

**FACTORS IMPACTING ON FEEDING PRACTICES OF INFANTS 0-12 MONTHS
WHICH LEAD TO MALNUTRITION IN A CHILD WELFARE CLINIC IN TEMA
MANHEAN (TEMA NEW-TOWN), GHANA**

by

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NOVEMBER 2013

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DECLARATION

I declare that **FACTORS IMPACTING ON FEEDING PRACTICES OF INFANTS 0-12 MONTHS WHICH LEAD TO MALNUTRITION IN A CHILD WELFARE CLINIC IN TEMA MANHEAN (TEMA NEW-TOWN), GHANA** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.



Adwoa Durowaa Williams
(FULL NAMES)

2 September 2013

Date

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Abstract

This cross-sectional exploratory and descriptive quantitative study explored the factors that impact on feeding practices of infants 0-12 months, encountered in the Child Welfare Clinic in Tema Manhean Health Centre and to determine the possible factors that lead to malnutrition.

The population for this study comprised all infants who attended the Child Welfare Clinic at the Tema Manhean Health Centre. Three hundred and ninety infants participated in this study. Data was collected by means of a structured questionnaire and analysed using the Statistical Package for the Social Sciences (SPSS) Version 20.

Findings of the study revealed that a larger number of the mothers were still breastfeeding at the time of data collection. All infants aged six months or older were given complementary foods. Some of the factors found to be associated with infant malnutrition included education of mother, employment status of mother, marital status, cultural practices and parity.

Key words

Infants, exclusive breastfeeding, complementary feeding, nutritional status, malnutrition.

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Dedication

*This dissertation is dedicated to my husband Steve,
who has been so supportive
and my children Steve Jnr, Stephanie and Jacquelin.*

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List of abbreviations

The following abbreviations were used throughout this study:

AAH	Action against Hunger
BECE	Basic Education Certificate Examination
CF	Complementary Feeding
CSPro	Census and Survey Processing System
CWC	Child Welfare Clinic
DHS	Demographic and Health Survey
DOB	Department of Biostatistics
EB	Exclusive Breastfeeding
FCUBE	Free Compulsory Universal Basic Education
GHS	Ghana Health Service
JSS	Junior Secondary School
MOH	Ministry of Health
MSF	Medecins Sans Frontures
MDGs	Millennium Development Goals
NFHS	National Family Health Survey
NHIS	National Health Insurance Scheme
SPSS	Statistical Package for Social Sciences
SRS	Simple Random Sampling
TMHC	Tema Manhean Health Centre
TMHD	Tema Metropolitan Health Directorate
UNICEF	United Nations Children's Educational Fund
UNISA	University of South Africa
WB	World Bank
WHO	World Health Organization

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CHAPTER 1

ORIENTATION TO THE RESEARCH STUDY

1.1 INTRODUCTION

The most essential determinants of the health, growth and development of infants and young children include adequate nutrition and good feeding practices. Under-nutrition is a major cause of disability, preventing children from reaching their full development potential (World Health Organization [WHO] 2010:1).

Most issues revolving around nutrient needs and delivery are consistent for all healthy infants. However, not all infants will develop or adapt to change at the same rate. The most positive feeding experiences are those that meet the nutrient demands of the infant while focusing on the individual developmental readiness of the infant (Akers & Groh-Wargo 2005:75).

Infant feeding practices include breastfeeding and timely introduction of complementary foods. Exclusive breastfeeding especially during infancy protects children from gastrointestinal and respiratory infections, promotes growth, supports the immune system and is positively associated with cognitive development and with immunoglobulin function. Other advantages of breastfeeding include a decrease in the risk of obesity and type 2 diabetes in childhood (Gonzalez-Cassio, Rivera-Dommarco, Moreno-Macias, Monterrusio & Sepulveda 2006:2928).

The World Health Organization (WHO) has recommended exclusive breastfeeding during the first six months of life followed by the introduction of adequate complementary feeding (introduction of solids, semi-solids or soft foods) which should only begin at six (6) months of age (WHO 2010:4).

An infant's need for energy and nutrients start to exceed what is provided by breast milk around the age of 6 months and complementary foods are necessary at this time to meet the energy and nutrient requirements. At 6 months, an infant is also

developmentally ready for other foods. In the event that complementary foods are not given at the end of 6 months or not given appropriately the growth of an infant may falter (WHO 2010:7).

Solids introduced before six (6) months of age displace breast milk intake while maintaining total energy consumption. Such foods which include porridge have no nutritional advantage at that age (before six months) since the nutritional quality of the mother's milk is superior. They are low in energy and nutrient content and have a risk of the infant getting diarrhea caused by inadequate hygiene. Late introduction (after six months) of complementary foods however, results in deficient growth because breast milk alone, is no longer sufficient to satisfy the nutritional needs after six months of age. The infant may be said to be malnourished (Gonzalez-Cassio et al 2006:2929).

Malnutrition is defined as a condition that develops when the body does not get the right amount of vitamins and minerals and other nutrients it requires, to maintain healthy tissues and organ function (*The Medical Dictionary* 2010:1). Malnutrition, defined as being underweight, is a serious public health problem that has been linked to a substantial increase in the risk of mortality and morbidity (WHO 2005:8).

Malnutrition essentially means "bad nourishment". It refers to not having enough as well as taking too much of the wrong types of foods. In such a situation the body responds to a wide range of infections as a result of mal absorption of nutrients or the inability to use nutrients properly to maintain health (WHO 2009:1).

Clinically malnutrition is characterised by inadequate or excess intake of protein, energy and micronutrients such as vitamins and this results in frequent infections such as diarrhoea (WHO 2009:1).

Basically, from the above definitions it can be seen that malnutrition results from taking an unbalanced diet in which certain nutrients are lacking in excess or in wrong proportions resulting in a wide range of infections including diarrhoea and subsequently causing stunted growth and eventually death in some children.

WHO estimates that globally, under-nutrition is responsible directly or indirectly for at least, 35% of deaths in children less than five years of age (WHO 2010:1). WHO also

estimates that, globally about 23% of children under 5 years are underweight, 13% are wasted (too thin for their height) and 34% are stunted (shorter than they should be for their age) (moderate and severe) (UNICEF 2010:15).

In Africa, it is estimated that, every year nearly 12 million children under the age of five years die, 55% of these deaths are due to malnutrition. About 30% of children are underweight while 40% are stunted (Indexmundi 2008:1).

In Ghana malnutrition is a problem amongst infants and children. About twenty eight percent (28%) of children in Ghana younger than five (5) years are stunted. Stunting is more common in rural areas than in urban areas. Wasting which is a sign of acute malnutrition is less common (9%). About 14% of Ghanaian children under 5 years of age are underweight or too thin for their age and 5% are obese or overweight (Ghana Demographic and Health Survey 2008:10; UNICEF 2010:12).

Infant malnutrition in Ghana has been most prevalent under the form of Protein Energy Malnutrition (PEM), which causes growth retardation and underweight. 54% of all deaths beyond early infancy were associated with PEM. Statistics indicate that in Ghana about 40% of all deaths that occur before the age of five (5) are due directly or indirectly to under-nutrition making it the single most important cause of child mortality (Ghana Health Service 2005:4; Ghana Health Service 2011:1).

Tema Manhean, the area where the researcher undertook her study, is one of the slum settlements in the Tema Metropolitan Area in Ghana. This area is known to have a problem with malnutrition especially amongst infants and children. There was an increase in the total number of reported cases of malnutrition in infants from the year 2008 to 2010 due to poor feeding practices (Tema Metropolitan Health Directorate 2009:7; Tema Metropolitan Health Directorate 2010:6).

The above information prompted the researcher to undertake this study.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

1.2.1 Background of Ghana

1.2.2 Geographical background

Ghana is located in West Africa near the equator and on the Greenwich meridian. It is bounded on the north and north west by Burkina Faso (Upper Volta), on the east by Togo, on the south by the Atlantic Ocean and on the west by the La Cote D'voire (known as the Ivory Coast) (Bureau of African Affairs 2011:1; Travel and Living Abroad 2010:1).

Ghana's total area is 238 538 square kilometers (92 100 square miles), with a population of about 24 million and its capital city is Accra. Other cities include Kumasi, Tema (chosen for the study), Tamale, Bolgatanga and Sekondi-Takoradi to mention a few (Bureau of African Affairs 2011:1; Travel and Living Abroad 2010:2).

The terrain is composed of plains and scrubland, rain forests and savanna. Ghana has a tropical climate (Bureau of African Affairs 2011:1; Indexmundi 2010:1). There are ten regions namely the Northern, Upper West, Upper East, Volta, Ashanti, Western, Eastern, Central, Brong-Ahafo and Greater Accra (Map of Ghana 2009:1).



Figure 1.1 Map of Ghana showing location of Tema
(Map of Ghana 2009:2)



Figure 1.2 Map of Ghana depicting the regions
(Map of Ghana 2009:3)

1.2.3 The economical status of Ghana

Ghana's economy has always been dependent on a number of key exports principally gold and cocoa. Diamonds, bauxite and manganese are also produced and exported. There has been a major discovery of oil off the Western coast of Ghana since 2007 which has led to significant commercial interest in the country.

Agriculture accounts for more than a third of the Ghana's Gross Domestic product (GDP). Agricultural products include timber, coconut and other palm products, shea butter and coffee. Ghana has established a successful programme of non-traditional agricultural products for export including, pineapples, cashews and pepper. Basic foodstuffs grown for local consumption include cassava, yam, plantain, corn, rice, peanuts, millet and sorghum. Fish, poultry and meat are also important of Ghana's diet (Bureau of African Affairs 2011:1).

Gross Domestic Product (GDP) from 2010 estimates is 18.06 billion, and inflation rate is 4.7%. Major trading partners include The European Union, United States, Nigeria and Togo (Bureau of African Affairs 2011:1; Indexmundi 2010:1).

1.2.4 Religious affiliation

Religions practiced include Christianity (68.8%), Islam (15.9%), Indigenous beliefs (8.5%), others (0.7%), none (6.1%) (Bureau of African Affairs 2011:1; Indexmundi 2010:1). Christianity is spread throughout Ghana and the people in Ghana which include Tema believe in a higher God (Ghana Embassy 2008:1).

1.2.5 Education

Basic education in Ghana now comprises the following:

Six (6) years of primary level and three (3) years of Junior Secondary School (JSS).

The Free Compulsory Universal Basic Education (FCUBE) 1996 programme has contributed immensely to the structure of basic education in Ghana today. Primary and middle school education is tuition-free in Ghana. Students begin their six (6) year primary education at age six; go through a three-year Junior Secondary School System which prepares them to sit for the Basic Education Certificate Examination (BECE) at the end of the third year. Continuing students move into the 3-year senior secondary school programme. Entrance to universities is by examination. School enrolment totals about 2 million out of which 5600 (0.28%) enter university (Modern Ghana 2013:1).

1.2.6 Health care services in Ghana

The medical system in Ghana falls under the jurisdiction of the Ministry of Health (MOH). Ghana has adopted a number of policies to ensure an improved health sector. These include the introduction of minimum fees paid by patients to augment state funding for health services and a national insurance plan introduced in 1989. Ghana has recently adopted the National Health Insurance Scheme (NHIS). There has also been various health programmes including the Expanded Programme of Immunization which is meant to protect all children and pregnant women living in Ghana against vaccine preventable diseases such as Tuberculosis, poliomyelitis, diphtheria, neonatal tetanus, whooping cough, hepatitis B, heamophilus influenza type B, measles and yellow fever (Ghana Health Service 2011:1).

There is also the National Malaria Control Program which protects inhabitants against malaria since malaria is the main cause of childhood deaths (26%) in Ghana and also Tuberculosis control Program (Ghana Health Service 2011:1).

The Millennium Development Goals (MDGs), which commit the international community to an expanded vision of development, promoting human development as the key to sustaining social and economic progress in all countries, identify general malnutrition and especially malnutrition in infants and children a threat to global development (UNICEF 2009:1). Investing in nutrition is very crucial to achieving the MDGs.

The following goals are of importance for this study:

- **Goal 1: Eradicate extreme poverty and hunger**

Goal 1 indicates eradication of extreme poverty and hunger, but then if a child is malnourished one of the nutrition effects is that the child would lose his/her cognitive and physical development among other diseases and so much capital would be eroded from parents/guardians to treat the resulting defects.

- **Goal 2: Achieve universal primary education**

A malnourished child will have diminished learning ability and as such will find difficulty going to school, staying there and performing well.

- **Goal 4: Reduce child mortality**

Malnutrition is directly or indirectly associated with deaths especially in children (Ghana Health Service 2011:2).

1.2.7 Background of Tema Manhean

Tema Manhean is one of the slum settlements in the Tema Metropolitan Area in Ghana. It is a rural settlement which is located on the Eastern Flank of Tema Fishing Harbour, near Tema Naval Base. The catchment's area shares boundaries with Kpone on the east, Industrial area on the north, and the Atlantic Ocean on the south. The sub-

municipal area is made up of eleven outreach communities with a projected population of about one hundred and five thousand and twenty three (105 023) (Tema Metropolitan Health Directorate 2009:3).

1.2.8 Health services in Tema Manhean Health Centre

The Child Welfare Clinic in Tema Manhean operates on Tuesdays and Thursdays. Infants and children who report to these facilities have their weights and heights monitored. Assessment tools (salter weighing scale for weight and microtoise for height) used for the measurements are valid and reliable. Measurements are taken systematically by well trained nurses and assistants, documented, analysed and interpreted appropriately. Those whose weights are found to deviate from the normal age per weight have their mothers/guardians alerted and counseled. Those with nutrition disorders which include Kwashiokor, marasmus, anaemia, underweight, to mention but a few, are referred to the rehabilitation centre in Tema Manhean Health Centre (Tema Metropolitan Health Directorate 2009:5, 7).

There is an antenatal clinic which operates everyday at Tema Manhean Health Centre where pregnant women from all the communities go to receive health education (Tema Metropolitan Health Directorate 2009:4).

Mothers, who do not deliver at the clinics or health centre, are deprived of useful health education obtained from these health outlets (Tema Metropolitan Health Directorate 2009:6).

1.2.9 Feeding practices

Tema Manhean is known to have breastfeeding as well as complementary feeding problems especially amongst infants and children. Breastfeeding problems include positioning and attachment of the infant to the breast. In terms of feeding their babies, the mothers are encouraged, at the antenatal clinic, to practice exclusive breastfeeding for six months and continue with complementary feeding (the introduction of solid or semi solid foods, including liquid, non human milk and formula whilst still breastfeeding) for two (2) years and even beyond (Tema Metropolitan Health Directorate 2009:1; WHO 2010:4).

There is a weaning food project at the Tema Manhean Health Centre which was started by the Catholic Relief Services called the weaning-mix project. The Catholic Relief Services phased out and the government took it up through the Ghana Health Service. This project demonstrates to mothers how to prepare and use locally available foods to produce nutritious diets like weaning-mix for children six months and older (Tema Metropolitan Health Directorate 2009:13).

1.2.10 Cultural influences on feeding practices

Cultural practices with regard to infant feeding are guided by certain beliefs: Infants are not fed with fish because the citizens believe that the babies would get diarrhoea when eating fish. Mothers also wean babies with very light porridge instead of semi-solid porridge because it is believed that very light porridge is equivalent to breast-milk. These practices have contributed to an increase in the number of infants who are underweight (Tema Metropolitan Health Directorate 2010:8; Tema Manhean Health Centre 2009:2).

Table 1.1 Malnutrition of infants and children under 5 years in the World, Africa and Ghana (latest WHO estimates)

Countries and territories	% of under fives (2003-2008) suffering from:		
	Underweight (WHO) moderate severe	Wasting (WHO) moderate and severe	Stunting (WHO) moderate and severe
Ghana	14	9	28
Africa	21	10	40
World	23	13	34

(UNICEF 2010:12-15)

Table 1.2 Reported cases of infant and children malnutrition in Tema Manhean from 2007-2009

	2008	2009	2010
Malnutrition	159	302	364

(Tema Manhean Health Directorate 2009a:8; Tema Metropolitan Health Directorate 2010:6)

1.2.11 Diagnosis of malnutrition

Anthropometric methods are used to identify malnutrition (under-nutrition and over-nutrition) in an individual. Anthropometry involves obtaining physical measurements of an individual, and relating these to standards that reflect, among other factors, the health and nutritional status of the individual (Walsh & Joubert 2007:299).

Malnutrition is diagnosed in one of three ways:

- **Weighing a child and measuring his/her height**

Weight-for-height compares the weight of a child to the weight of a “normal” child of the same height.

In measuring weight-for-height, normal weights for children are determined by studies that have weighed thousands of healthy children. The WHO has developed charts known as the International Standards for Expected Growth based on this information. If a child’s weight falls within the range considered normal for his/her height the child is found to be well nourished. If the weight on the other hand, is less than the international standards, the child is considered acutely malnourished or wasted. To determine the severity of malnutrition, WHO has created cut-off points, for example if a child’s weight-for-height is less than -2 z-scores (or standard deviations (sds)) of normal children he/she is considered to suffer from moderate acute malnutrition or wasting. If the child’s weight-for-height is less than -3 z-scores (sds) of normal children he/she suffers from severe acute malnutrition or is severely wasted (Action Against Hunger 2010:1-2; Walsh & Joubert 2007:299-300).

- **Measuring the circumference of the mid-upper arm**

In measuring the mid-upper arm circumference (MAUC) a simple colour-coded measuring band is used. MAUC of less than 12.5 cm indicates that the child is suffering from moderate acute malnutrition. If the measurement is below 11.0 cm, the child is suffering from severe acute malnutrition (Action Against Hunger 2010:2).

- **Checking for edema in the lower legs or feet**

Edema of either lower limbs or feet or face in a child may indicate severe acute malnutrition. It can be detected by small pits of indentations remaining in the child's lower ankles or feet, after pressing lightly with the thumb (Action Against Hunger 2010:2). Deprivation in one way or the other of care, health and nutrition among many others will certainly prevent infants from developing to their optimum potential. This has prompted the researcher to do a study on the feeding practices of infants 0-12 months in Tema Manhean.

1.3 RESEARCH PROBLEM

A research problem is an area of concern where there is a gap in the knowledge base needed for professional practice, a situation involving a perplexing or troubling condition, describing the need for the study (Burns & Grove 2005:70; Polit & Beck 2012:73).

Tema Manhean is one of the slum settlements in the Tema Metropolitan Area in Ghana. This area is known to have a problem with malnutrition amongst especially infants and children (Tema Metropolitan Health Directorate 2009:7, 8). From the year 2008 to 2010, the number of reported cases of malnutrition in infants and children under five (5) years increased in Tema Manhean Health Centre in spite of the continuous nutrition education. In 2008, out of 1316 infants that attended the clinic, 159 were found to be underweight. In 2009, 1164 infants attended the clinic and 302 were underweight and in 2010, out of 1172 infants who attended the clinic 364 were underweight. Available data indicated that 64% of infants in the Tema Manhean area were not well fed by their mothers or care takers and as such had a problem with malnutrition. The increase in the malnutrition cases was attributed to a number of factors including a lack of nutritious food fed to the infants as a result of certain cultural practices, financial problems and ignorance (Tema Metropolitan Health Directorate 2009:7; Tema Metropolitan Health Directorate 2010:6).

Pregnant women who visited the Tema Manhean Health Centre antenatal clinic were given health education on the importance of breastfeeding, nutritious diet, obtaining

vitamin A supplementation and healthy lifestyles which included eating of fruit and vegetables (Tema Manhean Health Directorate 2009:1).

Despite the availability of health education 64% infants in Tema Manhean are not well fed by their mothers or care takers and as such have a problem with malnutrition (Tema Metropolitan Health directorate 2009:5).

This study explored the common feeding practices of infants 0-12 months, encountered in the Child Welfare Clinic in Tema Manhean that leads to malnutrition and to determine the factors that impact on these feeding practices.

1.4 AIM OF THE STUDY

The aim of the study is to provide evidence of the factors that impact on the feeding practices of infants 0-12 months that lead to malnutrition, encountered in the Child Welfare Clinic in Tema Manhean Health Centre.

1.4.1 Research purpose

The purpose of this study explored the factors that impact on feeding practices of infants 0-12 months, encountered in the Child Welfare Clinic in Tema Manhean Health Centre.

1.4.2 Research objectives

The objectives of the study were to

- identify the common feeding practices of infants 0-12 months in Tema Manhean Child Welfare Clinic
- determine the possible factors that lead to malnutrition in infants 0-12 months

1.5 SIGNIFICANCE OF THE STUDY

- The study will provide comprehensive information on infant feeding practices in the project area to the health authorities and professional health care workers.

The results and findings of this study will assist the health management of Ghana and specifically Tema Manhean Health Centre in the following areas:

- Provide adequate information about the factors relevant to the choice and maintenance of feeding options as well as feeding strategies for infants 0-12 months.
- Provide information on the extent of breastfeeding among mothers of infants as a basis for protecting or promoting breastfeeding.
- Provide adequate information on the extent of complementary feeding among infants 0-12 months.
- Provide information for Tema Manhean Health Centre to assist to develop appropriate services, allocate resources, decide on priorities and target certain populations.

1.6 DEFINITION OF TERMS

The following definitions are used throughout the dissertation to enable readers obtain a better understanding of the study.

1.6.1 Infant

The term *infant* is typically applied to young children between the ages of 1 month and 12 months; also referred to (sometimes) as a child less than one year of age (*Concise Medical Dictionary* 2004:334).

1.6.2 Malnutrition

Malnutrition is defined as a condition that develops when the body does not get the right amount of vitamins and minerals and other nutrients it needs, to maintain healthy tissues and organ function (*The Medical Dictionary* 2010:1). The *Dorland's Medical Dictionary* (2011:7), however, defines malnutrition as the condition that results from eating a diet in which certain nutrients are lacking, in excess (too high an intake), or in the wrong proportions.

The term 'malnutrition' and 'underweight' will be used interchangeable throughout the study as literature refers to both definitions using the different terms.

1.6.3 Infant feeding practices

Infant feeding practices include breastfeeding and the introduction of solid, semi solid or soft foods (WHO 2010).

Infant feeding practices include breastfeeding and timely introduction of complementary foods (a combination of two key practices: continued breastfeeding at one year and continued breastfeeding at two years) (Gonzalez et al 2006:2928-2923; WHO 2010:4).

1.6.4 Exclusive breastfeeding

Infant receives breast milk (including breast milk that has been expressed from a wet nurse) as the sole source of nourishment from birth till six months. The infant is allowed to receive oral rehydration salt (ORS), drops, syrups (vitamins, minerals and medicines) (WHO 2010:4).

1.6.5 Complementary feeding

The child, from age six months, receives breast milk (including milk expressed from a wet nurse) and solid or semi-solid foods. This allows for any food or liquid including non human milk and formula (WHO 2010:4).

1.6.6 Solid food

Any solid substance (as opposed to liquid) that is used as nourishment (*The Free Dictionary* 2011:1).

1.6.7 Nutritional status

Nutritional Status is defined as the health status of individuals or population groups as influenced by their intake and utilisation of nutrients (Gibson 2000:427).

1.6.8 Stunting

A child is shorter than his/her age (Indexmundi 2008:1).

1.6.9 Wasting

A child is too thin for their height (UNICEF 2010:15).

1.6.10 Underweight

Weight-for-age that is more than two standard deviations below the international reference value (WHO 2005:2).

Underweight is defined for children aged 0-4 years as low weight-for-age relative to the National Centre for Health Statistics and World Health Organization (NCHS/WHO) reference median (WHO 2010:39).

1.7 RESEARCH DESIGN AND METHOD

A researcher's overall plan for obtaining answers to the research objectives is referred to as the research design. The purpose of a design is to control and thus to improve the validity of the study in examining the research problem (Burns & Grove 2005:231; Polit & Beck 2012:58).

The research methodology outlines the research process and the tools needed to achieve the research objectives (Mouton 2001:56).

The research design and methodology used for this study is described in more detail in chapter 3 of this dissertation.

A cross-sectional, quantitative study, which is descriptive in nature was selected in this research. This design was considered because of its efficiency in terms of time and money and the fact that smaller populations could be used, among others.

1.7.1 Population

The population, sometimes referred to as the target population, is the entire set of individuals or elements who meet the eligibility criteria, which includes a list of characteristics essential for membership (Burns & Grove 2005:342).

The population for the study comprised all infants 0-12 months who attended the child welfare clinic in Tema Manhean Health Centre.

1.7.2 Eligibility criteria

- **Inclusion criteria**
- A parent or guardian of an infant must participate on behalf of the infant.
- The infant must be between 0-12 months.
- The infant (with mother/guardian) must attend a child welfare clinic in Tema Manhean Health Centre which is being used for the study.

1.7.3 Sample

According to Burns and Grove (2005:40), a sample is a subset of a target population selected to participate in a study. The sample should be representative of the study population.

The sample in this study was infants 0-12 months who attended Tema Manhean Child Welfare Clinic during the period of data collection. This sample was selected from all the infants 0-12 months who attended the child welfare clinic.

1.7.4 Sample size

- **Sample size computation**

The sample size for this study was three hundred and ninety (390) (refer to chapter 3 for details).

1.7.5 Sampling

According to Burns and Grove (2005:341), sampling is the selection of a group of people, events, behaviors or other elements with which to conduct a study. A probability sampling technique was used to select the participating infants. According to Burns and Grove (2005:346), a systematic random sampling technique was found to be the most appropriate for this study (refer to chapter 3).

1.7.6 Data collection

The data collection techniques used for the study was a questionnaire which was self designed. A professional translator, Mr Annan, translated the questionnaire from English to Ga (the local language used by the people of Tema Manhean) (see annexure G).

Questionnaires were administered to the mothers or guardians of the infants. Items in the questionnaire included personal and socio economic characteristics as well as factors that impact on feeding practices of infants from 0-12 months (see annexure G).

1.7.7 Data analysis

Statistical analysis was done after data collection. Data were collected on the feeding practices of infants using a structured questionnaire. The data were analysed by a statistician who captured data by using statistical analysis software CPro (Census and Survey Processing System) Version 4.1. The entered data was validated for consistency. Thereafter, the data was exported into Statistical Package for Social Sciences (SPSS) Version 20 and analysed.

Exploratory diagnostic analysis was conducted to check for data irregularities, and outliers prior to the actual analysis. Descriptive and summary statistics were examined, with continuous data presented as means and standard deviations and discrete data presented as frequencies and percentages. Bivariate analysis to examine the associations between various factors (maternal characteristics) and sub-optimal feeding practices of infants was examined using the chi square tests. Further analysis using simple logistic regression models was done; covariates were included to adjust for confounding. A p-value of 0.05 was used to determine significance.

1.7.8 Ethical considerations

Research ethics involves protecting the rights of the participants and the institutions in which the research was done, whilst maintaining scientific integrity (Burns & Grove 2005:181-206).

Informed consent was sought from mothers/guardians of the infants selected for the study (see annexure F) and permission was sought from the institutions involved, which included, the child welfare clinic in Tema Manhean (see annexure C), Tema Metropolitan Health Directorate and the Ghana Health Service (see annexure E). This was done in the form of letters.

The participants involved by virtue of their vulnerability had their rights protected which included their right to autonomy, confidentiality, right to fair treatment, right to protection from discomfort and harm, and the potential benefits of the study should outweigh the degree of risk to be taken by the participants (see section 3.8).

1.8 SCOPE OF THE STUDY

Three hundred and ninety (390) infants of 0-12 months were enrolled in the study. Only infants whose parents/guardians gave their consent for participation of their infants and who attended Tema Manhean Child Welfare Clinic during the period of study were involved.

1.9 GENERALISABILITY

The results of the study may be applied only to the study population.

1.10 STRUCTURE OF THE DISSERTATION

This dissertation comprises five chapters.

Chapter 1 introduces the study and provides background information about malnutrition globally, in Africa and in Ghana, emphasising on feeding practices, factors that impact on feeding practices and malnutrition in Tema Manhean.

Chapter 2 discusses the literature reviewed on malnutrition and feeding practices as well as factors impacting on feeding practices.

Chapter 3 describes the research design and methodology used in collecting data for the study.

Chapter 4 presents the results and a discussion of the findings.

Chapter 5 concludes, states limitations and provides recommendations for the improvement of feeding practices of infants 0-12 months.

1.11 CONCLUSION

At the end of this study it would be ascertained if feeding practices of infants 0-12 months contribute to their malnutrition and also determine the factors that impact on feeding practices that lead to malnutrition in Tema Manhean.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A literature review is important in the research process because it gives the reader an insight as to what is currently known regarding the topic of interest, helps in developing a broad conceptual context into which a research problem will fit and also in pointing out the research strategies, specific procedures, measuring instruments and statistical analyses that might be productive in pursuing the research problem (Burns & Grove 2005:93; Polit & Beck 2012:98-110).

The researcher conducted a literature review which covers both published and unpublished reports related to feeding practices and malnutrition. Reviewed documents were obtained from journals, articles, and websites as cited in the list of sources. The review of literature would cover the period between 1999 and 2013.

2.2 OVERVIEW OF MALNUTRITION

Malnutrition is a broad term commonly used as an alternative to under-nutrition but technically it also refers to over-nutrition. One can be said to be malnourished if one's diet does not provide adequate calories and protein for growth and maintenance, or they are unable to fully utilise the food they eat due to illness (under-nutrition). Malnutrition can also be the consumption of too many calories (over-nutrition) (UNICEF 2006:1).

2.2.1 Definition of malnutrition

Malnutrition is defined as a condition that develops when the body does not get the right amount of vitamins and minerals and other nutrients it needs, to maintain healthy tissues and organ function (*The Medical Dictionary* 2010:1).

Malnutrition, defined as underweight, is a serious public health problem that has been linked to a substantial increase in the risk of mortality and morbidity (WHO 2005:8).

Malnutrition essentially means “bad nourishment”. It concerns not enough as well as too much food, the wrong types of foods, and the body’s response to a wide range of infections that result in mal absorption of nutrients or the inability to use nutrients properly to maintain health (WHO 2009:1).

Clinically malnutrition is characterised by inadequate or excess intake of protein, energy and micronutrients such as vitamins and the frequent infections and disorders that result (WHO 2009:1).

Basically, from the above definitions it can be seen that malnutrition results from taking an unbalanced diet in which certain nutrients are lacking in excess or in the wrong proportions resulting in a wide range of infections including diarrhea and subsequently causing death in especially in children.

2.2.2 Diagnosis of malnutrition

Anthropometric methods are used to identify malnutrition (under-nutrition and over-nutrition) in an individual. Anthropometry involves obtaining physical measurements of an individual, and relating these to standards that reflect, among other factors, the health and nutritional status of the individual (Walsh & Joubert 2007:299).

Malnutrition could be diagnosed in one of three ways:

2.2.2.1 *Weighing a child and measuring his/her height*

Weight-for-height compares the weight of a child to the weight of a “normal” child of the same height. In measuring weight-for-height, normal weights for children are determined by studies that have weighed thousands of healthy children. The World Health Organization (WHO) has developed charts known as the international standards for expected growth based on this information. If a child’s weight falls within the range considered normal for his/her height the child is found to be well nourished. If the weight on the other hand, is less than the international standards, the child is considered

acutely malnourished or wasted. To determine the severity of malnutrition, WHO has created cut-off points. For example if a child's weight-for-height is less than -2 z-scores (or standard deviations (sds)) of normal children he/she is considered to suffer from moderate acute malnutrition or wasting. If the child's weight-for-height is less than -3 z-scores (sds) of normal children he/she suffers from severe acute malnutrition or is severely wasted (Action Against Hunger 2010:1-2; Walsh & Joubert 2007:299-300).

2.2.2.2 *Measuring the circumference of the mid-upper arm*

In measuring the mid-upper arm circumference (MAUC) a simple color-coded measuring band is used. MAUC of less than 12.5cm indicates that the child is suffering from moderate acute malnutrition. If the measurement is below 11.0cm, the child is suffering from severe acute malnutrition (Action Against Hunger 2010:2).

2.2.2.3 *Checking for edema in the lower legs or feet*

A puffy, swollen look in either lower limbs or feet or face in a child may indicate the presence of edema and a sign of severe acute malnutrition. It can be detected by small pits or indentations remaining in the child's lower ankles or feet, after pressing lightly with the thumb (Action Against Hunger 2010:2).

2.2.3 Causes of malnutrition

It is believed that the major cause of malnutrition is lack of food rather than lack of feeding or other care practices. Causes of child malnutrition include:

Immediate causes made up of inadequate dietary intake and disease.

These two causes tend to create a vicious cycle. A malnourished child's resistance to disease is compromised and he/she easily falls ill again when the appropriate quality and quantity of food is not given (World Bank/UNICEF 2002:18). Underlying causes at household/family level is made up of insufficient access to food, inadequate maternal and child care practices, poor water/sanitation and inadequate health services (World Bank/UNICEF 2002:18).

- **Insufficient access to food**

Hunger is one of the causes of malnutrition with poverty as the main factor. When children are hungry or do not have sufficient access to the right food their physical and mental development can be damaged irreversibly and this may create a host of health problems (World Bank/UNICEF 2002:18).

- **Inadequate maternal and child care practices**

Good hygiene in and around the home and in handling food reduces the risk of illness. Care also includes all interaction between parent and child that help children develop emotionally and physically.

Poor water/sanitation and inadequate health services. Lack of safe drinking water and poor sanitation leads to the spread of infectious diseases causing childhood diarrhoea which leads to malnutrition (World Bank/UNICEF 2002:18).

Basic causes at societal level which is made up of quantity and quality of actual resources – human, economic, and organisational resources and the way they are controlled.

Inadequate and/or inappropriate knowledge and discriminatory attitudes limit household access to actual resources.

Political, cultural, religious, economic and social systems, including women's status, limit the utilisation of potential resources (World Bank/UNICEF 2002:18).

2.3 OVERVIEW OF INFANT FEEDING PRACTICES

Infant feeding practices include breastfeeding and introduction of complementary foods (solid, semi solid or soft foods) (Gonzalez-Cassio et al 2006:2928).

The World Health Organization (WHO) has recommended exclusive breastfeeding during the first six months of life followed by introduction of adequate complementary feeding (introduction of solids, semi-solids or soft foods) which should begin at six (6)

months of age in addition to breast milk which should be continued to about 18-24 months of age (WHO 2010:4).

2.3.1 Exclusive breastfeeding

Exclusive breastfeeding is the perfect way to provide the best food for infants during the first six months of their life. In exclusive breastfeeding, breast milk which includes milk expressed or from a wet nurse, serves as the predominant source of nourishment and the infant is allowed to receive oral rehydration salts, drops and syrups (vitamins, minerals and medicines) (WHO 2010:4).

2.3.1.1 Benefits of breastfeeding

Breastfeeding has various benefits which include:

Protecting infants against infections such as diarrhea, acute respiratory infections and other diseases, supporting infants' immune system, providing closeness and contact that help psychological development, promoting growth and contributing to the protection of infants from chronic conditions later in life, such as obesity and diabetes (Gonzalez-Cassio et al 2006:2928; WHO 2010:4; UNICEF 2011:1)

2.3.1.2 Physiology of breastfeeding

Breastfeeding or lactation is the secretion of milk from glands called mammary glands, to provide nourishment to an infant. Milk is produced from the acini cells of the breast and the myoepithelial cells squeeze the milk out of the ducts. The process is controlled by hormones. The effect of the hormones on breastfeeding is called the endocrine effect with several hormones stimulating the process with two major ones being prolactin and oxytocin. Prolactin governs milk production whilst oxytocin moves the milk from the cells where it is produced to the ducts for the baby to suckle. The mother is encouraged at this time to put her infant to the breast as frequently as possible (UNICEF 2008:14)

2.3.1.3 Why a new born infant cannot take solid food before six (6) months

According to Gupta (2013:1) giving infants solid foods too early could lead to problem of the intestines. Before the age of six months, an infant's kidney cannot handle the high protein and mineral content of solid foods. Some health related problems could occur which, include a higher risk of obesity and diabetes. Solid foods given to infants before the age of 4 months could lead to allergies and eczema.

2.3.1.4 Nutritious value of a diet for an infant 0-12 months

The first year of an infant's life is the most critical, particularly from a nutritional standpoint. During this period an infant experiences the most rapid growth and development period and nutrition is important at this time, as the infant's diet must support this rapid growth. A proper balance of essential nutrients such as proteins, carbohydrates, fats, vitamins and minerals are necessary to ensure and sustain rate of growth and development. Every infant is different. Some may need more or less of the nutrients in each food group. Too much or too little of any one nutrient in an infant's diet should be avoided; for example though protein is essential in an infant's diet too much of it can unduly stress an infant's developing kidneys. Iron is important in an infant's diet because of its role in the formation of haemoglobin, which carries oxygen through the blood to the rapidly growing cells and tissues. It is also essential for proper mental development. Iron deficiency may result in irritability, listlessness and anaemia. Breast milk is nourishment needed by infants. It contains nutrients which include proteins, vitamins, fat and minerals. Carbohydrates such as cereals and grains play a role in an infant's diet and can be given after 6 months of age (Infant feeding 2013:1; Normal Diet 2013:1).

2.3.2 Complementary feeding

Continued breastfeeding beyond six months should be accompanied by the consumption of nutritionally adequate, safe and appropriate complementary foods which contribute to meeting the nutritional requirements when breast milk is no longer sufficient.

Complementary feeding refers to breast milk including milk expressed or from a wet nurse and solid or semi solid foods. It allows anything else, for example, any food or liquid including non-human milk and formulae (WHO 2010:4).

2.3.2.1 Benefits of complementary feeding

With optimum breastfeeding children will become stunted if they do not receive sufficient quantities of quality complimentary foods.

An infant's need for energy and nutrients start to exceed what is provided by breast milk around the age of 6 months and complementary foods are necessary at this time to meet the energy and nutrient requirements. At 6 months, an infant is also developmentally ready for other foods. In the event that complementary foods are not given at the end of 6 months or not given appropriately the growth of an infant may falter (WHO 2010:7).

Solids introduced before six (6) months of age displace breast milk intake while maintaining total energy consumption. Such foods which include porridge have no nutritional advantage at that age (before six months) since the nutritional quality of the mother's milk is superior. They are low in energy and nutrient content and have a risk of the infant getting diarrhea caused by inadequate hygiene. Late introduction (after six months) of complementary foods, however, results in deficient growth because breast milk alone, is no longer sufficient to satisfy the nutritional needs after six months of age. The infant may be said as malnourished (Gonzalez-Cassio et al 2006:2929; WHO 2010:5).

Kalanda, Verhoeff and Brabin (2006:406) compared growth, morbidity incidence and risk factors for under-nutrition between infants receiving early complementary feeding, before 3 months of age with those receiving complementary foods after 3 months in a poor rural Malawian community. Indicators (weight, length, morbidity) including feeding practices of infants were recorded at four (4) weekly intervals from birth to fifty two (52) weeks. The proportion of exclusively breastfed infants, which included those receiving complementary feeds, was 63% at 4 months, 13% at 5 months and 1.5% at 6 months. The study showed that infants with early complementary feeding and lower weight for age at 3 and 6 months ($p < 0.05$) and at 9 months ($p < 0.01$) and at 2 months were

approximately 200 g lighter. There was therefore greater emphasis required to improve complementary feeding practices.

2.4 FACTORS IMPACTING ON FEEDING PRACTICES THAT COULD LEAD TO MALNUTRITION

During the literature search the researcher identified factors that could lead to malnutrition as most commonly reported on cultural practices, poverty factors and social marginalisation, status of women, funds allocated by government for nutrition, educational level of parents/guardian especially the mother. These factors are discussed in this chapter.

2.4.1 Feeding practices

Feeding practices contribute to the steep decline in weight during the first year of life (Engle 2002:109).

Demographic and socio-economic factors could impact on feeding practices.

The majority of mothers initiates breastfeeding late, fail to exclusively breastfeed and stop breastfeeding early. Complementary foods are diluted and contain large amounts of water (Hampshire 2010:1). Ibrahim and Alshiek (2010:1) conducted a cross-sectional study during 2008-2010 to understand the relationship between feeding practices and prevalence of stunting, wasting, and underweight among 6-59 months aged children, in Khartoum state. Out of the 780 children who participated in the study, the prevalence of acute malnutrition (wasting) was 19%; underweight 35% and chronic malnutrition (stunting) represents 51%. The study revealed that poor feeding practices may contribute to the higher risk of malnutrition in Khartoum.

Nguyen, Allen, Peat, Schofield, Nossar, Eisenbruch and Gaskin (2004:336) undertook a cohort study to investigate the growth and feeding practices of 239 first generation Vietnamese infants living in South Western Sydney Australia. The results revealed that Vietnamese women who had migrated to Western Sydney breastfed less frequently (less than 40% who breastfed their infants at 3 months of age), introduced solids earlier and used more commercial infant foods (over 75% of the infants received infant formula

within the first week of life) than in their native countries. The growth data of the infants showed that the Vietnamese infants had a significant decline in weight growth with age compared with reference data (Nguyen et al 2004:336).

Beukes (2003:1) undertook a cohort study with a prospective experimental design to identify the feeding practices of forty four (44) infant/mother pairs that could contribute to the development of malnutrition. Anthropometric measurements (weight and height of the infants) were measured monthly and it was realised that the weight-for-age Z scores dropped significantly with age from around four (4) months, when weaning had started. The results showed that inadequate dietary intake or weaning practices and breastfeeding practices were identified as the immediate cause that could contribute to the development of malnutrition in the community.

2.4.2 Cultural practices

Certain cultural practices affect aspects of feeding such as taboos, beliefs and practices about when and how one can introduce complementary foods, beliefs about the colostrum in breast milk (For example, in some cultures it's believed that colostrum is dirty so it's squeezed out before the baby starts breastfeeding), beliefs about breastfeeding patterns (for example mothers are not supposed to breastfeed whilst cooking because it's believed that the milk will get hot. When this happens, the mother's sister-in-law has to put the breast on the child's mouth before the mother can feed her) (Engle 2002:110).

These cultural practices (traditional food practices and taboos) in most countries including Ghana have a very great influence on what people eat, on how they prepare food and on their feeding practices and in some societies may contribute to nutritional deficiencies especially among infants and children. Food habits differ most widely depending on a particular tribe or society. A particular society may be deprived of certain foods of animal origin which are rich in important nutrients like protein and iron because it is a taboo to consume them.

In Ghana negative cultural practices also play a role in causing malnutrition. In certain traditional areas, especially in the northern part of Ghana children are denied access to meat and eggs which are the best source of protein and essential nutrients because it is

believed that when they are given, they would become thieves in future. Also colostrum was not given to first born children until recently, in many rural northern Ghanaian communities until certain “traditional cleansing of the mother took place” in the name of culture and tradition (Hampshire 2010:2).

2.4.3 Poverty

Poverty denies the rights of a child. It weakens a child’s protective environment and this may contribute to malnutrition of the child, ill health, impaired physical and mental development, among others. Chronic malnutrition results in the child, not likely to growing and developing to his/her full potential and this may lead to poor performance in school. Consequently, affected children are more likely to drop out of school early and work at occupations below the poverty line. Some may not find work at all (UNICEF 2004:1).

2.4.4 Status of women

The lower status of women affects their care practices and their ability to provide care for their children. They may have less autonomy in decision making, less control over time and resources and lower access to resources, health and nutritional well-being (Engle 2002:110). In many families in India where the main decision makers are the parents-in-law, targeting the mother for behavior change may be ineffective (Engle 2002:111). In South Asia women are discriminated and have poor access to education. As such they have low levels of participation in paid employment and this affects the child negatively (Engle 2002:111).

2.4.5 Educational level of parents

Globally, one can find more women working to supplement income in the home. This happens particularly in the early years of their children’s lives. Poverty may be a cause of this change and this often puts children at risk of poor nutritional status especially when they are infants (Engle 2002:112).

Salah, Mahgoub, Bandeke and Nnyepia (2002:195-199) did a cross-sectional descriptive study on the practices, attitudes, patterns and the socio-cultural factors

affecting breastfeeding in Botswana. About 76.4% of mothers (50) chosen for the study were single and a high proportion of them had primary or secondary education, 59.3% had a high level of information about breastfeeding mainly obtained before conception, 94.4% of mothers believed that breastfeeding was better than bottle feeding and 95% breastfed their children immediately or a few hours after delivery. More than 85% of mothers were planning to continue breastfeeding for 18 months or more. The mothers who stopped breastfeeding did so because of their work or school.

In another study Salah et al (2002:195-199) evaluated the level of malnutrition and the impact of some socio-economic and demographic factors of households on the nutritional status of children less than 3 years of age in Botswana. A descriptive cross-sectional survey was done using a structured questionnaire and measurements of weight and height. Four hundred households representing the twenty three health regions of Botswana participated in the study. The factors included: the number of children under 3 years of age in the family, occupation of the parents, marital status, family income, parental education, maternal nutritional Knowledge, residence location (urban or rural), gender, and breastfeeding practices. Reference standards used were those of the National Centre for Health Statistics (NCHS). Epi Info Software Version 5 was used for data entry and analysis. The results showed that the level of wasting, stunting, and underweight in children under 3 years of age was 5.5%, 38.7%, and 15.6% respectively. Malnutrition was significantly ($p < 0.01$) higher among boys than girls. Underweight was less prevalent among children whose parents worked in the agricultural sector than among those whose parents were involved in informal business. Children brought up by single parents suffered a significantly higher ($p < 0.01$) level of underweight than children living with both parents. As family income increased the prevalence of underweight decreased significantly ($p < 0.01$). Those children who had a lower level of underweight had mothers with higher level of education. Breastfeeding was found to reduce the occurrence of underweight among children.

Sika-Bright (2010:14) studied the socio-cultural factors that influence infant feeding practices of 147 mothers of infants 0-6 months visiting a child welfare clinic at the Central Regional Hospital in Cape Coast, Ghana.

The mothers were not exclusively breastfeeding as much as they should, instead majority of them were practicing mixed feeding. The study showed that current infant

feeding practices was found to be associated ($p < 0.05$) with the following demographic variables: age of last baby, marital status of mother, level of education and employment status of mother.

Studies have shown that despite the progress in India, malnutrition continues to be compromised in too many of its citizens especially infants and children. In India data collected from the National Family Health Survey (NFHS) in 1992-1998 revealed a slight decrease from the 1992-1993 survey in the percentage of children underweight from 51% to 46% at an average reduction of 0.8% per year. It was indicated that in 1992-1993, 51% of women did exclusive breastfeeding. However some studies have shown rates of 3% or less when a more rigorous definition of exclusive breastfeeding is used than the NFHS survey (Engle 2002:110).

2.5 CONCLUSION

This chapter discussed the reviewed literature on malnutrition, feeding practices and the possible factors impacting on feeding practices that lead to malnutrition.

Chapter 3 describes the research design and methodology.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research methodology which refers to the steps, strategies and procedures used for data gathering and analysis in research (Polit & Beck 2008:758). This includes the research design and method, population, data collection and analysis, ethical considerations and internal and external validity of the study. The study employs a quantitative descriptive design to determine the factors impacting on the feeding practices of infants 0-12 months that lead to malnutrition.

The purpose of this study is to explore the factors that impact on feeding practices of infants 0-12 months, encountered in the child welfare clinic in Tema Manhean Health Centre. The research design and method facilitated the attainment of the following research objectives: These were to

- identify the common feeding practices of infants 0-12 months in the Tema Manhean Child Welfare Clinic
- determine the possible factors that lead to malnutrition

3.2 RESEARCH SETTING

According to Burns and Grove (2005:25), a setting is a location where research is conducted. This study was done in Tema Manhean Child Welfare Clinic, where data was collected from the mothers or guardians of infants 0-12 months who visited the clinic. Tema Manhean is one of the slum settlements in the Tema Metropolitan Area in Ghana. It is a rural settlement which is located on the Eastern Flang of Tema Fishing Harbour, near Tema Naval Base.

3.3 RESEARCH DESIGN

The following section contains the definition of a research design, the rationale for the choice of the selected design and the description of the concepts used in the design.

3.3.1 Definition of research design

A research design is the researcher's overall plan for obtaining answers to the research objectives. It refers to the framework of theories and principles on which methods and procedures are based (Polit & Beck 2004:732). According to Brown and Green (2009:32), a research design is more than just the data collection methods used such as interviews and questionnaire – it refers to the logic of how data will be collected. Babbie and Mouton (2007:272) state that two steps need to be followed in the research design; the researcher must identify what he or she wants to find out and then determine 'the best way to do it. The purpose of a design is to control and thus to improve the validity of the study in examining the research problem (Burns & Grove 2005:231).

A cross-sectional, quantitative and exploratory design, which is descriptive in nature was used in this research.

3.3.2 Rationale for the choice of the research design

Literature on feeding practices of infants was explored nationally and internationally, however, in Tema Manhean research and literature was limited. Therefore a cross-sectional exploratory and descriptive design was deemed to be most appropriate, because the study sought to obtain new information on an area of interest (Wood & Ross-Kerr 2006:121). Furthermore, this design was considered because it is more manageable and efficient in terms of time and money. The results are more readily available because large amounts of data can be collected at one point in time (Brink, Van der Walt & Van Rensburg 2012:101).

3.3.3 Description of the related research concepts

The following section describes the various concepts related to the research design as referred to in section 3.3.1.1.

3.3.3.1 Quantitative design

Quantitative research is “a formal, objective, systematic process in which numerical data are used to obtain information about the world.” A Quantitative research method is used to describe, examine relationships among variables and examine cause- and effect interactions among variables (Burns & Grove 2005:23). The advantage of using measurement is that numbers have the advantage of being exact and can be analysed using descriptive and inferential statistics. Quantitative research was appropriate for this study because it explored and described numerical data on the factors that impact on feeding practices that lead to malnutrition as viewed by the participants. This statement is consistent with the view of Polit and Beck (2004:15), who state that quantitative research is a set of orderly and disciplined procedures used to gain knowledge. According to these authors, quantitative research designs are traditional, positivistic and scientific methods used to conduct research by using a series of steps according to a plan of action.

A highly quantitative research design has a high degree of generalisability. Polit and Beck (2004:16) maintain that generalisability is the degree to which findings of a study can be applied to other individuals than those who participated in the study. In this study the research design was quantitative, as the researcher used a structured questionnaire to collect data to make recommendations on how feeding practices could be enhanced. However, due to the limited scope of the area of study, the findings could not be generalised to other similar settings.

This method allowed the researcher to ask the participants the same questions with pre-determined responses which allowed objective data to be collected throughout the study.

3.3.3.2 Exploratory design

Exploratory design aims at investigating the full nature of a phenomenon, the manner of existence, and the characteristics of the subjects thereof, in order to gain additional information on the situation or practice. Exploratory design is done to increase researchers' knowledge on the field of study and provides valuable baseline information for further investigation (Polit & Beck 2006:21).

The need for such a study could arise from the lack of basic information on a new area of interest. In this study literature was reviewed on the factors that impact on feeding practices of infants 0-12 months old.

3.3.3.3 Descriptive design

According to Merroni and Myer (2007:78), a descriptive study in a health care area sets out to quantify the extent of a health problem or the burden of a disease in a population. It often takes the form of a survey or a summary of routine data.

Burns and Grove (2005:232) explain a descriptive study design as a design that provides a picture of situations as they occur naturally. They also provide information about characteristics within a particular field of study. Descriptive study designs describe situations, preferences, practices, opinions, concerns or interests of the phenomenon of interest (Polit & Beck 2006:189). This study described feeding practices and factors that lead to malnutrition of infants in a child welfare clinic at Tema Manhean Health Centre.

3.3.3.4 Cross-sectional design

A cross-sectional study is done at a specific point in time. All the information on a specific topic is collected at the same time from the participants and no identical study is done after a specific period. A comprehensive in-depth study is done of the specific phenomenon or problem of concern. A description of the relationships among phenomena or the status of the phenomena at a fixed point in time is investigated. The results of a cross-sectional study is more readily available because large amounts of

data can be collected at one point, it is manageable, cost effective and less time consuming (Brink et al 2012:101).

3.4 RESEARCH METHOD

The research methodology outlines the research process and the tools needed to achieve the research objectives (Mouton 2001:56). According to Burns and Grove (2005:211), research methodology is the entire strategy for the study, from identification of the problem to final plans for data collection.

3.4.1 Phases of the research

Table 3.1 Phases of the research

PHASES	APPLICATION
Phase 1	
Conceptual phase	Conceptualising a research project involves reading, creative thinking and obtaining ideas from colleagues and/or advisers.
Identifying the problem	Quantitative research is based on previous knowledge and investigations. A literature review which was undertaken before the commencement data collection was conducted to generate a picture of what was known about the research problem.
Formulating objectives	The researcher formulated research objectives.
Phase 2	
Design and Planning	These are procedures used in data collection and research objectives and they contribute to the validity and reliability of the study.
Selecting a design	The selected study design was appropriate. It minimised bias and enhanced the ability to interpret the study findings. The study design was quantitative, exploratory, and descriptive and cross-sectional (see section 3.3.3).
Identifying the study population	The entire population in which the researcher is interested and to which the researcher would like to generalise the findings (see section 3.4.2). The population for this study consisted of all infants 0-12 months who attended the child welfare clinic in Tema Manhean Health Centre.
Developing the sampling plan	Procedure for the selection of a sample that is representative of the target population (see section 3.4.3). A sample of 390 (three hundred and ninety) infants were selected in total for the study using a systematic random sampling technique. The researcher dealt with available infants, each of which

PHASES	APPLICATION
	had the opportunity to be included in the study. All infants used for the study were selected from Tema Manhean Health Centre.
Ethical consideration	Measures taken to ensure that the rights of participants are protected. This is described in section 3.8.
Finalising the research plan	A pre-test is conducted before data collection to ensure validity of the instrument (see section 3.5.3). Adjustments are made on the questionnaire based on the outcome of the pre-test results and data is collected and analysed.

(Burns & Grove 2005:36; Polit & Beck 2012:331).

3.4.2 Population

The population, sometimes referred to as the target population, is the entire set of individuals or elements who meet the eligibility criteria, which includes a list of characteristics essential for membership (Burns & Grove 2005:342).

The population for this study consisted of all infants 0-12 months who attended the child welfare clinic in Tema Manhean Health Centre.

3.4.3 Sample and sampling

3.4.3.1 Sample

According to Burns and Grove (2005:40), a sample is a subset of a target population selected to participate in a study. The sample should be representative of the study population.

The sample in this study was infants 0-12 months who attended Tema Manhean Child Welfare Clinic during the period of data collection. A sample of 390 (three hundred and ninety) infants were selected in total for the study using a systematic random sampling technique. The researcher dealt with available infants, each of which had the opportunity to be included in the study. All infants included for the study were selected from Tema Manhean Health Centre.

- **Sample size**

Sample size computation

There was no data on prevalence of malnutrition, hence researcher relied on the Ghana Demographic and Health Survey (DHS) (2008) which reported 14% as the prevalence of malnutrition (underweight).

The sample size for this study was determined taking the following factors into consideration.

Estimated proportion of the variables of interest (prevalence of malnutrition for example underweight (14%) as reported in the 2008 Demographic and Health Survey) was unknown (Ghana Demographic and Health Survey 2008:1).

Desired level of confidence, in this case 95% confidence level (standard value of 1.96)

Acceptable margin of error – 5% (standard value of 0.05).

Then relying on the formula based on the simple random sampling:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where n=minimum required sample size

d=margin of error at 5%

z=confidence level at 95%

p=proportion of infants who were malnourished (underweight).

$$\text{Therefore } n = \frac{(1.96)^2 0.14 \times 0.86}{(0.05)^2} = 185$$

However, since sampling was not to be based on simple random sampling (SRS), the value of n was multiplied by the design effect of 2.

Which implied that $n=185 \times 2=370$. This sample size is further increased by 5% to account for contingencies such as non-responses or recording errors ($0.05 \times 370=18.5$). Final sample size= $370+19=389$. This figure was rounded up to 390.

3.4.3.2 Sampling

According to Burns and Grove (2005:341), sampling is the selection of a group of people, events, behaviors or other elements with which to conduct a study. A probability sampling technique was used to select the participating infants. According to Burns and Grove (2005:346), in probability sampling, every element of the population has an opportunity to be included in the sample. In the selection of the sample for this study, a systematic random sampling technique was used. The first participant is chosen at random using a random number and the complete population need not be known before the selection is done. The required sample was obtained by selecting the first participant at random and subsequently selecting the rest at fixed intervals depending on the available queue. Participants who were available during the period of study were used. Only eligible infants that were between the ages 0-12 months and represented by their mothers/guardians who attended the child welfare clinic at Tema Manhean Health Centre during the period of study and agreed to participate in the research were selected. The weights of the infants were recorded from birth up to their present age and this was done in tabular form. This was done to determine which infants were included in the study and also to see which ones were underweight.

Anthropometric measurements were then taken. According to Walsh and Joubert (2007:299), anthropometric measurement of an individual involves obtaining physical measurements and relating these to standards that reflect, among other factors, the health and nutritional status of the individual. Hence malnutrition (under-nutrition, in this case) can be identified. Measures included height and weight as well as age which were used in this study. A salter weighing scale was used to measure the weight of the infants and a microtoise for their height.

The feeding practices of these groups of infants were recorded and they were related to their nutritional status.

3.4.3.3 Eligibility criteria

Eligibility criteria also referred to as sampling criteria include a list of characteristics essential for membership in the target population (Burns & Grove 2005:342).

Inclusion criteria

- Infant must be between 0-12 months.
- Infant must attend child welfare clinic with mother/guardian in Tema Manhean Health Centre where the study was undertaken.
- Mother/guardian must agree to answer questions on behalf of the child.

3.5 DATA COLLECTION

According to Burns and Grove (2005:430), data collection refers to the process involved in selecting participants and gathering data from these participants. The data was collected using a structured questionnaire (see annexure G). Each questionnaire was accompanied by a letter containing information about the purpose of the research and participants' rights regarding voluntary participation (see annexure F). The answers to the participants' questions were completed by the researcher and her research assistants.

3.5.1 Development and structure of the research instrument

The researcher developed the questionnaire after consultation with the supervisors for the study and a professional statistician. The questionnaire was set in English. The data collection instrument (questionnaire) was structured and items collected were derived from research variables which were based on the research problem, purpose, study objectives, and literature review.

The data collection instrument comprised the following sections:

Section A

This section covered participants' general information including demographic data such as age, gender and measures of socio economic status, information on the infant, his or her health status and reason for attending the clinic. The researcher used closed questions in this section which aimed at seeking responses on the demographic profile of mother and infant.

Section B

This covered information on the feeding practices of infants 0-12 months. The section consisted of closed and open questions. The infant's mother/guardian responded to questions on behalf of their infants. Questions asked included those pertaining to breastfeeding and weaning of the infant, types of food given during weaning and cultural practices of the family.

Section C

This covers information on malnutrition of infants 0-12 months. The section consisted of open and closed questions. Anthropometric measurements were taken and mothers/guardians were asked whether they knew why their child was not gaining weight.

3.5.2 Rationale for the selected instrument

The data collection instrument used was a self designed questionnaire and administered to mothers/guardians who brought their infants to Tema Manhean Child Welfare Clinic during the period when data was being collected.

The questionnaire was designed such that the same questions were used for all the participants to ensure consistency of responses.

3.5.2.1 *Advantages of questionnaire*

A questionnaire was suitable because:

- They are less expensive in terms of time and money.
- Data can be obtained from a large group of people.
- Bias is minimal because questions are presented in a consistent manner.
- They are designed to determine facts about the participants (Burns & Grove 2005:398; Polit & Beck 2006:296).

3.5.2.2 *Disadvantages of questionnaire*

In a questionnaire the questions tend to have less depth. The participants are unable to elaborate on responses or ask for clarification if all questions are closed. The researcher used both open and closed questions which thus does not apply to the study (Burns & Grove (2005:398; Polit & Beck 2006:296).

3.5.3 Pre-testing of the instrument

Pre-testing is a small scale version, or trial run, done to ensure validity of the instrument in preparation for a major study. It is conducted to identify possible gaps in the research instrument. Information obtained during pre-testing may be used to improve the questionnaire (Burns & Grove 2005:215). According to Polit and Beck (2006:296), a pre-test is a small-scale trial of the data collection instrument to determine clarity of questions and whether the instrument elicits the desired information.

To identify gaps in the questionnaire the structured instrument was pre-tested with five participants who fit the sampling criteria and attended the child welfare clinic but were not part of the study before the main data collection for the study took off.

This exercise helped to identify difficult or ambiguous questions in terms of language and also to estimate the time needed to complete a questionnaire. Adjustments were made based on the outcome of the pre-test results. Evidence regarding the adjustments are obtainable from the researcher.

3.5.4 Administration of the questionnaire

Before data were collected consent was obtained from the mothers and guardians of the participants (infants). Six research assistants fluent in English and Ga (local language spoken in Tema Manhean) were trained by the researcher. The programme of the training of the research assistance is obtainable from the researcher (see annexure H). Each instrument was numbered before data collection. During the process each assistant was visited by the researcher in the child welfare clinic to do spot checks on how they completed the questionnaires.

The responses of the completed questionnaires were checked for consistency, as well as completeness. The research assistants were monitored by observation and where necessary corrections were made on the spot. Proof of the cleaning of the questionnaires is obtainable from the researcher.

3.6 DATA ANALYSIS

Data analysis involves quantifying and statistically reducing raw data in order to make interpretation and conclusions (Burns & Grove 2005:452). According to Burns and Grove (2007:41), data analysis refers to techniques used to reduce, organise and give meaning to people.

3.6.1 Data management

Data were collected on the feeding practices of infants using a structured questionnaire. The data were analysed by a statistician who captured data by using statistical analysis software CPro (Census and Survey Processing System) Version 4.1. The entered data was validated for consistency. Thereafter, the data was exported into Statistical Package for Social Science (SPSS) Version 20 and analysed.

Exploratory diagnostic analysis was conducted to check for data irregularities, test assumptions, and outliers prior to the actual analysis. Descriptive and summary statistics were examined, with continuous data presented as means and standard deviations and discrete data presented as frequencies and percentages. Bivariate analysis to examine the associations between various factors (maternal characteristics)

and sub-optimal feeding practices of infants was examined using the chi square tests. Further analysis using simple logistic regression models was done; covariates were included to adjust for confounding. A p-value of 0.05 was used to determine significance.

3.7 VALIDITY AND RELIABILITY

3.7.1 Validity

Validity refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration (Babbie & Mouton 2007:122). According to Polit and Beck (2006:329), validity is the extent of accuracy of an instrument to measure the construct it is supposed to measure in the context of the variables being used. The research instrument was assessed for face, content and construct validity.

3.7.1.1 Face validity

Face validity refers to subjective judgment on whether the research instrument appears to measure what it is supposed to measure (Burns & Grove 2005:376). Face validity was maintained by constructing questions relevant to the study and the pre-test. The questionnaire was evaluated by three supervisors and a statistician to check its appearance, consistency and whether it measured what it was supposed to measure. Changes were made according to the feedback of the supervisors and statistician after review.

3.7.1.2 Content validity

Content validity ensures that all components of the variables to be measured are included in the questionnaire (Burns & Grove 2005:377). Content validity was ensured by conducting an in-depth literature review in the area of study, pre-testing the questionnaire before data collection and consulting knowledgeable people, for example supervisors who advised in diverse ways and a statistician who helped in the analysis of data collected.

3.7.1.3 Construct validity

Construct validity ensures that the concepts or variables are measured adequately and logically, and relationships between variables are identified with the instrument based on theory, and clear operational definitions (Burns & Grove 2005:217). In this study the questionnaire was based on literature reviewed and the relevance to the variables in the study.

3.7.2 Reliability

Reliability of the data collection instrument is the degree of consistency with which it produces the same results every time it is implemented in the same situation or used by different investigators (Burns & Grove 2005:374; Polit & Beck 2006:324,328). To ensure reliability of the questionnaire the researcher phrased questions carefully and accurately to avoid ambiguity. The questionnaire was pre-tested on participants to ensure consistency, accuracy and dependability.

3.8 ETHICAL CONSIDERATIONS

Research ethics involves protecting the rights of the participants and the institution in which the research was done and maintaining scientific integrity. Ethical principles on which standards of ethical conduct in this research are stated below:

To ensure the ethical conduct of the study, the researcher observed the following principles:

- **Informed consent**

Permission to do the study was granted by the higher degrees committee of University of South Africa (Unisa) (see annexure A) and ethical clearance was sought from the Ethical Review Committee of the Ghana Health Service (see annexure A).

Informed consent was sought from parents/mothers/guardians of the infants selected for the study (see annexure F) and permission was sought from the institutions involved, which included, the Child Welfare Clinic in Tema Manhean Health Centres (see

annexure C) and Tema Metropolitan Health Directorate (see annexure E). This was done in the form of letters. The researcher stated specific and essential information in these letters which included the purpose of the study, explanation of study procedures, description of risks and discomfort, benefits of the study, voluntary participation, option to withdraw from the study and ethical approval.

Anonymity was ensured. The researcher made sure that data obtained did not have any identifying information of the participant, for example name of participant and their address.

Privacy and confidentiality was maintained throughout the study. There was no intrusion into participants' personal lives and the researcher and research assistants assured participants that any information they provided would not be publicly reported in a manner that identifies them or made accessible to unauthorised persons.

- **Principle of beneficence**

This principle holds that one should do good and above all do no harm. The researcher therefore conducted the study to protect participants from discomfort and harm.

- **Right to protection from discomfort and harm**

The researcher ensured that the study was done in a safe environment and that no physical harm which includes injury or undue distress was caused to participants. There was no intrusion whatsoever on participants psyche by phrasing questions appropriately.

- **Benefits and risk ratio**

The researcher ensured that the potential benefits of the study outweighed the potential risks to be taken by participants in order to protect them from harm. In the study, there was no risk posed to the participants. The level of risk was described as low. However, participants were assured that in case of any psychological problems as a result of inappropriate questions which would depend on the level of understanding of each

individual, the researcher would resort to the assistance of counselors in Tema Manhean Health Centre

- **Freedom from exploitation**

The researcher assured participants that their participation or the information they provide to the researcher would not be used against them in any way. The participants were encouraged to be as frank as possible.

- **Principle of respect for human dignity**

This principle includes the right to self-determination and the right to full disclosure.

- **The right to self-determination**

It was ensured that the mother/guardian (representing the infant) had a degree of independence in this study. In other words they were autonomous. The researcher ensured that these participants had a right to decide voluntarily at any point to terminate their participation without any penalty, to refuse to give information or to ask for clarification about the purpose of the study or to any specific study procedures.

- **The right to full disclosure**

The researcher fully disclosed in writing (see annexure A), the nature of the study, the participant's right to refuse participation, the researcher's responsibilities, and the likely risks and benefits that would be incurred.

- **Principle of justice**

This principle includes the participants' right to fair treatment and their right to privacy.

- **Right to fair treatment**

Participants were fairly treated before, during and after the study. Participants were treated with respect and courtesy at all times and selected for participation in a fair and nondiscriminatory manner based on research requirements; honoring agreements made between the researcher and the participant, including adherence to all procedures outlined at the beginning of the study.

- **The right to privacy**

The researcher ensured that the study did not go beyond the level of intrusion than was needed to be and that the privacy of participants' was maintained throughout the study. Participants had a right to expect that any information collected during the course of the study was kept in the strictest confidence.

- **Vulnerable population**

The rights of the mother/guardian and infant needed to be protected through additional procedures and heightened sensitivity on the part of the researcher since they were vulnerable. The researcher informed these vulnerable participants of their right to refuse participation and their right to terminate participation (see Annexure A). In the study the infants were considered vulnerable and could not make informed decisions so their mothers/guardians stood in for them.

Questions were phrased appropriately such that there was no intrusion on the psyche of participants. In the event that participants could be affected psychologically, the researcher could engage the assistance of a counselor in the Tema Manhean Health Centre.

In Ghana the Convention on the Rights of the Child (CRC) was adopted by the United Nations General Assembly in November 1989 and was implemented in September 1990. The CRC identifies childhood as an important stage in one's life. As such it details the rights of all children to survival and life, moral and intellectual development, and protection from harmful influences and active participation in social and cultural life

(World Education 2006:11). In effect the CRC protects children with emphasis on those who are vulnerable.

3.9 CONCLUSION

This chapter described the research design and methodology used in the study, including sampling, data collection, data analysis, validity and reliability of the study and ethical considerations.

Chapter 4 discusses the results and discussions of the study.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 INTRODUCTION

This chapter presents the results and discussions of the study. The purpose of this study was to explore the factors that impact on feeding practices of infants 0-12 months, encountered in the child welfare clinic in Tema Manhean Health Centre.

In the case where 'other' was requested in the questionnaire, it was analysed by hand by the researcher and reported on.

4.2 DATA COLLECTION

Data were collected from participants using a structured questionnaire, which consisted of three sections:

Part A: Demographic data

Part B: Feeding practices (Identifying feeding practices of participants)

Part C: Malnutrition (Factors that could lead to malnutrition)

The population for this study consisted of all infants (1172) who attended the child welfare clinic in Tema Manhean Health Centre. A sample of 390 infants participated in this study.

4.3 RESULTS

The data were analysed by a statistician who captured data by using statistical analysis software CPro (Census and Survey Processing System) Version 4.1. The entered data was validated for consistency. Thereafter, the data was exported into Statistical Package for Social Science (SPSS) Version 20 and analysed. Epi Data was used to compute the nutritional status of infants.

Exploratory diagnostic analysis was conducted to check for data irregularities, test assumptions, and outliers prior to the actual analysis. Descriptive statistics were examined, with continuous data presented as means and standard deviations and discrete data presented as frequencies and percentages. Bivariate analysis to examine the associations between various factors (maternal characteristics) and sub-optimal feeding practices of infants was examined using the chi square tests. Further analysis using simple logistic regression models was done; covariates were included to adjust for confounding. A p-value of 0.05 was used to determine significance.

4.3.1 Part A: Demographic data

The demographic data collected included gender, age, marital status, educational level, employment and occupation, religion, number of births a mother have had and finally, the status of birth-whether child is dead or alive.

4.3.1.1 Infants' gender

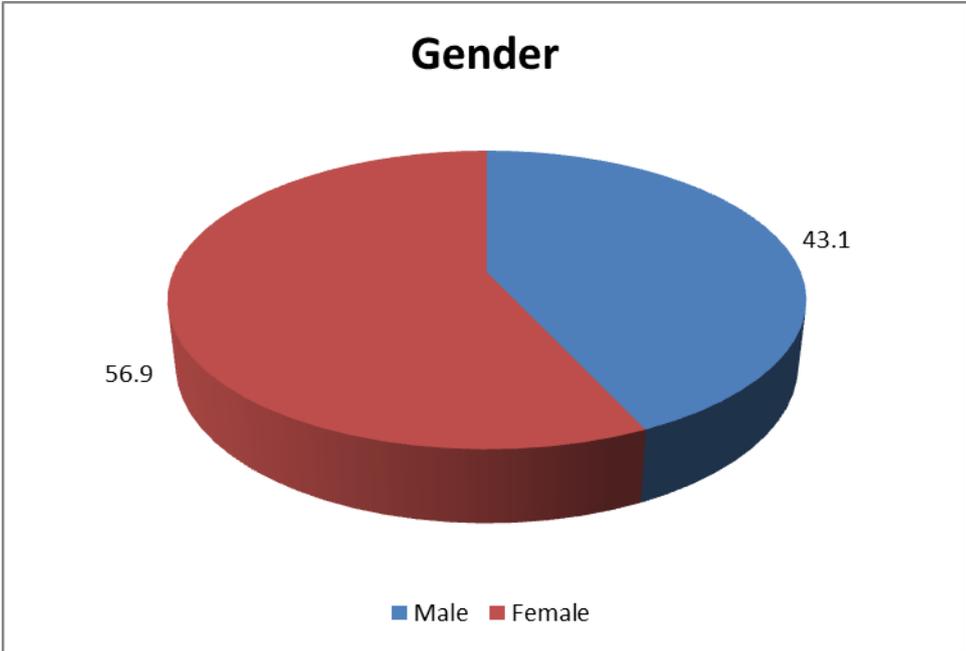


Figure 4.1 Infants' gender (N=390)

Out of the 390 infants that participated in the survey, 56.9% were females. Thus more female than male infants were investigated in the study but it was revealed that gender

did have a significant relationship with nutritional status (OR=5, 95% CI 3.012 – 8.28) (see table 4.14).

4.3.1.2 Age of mothers and their infants

The ages were categorised under two main headings and that is:

- Age group of infant
- Age of mothers

Table 4.1 Age mother and infant (N=390)

	Frequency	Percent
Age group of infant		
1-5 months	27	6.9
6-12 months	363	93.1
Total	390	100.0
Age of mother (years)		
17-20 years	57	14.6
21-25 years	179	45.9
26-30 years	89	22.8
31-35 years	60	15.4
Above 35 years	5	1.3
Total	390	100.0

Under the ages of infants, 6.9% (n=27) were between 1 to 5 months and 93.1% (n=363) were between 6-12 months. Mothers within the age bracket 21-25 years were the highest among the groups representing 45.9% (n=179). This was followed by mothers between 26-30 years old representing 22.8% (n=89) and mothers between 31-35, 15.4% (n=60) while mothers above 35 years recorded the lowest, representing 1.3% (n=5). A Pearson chi square test (table 4.13) found a significant relationship between mothers' age and nutritional status (chi square value=12.54, p=0.014). This is in agreement with a study in Cameroon by Pascale, Laure and Enyong et al (2007:260) which revealed that malnutrition was related to mothers' age. The researchers found that mothers in the age category (25-35) years had their infants well nourished.

4.3.1.3 Mothers' marital status

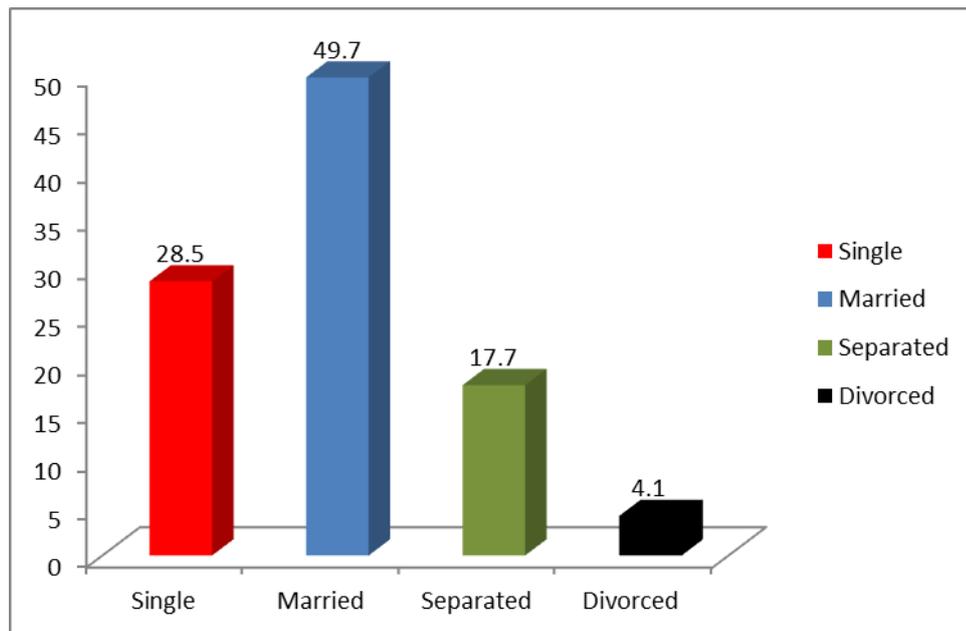


Figure 4.2 Mothers' marital status (N=390)

Of the mothers, 49.7% (n=194) were married, 28.5% (n=111) were single, 17.7% (n=69) were separated and 4.1% (n=16) were divorced. Married women may obtain some support from their husbands in the form of financial, emotional, psychological and encouragement to enable them to feed their infants properly. Table 4.13 showed that 53.4% (n=103) of the infants whose mothers were married had normal weight. This can be compared to a study done by Abuya, Ciera and Kimane-Murage (2012:5) who found that mothers' marital status significantly determine a child's nutritional status ($p < 0.5$).

4.3.1.4 Level of education of mother

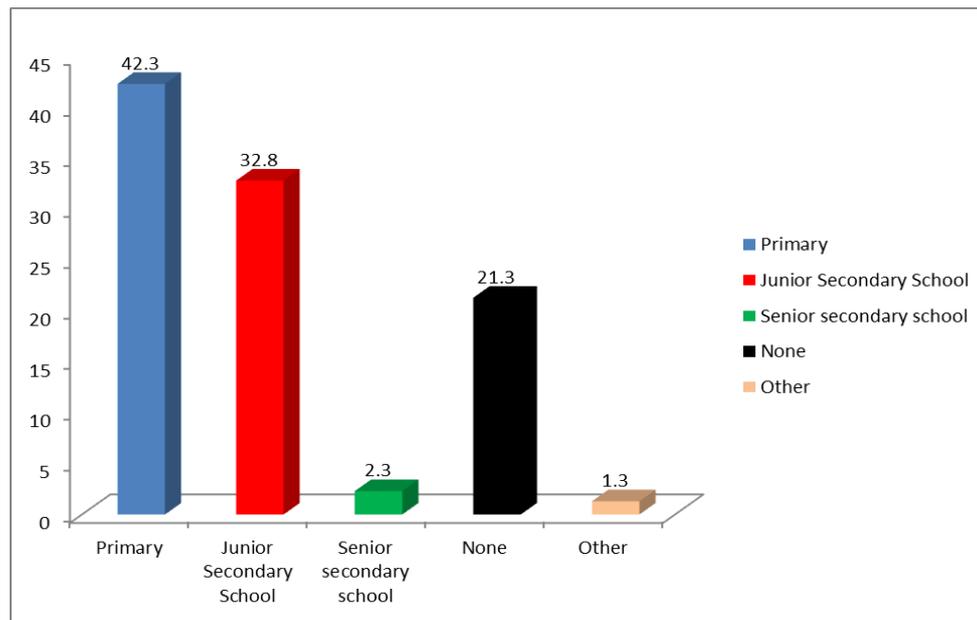


Figure 4.3 Mothers' level of education (N=390)

Figure 4.3 depicts that the largest group of the mothers representing 42.3% (n=165) were primary school leavers, 32.8% (n=128) of them were junior high school leavers, 2.3% (n=9) were senior high school leavers and 21.3% (n=89) represented those with no education and 1.3% (n=5) those who had other educational qualifications respectively. From the above information more than average of the mothers had education up to a level. In this study Pearson chi square test (table 4.13) found a significant relationship between the level of education of the mothers and the nutritional status of their infants (chi square value=17.38, p=0.002). This showed that mothers who were educated had their infants well-nourished and this is in accordance with the two studies below. According to Salah, Mahgoub, Babdeke and Nnyepia (2006:2), children who had a lower level of underweight had mothers with higher level of education. In another study by Abuya et al (2012:10) which revealed that mothers' educational status, is a strong predictor of child's nutritional status especially in urban slum settings.

4.3.1.5 Employment

Table 4.2 Mothers' employment status (N=390)

Employment status	Frequency	Percent
Employed	101	25.9
Unemployed	177	45.4
Self-employed	112	28.7

Of the mothers who participated in the study, 45.4% (n=177) were unemployed, 28.7% (n=112) were self-employed and the remaining 101 representing 25.9% of the mothers were employed. Unemployed mothers 45.3% (n=77) had their infants more underweight than the employed 30.0% (n=51) and self employed 24.7% (n=42) (table 4.13). This can be compared to a study by Engle (2002:109), in which women in South Asia were discriminated and had poor access to education. These women had low levels of participation in paid employment which affected their income and thus affected the child's nutrition negatively.

4.3.1.6 Occupation of mothers

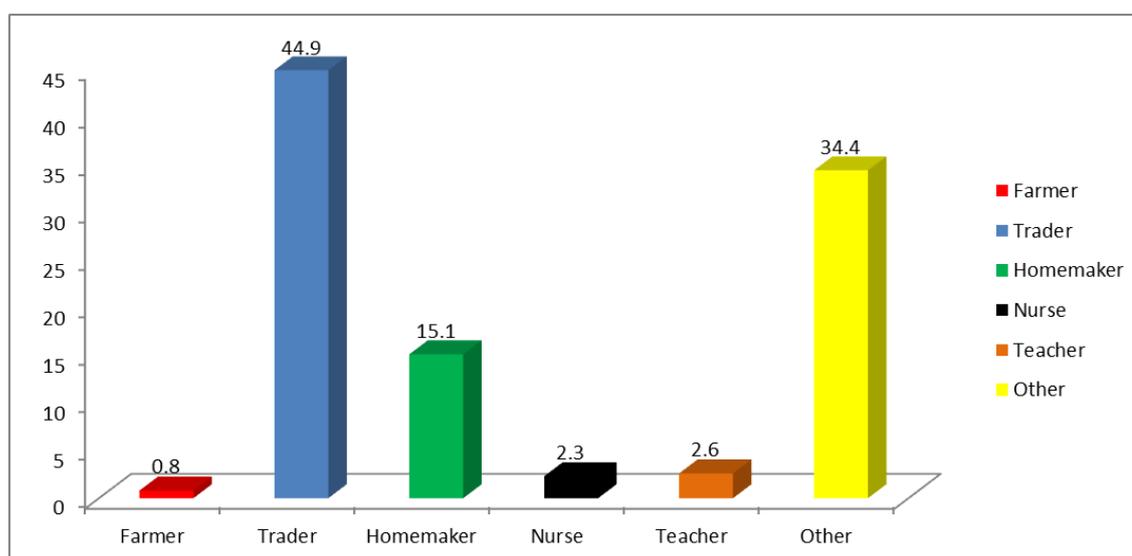


Figure 4.4 Mothers' occupation (N=390)

The study showed that most of the mothers representing 64.9% (n=253) were in the services sector and that consisted of Traders 44.9% (n=175), Home makers 15.1%

(n=59), Nurses 2.3% (n=9) and Teachers 2.6% (n=10) while 0.8% (n=15) were farmers. The remaining 34.4% (n=134) were engaged in other jobs, for example, charcoal selling, washing dishes in a chop bar, helping food sellers, to mention but a few.

4.3.1.7 Religious affiliation of mothers

Table 4.3 Religious affiliation of mothers (N=390)

Religion	Frequency	Percent
Christian	355	91.0
Muslim	31	7.9
African Traditional Religion	4	1.0

From the study, it was shown that most of the mothers were Christians 91% (n=355), 7.9% (n=31) were Muslims and 1.0% (n=4) were members of the African Traditional Religion. Within each religious grouping, families decide which food traditions to follow. For example, certain religions have a tradition of fasting – which could impact on a child’s health.

4.3.1.8 Parity

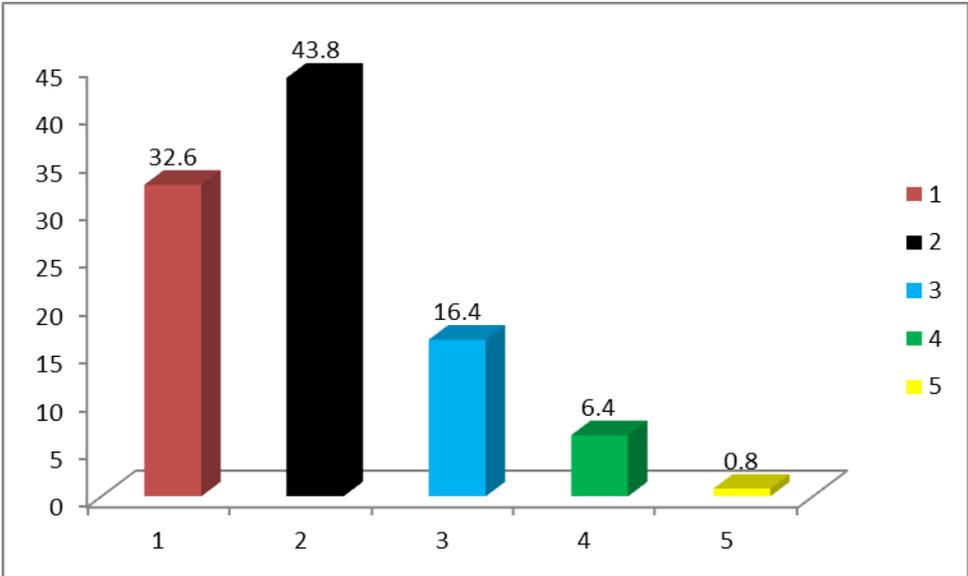


Figure 4.5 Mother’s parity (N=390)

Out of the mothers who participated in the survey, 43.8% (n=171) had 2 children, 32.6% (n=127) had 1 child each, 16.4% (n=64) had 3, 6.4% (n=25) had 4 and 0.8% (n=3) had 5 children. A Pearson chi square test (table 4.13) revealed that parity had a significant

relationship with nutritional status of the infants (chi square=5.93, p=0.0.015). This can be compared to a study done in Nigeria by Ukwuani and Suchindran (2003:2109) who examined the relationship between parity and child nutritional status (stunting and wasting). They found that mothers with high parity had increased stunting of their infants.

4.3.2 Part B: Feeding practices

Feeding practices of participants was assessed in several areas to see whether infants were fed adequately by their mothers. This was also done to determine whether participants had adequate knowledge of breastfeeding, its advantages and disadvantages.

4.3.2.1 *Initiation of breastfeeding*

Table 4.4 Initiation of breastfeeding (N=390)

Initiation of breastfeeding	Frequency	Percent
Within the first hour after birth	180	46.2
After the first hour	210	53.8
Never breastfed my child	0	0.0
Total	390	100.0

Mothers were asked to state how soon they initiated breastfeeding after their child's birth. Of the 390 participants, 46.2% (n=180) indicated that they initiated breastfeeding within the first hour after birth whilst a large number of the mothers, 53.8% (n=210) initiated breastfeeding after the first hour. According to the WHO (2010:1), early initiation of breastfeeding within one hour of birth is proven to help in the development of the new born. It protects the new born from acquiring infections and reduces their mortality. Infants who are partially breastfed or not breastfed at all stand the risk of mortality due to diarrhea and other infections. One of the steps to successful breastfeeding is to help mothers initiate breastfeeding within one half hour of birth.

Simple logistic regression model (table 4.16) revealed that initiation of breastfeeding (OR=0.66, 95% CI 0.43–0.99) was significantly related to the nutritional status.

4.3.2.2 Exclusive breastfeeding

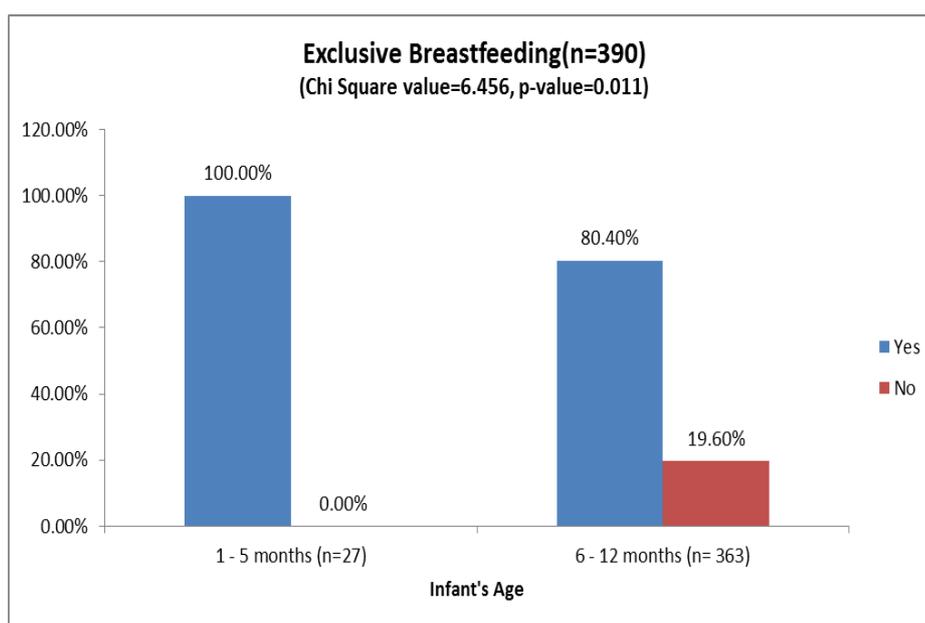


Figure 4.6 Exclusive breastfeeding (N=390)

Mothers were asked to specify if they exclusively breastfed their infants. All infants 100% (n=27) in the study between the age range 1-5 months exclusively breastfed their infants whilst those in the age range 6-12 months 80.4%, (n=290) were exclusively breastfed leaving 19.6% (n=71) fed with other food supplements. The age of infants showed a significant relationship with the practice of exclusive breastfeeding (chi square value=6.456, p-value=0.011) The WHO has recommended exclusive breastfeeding during the first six months of life followed by the introduction of adequate complementary feeding which should begin at six months of age (WHO 2010:4). The benefits that exclusive breastfeeding has includes supporting the immune system and protecting infants against intestinal infections which is observed both in industrialised and developing countries. This study revealed that a large number of infants 81.8% (n=319) were breastfed by their mothers which is in line with the WHO guideline. From table 4.15 it was realised that a larger number of infants who were not exclusively breastfed were underweight 84.1% (n=143) as compared to infants who were exclusively breastfed 77.2% (n=149). A Pearson chi square test found a significant relationship between exclusive breastfeeding and nutritional status (chi square value 2.747, p=0.097). This is in agreement with a study done by Imonikebe and Iroritereye (2009:1) on the breastfeeding practices and infant nutritional status in Nigeria. They found that infants who were exclusively breastfed had normal nutritional status.

4.3.2.3 Frequency of breastfeeding

Table 4.5 Frequency of breastfeeding (N=390)

Frequency in breastfeeding	1-5 Months		6-12 Months	
	Frequency	Percent	Frequency	Percent
More than two hours	27	100.0	190	52.3
Every hour	-	-	122	33.6
Every two hours	-	-	35	9.6
Less than an hour	-	-	16	4.4
Total	27	100.0	363	100.0

Table 4.5 indicates that 100% (n=27) of mothers in the age group 1-5 months were fed in intervals of more than two hours, while 52.3% (n=190) of infants aged 6-12 months were fed in intervals of more than 2 hours. A large number of infants 33.6% (n=122) were fed hourly while 4.4% (n=16) were fed less than hourly.

4.3.2.4 Complementary feeding

Table 4.6 Type of complementary foods given to infants

Type of food given(multiple response)	Age group of child		Total
	1-5 months	6-12 months	
Infant formula	8 (15.4%)	44 (84.6%)	52
Koko (maize-based fermented porridge)	8 (3.8%)	201 (96.2%)	209
Rice and stew	0 (0.0%)	249 (100.0%)	249
Kenkey and soup/stew	0 (0.0%)	220 (100.0%)	220
Banku and soup/stew	0 (0.0%)	205 (100.0%)	205
Fufu and soup	0 (0.0%)	40 (100.0%)	40
Other	0 (0.0%)	22 (100.0%)	22
Total multiple responses	16	981	997

The study also assessed if mothers gave complementary food to their infants. It was realised that infant formula 15.4% (n=8) and Koko (maize-based fermented porridge) 8 (3.8%) was the ideal complementary foods given to most infants aged 1-5 months. Complementary foods such as rice and stew 100.0% (n=249), Kenkey and soup/stew 100.0% (n=220), Banku and soup/stew 100.0% (n=205) and Fufu and soup 100.0% (n=22) were the main complementary foods mentioned by mothers of infants aged 6-12 months.

A Pearson chi square test found a significant relationship between complementary feeding and nutritional status (chi square value 2.629, p=0.105) (table 4.15). Kalanda et al (2006:406) reveal that infants who were given complementary feeding at the right time had their weights within normal range and vice versa.

4.3.2.5 Age at which mothers gave complementary food to their infant

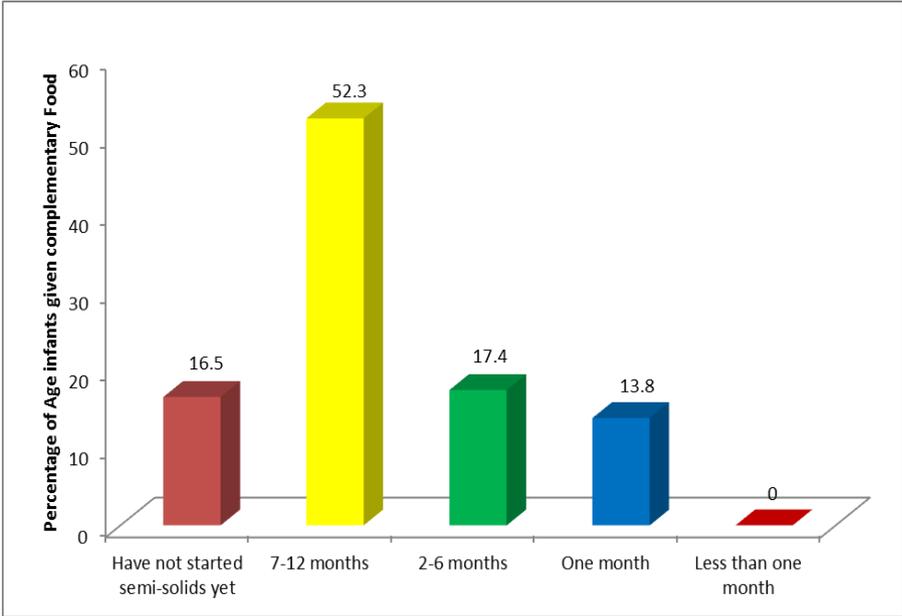


Figure 4.7 Age at which complementary food were introduced (N=334)

The study indicated that 52.3% (n=175) of the mothers gave their infants complementary food when they were aged between 7 to 12 months, 13.8% (n=46) when they were one month old, None of the mothers gave complementary food when their infants were less than a month old, 17.4% (n=58) when they were 2 to 6 months old and 16.5% (n=55) had not started semi-solid foods yet. The study showed that age at which infants were given complementary food had no significant relationship (chi square value=3.001, p-value=0.391) with the nutritional status of the infant (table 4.15).

4.3.2.6 Health education on complementary feeding

Table 4.7 Health education received on complementary feeding (N=390)

	Frequency	Percent
Education on how to give complementary food		
Yes	372	95.4
No	18	4.6
Total	390	100.0
Education on when to give complementary food		
Yes	375	96.2
No	15	3.8
Total	390	100.0
Complementary education on complementary feeding given by		
Mother	27	6.9
Relative	55	14.1
Ghana health service staff	308	79.0
Total	390	100.0
Content of feeding education (multiple response)		
Exclusive breastfeeding for 6 months	331	35.7
Complementary food at 6 months	308	33.3
Type of complementary food to give infant	274	29.6
Other (time intervals)	13	1.4
Total multiple responses	926	100.0

Mothers were to indicate if they had any education on complementary feeding especially on how and when to give complementary food, and if yes, were asked to also indicate who educated them on this important subject. From the information gathered, 95.4% (n=372) said they were educated on how to give complementary food and 96.2% (n=375) said they were educated on when, 4.6% (n=18) said they were not educated on 'how' and only 3.8% (n=15) said they were not educated on when to give complementary food. The study showed that education on how (chi square value=0.446, p-value=0.504) and when (chi square value=0.001, p-value=0.990) to give complementary food had no significant association with the nutritional status of the infant (table 4.15). This can be compared to a study by Imad, Yacoob and Bhutta (2011:525) who found that education of mothers on complementary feeding did not affect nutritional status. They did a study to find the impact of maternal education on complementary feeding on child growth and found that provision of appropriate complementary food with or without nutritional education led to a significant increase in weight and height of infants.

With regards to who educated the mother on complementary feeding, 79% (n=308) indicated that they were educated by Ghana health service staff, 14.1% (n=55) indicated that their relatives educated them and 6.9% (n=27) were educated by their mothers. The mothers indicated that 35.7 of the health education was on exclusive breastfeeding, 33.3% on complementary feeding at, 29.6% was on the food supplement to give infant during complementary feeding and 1.4% was to do with timing of feeding.

4.3.2.7 Foods given to infants

Table 4.8 Foods given to infants (N=390)

	Frequency	Percent (%)
Foods given to infant		
Yes	349	89.5
No	41	10.5
Total	390	100.0
Family food (multiple response)		
Koko (maize-based fermented porridge)	178	18.5
Rice and stew	292	30.4
Kenkey and soup/stew	195	20.3
Banku and soup/stew	239	24.9
Fufu and soup	48	5.0
Other (yam and stew)	8	0.8
Total multiple responses	960	100.0

Table 4.9 Buying cooked food for infants (N=390)

	Frequency	Percent (%)
Buy cooked food		
Yes	181	46.4
No	209	53.6
Total	390	100.0
Food (multiple response)		
Porridge (koko)	99	17.3
Porridge with pepper (Hausa koko)	119	20.8
Rice and stew	156	27.3
Banku and stew/soup	129	22.6
Kenkey and stew/soup	64	11.2
Fufu and soup	2	0.4
Other	2	0.4
Total multiple responses	571	100.0

Mothers were asked to indicate the kind of food they gave to their infants if they indeed did complementary feeding. They indicated whether cooked food was bought or whether the child was given family food. A large number of the mothers, 89.5% (n=349), indicated that foods given to their infants were family foods. Most identified rice and stew (30.4%), banku and soup/stew (24.9%), kenkey and soup/stew (20.3%), Koko (maize-based fermented porridge) (18.5%), fufu and soup (5.0%) and 0.8% for yam and stew (table 4.8).

Of the mothers 46.4% (n=181) also indicated that they sometimes bought cooked food for their infants while 53.6% (n=209) indicated that they didn't buy cooked food for their infants. The mothers who bought cooked food said that 27.3% was rice and stew, 22.6% was banku and stew/soup, 20.8% porridge with pepper (Hausa koko), 17.3% porridge (koko), 11.2% and 0.4% was for kenkey and stew/soup and fufu and soup respectively (table 4.9).

Factors such as food given to infants had no significant association (chi square value=0.018, p-value=0.894) with the nutritional status of the infant. The quality of food given and food bought for infants should be considered carefully. Foods bought for infants might not have the right nutrients and the right consistency to meet the efficiency of the digestive system and might affect the infant's nutritional status. For example, giving the child kenkey and soup.

Table 4.10 Challenges mothers faced when they bought cooked food (N=390)

Challenges faced	Frequency	Percent
Food is expensive (affordability)	77	19.7
Cannot get the right type of food to buy	63	16.7
Infant is not eating properly	229	58.7
Infant is ill	19	4.9
Other (infant cries when food is seen)	2	5.0
Total	390	100.0

The study identified some of the challenges mothers faced when they bought cooked food by sellers. A large number (229) of them representing 58.7% indicated infants did not eat properly if cooked food was given, 19.7% (n=77) agreed food bought was expensive, 16.2% (n=63) lamented on the difficulty in getting the right type of food to buy, 4.9% (n=19) reported that their infants normally got ill if they were fed with this kind

of food and an insignificant number (2) representing 0.5% indicated that infants cried when they saw food. From table 4.15 (chi square=13.590, p=0.009), a Pearson chi square test found a significant relationship between challenges faced in ensuring that infant was well fed.

4.3.2.8 Techniques and eating pattern of infants

Table 4.11 Techniques of feeding

	Frequency	Percent
Does this reflect the way the child is usually fed?		
Yes	140	35.9
No	250	64.1
Total	390	100.0
Technique (multiple response)		
Cup	20	2.9
Spoon and Cup	323	46.6
Hand	255	36.8
Feeding bottle	91	13.1
Other (bowls)	4	0.6
Total multiple responses	693	100.0

Table 4.11 depicts that 2.9% of mothers used only a cup in feeding infant, 93.8% used spoon and cup, 46.6% used their hand, 13.1% used feeding bottle and 0.6% used bowls. The mothers gave multiple responses in the techniques they used in feeding.

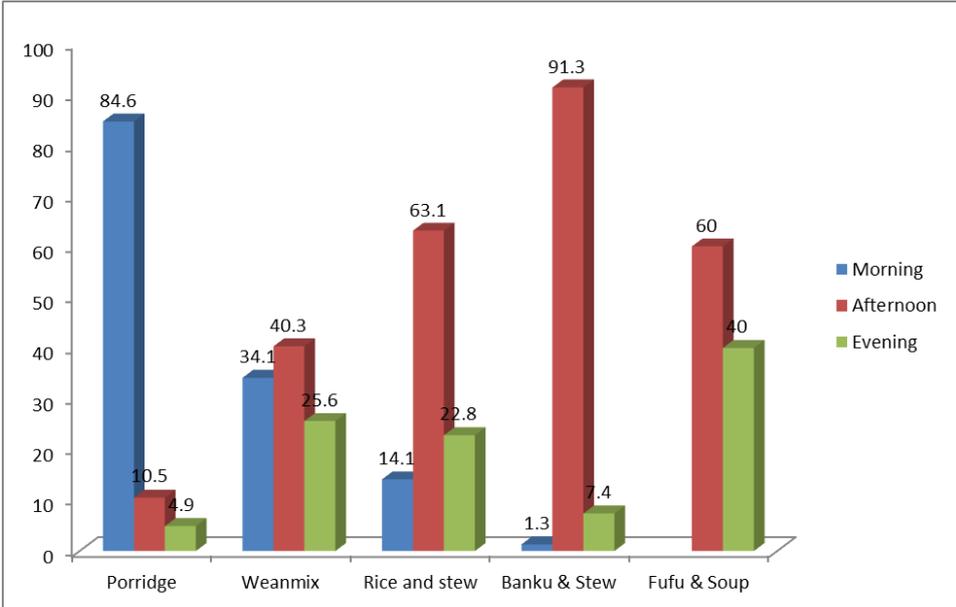


Figure 4.8 Infants' eating patterns

Figure 4.8 indicates that mothers normally fed their infants with porridge in the morning (84.6%), rice and stew (63.1%) or banku and stew (91.3%) or wean mix (40.3%) in the afternoons and fufu and soup (60%) in the evenings. Foods given to individual infants varied for morning, afternoon and evening.

4.3.2.9 Impact of cultural practices with regard to foods given to infants

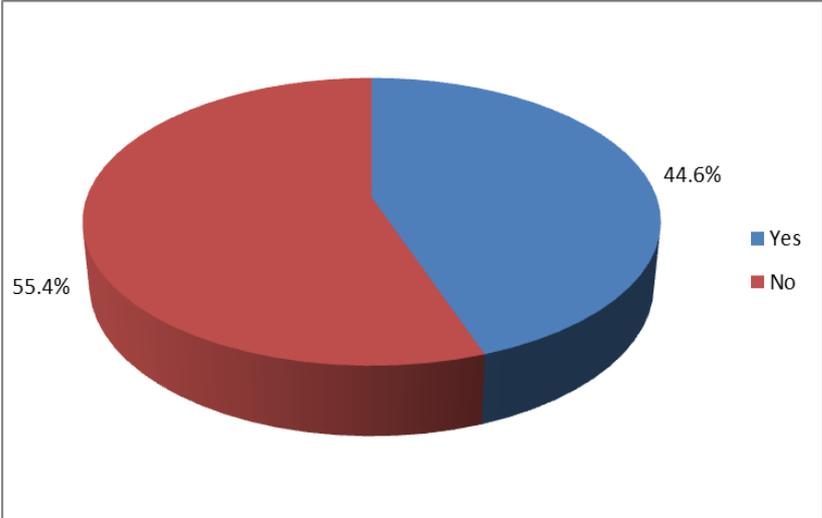


Figure 4.9 Cultural practices (N=390)

Of the mothers, 55.4% (n=216) said that food given to infants had nothing to do with the cultural practices of their area while 44.6% (n=174) dwelt on cultural practices. Some of the practices included: eggs not given to children before they turned one because it was believed that they would not be able to walk if they were given, fish not given to infants before age 1 because it was believed that if given they would be thieves and also get diarrhea, fufu and soup not given to infants before age 1 because it was believed that they would not be able to walk when given. From table 4.15, it was found that mothers who were involved in cultural practices had their infants more underweight (55.9%; n=95) than those who did not practice it 44.1% (n=75).

According to a study done by Awumbila (2003:95), every new infant (“visitor” as they called it) was welcomed into the family with water, or this visitor would “return” to where it came from. This belief was reinforced by the general perception that infants need additional fluids especially water to maintain adequate hydration. The study showed that exclusively breastfed infants maintained adequate hydration even in warm climates. This is in line with results of the study. It shows that without certain cultural practices, infants can have a normal growth.

4.3.3 Part C: Factors that lead to malnutrition in infants

The factors that lead to malnutrition in infants were divided into two sections. These are the demographic background of the participant and their feeding practices. The cultural and religious beliefs were also taken into consideration.

4.3.3.1 *Mother's reason for infant not gaining weight*

Table 4.12 Reasons infant is not gaining weight (N=390)

Why infant is not gaining weight	Frequency	Percent
Infant is not eating properly	193	49.5
Food is expensive	106	27.2
Infant is ill	88	22.6
Other	3	0.8
Total	390	100.0

Under this heading, mothers were asked hypothetically why an infant was not gaining weight. Of the mothers, 49.5% (n=193) attributed it to improper eating, 27.2% (n=106) indicated that infant foods were too expensive, 22.6% (n=88) of them said weight loss was as a result of illness in infants and the remaining 0.8% (n=3) gave other reasons such as infant cried a lot during feeding time, infant was teething hence difficulty in feeding.

4.3.3.2 Malnutrition status of infants

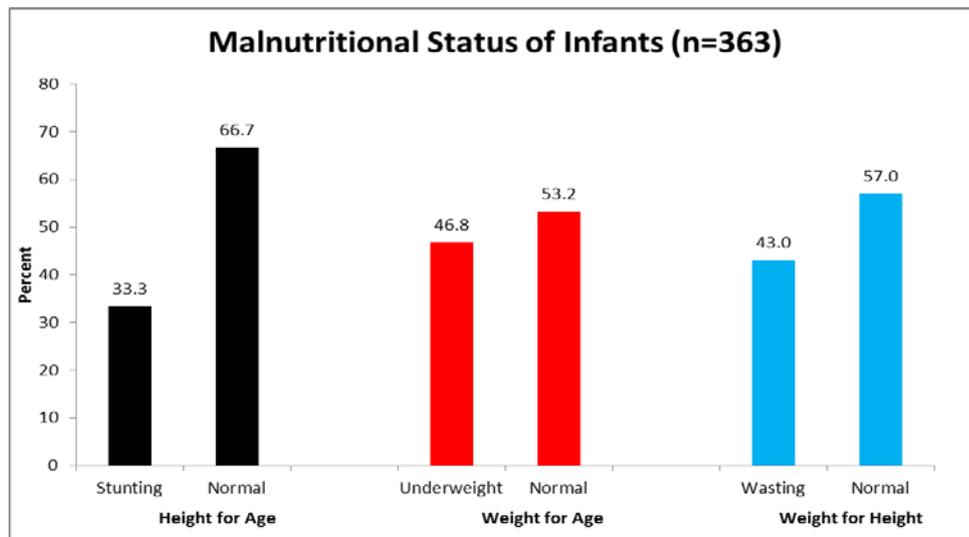


Figure 4.10 Malnutrition status of infants (n=363)

Out of the 390 mothers interviewed, 363 infants' anthropometric measurements were obtained. 33.3% (n=121) were stunted leaving 66.7% (n=242) normal under Height for age. About half of the infants were underweight 46.8% (n=170) leaving 53.2% (n=193) normal under Weight for Age. And lastly 43.0% (n=156) were described as wasted leaving 57.0% (n=207) normal under weight for height. The proportions of stunted (33.3%), Underweight (46.8%) and Wasted (43.0%) show that malnutrition is still high in the community. This is rather higher than the national prevalence (28% of children under the age of 5 are stunted, 14% are underweight and 9% are wasted (Ghana Demographic and Health Survey 2008:10; UNICEF 2010:12).

In this study weight-for-age was the most preferred anthropometric indicator used to describe the nutritional status of the infants. This is because it is easy to measure, cost effective and is suitable for screening. Weight-for-age compares the weight of a child to the weight of a 'normal' child of the same age. Low weight for age of an infant was described as underweight (Walsh & Joubert 2007:299-300).

4.3.3.3 Association and risk factors (socio-demographics of mothers and infant) with malnutrition (underweight) in infants 0-12 months

Table 4.13 Relationship between demographic Information and nutritional status (underweight) of infant

Factors	Nutritional status			Chi square value	P-value
	Underweight	Normal	Total		
Gender					
Male	108 (63.5%)	52 (26.9%)	160 (44.1%)	1	49.08
Female	62 (36.5%)	141 (73.1%)	203 (55.9%)		
Age of infant					
1-5 months	3 (1.8%)	8 (4.1%)	11 (3.0%)	1	1.74
6-12 months	167 (98.2%)	185 (95.9%)	352 (97.0%)		
Age of mother (years)					
17-20 years	30 (17.6%)	19 (9.8%)	49 (13.5%)	4	12.54
21-25 years	76 (44.7%)	91 (47.2%)	167 (46.0%)		
26-30 years	34 (20.0%)	55 (28.5%)	89 (24.5%)		
31-35 years	25 (14.7%)	27 (14.5%)	53 (14.6%)		
Above 35 years	5 (2.9%)	1 (1.0%)	4 (1.4%)		
Marital status					
Single	54 (31.8%)	49 (25.4%)	103 (28.4%)	3	5.31
Married	72 (42.4%)	103 (53.4%)	175 (48.2%)		
Separated	34 (20.0%)	35 (18.1%)	69 (19.0%)		
Divorced	10 (5.9%)	6 (3.1%)	16 (4.4%)		
Educational level					
Primary	83 (48.8%)	74 (38.3%)	157 (43.3%)	4	17.38
Junior Secondary School	38 (22.4%)	75 (38.9%)	113 (31.1%)		
Senior secondary school	5 (2.9%)	4 (2.1%)	9 (2.5%)		
None	44 (25.9%)	35 (18.1%)	79 (21.8%)		
Other	0 (0.0%)	5 (2.6%)	5 (1.4%)		
Employment status					
Employed	51 (30.0%)	50 (25.9%)	101 (27.8%)	2	1.03
Unemployed	77 (45.3%)	88 (45.6%)	165 (45.5%)		
Self-employed	42 (24.7%)	55 (28.5%)	97 (26.7%)		
Parity					
1-2 children	140 (82.4%)	138 (71.5%)	278 (76.6%)	1	5.93
3-4 children	30 (17.6%)	55 (28.5%)	85 (23.4%)		

A Pearson chi square test found a significant relationship between infant's malnutrition status and the gender of child (chi square value=49.08, p=0.001), mothers' age (chi square value=12.54, p=0.014), educational level (chi square value=17.38, p=0.002) and parity (chi square value=5.93, p=0.015) (table 4.13).

From table 4.13 (above) it was revealed that the underweight status was higher in infants 6-12 months (98.2%) than in infants 1-5 months (1.8%).

Mothers who were in the age category 21-25 years (44.7%) had their infants more underweight than their counterparts in the other age categories (table 4.13).

Unemployed mothers 45.3% (n=77) had their infants more underweight than the employed 30.0% (n=51) and self employed 24.7% (n=42) (table 4.13). Other associations are detailed in table 4.13 above.

Table 4.14 Socio-demographic risk factors for malnutrition in infants

Risk factors	Odds ratio (95% Conf. Interval)	P> z p-value
Gender of infant		
Male	5.00 (3.012-8.28)	0.001
Female	1	
Mother's age		
Youthful mother (below 25 years)	2.39 (1.13-5.05)	0.023
Adult or matured mother (above 25 years)	1	
Educational level of mother		
Primary	0.59 (0.31-1.14)	0.119
Junior secondary school	0.37 (0.18-0.74)	0.005
Senior secondary school	0.85 (0.17-4.33)	0.849
None	1	
Parity		
1-2	1.45 (0.86-2.45)	0.160
3-4	1	

Table 4.14 shows the socio-demographic risk factors for malnutrition in infants. The results obtained with simple Logistic regression model revealed that the risk for malnutrition (underweight) was independently associated with gender (OR=5, 95% CI 3.012-8.28). The findings further showed that the incidence of underweight was 5 times higher in males than in females.

Education is a key factor in combating malnutrition in infants and children. Educational level for mothers who attended Junior Secondary School (OR=0.37, 95% CI 0.18-0.74).

Mother's age showed a significant influence on nutritional status of the infant. Underweight was found twice higher in infants from youthful mothers (below 25 years) compared to adult or matured mothers (above 25 years) (OR=2.39, 95% CI 1.13-5.05).

4.3.3.4 Association of feeding practices and malnutrition in infants (underweight)

Table 4.15 Relationship between feeding practices and nutritional status of infant (underweight)

Factors	Nutritional status				Chi square value	p-value
	Under-weight	Normal	Total	D f		
Initiation of breastfeeding						
Never breastfed my child	90 (52.9%)	82 (42.5%)	172 (47.4%)	1	3.962	0.047
After the first hour	80 (47.1%)	111 (57.5%)	191 (52.6%)			
Exclusive breastfeeding						
No	143 (84.1%)	149 (77.2%)	292 (80.4%)	1	2.747	0.097
Yes	27 (15.9%)	44 (22.8%)	71 (19.6%)			
Complementary feeding						
Yes	161 (94.7%)	174 (90.2%)	335 (92.3%)	1	2.629	0.105
No	9 (5.3%)	19 (9.8%)	28 (7.7%)			
At what age did you do complementary feeding?						
Have not started semi-solids yet	22 (12.9%)	38 (19.7%)	60 (16.5%)	3	3.001	0.391
7-12 months	93 (54.7%)	97 (50.3%)	190 (52.3%)			
2-6 months	31 (18.2%)	32 (16.6%)	63 (17.4%)			
One month	24 (14.1%)	26 (13.5%)	50 (13.8%)			
Education on how to give complementary food						
Yes	168 (98.8%)	189 (97.9%)	357 (98.3%)	1	0.446	0.504
No	2 (1.2%)	4 (2.1%)	6 (1.7%)			
Education on when to give complementary food						
No	163 (95.9%)	185 (95.9%)	348 (95.9%)	1	0.001	0.990
Yes	7 (4.1%)	8 (4.1%)	15 (4.1%)			

Complementary feeding education by						
Mother	12 (7.1%)	15 (7.8%)	27 (7.4%)	2	1.561	0.458
Relative	30 (17.6%)	25 (13.0%)	55 (15.2%)			
Ghana Health Service staff	128 (75.3%)	153 (79.3%)	281 (77.4%)			
Foods given to child						
No	160 (94.1%)	181 (93.8%)	341 (93.9%)	1	0.018	0.894
Yes	10 (5.9%)	12 (6.2%)	22 (6.1%)			
Buy cooked food						
Yes	89 (52.4%)	92 (47.7%)	181 (49.9%)	1	0.793	0.373
No	81 (47.6%)	101 (52.3%)	182 (50.1%)			
Challenges faced						
Food is expensive (affordability)	35 (20.6%)	42 (21.8%)	77 (21.2%)	4	13.590	0.009
Cannot get the right type of food to buy	11 (6.5%)	33 (17.1%)	44 (12.1%)			
Infant is not eating properly	112 (65.9%)	109 (56.5%)	221 (60.9%)			
Infant is ill	12 (7.1%)	7 (3.6%)	19 (5.2%)			
Other (cries when food is seen)	0 (0.0%)	2 (1.0%)	2 (0.6%)			
Are there any cultural practices relating to foods given to infants in this area?						
No	75 (44.1%)	96 (49.7%)	171 (47.1%)	1	1.147	0.284
Yes	95 (55.9%)	97 (50.3%)	192 (52.9%)			
Why infant is not gaining weight?						
Infant is not eating properly	113 (66.5%)	80 (41.5%)	193 (53.2%)	3	32.305	0.001
Food is expensive	26 (15.3%)	80 (41.5%)	106 (29.2%)			
Infant is ill	29 (17.1%)	32 (16.6%)	61 (16.8%)			
Other (cries when food is seen)	2 (1.2%)	1 (0.5%)	3 (0.8%)			

A Pearson chi square test (table 4.15) found a significant relationship between nutritional status (underweight) and infant feeding practices such as initiation of breastfeeding (chi square value=3.96, p=0.047) exclusive breastfeeding, complementary feeding, age at which infant was given complementary food, complementary feeding education (by mother, relative, Ghana Health Service Staff), foods given to infant, buying cooked food for infant, challenges faced in ensuring that infant was well fed, cultural practices and lastly why infant was not gaining weight at p-

value less than 0.05 significance level (table 4.15) . This indicated that the feeding practices of the infants influenced their nutritional status. The result further indicated that education on how and when to give complimentary food had no significant relationship with the nutritional status of the child. This means that education on complementary feeding is not a key factor in determining the nutritional status (table 4.15). The mothers were educated by the Ghana Health Service staff but still their infants had a problem with nutrition.

4.3.3.5 Feeding practices and other related factors significantly associated with malnutrition in infants

Table 4.16 Feeding practices and other related factors significantly associated with malnutrition in infant

Risk factors	Odds ratio (95% Conf. Interval)	P> z p-value
Initiation of breastfeeding		
Never breastfed my child	0.66 (0.43-0.99)	0.047
After the first hour	1	
Challenges faced		
Food is expensive (affordability)	2.98 (1.46-6.11)	0.003
Cannot get the right type of food to buy	1	
Reasons why child in not gaining weight		
Child is ill and not eating properly	3.67 (2.23-6.02)	0.001
Food is expensive	1	

Table 4.16 shows related factors associated with malnutrition of infants (feeding practices). Simple Logistic regression model revealed that the risk for malnutrition (underweight) was independently associated with initiation of breastfeeding (OR=0.66, 95% CI 0.43-0.99), Challenges faced in ensuring that the infant was well fed (OR=2.98, 95% CI 1.46-6.11). Child’s illness showed a relationship with malnutrition in this study (OR=3.67, 95% CI 2.23-6.02).

4.4 CONCLUSION

This chapter discussed the results and discussions of the study using graphs, pie charts, frequency tables, descriptive and inferential statistics. The demographic information provided background information on the participants (mothers and infants), the feeding practices of the infants were identified as well as some factors leading to malnutrition.

Chapter 5 concludes the findings of the study, gives its limitations and makes recommendations for practice, education and future research.

CHAPTER 5

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

Chapter 5 concludes, gives limitations of the study and recommendations for strategies to improve feeding practices of infants, and further research.

The purpose of this study was to explore the factors that impact on feeding practices of infants 0-12 months, encountered in the child welfare clinic in Tema Manhean Health Centre.

The objectives of the study were to

- identify the common feeding practices of infants 0-12 months in Tema Manhean Child Welfare Clinic
- determine the possible factors that lead to malnutrition in infants 0-12 months

These objectives were evaluated to determine whether they had been attained.

A cross-sectional, quantitative and exploratory design, which is descriptive in nature was used in this research.

5.2 SUMMARY OF THE RESEARCH FINDINGS

This section is based on the research objectives.

5.2.1 Exploration of the common feeding practices of infants 0-12 months in Tema Manhean Child Welfare Clinic

5.2.1.1 *Initiation of breastfeeding*

Out of 390 mothers, 46.2% (180) indicated that they initiated breastfeeding within the first hour after birth while a larger number of the mothers 53.8% (n=210) indicated they initiated breastfeeding after the first hour. The study revealed that the risk for malnutrition was independently associated with initiation of breastfeeding, using simple logistic regression model (OR=0.66, 95% CI 0.43-0.99) (table 4.16).

5.2.1.2 *Exclusive breastfeeding*

A large number of the mothers, 81.8% (n=319) said they exclusively breastfed their infants for six months as compared to 18.2% (n=71) who said otherwise. This means that most infants who participated in the study were provided with safe and complete nutritional requirements from breast milk. From the study (table 4.15) it was realised that a larger number of infants who were not exclusively breastfed for six months were underweight 84.1% (n=143) as compared to infants who were exclusively breastfed 77.2% (n=149). According to the study, exclusive breastfeeding had a significant relationship with nutritional status (chi square value 2.747, p=0.097). This was compared to a study done in Nigeria by Imonikebe and Iroritereye (2009:1) on breastfeeding practices of infants and their nutritional status. They found that infants who were exclusively breastfed had normal nutritional status.

5.2.1.3 *Complementary feeding*

Complementary foods such as rice and stew 100.0% (n=249), Kenkey and soup/stew 100.0% (n=220), Banku and soup/stew 205(100.0) and Fufu and soup 100.0% (n=220) were the main complementary foods suggested by mothers of infants aged 6-12 months.

Infants either refused the food given to them or depended solely on the breast milk for survival. The study revealed that complementary feeding had an influence on the nutritional status of the infant (chi square value 2.629, p=0.105) (table 4.15).

5.2.1.4 Age mothers give complementary food

The results of the study indicated that 52.3% (n=175) of the mothers gave their infants complementary food when they were aged between 7 to 12 months and 13.8% (n=46) when they were one month old. None of the mothers (0%) gave complementary food when the infant was less than one month old, 17.4% (n=58) when they were 2 to 6 months old and 16.5% (n=55) had not started semi-solid foods yet. The study showed that age at which infants were given complementary food had no significant relationship (chi square value=3.001, p-value=0.391) with the nutritional status of the infant (table 4.15).

5.2.1.5 Health education on complementary feeding

From the findings, 95.4% (n=372) and 96.2% (n=375) agreed that they were educated on how and when to give complementary, 4.6% (n=18) said they were not educated on 'how' and only 3.8% (n=15) said they were not educated on when to give complementary food. This showed that information on complementary feeding was obtained by a larger number of mothers but they still had a challenge in practicing it properly. From the study, education on how and when to give complementary food did not have any impact on the nutritional status of the infant (how chi square=0.446, p=0.504; when chi square=0.001, p=0.990).

Imad et al (2011:525) conducted a study to find the impact of maternal education on complementary feeding on child growth and found that provision of appropriate complementary food with or without nutritional education led to a significant increase in weight and height of infants.

5.2.1.6 Foods given to infant

It was found that most mothers gave their infants family foods (the same food the family prepared at home for their consumption); others bought cooked food for their infants. In spite of the education mothers had from health workers they continued to feed their children in ways that were contrary to what they had been taught. Some of the mothers were compelled to do this because they were faced with numerous challenges which included, lack of funds to buy the right type of food since food was expensive, infant

refusing to eat properly because they did not like the type of food, infant getting ill when fed with a type of food. It is thus implied that the type of food given to infants can have an effect on their nutritional status and this can be confirmed with the results had in the study, that foods given to the infant had a significant relationship with their nutritional status

5.2.2 Factors that lead to malnutrition in infants 0-12 months

The factors that lead to malnutrition in infants were attributed to the following: These are the demographic background of the participants and their feeding practices. The cultural practices were also taken into consideration.

5.2.2.1 The demographic background

- **Mothers' marital status**

Although 49.7% (n=194) were married, 28.5% (n=111) indicated that they were single, 17.7% (n=69) were separated and 4.1% (n=16) were divorced. From the responses of the mothers, it can be said that those who were married were able to feed their infants properly because their husbands supported them as compared to mothers who were divorced, separated or single.

- **Level of education of mothers**

Almost half (42.3%; n=165) of the mothers were primary school leavers, 32.8% (n=128) were junior high school leavers, 2.3% (n=9) were senior high school leavers and the remaining 21.3% (n=89) and 1.3% (n=5) represented those with no education and those who had other educational qualification respectively. From these findings more than 50% of the mothers had education and were more likely to feed their infants better and the infants growing better as compared to those who did not have education. The results obtained with Logistics regression model revealed that the risk for malnutrition was independently associated with educational level for mothers who attended senior secondary school (OR=57.96, 95% CI 0.14-1.34), those employed (OR=3.79, 95% CI 1.13-2.77) and unemployed (OR=5.29, 95% CI 1.28-1.99). . Hence it can be said that education has a significant relationship in infant growth.

- **Employment status**

Of the mothers who participated in the survey, 45.4% (n=177) were unemployed, 28.7% (n=112) were self employed and 25.9% (n=101) of the mothers were employed. Most mothers were unemployed and were not supported by family members or husband or no income to take care of their children and this could affect the growth of their infants. The study showed that an unemployed mother 45.3% (n=77) had infants who were more underweight than the employed 30.0% (n=51) and self employed 24.7% (n=42) (table 4.13).

- **Occupation**

The results revealed that most of the mothers representing 64.9% were in the services sector and that consisted of traders (44.9%), house workers (15.1%), nurses (2.3%) and teachers (2.6%) while 3.8% were farmers. The remaining 34.4% (n=134) were engaged in other jobs such as charcoal selling, washing dishes in a chop bar.

Mothers who were in the “others” category 34.4% (n=134) did not have a skill and hence did not have any substantial job (figure 4.4). A large number of them were doing menial jobs which did not pay a good salary, for example washing dishes in a chop bar, helping someone sell food. The traders amongst them sold items that did not generate much income for example charcoal and toffees.

- **Parity**

Out of the participants in the survey, 43.8% had 2 children, 32.6% had 1 child, 16.4% had 3 children, 6.4% had 4 children and 0.8% had 5 children. Mothers who had more children than they could take care of complained about their finances. . A Pearson chi square test (table 4.13) revealed that parity had a significant relationship with nutritional status of the infants (chi square=5.93, p=0.0015). The high parity of mothers had a significant relationship with the infants’ nutrition, from the study (table 4.13).

5.2.2.2 Cultural practices of participants with regard to foods given to infants

Although 55.4% (n=216) of mothers reported that food given to infants had nothing to do with the cultural practices of their area 44.6% (n=174) dwelt on cultural practices. Some of the practices included: eggs not given to infants before they turned one year old because it was believed that they would not be able to walk or they would become thieves if they were given eggs; fish is not given to infants before age one because they would get diarrhea; fufu and soup were not given to infants before age 1 because it was believed that they would not be able to walk when given. The foods mentioned above are needed for growth of the infant and if they are not included in their diet, the growth rate would be low. From the study, cultural practices of the mothers had a significant relationship with the infants' nutritional status. From the results in table 4.15, it was found that mothers who were involved in cultural practices, infants were more underweight (55.9% (n=95) than those who did not practice it 44.1% (n=75)

5.3 RECOMMENDATIONS

The following recommendations were made based on the findings of the research:

Recommendations regarding health education:

- Knowledge of mothers on feeding practices of infants should be strengthened.
- Educational programs should be organised in all clinics, health centers and communities on methods of feeding their infants.

Awareness campaigns on appropriate methods of infant feeding such as:

- field visits for professional health personnel
- visiting communities
- advertising campaigns
- appropriate intervals in infant feeding
- lifestyle adjustments according to culture and health paradigms
- the curriculum – curriculum of health care professionals
- management of local clinics

Recommendation regarding support services:

It is recommended that the maternal and child health unit intensify home visits in the communities. This would enable the health workers to identify some of the problems in the individual homes that can lead to malnutrition in their infants.

It is recommended that:

- the district health directorate establishes malnutrition clinics at the various health facilities in the district to ensure early detection of malnutrition among infants and children who are malnourished
- the district health directorate should establish more nutrition rehabilitation centers in the district to take care of those infants who are malnourished

5.4 RECOMMENDATIONS FOR FURTHER RESEARCH

- A replication of this study at other child welfare clinics in Ghana to investigate on a more comprehensive basis, the feeding practices of infants that lead to malnutrition. This will establish baseline information and data for monitoring and evaluation of the feeding practices in relation to malnutrition throughout the district and the country as a whole.
- A study on the challenges faced by mothers in the feeding of their infants.
- Research on the impact of cultural practices on infant feeding status.

5.5 LIMITATIONS OF THE STUDY

The following limitations were identified:

- The research results are limited to Tema Manhean Health Centre where the study was conducted. The results obtained are not generalisable to all infants who visit child welfare clinics elsewhere in Ghana.
- Only infants in Tema Manhean who attended the health centre at the time of study were included. It is possible that there were infants who were very

malnourished who did not come to the child welfare clinic at that particular period of the study.

5.6 CONCLUSION

The study sought to identify the feeding practices of infants and then to find the factors that lead to malnutrition. The findings revealed that nutritional status of the infants was significantly related to breastfeeding and complementary feeding practices of the mothers and demographic parameters like employment status of mother, level of education, marital status and parity.

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Annexure A Ethical Clearance from UNISA



**UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE**

HS HDC 65/2011

Date of meeting: 12 December 2011 Student No: 3676-993-2
Project Title: Factors impacting on feeding practices of infants 0-12 months which lead to malnutrition in a child welfare clinic in Tema Manhean (Tema New Town) Ghana.
Researcher: Adwoa Durowaa Williams
Degree: Masters in Public Health Code: DIS4986
Supervisor: Mrs JE Tjallinks
Qualification: M CUR
Joint Supervisor: Prof MJ Oosthuizen

DECISION OF COMMITTEE

Approved



Conditionally Approved



Prof E Potgieter *E Potgieter*
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Dr MM Moleki *Dr MM Moleki*
ACTING ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

Ethical clearance from Ghana Health Service

GHANA HEALTH SERVICE ETHICAL REVIEW COMMITTEE

*In case of reply the
number and date of this
Letter should be quoted.*

*My Ref. :GHS-ERC: 3
Your Ref. No.*



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April 25, 2012

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C/O P. O. Box GP 17583
Accra-Ghana

ETHICAL CLEARANCE - ID NO: GHS-ERC: 14/03/12

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol titled:

“Factors Impacting on Feeding Practices of Infants 0-12 Months which lead to Malnutrition in a Child Welfare Clinic in Tema Manhean (Tema New Town), Ghana”

This approval requires that you submit periodic review of the protocol to the Committee and a final full review to the Ethical Review Committee (ERC) on completion of the study. The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

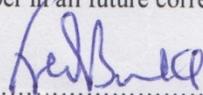
Please note that any modification of the project must be submitted to the ERC for review and approval before its implementation.

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

You are requested to submit a final report on the study to assure the ERC that the project was implemented as per approved protocol. You are also to inform the ERC and your mother organization before any publication of the research findings.

Please always quote the protocol identification number in all future correspondence in relation to this protocol

SIGNED.....


PROFESSOR FRED BINKA
(GHS-ERC CHAIRMAN)

Annexure B

Letter to the Ghana Health Service seeking permission to conduct research in Tema Manhean Health Centre – Child Welfare Clinic

Department of Health Studies
University of South Africa
PO Box 329
Pretoria 0003
South Africa
02/05/2011

The Regional Director of Medical Services
Ghana Health Service (GHS)
Accra, Ghana.

Dear Sir

PERMISSION TO CONDUCT RESEARCH IN YOUR HEALTH FACILITY (TEMA MANHEAN HEALTH CENTRE – CHILD WELFARE CLINIC)

I am a student of University of South Africa (UNISA), pursuing a master's degree in Public Health. As part of the program, I am undertaking a study on the feeding practices of infants 0-12 months that lead to malnutrition and that seeks to obtain information on feeding practices of infants. This exercise would take about one month to complete.

Your institution has been selected as a study site and I am by this letter seeking your permission to carry out this exercise.

The exercise would involve administering a questionnaire made up of personal and social information of the infant and parent/guardian and which would take about ten (10) minutes per participant to complete.

No potential risk, social implications or cost would be incurred on the participant as a result of participation. Confidentiality is assured, participation is voluntary and failure to comply would not result in any penalties.

Participants have a right to refuse to answer a particular question and also to withdraw from the study even after consenting to participate.

The findings would not be used to defame your institution and it would be given to you if you make a request. You could contact me (Mrs Adwoa Williams) on this telephone number (0244856846) in case you have any questions about the study.

Yours faithfully

Adwoa D Williams B Pharm (Hons)

Annexure C

Permission to conduct a study in your institution (Tema Manhean Health Centre)

I am a student of University of South Africa (UNISA), pursuing a master's degree in Public Health. As part of the program, I am undertaking a study on the feeding practices of infants 0-12 months that lead to malnutrition and that seeks to obtain information on feeding practices of infants. This exercise would take about one month to complete.

Your institution has been selected as a study site and I am by this form seeking your permission to carry out this exercise.

The exercise would involve administering a questionnaire made up of personal and social information of the infant and parent/guardian and which would take about ten (10) minutes per participant to complete.

No potential risk, social implications or cost would be incurred on the participant as a result of participation. Confidentiality is assured, participation is voluntary and failure to comply would not result in any penalties.

Participants have a right to refuse to answer a particular question and also to withdraw from the study even after consenting to participate.

The findings would not be used to defame your institution and it would be given to you if you make a request. You could contact me (Mrs Adwoa Williams) on this telephone number (0244856846) in case you have any questions about the study.

.....

Date

.....

Principal dental surgeon in-charge's signature

.....

Interviewer's signature

Annexure D Letter of support to Ghana Health Service

DEPARTMENT OF POPULATION, FAMILY & REPRODUCTIVE HEALTH
SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA

Tel: +233 028-910-9022

Cell: +233-24- 498- 2176

Cable: UNIVGhana



P O Box LG 13

Legon-Accra

GHANA

March 8 2012

The Chairman
GHS-Ethical Review Committee
Research and Development Division
P. O. Box MB 190
Accra-GHANA

Dear Sir/Madam,

LETTER OF SUPPORT: MRS ADWOA D. WILLIAMS (STUDENT NUMBER: 36769932)

As the Local Supervisor (Joint Supervisor 2) of the above-named student, I wish to express my strongest support for her study titled: "Factors impacting on feeding practices of infants 0-12 months which lead to malnutrition in a child welfare clinic in Tema Manhean (Tema New-town), Ghana". Mrs. Williams is a Master of Public Health Student at the University of South Africa (UNISA). As part of the requirement for the award of this degree, she is planning to implement the above study at a child welfare clinic in Tema Manhean.

Considering the knowledge gaps on this subject matter (infant feeding practices) in the area, this proposed study will be beneficial to the health institution, the study area, and Ghana as a whole.

Thank You.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'A. Williams', written over a horizontal line.

Annexure E Letter of introduction from Ghana Health Service to Tema Health Directorate

In case of the reply the number and the date of this letter should be quoted.



GHANA HEALTH SERVICE
REGIONAL HEALTH DIRECTORATE
GREATER ACCRA REGION
P. O. BOX 184
ACCRA.

Tel: 0302-226203

My Ref. No

7th May 2012

Your Ref. No.

THE MDHS
TEMA METRO HEALTH DIRECTORATE
TEMA

LETTER OF INTRODUCTION
MRS. ADWOA DUROWAA WILLIAMS – PRINCIPAL INVESTIGATOR

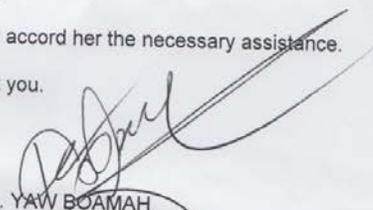
This is to introduce to you the above named MPH student of the University of South Africa (UNISA) who is working on a project entitled:

"Factors Impacting on Feeding Practices of Infants 0-12 months which lead to Malnutrition in a Child Welfare clinic in Tema Manhean (Tema New Town), Ghana"

She wishes to collect some data from the Manhean Health Centre to enable her carry out her study.

Kindly accord her the necessary assistance.

Thank you.


MR. A. YAW BOAMAH
DEPUTY DIRECTOR (ADMINISTRATION)
FOR: REGIONAL DIRECTOR OF HEALTH SERVICES
GREATER ACCRA REGION

Annexure F

Letter to the participants seeking permission to be selected for the study (informed consent)

Department of Health Studies
University of South Africa
PO Box 329
Pretoria 0003
South Africa
02/05/2011

To the Participant
Tema Manhean
Ghana

Dear parent/guardian(On behalf of infant 0-12 months),

PERMISSION TO BE SELECTED AS A PARTICIPANT

I am a student of University of South Africa (UNISA), pursuing a Master's degree in Public Health. As part of the program, I am undertaking a study on the factors impacting on feeding practices of infants 0-12 months that lead to malnutrition and that seeks to obtain information on feeding practices of infants. This exercise would take about one month to complete.

Your child has been selected as a participant and I am by this letter seeking your permission to carry out this exercise.

The exercise would involve administering a questionnaire made up of personal and social information of the infant and parent/guardian and which would take about ten (10) minutes per participant to complete.

No potential risk, social implications or cost would be incurred on the participant as a result of participation. Confidentiality is assured, participation is voluntary and failure to comply would not result in any penalties.

Participants have a right to refuse to answer a particular question and also to withdraw from the study even after consenting to participate.

The findings would not be used to defame you or your child and it would be given to you if you make a request. You could contact me (Mrs Adwoa Williams) on this telephone number (0244856846) in case you have any questions about the study.

I would be very grateful if permission is granted for this exercise.

Yours faithfully

Adwoa D Williams (B Pharm Hons)

Annexure G Questionnaire

Questionnaire on factors impacting on feeding practices of infants 0-12 months that lead to malnutrition in a child welfare clinic in Tema Manhean, Ghana

Number of questionnaire

1	2	3

1 OBJECTIVES: To

- explore the common feeding practices of infants 0-12 months in Tema Manhean child welfare clinic
- determine the possible factors that lead to malnutrition in infants 0-12 months

2 ETHICAL CONSIDERATIONS (Refer to attached consent form)

All information provided in this document will be treated confidentially. It is not necessary to indicate your name in this questionnaire.

3 INSTRUCTIONS

3.1 Your personal opinion in answering these questions would be appreciated.

SECTION A: DEMOGRAPHIC DATA

Infant

For official use only

1 Gender

1.1	M	
1.2	F	

--	--

2 How old is your child?

For official use only

Age in months	ANSWER
2.1 0	
2.2 1	
2.3 2	
2.4 3	
2.5 4	
2.6 5	
2.7 6	
2.8 7	
2.9 8	
2.10 9	
2.11 10	
2.12 11	
2.13 12	

--	--

Mother

3 How old are you?

For official use only

Age of mother (years)	ANSWER
3.1 Age	

--	--

4 What is your marital status?

For official use only

Marital status	ANSWER
4.1 Single	1
4.2 Married	2
4.3 Separated	3
4.4 Divorced	4
4.5 Widowed	5
4.6 Cohabiting	6

--	--

5 What is your level of education?

For official use only

Educational level	ANSWER
5.1 Primary	1
5.2 Junior secondary school	2
5.3 Senior secondary school	3
5.4 Tertiary	4
5.5 None	5
5.6 Other (please specify)	

--	--

6 Are you working?

For official use only

Employment status	ANSWER
6.1 Employed	1
6.2 Unemployed	2
6.3 Self employed (please specify)	3

--	--

7 What is your occupation?

For official use only

OCCUPATION	ANSWER
7.1 Farmer	1
7.2 Trader	2
7.3 Homemaker	3
7.4 Nurse	4
7.5 Teacher	5
7.6 Other(Specify)	6

--	--

8 What is your religious affiliation?

For official use only

Religion	ANSWER
8.1 Christian	1
8.2 Moslem	2
8.3 African Traditional Religion	3
8.4 Other please specify	4

--	--

9 How many births have you had (Parity)?

For official use only

9.1	Number of Children	Status of birth 1. Alive 2. Dead	Reasons for death
How many births have you had?	0		
	1		
	2		
	3		
	4		
	5		
	6		
	More than 6 (specify)		

--	--

SECTION B: FEEDING PRACTICES

10 When did you initiate breastfeeding your child?

Initiation of breastfeeding	ANSWER
10.1 Within the first hour after Birth	1
10.2 After the first hour	2
10.3 Never breastfed my child	3

For official use only

--	--

11 Are you exclusively breastfeeding your infant?

	Yes	1.	No
11.1 Exclusive breastfeeding			
11.2 If No why are you not breastfeeding exclusively – reasons			

For official use only

--	--

12 How frequently do you breastfeed?

Frequency in breastfeeding	ANSWER
12.1 Less than an hour	1
12.2 Every hour	2
12.3 Every two hours	3
12.4 More than two hours	4

For official use only

--	--

13 Are you giving your infant complimentary food?

For official use only

	YES	NO
13.1 Are you doing complimentary feeding?		

--	--

14 If yes with what complimentary food are you giving?

For official use only

Complimentary food	ANSWER
14.1 Infant formula	1
14.2 Koko (maize-based fermented porridge)	2
14.3 Rice and stew	3
14.4 Kenkey and soup/stew	4
14.5 Banku and soup/stew	5
14.6 Fufu and soup	6
14.7 Other (please specify)	7

--	--

15 At what age did you give complimentary food to your infant?

For official use only

Age	ANSWER
15.1 Less than one month	1
15.2 One month	2
15.3 2-6 months	3
15.4 7-12 months	4
15.5 Have not started semi-solids yet	5

--	--

16 Have you been told how to give complimentary food?

For official use only

	YES	NO
16.1 Education on how to give complimentary food		

--	--

17 Have you been told when to give complimentary food?

For official use only

	YES	NO
17.1 Education on when to give complimentary food		

--	--

18 If you answered yes to question 17, by whom?

For official use only

Complimentary feeding education by:	ANSWER
18.1 Mother	1
18.2 Relative	2
18.3 Ghana Health Service staff	3
18.4 Other (please specify)	4

--	--

19 What was the content of health education?

For official use only

Content of health education	ANSWER
19.1 Exclusive breastfeeding for 6 months	1
19.2 Complimentary food from 6 months	2
19.3 Type of complimentary food	3
19.4 Other (please specify)	4

--	--

20 Does your child eat family foods?

For official use only

Foods given to child	YES	NO
20.1 Eating of family foods		

--	--

21 Which family food do you give to your child?

For official use only

Family food	ANSWER
21.1 Koko (maize-based fermented porridge)	1
21.2 Rice and stew	2
21.3 Kenkey and soup/stew	3
21.4 Banku and soup/stew	4
21.5 Fufu and soup	5
21.6 Other (please specify)	6

--	--

22 Do you buy cooked food for your child?

For official use only

	YES	NO	SOMETIMES
22.1 Buy cooked food			

--	--

23 If you answered “yes” or “sometimes” to question 21, what food do you usually buy?

For official use only

Food	ANSWER
23.1 Porridge (koko)	1
23.2 Porridge with pepper (Hausa koko)	2
23.3 Rice and stew	3
23.4 Banku and stew/soup	4
23.5 Kenkey and stew/soup	5
23.6 Fufu and soup	6
23.7 Other (Please specify)	7

--	--

24 What are some of the challenges faced in ensuring that your child is well fed?

For official use only

Challenges faced	ANSWER
24.1 Food is expensive (affordability)	1
24.2 Cannot get the right type of food to buy	2
24.3 Child is not eating properly	3
24.4 Child is ill	4
24.5 Other(Please specify)	5

--	--

25 In the past 24 hours what foods did your child eat? (24 hour recall)

For official use only

Food given	Morning	Afternoon	Evening
25.1 Porridge			
25.2 Weanmix			
25.3 Rice & stew			
25.4 Banku& stew			
25.5 Fufu & soup			
25.6 Other (please specify)			

--	--

26 Does this reflect the way the child is usually fed?

For official use only

	YES	NO
26.1		

--	--

27 What technique do you use in feeding your child?
 (More than one of the options can be chosen)

For official use only

Technique	ANSWER
27.1 Cup	1
27.2 Spoon and cup	2
27.3 Hand	3
27.4 Feeding bottle	4
27.5 Other (please specify)	5

--	--

28 Are there any cultural practices relating to foods given to infants in this area?

For official use only

	YES	NO
28.1 Any cultural practices on feeding practices?		

--	--

29 If yes which cultural practices do you indulge in and why?

For official use only

Cultural practices	ANSWER
29.1 Eggs are not given to infants before age 1 because it is believed that they will not be able to walk if they are given	1
29.2 Eggs are not given before age 1 because it is believed the child would become a thief	2
29.3 Fish is not given to child before age 1 because it is believed that the child would be a thief if given	3
29.4 Fufu and soup are not given to infants before age 1 because it is believed that they cannot walk if given.	4
29.5 Other please specify	5

--	--

SECTION C: MALNUTRITION

30 Weight of child in weighing card

For official use only

Month	Weight (kg)
30.1 At birth	
30.2 Current Weight	

--	--

31 Anthropometric measurement of child (weight, height, age)

For official use only

	Child
31.1 Weight (kg)	
31.2 Height (cm)	
31.3 Age(months)	

--	--

32 Why do you think your child is not gaining weight?

For official use only

Why child is not gaining weight	ANSWER
32.1 Child is not eating properly	1
32.2 Food is expensive	2
32.3 Child is ill	3
32.4 Other (please specify)	4

--	--

THANK YOU

Annexure G

NIBII NI KE ABIFAOBII NI EYE(0—12) ANIYELI HE GB&JIANJTOO NAAGBAI BAA HE SANE BIMCI YE CHILD WELFARE HELATSAMCHE YE TEMA MANHEAN YE GHANA

Sanebimci yibo

1	2	3

1 OTII

- Ni ayɔse abifaobii ni eye keje nyɔji (0—12) aniyeli mli ye Tema Manhean Child Welfare Klinik
- Ni atao nibii ni ke abifaobii ni eye keje nyɔji (0—12) ni naaa niyenii kpakpa aye le baa

2 Nitsumci he mlai

Sanebimci fee aheto ni abaaha ye wolo nee mli le baafee teemɔɔ saji. Ehe ebahiã akɛ doo oɔma ogbei

3 Gbetsɔɔmci

- 3.1 Abaajie hesɔɔ kpo kple atsɔɔ oyinkpɛɛ ye sanebimci ke hetoi hamci nee mli.

Mlijaa A : Akutsonḡbii Ahe saji

Abifao

ጋfis gbጅhe nጅ

1 Nuu/yoo

1.1	M	
1.2	F	

--	--

2 Afii enyiጅ oye?

ጋfis gbጅhe nጅ

Afii yጅ nyጋji amlጅ	Hetoo
2.1	0
2.2	1
2.3	2
2.4	3
2.5	4
2.6	5
2.7	6
2.8	7
2.9	8
2.10	9
2.11	10
2.12	11
2.13	12

--	--

Mami/Nyጅ Awo

3 Afii enyiጅ oye?

ጋfis gbጅhe nጅ

Afii ni mami eye	Hetoo

--	--

4 Te ogbālā shidāamጋ ጅ

ጋfis gbጅhe nጅ

Gbālā Shidāamጋ	Hetoo	
4.1	Oshijafonyo	1
4.2	Mibote gbāla mli	2
4.3	Mikጅ miwu bጅ	3
4.4	Gbalatsemጋ	4
4.5	Okulāfp	5
4.6	Nuu ni mikጅ yጋጋ	6

--	--

5 Nጅgbጅ otee skul kጅshጅ

ጋfis gbጅhe nጅ

Skul ni otee	ANSWER
5.1 Prāme	1
5.2 Juuniɔ sɛkondri skul	2
5.3 Siniɔ sɛkondri skul	3
5.4 pɔlitɛkinik/ Kɔleg/ univɛsiti	4
5.5 Miyako skul daŋ	5
5.6 Okase nitsumɔ ko(tsɔɔmɔ)	6

--	--

6 Ani ootsu nii

ɔfis gbɛhe nɛ

Nitsumɔ shidāamɔ	Hetoo
6.1 Miyɛ nitsumɔ	1
6.2 Mibɛ nitsumɔ	2
6.3 Miyɛ midientɛ minitsumɔ	3

--	--

7 Mɛni otsuɔ?

ɔfis gbɛhe nɛ

Nitsumɔ	Hetoo
7.1 Okwaafonyo	1
7.2 Jarayɛɔ	2
7.3 Shia Kwɛɔ	3
7.4 Nɛɛsifonyo	4
7.5 Titsafonyo	5
7.6 Ekrokomei (tsɔɔmɔ mli)	6

--	--

8 mɛni jamɔ mli oyɔɔ

ɔfis gbɛhe nɛ

Jamɔ	Hetoo
8.1 Kristofonyo	1
8.2 Moslɛmfonyo	2
8.3 Wɔjalɔ	3
8.4 Ekrokomei	4

--	--

9 Shii enyie ofɔ

ɔfis gbɛhe nɛ

9.1	Bii abɔ	Hidããmɔ 1. Ameyɛ 2. Amɛgboi	Nɔ hewɔ
Sii enyie ofɔ	0		
	1		
	2		
	3		
	4		
	5		
	6		
	Mifɔ fe ekpaa		

--	--

Mlijaa B: : Niyenii hamɔ he gbejianɔto

10 Mɛni be mli obɔɔ obi ɛ fufɔ hamɔ

ɔfis gbɛhe nɛ

Beni mije fufɔ hamɔ shishi	Hetoo
10.1 Beni mifɔ nɔnɔ	1
10.2 Ni mifɔ nɔmɛletswaa kome sɛɛ	2
10.3 Mihako ɛ fufɔ dan	3

--	--

11 An ooha bi ɛ fufɔ pɛ?

ɔfis gbɛhe nɛ

--	--

11.1 Fufɔ pɛ hamɔ	Hɛɛ	1. Daabi
11.2 Keji daabi ɛ mɛni hewɔ		

12 Shii abo enyie oke haa obi le fufu

ofis gbethe ne

Shii abo ni oke haa fufu	Hetoo
12.1 Eshεε ημελετwsaa kome	1
12.2 ημελετswaa kome	2
12.3 ημελετswaa enyo	3
12.4 Fe ημελετswaa enyo	4

--	--

--	--

13 Ani ooha obi le niyenii krokomei

ofis gbethe ne

	Hεε	Daabi
13.1 Ani ooha gbekε le tseηsi mli niyenii		

--	--

14 Ke hεε, meni niyenii neke?

ofis gbethe ne

Niyenii kroko	Hetoo
14.1 Gbekεbii Tseηsi mli niyenii	1
14.2 Koko	2
14.3 Omo ke fob	3
14.4 Komi ke wono/fla	4
14.5 Banku ke wonu/fla	5
14.6 Fufui ke wonu	6
14.7 Niyenii krokomei	7

--	--

15 Afii enyie obi le ye dani obɔɔ le niyenii krokomei hamɔ?
ɔfis gbɛhe ne

Afii	Hetoo
15.1 Eyeko nyɔɔ kome	1
15.2 Eye nyɔɔ kome	2
15.3 Nyɔɔji(2-6)	3
15.4 Nyɔɔji (7-12)	4
15.5 Mi bɔɔ ko le niyenii krokomei hamɔ	5

--	--

16 Ani atɔɔ bo bɔni esani oha obi le niyenii krokomei ohã

ɔfis gbɛhe ne

	Hɛɛ	Daabi
16.1 Atɔɔ bo bɔni ahãã niyenii krokomei ahãã		

--	--

17 Ani atɔɔ bo beni esa ake obɔɔ obi le niyenii krokomei hamɔ?

ɔfis gbɛhe ne

	Hɛɛ	Daabi
17.1 Tsɔsemɔ keha niyenii krokomei hamɔ		

--	--

18 Ke ohetoo ji hɛɛ le, namɔtsɔɔ bo?

ɔfis gbɛhe ne

--	--

Namɔ tsɔsebo keha niyenii krokomei hamɔ	Hetoo
18.1 Mami	1
18.2 Wekunyɔ	2
18.3 Helatsamɔhe	3
18.4 meɪ krokomei	4

19 Mɛni atɔɔ bo

ɔfis gbɛhe ne

--	--

Nɔni atsoɔ	Hetoo
19.1 Aha fufɔ pɛ nyɔji ekpaa	1
19.2 Aha niyenii krokomei keje nyɔji ekpaa keyaa	2
19.3 Te niyenii in atsoɔ bo ɛ	3
19.4 Ekrokomei	4

20 Aniobi ɛ yeɔ niye nii in ahoɔ ye shiã

ɔfis gbɛhe nɛ

Niyenii ni akɛhaa gbekɛ ɛ	Hɛɛ	Daabi
20.1 Shai niyenii		

--	--

21 Mɛni niyenii ohãa gbekɛ ɛ?

ɔfis gbɛhe nɛ

Shiã niyenii	Hetoo
21.1 Koko	1
21.2 Omɔ ke flɔ	2
21.3 Kɔmi ke wonu/flɔ	3
21.4 Banku ke wonu/flɔ	4
21.5 Fufui ke wonu	5
21.6 Niyenii krokomei	6

--	--

22 Ani ohãa obi ɛ jaanɔ niyenii

ɔfis gbɛhe nɛ

	Hɛɛ	Daabi	Bei komei
22.1 Jaanɔ niyenii			

--	--

23 Kɛ ohtoo ji hɛɛ ɛ, mɛni niyenii oheɔ ye jaanɔ ohãã ɛ

ɔfis gbɛhe nɛ

Niyenii	Hetoo
23.1 Koko	1
23.2 Hausa koko	2
23.3 Omɔ ke flɔ	3
23.4 Banku ke flɔ/wonu	4
23.5 Kɔmi ke flɔ/wonu	5
23.6 Fufui ke wonu	6
23.7 Niyenii krokomei specify)	7

--	--

24 Mɛni naagbai okɛ kpeɔ ye obi lɛ niyenii yeli mli?

ɔfis gbɛhe nɛ

Naagbai ni okɛ kpeɔ	Hetoo
24.1 Niyenii lɛ jara wa	1
24.2 Minaaa niyenii ni mitao mahe lɛ	2
24.3 Mibi lɛ yeee nii ojogbanɲ	3
24.4 Mibi lɛ bɛ hewalɛ	4
24.5 Naagbai krokomei	5

--	--

25 Ni jetsɛre nɛɛ mɛni niyenii obi lɛ eye?

ɔfis gbɛhe nɛ

Niyenii ni oha lɛ	Leebi	Shwane	Gbɛkɛ
25.1 Koko			
25.2 Abelemamu			
25.3 Omɔ ke flɔ			
25.4 banku ke flɔ			
25.5 Fufui ke wonu			
25.6 Niyenii krokomei			

--	--

26 Ani enɛ tsɔɔ bɔni ahaa gbekɛ le niyenii ahaa?

ɔfi gbɛhe nɛ

	Hɛɛ	Daabi
26.1		

--	--

27 Mɛni ɲaa gbɛi anɔ otsɔɔ ohãã obi lɛ niyenii

ɔfis gbɛhe nɛ

Ɖaa gbɛi	Hetoo
27.1 Kɔkɔpoo	1
27.2 Awale kɛ kɔkɔpoo	2
27.3 Nine	3
27.4 Fufɔtɔ	4
27.5 Ɖai gbɛi krokomei	5

--	--

28 Ani kusumii komɛi yɛ ni kɔɔ niyenii ni ahãa gbekɛbii yɛ okutso lɛ mli?

	Hɛɛ	Daabi
28.1 Kusumii komɛi ni kɔɔ niyenii ahe		

ɔfis gbɛhe nɛ

--	--

29 Kɛ hɛɛ lɛ, tɛ nɔ ni okɛ ohe ewo mli lɛ

ɔfis gbɛhe nɛ

--	--

Kusumii komɛi	Hetoo
29.1 Ahããa gbekɛbii wuɔ wɔɔ kɛji amɛ na ko afi no lɛ amɛ nyiɛ	1
29.2 Ahããa gbekɛbii wuɔ wɔɔ kɛji amɛ na ko afi no lɛ amɛ baatsɔmɔ julɔi	2
29.3 Ahããa gbekɛbii loo kɛji amɛ na ko afi no lɛ amɛ baatsɔmɔ julɔi	3
29.4 Ahããa gbekɛbii fufui kɛji amɛ nako afi no lɛ amɛ nyiɛŋ	4
29.5 Kusumii krokomei	5

Mlijaa C: Niyeniii kpakpai ni anaaa aye

Nyɔŋ	Tsiimɔ
30.1 Ye fɔmɔ	
30.2 Amrɔnɛɛ	

--	--

31. Gbeken le tsii mo ke Kwɔle ke afii

ɔfis gbɛhe ne

	Gbeken
31.1 Tsiimɔ	
31.2 Kwɔle	
31.3 Afii	

--	--

32 Meni hewɔ obi le etsiii le?

ɔfis gbɛhe ne

No hewɔ ni gbeken etsii	Hetoo
32.1 Gbeken yeee nii jogbanɛ	1
32.2 Niyenii jara wa	2
32.3 Gbeken be hewale	3
32.4 Naagbai krokomei	4

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OYIWALADɔNDɔ

Annexure H

Programme of the training of the research assistants

About four (4) research assistants fluent in English and Ga (local language spoken in Tema Manhean) were trained by the researcher to assist in data collection.

After collecting all data required, the instrument in Ga language was translated back into English and kept secured.

The training process was divided into three sections, in line with the data collection instrument which included:

Section A

This section covered respondents' general information including demographic data such as age, gender and measures of socio economic status.

Section B

This covered information on the feeding practices of infants 0-12 months

Section C

This covered information on malnutrition of infants 0-12 months.

Annexure I Letter from statistician

**DEPARTMENT OF BIostatISTICS
SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
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My Ref. No.

Your Ref. No.



P O Box LG13
Legon-Accra
GHANA

November 1, 2012

TO WHOM IT MAY CONCERN

RE: FACTORS IMPACTING ON FEEDING PRACTICES OF INFANTS 0-12 MONTHS WHICH LEAD TO MALNUTRITION IN A CHILD WELFARE CLINIC IN TEMA MANHEAN (TEMA NEW TOWN) GHANA

This letter is to inform you that I was involved in the data collection and data analysis stages in respect of the above named research conducted by Mrs. Adwoa Williams.

The aforementioned stages of the research took place between September and October, 2012.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Anthony Godi'.

Anthony Godi,
(Statistician)

Annexure J Letter from editor

I, Esi Hammond, confirm that I have edited the thesis document prepared by Mrs. Adwoa Durowaa Williams titled "FACTORS IMPACTING ON FEEDING PRACTICES OF INFANTS 0 – 12 MONTHS WHICH LEAD TO MALNUTRITION IN A CHILD WELFARE CLINIC IN TEMA MANHEAN (TEMA NEW-TOWN), GHANA" for the award of a Masters Degree in Public Health.

Signed

A handwritten signature in cursive script, appearing to read 'Esi Hammond', written in black ink.

Esi Hammond

Accredited Member of the Institute of Public Relations, Ghana

Chairperson of the Member Service Committee of the Institute of Public Relations, Ghana

Head Public Affairs Office, Bank of Ghana and Editor, Newsletter of the Bank of Ghana