

UNIVERSITY OF CAPE COAST

FEEDING PRACTICES AND NUTRITIONAL STATUS OF CHILDREN IN
AMPAIN REFUGEE CAMP, GHANA

SOPHIA KOMASI

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AMPAIN REFUGEE CAMP, GHANA

BY

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Thesis submitted to the Department of Vocational and Technical Education of
the Faculty of Science and Technology Education, College of Education
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the award of Master of Philosophy degree in Home Economics

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DECLARATION

Candidate's Declaration

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

Candidate's Signature: Date:

Name: Sophia Komasi

Supervisors' Declaration

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

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ABSTRACT

Children under five years are known to be more vulnerable and susceptible to nutritional deficiencies and malnutrition worldwide than any other group of people. Child malnutrition especially is responsible for over a million direct and indirect causes of death worldwide. The effects are even higher in developing countries. It was against this backdrop that the purpose of this study found out the feeding practices and nutritional status of children in Ampain refugee camp in Ghana. A cross-sectional survey was adopted for the study. One hundred and fifty children between 6 - 59 months and their mothers were census sampled. A self-developed questionnaire was used to collect data. Ethical clearance was sought prior to data collection. Quantitative data were analysed using descriptive (means, standard deviations, frequencies and percentages) and inferential statistics (ANOVA, Independent T test and Chi square). Feeding practices of the children were not optimal which may account for malnutrition among children in the camp. Age group of child, sex of household head and income level of the caregivers were significantly different at $P > 0.05$. Majority (98.7%) of the children showed some degree of severity of food insecurity with only few (1.3%) being food secure. Specific educational programmes about adequate nutrition, breast feeding and weaning were recommended.

KEY WORDS

Diet Diversity

Feeding practices

Food Security

Malnutrition

Nutritional status

Refugee Camp

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DEDICATION

To my Parents and Siblings:

Mr. and Mrs. Komasi, Sylvia, Stella, Senyo and Nayram.

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LIST OF ACRONYMS

BMI	-	Body Mass Index (kg/m ²)
GAM	-	Global Acute Malnutrition
HAZ	-	Height – for Age Z score
SD	-	Standard Deviation
SAM	-	Severe Acute Malnutrition
UNHCR	-	United Nations High Commissioner for Refugees
UNICEF	-	United Nations Children’s Fund
WAZ	-	Weight – for – Age Z score
WFP	-	World Food Programme
WHO	-	World Health Organization
WHZ	-	Weight – for – Height Z score

CHAPTER ONE

INTRODUCTION

Background to the Study

Nutrition is fundamental to human life, health and development across the entire life span. From the earliest stages of foetal development, at birth, through infancy, childhood, adolescence, and on into adulthood and old age, proper food and good nutrition are essential for survival, physical growth, mental development, performance and productivity, health and well-being. It is also an essential foundation of human and national development (WHO, 2000).

Hunger and malnutrition remain part of the most devastating problems facing majority of the world's poor and needy, and continue to dominate the health of people in these nations. Nearly 30% of humanity (infants, children, adolescents, adults and older persons) in the developing world is currently suffering from one or more of the multiple forms of malnutrition. Forty-nine percent of the 10.7 million deaths among children under age five each year in the developing world are associated with malnutrition (WHO, 2000.)

The tragic consequences of malnutrition include death, disability, stunted mental and physical growth and thus, retarded national socioeconomic development. Malnutrition makes a child susceptible to infections and delays recovery, thus increasing mortality and morbidity (Chatterjee & Saha, 2008).

The World Health Organization estimates that globally, malnutrition contributes to one out of two deaths in children under the age of five indicating stagnating infant and under-five mortality rates (Save the Children, 2016). According to FAO (2009), in Ghana, infant mortality rate stands at

71%, Children under-five mortality rate 111%, prevalence of stunting is 22% while wasting and undernutrition are at 5% and 18%, respectively. Low access to health services and to safe water and sanitation, high incidence of malaria and malnutrition as an underlying factor are among the main causes of mortality, thus making refugees more at risk. Over the last decade, prevalence of undernourishment has decreased considerably. However, food insecurity persists, mainly due to unstable production, insufficient purchasing power and problems of physical access due to lack of road infrastructure (FAO, 2009).

Breastfeeding is a common practice and with the efficient promotion programmes, early initiation of breastfeeding is becoming more widely practiced. However, only half of children under 6 months are exclusively breastfed and complementary feeding practices are often inadequate. These feeding practices combined with food insecurity of households and low access to health services are among the main causes of malnutrition among young children (FAO, 2009).

Malnutrition is a serious medical condition characterized by a deficiency of energy, essential proteins, fats, vitamins, and minerals in a diet. Over 10 million children aged less than five years (under-five children) die annually from preventable and treatable illnesses, almost all these deaths occur in poor countries (Black, Morris & Bryce, 2003). Currently, 195 million under-five children are affected by malnutrition; 90% of them live in sub-Saharan Africa and South Asia. (Black *et al.*, 2008). At least 20 million children suffer from severe acute malnutrition (SAM), and another 175 million are undernourished (Black *et al.*, 2008). Malnutrition is the most recognizable

and perhaps most common consequence of poverty in children (Goel, Mishra, Gaur & Das, 2007).

Anthropometry is an essential component of child health supervision and the epidemiological assessment of the nutritional status of a defined population of children. Therefore, use of anthropometrical charts in public health clinics, supplemental feeding programmes, community health and nutrition surveys and in physicians' offices can assist in identification of individuals with growth or nutritional abnormalities.

Stunting reflects failure to reach linear growth potential due to sub-optimal health and/or nutritional conditions while underweight reveals low body mass relative to chronological age, which is influenced by both, a child's height and weight. Stunting is an indicator of chronic undernutrition, the accumulative result of growth failure and a marker of chronic inadequate protein and energy intake, frequent infection, sustained inappropriate feeding practices, and impaired brain development (Black et al., 2013; UNICEF, 2013).

Underweight, thus, cannot distinguish between a child that is small/low in weight relative to his/her height and a child that is short in height relative to his/her age, but who may be normal in weight-for-height. On the other hand, wasting (WS) is an indicator of acute undernutrition, the result of more recent food deprivation or illness; Underweight is used as a composite indicator to reflect both acute and chronic undernutrition, although it cannot distinguish between them (WHO 1995). Nearly a quarter of preschool children are stunted, that is, affected by chronic malnutrition (FAO, 2009).

Over the past decade, three national surveys have been conducted in Ghana to assess the nutritional status of preschool children. They are the Ghana Demographic and Health Surveys of 1998 and 2003, and the Multiple Indicator Cluster Survey (MICS3) of 2006 (Ghana Statistical Service, 2007). In 2006, the prevalence of stunting among children under five years was 22%, the prevalence of wasting was 5% and that of underweight was estimated at 18% (Ghana Statistical Service, 2007). Based on these prevalence rates, the severity of malnutrition in Ghana is defined as “medium” according to WHO criteria.

Table 1: Thresholds for classifying the status of nutrition in a population by WHO.

Index	Normal/Low	Poor/ Medium	Serious/ High	Critical/Very High
Wasting	<5%	5-9.9%	10- 14.9%	≥15%
Stunting	<20%	20- 29.9%	30-39.9%	≥40%
Underweight	<10%	10- 19.9%	20- 29.9%	≥30%

Source: WHO (1995)

Stunting also indicates chronic malnutrition, meaning long-term or accumulated nutritional deficiency resulting from lack of adequate dietary intake over a long period and/or recurrent illnesses. At national level in 2006, nearly a quarter of preschool children were stunted and 7% were severely stunted. There were no differences in prevalence by gender (Ghana Statistical Service, 2007). The prevalence of stunting increased sharply with age. Among infants aged 0-6 months 5% were stunted, probably because of intrauterine growth retardation and/or prematurity (Ghana Statistical Service, 2007). After the first year of life, the prevalence of stunting increased considerably to reach 28% among children aged 24-35 months and remained

high after the age of three years (Ghana Statistical Service, 2007). Deterioration of the nutritional status after the age of 6 months can be related to inappropriate complementary feeding practices, combined with cumulative effects of recurrent illnesses and inadequate health care.

In Ghana, although the nutritional status of preschool children has improved, malnutrition generally persists. Many factors still have negative impacts on the nutritional status of young children, among which are inadequate infant feeding practices, high morbidity and poor access to health care services. Although declining, poverty still affects a large proportion of the population and food insecurity persists. These factors are among the main causes of malnutrition among young Ghanaian children. (FAO, 2009).

Food security is defined as “A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, 2009). Food insecurity may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity may be chronic, seasonal or transitory.

In several countries, particularly in West Africa, food insecurity remains a major concern because of chronic vulnerability despite good crop production in 2015. In Ghana, 5.058 million people, representing 19.2% of the total population, are food insecure (Nkunzimana *et al.*, 2016). Other surrounding countries like Burkina Faso with 1.765 million people, representing 9.3% of the total population, Côte d'Ivoire with 2.241 million people, signifying 9.6% of the total population, and lastly Togo with 1.206

million people making 16.0% of the total population are all food insecure with the dominant risk factor being socio-economic (Nkunzimana *et al.*, 2016).

Food security in Ghana continues to be threatened by high food prices and inflation, low household income, persistent high levels of unemployment and the additional negative effects of variations in domestic production (FAO, 2003). The rapidly growing population poses another dimension to the question of food security in the country (FAO, 2009).

Food insecurity also represents a major global public health issue that has gained attention in most nations. Food and nutrition insecurity occurs when there is insufficient access to nutritious food to meet dietary needs and food preferences and lack of environmental support for a healthy and active life (FAO, 2009).

Among immigrants, asylum seekers and resettled refugees, the contributing factors to high prevalence of food insecurity are poverty, unemployment, low income and low education (Gallegos, Ellies & Wright, 2008; Hadley, Zodhiates & Sellen, 2007).

A study conducted by Gichunge, Harris, Tubei, Somerset and Lee (2015) reveals that refugees with low education and no social support were 5 and 4 times more likely to be food insecure, respectively. Food insecure households have been found to have poor diet quality as food insecurity is linked to unhealthy diets (Kirkpatrick & Tarasuk, 2008).

By definition, a refugee is any person who owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his/her nationality and is unable, or owing to such fear, is unwilling to avail

himself/herself of the protection of that country; or who, not having a nationality and being outside the country of his/her former habitual residence, is unable, or owing to such fear, is unwilling to return to it. (The 1951 UN Convention and its Protocol of 1967 as cited in Kadogbe, 2013).

Presently, there are about 21,331 refugees and asylum seekers in Ghana of which 9769 are Ivoirians. Over 19000 Persons of Concern from about 22 countries live in Ampain, Krisan, Fetentaa and Edjeikrom Refugee Camps in Ghana. (Ghana Refugee Board, 2016).

Statement of the Problem

The term ‘refugee’ connotes dejection and hopelessness especially for the vulnerable groups such as children, women, the chronically ill and the physically challenged. The plights of refugees are often worsened by the fragile economies of host countries particularly in Africa, rise in numbers of refugees globally and the decline in donor support for humanitarian assistance (Yorke, 2013).

After being dislodged from their homes and lands by conflict or fear of persecution, refugees are forced to leave behind their livelihoods and productive assets. Once they arrive in the country of refuge, their movement is often restricted, access to land limited and economic capital exhausted. Refugees rely mainly on the assistance provided by the host community, sovereign government and international community. United Nation High Commissioner for Refugees (UNHCR) is the main UN body responsible for refugees; but works closely with other UN agencies such as World Food Programme (WFP), World Health Organization (WHO), United Nations Development Fund (UNDP) and United Nations Children’s Fund (UNICEF).

Without the means to be productive, right to work, ability to earn an income, limited access to livelihoods opportunities or productive means such as arable land and market-oriented activities, refugees remain dependent on food assistance. Without adequate food assistance, these refugees are particularly vulnerable and may resort to negative coping strategies. Thus, the likelihood of them entering a vicious cycle of poverty, food insecurity, deterioration of nutritional status, increased risk of disease is high.

Due to funding shortages and insecurity, food assistance by WFP in Africa has been cut in many refugee sites in 2014, the majority already experiencing high rates of malnutrition. As of June 2014, food ration cuts were reported in 52 (25.9%) of 201 sites in 9 (40.9%) of 22 countries affecting 787,727 (32.8%) of 2,398,177 refugees. Food ration cuts of >50 % of the initial ration was reported at 27 (13.4%) sites in 3 (13.6%) countries affecting 449,516 (18.7%) refugees (UNHCR & WFP, 2014).

Even the smallest unforeseen reduction in the food ration or break in the food assistance pipeline can have long term negative impacts on a refugee population's nutrition situation and capacity to cope. The resilience of refugees to food related shocks is already weakened by displacement, whilst the availability of alternative food sources is often limited or not affordable to refugee populations since there are not many ways that refugees can earn income in the camps, they rely almost entirely on the food WFP provides and this "food basket" does not change much from month to month. As a result, refugees' diets typically lack diversity and this undermines nutrition, especially for pregnant and nursing mothers, and young children, whose

bodies need more nutrients for proper growth and development. (UNHCR & WFP, 2014)

Studies have been conducted on refugees in some refugee camps in Ghana. For example, right to food by refugees by Kadogbe (2013), adaptation of refugee to local foods of host countries by Awuku (2013) and evaluation of the united nations assistance to the ivorian child refugees by Yorke (2013). Although, there have been some studies on refugees in Ghana, little information is known about the feeding practices and nutritional status of children in Ghanaian refugee camps. This study thus looked at the feeding practices and nutritional status of children in Ampain refugee camp in Ghana.

Purpose of the Study

This study sought to find out the feeding practices and nutritional status of children in Ampain refugee camp in Ghana.

Specifically, the objectives of the study were to:

1. investigate the feeding practices of children between 6 – 59 months in Ampain refugee camp.
2. assess the nutritional status of the children in the camp.
3. determine the food security status of the children in the camp.

Research Questions and Hypotheses

Research Questions

The study was guided by the following research questions:

1. What are the feeding practices of children between 6 – 59 months in Ampain refugee camp?
2. What are the nutritional status of children in the camp?
3. What are the food security status of the children in the camp?

Hypotheses

1. H_0 : There is no statistically significant difference between sex of child and nutritional status of children under the age of five.

H_1 : There is a statistically significant difference between sex of child and nutritional status of children under the age of five.

2. H_0 : There is no statistically significant difference among the various age groups and nutritional status of children under the age of five.

H_1 : There is a statistically significant difference among the various age groups and nutritional status of children under the age of five.

3. H_0 : There are no statistically significant differences in the nutritional status of children in the camp in relation to selected demographic and socio-economic variables.

H_1 : There are statistically significant differences in the nutritional status of children in the camp in relation to selected demographic and socio-economic variables.

4. H_0 : There is no statistically significant association between nutritional status and some selected variables in the camp.

H_1 : There is statistically significant association between nutritional status and some selected variables in the camp.

Significance of the Study

The findings of this study will hopefully help the government of Ghana and organizations and partners like United Nations High Commissioner for Refugees (UNHCR), Ghana Refugee Board (GRB) and World Food Programme (WFP) to come up with policies and interventions that will support the wellbeing and nutrition of refugees.

Also, findings from this study could help build on monitoring initiatives by UNHCR, UNICEF and WFP to outline and track the current nutritional status of children in refugee camps. This would help in the identification of areas where gaps still exist and determine how these can be bridged to allow for improvements in nutrition of refugees in refugee camps.

This study when published will hopefully create awareness and provide knowledge on the nutritional state and management of refugees in Ghana to the general public. According to the Ghana Refugee Board (2016), Public knowledge on refugee issues is either lacking or poor, often resulting in Persons of Concern being denied services which ordinarily should be granted to them.

Finally, this study will provide information for researchers who want to research further into nutritional issues of refugees or would want to replicate the study elsewhere.

Delimitations

There are currently four refugee camps in Ghana namely Ampain, Egyeikrom, Fetentaa and Krisan camps but this study was conducted at Ampain camp. Also, there are people across the various life stages that are affected by malnutrition but this study focused on only children under five years as this group is the most vulnerable and represents a critical developmental period during which malnutrition might have long-term consequences.

The generalization of the findings will be limited to the sample of the study due to the non-probability sampling (purposive) technique that was used.

Finally, a complete assessment of nutrition should include an analysis of other nutrition indicators such as biochemical markers or clinical variables, and target other vulnerable groups such as women of reproductive age. However, to provide a rapid assessment and snapshot of the children, the study only focused on the anthropometric indicators of nutritional status, food security and feeding practices.

Limitations

The study was limited to children aged 6-59 months and caregivers in Ampain refugee camp of Ghana hence the study cannot be generalized to all the children and caregivers in other refugee camps in Ghana.

Another limitation was that, data was collected and analysed quantitatively, and thus, was not so helpful in gaining insight into the way caregivers really observed the recommended feeding practices.

Language barrier was also a limitation to this study as most of the caregivers only spoke and understood French and not English. The questionnaires therefore had to be translated into French before they were administered.

Definition of Terms

Anthropometry is the measurement of body parameters to indicate nutritional status. It is the easiest way to measure nutritional status.

Care-giver is a person who cares for a child, and provides for the daily needs of the child.

Food security is a situation that exists when all people, always, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Nutritional Status is the condition of health of a child that is influenced by the intake and use of nutrients.

Stunting Moderate and severe Height- for- Age below minus two standard deviations (-2SD) from Median Height- for- Age of the reference population.

Underweight Moderate and severe Weight- for- Age below minus two standard deviations (-2SD) from Median Weight- for-Age of the reference population.

Wasting Moderate and severe Weight- for- Height below minus two standard deviations (-2SD) from the median Weight- for- Height of the reference population.

Z-score Standard deviation units from the median reference population

Organization of the study

This study is divided into five chapters with the first chapter consisting of the background to the study, statement of the problem, purpose of the study, research objectives/hypotheses, significance of the study, delimitations of the study, limitations of the study, definition of terms, acronyms and organization of the study. The second part of the study discusses malnutrition, feeding practices and assessment of nutritional status, theoretical framework, conceptual framework and review of empirical literatures on study variables. The third chapter of the study discusses the methodological aspect of the research which includes the research design, population, sampling techniques, data collection method, instruments used to collect data and method of analysis of collected data. The fourth chapter presents the results of the study and discussions, based on the study questions and hypothesis. The fifth

chapter provides a summary, conclusion, recommendations and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter covers the review of relevant literature related to the feeding practices and nutritional status of children. It begins with the discussion of various concepts such as state of child malnutrition, malnutrition in Sub Saharan Africa, malnutrition in Ghana, malnutrition in refugee camps, consequences of child undernutrition, essential nutrients needed during childhood, determinants of child nutritional status, indicators for assessing nutritional status in children, food security and child undernutrition.

Similarly, some empirical studies were examined to review the works done by others which are related to or have bearing on this study. This allows for comparison to be made between the findings that would emerge from this study and the earlier findings from previous studies. A conceptual framework was also constructed by the researcher to show the interplay of various variables that determine child nutritional status. The chapter finally presents a summary of the related conceptual and empirical literature reviewed.

The State of Child Malnutrition

The United Nations Children's Fund (UNICEF) has coined malnutrition, which occurs in various forms like wasting, stunting and underweight as the “silent emergency” which endangers the lives of women and children all over the world. (Chakraborty, 2011). UNICEF/ WHO/ World Bank, (2017) notes that there were about 155 million stunted and 52 million wasted children under age 5.

According to Save the Children (2016), malnutrition in developing countries is often referred to as under nutrition in its acute or chronic form. In emergencies, the main focus is on acute malnutrition. Malnutrition continues to pose serious problems in many developing countries especially within Africa. It is estimated that, 59 million children under five are stunted with 14 million wasted in sub-Saharan Africa whereas in West Africa 19.2 million and 5.2 million children under age five are stunted and wasted respectively (UNICEF/ WHO/ World Bank, 2017).

Between 2005 and 2007, 830 million people in developing countries, many of them children, were estimated by WHO to be undernourished and with the recent economic crisis, the rate may exceed 1 billion in subsequent years. Young children are particularly vulnerable, thus one in four children under the age of 5 is underweight, that is, 146 million children in developing countries. Childhood undernutrition increases mortality rates and that it has been estimated that 60% of death during childhood in developing countries are associated with malnutrition (Mann & Truswell, 2012).

Malnutrition stunts physical growth, increases the risk of infections (gastroenteritis, pneumonia, tuberculosis) and of serious obstetric complications. Malnourished children are less able to benefit from education; hence there is lower economic productivity, and slowed socioeconomic development (Mann & Truswell, 2012).

In developing countries, nearly 23.0% of children < 5 years were identified to be moderately or severely underweight, while 28.0% were stunted, from the year 2000-2007 (Benoist, McLean, Egli, & Cogswell, 2008). The worst afflicted areas of under nutrition during that period were South

Asian countries where the prevalence of underweight (15.0%) and stunting (46.0%) surpassed those observed in other developing countries (United Nations Children's Fund, 2008). Similarly, it has been estimated that nearly 47% of preschool children worldwide are afflicted with anaemia, with the highest prevalence (67%) in Africa. (Benoist et al., 2008).

United Nations Children's Fund (2008), identifies under nutrition to be one of the main causes of child mortality worldwide, ascribing to at least 55.0% of all child deaths. A study conducted by Caulfield, de Onis, Blössner, & Black (2004) looking at 10 cohorts from developing countries reports a significant increase in risk (RR: 4.24; 95% CI: 3.13- 5.53) of overall child mortality associated with underweight (weight-for-age: -2.0 to -3.0 SDs).

Malnutrition mostly affects children under the age of 5 years, especially during the first two years of life (Save the Children, 2016). Availability and access to food (food security), feeding habit, and the health status of a child are the main underlying factors for malnutrition. Malnutrition and illness form a vicious cycle where a malnourished child is at a higher risk of infection and the illness contributes to malnutrition. It weakens the immune system, thus increasing the risk of dying from pneumonia, diarrhoea, malaria, and other infectious disease. Globally, the World Health Organization estimates that malnutrition contributes to one out of two deaths in children under the age of five. (Save the Children, 2016).

An acutely malnourished child (wasting/weight-for-height) is 20 times at higher risk of dying than a well-nourished child. Even though in emergencies it is the most important malnutrition, acute malnutrition can be treated (Save the Children, 2016).

Malnutrition in Sub Saharan Africa

Malnutrition continues to be a serious public health problem for young children in Sub-Saharan Africa. The region currently has the second highest rate of stunting among children with 34.1%, closely following southern Asia which has the highest rate of 35.8%, and these rates have shown little improvement over the past years (UNICEF/WHO/World Bank, 2017). UNICEF/WHO/World Bank (2017), again revealed Sub Saharan Africa to be the only region with an increase in the number of stunted children from 50.1 million to 56.8 million within the past sixteen years (2000-2016). Additionally, stunting has declined twice as quickly in Asia and Latin America and the Caribbean as it has in Africa in those past years. The situation is not any better in western Africa, where half of the increase in stunting rates of Africa could be traced to.

The environmental and economic conditions in Sub-Saharan Africa place extra burden on the nutritional status of children, coupled with sub-optimal feeding practices which account for higher rates of malnutrition. Only 30% of children less than 6 months of age in Sub-Saharan Africa are exclusively breast-fed (UNICEF, 2005). Complementary foods are mainly watery cereal porridges of low energy and nutrient densities, and they are often prepared, served and stored under conditions that expose the child to frequent infections (Gibson, Ferguson & Lehrfeld, 1998).

Malnutrition in Ghana

There has not been much improvement in Ghana in terms of childhood malnutrition and mortality even with the remarkable gains in health infrastructure and investment since independence (Mensah, 2014). Previous

studies show a trend of increases in the malnutrition rate among children in Ghana. For instance, malnutrition rate among children under two years recorded 2.3% in 2003, 5.4% in 2004, and 7.5% in 2005 (Nti, & Lartey, 2007).

The 2014 Ghana Demographic and Health Survey (GDHS) report revealed the prevalence of stunting, underweight and wasting among children under five years in Ghana to be 19%, 11% and 5%, respectively (GSS, GHS, & ICF, 2015).

Stunting increased with age, peaking at 28% among children age 24-35 months. A slightly higher proportion of male (20%) than female (17%) children were stunted, and stunting was greater among children in rural areas (22%) than urban areas (15%). Wasting was also found to be highest among children age 6-11 months (10-11%) (GSS, *et al.*, 2015).

Malnutrition in Refugee Camps

The challenges of living in a refugee camp could predispose children to malnutrition and mortality. Studies conducted have shown the effects of living in such a situation. Sampling 529 children between the ages of 6-59 months in Kakuma refugee camp in Kenya, to assess their nutritional status, a survey revealed the rate of stunting, underweight and wasting to be 25.1%, 12.0% and 5.2%, respectively. The prevalence of acute malnutrition when measured by MUAC was 2.5%. Most infant and young child feeding practices were practiced at higher rates. 86.2% of mothers initiated breastfeeding within an hour of birth, 76.4% exclusively breastfed their children to 6 months of age and 89.6% of the children consumed iron rich foods. Continued breastfeeding at 1 and 2 years was, however, low at 61.7% and 54.3%, respectively. Also,

almost half of the children were not receiving complementary foods at the appropriate time (UNHCR/IRC/UCL, 2013).

Consequences of undernutrition

The human and economic costs of undernutrition are enormous, affecting most the very poor and women and children. In developing countries, nearly one-third of children are underweight or stunted (low height-for-age). Undernutrition contributes to over one-third child deaths and high susceptibility to infectious diseases due to lowered immunity caused by inadequate dietary intake, as well as delayed cognitive and motor development (Lutter, 2003).

Globally, undernutrition is more common when household income is low, and is associated, within households, with chronic food shortage, diets lacking in diversity, high rates of infectious diseases and inappropriate infant feeding and care due to lack of knowledge.

Those who experience undernutrition between conception and 24 months of age have a higher risk of lifelong physical and mental disability, and are often not able to make a full contribution to the social and economic development of their households, communities and nations.

Increased morbidity and mortality

Compared to children with adequate weight and height, undernourished children face a higher risk of death. Undernutrition weakens the immune system, making children more susceptible to diseases, and reducing their chances of surviving illnesses, such as diarrhoea, pneumonia and malaria. It is estimated that undernutrition contributes to more than a third of child deaths. Children who do survive, face a cycle of recurring illness and

growth faltering, irreversibly damaging their physical development and mental capacity (Save the Children, 2016).

Impaired cognitive development

The 1,000 days from the start of a woman's pregnancy until her child's second birthday are a critical time for brain growth. During this period, malnutrition affects the development of the brain, directly affecting cognitive development. It also has an indirect impact, affecting the ways children learn and their ability to interact and engage with the world (Save the Children, 2016). Impaired cognitive development, can affect the child's performance in school. Research shows that students who are undernourished are also more likely to drop out of school than those who experience healthy childhoods.

Malnutrition can also affect cognitive development by influencing children's experiences and the stimulation that they receive. For example, infants whose mothers suffer from severe anaemia show symptoms of lethargy that may affect their ability to explore their surroundings (Grantham-McGregor & Ani, 2001).

Children who are malnourished may also receive lower levels of stimulus because of poor health – for example, missing opportunities to learn through increased frequency of illness. Although undernutrition is often associated with refugee status, concerns are increasing about overweight/obesity among refugees resettling to developed countries. Overweight and obesity are frequently assumed to be associated with assimilation to a U.S. lifestyle (increased availability of high-calorie foods, reduced physical activity), compounded by lack of nutritional education. (UNHCR, 2012).

Assessment of Physical Growth

Physical growth refers to the acquisition of tissue and increase in body size. Development refers to the increased ability of the body to function physically and intellectually. A positive energy and nutrient balance is critical in achieving and maintaining normal growth and development. There is increasing evidence of the importance of growth and nutrition in relation to cognitive development (Ministry of Health, 2008).

Weight is a good indicator of acute changes in intakes, while height reflects long-term nutrition. Infants and toddlers are more vulnerable than adults to rapid changes in nutritional intake. Acute and chronic childhood illnesses impair appetite and may cause a reduction in food intake to the detriment of growth. Many chronic diseases, for example, kidney, heart and metabolic problems, can also retard growth (Ministry of Health, 2008).

Growth is best assessed by measuring weight, length (infants) or height (toddlers), and head circumference. Growth is considered normal when weight and length (or height) are on similar percentiles. It is important to note any difference between the weight and length (or height) percentiles. In cases of acute nutritional problems, the weight percentile is likely to be substantially lower than the length (or height) percentile. Where there are endocrine deficiencies or other long-term diseases, both weight and length (or height) will be substantially depressed. Investigation is appropriate when there are changes in a child's growth velocity or there is concern about the child's growth, health or development. In general, the more pronounced the change in the growth rate, the younger the child and/or the more extreme the change in percentile, the greater the concern (Ministry of Health, 2008).

Essential Nutrients Needed During Childhood

Energy

Energy converted from food is needed for growth, development, movement and metabolic functions such as breathing, heart contractions, digestion and keeping warm.

The young infant uses a significant amount of energy for growing and metabolism and relatively little for physical activity. In the first three months of life, about 35 percent of energy intake is used for growth. As the infant grows, these proportions in energy use change, and the energy used for growing falls to 5% by 12 months and less than 2% over the second year of life (NHMRC, 2006). Metabolic needs increase as the child grows, and the amount of energy used in physical movements increases substantially as the child learns to roll, crawl and walk.

The estimated energy requirements for infants and toddlers were calculated using the total energy expenditure and the additional need for growth of 730 kJ per day for infants up to three months of age, 230 kJ per day for infants from four to six months of age, 90 kJ per day for infants from seven to 12 months of age and 85 kJ per day for infants one to two years of age (NHMRC, 2006). Physical activity levels were not used in calculating the energy requirements of infants.

Carbohydrate

The main role of dietary carbohydrate is to provide energy to the body, particularly to the brain, which needs glucose to function (NHMRC, 2006). Carbohydrates can be classified as sugars, oligosaccharides and polysaccharides. The Adequate Intake (AI) for carbohydrate for infants from

birth to six months of age is 60 g per day and for infants aged seven to 12 months is 95 g per day. No AI has been set for toddlers aged one to two years (NHMRC, 2006).

Dietary Fibre

Dietary fibre is found in all plant material and the main sources of dietary fibre are cereals, legumes, vegetables and fruits. Dietary fibre is generally not digested by normal digestive processes but is partially or fully broken down/ fermented by bacteria in the large intestine. Dietary fibre is vital for proper gut function and regular bowel motions and may be related to reducing risk for several diseases, including heart disease, certain cancers and diabetes.

Infants and toddlers given large amounts of dietary fibre-containing foods may have their appetite satisfied before their energy requirements have been met. However, adverse effects from the over-consumption of dietary fibre appears unlikely in infant and young children unless their intake has been extreme (European Society for Paediatric Gastroenterology Hepatology and Nutrition Committee for Nutrition (ESPGHAN), 2003).

Infants who are fed exclusively on breast milk or infant formula do not receive any dietary fibre. Complementary foods are the first sources of fibre in the infant diet. Cereals, vegetables, fruit and legumes should be introduced in orderly manner. Foods rich in dietary fibre should be served up to once a day with only breast milk or infant formula, then with cows' milk (or suitable alternatives) after one year of age. Bran-based cereals should not be given to infants and toddlers because they are generally too high in dietary fibre.

Protein

Infants require protein as an essential part of their diet for growth. Protein is necessary to build and repair tissue, to synthesize hormones, enzymes and antibodies, and for many other bodily functions. The Recommended Dietary Intake (RDI) for toddlers aged one to two years is 14g (1.08g/kg bodyweight) per day (NHMRC, 2006). RDI is the average daily dietary intake level that is sufficient to meet the nutrient requirements of nearly all (97%–98%) healthy individuals in a life stage and gender group.

The only recommended source of protein for infants from birth to six months is breast milk and infant formula. This continues to be the main sources of protein until the infant is one year of age. Once an infant is six months of age, complementary foods like meat, fish, chicken, eggs, dairy products, legumes and nuts are introduced to the infant's diet, which provide some protein (Ministry of Health, 2008).

Sources of protein vary in their nutritional value, digestibility, efficiency of use and ratio of indispensable amino acids. Protein from animal sources such as meat, poultry, seafood, eggs, milk, and milk products tend to be of higher protein quality because they provide all nine indispensable amino acids. Proteins from plant-based sources may be limited in at least one indispensable amino acid. However, plant protein can meet requirements when a variety of plant foods is consumed and energy needs are met (American Dietetic Association, 2003).

Iron

More than 60% of iron in the body is found as the haemoglobin in the blood, another 25% is stored in the liver, 8% as myoglobin in muscles, 5% as

enzymes, and a small amount is in transit in the circulation (Mann and Truswell 2007). Haem iron and non-haem iron are the two types of iron obtained in a diet. Haem iron which is more bio-available than non-haem iron is obtained from meat, liver, kidney, poultry and fish is conservatively estimated to be 25% absorbed, and absorption is not significantly affected by other components of the diet. Non-haem iron from non-animal sources such as plant foods (vegetables, fruit and cereals), eggs, iron medication and iron fortificants in food is less bio-available, with absorption around 17% (Institute of Medicine, 2001).

The absorption of non-haem iron from foods is improved in the presence of beef, lamb, pork, chicken, liver and fish (Lynch, 1997). Non-haem iron absorption is also enhanced by the presence of vitamin C. Other promoters of non-haem iron absorption include citric acid, malic acid and tartaric acid, which are found in fruit.

Zinc

The essential functions of zinc include growth and neurobehavioral development, immune and sensory function, reproduction, antioxidant protection, and membrane stabilization (Institute of Medicine, 2001). Since protein synthesis depends on several essential zinc-containing enzymes, the effects of zinc deficiency include impaired growth (NHMRC, 2006).

The absorption of zinc from breast milk is high and enough for babies for the first six months (Mann and Truswell, 2007). If the infant is not breastfed, then they should be given an infant formula until they are one year of age. Once the infant is six months of age, complementary feeding with solid

foods from which zinc is easily absorbed should be encouraged, such as red meat, fish, chicken, liver, kidney or dark-green leafy vegetables.

Calcium

Calcium is required for the normal development and maintenance of the skeleton. It is present in the bones and teeth to provide structure and strength. Calcium is important for the development of bone, muscle contraction, the transmission of nerve impulses and blood clotting. It is also an activator for several enzymes.

Breast milk is the optimal source of calcium during the first year of life. Milk and milk products are the main food sources of calcium and provide many other essential nutrients such as zinc, riboflavin and vitamin B12. Milk products such as cheese, yoghurt, custard and milk puddings are suitable foods to be introduced once the infant is around seven to eight months of age. The heat treatment or fermentation process that occurs to produce these foods denatures the protein, making them easier to digest. Once the toddler is in the second year of life, breast milk, cows' milk, milk products and alternative sources can provide calcium in the diet. Other sources include salmon, sardines, whole grains, egg yolk, legumes, nuts, green leafy vegetables

Vitamin A

Vitamin A is important for vision, reproduction, gene expression, embryonic development, growth, immune function, the integrity of the epithelium and bone remodeling. Vitamin A includes retinol (preformed vitamin A) from animal sources and pro-vitamin A carotenoids (precursors of retinol) in oils, vegetables and fruit. Infants and toddlers absorb beta-carotene

better if food is chopped, puréed and cooked with a small amount of fat (American Dietetic Association, 2003).

Children from 6 months up to 2 years should be given appropriate and nutritionally adequate complementary food in addition to breast milk. Vitamin A rich foods such as red palm oil, dark green leafy vegetable, carrots, orange fleshed sweet potatoes, yam, plantain, fish, liver, eggs, yellow, red and orange vegetables and fruit like mangoes, pawpaw, among many others, can be used for meals for children within this age group as well as older children. Children 6-59 months should receive an appropriate dose of Vitamin A capsules every 6 months.

Vitamin D

Babies who are exclusively breastfed for 6 months by mothers who have taken supplements and who have a good vitamin D status themselves are likely to get enough vitamin D during this period. Some infants may benefit from vitamin supplements from birth. Infants can also spend time safely outside in the sun. It is essential to ensure that they do not burn their skin, but short periods of safe sun exposure will help babies make vitamin D for themselves. Sources of vitamin D include herrings, pilchards, sardines, tuna, salmon & egg.

Determinants of Child Nutritional Status

1. Demographic and socioeconomic factors

Sex and age of child

Boys generally have greater biological vulnerability than girls to infections and most causes of infant death, which reduces their nutritional status, making male mortality higher for boys than for girls in the first year of

life. However, because of strong preference for sons in most countries, boys are usually provided with better nutrition, immunization and curative health care (United Nations Children's Fund, 1998; Zheng, 2015).

Again, parents of sons are more likely to discontinue childbearing or postpone the next birth while parents of a daughter are more likely to have the next birth after a small interval thereby limiting the care given to the older child which can lead to poor nutritional status (Zheng, 2015).

In emergencies or crisis situations, where food is in short supply, females tend to be more undernourished than males because women and girls are more likely to reduce their food intake as a coping strategy in favour of their male counterparts (IASC, 2006).

Other studies tend to report the reverse of this situation. Fuse (2010) for example, argued that daughter preference is slightly higher than son preference in Ghana and as such girls usually receive better treatments than boys.

Frempong and Annim (2017), analysed data obtained from the fourth round of the Ghana Multiple Indicator Cluster Survey (MICS4) collected in 2011. This cross-sectional survey sought to provide current information on the health, social and economic circumstances of women, children and other household members. Out of the 7550 children under the age of five sampled, approximately 25 percent of male children are stunted as compared to 20 percent of females. Similarly, 7.6 percent and 15.6 percent of male children are wasted and considered underweight, respectively, whilst 5.2 and 11 percent of female children are wasted and underweight. In all cases, the incidence of malnutrition tends to be higher among male children than female

children the situation was attributed to differences in biological composition and caregiving and possibly due to daughter preference.

In a study to determine undernutrition (as determined by mid-upper arm circumference) among children and its association with selected socio-demographic factors and feeding practices, Suri and Kumar (2015), sampled 750 children aged 1-5 years from 15 villages using multi-stage random sampling technique. Nutritional status was found to be significantly associated with age of the child ($P = 0.029$) and the prevalence of under-nutrition was found to decrease with advancing age. Gender of child, however, was not significantly associated with undernutrition. In relation to feeding practices, exclusive breastfeeding for 6 months was found to be significantly associated with child's nutritional status ($P = 0.048$). The duration of breastfeeding was found to have no significant association with prevalence of under-nutrition. The age at which weaning was initiated, was also found to have a significant association ($P = 0.006$) with the nutritional status of children.

Marital status

Marital status influences the quality of care given to the child because both the parents are able to contribute to the care of the child by providing the basic needs, psychological support and general welfare of the child (PAHO, 2003)

Family size

Family size or the number of people in a household has an impact on the nutritional status of children. Annim, Awusabo-Asare, Amo-Adjei (2013), argued that as the number of children in a household increase, children may have to compete for both household resources and caregiving. This may cause

each child to receive sub-optimal care and resources to achieve the desired nutritional status. Another study also found that children in the monogynous households have better nutritional status than their counterparts in the polygynous households (Gillett-Netting, & Perry, 2005).

Educational level of women

Several studies found that the mother's education level is associated with more efficient management of limited household resources, more utilization of available health care services, enhanced health promoting behaviors, lower fertility and greater child centered caring practices, all of which are associated with better child health and nutrition (Frempong & Annim, 2017; Smith & Haddad, 2000). Educational level of mothers often increases their nutritional knowledge. Poor nutritional knowledge may influence caregivers to make improper choices selecting food for children to eat at home.

In a study, having attended junior high school was the only education category found to be significantly associated with underweight and wasting. This may be because most mothers who only completed primary school or less were unemployed and therefore able stay home and care for their children, whereas mothers who had completed junior high school were more likely to be employed.

The results, however, do suggest that the mother's level of education played a significant role in reducing the prevalence of underweight and wasting.

Sex of household head

IASC (2006), noted that, in crisis situations women remain the main caregivers of children and other dependents within a household. They as household heads, take on additional activities to support household food security. This often leads to disruption in infant and young child feeding practices and reduced caring capacities.

Occupation and income level

Employment status and income earned by members of the household affect the nutritional status of children. Several studies indicate that maternal education and employment/ socio-economic status were important predictors of the overall nutritional status of children (Chakraborty, 2011; Das & Hossain, 2008; Mensah, 2014).

Economic changes also affect infant feeding. For example, the increasing demand for African women to work outside the home has been shown to decrease the duration of exclusive breastfeeding and to advance the early introduction of complementary foods (Woldegebriel, 2000). In a cross-sectional study involving 100 randomly selected mothers of children between 6 to 24 months in Dar-es-Salaam, Tanzania, Kulwa, Kinabo, and Modest (2006), found the prevalence of stunting to be higher in children whose mothers worked full-time than in those whose mothers did not work full-time. No significant association, however, was found between children's nutritional status and mothers' employment status (Kulwa *et al.*, 2006).

As women's roles in society change, one can conclude that so does their role in the household and their role in parenting, which likely can affect their infant feeding beliefs and practices (Schwartz *et al.*, 2002).

2. Feeding practices

One key determinant of nutritional status of infants and children is feeding practices. Appropriate feeding practices are therefore essential for the nutrition, growth, development and survival of infants and young children, (Kumar, Goel, Mittal & Misra, 2007). These along with access to food, adequate sanitation, health care and other childcare practices can help determine who thrives and who falters.

Early initiation of breastfeeding

Breastfeeding remains the simplest, healthiest and least expensive feeding method that fulfils the infants' nutrition needs (Oche, Umar & Ahmed, 2011).

According to WHO (2010), babies are to be placed in skin-to-skin contact with their mothers immediately following birth for at least an hour and encourages mothers to recognize when their babies are ready to breastfeed. Early initiation of breastfeeding facilitates eye-to-eye contact, physical closeness and emotional bonding, essential for optimal child growth and development. Moore, Anderson and Bergman (2009), found a positive effect on both the likelihood of exclusive breastfeeding (EBF) for one to four months of life, and the overall duration of breastfeeding, when mothers put the infant to the breast soon after birth.

A study in rural Ghana by Edmond *et al.* (2006) showed that early initiation within the first hours of birth could prevent 22% of neonatal deaths, and initiation within the first day, 16% of deaths, while a study in Nepal by Mullany *et al.* (2008), found that approximately 19.1% and 7.7% of all neo-

natal deaths could be avoided with universal initiation of breastfeeding within the first hour and first day of life, respectively

Exclusive breastfeeding

A child is usually solely dependent on breast milk in the first six months of life, and this single food provides all the nutrients and fluid a baby needs for growth and development if the maternal diet and stores are adequate (Butte, Lopez-Alarcon & Garza 2002; Lawrence & Lawrence 2005). The breast milk produced during the first few days after birth is called colostrum. Mature breast milk contains nutritional components like protein, fat, carbohydrate, vitamins, minerals and fluid, and non-nutritional components (antimicrobial factors, growth factors, cytokines, anti-inflammatory factors, digestive enzymes, hormones, transporters, and nucleotides) (Ministry of Health, 2008).

Guidelines concerning infant and child feeding practices have been issued by the World Health Organization (WHO) and other departments of health to encourage the promotion of exclusive breastfeeding for the first six months of life and initiation of complementary feeding (introduction of solid foods) thereafter (WHO & UNICEF, 2003). Continued breastfeeding till the child's second birthday was also promoted in the guidelines.

Breast milk, according to The Caroline Walker Trust (2011), is best to feed babies due to a number of reasons. Breast milk contains precisely the right amount of energy (calories) and nutrients for each baby in a form that is easy for a baby to digest and absorb and which will ensure a baby develops optimally. Breast milk contains the right amount of fluid; so extra drinks of water are not needed. Breast milk composition changes during a feed, during

the day and during the time the baby is breastfed. This means that the milk is always exactly right for each child and helps infants to learn to regulate their food intake.

There are many components of breast milk which are not reproducible anywhere else. Many of these constituents protect the infant from infection and boost the immune system. Babies who are breastfed have fewer gastrointestinal and respiratory problems and ear infections when they are babies. Other studies report that breastfed children may less likely develop allergies, type 1 and type 2 diabetes, heart diseases and obesity when they grow up (Couper, 2001; Mann & Truswell, 2012; Owen, Martin, Whincup, Smith & Cook, 2006)

More than 95% of children less than five years in Africa are currently breastfed but this is often inadequate because many people feed their infants with water and other liquids alongside the breast milk. As a result, the rate of exclusive breastfeeding is particularly low in West Africa (LINKAGES, 2002). Unlike exclusive breastfeeding, breastfeeding alone is generally not a problem in Ghana. This is evidenced by the fact that as high as 99% of children have ever been breastfed.

A study by Preko (2016) employing a descriptive design, sampled 355 breastfeeding mothers in the Tema Metropolis and assessed them on feeding practices of their infants and children 0-24 months. The study results revealed that most of the mothers (82.5%) were still breastfeeding and 36.6% of them practiced exclusive breastfeeding. Majority of mothers (63.4%) indicated to have started breast feeding within the first hour after delivery whereas 23.4.5% of them indicated they started within first 24 hours after delivery.

However, 24.2% of the mothers indicated to have offered their babies something before initiating breastfeeding whilst 75.8% of children's first feed was breastmilk.

Factors such as educational status, having attained a tertiary education, occupation and delivering through a caesarean section were found to be associated with the practice of exclusive breast feeding among the mothers.

Age of onset of complementary food

Complementary feeding is defined as the gradual introduction of solid food and fluids along with the usual milk feed (breast milk or infant formula) to an infant's diet (Ministry of Health, 2008), meaning breastfeeding continues and other foods are introduced to complement or add to the nutritional intake provided by breast milk or infant formula.

According to Mann and Truswell (2012), complementary foods must be introduced when exclusive breastfeeding no longer meets a growing infant's energy and nutrient needs. They suggest that breast milk be given exclusively to babies exclusively for the first 6 months after which complementary food should be introduced.

Studies have shown that introduction of complementary foods before 6 months or later than 6 months has more risks than benefits (Dell & To, 2001; Gdalevich, Minoumi & Minoumi, 2001; Kemp & Kakakios, 2004). The risks associated with too early introduction of complementary foods include infant malnutrition due to a decrease in maternal milk production or inadequate complementary foods, diarrhoea, dehydration, development of food allergies, childhood asthma eczema and increased vulnerability of the gut to infection (Dell & To, 2001; Gdalevich *et al.*, 2001; Kemp & Kakakios, 2004).

Chakraborty (2011) also notes that early introduction of complementary feeding that is before the age of 6 months, is significantly associated with poorer growth patterns among infants. A longitudinal study of 4 cohorts of infants in Vietnam examined this association and reports growth faltering in infants receiving early complementary feeding compared to exclusive breastfeeding at 3 months (Hop *et al.*, 2000). Not only were weight and length gain delayed among infants who were partially breast-fed or weaned compared to exclusive breastfed infants at 1 to 3 months of age, a similar trend was also observed among infants aged 3 to 6 months, thereby confirming the negative consequences of early weaning. Additionally, morbidity from diarrhoea and acute respiratory infections was significantly lower in infants who were exclusively breastfed compared to their weaned counterparts (Hop *et al.*, 2000).

On the other hand, late introduction of complementary foods puts the child at risk of having faltering growth, micronutrient deficiencies (iron deficiency), allergies (gluten from wheat) and others. (Faldella, Corvaglia, Lanari & Salvioli, 2003; Poole *et al.*, 2006; WHO, 2001).

In developing countries, adherence to the global guidelines on infant and child feeding practices is limited. A longitudinal study of newborns in Malawi, Africa, highlights this notion (Vaahtera *et al.*, 2001). Although universal breastfeeding was practiced for 18 months, rates of exclusive breastfeeding were only 19.0%, 8.0%, 2.0% and 0.0% at ages 1, 2, 3 and 4 months, respectively. Moreover, the average age range of introduction of complementary foods varied from 2.5 to 6.3 months, indicating premature initiation of weaning (Vaahtera *et al.*, 2001).

Mann & Truswell (2012) are, however, of the view that individual infants may have unique need or feeding behaviour that may require the introduction of complementary foods as early as 4 months of age.

Diet diversity

According to FAO (2011), dietary diversity reflects the nutrient quality of an individual's diet. Minimum dietary diversity is the proportion of children who ate at least four or more varieties of foods from the seven food groups in a 24-hour time period. A dietary diversity score is usually created by adding the different types of food groups reported to have been eaten. The dietary diversity therefore score ranges from 0 (no group) to the maximum number of food a child has eaten. If a child is reported to have eaten four or more food types, it means the child has met the WHO minimum dietary indicator.

Minimum meal frequency is the proportion of children who received complementary foods the minimum number of times recommended by the WHO in the previous 24 hours. For breastfed children, the frequency should be at least twice for those aged 6-8 months, and at least three times for those aged 9-23 months. For non-breastfed children, it should be at least four times in 24 hours (WHO, 2007; WHO, 2010). Toddlers and growing children require variety of nutritious foods from each of these four major food groups;

Table 2: Food Groups Needed by Children and Toddlers

Food group	Examples	Nutrients provided
Vegetables and fruits	<p>Vegetables Carrot, Tomato, green beans, spinach, zucchini, cabbage, cauliflower, peas, taro leaves, green leafy vegetables.</p> <p>Fruits Pineapple, apple, orange, banana, pawpaw, mango, watermelon, avocado,</p>	<p>Energy Carbohydrates Dietary fibre Vitamins: Vitamin A (yellow and green vegetable) vitamin C (dark green leafy vegetables and most fruit, folate Minerals: magnesium, potassium</p>
Cereals and grains,	Bread, Cornflakes, infant cereal (iron-fortified baby rice), corn, millet, porridge, wheat biscuits, Plain rice, Pasta and noodles	<p>Energy Protein Carbohydrates Dietary fibre Vitamins: B group (except B12), vitamin E Minerals Magnesium, calcium, iron, zinc and selenium</p>
Milk and milk products (cheese, yoghurt and suitable alternatives)	Breast milk, Whole cows' milk,(should not be given before age 1) Yoghurt, Cheese, Plant-based milk (calcium and vitamin B12 fortified) (soy, rice), Soy yoghurt and cheese (calcium-fortified) Milk puddings (custard)	<p>Protein Fats Energy Vitamins: riboflavin, vitamin B12, vitamin A, vitamin D Minerals: calcium, phosphorus zinc and iodine.</p>
Lean meat, poultry, seafood, eggs, legumes, nuts and seeds	Minced beef or lamb, Chicken, Fish, shrimps, oysters, crabs, eggs, groundnuts, beans. Soy meat alternatives	<p>Protein Fats and oils Carbohydrates: Energy Vitamins: niacin, thiamin, B12 Minerals: iron, magnesium, copper, zinc, potassium, phosphorus and selenium Iodine: particularly in seafood and eggs</p>

Source: Ministry of Health, (2003).

Empirical Review of Literature Related to Diet Diversity

Sampling 250 children aged six to fifty-nine (6-59) months in Ekumfi Narkwa to identify factors leading to malnutrition, a research conducted

revealed the rate of stunting, wasting and underweight to be seventeen point six percent (17.6%), four point four percent (4.4%) and twelve percent (12%), respectively. The study also revealed that over 70% of the children consumed four food groups a day, implying that the children met the adequate dietary diversity minimum of four groups a day while less than one-third (23.6%) of the children were fed less than four food groups a day (Bandoh, 2015).

Ukegbu and Ogu (2017), in a descriptive cross-sectional survey involving 226 mothers and their under-five children in Imo state, Nigeria to assess dietary diversity score (DDS) of rural under-five children and the relationship with their nutritional status and socio-demographic characteristics of their mothers/caregivers, revealed the following: mean DDS for all food groups was 6.04 ± 4.18 . (DDS= representing the number of food groups, based on a scale of 12 groups) and the scores were divided into terciles low= ≤ 4 , medium=5 - 8, and high= 9 - 12). Cereals and vegetables had higher mean values (0.78 ± 0.29 and 0.78 ± 0.30 , respectively), while eggs had the least value (0.15 ± 0.25). The prevalence of low, medium and high DDS (in terciles) was 73.5%, 25.2% and 1.3%, respectively. DDS was significantly associated with HAZ ($\chi^2 = 10.63; p = 0.03$), while total family income remained significantly and positively associated with dietary diversity score ($p < 0.05$) in the linear regression model.

Importance of Assessing Children's Nutritional Status

According to Whitney and Rolfes (2016), nutrition assessment evaluates a person's health from a nutrition perspective. Determining a child's nutritional status is important because it helps define the child's health status. Proper nutrition levels are generally associated with better health status among

young children and later health when these children reach adolescence and adulthood.

Indicators for Assessing Nutritional Status in Children

1. Anthropometric Indicators

According to Olack *et al.* (2011), anthropometry is a vital component of child health supervision and the epidemiological assessment of the nutritional status of a defined population of children. Therefore, use of anthropometrical charts can assist in identification of individuals with growth or nutritional abnormalities.

The most important and common tool used to assess the nutritional status of a population and to monitor growth in children is anthropometric measurement. The anthropometric indices commonly used are weight-for-height, height-for-age and weight-for-age expressed as percentiles or z-scores representing the overall nutritional status of a child. The World Health Organization recommends the use of these Z scores or standard deviation score (SDS) for evaluating anthropometry as they accurately classify individuals with indices below the extreme percentile (Pathak *et al.*, 2017). Wasting, stunting and underweight are therefore identified by the weight-for-height, height-for-age and weight-for-age $< - 2.0$ standard deviation (SD), respectively while weight-for-height and weight-for-age > 2.0 SD are also used to assess overweight in children (WHO, 2006).

The new WHO growth charts are considered international in scope because they reflect the growth of about 8500 children from six developed and developing countries (Brazil, Ghana, India, Norway, Oman and the United States) around the world who were raised under favourable conditions for

supporting optimal growth. Based on the growth pattern of breastfed infants, the charts now reflect current international guidelines for optimal feeding of infants and toddlers and, as such, are considered growth *standards*, rather than growth *references* (Mann & Truswell, 2012).

2. Biochemical Assessment

Growth and development can be determined using anthropometrics however; the detection of a single nutrient deficiency or toxicity can be discovered quicker in biochemical testing than in anthropometric testing. Interpretation of anthropometrics can be improved with the use of other data, such as biochemical results. In nutritional assessment, the most quantitative and objective data used to determine the nutritional status of a child is the biochemical component (Bauer, 2002). Biochemical analyses or laboratory tests help to determine what is happening to the body internally. Common tests are based on analysis of blood and urine samples, which contain nutrients, enzymes, and metabolites that reflect nutrition status. Other tests, such as blood glucose, help pinpoint disease-related problems with nutrition implications (Whitney & Rolfes, 2016).

Biochemically testing for cholesterol, haemoglobin, glucose and others can aid in the detection of risk factors associated with certain medical conditions, such as hypercholesterolemia or iron deficiency and helps to determine the nutritional status of a child (Benoist et al. as cited in Chakraborty, 2011).

Whitney and Rolfes (2016), note that they are especially useful in helping to detect subclinical malnutrition by uncovering early signs of malnutrition before the clinical signs of a classic deficiency disease appear.

Laboratory tests used to assess vitamin and mineral status are particularly useful when combined with diet histories and physical findings.

Iron deficiency with anaemia was classified as haemoglobin below 11 mg/dL, while iron deficiency without anaemia was classified as erythrocyte protoporphyrin level below 35.0 ~tg/dL and iron insufficiency was considered as ferritin below 10 ~tg/L. Iron deficiency can lead to delayed psychomotor, intellectual, and cognitive abilities and that screening for prevention should be strongly encouraged (Kleinman as cited in Bauer, 2002).

3. Clinical Assessment

Clinical assessment emphasizes on the nutritional status of a child through physical examination, including measuring blood pressure, medical history, and the examination for signs and symptoms of nutrient deficiency or toxicity (Bauer, 2002).

4. Dietary Assessment

The dietary component of a nutritional assessment consists of the assessment of food intake. Dietary data collection provides information on a child's current food intake and can be used to estimate the child's usual intake, compare the child's nutrient intake to different group references or standards, and to rank the child within the group reference.

The dietary data collection can be done using different instruments and methods. For example, the 24-hour food recall, diet history, three to seven-day food record, and food frequency questionnaire are some of the instruments available. Food models or photos and measuring devices can help patients identify the types of foods and quantities consumed. The assessor also needs to know how the foods are prepared and when they are eaten.

The choice of the instrument depends on the purpose of the study, the convenience to both the examiner and examinee, and the cooperation and complexity (Bauer, 2002).

Food Security and Child Undernutrition

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2009). A general agreement on what food insecurity is has been reached and said to be a phenomenon of access by people to food rather than only the availability of food in a country (Smith, Alderman & Aduayom 2006).

World Food Programme, (2012) explained access to food to be a situation when communities, households and individuals have enough resources to obtain sufficient food for nutritious diet through combination of home production, stocks, purchase, barter, gifts, borrowing and food aid.

Poverty is usually not experienced equally across all members of the population. Within the same family, it is common for children and women to have more limited access to resources, including food, than men. Growing up in a developing country may mean that there is less food and that the nutritional quality of the food is lower. In many cases, access to clean water, health care, education, and good sanitation is limited or absent. These factors all have an impact on food security and on nutritional status (Mann & Truswell, 2012).

Studies indicate that food insecurity is linked with lower dietary intakes or poor diet quality that can lead to nutrition deficiencies among children and the other populace (Cook *et al.*, 2004; Kirkpatrick & Tarasuk,

2008; Potamites & Gordon, 2010). Other factors such as poverty, unemployment, low income, and low education have also contributed to the high prevalence of food insecurity among immigrants, asylum seekers, and resettled refugees⁸ (Gallegos, Ellies & Wright, 2008; Hadley, Zodhiates & Sellen, 2007).

A study conducted by Gichunge, Harris, Tubei, Somerset and Lee (2015) reveals that refugees with low education and no social support are 5 and 4 times more likely to be food insecure, respectively. Rose (1999), however, notes that although household food insecurity is associated with socioeconomic status, $\approx 50\%$ of food-insecure households have incomes above the poverty line.

Smith, Alderman and Aduayom (2006), conducted a study in 12 Sub-Saharan African countries (including Ghana), using diet quantity and quality, to explore the extent and location of food insecurity across and within these countries. The results confirmed that food insecurity is a major problem in Sub-Saharan Africa. The prevalence of food energy deficiency among the study countries ranged from 37% (Uganda) to 76% (Ethiopia). Income was found to have a potent bearing on food insecurity.

Categorical measure of food security

Unisa, Chattopadhyay, Fulpagare and Sinha (2016), came up with a table that can be used to report prevalence of household food insecurity, make geographic targeting decisions as well as change in the prevalence over time. Households are categorised into four levels of household food insecurity (access): 1) food secure, 2) mild, 3) moderately and 4) severely food insecure.

Table 3: Levels of Household Food Insecurity

Level of food security	Experience
1. Food Secure	Household experiences none of the conditions, or just experiences worry, but rarely.
2. Mildly Food Insecure	Household worries about not having enough food sometimes or often, and/or is unable to eat preferred foods, and/or eats a more monotonous diet than desired and/or some foods considered undesirable, but only rarely. But it does not cut back on quantity nor experience any of three most severe conditions.
3. Moderately Food Insecure	Moderately food insecure household sacrifices quality more frequently, by eating a monotonous diet or undesirable foods sometimes or often, and/or has started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes.
4. Severely Food Insecure	Severely food insecure Household is cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely. In other words, any household that experiences one of these three conditions even once in the last four weeks (30 days) is considered severely food insecure.

Source: Unisa, Chattopadhyay, Fulpagare & Sinha (2016).

Conceptual Framework

This study presents a conceptual framework on feeding practices and nutritional status of children under five in Ampain refugee camp. Figure 1 shows the conceptual framework for the study. This was drawn to show the different variables that affect nutritional status of children based on the objectives of the study.

Demographic factors of caregivers and children such as age, educational or income level of caregivers, family size among others affect the way children are fed which in turn affects their nutritional status. Another major determinant of nutritional status is food security, which in turn is determined by the availability of and access to food supplies. Availability of

food is defined as the capacity of the country to ensure the physical presence of food supplies at all times to all people, either through local production or through importation. Access to food is defined as the ability of people to obtain, whenever required, food supplies for their basic requirements. When these variables interact positively, the nutritional status of children improves making them grow and thrive.

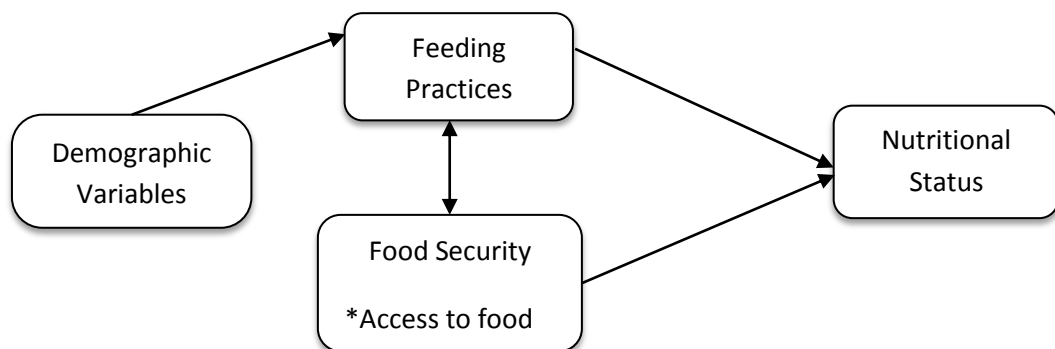


Figure 1: Conceptual framework of the factors that influences the nutritional status of children

Chapter Summary

The conceptual framework developed for the study presented the various causes and determinants of child malnutrition. From literature, it was discovered malnutrition stunts physical growth, increases the risk of mortality and morbidity and impairs cognitive development. Malnourished children are also less able to benefit from education; hence there is lower economic productivity, and slowed socioeconomic development. It was also revealed that Sub Saharan African regions have increasing rates of stunting with little improvements in other forms of malnutrition. Demographic and socio-economic factors, child feeding practices and food security all have effects on child nutritional status, thus appropriate infant and young child feeding practices with food secured environment tend to protect child from malnutrition.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter described the procedure adopted in conducting the study. It was divided into six sections. The first section dealt with research design, and the second; dealt with the population. The third section covered sample and sampling procedure. The fourth section discussed the research instrument (including pre-testing procedure conducted) while the fifth section dealt with data collection procedure. The last section covered how data collected was analysed.

Research Design

The research design used was cross-sectional descriptive survey. Cross-sectional survey was used to examine current attitudes, beliefs, opinions, or practices and collect data at one point in time. It had the advantage of providing a snapshot of the current behaviours, attitudes, knowledge and beliefs among a group of people. It also provided data relatively quickly as the researcher did not have to wait for a certain period of time before data could be gathered, analysed, and conclusions made as in the case of longitudinal survey designs (Gay, Mills & Airasian, 2009). It also provided information in a short amount of time, such as the time required for administering the survey and collecting the information (Creswell, 2012).

Study Area

Ampain refugee camp is the biggest of the four refugee camps in Ghana. The camp is located in the Ellebelle district of the Western region of Ghana. The camp was started in March 2011 and hosts about 3616 refugees

who are mainly from La Cote D'Ivoire. The predominant language spoken in the camp is French.

Population

A population is a group of individuals (or a group of organizations) with some common defining characteristic that the researcher can identify and study (Creswell, 2012). It can also be defined as the target group about which a researcher is interested in gaining information and drawing conclusions. In this study, the target population was all refugee children and their mothers/caregivers in the Ampain refugee camp in the western region of Ghana. The accessible population for this study, therefore, consisted of 164 children aged 6 to 59 months and their caregivers. It was common to focus on this group as it was among the most vulnerable and represented a critical developmental period during which under nutrition had long-term consequences.

Sampling Procedure

Sampling is a research technique that seeks to select a part of the population to represent the whole. The multistage sampling procedure was used to select participants for the study. In the first stage, purposive sampling technique was used to select refugee children and their care givers for the study. Purposive sampling, according to Oliver (2006), is a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include respondents' specialist knowledge of the research issue, or capacity and willingness to participate in the research. This technique was thus used because the study sought to assess the feeding practices and

nutritional status of children in Ampain refugee camp. It was, therefore, important to deliberately choose respondents whose responses directly answered the research questions.

The second stage involved the use of total population sampling (census). This is a sampling technique where data is gathered on every member of the population. Census was deemed appropriate because the entire population was relatively small, that is 164 children, so it was easier to include all the children.

Inclusion Criteria

Inclusion criteria for the study were children aged 6 to 59 months, who were refugees in the camp and had not been sick in the past week.

Exclusion Criteria

Children below 6 months and above 59 months and were not refugees excluded from the study. Children who were too agitated and unwilling for anthropometric measurement were also excluded. Again, caregivers who were unwilling to participate or demonstrated signs of being in a hurry were not included in the study. Finally, children who had been sick in the past week were excluded from the study.

Data Collection Instruments

The instruments used to collect data for the study were a six-section questionnaire and tools for anthropometric measurements (weighing scales, infantometer/stadiometer and MUAC tapes).

The first section (Section A) consisted of 12 items which sought information on caregivers' background or demographics. Section B of the

questionnaire comprised of a table that was used to record anthropometric measurements of each child.

Section C covered the feeding practices of children in Ampain refugee camp, Ghana. This section was made up of 13 items developed using adapted WHO Infant and Young Child Feeding Practices Monitoring Tool to answer questions on recommended WHO feeding practices of children (WHO, 2003). Questions on breastfeeding, complementary feeding and meal frequency were asked.

Section D of the questionnaire was a food frequency table. Information on the number of times a child has eaten from a particular food group during the past seven days was collected using food group frequency questionnaire. Ten food groups were used. These included; cereals/grains; starchy roots/tubers/plantain; legumes/nuts; fish/poultry/animal foods; eggs; vitamin A-rich fruits and vegetables; other fruits and vegetables; milk/milk products; oils/fats and sugary foods and drinks. Caregivers were asked to recall the number of days in a week that children ate from each of the seven food groups.

Section E of the data collection instrument comprised a diet diversity table. This sought for information on the number of food groups a child had eaten within the previous 24 hours. Caregivers were asked to select foods from eight food groups they had given their children groups. These eight food group were foods from cereal, grains, starchy roots and plantain; Vitamin A-Rich fruits or vegetables; other vegetables and fruits; meat, poultry, fish, seafood, shellfish; eggs; pulses and nuts; milk or other milk and oils/fats.

The final section was made up of the food insecurity scale and sought to measure child food insecurity access. This instrument was developed using modified items from the validated Household Food Insecurity Access Scale (HFIAS) that was specifically developed for use in developing countries (Frongillo & Nanama, 2006; Knueppel, Demment & Kaiser, 2010; Maxwell, 2008).

The CFIAS questionnaire was made up of nine occurrence questions that represented a generally increasing level of severity of food insecurity (access), and nine “frequency-of-occurrence” questions that were asked as a follow-up to each occurrence question to determine how often the condition occurred. The frequency-of-occurrence question was skipped if the respondent reported that the condition described in the corresponding occurrence question was not experienced in the previous four weeks (30 days) (Unisa, Chattopadhyay, Fulpagare, & Sinha, 2016).

Pre-testing Procedure

The questionnaire was pre-tested on 20 children and their caregivers in Krisan refugee camp also located in the western region of Ghana. These 20 children were selected from various age groups between 6 to 59 months. Children from Krisan refugee camp were selected because they shared similar characteristics with the population of this study.

Pre-testing of the questionnaires helped to determine the clarity of the directions and instructions, examined the usefulness of the questions in relation to the research objectives and tested the comprehension of the items in the instrument.

Validity and Reliability of the Instrument

The researcher's supervisors at the University of Cape Coast, who are experts in food and nutrition, helped establish the validity (i.e. content and construct validity) of the questionnaire. Specifically, they read through the questionnaire to check the construct validity of the instrument.

Scales for anthropometric measurements were checked for accuracy and calibrated every 2 hours using standard known weights since they were prone to error drift. The reliability of the items in the questionnaire were also estimated using Cronbach's co-efficient alpha. The questionnaire had a Cronbach's alpha of 0.788 as an estimate of its reliability index. This is considered appropriate as it is above a co-efficient alpha of 0.70.

Data Collection Procedures

An introductory letter was collected from the Department of VOTEC of the University of Cape Coast and given to the Ghana Refugee Board to seek permission to conduct the study. Work started at the camp when the approval was given. At the refugee camp, permission was also sought from the camp managers and the appropriate authorities in order to collect data from the refugees. Informed consents of the respondents were also sought before they were engaged in the data collection.

Anthropometric measurements like ages, heights/lengths and weights of all children were recorded. The caregiver of each respondent was orally questioned to find out the feeding practices used for the children. Children's heights were taken to the nearest centimeter using an infantometer and taken with no shoe on the child's feet. Length of children under 2 years was obtained in the recumbent position using an infantometer. An infantometer is a

device which consists of a flat board with a fixed headboard and a movable footboard which are perpendicular to the table surface. The device has a fixed measuring tape marked off in millimeters or inches with its zero end at the edge of the headboard. The child's length is recorded as the distance between the headboard and footboard. To obtain accurate measurements two people were used. An assistant stands at the head of the table and holds the child's head so the child looks vertically upward with the crown of the head against the headboard. The examiner straightens the child's legs holding the feet with toes pointed directly up, and moves the footboard against the feet. The measurement is indicated by the position of the footboard.

The height of an older child (above 2 years) is measured with a stadiometer consisting of a metric tape affixed to a vertical surface and a movable block that can be brought down to the crown of the head. The movable block is brought down until it touches the head, and then the measurement is recorded.

Portable scales were used for measuring weight of children dressed in light clothing. Scales were prone to error drift therefore they were checked for accuracy and calibrated every 2 hours using standard known weights. Weights were recorded to the nearest 0.1 kg.

Mid-upper arm circumference (MUAC) was taken using the left arm. The arm was bent at the elbow to make a right angle. With the MUAC tape placed at zero and on the tip of the shoulder, the tape was pulled to the tip of the elbow. The midpoint of the arm was marked with a pen. The arm was then straightened, and the tape placed around the marked area the reading was taken to the nearest 0.1 cm. (Cogill, 2001).

Data Processing and Analysis

The data collected was coded and analysed using the Statistical Product for Service Solution (SPSS) version 21. The one-way Analysis of Variance (ANOVA) and T-test were used to assess the significance of nutritional indices and various independent variables of interest. Means and standard deviations were also used to compare the various dependent and independent variables. Results were presented in tables and graphs.

Anthropometric data were calculated using the WHO Anthro Software and indices were reported and classified according to standard deviation units (z-scores), and then compared with the World Health Organization (WHO) 2006 growth standard to determine the nutritional status of children in the following categories; underweight, stunted, wasted or normal.

It must be noted that, those classified as “normal” in this study may include overweight or obese children since the purpose of the study was only to determine those under five children with underweight, wasting and stunting conditions.

The children’s ages were re-categorised into 6-11, 12- 23, 24-35, 36-47 and 48-59 with which the prevalence of malnutrition among them was determined.

Wasting (weight-for-height z-score–WHZ) indicates thinness. It is usually the result of recent nutritional deficiency and is affected by seasonal shifts associated with availability of foods and/or prevalence of disease. A WHZ of <-2 defines the presence of acute malnutrition (wasting).

Stunting, represented by low height-for-age z-score (HAZ), results from extended periods of inadequate food intake, poor dietary quality,

increased morbidity, or a combination of these factors. A HAZ of <-2 defines chronic malnutrition (stunting).

Weight for-age z-score (WAZ) is essentially a composite of weight-for-height and height-for-age, thus a measure of both acute and chronic malnutrition. A WAZ of <-2 is used for defining a child as underweight. A z-score of <-3 defines severe levels of each of the indices.

Diet Diversity was determined by adding all the foods a child has eaten to ascertain whether he/she has met the minimum dietary diversity. Minimum dietary diversity is the proportion of children who ate at least four or more varieties of foods from the eight food groups in a 24-hour time period. A dietary diversity score was created by adding the different food groups reported to have been eaten. If a child consumed at least one food item from a food group, the group was assigned a value of one for that child. The group scores are then summed to obtain the dietary diversity score, which ranges from zero to eight, where zero represents non-consumption of any of the food items and eight represents the highest level of diet diversification. If a child is reported to have eaten four or more food types, it means the child has met the WHO minimum dietary indicator.

To determine the status of food insecurity, the average child food insecurity access score was computed along with child food insecurity access prevalence (CFIAP) categories (Jebena *et al.*, 2015). Thus, the CFIAP indicator categorises children into four levels of food security: food secure, mildly insecure, moderately insecure, and severely food insecure based on the response of the caregivers in nine questions and combining them with specified methods as suggested by FANTA. The categorisation scheme is

designed to ensure that a caregiver's responses can place them in a single, unique category.

Children who experience no food insecurity, but their caregivers rarely experience some anxiety over sufficiency of food are categorised as food secure. Caregivers who worry about not having enough food frequently as well as children who sometimes in last one month could not have their preferred food or have to eat to eat limited variety of food, or food that they really do not want to eat are categorised as mildly food insecure. Children who frequently have to eat food of limited choice and sometimes have to eat lesser quantity of food are categorised as moderately food insecure. Children who have no food to eat or have to starve day and night are categorised as severely food insecure. For all the questions on food security, a reference period of one-month period prior to survey was used (Unisa, Chattopadhyay, Fulpagare, & Sinha, 2016).

A probability value (p-value) of less than 0.05 was considered to be statistically significant at 95% confidence interval.

Ethical Issues

Permission was sought from the Ghana Refugee Board and enabled me go to the refugee camps to collect data for the study. Ethical clearance with ID number UCCIRB/CES/2017/28 was obtained from the Institutional Review Board (IRB) of the University of Cape Coast. At the camps, permission was sought from the camp managers to enable me get access to the refugees. Measures were taken to protect respondents from personal harm including preserving their confidentiality and an assurance that the information provided by them was not going to be used for any other purpose but specifically for

academic purposes. Again, informed consents of the respondents were sought before they were engaged in the data collection.

Chapter Summary

This chapter explained the research method adopted for this study. A cross-sectional descriptive survey research design was used to assess the feeding practices and variables that determine nutritional status of children aged 6-59 months in Ampain refugee camp, Ghana. The study adopted a multistage sampling procedure made up of census and purposive sampling technique to select all children and their caregivers who satisfied the inclusion criteria and resided in Ampain refugee camp. Questionnaires were used to collect data on the feeding practices of children and assess the food security status of the children. Anthropometric measurements were also taken. The data collected and processed were analysed using means and standard deviations, independent-sample t-test, ANOVA, Chi-square and frequency and percentages.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the analysis and interpretation of the findings of this study. The purpose of the study was to find out the feeding practices and nutritional status of children in Ampain refugee camp in Ghana. The research questions were answered and analysed using descriptive statistics (means, standard deviations, frequencies and percentages) while the hypotheses were tested using inferential statistics (ANOVA, Independent sample T-test and Chi square).

The analysis was based on the 91% return rate data obtained from 150 respondents out of the 164 sampled for the study. The first part of this chapter describes the demographic characteristics of the respondents which were analysed using tables and graphs. In the second part, the research findings are presented based on the research questions and testing the study hypotheses as well as presenting other relevant findings from the study.

Caregivers' Demographic Information

This section relates to the background information of the caregivers who responded to the questionnaires. Demographic variables for the respondents included gender, age, relationship with guardian, marital status, sex of household head, number of members, occupation. The results were discussed using frequency and percentages and presented in Table 4. to indicate how the demographic data represented the respondents of the study.

Table 4: Background Information of Respondents

Variables	Frequency	Percentages
Gender		
Male	2	1.3
Female	148	98.7
Relationship with child		
Parent	135	90.0
Grandparent	13	8.0
Others (aunt, guardian)	3	2.0
Age groups of caregiver		
Below 19	7	4.7
20-29yrs	50	33.3
30-39yrs	63	42.0
40-50yrs	23	15.3
Above 50yrs	7	4.7
Highest level of education		
No formal education	49	32.7
Primary education	54	36.0
Middle/JHS	18	12.0
SSS/vocational/technical	11	7.3
Tertiary education	18	12.0
Marital status		
Single	34	22.7
Cohabiting	51	34.0
Married	59	39.3
Divorced/Separated	2	1.3
Widowed	4	2.7
Head of household		
Males	92	61.3
Females	58	38.7
Number of persons in household		
1-5	87	58.0
6-10	51	34.0
11-15	12	8.0
Occupations of caregiver		
Unemployed	36	24.0
Trader	63	42.0
Artisan (dressmaker, hairdresser etc)	35	23.3
Agriculture activities	7	4.7
Professionals (teachers, nurse etc)	3	2.0
Others (pastors, volunteers etc)	6	4.0

Table 4 continued

Occupations of head of household		
Unemployed	33	22.0
Trader	29	19.3
Artisan (dressmaker, hairdresser, mason etc)	44	29.3
Agriculture activities	9	6.0
Professionals (teachers, nurse etc)	5	3.3
Others (pastors, volunteers etc)	30	20
Income level of household		
Less than GHS 200	110	73.3
Between GHS 200-500	33	22.0
Between GHS 500-1000	7	4.70
Geographical location		
Zone A	77	51.3
Zone B	73	48.7

Source: Field survey, Komasi (2017)

Table 4 shows the background information of the respondents. Majority of the caregivers were female (n=148; 98.7%). Most of the caregivers were parents to the children (n=135; 90.0%) while 12(8.0%) were their grandparents. The mean age of the caregivers was 32.69 ± 8.827 with the minimum and maximum ages being 17 years and 61 years, respectively. The ages were categorised into ranges of below 19, 20-29, 30-39, 40-49 and above 50 years. However, most of the caregivers were between the ages of 30-39 years (n=63, 42.0%, n=150).

The educational level of the caregivers from the table indicated that most of the caregivers did not have higher education. Majority of them only had primary education (n=54, 36%) and non-formal education (n=49, 32.6%). Few of them had middle/JHS (n=18, 12%), SSS/VOC/Tech (n=11, 7.3%) and Tertiary (n=18, 12%).

The marital status of the caregivers was also elicited. As shown in table 4, majority of the caregivers were married (n=59, 39.3%). Those who were cohabitation recorded the second highest (n=51, 34.0%). Thirty-four (34)

of caregivers representing 16% were single. The widows were 4 representing 2.6% and 2 of caregivers representing a marginal percentage of 1.3%.

Majority of the caregivers indicated that the males (n=92; 61.3%) were the head of the household while 58(38.7%) of the female also played headship role in the household. Most households (n=87; 58%) had between 1-5 members and some (n=51; 34%) of households also had about 6-10 members.

To their occupational status, majority of the caregivers were employed (n=114; 76%). Trading, being artisans and engaging in agricultural activities were some of the incoming earning occupations engaged in by parents in the camps. Most of the household heads were also employed (n= 117; 78%) and engaged in similar income earning activities. Most of the heads of households were artisans (carpenters, masons, tailors) (n=44; 29.3%) unlike the caregivers who were mostly traders (n=63; 42%). Only few of them were professionals (teachers, nurses), caregivers (n=3; 2%), household heads (n=5; 3.3%),

The income level of the respondents as shown on the table imply that since most of caregivers were unemployed in formal sectors, their income levels were low. Majority of them earn less than 200 cedis (n=110, 73.3%). Those who earn between 200-500 followed (n=33, 22%). Few of them earn above 500-1000 cedis (n=7, 4.7%). It could be said that the income levels of the caregivers were very poor. These could affect the nutritional status of the children under their care. Finally, in terms of their geographical location, the table clearly shows that those who were living in the Zone A (n=77, 51.3%) were higher than those in Zone B (n=73, 48.7%).

Analysis of Research Questions

The excerpt from the second aspect of the questionnaire elicited information on the anthropometric measurement, feeding practices and food security scale of the children. The results were analysed and reported using frequencies and percentages.

Research Question 1: What are the feeding practices of children between 6 – 59 months in Ampain refugee camp?

Table 5: Feeding Practices of Children between 6 – 59 Months in Ampain Refugee Camp

Variables	Frequency	Percentages
Child ever been breastfed		
Yes	148	98.70
No	2	1.30
Time of initiating breastfeeding N=148		
Less than one hour of birth	44	29.70
Between 1-23 hours	66	44.60
A day after birth	22	14.90
Several days after birth	16	10.80
First feed after delivery		
Breastmilk	138	92.00
Infant formula	3	2.00
Water	8	5.30
Others (diluted milk)	1	0.70
Frequency of breastfeeding in a day N=148		
Less than 8 times	50	33.80
Between 8-12 times	64	43.20
More than 12 times	34	23.00
The age (in month) of introducing water		
Below 3months	92	61.30
Between 3-5months	21	14.00
Within 6months	33	22.00
7months and above	4	2.70
The age (in month) of introducing food		
Below 3months	24	16.00
Between 3-5months	54	36.00
Within 6months	48	32.00
7months and above	24	16.00

Table 5 continued

Has child stopped breastfeeding N=148		
Yes	132	89.20
No	16	10.80
Months at which child stopped breastfeeding completely N=132		
Below 6months	3	2.3
Between 6-12months	41	31.1
Between 13-23months	85	64.4
24months after	3	2.3
Frequency of complementary foods in a day N=16		
Once	6	37.5
2times	6	37.5
3times	1	6.3
4times		
Frequency of meals in a day N=134		
Once	11	8.2
2times	13	9.7
3times	78	58.2
4times	20	14.9
5times or more	12	9.0
Give a child any snacks		
Yes	116	77.30
No	34	22.70
Frequency of snacks in a day		
None	34	22.70
Once	31	20.70
Twice	34	22.70
Thrice	27	18.00
4times or more	24	15.90
Foods given to children N=116		
Fruits	6	5.2
Pastries	106	91.4
Others (yoghurt, chocolate, eggs etc)	4	3.4

Source: Field survey, Komasi (2017)

Table 5 shows the results of respondents (caregivers) concerning the feeding practices of children between 6-59 months in Ampain refugee camp. It is quite obvious from the results that most of the caregivers diversely and

moderately adhered to the feeding practices of children between 6-59 months. For example, majority (n=148; 98.7%) of the caregivers had ever breastfed their children. However, only 44 (29.7%) adhered to WHO's principle of initiating breastfeeding less than an hour of giving birth. Majority of the children were introduced to breastmilk between 1-23 hours of birth (n=66; 44.6%). The caregivers were asked about the first feed given to the children after their delivery, it was found that majority (n=138; 92%) of them gave breastmilk (Table 5).

Regarding the frequency of breastfeeding, it was revealed that a greater number 98(66.2%) of the children were breastfed at least 8 times a day, while 50(33.8%) of them breastfed less than 8 times in day. The study also showed that, majority (n=113; 75.3%) of the children were introduced to water before they turn 6 months. This goes to show that only (n=37) 24.7% were exclusively breastfed. Similarly, about the introduction of food (complementary feeding), it was observed that only 48(32%) of the caregivers introduced food to their children at the appropriate age of 6 months. The remaining 102(68%) introduced food either too early or too late.

With regards to duration of breastfeeding, 45(30%) of participants were children under 24 months, however, only about one third of the them were being breastfed (n=16; 10.8%) and 3(2.3%) of the total population breastfed their children to the recommended age of 24months.

Per the results, most of the breastfed children were given complementary foods at the appropriate frequency (n=16; 81.3%). The older children also had similar results where they were given the right frequency of main meals in the day. Most of the caregivers (n=78; 52%) gave main meals to

the children 3times in day (n=110; 82.1%). In addition to the main meals, the caregivers also gave snacks (n=116; 77.3%) to majority of the children. Some of the food given to the children were pastries (n=107; 71.3%), yoghurt, chocolate, eggs (n=37; 24.7%) and fruits (n=6; 4%).

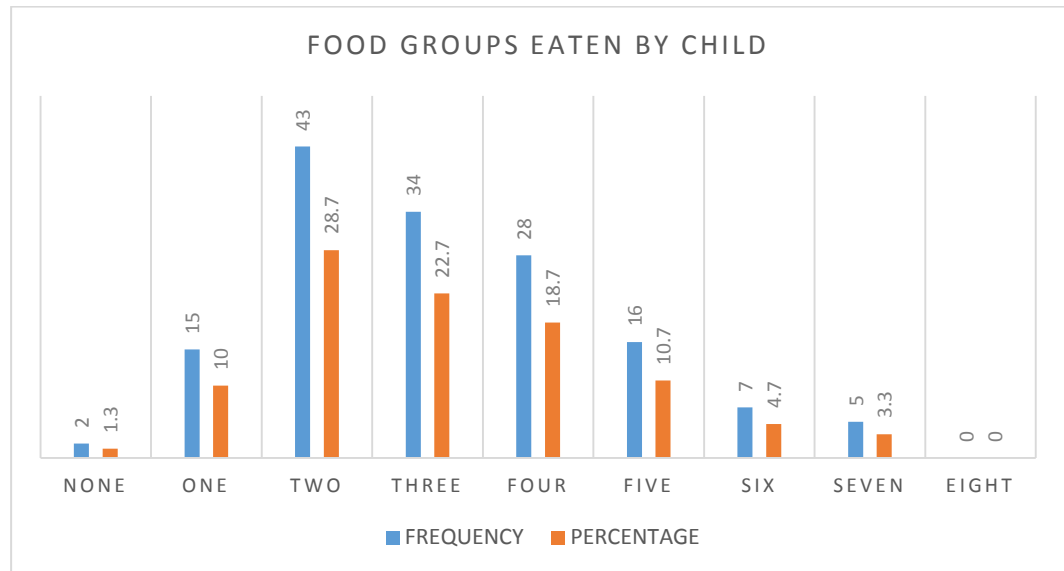


Figure 2: Dietary Diversity Score of Children between 6 – 59 Months in Ampain Refugee Camp

The mean diet diversity score was 3.15 ± 1.54 . Results from figure 2 indicated that, even though majority of the children were fed the appropriate number of times per day and also given snacks, they were not provided with food from the various food groups. For example, majority (n= 94; 62.7%) were fed with food from three or less groups. WHO recommends that children under 5 years eat food from a minimum of 4 food groups per day, thus having a dietary diversity score 4 or more. This was however not the case, as only 56(37.3%) of the children achieved that. Most children (n=43; 28.7) were fed food from two groups only.

Food Frequency

Table 6 shows the results of food groups children consumed within a week in Ampain Refugee camp. It is quite obvious from the results that most of the children ate variety of foods. For example, it was found that the majority (n=132; 88%) of the caregivers daily gave their children foods made from cereals and grains (example rice, wheat, maize, bread, pasta). Concerning starchy roots, tubers and plantain (example cassava, yam, potatoes), 62(41.3%) of the caregivers indicated that they occasionally gave children foods made from starchy roots, tubers and plantain (example cassava, yam, potatoes) and in a week, 48(32%) of the caregivers gave children foods made from starchy roots, tubers and plantain (example cassava, yam, potatoes) 1-3times.

In Table 6, most of the caregivers (n=76; 50.7%) indicated that they occasionally gave children foods made from legumes and nuts (example beans, peas, groundnuts), 23(15.3%) of them daily gave children foods made from legumes and nuts (example beans, peas, groundnuts) and in a week, 22(14.7%) of the caregivers gave children foods made from legumes and nuts (example. beans, peas, groundnuts) 1-3times.

Table 6: Food Frequency Table

Food item consumption	Never	Occasionally	1-3 times	4-6 times	Daily
	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)
Cereals and grains	1 (0.7)	3 (2.0)	4 (2.7)	10 (6.70)	132 (88.0)
Starchy roots, tubers and plantain	9 (6.0)	62 (41.3)	48 (32)	8 (5.3)	23 (15.3)
Legumes and nuts	21 (14.0)	76 (50.7)	22 (14.7)	8 (5.3)	23 (15.3)
Vitamin A rich fruits and vegetables (dark green leafy)	18 (12)	52 (34.7)	49 (32.7)	12 (8.0)	19 (12.7)
Other fruits and vegetables	10 (6.7)	52 (34.7)	64 (42.7)	5 (3.3)	19 (12.7)
Fish, poultry and animal foods	5 (3.3)	5 (3.3)	24 (16.0)	15 (10.0)	101 (67.3)
Eggs	13 (8.7)	72 (48.0)	39 (26.0)	12 (8.0)	14 (9.3)
Milk and milk products	44 (29.3)	80 (53.3)	16 (10.7)	2 (1.3)	8 (5.3)
Oils, fats or butter	18 (12.0)	12 (8.0)	35 (23.3)	43 (28.7)	42 (28.0)
Sugary foods or drinks	25 (16.7)	30 (20.0)	20 (13.3)	16 (10.7)	59 (39.3)

Source: Field survey, Komasi (2017)

Occasionally, 52(34.7%) of the caregivers gave children foods made from vitamin A rich fruits and vegetables (dark green leafy example; “kontomire”, cassava leaves, potato greens) red palm nut carrots, mangoes, pawpaw and in a week, 49(32.7%) of the caregivers also gave children foods made from vitamin A-rich fruits and vegetables (dark green leafy example; kontomire, cassava leaves, potato greens) red palm nut carrots, mangoes, pawpaw 1-3 times. Similarly, 64 of the caregivers representing 42.7%

revealed that they gave children foods made from other fruits and vegetables (example; oranges, banana, coconut, avocado, tomatoes, okra, garden eggs) 1-3times in a week and 52(34.7%) of them occasionally gave children foods made from other fruits and vegetables (example oranges, banana, coconut, avocado, tomatoes, okra, garden eggs).

As shown in Table 6, majority (n=101; 67.3) of the caregivers daily gave children foods made from fish, poultry and animal foods (example beef, pork, lamb, goat, shellfish). Similarly, 72(48%) of the caregiver reported that they occasionally gave children foods made from eggs while 39(36%) and 14(9.3%) of them indicated that they gave children foods made from eggs 1-3times in a week and daily, respectively. Concerning consumption of milk cheese, yogurt or other milk products, it was found that the majority (n=80; 53.3%) of the caregivers occasionally gave children foods made milk cheese, yogurt or other milk products while 44 of them representing 29.3% said that they never gave children foods made from milk cheese, yogurt or other milk products. The caregivers indicated that they gave 4-6times to children with foods made from oils, fats or butter while 42(28%) and 35(23.35%) of the caregivers also reported that they daily and 1-3times gave children foods made from oils, fats or butter. To sugary foods or drinks (example; chocolate, toffee, pastries, biscuits, drinks, ice cream), it was observed that 59 of the caregivers representing 39.3% reported that they daily gave children foods made from sugary foods or drinks while 30(20%) and 25(16.7%) of them revealed that they occasionally and never gave children foods made from sugary foods or drinks, respectively.

Research Question 2: What are the nutritional status of children in Ampain refugee camp?

The main objective of this research question was to determine the nutritional status of children in Ampain refugee camp. The results of the study were investigated using frequency, percentages, means and standard deviations and illustrated in Tables 7 to 10. The results show the nutritional status of the entire children in Ampain refugee camp, by sex and by age group.

Table 7 shows the frequencies and percentages of the children by age ranges and gender. Majority of the children (27.3%) were between the ages of 24 and 35 months and 6.7% (10) were less than 12 months. Eighty-one (54.0%) of the children were males and the remaining 69 (46.0%) were boys.

Table 7: Demographic Data of the Children

Variables	Frequency	Percentages
Gender		
Male	81	54.0
Female	69	46.0
Age groups of children		
6-11 months	10	6.7
12-23 months	35	23.3
24-35 months	41	27.3
36-47 months	32	21.3
48-59 months	32	21.3

Source: Field survey, Komasi (2017).

Table 8: Overall Nutritional Status of Children in Ampain (N=150)

	(f)	(f) < -3SD	(f) < -2SD	(f) Normal	Mean	SD
Underweight (WAZ)	(150)	(0) 0%	(9) 6%	(141) 94%	-0.66	0.86
Stunting (HAZ)	(150)	(1) 0.7%	(26) 17.3%	(123) 82%	-1.01	1.06
Wasting (WHZ)	(150)	(0) 0%	(2) 1.3%	(148) 98.7%	-0.1	0.81

Source: Field survey, Komasi (2017).

Table 9: Nutritional Status of Children in Ampain by Sex (N=150)

Sex	(f) < -3SD	(f) < -2SD	(f) Normal	Mean	SD
Underweight Male (81)	(0) 0%	(6) 7.4%	(75) 92.6%	-0.65	0.92
Female (69)	(0) 0%	(3) 4.3%	(66) 95.7%	-0.68	0.79
Stunting Male (81)	(1) 1.2%	(17) 21%	(63) 77.8%	-1.02	1.21
Female (69)	(0) 0%	(9) 13%	(60) 87%	-1.00	0.85
Wasting Male (81)	(0) 0%	(1) 1.2%	(80) 98.8%	-0.13	0.87
Female (69)	(0) 0%	(1) 1.4%	(69) 98.6%	-0.20	0.74

Source: Field survey, Komasi (2017).

Table 10: Nutritional Status of children in Ampain by Age Group (N=150)

	Age group	(f)	< -3SD	(f)	< -2SD	(f)	Normal	Mean	SD
Underweight	6-11	(10)	(0) 0%	(0)	0%	(10)	100%	-0.11	1.02
	12-23	(35)	(0) 0%	(0)	0%	(35)	100%	-0.46	0.92
	24-35	(41)	(0) 0%	(5)	12.2%	(36)	87.8%	-0.77	0.97
	36- 47	(32)	(0) 0%	(4)	12.5%	(28)	87.5%	-1.09	0.68
	48-59	(32)	(0) 0%	(0)	0%	(32)	100%	-0.49	0.51
Stunting	6-11	(10)	(0) 0%	(0)	0%	(10)	100%	-0.38	0.84
	12-23	(35)	(0) 0%	(12)	34.3%	(23)	65.7%	-0.97	1.36
	24-35	(41)	(1) 2.4%	(9)	22%	(31)	75.6%	-1.14	1.25
	36- 47	(32)	(0) 0%	(4)	12.5%	(28)	87.5%	-1.28	0.67
	48-59	(32)	(0) 0%	(1)	3.1%	(31)	96.9%	-0.83	0.67
Wasting	6-11	(10)	(0) 0%	(0)	0%	(10)	100%	0.18	1.06
	12-23	(35)	(0) 0%	(0)	0%	(35)	100%	0.01	0.67
	24-35	(41)	(0) 0%	(2)	4.9%	(39)	95.1%	-0.22	0.97
	36- 47	(32)	(0) 0%	(0)	0%	(32)	100%	-0.55	0.68
	48-59	(32)	(0) 0%	(0)	0%	(32)	100%	0.02	0.63

Source: Field Survey, Komasi (2017).

Nutritional Status of Children between 6 – 59 Months

The total number of children assessed were 150, made of 81 (54%) males and 69 (46%). The minimum and maximum ages of the child in months were 6.87 and 59.70, respectively with mean and standard deviation of 33.82 ± 14.33 .

Anthropometric data from the survey was compared between sexes and among age groups. The mean Height-for-age (HAZ) Z-score for all the children was -1.01 ± 1.06 while the mean weight-for-age (WAZ) and weight-for-height (WHZ) Z-scores were -0.66 ± 0.86 and -0.16 ± 0.81 , respectively.

Based on Table 8, it was revealed that 6% of the children were underweight, 18% were stunted, of which 0.7% were severely stunted and 1.3% were wasted. None of the children were either severely wasted or underweight.

Nutritional Status by Sex

From Table 9, out of the 7.4% (n=6) of the males and 4.3% (n=3) of the females were moderately underweight (WAZ < -2z). The percentage of males and females that were moderately wasted (WHZ < -2z) were 1.2% and 1.4%, respectively with none of the sexes being severely underweight (WAZ < -3z) or severely wasted (WAZ < -3z). In regards to stunting, 13.0% of females and 22.2% of males had Height-for-Age Z score < -2z, with no female severely stunted. 1.2% of males were however severely stunted (HAZ < -3z).

From the results, males were more vulnerable to being underweight (n=6; 7.4%) and stunted (n=18; 22.2%) than females while 1.4% females were more prone to wasting. This figure is almost the same as the percentage of boys who were wasted. (1.2%).

Nutritional Status by Age groups

From Table 10, the age group 24-35 months represents most of the cases, this group constitutes 41 (27.3%), followed by the age group 12-23 months which represents 35 (23.3%) then age groups 36-47 months and 48-59 months equally represent 32 (21.3%) each and few of the children (n=10; 6.7%) were in the 6-11 months group.

The age group affected most by less than -2 SD weight for age (underweight) was children between the 36-47 months range with a percentage of 12.5, mean of -0.77 ± 0.97 , followed by the age group 24-35 months which represents 12.2%. All the other age groups did not record any -2 WAZ scores.

For stunting (height for age), 34.3% of the children in the 12-23 age group represented most cases with a mean of -0.97 ± 1.36 . The age group 24-35 months were the next to record cases of moderate and severe stunting with a mean and SD of -1.14 ± 1.25 and percentages of 22 and 2.4. The third age group to show prevalence of stunting was children between 36-47 months (12.5%; -1.28 ± 0.67). This was followed by the 48-59 months age group representing 3.1% with -0.83 ± 0.67 mean and SD. No child in the 6-11 age group was stunted.

Children between the ages of 12-23 were most vulnerable to stunting probably because of poor complementary feeding practices.

Standard deviation less -2 for Weight for Height (wasting) showed that only the children from the age group 24-35 (4.9%) with -0.22 ± 0.97 mean and SD were wasted. No other children from various age groups were wasted.

Table 11: Prevalence of Global Acute Malnutrition based on MUAC cut off points

Categories of malnutrition	MUAC (cm)	Number of children	%
Global Acute Malnutrition	<12.5	2/150	1.3
Severely malnourished	<11.5cm	0/150	0
Moderately malnourished	>11.5 <12.5	2/150	1.3
At risk	>12.5 <13	2/150	1.3
Normal	>13	146/150	97.3
Total		150	100

Source: Field survey, Komasi (2017).

From Table 11, there were no cases of severe acute malnutrition among children of Ampain refugee camp. However, 2 (1.3%) children each were either moderately malnourished or at risk of being malnourished. Majority (97.3) of the children had normal nutritional status based on their MUAC measurements.

Research Question 3: What is the food security status of the children in the camp?

One of the prime objective of the study was to ascertain the food security status of the children in the camp. Thus, the Child Food Insecurity Access indicator was used to categorise children into four levels of food security: food secure, mildly food insecure, moderately food insecure, and severely food insecure, based on the response of the caregivers to nine questions and combining them with specified methods as suggested by FANTA. Frequencies and percentages were used to quantify the results. The results are presented in Table 12.

Table 12: Analysis of Food Security Status of the Children in the Camp

Food Security Scale	Frequency (N)	Percent (%)
Food Secure	2	1.3
Mildly food insecure	2	1.3
Moderately Food Insecure	76	50.7
Severely Food Insecure	70	46.7

Source: Field survey, Komasi (2017)

From Table 12, the results depict that majority of the children were moderately food insecure (n=76, 50.7%). This was followed by those who were severely food insecure (n=70, 46.7%). Few of them were food secure and mildly food insecure (n=2, 1.3%) each.

Analysis of Research Hypotheses

Research Hypothesis One

H₁: There is no statistically significant difference between sex of child and nutritional status (in terms of wasting, stunting and underweight) of children under the age of five in the camp.

Sex of the child is one of the elements that is perceived to have influence on the nutritional status of children in the camp. Based on this, the sex of the children was tested to find out whether they will differ in influencing the nutritional status of children in the camp. To accomplish this, independent T- test was deemed appropriate for the analysis. The results are presented as below.

Table 13: Descriptive Results of the Study Variables

Nutritional Status	Sex of Child	WHZ Wasting		n
		Mean	±SD	
Wasting	Male	-0.13	±0.87	81
	Female	-0.20	±0.74	69
	Total	-0.16	±0.81	150
		HAZ Stunting		
		Mean	±SD	
Stunting	Male	-1.02	±1.21	81
	Female	-1.00	±0.85	69
	Total	-1.01	±1.06	150
		WAZ Underweight		
		Mean	±SD	
Underweight	Male	-0.65	±0.92	81
	Female	-0.68	±0.79	69
	Total	-0.66	±0.86	150

Source: Field survey, Komasi (2017).

Table 13 shows the descriptive results of the study variables. From the Table, the results indicate that there were differences in the mean scores of the sex of the respondents. For example, in relation to Wasting, there were differences between the mean scores of males (mean= -0.13, Std.D=±0.87, n=81) and females (mean= -0.20, Std.D=±0.73, n=69).

With respect to Stunting, the results again showed that there were differences in the mean scores of the sex of the respondents. Males (mean= -1.02, Std.D=±1.21, n=81). Females (mean=-0.99, Std.D=±0.85, n=69).

The results of the Underweight were not different from the others in that there were differences in the mean scores of the males (mean=-0.65, Std.D=±0.92, n=81) and females (mean=-0.68, Std.D=±0.79, n=69). The mean plots figures (Fig. 3, 4 and 5) also give the graphical way to compare the differences in the means scores of the variables.

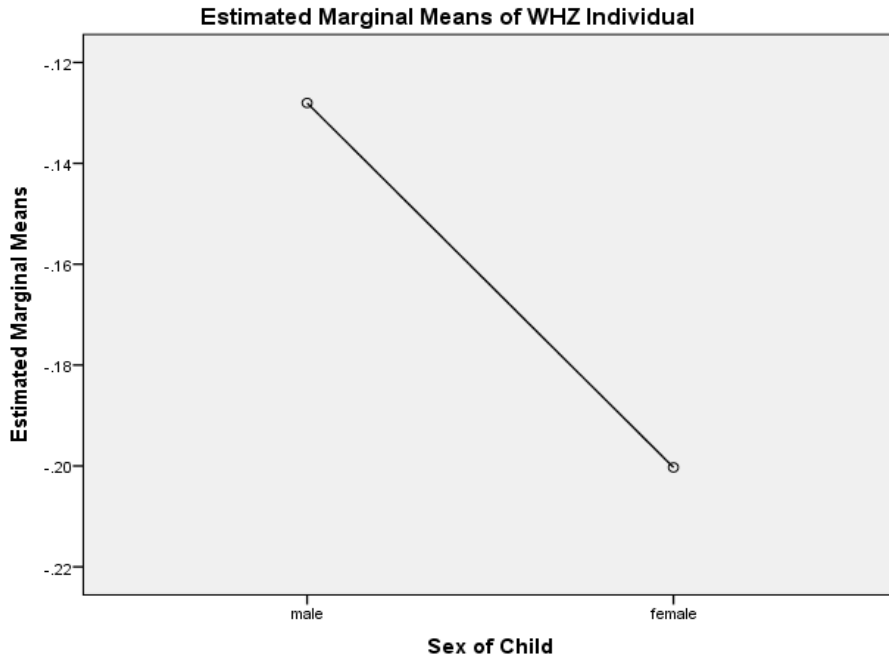


Figure 3: Means Plot of WHZ Wasting and the Sex of the Children

Per the means plot, mean differences existed between males and females with respect to the wasting of the children. On the graph, the mean scores of females show them to be more wasted than males.

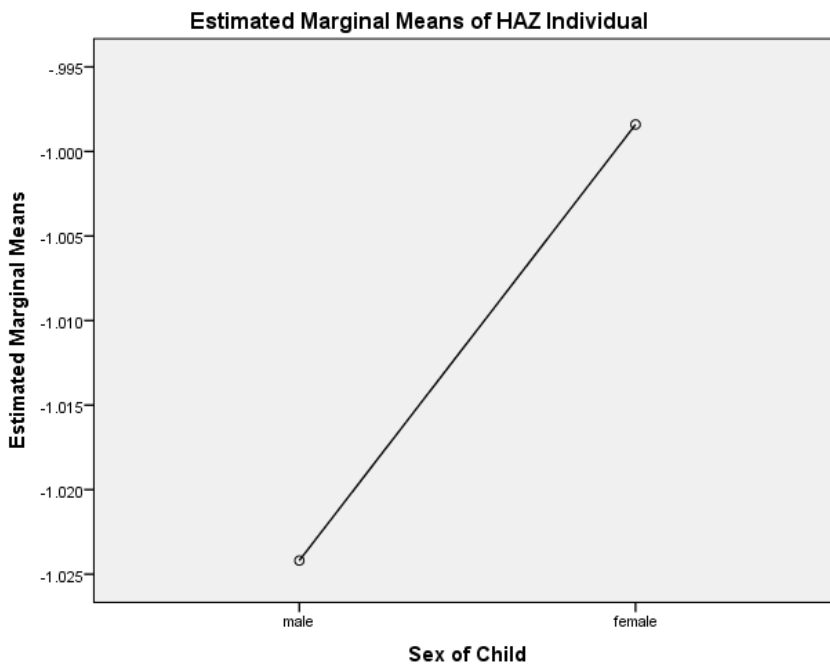


Figure 4: Means Plot of Stunting and the Sex of the Children

From Figure 4, mean differences existed between males and females with respect to stunting of the children. This is evident on the on the graph that males are more stunted than the female in terms of their means.

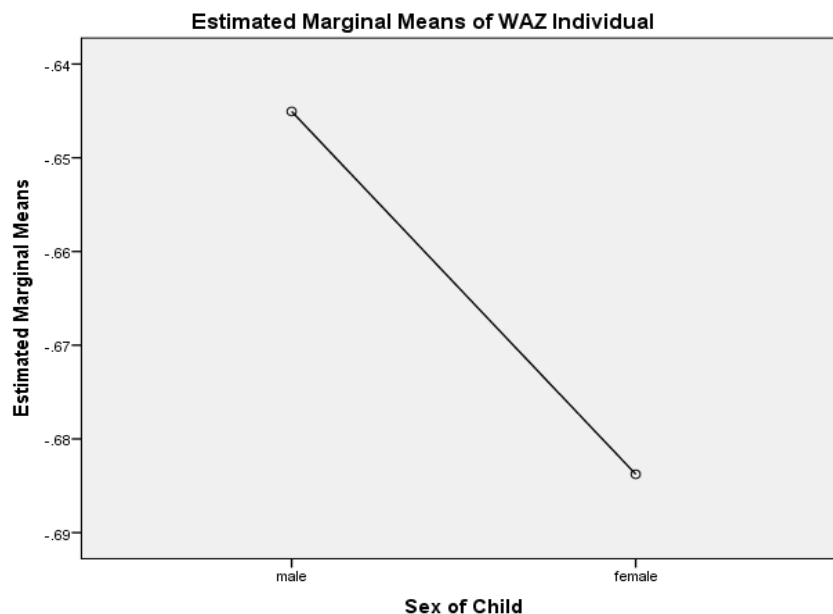


Figure 5: Means Plot of Underweight and the Sex of the Children

Figure 5 also shows that, mean differences existed between males and females with respect to the Underweight of the children. This is obvious on the graph that the mean scores of females indicate they are more underweight than the male children. Nevertheless, in order not to gain more conclusions, Independent T- test was conducted to gain more statistical evidence. The results are presented in Table 14.

Table 14: Results of Independent Sample T- Test

	Underweight	Stunting	Wasting
T-test	t=0.274	t=-0.148	t=0.543
	p=0.784	p=0.883	p=0.588

Source: Field survey, Komasi (2017). *Computed using alpha value of =0.05*

Table 14 presents the results of the Independent T-test which check for the significant differences of the various dependent (nutritional status) and

independent (Sex) variables. The results show that there were no statistically significant differences in sex of the children in the camp based on their nutritional status (Underweight $t=0.274$, $p=0.784$; Stunting $t=-0.148$, $p=0.883$; and wasting $t=0.543$, $p=0.588$). Since the T-test did not achieve a statistically significant result, further follow-up tests was not conducted. The null hypothesis, which states that there is no significant difference between sex of child and nutritional status of children under the age of five, is therefore accepted.

Research Hypothesis Two

H₁: There is no statistically significant difference among the various age groups and the nutritional status (Wasting, Stunting and Underweight) of children in the camp.

Age is one of the main variables that could noteworthy have impact on the nutritional status of children, therefore, it was tested to find out whether there will be statistical significant differences in the nutritional status of children in the refugee camp and their age groups. Mean differences were checked for and one-way analysis of variance (ANOVA) was to determine the statistical significant differences.

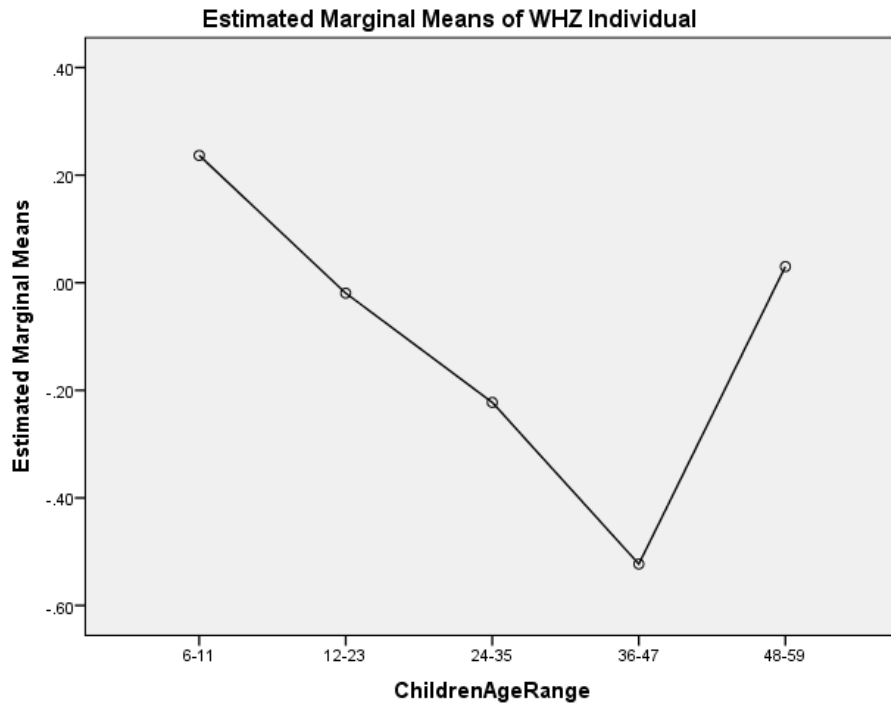


Figure 6: Means Plot of Wasted and Age Ranges of the Children

Figure 6 shows that there were differences in the means scores of the variables (WHZ and Age Groups of the Children) and as such those within the ages of 36-47 were more wasted than other age groups.

It is important to note that wasting increases with age up to age 36-47 months and then falls, thus, suggesting a non-linear relationship between child age and wasting (Frempong & Annim, 2017).

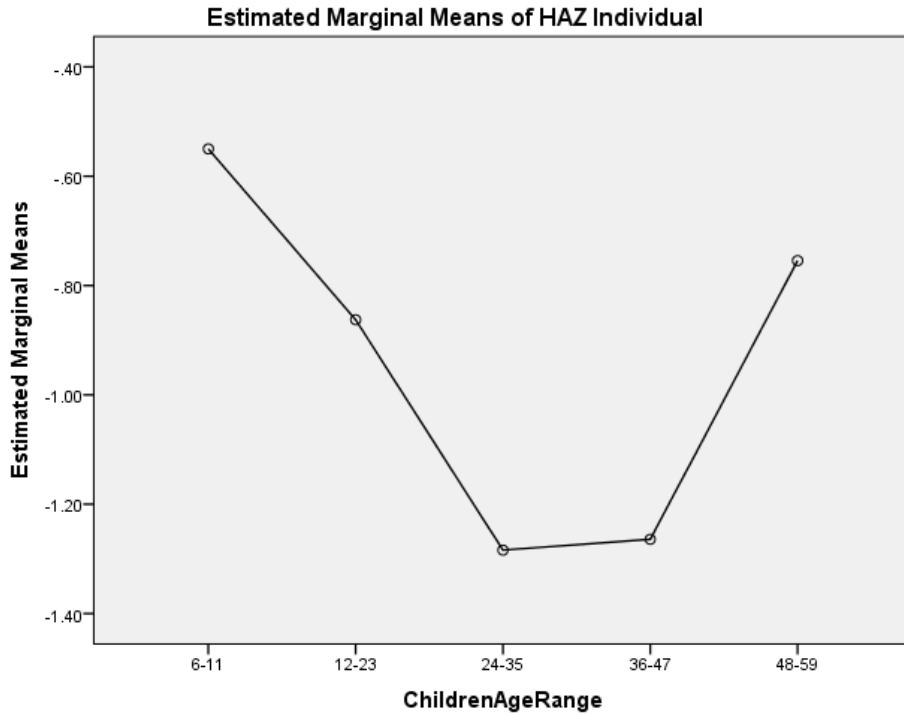


Figure 7: Means Plot of WHZ Stunting and age ranges of the children

Figure 7 shows that there were differences in the means scores of the variables (WHZ Stunting and age ranges of the children) and as such those within the ages of 24-35 were more stunting than other age groups.

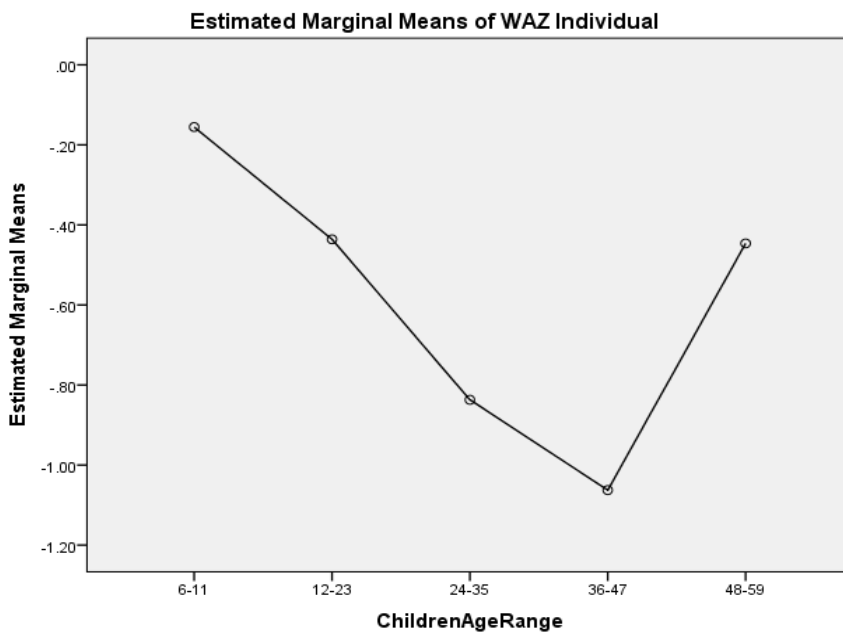


Figure 8: Means Plot of WHZ Underweight and Age Ranges of the Children

Figure 8 shows that there were differences in the means scores of the variables (WHZ Underweight and age ranges of the children) and as such those within the ages of 36-47 were more Underweight than other age groups. Nonetheless, in order not to give hasty conclusions, one-way ANOVA was conducted to gain more statistical evidence.

Table 15: Results of one way ANOVA Test

Variable	Mean±SD Underweight(WAZ)	Mean±SD Stunting(HAZ)	Mean±SD Wasting(WHZ)
Age of Child(Months)			
Total	-0.66±0.86	-1.01±1.06	-0.16 0.81
6-11 ¹	-0.11±1.02	-0.38±0.84	0.18±1.06
12-23 ²	-0.46±0.92	-0.97±1.36	0.01±0.67
24-35	-0.77±0.97	-1.14±1.25	-0.22±0.97
36-47 ³	-1.09±0.68	-1.28±0.67	-0.55±0.68
48-59 ⁴	-0.49±0.51	-0.83±0.67	0.02±0.63
ANOVA test	F=4.292 <i>p</i> =0.003	F=1.825 <i>p</i> =0.127	F=3.332 <i>p</i> =0.012
Tukey Post	<i>p</i> = 0.012 ^{1&3}		<i>p</i> = 0.033 ^{2&3}
Hoc test	<i>p</i> = 0.018 ^{2&3} <i>p</i> = 0.033 ^{3&4}		<i>p</i> = 0.035 ^{3&4}

Source: Field survey, Komasi (2017)

n=150

Table 15 shows the results of one-way ANOVA which check for the significant differences of the dependent (nutritional status) and independent (Age of the children) variables. The results show that there were statistically significant differences in age group of the children in the camp based on some of their nutritional status (WAZ; *p*= 0.003 and WHZ; *p*= 0.012). The one-way ANOVA test showed a statistically significant result, therefore, follow-up tests using Tukey Post Hoc test was conducted to check for which specific age

groups the differences were. The results showed that differences existed in age groups 6-11 and 36-47 ($p=0.012$); 12-23 and 36-47($p=0.018$); 36-47 and 48-59 ($p=0.033$) for WAZ and 12-23 and 36-47($p=0.033$); 36-47 and 48-59($p=0.035$) for WHZ. The null hypothesis is thus rejected and the alternate is accepted.

Research Hypothesis Three

H₀: There is no statistically significant differences in the nutritional status of children in the camp in relation to selected demographic and socio-economic variables.

It is postulated that demographic and socio-economic variables could have significant impact on the nutritional status of children. It is against this backdrop that the researcher tested to find out whether there will be statistical significant differences in the nutritional status of children in the refugee camp in the case of Ghana in relation to these variables. To accomplish this, analysis of variance (ANOVA) test and T- test were deemed appropriate for the analysis. The results are presented below.

Table 16: Determinants of Nutritional Status

Variable	N	Mean Underweight (WAZ) \pm SD	Mean Stunting (HAZ) \pm SD	Mean Wasting (WHZ) \pm SD
Total mean\pmSD		-0.66 \pm 0.86	-1.01 \pm 1.06	-0.16 \pm 0.81
Caregiver's age				
Below 19	7	-1.09 \pm 1.00	-1.48 \pm 1.49	-0.38 \pm 0.69
20-29	50	-0.55 \pm 0.76	-0.82 \pm 1.02	-0.18 \pm 0.77
30-39	63	-0.66 \pm 0.93	-1.05 \pm 1.14	-0.12 \pm 0.82
40-50	23	-0.64 \pm 0.86	-1.07 \pm 0.82	-0.03 \pm 0.92
Above 50	7	-1.10 \pm 0.58	-1.30 \pm 0.68	-0.60 \pm 0.75

Table 16 continued

ANOVA test		F=1.112 p= 0.353	F=0.887 p= 0.473	F=0.823 p= 0.513
Sex of Household head				
Male	92	-0.52±0.88	-0.87±1.07	-0.06±0.86
Female	58	-0.89±0.77	-1.25±1.01	-0.32±0.71
T-test		t= 2.582 p= 0.011	t= 2.165 p= 0.032	t= 1.859 p= 0.065
Educational level of caregiver				
non formal	49	-0.63±0.93	-1.12±1.14	-0.04±0.85
primary	54	-0.77±0.81	-1.06±0.90	-0.29±0.82
middle/jhs	18	-0.88±0.94	-1.0±1.16	-0.45±0.78
sss/voc/tech	11	-0.26±0.60	-0.50±1.19	0.02±0.73
Tertiary	18	-0.44±0.79	-0.90±1.13	0.07±0.66
ANOVA test		F=1.440 p= 0.224	F= 0.841 p= 0.501	F= 1.655 p= 0.164
Marital status of caregiver				
married	59	-0.73±0.85	-1.12±0.93	-0.14±0.87
cohabitating	51	-0.52±0.90	-0.92±1.16	-0.05±0.84
single	34	-0.70±0.85	-0.91±1.17	-0.29±0.64
Divorced	2	-0.55±0.30	-1.00±0.78	0.00±0.13
Widowed	4	-1.23±0.55	-1.36±0.80	-0.76±0.86
ANOVA Test		F=0.876 p=0.480	F=0.460 p=0.765	F=1.012 p=0.403
Household size				
1-5 members	87	-0.65±0.86	-1.00±1.03	-0.16±0.84
6-10 members	51	-0.72±0.89	-1.06±1.18	-0.20±0.80
11-18 members	12	-0.50±0.75	-0.88±0.78	-0.02±0.67
ANOVA Test		F=0.339 p=0.713	F=0.165 p=0.848	F=0.246 p=0.783
Occupation of Caregiver				
Employed	114	-0.71±0.89	-1.05±1.03	-0.20±0.85
Unemployed	36	-0.51±0.75	-0.89±1.14	-0.05±0.68
T- test		t=-1.195 p=0.234	t=-0.824 p=0.411	t=-0.921 p=0.359

Table 16 continued

Occupation of Household Head				
Employed	117	-0.67±0.90	-1.05± 1.04	-0.14±0.82
Unemployed	33	-0.65±0.72	-0.89± 1.12	-0.25±0.77
		t=-0.093 p=0.926	t=-0.764 p=0.446	t=-0.711 p=0.478
Income level of Household				
Less than 200 cedis ¹	110	-0.58±0.83	-0.93±1.02	-0.10±0.82
Between 200-500 cedis ²	33	-1.07±0.74	-1.45±0.91	-0.42±0.71
Above 500-1000 cedis ³	7	-0.09±1.20	-0.18±1.58	0.03±0.94
ANOVA test		F=6.208 p=0.003	F=5.589 p=0.005	F=2.309 p=0.103
Tukey Post Hoc test		<i>p</i> = 0.009 ^{1&2} <i>p</i> = 0.014 ^{1&3}	<i>p</i> = 0.033 ^{1&2} <i>p</i> = 0.010 ^{2&3}	
Geographical location				
Zone A	77	-0.58±0.93	-0.91±1.15	-0.12±0.80
Zone B	73	-0.76±0.77	-1.12±0.95	-0.21±0.83
t- test		t= 1.305 p= 0.194	t= 1.250 p= 0.213	t= 0.654 p= 0.514
Food Security				
Food secure ¹	2	-1.44±0.24	-2.30±0.29	-0.33±.71
Mildly food insecure ²	2	0.67±1.47	1.20±2.55	0.03±0.24
Moderately food insecure ³	76	-0.66±0.84	-1.07±1.07	-0.13±0.83
Severely Food Insecure ⁴	70	-0.67± 0.85	-.98±0.94	-.20±0.81
ANOVA Test		F=2.210 p=0.089	F=4.232 p=0.007	F=0.138 p=0.937
Tukey Post Hoc test			<i>p</i> = 0.005 ^{1&2} <i>p</i> = 0.013 ^{2&3} <i>p</i> = 0.033 ^{2&4}	

Source: Field survey, Komasi (2017).

The results from Table 16 show that there are statistically significant differences in sex of household head, income level and food security status of

the children in the camp based on their nutritional status. No significant differences, however, were found in majority of the variables tested like caregivers age, educational status, marital status, household size, occupational status and geographical zone. The mean scores of all the three forms of malnutrition were also found to be worse in children whose caregivers were employed than those who were unemployed.

The differences in mean scores, as shown in Table 16, were however not statistically significant, (p=0.234 for WAZ; p= 0.411 for HAZ & p= 0.359 for WHZ).

Research Hypothesis Four

H₀ There is no statistically significant association between nutritional status and some selected variables in the camp.

The purpose of this hypothesis was to find out whether there is any statistically significant association between some selected variables and nutritional status. A chi square test was performed on variables like sex of child, age group of child, income, exclusive breastfeeding, time of initiation of breastmilk and the duration of breastfeeding.

Table 17: Chi Square Test of Some Selected Variables and Nutritional Status

Variable	Underweight			Stunting			Wasting		
	X ²	df	p-value	X ²	df	Sig.	X ²	df	Sig.
Sex	0.20	1	0.659	1.55	1	0.213	0.00	1	1.000
Age group	10.1	4	0.039	15.07	2	0.005	5.39	4	0.250
Income	3.05	2	0.217	7.68	2	0.021	0.97	2	0.616
Exclusive Breastfeeding	2.76	1	0.096	0.01	1	0.937	2.76	1	0.096
Initiation of Breastmilk	0.01	1	0.916	4.26	1	0.039	0.00	1	1.000
Duration of Breastfeeding	1.06	1	0.304	0.614	1	0.433	0.047	1	0.828

Source: Field survey, Komasi (2017)

The results show that stunting was significantly associated with age group, income and time of initiation of breastmilk ($p < 0.05$). From the table however, none of the variables was significantly associated to wasting. Again apart from age group of children which was found to be significantly associated to underweight ($p < 0.05$), all the other variables were not. This goes to show that child characteristics and breastfeeding practices do not have any relationship with wasting or acute malnutrition of children in camp.

Discussion of Results

This section presents discussion of the results of the study in relation to published literature and empirical findings on feeding practices, food security and nutritional status of children aged 6 -59 months.

Caregivers' Demographic Information

Caregivers of children between 6-59 months in the Ampain refugee camp are mostly females, middle aged (30-39years), and energetic. Majority of these caregivers have some level of formal education even though only few had higher education. Having had some form of formal education means that they were exposed to basic skills of improving life style through better nutritional and sanitation care (Nyarko, 2008). Again, majority (73%) of the caregivers were either married or co- habiting with their partners which suggests that they may have social and financial support from their partners which may influence the nutritional status of the children as evident from results of a study conducted by Nyarko (2008).

Majority of caregivers were employed or engaged in some form of work/activity to earn a living but most of them earn less than 200 Ghana

Cedis. It could be said that the income levels of the caregivers were very poor and could affect the nutritional status of the children under their care.

Feeding Practices

The results from the feeding practices of children between 6 – 59 months in Ampain refugee camp showed that, generally caregivers performed most of these practices, even though there were a few of them that were not performed to their optimal rate. For instance, almost all the children had been breastfed but not exclusively and most of them were fed at the recommended frequency but not with diversified diet.

The finding that breastfeeding is widely practiced but not exclusively to age 6 months by most mothers is in accordance with those of previous studies (Awumbila, 2003; Preko 2016). Mothers revealed that due to limited access to food, they could not produce enough breastmilk for their children. They therefore felt the need to supplement their breastmilk with other drinks and foods. It might also be due to cultural reason as confirmed by Awumbila (2003), that despite efforts of health workers to increase the percentage of exclusively breastfed babies, not much success has been achieved, because feeding practices are often difficult to change as they are directly related to varied economic, socio-cultural and religious factors in the community and to various dynamics prevailing at the household level.

The findings from the study concerning time of initiation of breastmilk showed that majority of the children were put to the breast more than 1 hour of birth. This disagrees with findings from Mtimuni, Nhkoma, Katundu & Geresomo, (2010), where majority of the children were put to the breast within 1 hour of birth. Importance of initiating breastfeeding within the first hour of

birth has been shown to supply children with colostrum which protects them from diseases. It also facilitates eye-to-eye contact, physical closeness and emotional bonding, essential for optimal child growth and development (WHO, 2010). In Ampain however, only 29.7% the children were breastfed within the first hour of birth. This number is worrisome because it indicates that less than one third of children under five may have received colostrum and bonded with their mothers at birth.

Breastfeeding to age 2 years is vital to boost the immune system of children, increasing their chances of surviving illnesses, such as diarrhoea, pneumonia and malaria. (Jones, Steketee, Black, Bhutta & Morris, 2003). Considering the significant impact of breastfeeding, it was revealed that most of the mothers did not breastfeed their children to the recommended age of 24months. This finding is consistent with those Preko (2016).

Giving of snacks between meals was highly practiced by most of the caregivers (n=116, 77.3%), however very few gave fruits as snacks.

Diet Diversity

Comparable to studies undertaken by Ghana Statistical Service (2011) and Gyampoh, Otoo & Aryeetey, (2014), where more children aged 6–23 months were fed the minimum recommended times or more in a day than were fed dietary diverse diets, with few meeting the minimum acceptable diet. This implies that, nutrient requirements may not have been met in over half of the children in this study.

This could be attributed to the fact that majority of caregivers do not earn enough money to provide a more diversified diet for their children. Also

the food insecurity status could also contribute to this by making caregivers have limited access to variety of food.

Food Frequency

The food frequency table is the quantitative aspect of food consumed by children over a given period (usually 7 days). This was used to assess how many times a particular food group(s) had been consumed within previous 7 days based on the 10 food groups.

As seen on the table, majority of the children were fed daily with food from the cereals and grains (n=132; 88%), fish, poultry and meat from other animals (n= 101, 67.3%) and sugary foods and drinks. This is expected as children under five years are usually fed foods like maize porridge, rice and stew, ‘akyeke’ and so on. Unfortified complementary foods that are predominantly plant-based generally may not provide sufficient amounts of key nutrients often designated as “problem nutrients,” such as essential minerals, to meet the recommended nutrient intakes during the age range of 6–23 months (Gibson *et al.*, 1998).

They also consume a lot of sugary foods and drinks like toffees, biscuits other many others. Looking at this trend, one could deduce that, majority of the children were eating from less than four food groups per day.

Fruits and vegetables especially the Vitamin A rich ones are considered one of the most important foods children under 5 need to consume daily, however, majority of children in this study reported to have eaten these foods occasionally and 1-3 times in a week, respectively. Only very few (n=19, 12.7%) ate Vitamin A and other fruits and vegetables daily.

Nutritional Status of Children between 6 – 59 Months in Ampain Refugee Camp

The prevalence of all three indices of malnutrition in Ampain refugee camp were not alarmingly high, especially, acute malnutrition (wasting/ low weight-for-height) which is considered the most important malnutrition in emergencies (Save the Children, 2016). Per the 1995 WHO thresholds for classifying the status of nutrition in a population, the prevalence of underweight (6%), stunting (18%) and wasting (1.3%) recorded in children in Ampain refugee camp are all rated low. Again, the prevalence rate for stunting was the highest probably due to the fact that it reflects long term damage that is done from the interaction of poor diets and repeated infections (Black et al., 2013; UNICEF, 2013).

These prevalence rates are, again, lower than the 20.8%, 21.9% and 19.7% quoted for underweight, stunting and wasting, respectively, by Pedavoah (2015), in children age 0 to 23 months in the Kumbungu District of Ghana and those obtained from Kakuma refugee camp at the rates of 25.1%, 12.0% and 5.2% for stunting, underweight and wasting, respectively (UNHCR/IRC/UCL, 2013).

Nutritional Status by Sex

In this study, males were more vulnerable to malnutrition than females. This is because more boys were found to be stunted and underweight while both males and females had similar risk of being wasted. The results are consistent with findings of Amegah (2009), Frempong and Annim (2017) and Mensah (2014). In all these studies, the incidence of malnutrition tends to be higher among male children than female children. This situation can be

attributed to differences in biological composition and caregiving and possibly due to daughter preference (Fuse, 2010).

The results however disagree with those of IASC (2006), which states that in emergencies or crisis situations, where food is in short supply, females tend to be more undernourished than males because women and girls are more likely to reduce their food intake as a coping strategy in favour of their male counterparts.

Nutritional Status by Age groups

In the present study, it was observed that younger children had a higher prevalence of stunting which decreased with increasing age. Underweight and wasting were also prevalent only in children between 24 months to 47 months. The results obtained in this study are consistent to those reported by Suri and Kumar (2015). Avachat, Phalke and Phalke, (2009) also observed that the majority of children in ages of 1-3 years significantly suffer from under-nutrition as compared to older children.

The prevalence of acute malnutrition was determined using the Mid Upper Arm Circumference (MUAC), and the results from this study indicated that there were no cases of severe acute malnutrition among children of Ampain refugee camp. Again, very few children were either moderately malnourished or at risk of being malnourished

This result is similar to those obtained by UNHCR/IRC/UCL (2013). In their study which was carried out in Kakuma refugee, the prevalence of acute malnutrition when measured by MUAC was 2.5%. This shows that very few children in refugee camps are acutely malnourished as determined by MUAC. This could be due to the fact that, children at risk of acute malnutrition

are usually enrolled on supplementary feeding programme where they are provided with fortified foods to improve or prevent deterioration of their condition.

Food Security (Access)

The results from this study revealed that majority of children in Ampain refugee camp are experiencing various severity of food insecurity. These results support studies of Potamites and Gordon (2010), who argued that food insecurity is linked with lower dietary intakes among children and the other populace and once children dietary intake (feeding practices) is poor, it leads to insecurity of their food. In similar studies conducted by Gichunge, Harris, Tubei, Somerset and Lee (2015), they reveal that refugees with low education and no social support are 5 and 4 times more likely to be food insecure, respectively.

Further studies pointed out that poverty, unemployment, low income, and low education have contributed to the high prevalence of food insecurity among immigrants, asylum seekers, resettled refugees as well as people from developing countries (Gallegos, Ellies & Wright, 2008; Hadley, Zodhiates & Sellen, 2007; Nyangasa, 2011). These factors may have contributed to food insecurity among children in Ampain refugee camp.

Hypotheses

Sex of the child is one of the elements that is known to have influence on the nutritional status of children in the camp. The results of this study however show that there were no statistically significant differences in sex of the children in the camp and their nutritional status

Age is also one of the main variables that could noteworthy have impact on the nutritional status of children, and the results show that there were indeed statistically significant differences in age group of the children in the camp based on some of their nutritional status. These indices were wasting ($p=0.012$) and underweight ($p=0.003$). There were however no statistically significant differences in stunting ($p=0.127$).

Research hypothesis three sought to find out whether there will be statistical significant differences in the nutritional status (Wasting, Stunting and Underweight) of children in the camp on the basis of some selected demographic and socio-economic variables. The results give ample evidence to suggest that there were statistically significant differences in sex of household head, income level and food security status of the children in the camp based on their nutritional status. There were however, no significant difference in majority of the variables tested like caregivers age, educational status, marital status, household size, occupational status and geographical zone.

The findings of research hypothesis three are similar to those of other researchers like Amegah (2009), who found out that children in female-headed households are more likely to be underweight and stunted than their counterparts in male-headed households ($p<0.05$). This was attributed to extreme poverty in female-headed households.

The mean scores of all the three forms of malnutrition were also found to be worse in children whose caregivers were employed than those who were unemployed. The results are similar to those of Kulwa et al. (2006) who found the prevalence of stunting to be higher in children whose mothers worked full-

time than in those whose mothers did not work full-time. They, however, found no significant association between children's nutritional status and mothers' employment status. This finding, again, seems to buttress the point made by Woldegebriel (2000) that the increasing demand for African women to work outside the home has been shown to decrease the duration of exclusive breastfeeding and to advance the early introduction of complementary foods. These inappropriate feeding practices could make a child with an employed caregiver have poor nutritional status.

The final hypothesis was to find out whether there will be statistically significant association between nutritional status and some selected variables in the camp. The results from chi square test showed that there were statistically significant association between nutritional status and age groups of children, early initiation of breastfeeding and income level of household. This result could be inferred that parents economical/financial status significantly determine the nutritional status of the children.

The findings are inconsistent with those of Suri and Kumar (2015), who found that exclusive breastfeeding was significantly associated with child undernutrition.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a summary of the findings of the study as well as the conclusions, recommendations and directions for further research. Thus, the chapter focuses on the implications of the findings from the study for policy formulation and further research. The recommendations are made based on the key findings and major conclusions arising from the study.

Summary of the Study

The main purpose of this study was to find out the feeding practices and nutritional status of children in Ampain refugee camp in Ghana. To achieve the purpose of the study, descriptive cross-sectional survey design involving the quantitative approach was adopted for the study. A sample size of 150 children between 6 - 59 months and their mothers were used for the study. Purposive sampling and census/total sampling techniques was used to get the samples from the population. A self-developed questionnaire was used for the data collection. Ethical consideration was also ensured before the actual data collection. The obtained quantitative data were analysed using descriptive (frequencies, percentages, means and standard deviations) and inferential statistics (ANOVA, Independent sample T-test and Chi square).

Key Findings

The following findings were discovered from the study:

The first research question was to assess the feeding practices of children between 6 – 59 months in Ampain refugee camp. The results from the study revealed that the caregivers of the children generally performed most of

the feeding practices recommended for children by World Health Organization, but they were not performed to their optimal rate and could have accounted for malnutrition of some of the children in the camp.

Research question two focused on the nutritional status of the children in Ampain refugee camp. The results showed that 6% of the children were underweight, 18% were stunted, of which 0.7% were severely stunted and 1.3% were wasted. None of the children were severely wasted or underweight. Per the WHO thresholds for classifying the status of nutrition in a population, the prevalence of underweight (6%), stunting (18%) and wasting (1.3%) are all rated low. Per the MUAC measurements, there were no cases of severe acute malnutrition among children of Ampain refugee camp. However, 4 (2.7%) children each were either moderately malnourished or at risk of being malnourished with majority (97.3) of the children having normal nutritional status.

The primary focus of research question three was to explore the food security status of the children in the camp. The obtained results from the study revealed that food insecurity with regards to access was very high as 98.7% of the children were experiencing different degrees of severity of food insecurity. This may have affected their nutritional status.

Research hypothesis one was tested to find out whether there were statistical significant differences in the nutritional status (Wasting, Stunting and Underweight) of children in the camp on the basis of their sex (male and female). Per their mean scores, females were found to have worse weight for height and weight for age z scores. The mean scores of males in terms of height for age z scores however, were found to be worse than females

The results from the analysis also suggest that there were no statistically significant differences in nutritional status of the children in the camp based on their sex. ($p=0.784$, $p=0.883$ and $p=0.588$) for Underweight, Stunting and Wasting respectively. This means that sex of the children does not serve as a basis for the children nutritional status.

Research hypothesis two was also tested to find out if there were statistical significant differences in the nutritional status (Wasting, Stunting and Underweight) of children in the camp based on the various age groups. In relation to mean scores, children between the ages of 36-47 months were found to have the lowest weight for height and weight for age z scores while 24-35 months children had the lowest mean scores for their height for age z scores. The results from the analysis further show that there were statistically significant differences in wasting ($p=0.012$) and underweight ($p=0.003$) status of the children in the camp on the basis of their age groups but not on stunting (0.127). This means that age groups of children have an effect on nutritional status.

Research hypothesis three sought to find out whether there will be statistical significant differences in the nutritional status (Wasting, Stunting and Underweight) of children in the camp on the basis of some selected demographic and socio-economic variables. The results give ample evidence to suggest that there were statistically significant differences in sex of household head, income level and food security status of the children in the camp based on their nutritional status. There were however, no significant difference in majority of the variables tested like caregivers age, educational

status, marital status, household size, occupational status and geographical zone.

To accomplish the purpose of the study, research hypothesis four was formulated to find out whether there will be statistically significant association between nutritional status and some selected variables in the camp. The results from chi square test showed that there were statistically significant association between nutritional status and age groups of children, early initiation of breastfeeding and income level of household. This result could be inferred that parents economical/financial status significantly determine the nutritional status of the children.

Conclusions

From the results and findings, it can be concluded that despite food ration cuts and stoppage among ivoirian refugees in Ampain camp, the prevalence of all indices of malnutrition (underweight, stunting and wasting) are relatively low in the population per WHO threshold.

It can also be concluded that feeding practices were not practiced optimally in the camp and there is high prevalence of food insecurity among majority of the children in the camp.

It can also be concluded that factors such as age groups of children, early initiation of breastfeeding and income level of household significantly influence nutritional status of children in the camp.

Recommendations

Based on the findings and conclusions of the study, the following recommendations were made:

It is recommended that specific educational health programmes that promote and encourage caregivers to actively engage in appropriate feeding practices be made priority in the refugee camps by nutrition and health care partners.

Again, midwives, nurses, other health and nutrition partners should educate mothers on the importance of early initiation of breastfeeding and help mothers to initiate breastfeeding early (within 30 minutes after delivery). They should also be provided with breastfeeding support and lactation counselling. These will encourage and promote the practice of exclusive and continued breastfeeding.

Knowledge and skill should be provided to caregivers on the use of locally available and affordable foods to use in the preparation of nutritionally balanced meals. This can be done through cooking demonstration.

Livelihood enhancement interventions should be intensified and effectively implemented in the camp by UNHCR and its partners so as to make refugees more food secure, as evidences from the study give reasons to the fact that the feeding practices and nutritional status could be improved when parents as well as the caregivers are economically and financially sound. Also, partners and local authorities should be involved in the efforts by government to encourage the social acceptance of refugees by local communities as well as enhance their ability to be active participants in the commercial and industrial sector of the economy.

Furthermore, it is recommended that various agencies in charge of issues relating to refugees in Ghana, especially, at Ampain refugee camp should collaborate and coordinate their work to ensure greater harmonization

of their interventions in the lives of the camp residents so as to achieve greater efficiency and effectiveness.

Suggestions for Further Research

In addition to the main arguments of the thesis, a number of issues which were raised require further research and analysis, as they are beyond the scope of this thesis. This propelled the researcher to suggest the following areas for further studies.

An experimental study should be conducted to assess the nutritive value of foods eaten by children in the camp and its effect on their nutritional status.

Again, a comparative study on feeding practices and nutritional status of children aged 6-59 months living in a refugee camp and those in the host community should be conducted.

This study employed questionnaires as the sole instrument for data collection, therefore further studies should employ qualitative study approach; observations and interviews to give more practical and realistic evidence.

Finally, the same study should be replicated in other refugee camps in Ghana to determine if results are consistent with that of Ampain refugee camp.

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APPENDICES

APPENDIX B

UNIVERSITY OF CAPE COAST

FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

TOPIC: Feeding Practices and Nutritional Status of Children in Ampain Refugee Camp, Ghana.

STRUCTURED QUESTIONNAIRE FOR CARE GIVERS

INTRODUCTION

This study is carried out to examine the feeding practices and nutritional status of children in Ampain refugee camp in Ghana. The information collected will be used purely for academic purposes. All information provided will be kept confidential and identity kept anonymous. I would like you to answer the questions honestly. Completion of this form will take approximately 30 minutes of your time. You have the right to withdraw from the study without any consequences or penalty. Participating is strictly voluntary.

A. CAREGIVER'S DEMOGRAPHICS

1. Respondent code _ _ _ _

2. Sex

A. Male ()

B. Female ()

3. Relationship

What is your relationship with the child you take care of?

A. Parent

B. Grandparent

C. Other (Specify).....

4. Caregiver's age

5. Highest level of education:

A. No formal education B. Primary education C. Middle/ JHS

D. S.S.S/Vocational / Technical E. Tertiary education

6. Marital Status

A. Married B. Cohabiting C. Single D. Divorced

E. Separated F. Widowed

7. Sex of household Head A. Male () B. Female ()

8. Number of members currently in household.....

9. Occupation of the caregiver of the child.

A. Trader B. Artisan (Dressmaker, hairdressers etc)

C. Agriculture activities (Crop, Animal farming) D. Professionals (Teacher,

Nurse, etc.) E. Unemployed F. Others.....

10. Occupation of the head of the household.

A. Trader B. Artisan (Dressmaker, hairdressers etc)

C. Agriculture activities (Crop, Animal farming) D. Professionals (Teacher,

Nurse, etc.) E. Unemployed F. Others.....

11. Income level of the household

How much do you earn in a month?

A. Less than 200 Ghana Cedis a month B. between 200-500 Ghana cedis

a month

C. Above C'500 - C'1000 D. Above 1000 Ghana Cedis E. No income

12. Geographical characteristics

Where do you live? A. Zone A B. Zone B

B. ANTHROPOMETRIC MEASUREMENT

Child ID	Date of Birth (d/m/y)	Sex	Weight (Kg)	Height (Cm)	MUAC

C. FEEDING PRACTICES

13. Has (name) ever been breastfed?

- A. Yes B. No

14. How long after birth did (name) start breastfeeding?

- A. Less than one hour of birth B. Between 1-23 hours
C. A day after birth D. Several days after birth

15. First feed to (name) after delivery

- A. Breastmilk B. Infant Formula C. Water D. Other.....

16. How many times did/do you breastfeed (name) in a day?

- A. Less than 8 times B. Between 8 to 12 times a day
C. More than 12 times a day

17. At what age did you introduce **water**?

- A. Below 3 months B. 3-5months C. 6 months D. 7 months and above

18. At what age did you introduce **food**?

- A. Below 3 months B. 3-5months C. 6 months D. 7 months and above

19. Has (name) stopped breastfeeding?

- A. Yes B. No.

20. If yes, at what age did (name) stop breastfeeding completely?

- A. Before 6 months B. Between 6 to 12months
C. Between 13 – 23months D. 24 months and after

21.a How many times do you give (name) complementary foods in a day? (*If child is breastfeeding*)

- A. Once B. 2 times C. 3 times D. 4 times E. 5 or more times

21.b How many times do you give (name) main meals in a day? (*If child has stopped breastfeeding*)

- A. Once B. 2 times C. 3 times D. 4 times E. 5 or more times

22. Apart from main meals and/or breast milk, do you give your child any snacks between meals?

- A. Yes B. No

23. How many times a day?

- A. Once B. Twice C. Thrice D. 4 or more times

24. Which foods do you give?

- A. Fruits B. Pastries C. Others, Specify

D. FOOD FREQUENCY QUESTIONNAIRE

Food items	Daily	4-6 times / week	1-3 times / week	Occasionally	Never
Cereals and Grains. Eg. Rice, wheat, maize, bread, pasta					
Starchy roots, Tubers and Plantain. Eg. Cassava, Yam, Potatoes,					
Legumes and Nuts Eg. Beans, Peas, Groundnuts					
Vitamin A rich Fruits and Vegetables (dark green leafy eg. Kontomire, Cassava leaves, Potato greens) Red palm nut Carrots, Mangoes, Pawpaw?					
Other Fruits and Vegetables Eg. Oranges, Banana, Coconut, Avocado, Tomatoes, Okro, Garden Eggs					

Fish, Poultry and Animal Foods like Beef, Pork, Lamb, Goat, Shellfish,					
Eggs					
Milk Cheese, Yogurt Or Other Milk Products?					
Oils, Fats Or Butter, or Foods made with any of this?					
Sugary Foods or drinks As Chocolate, toffee, Pastries, Biscuits, drinks, ice cream?					

E. DIET DIVERSITY

QUESTIONS	CODING CATEGORIES
<p>Now I would like to ask you about the types of foods that your child ate yesterday during the day and at night.</p> <p><i>Read the list of foods. Place '1' in the box if the child ate the food in question, place '0' in the box if the child did not eat the food.</i></p> <p>A. Any bread, rice, noodles, or any other foods made from millet, maize, rice, wheat, cassava, yam, plantain</p> <p>B. Any Vitamin A-Rich Fruit or vegetables like yellow ripe mangoes, ripe pawpaw and dark green leafy vegetables like cassava leaves, kontomire, Red palm nut</p> <p>C. Any other vegetables and fruits? Oranges, Banana, Coconut, Avocado, Tomatoes, Okro,</p> <p>D. Meat, poultry, fish, seafood, shellfish</p> <p>E. Any eggs?</p> <p>F. Any foods from beans, peas, or groundnuts</p> <p>G. Any cheese, yogurt, milk or other milk products?</p> <p>H. Foods cooked in oil. fat, margarine or butter</p>	<p>A.....</p> <p>B.....</p> <p>C.....</p> <p>D.....</p> <p>E.....</p> <p>F.....</p> <p>G.....</p> <p>H.....</p>

F. FOOD SECURITY SCALE

No	Questions	No	Yes	Rarely (Once/ twice in the month)	Someti mes (3 to 10 times in the month)	Often (more than 10 times in the month)
1.	In the past four weeks, did you worry that (child's name) would not have enough food?					
2.	In the past four weeks, was (child's name) not able to eat the kinds of foods he/she preferred because of lack of resources?					
3.	In the past four weeks, did (child's name) have to eat a limited variety of foods due to lack of resources?					
4.	In the past four weeks, did (child's name) have to eat some foods that he/she really did not want to eat because of lack of resources to obtain other types of food?					
5.	In the past four weeks, did (child's name) have to eat a less/smaller meal than you felt he/she needed because there was not enough food?					
6.	In the past four weeks, did (child's name) have to eat fewer meals in a day because there was not enough food?					
7.	In the past four weeks, was there ever no food to eat of any kind, for (child's name) to eat, because of lack of resources to get food?					
8.	In the past four weeks, did (child's name) go to sleep at night hungry because there was not enough food?					
9.	In the past four weeks, did (child's name) go a whole day and night without eating anything because there was not enough food?					