouse's occupation, total monthly household income and the number of children. Table 3 presents details on the afore-mentioned variables.

**Table 3: Demographic Characteristics of Respondents**

<b>Variables</b>	<b>No.</b>	<b>%</b>
<b>Age (in years)</b>		
16 – 20	8	4.6
21 – 25	8	4.6
26 – 30	100	58.1
31 – 35	37	21.5
36 – 40	19	11.0
<b>Marital Status</b>		
Single (never married)	24	14.0
Married	148	86.0
Divorced/Widowed/Separated	0	0.0
<b>Religion</b>		
Christianity	163	94.8
Islam	0	0.0
Traditional	0	0.0
Non-response	9	5.2
<b>Ethnic Group</b>		
Akan (Ashante)	34	19.8
Ga	91	52.9
Akan (Fanti)	39	22.7
Ewe	8	4.6
<b>Highest Educational Level</b>		
No formal education	33	19.2
Basic	80	46.5
Secondary/Technical/Vocational	59	34.3
Tertiary	0	0.0

**Table 3 (Continued)**

<b>Variables</b>	<b>No.</b>	<b>%</b>
<b>Employment Status</b>		
Unemployed	26	15.1
Employed	146	84.9
<b>Occupation</b>		
Traders	88	51.2
Caterers	20	11.6
Hairdressers/Beauticians/Seamstresses	54	31.4
Civil servants (Nurses, Teachers)	10	5.8
<b>Spouse' Employment Status</b>		
Unemployed	48	27.9
Employed	124	72.1
<b>Monthly Income (GH¢)</b>		
No income	17	9.9
Less than 157.20 (minimum wage)	43	25.0
More than the minimum wage to 500	112	65.1
<b>Number of Children</b>		
One	42	24.4
Two	59	34.3
Three	44	25.6
Four	27	15.7

*Total number of respondents (N) is 172*

A study of Table 3 indicates that eight representing 4.6% of the respondents were aged between 16 and 20 years. According to Henry and Fayorsey (2002), James Town and its environs are noted for high prevalence of teenage pregnancies due to harsh socio-economic conditions prevailing there. A total of 116 of the respondents (67.3%) were between 16-30 years. Thirty-seven

representing 21.5% and 19 (11.0%) of the respondents were aged from 31 to 35 years and 36 to 40 years, respectively, while none of them was aged above 40 years. The average age of the respondents was 29.5 years, which agrees with a similar finding of the 2008 Ghana Demographic and Health Survey conducted by the Ghana Statistical Service [GSS]/Ghana Health Service [GHS]/ICF Macro (2009).

In terms of their marital status, the result revealed that majority were married. This is consistent with the findings of GSS/GHS/ICF Macro (2009) that majority of Ghanaians are married as the society frowns on bearing children without marriage. However, the results also showed that the remaining 14.0% were never married yet had children. This lends credence to a study by Henry and Fayorsey (2002) pointing to the increase in unplanned pregnancies in the area. Being single parents implies that they have to fend for themselves and their children all alone with an occasional assistance from external family relations. This is likely to affect the quality of food they give the children leading to malnutrition. None of the respondents was divorced, widowed or separated; implying that at least the fathers of their children are alive even if they do not accept to look after them.

The essence of including religious affiliation of the mothers stems from the fact that certain types of foods are 'banned' in some religious circles. The results from Table 3 showed that an overwhelming majority of the respondents (94.8%) were Christians, while 9 (5.2%) of the remaining respondents remained silent over their religious affiliations. Several studies including that of the 2010



Population and Housing Census (GSS, 2012) and Ghana Demographic and Health Survey (GSS, 2008) separately found the dominance of Christians in the country. They also pointed to the emergence of other religions as well.

With regard to their ethnic backgrounds, there were many Gas in the sample compared to all other three ethnic groups sampled. They constituted more than half (52.9%), while the Akans (Fantis), Akans (Asantes) and Ewes made up 22.7%, 19.8% and 4.6%, respectively. The results reconfirm that the community is hugely dominated by the Ga people whose main occupation is fishing.

Moreover, the results depicted that a proportion of the respondents (19.2%) had no formal education. Although the majority of them were found to have had obtained some amount of formal education, none of them had attained a tertiary level of education. One hundred and forty-six, representing 84.9% and 124 (72.1%) of the respondents and their spouses were employed, respectively. This means that only 26 (15.1%) of the mothers and 27.1% of their husbands, respectively were unemployed. It was also found that the respondents were mainly traders, hairdressers, beauticians and seamstresses. This palpably means that many residents especially girls are less interested in schooling. Therefore, a greater number of them engage in (petty) trading in fishing, provisions, etc. and vocations to keep “body and soul together” of themselves and their dependants. This agrees with the findings of Henry and Fayorsey (2002) that a lot of both teenage, young and middle aged women in the Ga Mashi are basically into selling or fish-mongering in order to survive. Thus, Central Accra is populated largely by traders and fisher folks.

As many as 60 (34.9%) of them were either earning nothing or less than GH¢157.20, the current minimum wage per month. The modal wage of the respondents was GH¢157.20-500.00, and none of them earned above this amount in a given month. The income profile of the respondents showed that the respondents are in the lower socio-economic class.

With reference to the number of children they had between the ages of 1-6 years, 59 (34.3%) of them had two children, while 44 (25.6%) and 27 (15.7%) had three and four children, respectively. In addition, 42 (24.4%) of the respondents had a child aged between 1-6 years.

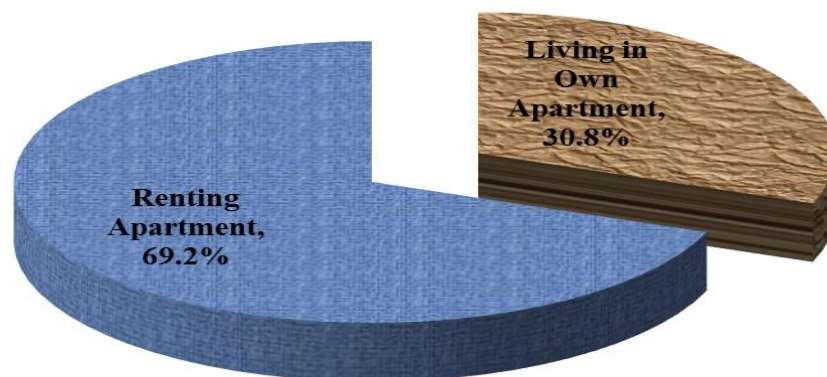
The study also requested the respondents to provide the ages of their children. Table 4 is a summary of their responses. It was gathered from their responses that some of the respondents had more than a child within this age group. However, further analysis in this study would be based on their youngest children with the age interval of 0-6 years.

**Table 4: Ages of Children**

Age (in years)	No.	%
One	75	43.4
Two	46	26.7
Three	5	3.1
Four	12	7.0
Five	11	6.2
Six	23	13.6
<b>Total</b>	<b>172</b>	<b>100.0</b>

As many as 43.4% of the respondents had children aged a year, while 46 (26.7%) were nursing two-year old children. Similarly, five representing 3.1% and 12 (7.0%) of the respondents had three and four years old children, respectively. Moreover, 11 (6.2%) of them had children aged five years, while the remaining 13.6% had six year old children. As indicated earlier, further statistical analyses were based on the youngest children of the respondents. This means that if a respondent had both a two and four years old children, the study collected further data on the two-year old instead of the four years old child. This is to critically study the younger ones who are at a higher risk of malnutrition compared to the older ones.

In order to appreciate the socio-cultural status of the respondents, their residential and property ownership were also explored in the study. In addition, they were asked whether they stayed in their own apartments or not, and the nature of their residences. Figure 2 presents the details.



*Figure 2.* Residential Status of Respondents

The results revealed that approximately the majority of the respondents (69.2%) were living in rented apartments, while the remaining 53 (30.8%) were in their 'own' homes. It was also realised that out of the 51 respondents who said they lived in their own houses, a good number of them were in ghettos/ squatters, while others lived in their family houses. James Town, although located in the Accra central, has a lot of indecent structures in which residents live according to the 2010 Population and Housing Census (GSS, 2012). Most houses do not have kitchens, bathrooms, and/ or toilets.

In essence, the average age of the respondents was 29.5 years with majority being married women. The respondents were mainly Christians. Also, the educational status of the respondents was low as none of them had had tertiary level education. However, as much as 146 (84.9%) of them were working as traders, beauticians and seamstresses, civil servants and caterers.

**Research Question 2: What are the sources of mothers' nutritional knowledge?**

The aim of this research question was to identify the sources from which the respondents obtained their information on child nutrition. They were first asked whether they had any source(s) of information on the subject. Ninety-nine, representing 58.0% did not indicate any sources of information on child nutrition. However, the remaining 73 (42.0%) indicated knowledge on sources of information, which are summarised in Table 5.

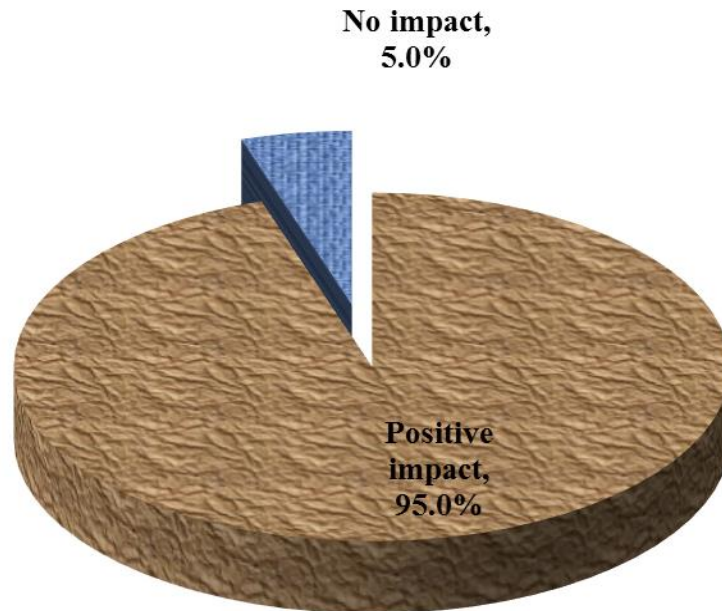
**Table 5: Respondents' Sources of Nutritional Information (n=73)**

<b>Source</b>	<b>No.</b>	<b>%</b>
Health workers	31	42.5
Mother	30	41.1
TV/Radio (mass media)	9	12.3
Books and newspapers	3	4.1
<b>Total</b>	<b>73</b>	<b>100.0</b>

Among the 73 respondents who had sources of information on nutritional knowledge, the main sources of information include as highlighted in Table 5 health workers (42.5%) and their mothers (41.1%). Only nine representing 12.3% indicated TV and radio, while the remaining indicated books and newspapers. This means that the respondents had varied sources of information. The above finding agrees with that of Abdollabi et al. (2008) that mothers obtained their knowledge from many sources, including doctors, parents and TV programmes such as children's programmes, family programmes, advertisements, news and educational programmes. Other sources of knowledge were books, teachers, friends, newspapers, doctors and nutritionists. They further reported that the factors that had the greatest effect on children's nutritional behaviour were TV advertisements, parents and family environment.

Chew, Palmer and Kim (1995) also identified magazines, television, newspapers and doctor/clinic/hospital as key sources of nutritional knowledge among mothers. Moreover, on the impact of such education on their nutritional

knowledge, an overwhelming majority of them (95.0%) reported that such nutritional education had had positive impact on their nutritional knowledge level as shown in Figure 3.



**Figure 3.** Impact of Education on the Nutritional Knowledge of Mothers

It can be concluded from the discussion that the respondents had several and varied sources of information on child nutrition. Their main sources included health workers and their mothers as well as TV and radio.

**Research Question 3: What is the level of nutritional knowledge of the respondents?**

The study sought to assess the level of knowledge of the respondents on child nutrition. It is believed that an adequate nutritional knowledge of mothers will reflect on the health status of their children. Table 6 contains the descriptive analysis of their responses on the subject matter.

From Table 6, it can be seen that as many as 54 (31.4%) and 65 (37.8%) of the respondents strongly agreed and agreed respectively that consuming a low-protein diet in childhood could greatly affect ultimate adult height. However, the remaining 30.8% got it wrong by disagreeing. On whether or not an infant's length increased by 50% in the first year, 53 (30.8%) and 17 (9.9%) of them disagreed and strongly disagreed, respectively. It was also seen that 100 (58.2%) of the respondents responded in the affirmative that an infant's diet should be very low in fat. Meanwhile, 53 (30.8%) and 17 (9.9%) of them respectively reported "disagree" and "strongly disagree."

**Table 6: Knowledge of Respondents on Nutrition**

<b>Nutritional knowledge</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
	<b>No. (%)</b>	<b>No. (%)</b>	<b>No. (%)</b>	<b>No. (%)</b>
Consuming a low-protein diet in childhood can greatly affect ultimate adult height.	54 (31.4)	65 (37.8)	45 (26.2)	8 (4.6)
An infant's length increases by 50% in the first year.	9 (5.2)	93 (54.1)	53 (30.8)	17 (9.9)
An infant's diet should be very low in fat.	45 (26.1)	55 (32.1)	45 (26.1)	27 (15.7)
Infants do not enjoy blend foods.	38 (22.1)	77 (44.8)	37 (21.5)	20 (11.6)
Infant have lower energy needs per pound than older children.	71 (41.3)	82 (47.7)	0 (0.0)	19 (11.0)
Iron-deficiency anaemia often occurs in children who have low consumption of fruits.	54 (31.4)	75 (43.6)	0 (0.0)	43 (25.0)
It is nutritionally important to put children under a schedule of three meals a day.	68 (39.5)	104 (60.5)	0 (0.0)	0 (0.0)
The two most common nutritional problems in childhood are obesity and anaemia.	28 (16.3)	45 (26.1)	72 (41.9)	27 (15.7)
Parents should control the amount of food their children eat.	84 (48.8)	49 (28.5)	21 (12.2)	18(10.5)
Infants need sodium in moderation.	47 (27.3)	70 (40.7)	29 (16.9)	26 (15.1)
Infant need iron, zinc and calcium for best growth in the first two years of life.	81 (47.2)	63 (36.6)	19 (11.0)	9 (5.2)
Self-feeding by children should be encouraged.	29 (16.9)	132 (76.7)	0 (0.0)	11 (6.4)

*N=172*



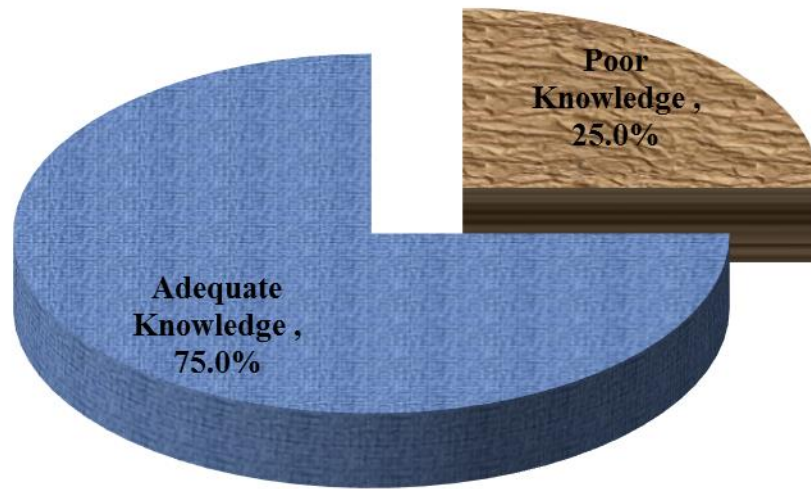
Most of the respondents being 115 (66.9%) said that infants did not enjoy blended foods, while the remaining 57 (33.1%) somewhat disagreed. Similarly, there was a general consensus that infants had lower energy needs per pound than older children. In fact, an overwhelming majority of them (89.0%) had agreed to this statement. A substantial proportion of the respondents (25.0%) strongly disagreed that iron-deficiency anaemia often occurred in children who had low consumption of fruits. This assertion is wrong because this condition is as the result of the inadequacy of the constituents of fruits. A further data analysis revealed that not only those without formal education were wrong on point, but even some with relatively higher educational qualification. Parents are always encouraged to give appreciable amount of fruits and vegetables daily to their children.

Similarly from Table 6, the results also showed that all the respondents (100.0%) had indicated that it was nutritionally important to put children under a schedule of three meals a day. On the two most common nutritional problems in childhood being obesity and anaemia, more than half (57.6%) disagreed. However, the remaining 42.4% agreed that obesity and anaemia were main causes of nutritional challenges among children. About 23% of the respondents were of the view that parents should not consider controlling the amount of food their children ate.

On whether infants need sodium in moderation or not, as many as 29 (16.9%) and 26 (15.1%) of them indicated “disagree” and “strongly disagree”, respectively. One hundred and forty-four, representing 83.8% of the respondents

agreed that infant needed iron, zinc and calcium for best growth in the first two years of life. Even though self-feeding among children is encouraged, a few of the respondents were unaware of this. This depicts their lack of knowledge on child nutrition. The study further sought to classify the respondent into two main groups, namely, those with adequate and those with poor knowledge on child nutrition. Their respective scores on the 12 nutritional items in Table 6, where Strongly Agree was coded as 4, Agree (3), Disagree (2) and Strongly Disagree (1) were composited and an indexing was done as explained in Chapter Three.

This implies that the score of each respondent could range between 12 and 48, and a 75% cut-off point criterion was chosen for the classification into those with adequate knowledge and those without. Therefore, any respondent who scored less than 36 was classified as having “Poor Knowledge” on nutrition otherwise, she was classified as having “Adequate Knowledge.” The 75% cut-off point criterion was used because of the conscious effort made by the Ministry of Health in collaboration with the Ghana Health Service, to the extent that child nutrition education are carried out in both antenatal and post-natal clinics, at all health facilities in the country.



**Figure 4.** Impact of Education on the Nutritional Knowledge of Mothers

The results from the classification showed that a high majority of the respondents (75.0%) had poor knowledge on child nutrition, while only 43 (25.0%) of them had adequate knowledge on child nutrition. This finding contradicts that of Gyampoh, Otoo and Aryeetey (2014), who found that most mothers sampled from the six public health facilities in the Accra Metropolitan Assembly (AMA) were knowledgeable about child nutrition. According to Emina et al. (2009), women with knowledge on healthcare know the effects of unhygienic conditions and diseases on their children, children of educated women live in more hygienic environment, have higher prevalence of vaccination than their counterparts, receive appropriate care in case of disease, and therefore, have

better nutritional status than others. Hygienic environment is important for all, especially, children to avoid infections.

The study further examined the cross-relationship between mothers' knowledge on nutrition and clinic attendance. The researcher employed the cross-tabulation statistical method. Table 7 presents the details of the results.

**Table 7: Mothers' Attendance of Clinics and Level of Nutrition Knowledge**

Clinic attendance	Knowledge on Nutrition		No.	%
	Poor knowledge (n=129)	Adequate knowledge (n=43)		
<b>Did you attend antenatal clinic during pregnancy</b>				
Yes	4	15	19	11.0
No	125	28	153	89.0
<b>How would you grade the education you received during postnatal clinics?</b>				
Very helpful	87	14	101	58.7
Fairly helpful	29	11	40	23.3
Helpful	9	1	10	5.8
Not helpful	4	17	21	12.2
<b>Has the postnatal clinic attendance affected the growth of your child in anyway?</b>				
Yes	110	34	144	83.7
No	19	9	28	16.3
<b>Total</b>	<b>129</b>	<b>43</b>	<b>172</b>	<b>100.0</b>

Among the respondents, only 19 (11.0%) of them attended antenatal clinics during pregnancy with majority of 15 out of 19 (78.9%) having adequate knowledge about child nutrition. Similarly, approximate total percentage of 88.0% rated the effectiveness of the nature of nutritional education they had obtained from post-natal clinics as useful. More than half of them (58.7%) agreeing that the education obtained had been very helpful. However, 21 (12.2%) of them totally dismissed the benefits of such education. Meanwhile, in their views, majority of the respondents (83.7%) agreed that such postnatal clinic attendance had contributed positively to the growth of their children. They perceived the nature of nutritional knowledge that they had gotten from the clinics to be helpful. Among this group, only 34 (30.9%) of them were found to have had adequate knowledge about child nutrition.

The reasons why mothers could give water to their wards was also gathered from the study. Table 8 presents the details of the results.

**Table 8: Reasons for Giving Children Water**

<b>Reasons</b>	<b>No.</b>	<b>%</b>
For the child to grow stronger	120	69.8
Since they eat, they have to take water	34	19.8
When thirsty	9	5.2
If the child is not eating you can give water	9	5.2
<b>Total</b>	<b>172</b>	<b>100.0</b>

Table 8 reveals that about 70% of the respondents said that they gave water to their children in order to see them grow stronger. Thirty-four representing 19.8% were of the view that since their children eat, they must be given water as well. Meanwhile, 5.2% of the respondents said they only fed them with water when they are thirsty, while others indicated that if their children would not eat, they had to give them water. LINKAGES (2004) revealed in its study that at least 95% of children in Africa are breastfed, but this is often inadequate because many people feed their infants with water and other liquids alongside the breast milk. This has resulted in many women not doing exclusive breastfeeding. This situation might be underscored by several reasons. In Ghana, for instance, the misinformation among mothers, especially the young ones is that they risk having flat breasts after practicing exclusive breastfeeding. This makes them to fear the practice although exclusive breastfeeding is said to have several nutritional benefits for children (Nikoi, 2011). The absence of exclusive breastfeeding for a child could result in malnutrition.

In addition, the respondents also reported that water causes certain diseases and the main ones indicated were malaria (38.4%), diarrhoea (23.2%), cold (21.5%), cholera (5.2%), stomach pains (4.7%), high temperature (4.7%), and measles (23%).

On the possible risk factors of obesity among children, respondents identified five main possible causes as presented in Table 9.

**Table 9: Possible Causes of Obesity in 5-6 Years Old Children**

<b>Causes</b>	<b>No.</b>	<b>%</b>
Over-eating	89	51.8
Excessive intake of sweets	52	30.2
Hereditary	21	12.2
Blood tonic	10	5.8
<b>Total</b>	<b>172</b>	<b>100.0</b>

According to the respondents, over-eating was identified as the main cause of obesity among children. It can be seen that 51.8% of them identified this as a possible cause of this medical condition. Fifty-two, representing 30.2% of the respondents, however, attributed obesity among children to excessive intake of sweets. Other possible causes mentioned included hereditary and the intake of blood tonic.

The study also assessed the knowledge of the respondents on the kinds of foods that provide vitamins and minerals to children. Fosu (2008) mentioned that vitamins and minerals are important for growth and development, especially in children. He said vitamins transport energy from the food we eat to the body system, help the body derive the best from food and also help regulate the body to function in order to be resistance to infections. Table 10 presents the details of their responses.

**Table 10: Knowledge on Food Groups that are Sources of Vitamins and Minerals for Children**

<b>Food groups</b>	<b>No.</b>	<b>%</b>
Fruits	124	72.1
Proteins	22	12.8
Vegetables	21	12.2
Carbohydrates	5	2.9
<b>Total</b>	<b>172</b>	<b>100.0</b>

The majority of the respondents (72.1%) said that fruits were the main source of vitamins and minerals for children, while 22 (12.8%) also believed that protein foods could yield a good amount of vitamins and minerals. However, a finding by Wood and Harper (2008) in the UK revealed that children do not eat the recommended amounts of fruit and vegetables. They revealed that one in seven children never eat fruit. Disabled World (2007) recommended the eating of fruits (particularly citrus fruits) as they are good sources of vitamins, especially C.

They also mentioned vegetables and carbohydrates as other sources of vitamins and minerals. Some of the recommended vegetables include peppers, tomatoes, broccoli, and dark green vegetables to support the assertion made by GHEA (1990). GHEA also mentioned the importance of cereals and legumes. They said that cereals and legumes are of vegetable origin which provides a substantial amount of protein for the body.



When they were asked, “Why is it not advisable to give large amount of protein to children all day?”, they reported that doing so would cause the child to become excessively fat and also fall sick frequently. Although severe malnutrition is mainly due to the shortage of calories and/or protein, which are necessary for the normal growth and body maintenance, excess will also not auger well for the growth of the child.

In response to this research question, the results showed that a high majority of the respondents (75.0%) had poor knowledge on child nutrition. Only 43, representing 25.0% of them had adequate knowledge.

**Research Question 4: What are the socio-cultural factors that affect the level of nutritional knowledge of the selected mothers in the study?**

The study also sought to identify the socio-cultural factors that influence the nutritional knowledge level of the respondents. These included the kinds of foods they fed their children with and taboos in James Town that prevent the eating of certain groups of foods. The influence of some of the key items on the knowledge level of the respondents was determined using the Chi-square test and conclusions drawn at a .05 significance level. The classification of the nutritional knowledge levels of the respondents where 129 (75.0%) and 43 (25.0%) were said to have poor and adequate knowledge, respectively from Figure 4 was used here. Tables 11 and 12 present the details of the analyses.

**Table 11: Kinds of Foods Consumed by Mothers**

Kinds of foods	Knowledge on Nutrition		No.	%
	Poor knowledge (n=129)	Adequate knowledge (n=43)		
Which food types do your household members eat often?	$\chi^2=4.735, df=4,$		$p=.316$	
Kenkey	59	15	74	43.0
Banku	29	9	38	22.1
Fufu	20	11	31	18.0
Rice	18	5	23	13.4
Ampesi	3	3	6	3.5
Why do you eat what you eat?	$\chi^2=21.366, df=4,$		$p=.000$	
Convenience	61	4	65	37.8
Health benefits	32	21	53	30.8
Availability	28	9	37	21.5
Cost	8	8	16	9.3
Values/beliefs	0	1	1	0.6
Do you feed the same food to a child regardless of the age?	$\chi^2=11.416, df=1,$		$p=.001$	
Yes	65	9	74	43.0
No	64	34	98	57.0
<b>Total</b>	<b>129</b>	<b>43</b>	<b>172</b>	<b>100.0</b>

The results from Table 11 revealed that the respondents had identified five main food types that were usually consumed by their households, namely, Kenkey, Banku, Fufu, Rice and Ampesi, which they usually cooked or they

bought. However, the staple food of the respondents was Kenkey (which they usually cooked themselves) as indicated by 43.0% of them. Similarly, Banku came second as another favourite food among the respondents. Thirty-eight representing 22.1% of them indicated this, while 18.0% and 13.4% reported of Fufu and rice, respectively. The consumption of Ampesi was not so much common among the respondents (3.5%). On whether or not food groups had any association with the nutritional knowledge of the respondents, the Chi-square value of 4.735 with an associated  $p$ -value of .316 showed that there was no significant association. Therefore, it can be said that there was no relationship between the nutritional knowledge of the respondents and the kinds of foods their households consumed.

On the reasons for the choice of food types, the respondents indicated convenience, health benefits, and availability as the main reasons underpinning the choice of foods for their households. They were of consensus that the cost and values/beliefs of food were not factors to be considered. The study, however, found a statistically significant association between the nutritional knowledge level of the respondents and why they were eating certain foods, since the  $p$ -value was less than .05. This gives the implication that the nutritional knowledge of the respondents could be responsible for the reasons for eating a particular food.

As much as 43.0% of the respondents said they fed their children with the same foods regardless of their ages. This is a bad practice since such meals might not be appropriate for children aged 6 years and below. A further analysis revealed that there was a significant association between the knowledge level of

the respondents and the kinds of foods they fed their wards with. This is because the *p*-value obtained was less than .05.

Similarly, the study analysed the influence of taboos on the level of nutritional knowledge of the respondents using the Chi-square test. Table 12 is a summary of the results.

**Table 12: Taboos Hindering Child Nutrition**

Taboos	Knowledge on Nutrition		No.	%
	Poor knowledge (n=129)	Adequate knowledge (n=43)		
Are there any taboos or customs that prohibit the consumption of certain foods by your family members?	$\chi^2=3.185, df=1,$		$p=.074$	
Yes	59	13	72	41.9
No	70	30	100	58.1
Are there any taboos or beliefs that prohibit children from eating certain foods?	$\chi^2=2.068, df=1,$		$p=.150$	
Yes	16	2	18	10.5
No	113	41	154	89.5
Do you face any challenges in the feeding of your children?	$\chi^2=16.259, df=1,$		$p=.000$	
Yes	19	19	38	22.1
No	110	24	134	77.9

From Table 12, although the majority of the respondents claimed that there were no customs or taboos prohibiting them from eating certain foods, a substantial proportion of them (41.9%) responded in the affirmative. Some of these taboos among the respondents included the consumption of snails as a taboo

among the Gas and some Ewes, particularly those from Adaklu. Also, consumption of water yam was highlighted as a permanent taboo among the Gas. This is an indication that a good number of the respondents still hold on to traditional/cultural beliefs. On the impact of customs/taboo on the nutritional knowledge of the mothers, the results showed a  $p$ -value of .074, which was slightly greater than the .05 significance level. This means that traditional/cultural beliefs do not contribute significantly to their nutritional knowledge.

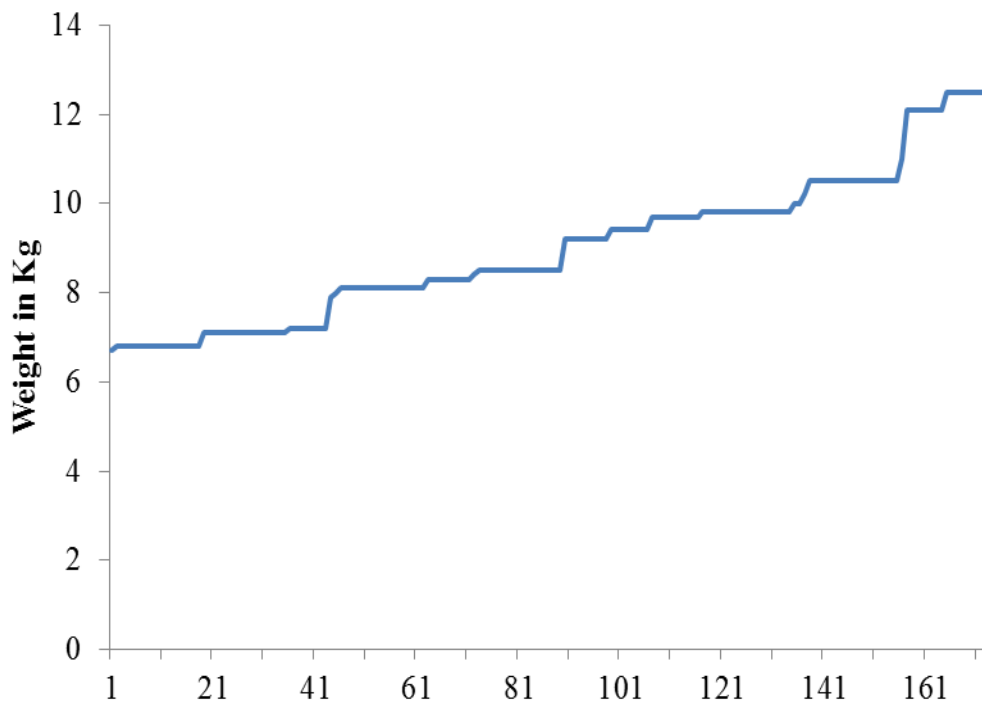
There was a massive disagreement over children being prohibited from eating certain foods in James Town. The results revealed that children were usually given normal foods including eggs, plantain, beef and mutton. This was evident in the Chi-square value of 2.068 and a  $p$ -value of .150 to indicate that there was no significant association among the two variables. However, as much as 22.0% of the respondents confirmed that they faced challenges in the feeding of their children as the Chi-square value ( $\chi^2=16.259$ ) and a  $p$ -value of .000 had shown to be significant. Some of the challenges identified were lack of money, expensive food stuffs, inadequate time to cook and large family size. The conclusion is that the respondents' nutritional knowledge was statistically influenced by the challenges that they encountered in feeding their children.

Bentum (2011) and Alhassan (2008) stated that religious belief/taboo of mothers, sometimes, determines the kind of foods they give to their children. Some communities may regard certain foods as taboos and though such foods may be nutritionally good, they will not be considered as good for feeding children. They continued that some mothers perceived as taboo for children to be

given eggs, meat and fish because they will grow to become thieves. However, the finding in this study is that taboos are not important determinants of the nutritional knowledge of the mothers.

**Research Question 5: What are the nutritional status of the children of the selected women?**

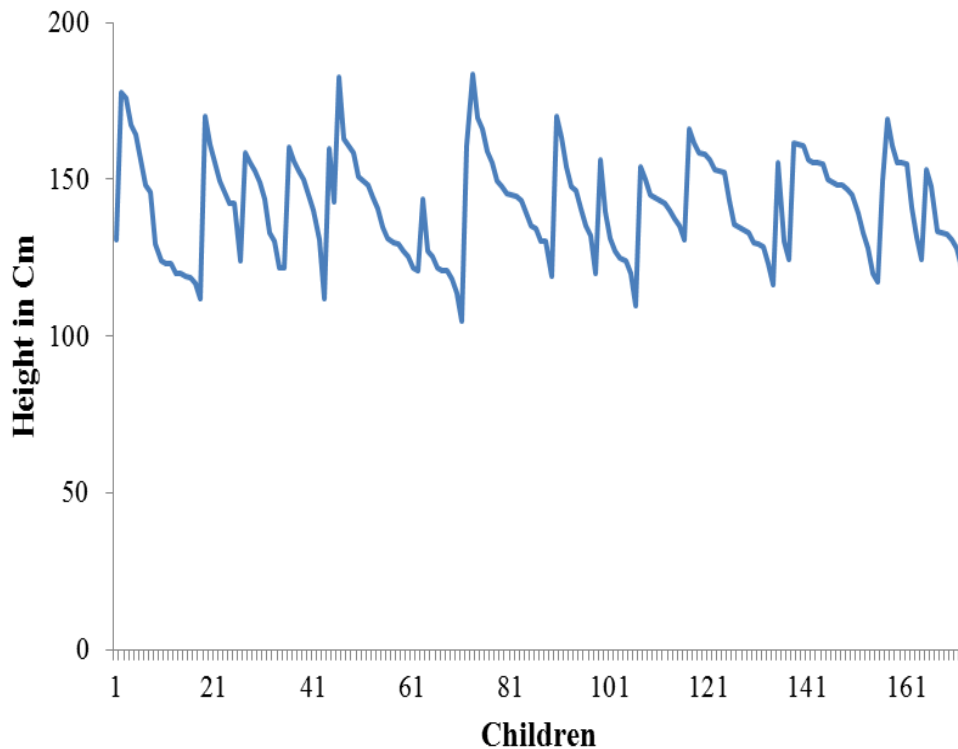
This study attempted to assess the nutritional status of the children involved in the study. To this end, data were gathered on the weights and heights of the respondents' children so that their body mass index (BMI) could be computed. Figures 5-6 and Table 12 present the details of the analysis.



**Figure 5.** Weight of Children (in kilogram)

On the weights of the children, it was ascertained that the least and the highest values were 6.70kg and 12.50kg, respectively. Their average weight was 8.96kg with variability of 1.60kg. Similarly, the heights of the children of the

respondents were taken and Figure 6 is a pictorial representation of the data. The values ranged between 105.00cm and 183.5cm (i.e., 1.05-1.84m). The mean height was 141.52cm or 1.42m, while the standard deviation was 16.12cm or 0.16m.



**Figure 6.** Height of Children (in centimeters)

To determine the well-being or otherwise of the children, their BMIs were computed. Using the WHO's (2000) international classification of weight status according to BMI, the results in Table 13 were obtained. WHO (2000) argues that underweight refers to children with less than the 5<sup>th</sup> percentile; normal weight children have their BMI between 5<sup>th</sup> percentile to less than the 85<sup>th</sup> percentile; overweight ranges between the 85<sup>th</sup> percentile to less than the 95<sup>th</sup> percentile; and obesity equals to or greater than 95<sup>th</sup> percentile.

**Table 13: BMI of Children**

<b>Weight status category</b>	<b>Percentile range</b>	<b>No.</b>	<b>%</b>
Underweight	<2.77	8	4.7
Normal weight	2.77<5.94	138	80.2
Overweight	5.94<7.24	18	10.4
Obese	≥7.24	8	4.7
<b>Total</b>		<b>172</b>	<b>100.0</b>

Out of the 172 children whose BMIs were calculated, eight (4.7%) were found to have been underweight because their BMIs were below the 5<sup>th</sup> percentile of the entire dataset of the 172 children. Per the data, this translated into a BMI of 2.77. Similarly, the majority of the children were found to be of normal weights as their BMIs were above 2.77, but less than 5.94. Among the respondents, 18 (10.4%) were overweight, with their BMI over 5.94 and below 7.24. Eight, representing 4.7% of the 172 were seen to be obese. This finding contradicts Kumar et al.'s (2006) who conducted a similar study in Anganwadi (AW) areas of urban Allahabad, Delhi and found 36.4% of the children being underweight, 51.6% stunted, and 10.6% wasted. IFPRI (2000) and WHO (1998) were of the view that the recent improvements in female secondary school enrolment rates tend to be responsible for about 43.0% of the total of 15.5% reduction in child underweight rates in developing countries during the 1970-1995 periods. Possibly, the relatively high educational level of the mothers had resulted in over 80.2% of the children being of a normal weight.



**Research Question 6: Are there any relationship between mothers’ nutritional knowledge and nutritional status of their children?**

The aim of this research question was to assess the relationship between the knowledge level of the respondents on the nutritional status (BMIs) of their children using the results from the indexing done in Table 12. This was to determine if a child’s well-being could be as a result of the mother’s knowledge on nutrition. Furthermore, the classification of the nutritional knowledge levels of the respondents where 129 (75.0%) and 43 (25.0%) were said to have poor and adequate knowledge, respectively from Figure 4 was used. A cross-tabulation was employed and the Chi-square test was also performed, and the results are summarised in Table 14.

**Table 14: Nutritional Knowledge of Mothers and Children’s BMIs**

BMI of Children	Knowledge on Nutrition				Total	
	Poor Nutrition		Adequate Nutrition			
	Freq.	%	Freq.	%	No.	%
Underweight	7	5.4	1	2.3	8	4.6
Normal weight	108	83.7	30	69.8	138	80.2
Overweight	8	6.2	10	23.3	18	10.6
Obese	6	4.7	2	4.6	8	4.6
<b>Total</b>	<b>129</b>	<b>100.0</b>	<b>43</b>	<b>100.0</b>	<b>172</b>	<b>100.0</b>

$\chi^2=10.412, df=3, p=.015$

As seen from Table 14, out of the eight underweight children, only one of them had a mother with adequate knowledge on nutrition. Meanwhile, most of the 18 overweight children had their mothers classified as having proper knowledge

compared to those having poor knowledge on the subject. Similarly, among the 138 children with normal weight, 30 of them had mothers who were seen as having adequate knowledge on child nutrition, while the remaining 108 of them were not. Again, out the eight children classified as being obese, only two of their mothers had adequate knowledge, while six of them did not. These children are at a very high risk of several health challenges.

To estimate the nature of the association between the nutritional status of the children and their mothers' nutritional knowledge, the Chi-square test produced a Chi-square value of 10.412 with an associated  $p$ -value of .015, which was less than 0.05. This means that truly, there is a significant association between the two variables, giving the implication that the nutritional status of the children depends largely on the nutritional knowledge of their mothers. The higher a mother's knowledge on child nutrition, the healthier her child could be and vice versa.

### **Other Analysis**

Furthermore, this study formulated four hypotheses as, "There is no relationship between mothers' nutritional knowledge and their ages, marital statuses, educational levels, and the number of children they have." The results from the Chi-square test are summarised in Table 15.

**Table 15: Demographic Predictors of Mothers' Nutritional Knowledge**

Demographic variables	Knowledge on Nutrition		No.	%
	Poor knowledge (n=129)	Adequate knowledge (n=43)		
Age (in years)	$\chi^2=21.729$ , $df=4$ , $p=.000$			
16 – 20	8	0	8	4.6
21 – 25	0	8	8	4.6
26 – 30	74	26	100	58.1
31 – 35	28	9	37	21.5
36 – 40	19	0	19	11.0
Marital status	$\chi^2=9.297$ , $df=1$ , $p=.002$			
Single	24	0	24	14.0
Married	105	43	148	86.0
Highest Educational Level	$\chi^2=7.395$ , $df=2$ , $p=.025$			
None	25	8	33	19.2
Basic	53	27	80	46.5
Sec/Tech/Voc.	51	8	59	34.3
Number of Children	$\chi^2=35.128$ , $df=3$ , $p=.000$			
One	38	4	42	24.4
Two	51	8	59	34.3
Three	32	12	44	25.6
Four	8	19	27	15.7

The results from Table 15 reveal that all four demographic predictors significantly influenced the nutritional knowledge of the respondents at a .05 significance level. With respect to age, all those aged 21-25 years were found to be having adequate knowledge on child nutrition, while all 16-20 years old mothers had poor understanding about this subject. It was also seen that all the respondents aged from 36 to 40 years had poor knowledge on children's nutrition. A Chi-square value of 21.729 was highlighted with a *p*-value of .000 indicating a

significant association, indicating that age has an influence on the nutritional knowledge of mothers, with the younger ones (aged 26-30 years) commonly found among those with poor knowledge.

With regard to marital status, all the 43 respondents classified as having adequate knowledge were married showing that married mothers have better knowledge on child nutrition than the unmarried mothers. Similarly, it was found that the educational status of mothers was an important determinant of their nutritional knowledge, as a large value of 7.395 was obtained for the Chi-square with a *p*-value less than .05. This supports the findings IFPRI (2000) and WHO (1998) that women's education tends to be strongly associated with child malnutrition in developing countries. This confirms Saaka's (2014) assertion that maternal education has the potential to improve the health seeking and child caring practices of the mother. Their study also agrees with the findings that maternal education is significantly associated with child nutrition outcomes. Similarly, Ojofeitimi et al.'s (2003) study is in line with this study's findings.

Additionally, Kabubo-Mariara et al. (2009) indicated that children born to educated women suffer less from poor nutrition which manifests as underweight, wasting and stunting in children with Abuya et al.'s (2012) statement that maternal education is associated with nutritional outcomes among children in various studies across the world. The number of children (parity) a mother had was also seen to be a significant predictor of the mother's nutritional knowledge. It was found that those with a higher number of children were much knowledgeable on child nutrition compared to those with fewer children. The

magnitude of the Chi-square value and its associated  $p$ -value was an indication of the extent of the association. The implication is that the higher the number of children a mother has, the better her knowledge on child nutrition, which confirms the findings of Ojeifeitimi et al. (2003) that parity is a key determinant of the nutritional status among children.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

In this chapter, the entire study is summarised with the key findings from the data analysis and the discussions. It also includes the conclusions drawn based on the findings as well as the recommendations offered to draw attention to mothers' nutritional knowledge and child well-being.

#### **Summary**

The study sought to assess the factors affecting the nutritional status of children (0-6 years) in James Town in Accra. It specifically examined the background characteristics such as age, level of education, and marital status of mothers, investigated the nutritional literacy of mothers of the children, identified the sources of mothers' nutritional literacy, examined the socio-cultural factors that affect the level of nutritional literacy, assessed the nutritional status of the children of the selected women, and established the relationship between mothers' nutritional literacy and nutritional status of their children. Four main hypotheses were also formulated and tested at a .05 significance level.

In order to establish the gap in literature, several related works of researchers were reviewed. Concepts and theories as well as empirical studies were cited, compared, contrasted, critiqued and connected. These included the definition of nutrition, knowledge of mothers in nutrition and its impacts on the growth and development of children, and children anthropometric measurements.

It also looked at the barriers to knowledge acquisition by caregivers and the impact of these barriers to the growth and development of children, socio-economic factors that influence the choice of food and feeding of children by their mothers.

The cross-sectional descriptive survey was employed where 175 randomly selected respondents were initially selected for the study. However, some of them were not seen during the data collection stage, leaving 172 respondents representing 98.3% taking part in the study. A self-administered questionnaire was designed for the respondents.

However, majority were not able to independently complete their copies of the questionnaires due to difficulties in reading and writing of the English language, so the researcher engaged the services of research assistants to translate the questions/items to them in Ga and provide the answers in English. The data collection instrument was first pre-tested among 15 randomly selected mothers at the University Hospital in Cape Coast and a Cronbach's reliability coefficient of .815 was obtained; indicating that the instrument was reliable and had 'adequate' internal consistency.

In analysing the data, the SPSS was used and both descriptive and inferential statistics were computed to address the research questions. Specifically, frequency and percentage, tables, graphs and Chi-square tests were used.

## Key Findings

The following were the major findings that emerged from the study according to the research questions:

1. The average age of the respondents was 29.5 years, who were mainly married couples. About 95% of them were Christians, and predominantly Gas and Akans. The educational profile of the respondents was generally low as much as 19.8% of them were uneducated and none had attained a tertiary level of education. In addition, majority of the respondents (84.9%) and their spouses (95.3%) were employed particularly in trading businesses and earned income above the minimum wage of GH¢ 157.20.
2. Seventy three representing 42.4% of the respondents said that they had source(s) of information on child nutrition and identified them as follows: health workers (45.5%); their mothers (41.1%); TV/radio (12.3%); and books/newspapers (4.1%). Majority of them (95%) described the kind of education they had received from both antenatal and postnatal clinics as positive.
3. Only 43 (25.0%) of the respondents were identified to have had adequate knowledge on child nutrition.
4. The main socio-cultural determinants of mothers' nutritional knowledge were the reasons for eating a particular food (i.e., convenience, health values, availability, cost and values/belief), feeding their children with the same kind of foods for the entire household, and the challenges faced in feeding their children. Alternatively, taboos were not statistically associated with mothers' knowledge on nutrition. It was also found that



43.0% of the respondents fed their children with household meals other than preparing special diets for them.

5. Although the nutritional status of the majority of the children (80.2%) was found to be good giving the implication of having normal weight, as much as 4.6%, 10.6% and 4.6% were underweight, overweight and obese, respectively. It therefore means that about 19.8% of the children were malnourished.
6. There was a significant association between the nutritional knowledge of the mothers and their children's nutritional statuses, since  $p$ -value of .015 was obtained. Also, all four (4) demographic variables including age ( $p=.000$ ), marital status ( $p=.002$ ), educational level ( $p=.025$ ) and the number of children ( $p=.000$ ) of the respondents significantly influenced their nutritional knowledge levels.

### **Conclusions**

Based on the findings of the study, it can be concluded that the health and well-being of children is dependent on the nutritional knowledge of their mothers. The implication is that the nutritional status of the children in this study depended largely on the nutritional knowledge of their mothers. However, the relatively low knowledge among the mothers is a risk factor in the nutritional status of their children.

The demographic factors of mothers including age, marital status, educational level and parity are important factors that either improve mothers' child nutritional knowledge or otherwise therefore they should be critically

considered in strategies aimed at improving their knowledge in child nutrition. Again, as social and cultural factors (such as reasons for giving their children particular meals and challenges in feeding their children) being the key determinants of mothers' child nutritional knowledge, they have to be well considered in all nutritional programmes since they may determine the success or otherwise of such programmes. Obviously, underweight, stunting and wasting of children are public health concerns that could be reversed through an effective education of parents, especially the mothers.

In an attempt to achieve the Millennium Development Goal 4, Ghana is gradually progressing due to deliberate and concerted efforts by stakeholders to achieve this within the stipulated time. However, this will elude us as a nation until and unless issues such as improved mother nutritional knowledge and child nutrition are included and properly recognised as key indicators.

### **Recommendations**

Based on the findings and conclusions, the following recommendations were made for possible implementation by stakeholders for better child nutrition among children in James Town, Accra:

#### **Ministry of Health and Ghana Health Service**

1. The Ministry of Health and Ghana Health Service should engage in regular and rigorous education of parents, especially mothers in James Town to improve their knowledge on child nutrition for better child nutritional status since there is a significant association between the nutritional status of children and their mothers' knowledge on nutrition.

This will help them to be abreast with the modern nutritional techniques and thereby increase the number of mothers with adequate knowledge on the subject.

### **Health Workers**

2. Health authorities and policy-makers should consider some socio-demographic characteristics (e.g., age, marital status, educational level and the number of children) of mothers when devising strategies/plans to educate them on child nutrition. This is because these variables have significant effects on their nutritional knowledge.

### **Parents (Mothers and Fathers)**

3. Husbands should encourage the women to regularly attend antenatal and postnatal clinics for education on child nutrition. This is the best avenue for such education.
4. Mothers should be encouraged to give enough water to their children to prevent their children from getting sicknesses such as malaria, diarrhoea, cold, cholera, stomach pains, high temperature and measles. Also, giving adequate fruits to children is very nutritious. Therefore, mothers should be educated to feed their children with fruits. This will help the children to develop strong and robust immune system to help fight sicknesses and diseases.
5. Mothers of overweight and obese children should help them to undertake some child-friendly exercises to help them reduce their weights for healthy living.

### **Community**

6. As a good number of mothers still hold unto taboos regarding nutrition and its effect on their nutritional knowledge level, efforts should be made by chiefs and opinion leaders to reverse some of these taboos.

### **Suggestions for Further Research**

The scope of the study should be expanded to cover more mothers in order to have “macro picture” of their children’s nutritional conditions. Additionally, the following topics could be explored:

1. Mothers’ nutritional intervention on overweight and obese children in the Accra Metropolitan Assembly;
2. The contributions of fathers to the nutritional status of their children;
3. Child feeding knowledge and practices among women; and
4. Socio-economic predictors of the nutritional status of children.

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## APPENDICES

**APPENDIX A**

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATION STUDIES

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

This questionnaire is to solicit responses from mothers of children aged 1-6 years on the topic: *“Assessing the Factors that Affect the Nutritional Status of Children (0-6 years) in James Town in the Accra Metropolis.”* The questionnaire is for academic purposes only and the identity of respondents would be treated with the highest level of confidentiality.

*Please tick (✓) where appropriate and provide details when required.*

**SECTION A: DEMOGRAPHIC CHARACTERISTICS OF MOTHERS**

1. Age (in years): 10-15 [ ] 16-20 [ ] 21-25 [ ] 26-30 [ ]  
31-35 [ ] 36-40 [ ] 41-45 [ ]
2. Marital status: Married [ ] Single [ ] Divorced/Separated/Widowed [ ]
3. Religion: Christianity [ ] Islam [ ] Traditional [ ] Others (specify).....
4. Ethnic group: .....
5. What is your level of education? No Formal Education [ ] Basic Education [ ]  
Secondary/Technical/Commercial [ ] Tertiary [ ]
6. Are you employed? Yes [ ] No [ ]
7. If ‘Yes’, what type of employment? Full-Time [ ] Part-Time [ ]
8. What is your occupation?.....
9. What is the employment status of your spouse? Employed [ ] Unemployed [ ]

10. Do you have any additional source(s) of income apart from the income from your regular occupation? Yes [ ] No [ ]
11. Give reasons for your response in Q10.....  
.....
12. What is your total monthly household income?
- None [ ]
- Below GH¢100 [ ]
- GH¢ 101 – 500 [ ]
- GH¢ 501 – 1000 [ ]
- More than GH¢1000 [ ]
13. How many children do you have altogether?.....
14. Indicate the number of your children aged 1-6 years
- 1 year.....2 years.....3 years.....  
4 years.....5 years.....6 years.....
15. Weight (kg).....Height (cm).....of your last child
16. Are you living in your own apartment? Yes [ ] No [ ]
17. What type of occupancy is it? Family [ ] Rented [ ] Squatter [ ] Others.....

**SECTION B: NUTRITION KNOWLEDGE**

18. Indicate your level of agreement or disagreement using Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with the following statements:

Statement	SA	A	D	SD
Consuming a low-protein diet in childhood can greatly affect ultimate adult height.				
An infant's length increases by 50% in the first year.				
An infant's diet should be very low in fat.				

Statement	SA	A	D	SD
Infants do not enjoy blend foods.				
Infant have lower energy needs per pound than older children.				
Iron-deficiency anaemia often occurs in children who have low consumption of fruits.				
It is nutritionally important to put children under a schedule of three meals a day.				
The two most common nutritional problems in childhood are obesity and anaemia.				
Parents should control the amount of food their children eat.				
Infants need sodium in moderation.				
Infant need iron, zinc and calcium for best growth in the first two years of life.				
Self-feeding by children should be encouraged.				

19. Why do children need a regular intake of water?

.....  
 .....

20. Which two disease conditions of children require extra water supplement?

(i).....(ii).....

21. What **three** factors contribute to obesity in a typical 5-6 years old?

(i) .....  
 (ii).....  
 (iii) .....

22. What food groups contribute vitamins and mineral element to children?

(i).....(ii).....

23. What is the importance of protein in a child's nutrition?

(i).....  
 (ii).....

24. Why is it not advisable to give large amount of protein to children all day?

.....

.....  
25. Why is sanitation very vital in the feeding of children?  
.....  
.....

26. What are the relationships between malaria and measles and meals fed to children?  
.....  
.....  
.....

**SECTION C: HEALTH CARE PRACTICES**

27. Do you still attend Maternal and Child Health Clinics? Yes [ ] No [ ]

Give reasons for your answer.....

28. How often do you attend MCH clinics in a month? Once [ ] Twice [ ]

Three times [ ] Four times [ ] When child is sick [ ]

29. What **three** common diseases affect your child or children?

(i).....(ii).....(iii).....

30. How often do you visit the hospital in a month because of the child or

children? Once [ ] Twice [ ] Three times [ ] Four times [ ]

When necessary [ ]

**SECTION D: FACTORS AFFECTING CHILDREN'S FEEDING**

31. What is the source of your nutritional knowledge? .....

32. Did you attend antenatal clinic during pregnancy? Yes [ ] No [ ]

33. If 'Yes', what did the knowledge acquired impact on your nutrition, care and

child survival knowledge? Positive [ ] Not sure [ ] Negative [ ]

34. How would you grade the education you received during postnatal clinics?

Very helpful [ ] Fairly helpful [ ] Helpful [ ] Not helpful [ ]

35. Has the postnatal clinic attendance affected the growth of your child in

anyway? Yes [ ] No [ ]

36. If 'Yes', state how .....

.....  
.....

37. Which food types do your household members eat often?.....

.....  
.....

38. Why do you eat what you eat? *Please tick the most important option.*

Cost [ ] Convenience [ ] Availability [ ] Value and/or beliefs [ ]

Nutritional and health benefits [ ] Others (specify).....

39. Do you feed the same food to a child regardless of the age? Yes [ ] No [ ]

40. Give reasons for your response.....

.....  
.....

41. Are there any taboos or customs that prohibit the consumption of certain foods

by your family members? Yes [ ] No [ ]

42. If 'Yes', please state them.....

.....

43. Are there any taboos or beliefs that prohibit children from eating certain

foods? Yes [ ] No [ ]



44. If 'Yes', please state them.....

.....

45. What food nutrient do you think the taboo(s) deprive(s) your child of?

.....

.....

.....

46. Do you face any challenges in the feeding of your children? Yes [ ] No [ ]

47. If 'Yes', indicate the challenges.....

.....

.....

.....

**SECTION E: SUGGESTIONS**

48. In your views, how can child feeding practices of mothers be improved upon?

(i) .....

(ii) .....

(iii).....

**Thank You For Your Time !!!**