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**NUTRITIONAL STATUS ASSESSMENT OF CHILDREN (0-5 YEARS) OF  
FEMALE HEAD PORTERS (KAYAYEI) IN KAJETIA MARKET KUMASI,  
GHANA**



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## DECLARATION

I, Priscilla Nkrumah, declare that with the exception of the references cited, all information in this document was obtained via research under the supervision of Dr. Sampson Gilbert Owiah of the Faculty of Vocational Education, University of Education Winneba. This dissertation has never been presented in part or whole to any institution for the award of any degree or diploma.

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## DEDICATION

This work is dedicated to my Husband Mr. Kwaku Amponsem Acheampong and My Mentor, Dr. Baba Campion. It is also dedicated to my four kids Nana Kwaku Amponsem Acheampong, Kwaku Amponsem Acheampong, Berchie Amponsem Acheampong and Boapim Amponsem Acheampong.

This work is also dedicated to all the hard working kayayei mothers at the Kejetia market who were generous enough to volunteer relevant information for this study.



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Great is your faithfulness, God my father. I owe the successful completion of this work to the Almighty God. I am thankful to Dr. Sampson Gilbert Owiah, my supervisor for all the help.

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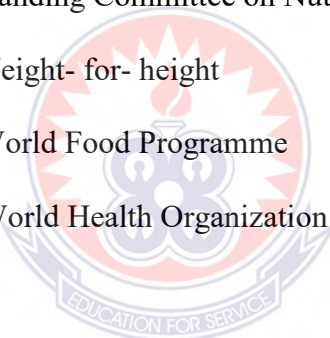
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## ABBREVIATIONS

BMI	Body mass index
FFQ	Food Frequency Questionnaire
IASC	Inter-Agency Standing Committee
KW	kwashiorkor
MAM	Moderate Acute Malnutrition
MM	Moderate malnutrition
MUAC	Mid upper arm circumference
PEM	Protein energy malnutrition
SAM	Severe Acute Malnutrition
SCN	Standing Committee on Nutrition
WFH	Weight- for- height
WFP	World Food Programme
WHO	World Health Organization



## ABSTRACT

Nutritional status is the balance between the intake of nutrients and the expenditure of these in the processes of growth, reproduction, and health maintenance. Under nutrition, especially in children, can lead to substantial problems in mental and physical development. Undernourished children can also suffer several diseases from nutrient deficiencies. Although the overall pattern of growth is genetically determined, it is significantly affected by nutrition. Socioeconomic status, nutritional knowledge and feeding practices among others are some of the reasons why children may be undernourished. Female head porters (kayayei) who care for their children, due to the low wages they earn may not be able to afford healthy meals and provide the necessary care for these children. This study assessed the nutritional status of children of kayayei at Kejetia market in Accra. Purposive sampling method was used to recruit subjects at Kejetia market. A validated questionnaire was used to collect data on demographic characteristics, feeding habits, dietary history and anthropometric measures. Dietary intake of the children was assessed using a food frequency questionnaire. Results: Seventy-three female head porters (kayayei), each with her child, participated in the study. All the kayayei were from northern Ghana. Majority of the children (32.9%) were between the ages of 25 and 36 months and 50.7% of them were girls. Most (58.9%) of the kayayei described a balanced diet correctly and 95.9% breastfed their children. However only 9.6% practiced exclusive breastfeeding. Most (63%) of the mothers fed their children three times daily though the majority (89%) of the children were not fed with home cooked meals. More than half of the children (53.4%) had fish once a day and a grain or cereal daily in the form of tuo zafi (53.4%) though less than half (46.6%) had white bread or millet porridge (46.6%). Majority of the children, 78.1% and 67.1%, had their weight-for-height (WFH) and mid upper arm circumference (MUAC) measures, respectively, being normal. There was a relationship between the nutritional knowledge of the kayayei, their feeding practices and the nutritional status of their children. Majority of the children were within normal WHO growth standards of WFH and MUAC measures. Consumption frequencies of the various food groups by the children varied.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the study

Nutritional status is the balance between the intake of nutrients and the expenditure of these in the processes of growth, reproduction, and health maintenance. Because this process is highly complex and quite individualized, nutritional status assessment can be directed at a wide variety of aspects of nutrition (WHO, 2010).

The assessment of nutritional status is commonly summarized by the mnemonic "ABCD," which stands for anthropometric measurement, biochemical or laboratory tests, clinical indicators, and dietary assessment (WHO, 2010). Anthropometric measurement involves the use of weight, height, arm circumference and skin fold measurements as indicators for assessment of nutritional status (Abraham et al., 1977).

Biochemical analysis involves quantitative chemical analysis of the blood, urine or other bodily fluids. The analyses are either made for a given nutrient or for some of the metabolites of that nutrient (Pearson, 1966). Clinical assessment of an individuals' nutritional status indicates the level of health in relation to food consumption. Clinical examination is usually made by a doctor or nutritionist (Wilson et al., 1979). The first stage of any nutritional deficiency is identified by dietary assessment methods. Several dietary methods are available including the 24-hour recalls, food records, dietary history and food frequency questionnaire.

The monetization of society has created a precondition for human beings to work and earn income to meet their necessities of life such as food, shelter and clothing. Thus, given sufficient opportunities for personal fulfilment, and a more equitable distribution of resources and wealth, many people would prefer to live close to relatives and within their cultural milieu (Martin, 2003; Opare, 2003). However, the absence of such an ideal

world compels people to migrate to expand the range of socioeconomic livelihood opportunities available to them (Klein, 2000 cited in Opare, 2003). This increasing drive by people to meet their daily needs and improve their living conditions results in individuals migrating from their places of socio-cultural comfort and breaking their family ties in search for life enhancing opportunities. The migrants choose economic opportunities at their destinations over the socio-cultural comfort at the origin. The point to note is that migration is not a recent phenomenon.

According to the Caritas Internationalis (2012), since the early 1980s, increasing number of women has been migrating on their own to take up jobs in other areas. Subsequently, more than half of all migrants today are women and girls, with many of them migrating independently rather than as part of a family (Kwakye et al, 2007). The contribution of women to migration in recent times has given birth to the term "feminization of migration" which has gained currency in development discourse. The Ministry of Women and Children's Affairs (MOWAC) estimated that as many as 40,000 porters most of whom are girls under age 18 years lived on the streets in major cities, including Accra, Kumasi, and Takoradi. In a similar vein, the US State Department of Trafficking in Persons, estimated that over 30,000 children are working as head porters on the streets of Accra alone, a phenomenon which is considered as a major setback to the attainment of the Millennium Development Goals (MDGs) (United States Department of State, 2009).

Opare (2003) adds that the number of the head porters increase every day. Majority of these children lack almost all the basic needs of life: education, shelter, health care, adequate nutrition, and personal safety and are often targets for exploitation, abuse, threats and violence (UNICEF, 2007). Premised by the north's comparative advantage in cereal cultivation, the Government of Ghana has sought to encourage all-year-round farming with the construction of irrigation dams (Inkoom and Nanguo, 2011). Inkoom

and Nanguo (2011) believe that the effective utilization of the irrigation dams would reduce the migration of labour from the northern to southern Ghana. The Government of Ghana has reinforced her free Compulsory Universal Basic Education (fCUBE) policy with social interventions such as the Capitation Grant, School Feeding Programme and Free School Uniforms. Her intention is to retain the children in school to forestall their migration to the south to engage in head portorage. Despite the increasing recognition and efforts by successive governments to discourage head portorage, many more young females are leaving their homes and finding solace on the streets of major cities (Opare, 2003).

In Ghana, the high poverty levels in the Northern parts of the country, namely, the Upper West Upper East, and Northern Region, compel girls and women to migrate to the southern parts, mostly to the capital cities like Accra and Kumasi, to engage in what is locally called "kaya business".

"Kaya business" refers to the act of carrying loads on the head for a fee and the women who are engaged in this activity are called "Kayayei" (Kayayo for singular). Most of the girls and women who engage in the kaya business or head portage are mainly from the Mamprusi, Gonja, Kotokoli, Mossi, Frafra, Bimoba, and Dagomba ethnic groups which are all located in the Northern parts of Ghana, with a few of the Kayayei from Burkina Faso and Togo. Opare and Agarwal et al. that most of these female migrants who travel down to the south and to the middle belts are young ladies who are mostly between the ages of 10 and 35 and have limited or no formal education. As a result, these female migrants have no prospects of gaining employment in the formal sector in the cities and, for this reason, they engage in the kaya business as a short-term means of earning income and saving enough money to enter into other profitable ventures in the future.

According to Opare, some Kayayei engage in the kaya business to acquire possessions like utensils and clothes in the preparations towards marriage while others save money to enable them to undergo an apprenticeship in hairdressing or dressmaking. Some Kayayei want to earn income and send remittances to their families such as husbands, children, and parents back home. When these female migrants arrive at the urban areas, most of them do not have any relations to support them financially. This leads them to settle in slum areas where accommodation comes with a cheap cost and poor quality. Securing such cheap accommodation is one of the survival strategies employed by the Kayayei in the quest to spend little and save more money.

In spite of the fact that the kaya business serves as a source of income for most female migrants from Northern Ghana the activity exposes them to various health conditions like diarrhea, malaria, and Sexually Transmitted Infections (STIs). The health of the Kayayei is a major concern since, without a healthy mind and body, the Kayayei will not be in a capable position to perform any of their daily tasks of carrying luggage and goods for people, which is their major purpose of being at the market centres.

Most of the young ladies who come the south to perform the kaya business lack basic education and for that reason lack they basic nutritional knowledge, this problem is again compounded by their financial status which is mostly very bad. Due to this they tend to eat anything they come across because they think food is eaten basically to satisfy their hunger. Most of the food they eat are also prepared and sold in unhygienic locations. These feeding habits affect their health as it goes a long way to reduce the strength of their immune system and lead to incidence of disease and infections. Kayayeis with children transfer this behavior to the feeding of their children, they normally give the same food they eat to their children, which affect the growth and development of their children because food consumption is based on factors such as age and health status. It is



based on this premise that this research seeks to investigate the nutritional status of the children of these Kayayeis.

## **1.2 Problem Statement**

The Kayayei population in Kumasi continues to grow, most of them homeless immigrants, illiterate, lacking knowledge of personal hygiene and healthy eating, poor hygiene and suffering from poverty. These conditions under which they live together with their children render them at high risk of malnutrition and other health complication (Opare, 2010). Many kayayei are encouraged by their families in northern Ghana to move to the cities due to financial hardships (Opare, 2010). Because of their lack of education, these women tend to work in the informal sector when they reach the metropolis, where they earn little money and have little or no time to care for themselves. The insanitary environment and unhygienic conditions under which they live and prepare their food is problematic. Many kayayei work for long hours and earn low wages. The wages that the kayayei earn typically go "from hand to mouth" (Ahlvin, 2012). Because of these, many kayayei who care for their children are not able to afford healthy meals and provide the necessary care when illness strikes in the slum (Yeboah and Appiah-Yeboah, 2009).

Under nutrition can lead to substantial problems in mental and physical development. In children, the impact of under nutrition on the cognitive abilities may lead to poor school achievement in later years (Olness, 2003). Under nourished children can also suffer several diseases from nutrient deficiencies. Although the overall pattern of growth is genetically determined, it is significantly affected by nutrition (Alan et al, 2002). Socioeconomic status, nutritional knowledge and feeding practices among others are some of the reasons why children may be under nourished.

### **1.3 Main Objective**

The main objective of the study was to assess the nutritional status of children of the kayayei and their child feeding practices.

#### **1.3.1 Specific Objectives of the Study**

The specific objectives of the study is to:

1. Assess the child feeding practices of kayayei who are mothers.
2. Determine the nutritional status of the children using anthropometric measures
3. Determine the relationship between the level of nutritional knowledge of the mother and the nutritional status of their children.
4. Determine the relationship between child feeding practices of the mothers and the nutritional status of their children.

#### **1.4 Significance of the Study**

The study will help to identify nutritional and other health needs of the kayayei and their children and serve as a basis for providing nutrition education for them. The study will also identify the relationship between mothers' feeding practices and child's nutritional status. This will help to determine their effect on the nutritional status of the children.

The study will also serve as a reference material for future investigation into nutritional status assessment in other areas.

#### **1.5 Hypothesis**

Null hypothesis: There is no relationship between feeding practices of the kayayei and nutritional status of their children.

Alternate hypothesis: There is a relationship between feeding practices and nutritional status.

### **1.6 Organization of the Study**

The study is structured into five chapters. Chapter one deals with the introduction of the study and specifically looks at the statement of the problem, objectives of the study, hypotheses, significance of the study and chapter organization. Chapter two represents a review of related literature. The literature on female head porters (kayayei), concept of child nutrition and young child feeding practice, nutritional status and saliva, saliva as a diagnostic specimen, Saliva, the who child growth standards etc.

The third chapter looks at the research methodology and it includes the study area, research philosophy, and research design, sources of data, study population, sample size and sampling procedure. It also includes the research instrument, pre-testing, data collection procedure, problems encountered in the field, data analysis, and ethical issues. Chapter Four presents the results, discussions of the findings from the Study, strength and limitation of the Study. Finally, chapter Five reflects a general summary of the entire study. It consists of the summary of the major findings of the study, conclusion, and recommendations. Also, suggestions for future studies were also outlined.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Nutrition

Nutrition is defined as the "science of food, the nutrients and other substances therein, their action, interaction and balance in relation to health and disease, and the processes by which the organism ingests, absorbs, transports, utilizes and excretes food substances (Lagua and Claudio, 2004).

The macronutrients, needed in large amounts, are carbohydrates, fats, protein, and water. They provide structural material and energy. Some of the structural material can be used to generate energy internally. Carbohydrates and proteins provide approximately 4 kcal of energy per gram, while fats provide 9 kcal per gram (Dunford, 2006). The net energy from either depends on such factors as absorption and digestive effort, which vary substantially from instance to instance. Micronutrients (vitamins, minerals), fibre, and water do not provide energy, but are required for other reasons (Berg et al., 2002).

Individuals are malnourished, or suffer from under nutrition if their diet does not provide them with adequate nutrients for maintenance and growth, or they cannot fully utilise the food they eat due to illness.

#### 2.2 Malnutrition

Malnutrition is the condition that results from eating a diet in which certain nutrients are lacking (under nutrition), in excess (over nutrition), or in the wrong proportions (Arthur, and Stevens, 2003).

There are two major types of under nutrition:

- i. Protein-energy malnutrition (PEM) - resulting from deficiencies in any or all nutrients

ii. Micronutrient deficiency diseases - resulting from a deficiency of specific micronutrients

### **2.2.1 Protein-energy malnutrition (PEM)**

There are three types of protein-energy malnutrition in children (Table 1) [Franco et al., 1999]. These forms of protein-energy malnutrition in children can be pictured in Fig.1.

Losing 20% of body weight or more is generally classified as severe PEM.

Marasmus is one of the three forms of severe protein-energy malnutrition (PEM). The other two forms are Kwashiorkor (KW) and marasmic KW. These forms of serious PEM represent a group of pathologic conditions associated with a nutritional and energy deficit occurring mainly in young children from developing countries at the time of weaning

(Scrimshaw and Viteri, 2010). Marasmus is a condition primarily caused by a deficiency in calories and energy. It is characterised by stunted growth and wasting of muscle and tissue (Scrimshaw and Viteri, 2010). It usually develops between the ages of six months and one year in children who have been weaned from breast milk or who suffer from weakening conditions such as chronic diarrhea (Kessler and Dawson, 1999).

This condition usually appears at about the age of 12 months when breastfeeding is discontinued, but it can develop at any time during a child's formative years (Kessler and Dawson, 1999). It causes fluid retention (oedema), dry, peeling skin; and hair discoloration (Kessler and Dawson, 1999). Marasmic KW indicates a condition that has features of both Kwashiorkor and marasmus (Scrimshaw and Viteri, 2010). This diagnosis is given for a child with severe malnutrition who is found to have both oedema and a weight for age below 60% of that expected for his or her age. Children with marasmic KW have all the features of nutritional marasmus including severe wasting,

lack of subcutaneous fat and poor growth, and in addition to oedema, which is always present, they may also have any of the features of Kwashiorkor described above. There may be skin changes, including flaky-paint dermatosis, hair changes, mental changes and hepatomegaly. Many of these children have diarrhoea.

Moderate malnutrition (MM) is defined as a weight-for-age between -3 and -2 z-scores below the median of the WHO child growth standards. It can be due to a low weight-for-height (wasting) or a low height-for-age (stunting), or to a combination of both. Similarly, moderate wasting and stunting are defined as a weight-for-height and height-for-age, respectively, between -3 and -2 z-scores. MM affects many children in poor countries.

Children with moderate malnutrition have an increased risk of mortality, and MM is associated with a high number of nutrition-related deaths (Pelletier et al., 1995). Severe acute malnutrition (SAM) is defined by very low weight for height (below -3z scores of the median WHO growth standards), visible severe wasting, or the presence of nutritional oedema. (WHO/UNICEF, 2007)

### **2.2.2 Micronutrient deficiency**

In its 2002 report, the World Health Organization (WHO) estimates that approximately 168 million children under five years of age are underweight, meaning they do not get enough nutrients to meet their body's needs. Multiple micronutrient deficiencies (Table 2), such as iron, zinc, and vitamin A, are affecting the lives and health of billions of people in the developing world (WHO, 2002).

Malnutrition at an early age leads to reduced physical and mental development and affects school performance (WFP, 2013). Malnutrition increases the risk of infection and infectious disease, weakens every part of the immune system, lowers energy and impairs

the function of the brain (Stillwaggon, 2008). The World Health Organization estimates that malnutrition accounts for 54% of child mortality worldwide (Walker and Watkins, 2008) about 1 million children (Manary et al., 2013). Even mild degrees of malnutrition double the risk of mortality for respiratory and diarrheal disease mortality and malaria (Walker and Watkins, 2008). There are three commonly used measures for detecting malnutrition in children: stunting (extremely low height for age), underweight (extremely low weight for age), and wasting (extremely low weight for height) (Adam and Naoke, 1999). These measures of malnutrition are interrelated, but studies for the World Bank found that only 9% of children exhibit stunting, underweight, and wasting (Adam and Naoke, 1999).

According to a 2008 review, an estimated 178 million children under age five are stunted, most of who live in sub-Saharan Africa (Bhutta et al., 2008). A 2008 review of malnutrition found that about 55 million children are wasted, including 19 million who have severe wasting or severe acute malnutrition (Bhutta et al., 2008). Measurements of a child's growth provide the key information for the presence of malnutrition (Walker and Watkins, 2008).

### **2.2.2.1 Micronutrient Major Deficiency Disorders**

#### **Iodine**

Goitre, hypothyroidism, iodine deficiency disorders, increased risk of stillbirth, birth defects, infant mortality, cognitive impairment.

#### **Iron**

deficiency, anaemia, reduced learning and work capacity, increased maternal and infant mortality, low birth weight

Micronutrient Major Deficiency Disorders Zinc Poor

pregnancy outcome, impaired growth (stunting), genetic disorders, decreased resistance to infectious diseases

### **Vitamin A**

Night blindness, xerophthalmia, increased risk of mortality in children and pregnant women Folate (Vitamin B6) Megaloblastic anaemia, neural tube and other birth defects, heart disease, stroke, impaired cognitive function, depression

### **Cobalamin (Vitamin B12)**

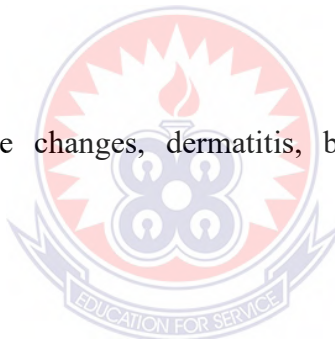
Megaloblastic anaemia (associated with Helicobacter pylori-induced gastric atrophy)

### **Thiamine (Vitamin B1)**

Beriberi (cardiac and neurologic), Wernicke and Korsakov syndromes (alcoholic confusion and paralysis)

### **Riboflavin (Vitamin B2)**

Non-specific – fatigue, eye changes, dermatitis, brain dysfunction, impaired iron absorption Niacin



### **Vitamins B3**

Pellagra (dermatitis, diarrhoea, dementia, death)

### **Vitamin B6**

Dermatitis, neurological disorders, convulsions, anaemia, elevated plasma homocysteine

### **Vitamin C**

Scurvy (fatigue, haemorrhages, low resistance to infection, anaemia)

### **Vitamin D**

Rickets, osteomalacia, osteoporosis, colorectal cancer Calcium Decreased bone mineralisation, rickets, osteoporosis

### **Selenium**

Cardiomyopathy increased cancer and cardiovascular risk



## **Fluoride**

Increased dental decay affects bone health

The 2008 Copenhagen Consensus estimated that undernutrition causes 35% of the disease burden in children younger than five years old and that the nutrition of children five years and younger depends strongly on the nutrition level of their mothers during pregnancy and breastfeeding (Sue-Horton et al., 2008). Malnutrition can be detected by screening, interpretation of mid- upper-arm circumference measures, plotting of weight on growth charts etc. (Myatt, 2005). Children in sub-Saharan Africa and South Asia face a higher risk of dying before their fifth birthday [Fig. 2] (UNICEF, 2013). Poor diet, frequent illness, and inadequate or inattentive care of young children can lead to malnutrition (WHO, 2002). Between five and six million under-fives die each year from diseases that are from malnutrition (Wadhvani, 2011). Globally, nearly half of all deaths among children under five are attributable to undernutrition (UNICEF, 2013).

Acutely malnourished children lack growth nutrients that are required to build new tissues. These nutrients aid weight gain after illness, repair damaged tissues and help replace the rapid turnover of cells (intestine and immune cells). Correct replenishment of nutrients like essential amino acids (protein), potassium, magnesium and zinc (among other minerals) is essential for recovery from malnutrition (Wadhvani, 2011).

Effects of malnutrition could be seen as deficiency diseases such as scurvy, beriberi, Kwashiorkor, obesity, cardiovascular disease, diabetes and osteoporosis (Bowden, 2008).

Improving nutrition is widely regarded as the most effective form of aid.

## **2.3 Nutritional Status**

Nutritional status is the balance between the intake of nutrients by an organism and the expenditure of these in the processes of growth, reproduction, and health maintenance.

Because this process is highly complex and quite individualised, nutritional status assessment can be directed at a wide variety of aspects of nutrition (WHO, 2010).

Nutritional status assessment is important because

- i. It helps in identifying people who are at nutritional risk
- ii. It helps to develop educational programs which encourage people to improve their eating habits.
- iii. Information gathered from nutritional status assessment helps the government in setting priorities in food production and distribution and in the allocation of health facilities.
- iv. It helps to formulate policies to improve the overall nutrition of the population.

### **2.3.1 Methods of Assessment**

The assessment of nutritional status is commonly summarised by the mnemonic "ABCD," which stands for anthropometric measurement, biochemical or laboratory tests, clinical indicators, and dietary assessment (Johnston and Ouyang, 1991).

#### **2.3.1.1 Anthropometry**

Nutritional anthropometry has been defined as "measurements of the variations of the physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition" (Jelliffe, 1966). Anthropometric measurement involves the use of weight, height, arm circumference and skin fold measurements as indicators for the assessment of nutritional status (Abraham et al., 1977). In children, growth charts have been developed to allow researchers and clinicians to assess weight-for-age and height-for-age, as well as weight-for-height. For children, low height-for-age is considered stunting, while low weight-for-height indicates wasting. In addition to weight and height,

measures of mid-arm circumference and skin fold measured over the triceps muscle at the mid-arm are used to estimate fat and muscle mass. To interpret anthropometric data, they must be compared with reference data. The choice of the appropriate reference has been discussed by Johnston and Ouyang (1991). Because well-nourished children in all populations follow similar patterns of growth, reference data need not come from the same population as the children of interest. It is of greater importance that reference data be based on well-defined, large samples collected in populations that are healthy and adequately nourished. Reference growth charts (Kuczmarski et al., 2002) have been compiled from cross-sectional data collected from population surveys of US children. These have been adopted as international standards by the World Health Organization (WHO).

#### **2.3.1.1.1 Anthropometric measures in young children**

##### **a) Weight**

Body weight represents the sum of protein, fat, water and bone mineral mass. Several indices can be conducted from body weight. For example, weight-for-age, an acute index for malnutrition, is widely used to assess protein-energy- malnutrition and nutrition, especially in childhood (WHO and UNICEF, 2009). The prevalence of malnutrition in children can be estimated if weight-for-age is used. To interpret a single measurement of weight in relation to reference data, the age of the child must be known (WHO and UNICEF, 2009). A paediatrics scale with pan, a suspended spring balance and weighing sling or a beam balance are used for weight measurement in children (Waterlow et al., 1978).

### **b) Height or Length**

Recumbent length or height in children concerning age are used as indices of chronic nutritional status of children. They are particularly valuable in children as indices of stunting of a child's full growth potential. Stunting is slowing down the skeletal growth of a child and the end result of a reduced rate of linear growth (Waterlow et al., 1978). The condition results from long periods of inadequate food intake and increased morbidity and are generally found in countries where economic conditions are poor. When weight is combined with height, it provides a sensitive index of current nutritional status which is relatively independent of age. For infants less than two years, recumbent length is measured; above two years, height is measured (Waterlow et al., 1978).

### **c) Mid-upper arm circumference (MUAC)**

The arm contains subcutaneous fat and muscle. A decrease in mid-upper arm circumference may therefore reflect a reduction in muscle mass, a reduction in subcutaneous tissue or both. In less industrialized countries, where the amount of subcutaneous fat is frequently small, changes in mid-upper arm circumference tend to parallel changes in muscle mass and hence are particularly useful in the diagnosis of protein-energy-malnutrition or starvation. MUAC is an indicator of wasting and, in particular lean body mass (Young and Susanne, 2009). It is a proxy measure of nutrient reserves in muscle and fat (IASC Global Nutrition Cluster, and Standing Committee on Nutrition (SCN), 2009). Measurement is not time-consuming and has been documented as an effective predictor of the risk of death in children aged 6 to 59 months (Young and Susanne, 2009).

Changes in mid-upper arm circumference measurements can also be used to monitor progress during nutritional therapy (Hofvander and Eksmyr, 1971), correlating positively with changes in weight. Arm circumference changes are easily detected and require a

minimal amount of time and equipment (Gurney and Jelliffe, 1973). Some investigators claim that mid-upper arm circumference can differentiate normal children from those with protein-energy-malnutrition as reliably as the weight for height. Mid-upper arm circumference measurements are made using flexible, non-stretch tape.

### **2.3.1.2 Biochemical analyses**

The biochemical analysis involves quantitative chemical analysis of the blood, urine or other bodily fluids. The analyses are either made for a given nutrient or for some of the metabolites of that nutrient (Wilson and Walker, 2005). Evaluations of nutritional conditions are based, directly or indirectly, on measurements of body energy reserves (Harder and Kirkpatrick, 1994; Brown, 1996). The concept of nutritional condition assumes a relationship between energy stores and fitness; indeed, a number of studies have reported correlations between the number of energy reserves and survival (Miranda and Hubbard, 1994; Sogard and Olla, 2000) or adaptive aspects of life-history variation (Crossin et al., 2004). Body energy reserves may be determined by proximate composition analysis.

### **2.3.1.3 Clinical assessment**

Clinical assessment is an essential feature of all nutritional surveys. It is the simplest and most practical method of ascertaining the nutritional status of a group of individuals. It utilises a number of physical signs, specific and non-specific, that are known to be associated with malnutrition and deficiency of vitamins and micronutrients (Jelliffe, 1966). Clinical examination (Table 3), with special attention to organs like hair, angles of the mouth, gums, nails, skin, eyes, tongue, muscles, bones, and thyroid gland detection

of relevant signs helps in establishing the nutritional diagnosis (Darby et al., 1953). Clinical assessment is fast and easy to perform, inexpensive and non-invasive.

#### **2.3.1.4 Dietary assessment**

The dietary assessment encompasses food supply and production at the national level, food purchases at the household level, and food consumption at the individual level (Clay, 2002). Several dietary assessment methods exist.

##### **2.3.1.4.1 24-hour dietary recall**

In the 24-hour dietary recall, the respondent is asked to remember and report all the foods and beverages consumed in the preceding 24 hours or in the preceding day. The recall typically is conducted by interview, in person or by telephone (Buzzard et al., 1996). The interview is often structured, usually with specific probes, to help the respondent remember all foods consumed throughout the day. An early study found that respondents with interviewer probing reported 25% higher dietary intakes than did respondents without interviewer probing (Campbell, 1967). The main weakness of the 24-hour recall approach is that individuals may not report their food consumption accurately for various reasons related to knowledge, memory, and the interview situation.

##### **2.3.1.4.2 Food frequency**

The food frequency approach asks respondents to report their usual frequency of consumption of each food from a list of foods for a specific period. Information is collected on frequency, but little detail is collected on other characteristics of the foods as eaten, such as the methods of cooking or the combinations of foods in meals (Willett, 1998). The strengths of the food frequency approach are that it is inexpensive to

administer and process, and it asks about the respondent's usual intake of foods over an extended period of time. The major limitation of the food frequency method is that it contains a substantial amount of measurement error (Subar et al., 2003).

#### **2.3.1.4.3 Diet history**

Originally, as coined by Burke, the term dietary history referred to the collection of information not only about the frequency of intake of various foods but also about the typical make up of meals (Burke, 1947). The Burke diet history included three elements: a detailed interview about the usual pattern of eating, a food list asking for the amount and frequency usually eaten, and a 3-day dietary record. The major strength of the diet history method is its assessment of meal patterns and details of food intake rather than intakes for a short period of time (as in records or recalls) or only frequency of food consumption. A weakness of the approach is that respondents are asked to make many judgments about both the usual foods consumed and the amounts of those foods eaten. These subjective tasks may be difficult for many respondents.

#### **2.4. The world health organization (who) child growth standards**

Assessing a child's growth provides important information on the adequacy of the child's nutritional status and health. There are several measures to assess growth, including weight-for-age, weight-for-height, and height-for-age (WHO, 2005).

- i. **Weight-for-age:** Weight-for-age reflects body weight relative to the child's age on a given day. A series of weights can tell you whether or not a child's weight is increasing over time, so it is a useful indicator of growth. This indicator is used to assess whether a child is underweight or severely underweight, but it is not used to classify a child as overweight or obese.

Because weight is relatively easily measured, this indicator is commonly used, but it cannot be relied upon in situations where the child's age cannot be accurately determined. Also, it cannot distinguish between acute malnutrition and chronic low energy and nutrient intake.

- ii. **Weight-for-length/height:** Weight-for-length/height reflects body weight in proportion to attained growth in length or height. This indicator is especially useful in situations where children's ages are unknown (e.g. refugee settlements). Weight-for-length/height charts help identify children with low weight-for-height who may be wasted or severely wasted. These charts also help identify children with high weight-for-length/height who may be at risk of becoming overweight or obese.
- iii. **Length/height-for-age:** Length/height-for-age reflects attained growth in length or height at the child's age at a given visit. This indicator can help identify children who are stunted (or short) due to prolonged undernutrition or repeated illness. Children who are tall for their age can also be identified, but tallness is rarely a problem unless it is excessive and may reflect uncommon endocrine disorders. Acute malnutrition does not affect height.
- iv. **Mid-upper arm circumference (MUAC):** Another useful way to assess a child's present nutritional status is to measure the mid-upper arm circumference (MUAC) (WHO/UNICEF/WFP/UNSCN, 2007). MUAC below 115 mm is an accurate indicator of severe malnutrition in children 6–59 months of age (WHO/UNICEF). MUAC can be used for rapidly screening all children in a community for severe malnutrition.

In 2006, WHO published child growth standards for attained weight and height, these new standards are based on breastfed infants and appropriately fed children of different



ethnic origins raised in optimal conditions and measured in a standardized way (WHO, 2006). The same cohort was used to produce standards of mid-upper arm circumference (MUAC) in relation to age. The new WHO growth standards confirm observations that the effect of ethnic differences on the growth of infants and young children in populations is small compared with the effects of the environment. Studies have shown that there may be some ethnic differences among groups, just as there are genetic differences among individuals, but for practical purposes, they are not considered large enough to invalidate the general use of the WHO growth standards population as a standard in all populations (WHO, 2006). Using weight-for-height, WHO and UNICEF recommend the use of a cut-off for weight-for-height of below -3 standard deviations (SD) of the WHO standards to identify infants and children as having severe malnutrition. The commonly used cut-off is the new 2006 WHO child growth standards (WHO standards). When using the WHO child growth standards to identify the severely malnourished among 6–60 month old children, the below -3SD cut-off for weight-for-height classifies two to four times as many children compared with the National Centre for Health Statistics (NCHS) reference.

The reasons for the choice of this cut-off are as follows (WHO, 2006):

1. Children below this cut-off have a highly elevated risk of death compared to those above.
2. These children have a higher weight gain when receiving a therapeutic diet compared to other diets, which results in faster recovery.
3. In a well-nourished population, there are virtually no children below -3 SD (<1%).

4. There are no known risks or negative effects associated with therapeutic feeding of these children applying recommended protocols and appropriate therapeutic foods.

### **2.5. Concept of child nutrition and young child feeding practices.**

Good nutrition during childhood is essential for growth and development, health and well-being, and the prevention of some chronic diseases in old age (CDC, 1999).

Children require sufficient energy, protein, and other nutrients for growth as well as maintenance of body functions. Nutrient needs tend to parallel rates of growth. Growth continues at a steady rate during childhood and then accelerates during adolescence, creating increases in nutrient needs to support the rapid growth rate and increase in lean body mass and body size (Story et al., 2002).

Dietary practices represent the ways individuals or groups of people select, prepare, consume and generally use food available to them. Different societies use food differently and have chosen different flavours, textures and food combinations and have patterned their eating differently (Wardlaw, 1997). In addition to the impact on growth and development, children's diets are important to ensure overall health and well-being.

Dietary practices of children affect their risk for a number of health problems, including obesity, iron deficiency, and dental caries. Inadequate nutrition also lowers resistance to infectious disease and may adversely affect the ability to function at peak mental and physical ability (IOM, 2005).

Inappropriate nutrition can also lead to childhood obesity which is an increasing public health problem in many countries. Early nutritional deficits are also linked to long-term impairment in growth and health. Malnutrition during the first two years of life causes stunting, leading to the adult being several centimetres shorter than his or her potential height (Martorell et al., 1994). The first two years of life provide a critical window of

opportunity for ensuring children's appropriate growth and development through optimal feeding (World Bank, 2006). Based on the evidence of the effectiveness of interventions, achievement of universal coverage of optimal breastfeeding could prevent 13% of deaths occurring in children less than five years of age globally, while appropriate complementary feeding practices would result in an additional 6% reduction in under-five mortality (Jones et al., 2003).

### **2.5.1. Recommended infant and young child feeding practices**

In 2002, the World Health Organization and UNICEF adopted the Global Strategy for infant and young child feeding (WHO/UNICEF, 2003). The strategy was developed to revitalise world attention to the impact that feeding practices have on the nutritional status, growth and development, health, and survival of infants and young children. WHO and UNICEF's global recommendations for optimal infant feeding as set out in the Global Strategy are (i) Exclusive breastfeeding for six months and (ii) nutritionally adequate and safe complementary feeding starting from the age of 6 months with continued breastfeeding up to 2 years of age or beyond.

- i. Exclusive breastfeeding: This means that an infant receives only breast milk from his or her mother or a wet nurse, or expressed breast milk, and no other liquids or solids, not even water, with the exception of oral rehydration solution, drops or syrups consisting of vitamins, minerals supplements or medicines (WHO, 2008). The advantages of exclusive breastfeeding compared to partial breastfeeding were recognised in 1984, when a review of available studies found that the risk of death from diarrhoea of partially breastfed infants 0–6 months of age was 8.6 times the risk for exclusively breastfed children. For those who received no breast milk, the risk was 25

times that of those who were exclusively breastfed (Feachem and Koblinsky, 1984). A study in Brazil in 1987 found that compared with exclusive breastfeeding, partial breastfeeding was associated with 4.2 times the risk of death, while no breastfeeding had 14.2 times the risk (Victora et al., 1987). More recently, a study in Dhaka, Bangladesh, found that deaths from diarrhoea and pneumonia could be reduced by one third if infants were exclusively instead of partially breastfed for the first four months of life (Arifeen et al., 2001). Exclusive breastfeeding for six months has been found to reduce the risk of diarrhoea (Kramer et al., 2003) and respiratory illness (Chantry et al., 2006) compared with exclusive breastfeeding for 3 and 4 months, respectively.

- ii. Complementary feeding: This is defined as the process starting when breast milk is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk. The target range for complementary feeding is generally taken to be 6 to 23 months of age, even though breastfeeding may continue beyond two years (PAHO/WHO, 2003). From the age of 6 months, an infant's need for energy and nutrients starts to exceed what is provided by breast milk, and complementary feeding becomes necessary to fill the energy and nutrient gap (Dewey and Adu-Afarwuah, 2008).

If complementary foods are not introduced at this age or if they are given inappropriately, an infant's growth may falter. In many countries, the period of complementary feeding from 6–23 months is the time of peak incidence of growth faltering, micronutrient deficiencies and infectious illnesses (Dewey and Brown, 2003).

## **2.6. Female head porters (kayayei)**

Kayayei (Figs. 4a and 4b) are women who carry goods and wares on their heads for shoppers and traders in and around commercial centres for a petty fee. "Kaya" in the Hausa language means luggage, load or goods. "Yoo" means woman in Ga, the language of the indigenes of Accra, the Ghanaian capital. A kayayei (singular) is thus a young woman or a teenage girl who carries other people's loads on the head for a fee (Klein, 2000). According to one study, kayayei are typically younger, and their work in southern Ghana is more temporary than their male porter counterparts (Yeboah and Appiah Yeboah, 2009).

The kayayei are often times unskilled migrants from northern Ghana who come from underdeveloped, rural areas in search of jobs in the cities to the south. The areas in northern Ghana from which the kayayei hail are common places of abject poverty. In the past ten years, the rainfall in the north has become unpredictable due to environmental degradation. Drought, unfertile soil due to excessive farming, and inadequate jobs in the northern rural areas are positively correlated with crop failures and, ultimately, low wages (Opare, 2010).

The result is that youth from these areas have been known to migrate to the south in search of greener pastures in the cities. In fact, many kayayei were encouraged by their families in northern Ghana to move to the cities due to financial hardships on the home front (Opare 2010).

Because of their lack of education and hard skills, women from the north tend to work in the informal sector when they reach the metropolis. To the porters, the kaya business is seen as simple self-employment with quick results that afford them minimum assets for marriage or for sending funds back home to their family in northern Ghana. According to

one study, the majority of kayayei are saving their wages to "enter into large-scale trading or other sedentary work" (Opare 2010).

The second most common reason the women enter the kaya business is to purchase material items such as clothing, jewellery and kitchenware for marriage (Opare 2010). Some studies have shown that kayayei "live and work in closely-linked groups held together through strong social networks" (Yeboah and Appiah-Yeboah, 2009). Through social networking, the kayayei choose which city to go to for work. Most kayayei have family already working in the cities, and they arrange to stay with them while they work in the markets. Kayayei is employed by travellers, shop owners, general shoppers, or traders and is used to offset the difficulty of vehicles accessing the centre of the markets to load or discharge goods (Yeboah and Appiah-Yeboah, 2009:1). It is common that kayayei are exploited by their patrons and hassled by police and city authorities (Yeboah and Appiah Yeboah, 2009).

The wages that the kayayei earn typically go "from hand to mouth" and, more often than not, are spent on living accommodations within Kumasi metropolis. Many kayayei who care for their children are not able to afford the school fees; consequently, children follow their mothers and begin work as kayayei at alarmingly young ages. The kayayei who live in Kumasi share rented kiosks and contribute to the payment of weekly (sometimes daily) rent; potable water, toilets, and showers also come with a user's fee in the slum.

Yet, the residents consider the prices of their accommodations to be cheap, although many residents do not realise that the accumulated annual costs of living are often greater within the slum compared to other low-income communities.

### **2.6.1 Factors that have Promoted Head Portage in Ghana**

Literature on migration (both internal and external) seems to point to a consensus that, throughout the globe, economic considerations are the principal triggers for migration (source). Besides the economic considerations, social and political factors are also some of the triggers of migration. These social factors include movement, joining spouses, being free from the burden posed by family members, enjoying social services such as education and health from social amenities abundant in the urban areas and religious reasons. The political factors also include asylum, freedom from conflicts. Anzagra and Yeboah (2012) identified that more than 50 percent of the child migrants they covered in their study migrated in order to find jobs in the Kumasi metropolis. Furthermore, 46.7 percent of the children migrated in order to fend for themselves because they claimed their parents were poor and could not take care of them.

Their findings were consistent with Kwankye's view that the main reason for the children's decision to migrate is 'independence and money' (Kwankye, 2011). Similarly, Kese (2004) revealed a less known but very important trigger of young females moving to the cities in southern Ghana to work as head porters. Kese (2004) argues that the architectural designs of markets in the Ghanaian cities, which do not allow for the use of intermediate and modern modes of transport in the congested markets, promote the carriage of goods by human beings. The socio-cultural environments in which female porters live in Ghana are also known to influence the migration of girls to cities. Many migrant girls in Ghana come from poor rural communities in which children start earning their own independent incomes quite early, as well as contributing to family income. Thus, young girls are encouraged to earn some income for their own consumption and upkeep. Besides the need for income, the out-migration of unmarried females to the cities of Accra and Kumasi is also variously linked to females escaping from the

traditionally ascribed status such as obeying male kinsmen, or excessive hard work or customary practices such as female genital mutilation or arranged marriages (Whitehead and Hashim, 2005; Awumbila, 2007). These socio-cultural factors make it very complex and challenging to totally eradicate the migration of young girls to the cities to work as head porters.

The authors note that myriad social, economic, political and cultural factors underpin people's decision to migrate. While several migrants move voluntarily to improve their living conditions, other moves in order to flee from outmoded and inhuman cultural practices.

### **2.6.2 Theoretical Underpinning of Migration**

These causes of migration are explained by several theories on migration. Most studies on migration, for example, consider the "push and pull" theoretical framework developed by Lee in 1966 as one of the major theoretical underpinning for rural-urban migration, especially for head portage (Yeboah, 2008). The theory indicates that 'push' factors exist at the point of origin and act to trigger emigration. The push factors include poverty, lack of adequate infrastructure in rural areas, parental neglect, breakdown of family structures, lack of education and employment opportunities, low family incomes, peer influence and debilitating socio-cultural practices.

On the other hand, the 'pull' factors include the perceived availability of jobs at the destination, better infrastructure/social services and food and freedom from family pressure (Opare, 2003; Kese, 2004; Awumbila, 2007; Berg, 2007; Kwankye et al., 2007).

This means that migration can only occur if the reason to emigrate (the push) is remedied by the corresponding pull factors at an attainable destination (Muñiz-Solari et al. 2010 cited in Solem et al. Eds 2011). The theory, however, stipulates that the flow of migrants



between two places may not totally develop if intervening opportunities exist between them; that is, the presence of other places between an origin and destination point to which one could migrate. Two issues emerge from the discussion of the causes of migration with Lee's theory of migration as the underpinning.

That a combination of socioeconomic and political reasons influences decision to either emigrate (push factors) or in-migrate (pull factors); and that the destination of the migrants is the shortest destination which has the socioeconomic and political answers the migrants seeks. The intervening opportunity in the case of child migrants from Northern Ghana to the south could have been the Tamale metropolis or the Sunyani municipality. However, relative to the Kumasi metropolis, which is the commercial hub of the northern sector of Ghana, the interventions from Tamale and Sunyani are not enough to prevent the child migrants from choosing Kumasi as their destination (Ghana Statistical Service, 2005).

Thus, the Kumasi metropolis' endowment in social and economic infrastructure coupled with its proximity to the north relative to Accra, Sekondi Takoradi and a host of other cities in the north makes it the first destination for migrants, including the children. In sum, Lee's push and pull theory has affirmed the economic dimension of migration alluded to by the authors of this paper above. What is evident is that economic reasons are the major triggers of migration across the globe.

The survival strategy approach" proposed by Stark (1984) and household strategy approach" by Chant (1998) further explain the economic underpinning of migration. The survival strategy asserts that the migration of labour from rural areas is essential for the survival of urban capitalism. Stark (1984) asserts that rural families use rural-urban migration as a wealth accumulation strategy through remittances received from the migrants. Thus, head portage can be said to be mutually beneficial to both the head porter and their operational areas and should not be entirely regarded as a nuisance. This

claim is supported by Kwankye et al. (2011) and Adu-Okoree (2012) claim that some of the young girls migrate to the cities to earn incomes to expend on cooking and other household wares. Their possession of these wares is a demonstration of their readiness for marriage. Adu-Okoree (2012) explains that every woman is expected to have a quantity of cooking and dining sets to decorate their rooms. The more of these items a woman has, the more attractive she is and therefore gets the best of potential suitors". The authors note that economic and social reasons come to play to compel the Tamale metropolis is the capital of the Northern Region of Ghana. The northern region is one of the 16 administrative regions in Ghana. Sunyani municipality is the capital of the Brong Ahafo region of Ghana.

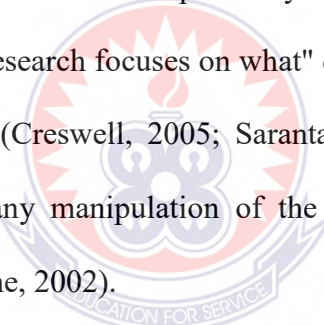
The Classical Economists also argue that rural inhabitants are attracted to the urban areas by high industrial wages. This is the premise of the modernization theory. Furthermore, the Urban Bias Theory indicates that the concentration of economic opportunities (investments) results in the exodus of rural labor to the urban areas. This bias in favour of the city has created a disparity between country and city (in terms of consumption, wage and productivity levels), thus translating into a higher standard of living from urban citizens, which draws migrants from poorer (rural) areas to the cities. The Harris-Todaro Model of migration model also explains that migration is stimulated by rational economic considerations. Todaro and Smith (2012) highlight that the decision to migrate depends on expected rather than actual urban-rural real wage differential. In conclusion, the authors note that the consensus among the theories on migration is the economic consideration. This is summed up by the Ghana Statistical Service (2005), citing Kelly and Williamson (1984) that rural-urban migration is more a function of opportunities in the cities than it is of population pressure from the rural areas, as perfectly explained by the urban bias theory

## CHAPTER THREE

### METHODS

#### 3.0 Research Design

The study shall adopt the descriptive research design, which describes and interprets what exists (Rosalin & Soetanto, 2006; Payne & Payne, 2004; Punch, 2003). According to Zikmund, Babin, & Carr (2010), descriptive research is used to describe the characteristics of a population or phenomenon. According to Creswell (2003), a descriptive study design is concerned with conditions or inter-relationships that exist, opinions that are held, processes that are going on, effects that are evident, and trends that are developing. It describes the situation or the phenomenon as it exists and does not focus on identifying causes “unlike the explanatory research design, which focuses on why" questions, descriptive research focuses on what" questions with respect to variables or conditions in a situation (Creswell, 2005; Sarantakos, 2005). Descriptive research design does not allow for any manipulation of the key variables but describes and interpret what exists (Amedahe, 2002).



#### 3.1 Population

The study focused on female head porters operating in the Kejetia Market of the Kumasi metropolis. The participants were children (0-5 years) of female head porters and their mothers. Kumasi is the second-largest city (coming only after Accra) in Ghana and serves as a major administrative and commercial centre, especially for the middle and northern belts of Ghana. This makes it a good business destination and a hub for both internal and international migrants in Ghana and the West African Sub-region. Kumasi's strategic location also makes it a profitable location for head porters to operate as they

find a lot of travelers and shoppers' luggage to carry, hence its choice as a study area for this research.

The Kejetia market is located in the heart of Kumasi. Being the city centre and a large market which is directly supplied by farmers are factors that entice the migrants to settle. It is one of the largest markets in Kumasi and accommodates a high-density population of female head porters

### **3.2. Sampling techniques and sample size**

Sampling was done between the first and third week of March 2022. A purposive sampling method was used to select the kayayei. Purposive sampling allows the researcher to gather qualitative responses, which leads to better insights and more precise research results. Because the researcher collects information from the best-fit participants, the results are relevant to the research context. The mothers were part of the participants because, at age 0-5 years, the children depend mainly on their mothers for their meals. Data on the kayayei relating to demographic characteristics, feeding practices as well as nutritional knowledge were obtained by the use of a validated questionnaire.

A sample size of 73 was determined based on an absolute precision of 5% and a confidence interval of 95% (Daniel, 1999):

$$N = (Z)^2 P(1-P) / d^2$$

$$= 1.96^2$$

$$(0.05)(1-0.05)$$

$$(0.05)^2$$

$$= 72.9904$$

$$= 73$$

N is sample size

Z is level of significance

P is expected prevalence

d is precision

### **3.3 Data Collections instruments**

#### **3.3.1 Dietary Assessment**

The instrument that was used to collect data for dietary assessment for the study will be a questionnaire. A questionnaire was used because it guarantees easy data collection and also makes it efficient for collecting statistically quantifiable data in social science research (Twumasi, 2001). The questionnaire contained closed-ended items for the study. Close-ended questions allow respondents to choose from possible answers.

A food frequency questionnaire (FFQ) was used to gather information on the regular eating pattern of the children from their mothers. Information on the specific foods consumed and their frequency of consumption was obtained from the FFQ. The mothers provided detailed information of all foods and beverages consumed, including cooking methods used. Food models was used to describe the quantity and portions of food.

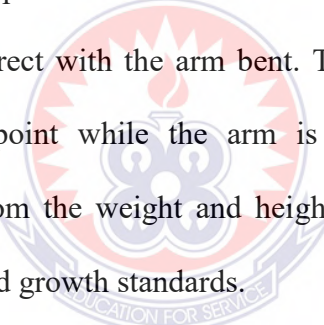
These shall be sex, age, marital status, educational level, employment status, religion, income, and ethnicity

#### **3.3.2 Anthropometric Measurement**

The weight, height and mid-upper-arm-circumference (MUAC) of the children were taken and compared with WHO Child Growth Standards (WHO, 2006). Weight measurements were taken with a normal weighing scale for children who could stand without difficulty. The children were made to remove any footwear and heavy clothing.

For children who could not stand without help, their weights were taken by weighing both mother and child and then mother only the weight of the child was then deducted. In both cases, weights were measured in light clothing. The weights were measured correct to the nearest 0.1kg. Measurements were taken twice, and an average value was derived. Height measurements were taken with a portable stadiometer placed on firm flat ground to ensure accuracy. Measurements were made without shoes/footwear. Each child was asked to stand upright with hands by the sides and back towards the measuring pole. The marker on the stadiometer was dropped to the head to measure the height. Heights were recorded to the nearest 0.1 cm.

MUAC measures were taken with a non-stretch MUAC tape. The measurement was done by determining the midpoint between the shoulder and the elbow of the left arm while the child is standing erect with the arm bent. The mid-upper circumference will then be measured at this point while the arm is straightened. Weight-for-height measures were calculated from the weight and height measures taken, and the values were compared to WHO Child growth standards.

The logo of the University of Education, Winneba, is a circular emblem. It features a central shield with a sunburst at the top and a book at the bottom. The shield is surrounded by a wreath. The text 'UNIVERSITY OF EDUCATION, WINNEBA' is written around the top inner edge of the circle, and 'DEDICATION FOR SERVICE' is written around the bottom inner edge.

### **3.4. Data Analysis**

Statistical analyses were done using SPSS Version 19 for Windows (2007, SPSS Inc., Chicago, IL). Graphs, charts and tables will be used to summarize data and display figures where appropriate. A correlation was used to test the association between mothers' knowledge and the nutritional status of the children.

### **3.5. Ethical considerations**

Ethical approval was obtained from the Ethics and Protocol Review Committee of the Faculty of Vocational Education. In addition, informed consent to participate after a detailed explanation of the study to the subjects was obtained on behalf of the children.



## CHAPTER FOUR

### RESULTS

#### 4.1. Socio-demographic data of the mothers

A total of 73 female head porters (kayayei), each with her child, at the Kejetia market in Kumasi participated in the study. Table 1 summarizes the socio-demographic characteristics of the kayayei. Out of the total of 73 kayayei, 53 (72.6%) were between the ages of 20 and 25 years and only one (1.4%) was above 30 years. All 73 kayayei were from northern Ghana with 22 of them (30.1%) being Sisala and Dagarti, and 20 (27.4%) being Dagomba. More than half (89%) of the kayayei had no formal education and only 8 (11%) had up to primary education. Forty-seven (64.4%) of the kayayei were married and the remaining 26 were single. Each kayayei had at least one child. More than half (54.4%) of the kayayei earned between GH¢ 20-30 daily and almost 3% earned less than GH¢ 10 daily. Majority of the kayayei (89%) lived in a common room (shared with other kayayei) and 28 (34.4%) of them had lived in Accra for less than a year or between one and two years.

Table 2 shows the age ranges and gender of the children. Majority of the children (32.9%) were between the ages of 25 and 36 months and 4.1% (3) were less than 12 months. None of the children was less six months. Thirty seven (50.7%) of the children were girls and the remaining 36 (49.3%) were boys.



**1: Socio-demographic data of the mothers**

<b>Variable</b>	<b>Category</b>	<b>N = 73</b>	<b>%</b>
Age	Below 20 years	9	12.3
	20-25 years	53	72.6
	26-30 years	10	13.7
	30 and above	1	1.4
Ethnicity	Dagomba	20	27.4
	Kokomba	9	12.3
	Sisala	22	30.1
	Dagarti	22	30.1
Level of education	No Formal Education	65	89.0
	Kindergarten/ Primary	8	11.
Marital status	Single	26	35.6
	Married	47	64.4
Average daily income	Less than GH¢ 10	2	2.7
	GH¢ 10-20	22	30.1
	GH¢ 20-30	40	54.8
	GH¢ 30-40	9	12.3
Permanent residence	Kiosk	7	9.6
	Common room/Veranda	65	89.0
	Street	1	1.4
Length of stay at area of residence	Less than 1 year	28	38.4
	1 – 2 years	28	38.4
	3 –4 years	17	23.3

**Table 2: Demographic data of the children.**

Variable	Category	N = 73	%
Age	Less than 12 months	3	4.1
	12 to 24 months	13	17.8
	25 to 36 months	24	32.9
	37 to 48 months	18	24.7
	49 to 60 months	15	20.5
Gender	Female	37	50.7
	Male	36	49.3

#### 4.2. Reasons for the feeding practices of the kayayei

Table 3 presents the nutritional knowledge of the mothers. Fifty-two (71.2%) kayayei fed their children for growth and development and 21 (28.8%) did so to satisfy hunger. Concerning what a balanced diet is, 58.9% (43) described a balanced diet as one that had appropriate amount of all nutrients and 1.4% described a balanced diet as one that had most nutrients. Most of the kayayei (91.8%) responded that different people required different amounts of food.

#### 4.3. Breastfeeding practices

Almost all the mothers (95.9%) breastfed their children (Table 9). However only seven (9.6%) did exclusive breastfeeding and 24 (32.9%) breastfed their children up to two years as recommended by WHO.

**Table 3: Reasons for feeding practices**

Variable	Category	N	%
Why must we eat?	Growth and development	52	71.2
	Satisfy hunger	21	28.8
How would you describe a balanced diet?	Appropriate amount of all nutrients	43	58.9
	Large amount of all nutrients	29	39.7
	Most nutrients	1	1.4
Do all people require the same quantity of food daily?	Yes	3	4.1
	No	67	91.8
	No Response	3	4.1

**Table 4: Breastfeeding practice**

Variable	Category	N	%
Breastfeeding	Yes	70	95.9
	No	3	4.1
Duration of breastfeeding	Less than 2years	49	67.1
	2years	24	32.9
Practice of exclusive breastfeeding	Yes	7	9.6
	No	66	90.4
Start of complementary breastfeeding before six months		64	87.7
	After six months	9	12.3

#### **4.4 General Child feeding practices of the kayayei**

Table 4 presents the general child feeding practices of the kayayei. Sixty-three percent (46) of the mothers fed their children three times daily and just 6.8% (5) fed their children twice daily. The kayayei fed their children these number of times mainly due to affordability (71.2%), with time factor (2.7%) being the least reason.

Sixty-five (89%) of the kayayei did not feed their children with home cooked meals and 72 (98.6%) provided food for their children by buying. Most of the kayayei (80.8%) bought food for their children because it was affordable and 19.2% (14) bought food for their children because it was available. In addition, almost all the kayayei (95.9%) ate the same food with their children always.

#### **4.5 Food frequency questionnaire**

##### **4.5.1 Fruits**

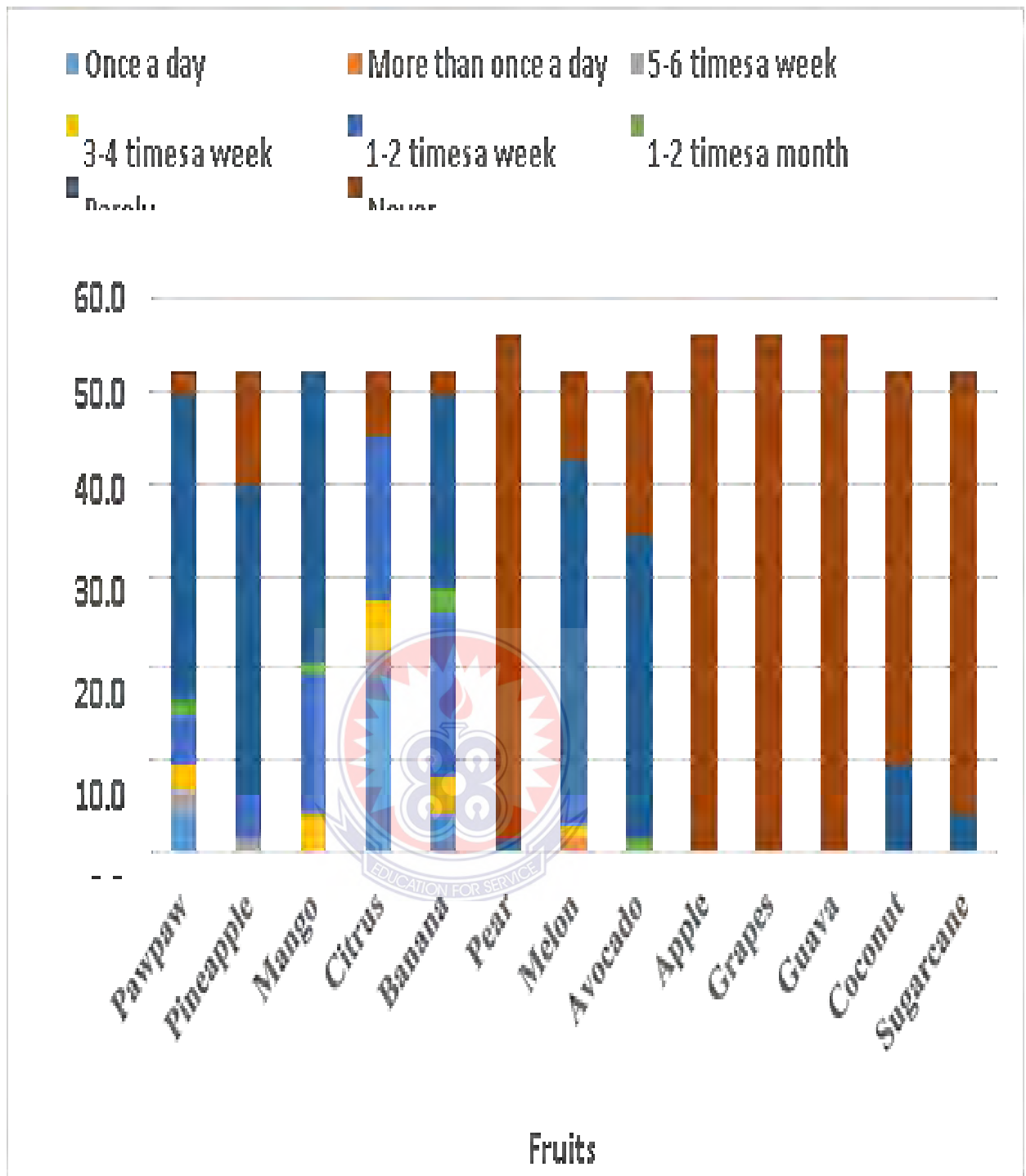
Figure 1 shows the consumption frequencies of fruits by the children. None of the mothers fed their children apples, grapes or guava fruits. Less than 10% fed their children sugarcane Coconut was given occasionally. Less than 10% fed their children pawpaw and banana once daily and almost 20% gave their children a citrus fruit once daily.

##### **4.5.2 Legumes, nuts and oil seeds**

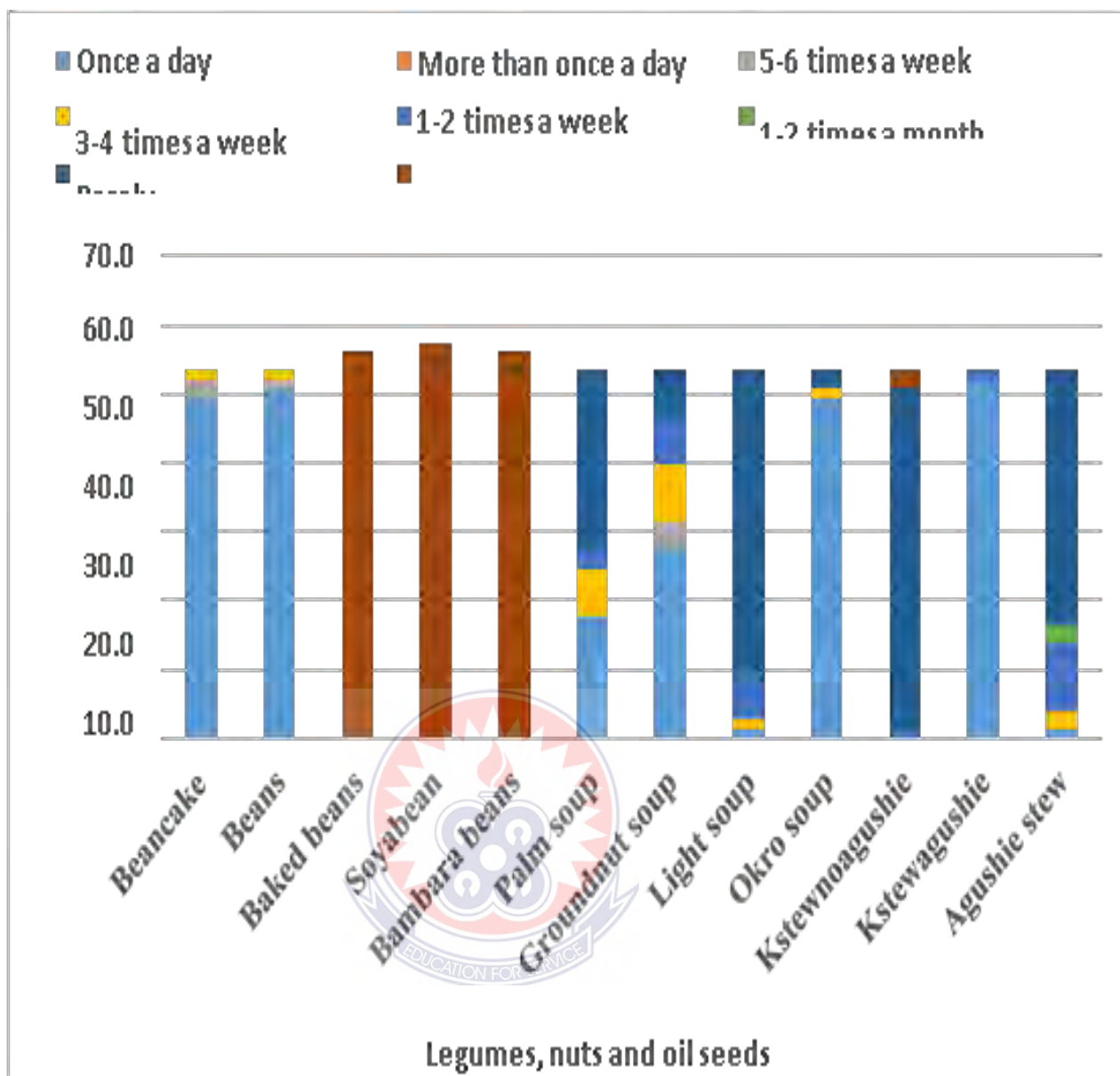
Figure 2 shows the consumption frequencies of legumes, nuts and oil seeds by the children. None of the kayayei mothers fed their children soya beans, baked beans or bambara beans. Almost 50% fed their children bean cake (akara/koose) and agushie once daily. About 30% gave their children groundnut soup daily and almost 20% gave palm nut soup daily.

**Table 5: General Child feeding practice**

Variable	Category	N	%
Frequency of child feeding	Twice	5	6.8
	Thrice	46	63.0
	More	22	30.1
Reasons for frequency of child feeding	Affordability	52	71.2
	Availability	15	20.5
	Nutritional Value	4	5.5
	Time	2	2.7
Do you feed your child home cooked meals?	Yes	1	1.4
	No	65	89.0
	No Response	7	9.6
If no, how do you obtain food for child?	Buying	72	98.6
	Food from relatives/friend	1	1.4
Why do you feed such foods to your child?	Affordability	59	80.8
	Availability	14	19.2
Do you eat the same food with your child?	Always	70	95.9
	Usually	1	1.4
	Sometimes	2	2.7



**FIGURE 1: Frequency of consumption of fruits by the children**



**FIGURE. 2: Frequency of consumption of legumes nuts and oil seeds by the children.**

#### 4.5.3 Starchy roots and plantain

Figure 3 shows the frequency of consumption of starchy roots and plantain by the children. The most common starchy root that was consumed by the children was yam. About 20% consumed yam three or four times in a week and about 10% consumed yam

once or twice a week. Majority (about 50%) fed on plantain occasionally, either as boiled, fried or plantain chips.

#### **4.5.4. Animal and animal products**

Figure 4 shows the frequency of consumption of animal and animal products by the children. More than half of the children (53.4%) had fish once a day. None of the mothers fed their children game or seafood. More than 50% ate poultry, meat and sausage occasionally. About 40% had gave eggs and offal once or twice a week and only about 5% gave milk daily.

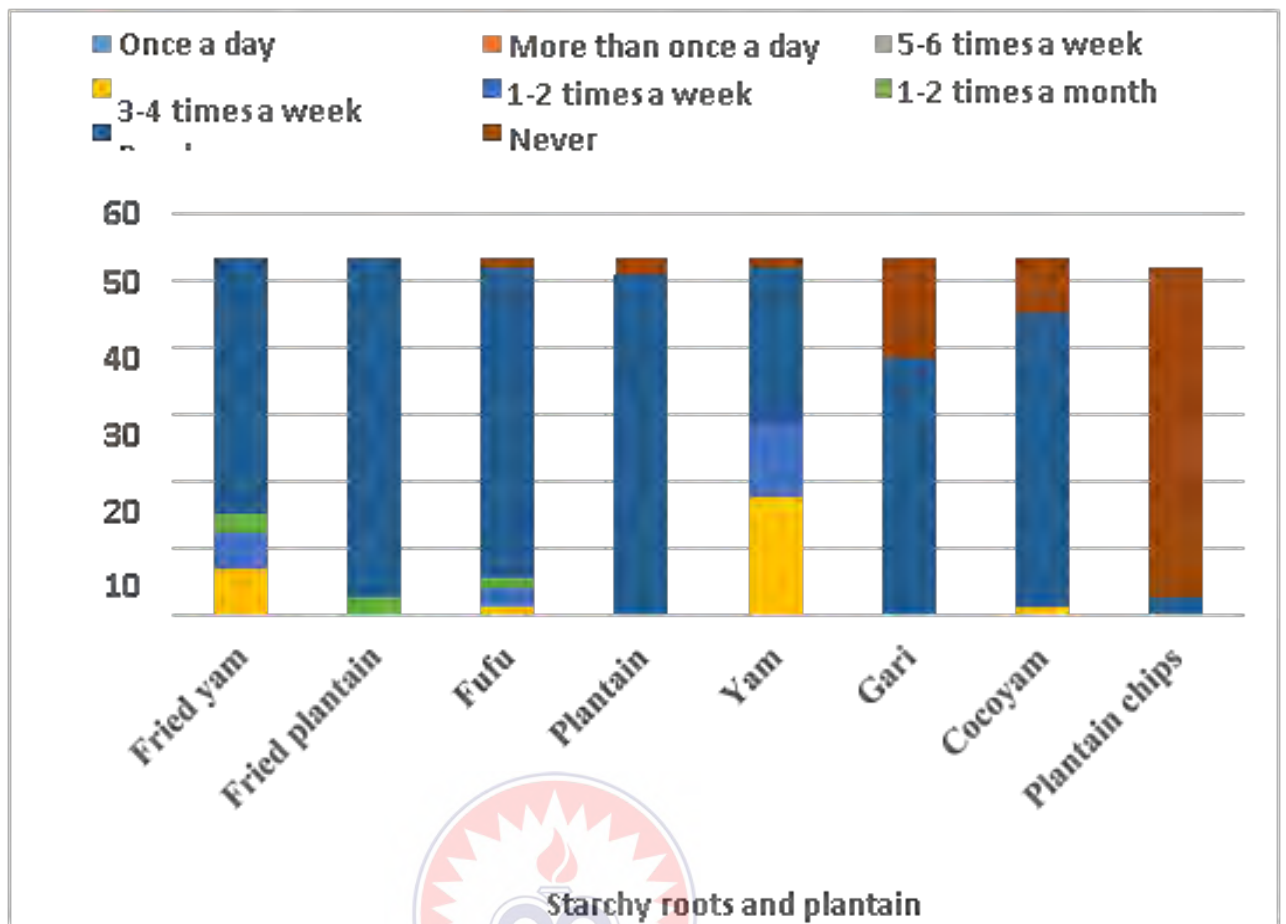
#### **4.5.5. Vegetables**

Figure 5 presents the frequency of vegetable consumption by the children. The most common vegetable that was consumed by the kayayei children was kontomire. More than 50% of the mothers gave their children kontomire daily. Almost 50% gave their children okro daily and about 10% gave their children garden eggs three or four times a week.

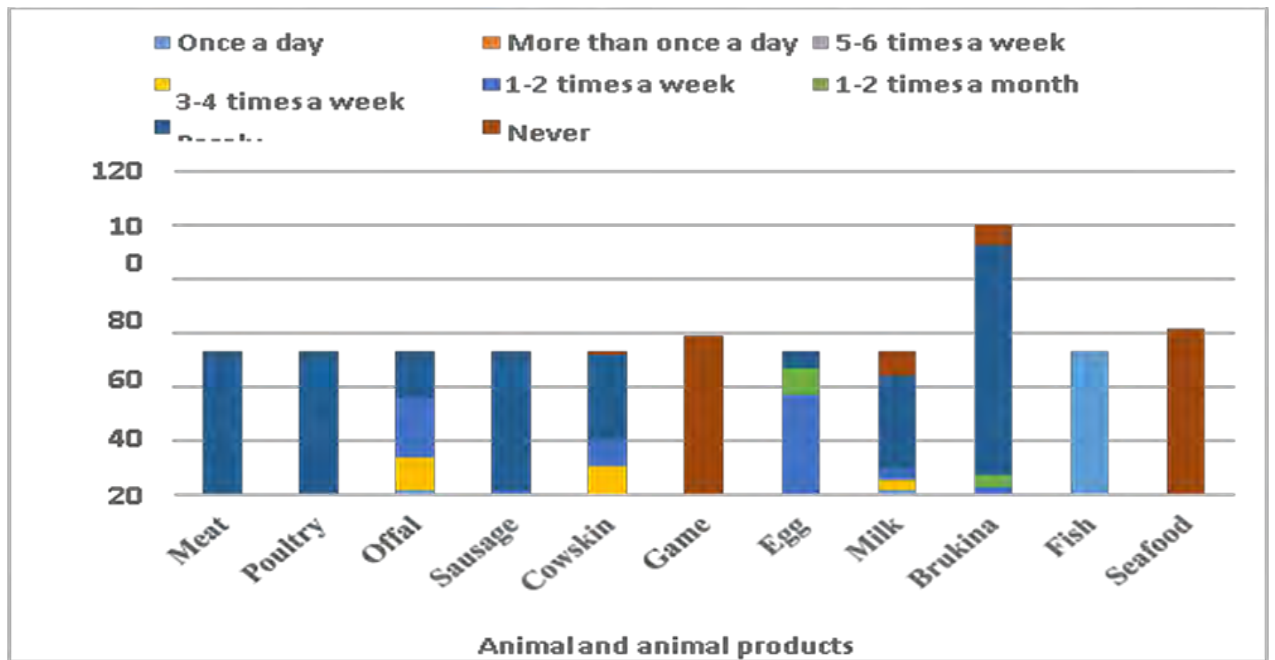
#### **4.5.6. Grains and cereals**

Figure 6 shows the frequency of consumption of grains and cereals by the children. Majority of the kayayei fed their children a grain or cereal daily in the form of tuo zafi (53.4%), white bread (46.6%) or millet porridge (46.6%), once a day. Kenkey and indomi/spaghetti were rarely taken.

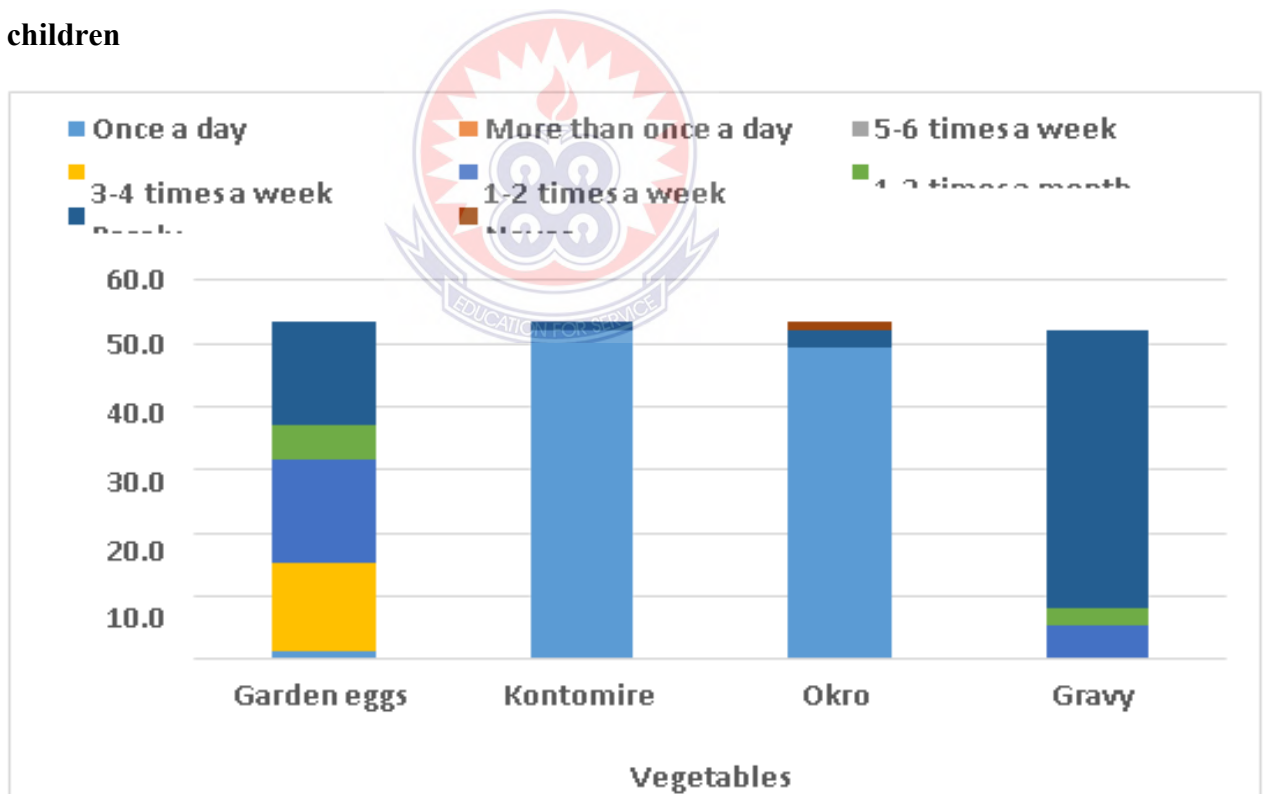




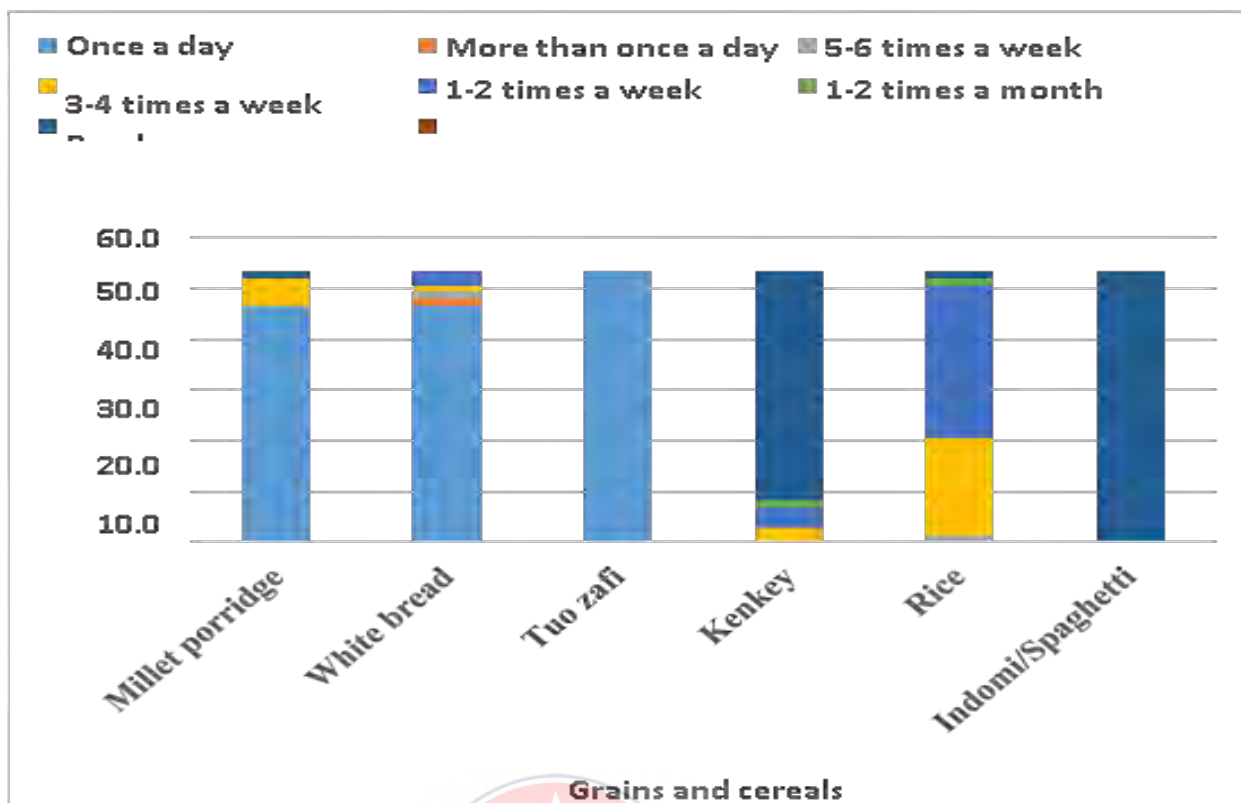
**FIGURE 3: Frequency of consumption of starchy roots and plantain by the children**



**FIGURE 4: : Frequency of consumption of animal and animal products by the children**



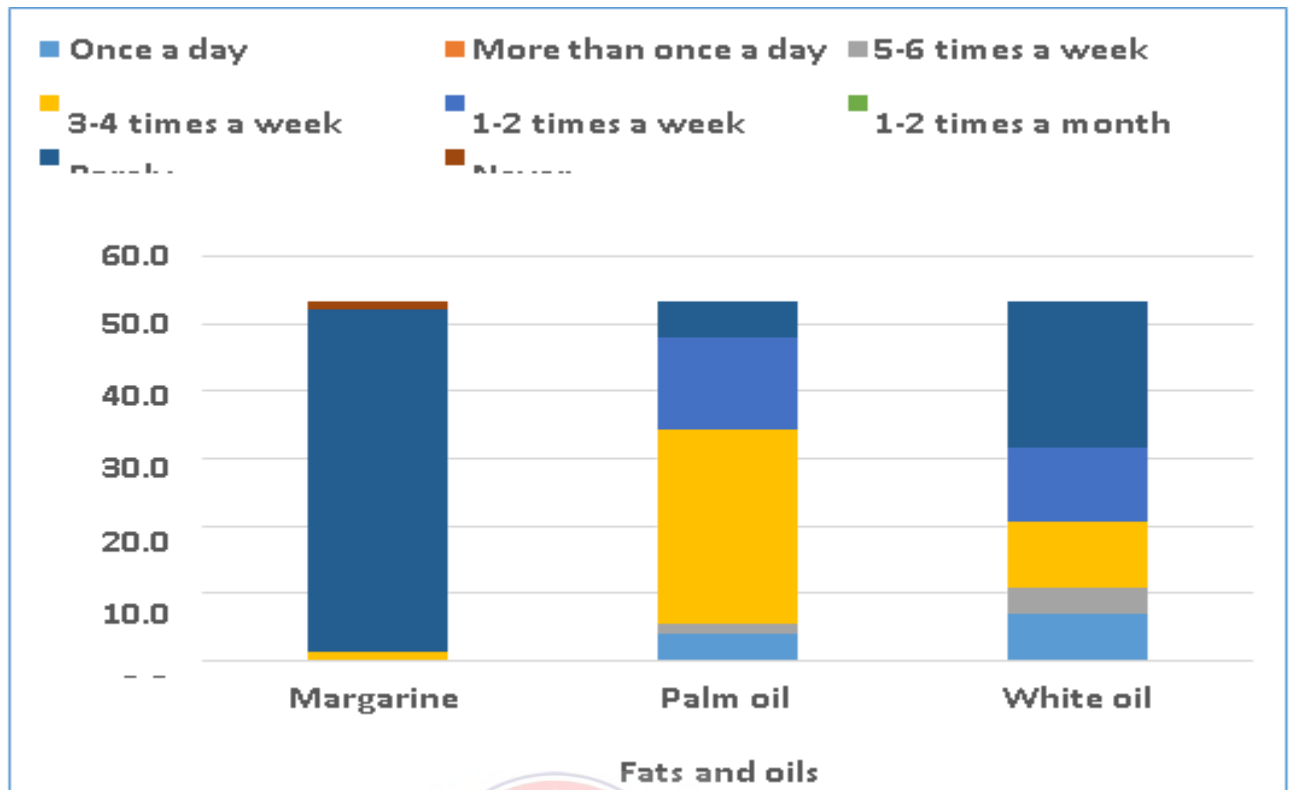
**FIGURE 5 : 9 Frequency of consumption of vegetables by the children**



**FIGURE 6: Frequency of consumption of grains and cereals by the children.**

#### 4.5.7. Fats and oils

Figure 7 shows the fats and oil consumption of the children. The commonest oil consumed was palm nut oil which was taken by most of the children, either 1-2 week a week (13.7%) or three to four times per week (28.8%). Margarine was rarely consumed by more than 50% and 11.1% consumed white oil daily



**FIGURE 7: Frequency of consumption of fats and oils by the children**

#### 4.6. Nutritional status of the children using anthropometric measures

##### 4.6.1 MUAC

Table 6 shows the summary of the MUAC measures of the children. Majority of the children (67.1%) had measures in the normal range ( $>12.5$  cm). A few children (12.3%) were identified with SAM ( $<11.5$  cm). MUAC ranges in relation to age ranges of the children is shown under Table 7. The children identified with SAM were in the 12 to 48 months age range. Table 8 shows the MUAC ranges in relation to the gender of the children. More females (6) were identified with SAM compared males (3)

##### 4.6.2. Weight-for-height (WFH) measures

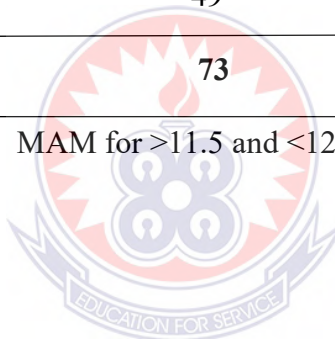
Table 9 shows the summary of WFH measures of the children. Majority of the children (78.1%) had their WFH measures being normal ( $< -2$  SD of the WHO weight –for-height

standards) whilst 11% (8) were identified with SAM. Table 10 shows the WFH ranges in relation to the age ranges of the children. The children identified with SAM were in the 12 to 48 months age range. Table 11 shows the WFH ranges in relation to the gender of the children. More females (6) were identified with SAM compared males (3)

**Table 6: MUAC measures of the children**

<b>MUAC* Ranges (cm)</b>	<b>N</b>	<b>%</b>
<11.5	9	12.3
≥11.5 and <12.5	15	20.5
>12.5	49	67.1
<b>Total</b>	<b>73</b>	<b>100.0</b>

\*Normal >or equal to 12cm, MAM for >11.5 and <12.5cm, SAM for <11.5 cm



**Table 7: Age ranges of the children and MUAC measures**

Age Ranges (months)	MUAC* Ranges (cm)		
	<11.5	≥11.5 and <12.5	>12.5
Less than 12	0	1	2
12 to 24	3	3	7
25 to 36	4	6	14
37 to 48	2	3	13
49 to 60	0	2	13

Normal > or equal to 12.5cm, MAM for >11.5 and <12.5cm, SAM for <11.5 cm

**Table 8 : Child gender and MUAC measures**

Gender	MUAC* Ranges (cm)		
	<11.5	≥11.5 and <12.5	>12.5
Female	6	8	23
Male	3	7	26

\* Normal > or equal to 12.5cm; MAM for >11.5 and <12.5cm; SAM for <11.5 cm

**Table 9: WFH measures of the children**

Variable	Category	N	%
Weight-for-height	Normal, < -2 SD	57	78.1
	Moderate, -3 to -2 SD	8	11
	Severe, < -3SD	8	11

**Table 10: Age ranges and WFH measures**

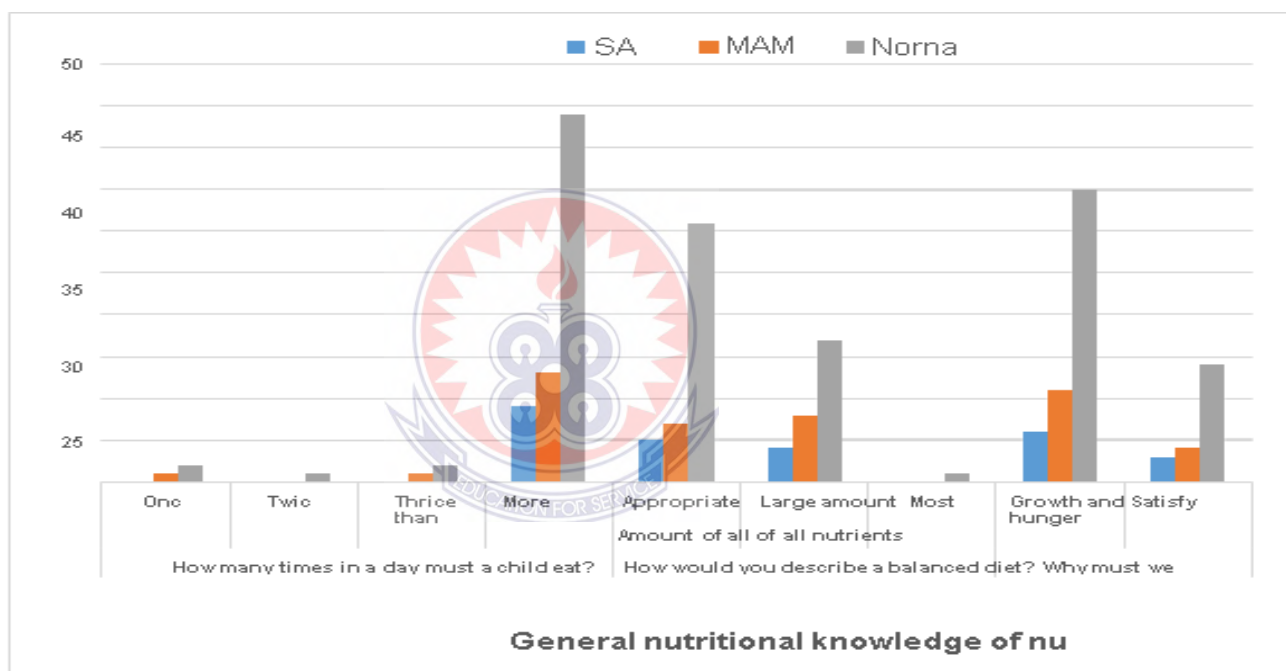
Child age ranges (months)	Weight for height		
	Normal, <-2 SD	moderate, -3 to -2 SD	Severe,
<b>&lt; - 3SD</b>			
Less than 12	3	0	0
12 to 24	8	3	2
25 to 36	17	3	4
37 to 48	14	2	2
49 to 60	15	0	0

**Table 11: Gender and WFH measures**

Gender	Weight for height		
	Normal, < -2 SD	Moderate, -3 to -2 SD	Severe, < -3SD
<b>Total</b>			
Female	29	2	6
37			
Male	28	6	2
36			
<b>Total</b>	<b>57</b>	<b>8</b>	<b>8</b>

#### 4.7. Relationship between the level nutritional knowledge of the mothers and the nutritional status of their children

Figure 8 shows the nutritional knowledge of the mothers in relation to the MUAC values of the children. Majority of the children who were fed more than thrice daily had their MUAC measures greater than 12.5cm. More than half of the mothers who knew what a balanced diet was had children with MUAC values > 12.5cm. Women who fed their children for growth and development had most of the children with MUAC values >12.5cm. A similar trend was observed with the WFH values

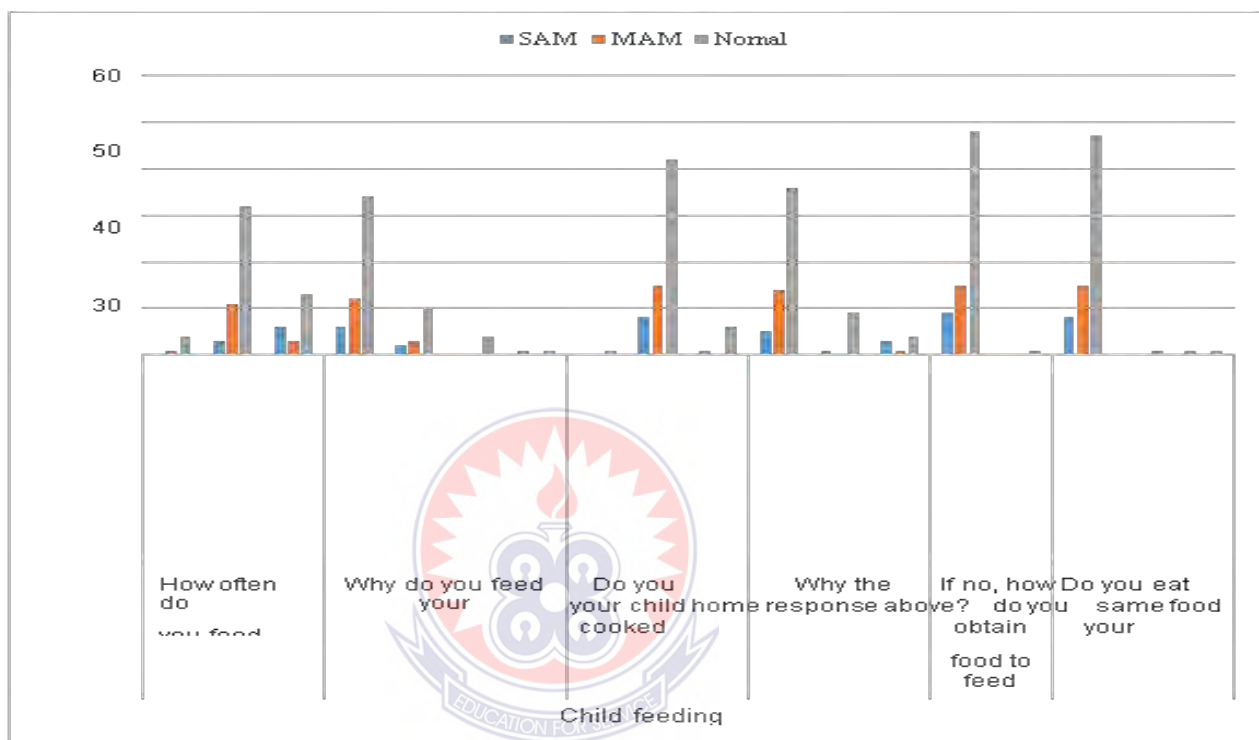


**Fig. 8: Reasons for the feeding practices of the kayayei**



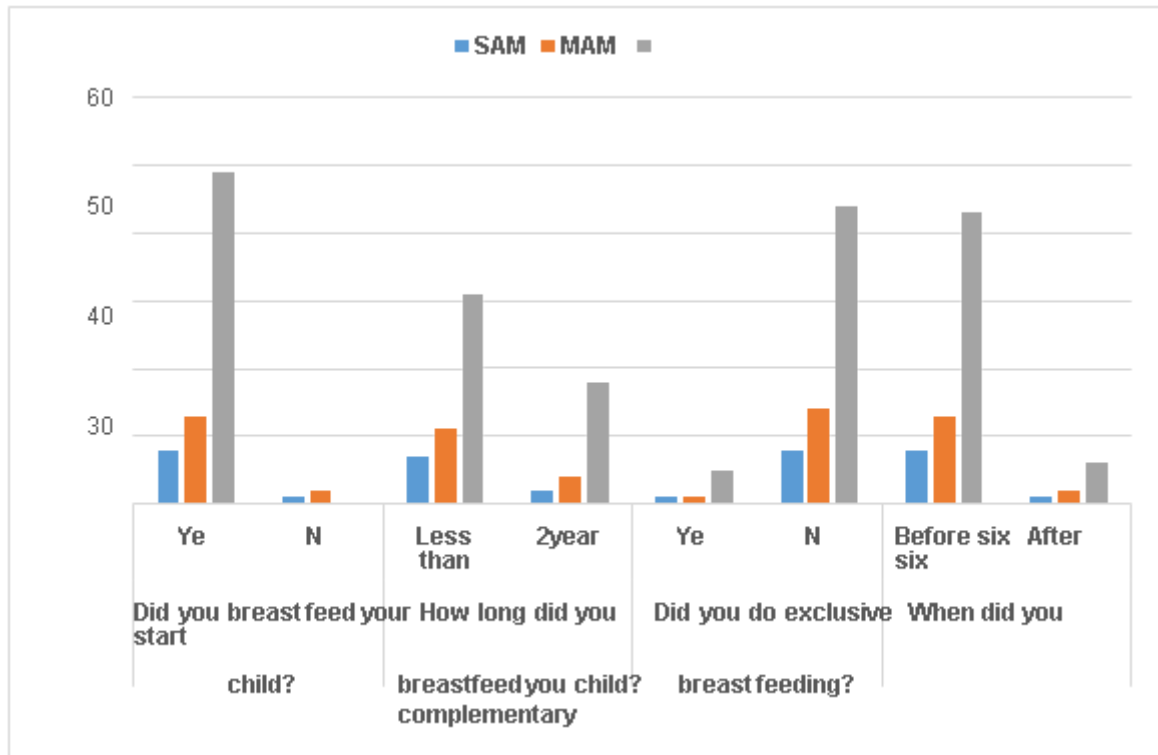
#### 4.8. Relationship between child feeding practices of the mothers and the nutritional status of their children

Figure 9. shows the summary of the child feeding practices of the mothers and the MUAC measures of the children. Majority of the children who were fed more than thrice daily had their MUAC measures > 12.5cm.



**Fig. 9: Child feeding practices and MUAC measures**

Figure 10. Shows the breast feeding practices and the MUAC measures of the children. More than half of the mothers breastfed their children however they did not practice exclusive breast feeding. Majority breastfed for two years and complementary feeding started before children attained the age of six months.



**FIGURE 10: Bastfeeding practice and MUAC measures**



## CHAPTER FIVE

### DISCUSSION AND CONCLUSION

#### 5.1. Discussion

The aim of the study was to assess the nutritional status of children of kayayei as well as the level of nutritional knowledge of the women and their child feeding practices.

In this study, 72.6% of the kayayei were between the ages of 20 and 25 years and all 73 of them were from the northern region of Ghana. This agrees with the study by Yeboah and Appiah-Yeboah (2009) who reported that Kayayei are mostly younger women, are often times unskilled migrants from northern Ghana who come from underdeveloped, rural areas in search of jobs in the cities to the south.

In Ghana, it is a very popular cultural belief that women are seen as homemakers. Thus, the socialization of females is very different from that of males. While boys are socialized to fit into the production system, girls are socialized into a homemaker role. Because school leads to one's role within the production system, the idea of sending girls to school is not taken seriously (Amu et al., 2005). One study of 80 kayayei found that a majority lacked basic education - the first nine years of schooling, from kindergarten through junior high school (Yeboah and Appiah-Yeboah, 2009). To the porters, the kaya business is seen as simple self-employment with quick results that afford them minimum assets for marriage or for sending funds back home to their family in northern Ghana. In this study as well, most of the kayayei (89%) had no formal education and 11% had up to primary education. Many kayayei are encouraged by their families in northern Ghana to move to the cities due to financial hardships at home (Opare, 2010). Because of their lack of education and hard skills, women from the north tend to work in the informal sector when they reach the metropolis (Opare, 2010).

The kayayei who live in kejetia share rented kiosks and contribute to the payment of weekly (sometimes daily) rent; potable water, toilets, and showers also come with a user's fee. Kayayei accommodation is clearly of a poor quality. However, 'economising' on accommodation costs is part of their savings strategy. The less spent on survival needs in the urban context, the quicker can be the return to the rural context. Even where kayayei are sleeping outside, their accommodation practices are organised. They sleep together as a group to provide both for safety and identification purposes (Agarwal et al., 1994). From this study, more than half (71.2%) kayayei fed their children for growth and development and that 58.9% described a balanced diet as one that had appropriate amount of all nutrients although almost all the mothers had no formal education. This is contrary to other studies. Formal education of mothers directly transfers health knowledge to future mothers (Desai and Alva, 1998). Children born to educated women suffer less from under nutrition which manifests as underweight, wasting and stunting in children. Maternal education has been associated with nutrition outcomes among children in studies in various settings (Abuya et al, 2011). The literacy and numeracy skills that women acquire in school enhance their ability to recognize 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. A strong link between maternal education, social economic status and child nutritional status has been found (Desai and Alva, 1998). Another study by Lorant et al., 2003 also found an association between maternal education and maternal depression which has been associated with poor child health outcomes, including poor nutritional outcomes. Thus despite results of these studies, this current study shows that maternal education had no association with nutritional status of the children of the kayayei.

Adequate nutrition during infancy and early childhood is essential to ensure the growth, health, and development of children to their full potential. Parental education had been identified as a predictor of child's nutritional status (Musa et al, 2014). A study conducted by Musa et al. (2014), found that most parents of malnourished children either completed their basic education or were illiterate, and their average income was low. However this study found that even though majority of the kayayei (89%) had no formal education, majority of their children had normal weight-for-height and MUAC measures indicating that they were not malnourished. Poor nutrition increases the risk of illness, and is responsible, directly or indirectly, for one third of the estimated 9.5 million deaths that occurred in 2006 in children less than 5 years of age (WHO, 2009).

Studies in Lesotho by Ruel et al. (1992) show that nutrition education for mothers could contribute to improving children's growth, but only in households that have access to a minimum level of resources. However this study showed that even though majority of the female head porters had no formal education and earned between GH¢ 20-30 daily their children were not malnourished. Poor breastfeeding and complementary feeding practices are widespread. Worldwide, it is estimated that only 34.8% of infants are exclusively breastfed for the first 6 months of life, the majority receiving some other food or fluid in the early months (WHO, 2009). Complementary foods are often introduced too early or too late and are often nutritionally inadequate and unsafe (WHO, 2009). The results from this study indicate that majority of the female head porters (90.4%) did not practice exclusive breastfeeding. However almost all the mothers (95.9%) breastfed their children and 87.7% started complementary feeding before their children were six months old. As a global public health recommendation, infants should be exclusively breastfed for the first 6 months of life to achieve optimal growth, development and health. To meet their evolving nutritional requirements, infants should

receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond.

This study showed that majority of the kayaye (63%) fed their children three or more times daily and dark-green leafy vegetables (e.g. kontomire) were consumed daily and citrus fruits were also consumed often. This result is in accordance with WHO (2005), statement that non-breastfed children need to eat meals 4-5 times per day with additional nutritional snacks 1-2 times per day as desired. The child should be given pulses daily to help provide iron and vitamins, with vitamin C-rich foods to help iron absorption. The child should also be given orange and yellow fruits and dark-green leafy vegetables to provide vitamin A and other vitamins.

Anthropometry has become a practical tool for evaluating the nutritional status of children in developing countries (Hakeem et al 2004). Severe malnutrition in children 6-59 months of age is defined as weight-for-height less than -3 z-scores, or the presence of oedema of both feet and a mid-upper arm circumference (MUAC) of less than 11.5 cm. This current study found that using MUAC, 67.1% of the children had their MUAC value >12.5 indicating that they were not malnourished though 12.3% had their MUAC value <11.5 indicating SAM. Using MUAC a study by Musa et al. (2014) found that 79.0% of children were well nourished, 18.1% had mild malnutrition and 2.9% had moderate malnutrition. Children with a MUAC <11.5 cm should be treated for severe malnutrition regardless of their weight-for-height ratio (Prudhon et al., 2006).

This study showed that majority of the children (78.1%) of the female head porters had a WFH value greater than -2SD indicating absence of malnutrition and no need for immediate nutritional support and 11% had weight-for-height values less than -2 SD indicating moderate malnutrition. A low WFH reflects wasting, a result of acute

nutritional stress and severe food shortages or serious illness (WHO, 1995), which would need immediate nutritional support (Solarsh et al., 1994).

This study showed that majority of the mothers (95.6%) breastfed their children though they started complementary feeding before their children were six months old. However, these children were found to have normal MUAC and WFH measures. This indicates that they were not malnourished. The results from this study are in agreement with studies by Adokiya (2010) which showed that there was no association between early introduction of complementary foods before six months and child under nutrition based on univariate analysis (unadjusted). The study also found that there was no statistically significance when the children were compared using complementary foods introduction time and child under nutrition. More than half of the children were fed at least three times daily.

## **5.2. Conclusion**

There was a relationship between feeding practices of the kayayei and the nutritional status of their children. Majority of the mothers (58.9%) knew what a balanced meal was, they (71.2%) fed their children for growth and development and this showed in the anthropometric measures of their children: majority of the children 78.1% and 67.1%, were within normal WHO growth standards of weight-for-height measures, respectively. Most of the kayayei (91.8%) also responded that different people required different amounts of food. Majority of the children (95.5%) were breastfed and they (63.0%) were fed more than three times daily and these children had anthropometric measures that were with normal ranges indicating the absence of malnutrition. Consumption frequencies of the various food groups by the children varied.

It is recommended that:

1. The kayayei should be encouraged to include more fruits in their daily meals.
2. Although most of the children were not malnourished, emphasis should be given in improving the knowledge and practice of the kayayei parents on appropriate infant and young child feeding practices and appropriate child health care measures.
3. Further research should be conducted to include a larger number of the kayayei and their children in different locations





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## APPENDIXES

### APPENDIX I

#### ASSESSMENT OF NUTRITIONAL STATUS OF CHILDREN OF HEAD PORTERS AT KEJETIA MARKET IN KUMASI.

##### **SECTION 1: DEMOGRAPHIC CHARACTERISTICS OF MOTHER**

1.2 Age distribution :( 1) Below 20 years (2) 20-25 years (3) 26-30 years (4) 30 and

above 1.3 Ethnicity.....

1.4 Level of education (1) None (2) Kindergarten/ Primary (3) JHS (4)SHS (5) Tertiary

1.5 Marital status (1) Single (2) married (3) separated / divorced (4) widowed

1.6 What is your average daily income? (1) <GHC 10 (2) GHC 10-20 (3) GHC 20-30- (4) GHC 30-40 (5) More

1.7 Where is your permanent residence? (1)Kiosk (2) Common room/Verandah (3) Street

(4) Others (Please specify..... )

1.8 Length of stay at area of resident. (1) < 1 yr (2) 1 – 2 yrs (3) 3 –4 yrs (4) 5 yrs or more

11.8 How do you perceive your overall health status? (1) Very good (2) Good (3) Fair (4) poor

##### **SECTION 2: FEEDING PRACTICES**

2.1 Did you breast feed your child? (1) Yes (2) No

2.2 How long did you breastfeed you child? (1) < 2yrs (2) 2years (3) more than 2 years

2.3 Did you do exclusive breast feeding? (1) Yes (2) No

2.4 When did you start complementary feeding? (1) Before six months (2) after six months

**SECTION 3: FACTORS THAT INFLUENCE CHILD FEEDING PRACTICES**

3.1 How often do you feed your child? .....

(1) Once (2) Twice (3) Thrice (4) More

Which of these do you normally give your child?

Breakfast....., Lunch....., Supper.....

3.2 Why do you feed your child this way?

(1) Affordable (2) Available (3) Nutritional value (4) time  
(5) other (specify).....

3.2 Do you eat the same food with your child? (1) often (2) usually (3) sometimes  
(4) rarely/never

Why? .....

3.3 What do you know about child feeding?  
.....

3.4 Do you feed your child home cooked meals? (1) Yes

(2) No

Why.....

3.4 b. If no, how do you obtain food to feed your child?  
.....

3.5 Why do you feed such foods to your child? (1) Affordable (2) Available (3)

Nutritional value (4) other (specify).....

**NUTRITIONAL STATUS-ANTHROPOMETRIC DATA**

AGE OF CHILD (months):

Gender:

<b>MEASUREMENT</b>	<b>FIRST READING</b>	<b>SECOND READING</b>	<b>MEAN</b>
Height(CM)			
Weight(KG)			
MUAC(CM)			

50. Weight-for-age .....

51. Weight-for-height .....

52. Height-for-age .....



## APPENDIX II

### Food Frequency Questionnaire (Adapted from WHO, 2010)

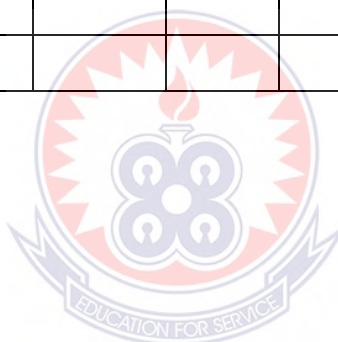
Thank you for agreeing to take part in this study. Can you please answer the following questions?

**How often does your child usually eat the following foods? (Please tick one)**

<b>Food/dish</b>	<b>Once a day</b>	<b>More than once a day</b>	<b>5-6x a week</b>	<b>3-4x a week</b>	<b>1-2x a week</b>	<b>1-2x a month</b>	<b>Rarely</b>	<b>Never</b>
<b>Beverages</b>								
Tea								
Cocoa eg milo								
<b>Porridges</b>								
Corn porridge								
Millet porridge/ fula								
Rice porridge								
Tombrown								
<b>Milk and milk products</b>								
Evaporated								
Brukina								
Cheese/wagashie								
<b>Spreads</b>								
Margarine								
Peanut butter								
<b>Bread</b>								
Wholemeal								
White bread								
<b>Deep fried foods</b>								



Fried yams								
Fried plantain								
Beans cake(akara)								
<b>Oils</b>								
Palm oil								
White oil e.g. frytol								
<b>Fish and seafood</b>								
Fish								
Sea foods								
<b>Vegetables</b>								
Garden egg								
Kontomire/ademe/a l efu/ayoyo								
Okro								



<b>Food/dish</b>	<b>Once a day</b>	<b>More than once a day</b>	<b>5-6x a week</b>	<b>3-4x a week</b>	<b>1-2x a week</b>	<b>1-2x a month</b>	<b>Rarely</b>	<b>Never</b>
<b>Meat and meat products</b>								
Meat (Beef, goat meat etc.)								
Poultry								
Offals								
Sausages								
Cow's skin (wale)								
Game (Bush meat)								
Eggs								
<b>Starches</b>								
Banku/TZ								
Kenkey								
Fufu								
Plantain								
Yam								
Gari								
Cocoyam								
Rice								
indomie, spaghetti,								
<b>Legumes</b>								
Black/red-eyed beans								
Baked beans								
Soy flour								
Bambara beans								
<b>Soups</b>								

Palm soup								
Ground-nut soup								
Light soup								
Okro soup								
<b>Stews</b>								
Kontomire stew (no agushie)								
Kontomire stew (plus agushie)								
garden egg stew								
Agushie stew								
Ghanaian gravy								



<b>Food/dish</b>	<b>Once a day</b>	<b>More than once a day</b>	<b>5-6x a week</b>	<b>3-4x a week</b>	<b>1-2x a week</b>	<b>1-2x a month</b>	<b>Rarely</b>	<b>Never</b>
<b>Fruits</b>								
Pawpaw								
Pineapple								
Mango								
Citrus fruits								
Banana								
Pear								
Melon								
Apples								
Avocado								
pear								
Grapes								
Guava								
Coconut								
Sugarcane								
<b>Soft drinks</b>								
Fanta, coke etc.								
Sobolo								
<b>Snacks</b>								
Pastries								
Plantain chips								
Biscuits								
Roasted groundnuts								
<b>Sweets</b>								
Toffees								

**Thank you for completing the questionnaire**