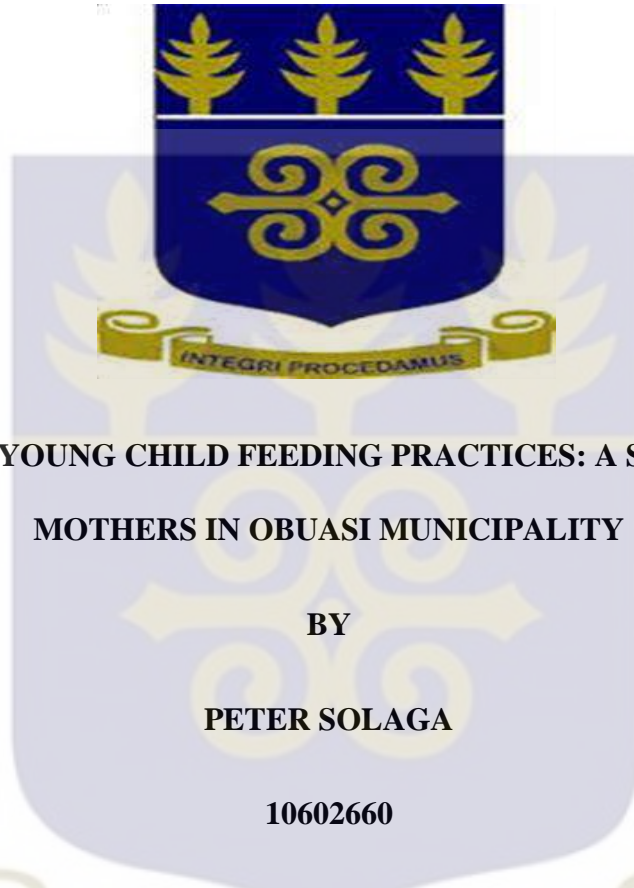


**SCHOOL OF PUBLIC HEALTH**

**COLLEGE OF HEALTH SCIENCES**

**UNIVERSITY OF GHANA**



**INFANT AND YOUNG CHILD FEEDING PRACTICES: A STUDY AMONG  
MOTHERS IN OBUASI MUNICIPALITY**

**BY**

**PETER SOLAGA**

**10602660**

**THIS DISSERTATION IS SUBMITTED TO UNIVERSITY OF GHANA, LEGON IN  
PARTIAL FULFILMENT FOR THE REQUIREMENT FOR THE AWARD OF  
MASTER OF PUBLIC HEALTH DEGREE**

**DECEMBER, 2018**

**DECLARATION**

I, Peter Solaga affirm that apart from references to other people's work which the authors have been duly acknowledged, this dissertation is as an outcome of my own original research work under supervision. I state that it has neither in part nor whole presented for a degree elsewhere.

PETER SOLAGA

DR. PHYLLIS DAKO-GYEKE

(CANDIDATE)

(SUPERVISOR)

.....

.....

(SIGNATURE)

(SIGNATURE)

.....

.....

(DATE)

(DATE)

## DEDICATION

I offer this dissertation to all children below two years in sub-Saharan Africa, who for no faults of theirs became malnourished and for which the consequences could not be reversed.

“We are guilty of many errors and faults, but our most crime is abandoning the children, neglecting the foundation of life. Many of the things we need can wait. The child under two cannot. Right now is the time his bones are being formed, his blood is being made and his senses are being developed. To him we cannot answer “Tomorrow”. His name is “Today” (*Gabriela Misbal, 1948*).

## **ACKNOWLEDGEMENT**

I give thanks to Our Father in heaven, the creator of the universe, for making this work a success.

I sincerely thank my supervisor Dr. Phyllis Darko-Gyeke, of School of Public Health, College of Health Sciences, University of Ghana, for her guidance and assistance given me. Without her, this dissertation would not have been a success. God richly bless you.

I acknowledge Dr. David Kwasi Amankwa, the Municipal Health Director and his administrative staff for their support.

My sincere appreciation also goes to my research assistants, Frank Asante and Constance Appiah from Municipal Health Directorate of Obuasi.

My deep appreciation goes to my wife, Doris Solaga and children, Yayra Afi Solaga, Koenya Amiyo Solaga, Enam Mansa Solaga and Eli Boakye Solaga for their care, support and prayers.

I am grateful to a good cousin, Frederick Solaga and a respectable friend, Monsen Owusu Aboagye for their financial support.

## ABSTRACT

**Background:** Optimal Infant and Young Child Feeding (IYCF) practices are established recommendations for feeding children 0-23 months to achieve ultimate growth and development. Ideal nourishment throughout the first 2 years of a child's life is predominantly significant, as it leads to high intelligent quotient and lowers morbidity and mortality. Any damage caused within two years of life is reversible but beyond is irreparable. Inappropriate feeding practices are known to be among causes of malnutrition and death. This study assessed IYCF practices among mothers with children aged 0 - 23 months to obtain baseline of IYCF practices.

**Methods:** A Cross-sectional survey was used to collect quantitative data using a structured questionnaire. The study was conducted among 228 mothers attending Child Welfare Clinic with their children from the five sub-municipality capital health facilities in Obuasi Municipality. Simple random sampling method was used to select the mothers for the study. This study assessed breastfeeding, and complementary feeding practices, 24 hour food recall as well as infant nutritional status, from anthropometry measurements. The measurements were classified into underweight, stunting and wasting. The data was analysed using stata 15. Frequencies, percentage, chi square and bivariate logistic regression model were run to determine relations between the dependent and independent variables.

**Results:** The findings showed that 93.7% delivered at the health facility. Moreover, they all gave the colostrum to their babies. The percentage for children delivered with low birth weight was 15.6% and there was 71.6% of new born who early initiation of breastfeeding started within the first hour after birth. However, exclusive breastfeeding (EBF) among children below 6 months was 58.2%. Only quarter of the children continued breastfeeding at age 2 years. Sixty four percent of all the children within 6-8 months started complementary feeding and only 8.7 % used

the appropriate food of solid and semi-solid food. Koko (cereal porridge) and cerelac (instant cereal food) were the first common food introduced to the children. Beside, only 15.6% met minimum acceptable diet. Children who were bottle fed the previous day of the study was 27.3%. Prevalence of under-weight, stunting and wasting were 7%, 7% and 6.1%, respectively. Infants with a good Infant Feeding Score were less likely to be well-nourished as compared to those with poor Infant Feeding Score (OR=0.83; 95%CI=0.23-3.02; P-value=0.78).

**Conclusion:** Generally breastfeeding and complementary feeding practices were suboptimal but breastfeeding practices were quite good. The nutritional statuses of the children were quite good. This study found no association between maternal characteristics, feeding practices and nutritional status of the children from the 24 hour food recall.

Health professionals, especially the Community Health staff, Midwives and other partners in health should be empowered with IYCF skills, knowledge and feeding counseling tools. With this they can apply at the community to improve upon the IYCF practices, especially breast milk expression, texture of food and minimum acceptable diet in Obuasi municipality.

**TABLE OF CONTENTS**

<b>DECLARATION.....</b>	<b>i</b>
<b>DEDICATION.....</b>	<b>ii</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>iii</b>
<b>ABSTRACT.....</b>	<b>iv</b>
<b>TABLE OF CONTENTS .....</b>	<b>vi</b>
<b>LIST OF TABLES .....</b>	<b>x</b>
<b>LIST OF FIGURES .....</b>	<b>Error! Bookmark not defined.</b>
<b>LIST OF ABBREVIATIONS .....</b>	<b>xi</b>
<b>DEFINITION OF TERMS.....</b>	<b>xii</b>
<b>CHAPTER ONE .....</b>	<b>1</b>
<b>INTRODUCTION.....</b>	<b>1</b>
1.1Background .....	1
1.2 Problem statement.....	2
1.3 Research question.....	4
1.4 Main objective IYCF practices among mothers with children of age 0-23 months .....	4
1.5 Specific objectives.....	4
1.6 Justification of the study .....	4
<b>CHAPTER TWO .....</b>	<b>7</b>
<b>LITERATURE REVIEW .....</b>	<b>7</b>
2.1 Health risk of malnutrition among children under five years .....	7
2.2 WHO and UNICEF recommendation for IYCF .....	8
2.3 Criteria that define selected infant feeding practices .....	9
2.4 Benefits of optimal IYCF .....	9

2.5 Challenges mother encounter in IYCF practices.....	11
2.6 IYCF practices and nutritional status indicators .....	11
<b>CHAPTER THREE .....</b>	<b>13</b>
<b>METHODOLOGY .....</b>	<b>13</b>
3.1 Study area.....	13
3.2 Study design .....	15
3.3 Study variables .....	15
3.4. Sampling.....	15
3.4.1 Study population.....	15
3.4.2 Inclusion criteria .....	16
3.4.3 Exclusion criteria.....	16
3.4.4 Sample size.....	16
3.4.5 The number of mothers recruited from each facility .....	17
3.4.6 Sampling procedures .....	17
3.5. Data collection techniques/methods and tools .....	18
3.5.1 Calculating age of child.....	18
<b>3.5.2 Weight and length of a child .....</b>	<b>18</b>
<b>3.6.1 Dietary assessment from 24-Hour Food Recall for children 6 – 23 months .....</b>	<b>18</b>
3.6.2 Dietary diversity .....	19
3.6.3 Categorisation of mothers on IYCF practices .....	19
<b>3.6.4 The minimum acceptable diet within 24 hours .....</b>	<b>19</b>
3.6.5 Positioning and attachment of infant during breastfeeding .....	20
3.7 Data collection tools and procedures .....	20
3.8 Quality control.....	21
3.9 Data processing and analysis.....	21



3.10 Ethical consideration .....	22
3.10.2 Potential risks and discomforts .....	22
3.10.3 Compensation .....	23
3.10.4 Possible benefits to participants .....	23
3.10.5 Voluntary participation and right to leave the study .....	23
3.10.6 Confidentiality .....	23
3.10.7 Rights as Participants .....	23
3.10.8 Contacts for Additional Information .....	24
<b>CHAPTER FOUR.....</b>	<b>25</b>
<b>4.0 RESULTS .....</b>	<b>25</b>
4: 1 Socio-demographic characteristics of children .....	25
4:2 Socio-demographic characteristics of mothers .....	27
4:3 Breastfeeding practices among mothers.....	29
4:4 Complementary feeding practices among mothers .....	31
4:5 24 Hour food recall for children.....	33
4:6 Nutritional status of children from anthropometry measurement .....	35
4:7 Associations between maternal characteristics and nutritional status of the infants .....	38
4: 8 Association between feeding practices and the nutritional status of the infants.....	39
<b>CHAPTER FIVE .....</b>	<b>41</b>
<b>5.0 DISCUSSION .....</b>	<b>41</b>
<b>5.1 Socio-demographic characteristics of mothers and their children,</b> .....	42
<b>5.2: Breastfeeding practices</b> .....	42
5.3 Complementary feeding practices .....	44
5.4: 24 hour food recall of mother’s feeding practices for children 6 -23 months.....	45
5.5 Nutritional status of children from the anthropometry measurement. ....	47

5.7 Association between maternal characteristics, feeding practices and nutritional status of the children.....	48
<b>CHAPTER SIX .....</b>	<b>50</b>
<b>6.0 CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>50</b>
6.1 Conclusion.....	50
6.2 Recommendation.....	51
<b>REFERENCE .....</b>	<b>53</b>
<b>APPENDICES .....</b>	<b>57</b>
Appendix I.....	57
Appendix II .....	60

## LIST OF TABLES

Table3.1: Number of mothers recruited from each facility .....	17
Table 4.1 Socio-demographic characteristics of children (n=228).....	26
Table 4: 2 Socio-demographic characteristics of mothers .....	28
Table 4:3 Breastfeeding practices among mothers .....	30
Table 4:4 Complementary feeding practices .....	32
Table 4:5 24 Hour food recall for children (n=173).....	34
Table 4.6: Nutritional status of children from anthropometry.....	37
Table 4:7 Associations between maternal characteristics and nutritional status of the infants .....	<b>Error! Bookmark not defined.</b>
Table 4:8 Associations between feeding practices and the nutritional status of the infants.....	40

## **LIST OF ABBREVIATIONS**

IYCF- Infant and Young Child Feeding

WHO- World Health Organization

UNICEF- United Nations Children’s Fund

GDHS - Ghana Demographic and Health Survey

GSS - Ghana Statistical Service

CHAG - Christian Health Association of Ghana

EBF - Exclusive Breastfeeding

EIB- Early Initiation of Breastfeeding

CWC - Child Welfare Clinic

CHPS - Community-based Health Planning and Services

ANC- Antenatal Clinic

AGA - AngloGold Ashanti

IFS - Infant Feeding Score

CHAG – Christian Health Association of Ghana

## DEFINITION OF TERMS

**Infantometre** (Length board): is equipment used to measure Length / height of children.

**Infant:** A child not more than 12 months of age.

**Young child:** A child 12 to 23 months of age.

**Infant and Young Child Feeding:** is a set of well-known and common recommendations for appropriate feeding of new-born and young children.

**Milk expression:** Removing milk from the breasts manually or by using a pump.

**Under-nourished** is a child who had  $< -2SD$  in any of Weight-for- age, weight-for-height and height-for-age

**Well- nourished** is a child who had a  $>-2SD$  in any of Weight-for- age, weight-for-height and height-for-age

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Infant and young child feeding (IYCF) is the foundation of care for childhood development. IYCF has been confirmed to be the only intervention that has the ultimate possible effect on child survival. Hence, decrease of child mortality can only be attained when IYCF is highly ranked in national policies and strategies (UNICEF, 2011). Globally, in 2014 about one-third of children below five years were stunted as a result of poor feeding and recurrent infections. Malnutrition decreases a child's chance of survival, hampering ideal health, growth and development. Stunting is associated with subnormal brain development, which is possible to have lasting detrimental consequences for cognitive ability and future earnings (UNICEF, 2013).

Malnutrition starts from age 6-23 months when they are not appropriately fed and this contributes considerably to the high prevalence of malnutrition in children below five globally (WHO, 2015). Adoption of appropriate feeding practices during the first 2 years of life, offers a serious window of opportunity for warranting child's optimum growth. UNICEF recommend: early initiation of breastfeeding within the first hour after delivery, exclusive breastfeeding (EBF) for the first six months of life and the timely introduction of nutritionally-adequate, safe, age-appropriate complementary food (Martinez & Brumfield, 2016; Sinhababu, Mukhopadhyay, Panja, Saren, Mandal & Biswas, 2010; WHO, 2016a). Adhering to these recommendations, can reduce

mortality and morbidity related to neonatal infections, diarrhoea, and pneumonia and also reduces the risk of chronic disease (Welfare, 2013; WHO, 2016a).

Globally, there was poor feeding practices for children under two years and also EBF for infant under 6 months was 43% and only 29% of 6-23 months children were fed a diverse forms of diet during the complementary feeding period (UNICEF, 2017). In 2014, stunting estimation was 156 million children and that of wasting was 50 million children (WHO, 2016b). Poor feeding practices cause almost half of deaths in children below five years. Developing countries now witnessing childhood obesity and is on the increase at a rate 30% quicker than in developed nations (WHO, 2016b). Appropriate child feeding practices have been proven to have a positive influence on infants and young children's growth (Saha, Frongillo, Alam, Arifeen, Persson, & Rasmussen, 2009). Globally, from 1990 malnutrition has been decreasing among children below five years but generally the improvement is inadequate (UNICEF, WHO, & The World Bank, 2012).

## **1.2 Problem statement**

The Convention on the Rights of the Child states that every infant and young child has the right to good nutrition. However, malnutrition estimation globally for 2017 was 150.8 million (22.2%) stunting and 50.5 million (7.5%) wasting. The estimation for Africa was 14 million (7.4%) wasting and stunting was 2.2 million (8.5%) (UNICEF, WHO & World Bank Group, 2016).

In Ghana, prevalence of stunting among children under 5 in 2014 was 19%, wasting was 5% and low birth weight was 11%. For Ashanti region stunting was 16.1%, wasting 3.5% and underweight is 9.2% (Ghana Statistical Service, 2014).

IYCF practices were established to be significantly associated with undernutrition in India and Luweero District, Central Uganda (Syed & Das, 2017; Nankumbi & Show, 2012). A study by Kumar, Goel, Mittal, & Misra (2006) reported that improper complementary feeding is a significant risk factor for undernutrition. The effect of malnutrition after two years is scientifically proven to be irreversible, moreover child undernutrition is main contributor to under five mortality (Sullivan & Brumfield, 2016). In Ghana, the minimum acceptable diet reported for children aged 6-23 months was as low as 13% and EBF prevalence in Ghana as at 2014 was 52% which was a decline from the 63% reported in 2008 (Ghana Statistical Service, 2014).

Obuasi is cosmopolitan and a mining community with different ethnic groups and cultural setting often observed in feeding practices. Food stuff is more expensive than in Kumasi. The daily average admission of under 5 children at Obuasi Government Hospital was 5. (District Annual report, 2016). The rate of underweight, stunting and wasting were 30.2%, 19.7% and 20.7% respectively as revealed from the in hospital for children under 2 years in 2016. Research proves that undernutrition is rampant during introduction of complementary feeding and after. (WHO, 2015) There is now a shift of food eaten locally to that of junk food in Ghana.

The aim of the study was to get general information and the current level of IYFC practices, the nutritional status of children below 2 and find the association between them.



### **1.3 Research questions**

- What are the IYCF practices among mothers?
- How is IYCF practices associated with the nutritional status of children under 0-23 months?

### **1.4 Main objective**

To assess infant young child feeding practices among mothers with children of age 0-23 months.

### **1.5 Specific objectives**

- To assess mother's feeding practices for children under two years.
- To determine the nutritional status of children under two years.
- To determine the association between the complementary feeding practices of mothers and the nutritional status of their children aged 6 -23 months.

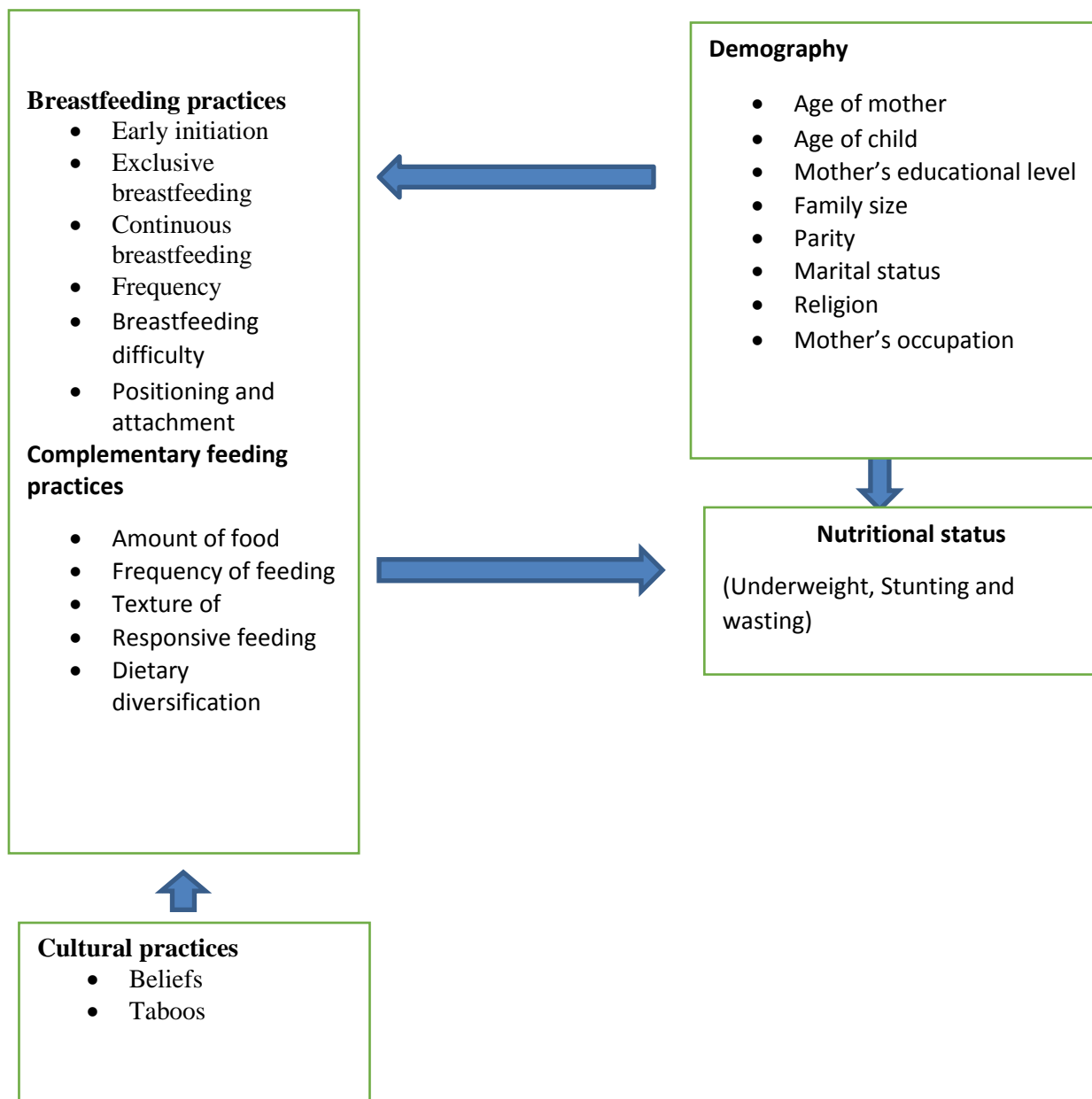
### **1.6 Justification of the study**

This study compared the findings with IYCF recommended by UNICEF and WHO. To come out with adequate information on present IYCF situation, the nutritional status of under two children and identify the gaps for stakeholders: health directorate, policy makers and development partners in health and propose strategy to improve IYCF practices in the municipality. However, the finding will serve as a record of information. High magnitude of the malnutrition rate of children admitted at the Government Hospital

necessitated for this study. Appropriate IYCF practices are proven without reproach to reduce malnutrition and promote child survival.

### **Conceptual framework**

The causes of malnutrition are complex and are at different levels. These are the immediate, underlying and basic causes. This research is looking at mothers feeding practices as one of the key factors under care for children, which is one of the underlying causes. The feeding practices for the child are breastfeeding and complementary feeding. The feeding practices affect the nutritional status of the child. There are recommended breastfeeding practices that make it optimal. These include: early initiation of breast feeding, EBF, frequency of breastfeeding in a day, age at which breastfeeding is stopped, techniques in breastfeeding and difficulty in breastfeeding. The optimal complementary feeding include: frequency of meal taken in a day, the amount of food eat at a meal, the texture of the food and dietary diversification (variety of foods at a meal) and responsive feeding. The maternal characteristics have direct and indirect effect on the nutritional status of the child. It has relationship with feeding practices which intend lead to the nutritional status of the child. The maternal characteristics are: age, educational status, marital status, occupation, religion, ethnicity, family size and parity. Culture practices could also have a relationship with the feeding practices (UNICEF, 2011).



**Conceptual framework for feeding practices and nutritional status (Gyasi,2008)**

## CHAPTER TWO

### LITERATURE REVIEW

#### **2.1 Health risk of malnutrition among children under five years**

In developing nations many children do not have access to adequate nutritious diet they need to develop properly mainly due to poverty. The most detrimental effects of malnutrition is the inability to resist diseases and death (Child Fund,2013). About 2.7 million children were estimated to die from malnutrition in 2015. Malnutrition is the cause of 45% of all child deaths. If children below 2 years were optimally fed, more than 800,000 lives could be saved every year among children below 5 years (WHO, 2016a; Kakuma, 2012). Malnutrition is accountable for one out of three deaths among children below five years. About two thirds of deaths, often were related to poor feeding practices, occur during infancy (Kakuma, 2012). Many infants and young children received suboptimal feeding practices and globally, one out of three children of age under 6 months were exclusively breastfed over the period of 2007-2014 (WHO, 2016a). The transition from EBF to the introduction of complementary food, starts from 6 through to 23 months of age and is the time they are exposed to malnutrition. This contributing considerably to the high prevalence of malnutrition in children below five years of age globally (WHO, 2015).

## **2.2 WHO and UNICEF recommendation for IYCF**

The endorsement made by WHO and UNICEF on IYCF practices includes: Just after delivery mother are expected to have skin-to-skin contact with her new born; Promote early initiation of breastfeeding within the first hour of life; Giving colostrum to the new born; EBF for the first 6 months of life; The mother has the duty to continually breastfeed frequently, on-demand until 2 years of age or after (WHO, 2016a).

At age 6 months and above, breast milk alone provide inadequate energy and nutrients. Therefore introduction of nutritionally-adequate and safe complementary food at 6 months of age are needed to meet those needs. The food should be soft, semi-solid or solid. There is different age grouping within 6-23 months which has its specified recommended feeding practices. It is therefore necessary for mothers to appropriately adhere and apply to the recommendation. In addition applying the principles of psychosocial care which is known as responsive feeding in which infants are fed directly and older children are assisted. The caregiver have patient in feeding, and encouraging child to eat, without forcing them. During child feeding, learning takes place, happiness is instilled and love is established (WHO, 2004).

A child should eat variety of foods (4- star diet) at a meal, to ensure that nutrients need is met. The four 4-star diets includes: Food from vitamin A rich fruits and vegetables, animal protein, plant proteins, and the staple foods' should be eaten daily. A diet should have adequate fat content (WHO , 2016a; Welfare, 2013). However, at age 6 months, soft food is given, frequency of food should be given 2 -3 times a day and about 3 table spoons full of food should be eaten at meal. Between ages 6- 9 months, mashed food should be given ,frequency of food should be 2 -3 times a day and more than 3 table

spoon full to about half a cup full of food should be eaten at a meal. For 9-12 months, Fine chopped or mashed foods and foods that infant can pick up with his or her fingers, food should be eaten 3 to 4 times a day and at least one half (1/2) cupful of food should be eaten. Above 12 to 23 months, family food should be given. Frequency of 3 to 4 times a day and about (3/4) up to 1 full cup of food should be eaten at a meal. One to two snacks should be given to children 6 to 23 months a day (WHO , 2016a; Welfare, 2013). A snack is extra food eaten between meals and a cup is 250 ml.

### **2.3 Definition and criteria of selected infant feeding practices**

The feeding practices that are to be met are: Breastfeeding that is breast milk (including milk expressed or from a wet nurse) with any drink or food. EBF is giving breast milk only and the breast milk could be milk expressed or from a wet nurse. However, medicine could be prescribed by a qualified prescriber. Bottle-feeding is feeding a child with any liquid including breast milk or semi-solid food from a bottle with nipple/teat. Complementary feeding giving breast milk (including milk expressed or from a wet nurse) and solid or semi-solid food Source (WHO , 2008).

### **2.4 Benefits of optimal IYCF**

Children under two years get energy and nutrients from breast milk. Early breastfeeding initiation and EBF are most effective sure ways of preventing morbidity and mortality among infants. Infant's emotional and psychological development is positively related to breastfeeding. Beside, breastfeeding enhances cognitive functions and increases productivity. Malnutrition could be prevented or reduce when complementary foods are introduced timely and are age appropriate. Complementary feeding also reduces disease and can prevent 6% of the estimated under-five deaths. Moreover , health cost will reduce ,productivity will increase and

wealth would be created (Welfare, 2013). If complementary foods are inappropriately introduced, infant's growth may falter.

A study in Ghana revealed that delay in breastfeeding beyond 2 hour after birth increases the risk of dying in neonate by 33% and it is higher (85%). when breastfeeding delays after 24 hours or more (Smith, Hurt, Lisa Chowdhury, Ranadip, Sinha, Bireshwar, Fawzi, Wafaie, Edmond & Karen ,2017). A similar research conducted in South India showed that initiation of breastfeeding to the new born within 12 hours and 12-24 hours were 82.1% and 13.8% respectively. Delay after 24 hours put the new born at approximately 78% higher risk of death (Garcia, Mullany, Rahmathullah, Katz, & Thulasiraj, 2011). Also EBF up to 6 months substantially decreases the risk of diarrhea incidence, hospitalization and all- cause mortality (Lamberti, Fisher, & Black, 2011). As mothers breastfeed and interact with new born, bonding is established between mother and child because it releases 'love hormone 'oxytocin. It has been found to have direct positive impact on brain development (Don, 2017). Moreover, breastfeeding protects against childhood obesity. Overweight and obese children are at higher risk of developing type 2 diabetes, high blood pressure, asthma, and liver disease, premature death and disability in adulthood (UNICEF, 2011).

A study in Bangladesh revealed that mothers who followed the recommended infant feeding practices were positively associated with gains in weight and length of their infants. The more mothers practice the appropriate IYCF recommendations the better growth and length of their children ( Mullany, Katz, Li, Khatry, LeClerq, Darmstadt, & Tielschition, 2008). It was also estimated that 6% of children below five death could be prevented through appropriate complementary feeding and also reduce morbidity and undernutrition (Welfare, 2013).

## **2.5 Challenges mothers encounter in IYCF practices**

Breastfeeding is the natural way to feed a baby but that does not always mean it is easy, because many breastfeeding mothers face a few challenges along the way, this push some of them to go for bottle feeding (Pitman, 2010).

A survey by Shepherd (2012) indicated that two third of lactating mothers were unable to manage breast feeding due to the fatigue during delivery, so some have difficulty to start breastfeeding. Some mothers believe their baby is not getting breast milk enough and also feeling awkward to nurse in public, because breasts are considered very sexual (Brown, Rance, & Bennett, 2015). A study in Mauritius about breastfeeding problems encountered showed that 46.2% of the mothers had no challenges during breastfeeding, but those with challenges, one out of three had breast engorgement and about quarter had sore nipple. The other challenges included fatigue and back pain (Motee, Ramasawmy, Pugo-gunsam, & Jeewon, 2013). One of the challenges militating against EBF for six month for women in employment was assumption of work earlier than six months. This compelled them to start complementary feeding earlier than the six month (Syed, Gaidhane, & Kogade, 2016). A study concluded that infants refused food during introduction of complementary food was due to untimely and infrequent giving of different food of taste (Harris & Coulthard, 2016).

## **2.6 IYCF practices and nutritional status indicators**

Three standard indices of physical growth measured from anthropometry describe the nutritional status of children are: Height-for-age (stunting), Weight-for-height (wasting) and Weight-for-age (underweight). Each of the three nutritional indicators is expressed in standard deviations (Z-scores) from the mean of the reference population. Deviations of



the indicators between below -2 and -3 standard deviations (SD) of the WHO child growth indicate that the children are moderately affected, while deviations below -3 SD indicate that the children are severely affected (WHO, 2010).

A study revealed strong relationship between maternal education and the nutritional status of infant and young child ( Abdelrahman, Abdelmokaram , Idriss, & Aboshora, 2017). A study by Pagui (2015) assessing mothers on IYCF practices had found that none of the nutritional knowledge variables was significantly associated with child nutritional status and as such a caregiver's knowledge of any of these nutritional behaviours and practices was not related to whether or not their children were well-nourished or malnourished. However, a study by Gandhi, Godara, Modi & Kantharia (2014) in India found that there was positive association between malnutrition and infant feeding practices.

Information and the rates of mothers who practice good positioning and attachment of babies during breastfeeding have not been reported in Obuasi for that matter Ghana. Moreover, association of texture, frequency of snacks and amount of food given to infants on their nutritional status have not also yet been clarified. This study tried to address these gaps.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Study area**

Obuasi is one of the municipalities in Ashanti Region of Ghana and is located in the Southern –Western part of the region. It is within 64km drive from Kumasi, the regional capital. It lies between latitudes 5°35’N and 5 °65N, and longitudes 6°35’W and 6°90’W and covers a total land area of 220.7square km with a projected population of 194288 from the 2010 census.

The Obuasi Municipality falls under the paramount of Fomena Traditional Council. Administratively, the Municipality is divided into five zones: Akaporiso-Brahabebome, Odumasi-Tutuka, Kwabrafosso-Wawase, Obuasi Central and Anynam-Kunka. Mining is the mainstay of municipality’s economy. The surrounding communities also indulge in farming. The Municipality has nice scenery due to the hilly nature of the place. Almost all the land is owned by AngloGold Ashanti, (AGA) a mining company under leased hold status. The periphery of the AngloGold Ashanti concession is owned by individual families within and outside the municipality. The youth engaged in the in illegal mining, popularly called ‘galamsey’ but in 2015 they were stopped by AGA. AGA used to have a

workforce of about 7000 but reduced to less than 1000 due to restructuring and the retrenchment exercise currently. This has reduced the economic activities drastically leading to economic hardship in the municipality. The Municipality is a cosmopolitan settlement, with every major ethnic in Ghana represented but the Akan were the majority followed by Dagombas, Dagartis and ewes. Population distribution in the Municipality is mainly urban of about 90% while 10% is rural.

The Obuasi Municipality experiences semi-equatorial climate with degraded semi-deciduous forest. Most of the foodstuffs come from the neighbouring Districts like Amansie Central, Adansi North and Adansi South. Others such as Maize and Yam are imported from other parts of Ashanti and the Brong Ahafo Regions while the manufactured goods originate mainly from Kumasi.

The District Health Management Team (DHMT) has subdivided the municipality into five sub-municipalities. Namely Brahabebome, Gausu, Kwabrafosu, New Nsuta and Tutuka. There are 17 health facilities (4 Government, 1CHAG, 12 private). The municipality has a population size of about 198904. Population for women in reproductive age is 51996 and that of children under two years is 15384. There are 66 CWC sessions held in a month in the 38 CHPS zone within 89 communities.

The data was collected from the five sub-municipal capital health facilities. These are: Brahabebome (SDA Hospital), Gausu (Government Hospital), Kwabrafosu (AGA Hospital), New Nsuta (Central Market Health centre) and Tutuka (Bryant Mission Hospital). Each of these 5 facilities holds weekly CWC sessions for four different groups in a month. Each facility was visited four times to get the sample size.

### **3.2 Study design**

The study was a quantitative descriptive one and cross-sectional survey method was used. Structured questionnaire was used. The questionnaire was pretested and the lapses and correction were made to improve it for final use. The study examined the relationship between the study variables.

### **3.3 Study variables**

The dependent variable is nutritional status from the anthropometry measurements of the children. Independent variables are, socio-demography characteristics which include: mother's educational level, family size, marital status, parity, religion, ethnicity, and mother's occupation. Breastfeeding practices which include: early initiation of breastfeeding, exclusive breastfeeding, frequency, breastfeeding difficulty, positioning and attachment. Mother's complementary feeding practices which include: child's age, quantity of food eaten at a meal, frequency of feeding in a day, texture of food, variety of food and responsive feeding.

### **3.4. Sampling**

#### **3.4.1 Study population**

The study participants were mothers with children below two years who were selected from the five sub-municipal capital health facility's CWC sessions. The children from age group 0-23 months were sub-divided into 0-5 months, 6-8 months, 9-11 month and 12-23 months. This was to differentiate the feeding practices, since each of the age groupings has its specific feeding practices ( Helz, Soekarjo, Wilson, Stucki ,Myatt, Maclaine & Sibson, 2010).

### **3.4.2 Inclusion criteria**

1. Mothers with children aged 0-23 months were eligible to partake
2. The child has his/her name in the CWC register at the facility.

### **3.4.3 Exclusion criteria**

1. The child has skeletal deformity and physical disabilities that require specialized measurements.
2. The child has medical condition that interferes with feeding.

### **3.4.4 Sample size**

The sample size for the respondents in the study was estimated using the prevalence of stunting of children under 5 in Ashanti region, using formula  $N = Z^2 \times P(1-P) / D^2$

Where N represent the minimum sample size needed, Z is the critical value for the 95% confidence level (1.96), P the estimated prevalence of stunting in Ashanti region (16.1%), for children under five.(Ghana Statistical Service, 2014).D the margin of error or level of precision (5.0%).The sample size N is 207. This was adjusted by 10% to cater for non-response data. The sample size recruited in the study was 228 mothers-child pair.

Mothers were selected from each of the 5 sub-municipal capital CWC sessions. Each sub-municipality has a health facility where static CWC is carried out weekly for four different groups of mothers. Mothers were selected from each of the four CWC sessions within the month.

### 3.4.5 The number of mothers recruited from each facility

The total number of children 0-23 registered for CWC was collated from the 5 sub-municipal capital CWC sessions. Proportion was used to calculate for number of mothers recruited per facility. Each facility holds four CWC sessions in a month. About equal proportion of mothers were selected from each of the age groupings.

The children 0-23 months was sub grouped into 0-5 months, 6-8 months, 9-11 months and 12-23 months to account for the difference in feeding recommendations.

**Table3.1: Number of mothers recruited from each facility**

Sub-municipality	Name of facility	Total number of children 0-23 registered	Number of mother recruited
Brahabebome	SDA Hospital	312	55
Gausu	Government Hospital	208	36
Kwabrafoso	AGA Hospital	188	33
New Nsuta	Central Market Health Centre	280	50
Tutuka	Bryant Mission Hospital	300	54
<b>Total</b>		<b>1288</b>	<b>228</b>

### 3.4.6 Sampling procedures

A simple random sampling was used to select the participants for the study. The “lottery bowl” method was used, which gave the individual participants equal chance to be

selected. Each facility was visited 4 times because each data collection site has 4 CWC sessions in each month for different groups of mothers. The mothers were grouped according to the age (i.e. 0-5 months, 6-8 months, 9 -11 months and 12-23 months). The number of mothers present and qualified at each CWC session and for each age group was identified. Therefore, number of mothers needed in each age group had the corresponding number “Yes “and the rest “No” written on pieces of paper put in a bowl. Mothers were allowed to pick without looking into the bowl, one after the other without replacing. Mothers who picked “Yes” were recruited for the study.

### **3.5. Data collection techniques/methods and tools**

#### **3.5.1 Calculating age of child**

Ages in completed months of the children were used and the date of interview was the reference point. The date of birth of the child was mainly picked from the mother’s ANC or the children’s Road -To- Health card.

#### **3.5.2 Weight and length of a child**

The Salter spring hanging scale was used for taking weight of children under 2 years. This scale could weigh up to 25 kg and is graduated by 0.1kg (100g) increments.

The zero error was corrected by suspending the weighing pants on the scale. The child was undress and put in weighing pant hooked to the scale.

Infantometre was used to take the length of the children. It is made of wooden board, of length of 90 cm and 30 cm broad. Instrument accuracy 0.1cm (Mother and Child Nutrition, 2017).

#### **3.6.1 Dietary assessment from 24-Hour Food Recall for children 6 - 23 months**

Mothers were asked to mention all foods and drinks taken by their children the previous day. The texture of food, sources of food (bought or self-prepared) and how much or size of food consumed were collated and the number of star food was deduced.

### **3.6.2 Dietary diversity**

In this study the 4- star food groupings were used: The staple, legumes and nuts, animal and animal products and vitamin-A rich fruits and vegetables plus other fruits and vegetable (Mother and Child Nutrition, 2017). Eating foods from all the four star group within the 24 hour food recall was rated very good, from three groups was good, from two food groups was rated fair and from only one group was poor.

### **3.6.3 Categorisation of mothers on IYCF practices**

Mothers with children 0-23 months were graded for feeding score based on the IYCF practices. The indicators considered were: breastfeeding, dietary diversification, feeding frequency, texture of food, amount of food and snacks. A mother who scored 0-8 points categorised as poor, scoring 9-11 points is classified as fair and good for scoring 12 and above points. The indicators assessed were from the 24 hour food recall. This scoring was modified from other studies.

### **3.6.4 The minimum acceptable diet within 24 hours**

The minimum acceptable diet is meant for children 6 – 23 months. This means the child breastfed the previous day, fed with minimum food frequency per day according to age and fed with 4-star diet. The proportion of children who met this entire requirement was estimated. The recommended minimum food frequency per day is based according to age and breastfeeding status. For breastfed children, the minimum meal frequency is eating solid or semisolid food at least twice a day for infant's age 6-8 months with snacks and at



least three times a day for children age 9-23 months with snacks. For non-breastfed children, age 6-23 must take not less than four times a day a commercial infant formula (Ghana Statistical Service, 2014). Children age 6-23 months who had a good minimum acceptable diet met all the three criteria: breastfeeding, dietary diversity and feeding frequency.

### **3.6.5 Positioning and attachment of infant during breastfeeding**

Mothers with children less than 2 months were asked to breastfeed their children and it was observed for both positioning and attachment. Mothers who could use their children to demonstration positioning did so and those who could not were given a baby doll for demonstration. These are positioning techniques observed: baby's body should be straight, baby's body should be facing the breast, baby should be close to mother and mother should support the baby's whole body.

These are attachment techniques observe: baby's mouth open wide, lower lip turned out, baby's chin touching breast and more areola above than below nipple.

Positioning and attachment key techniques during breastfeeding were observed and graded. Observed all the 4 techniques being performed was graded good, observed 3 was fair and observed 1-2 is poor.

### **3.6 Data collection tools and procedures**

Before the start of the data collection, two Community Health Nurse recruited and trained for data collection. The field assistants were natives of Obuasi and could speak Twi language fluently and were well informed of the customs and practice of the people. They were taken through the purpose of the research, and trained on how to administer the research questionnaires, first in English and then in Twi and how to record mothers'

responses to the questions asked. They were also guided on how to seek consent, how to administer the 24 hour food recall questionnaire. They were trained thoroughly on the standard procedures for taking anthropometric measurement and make sure they are conversant with the procedures. Inconsistencies in the questionnaire administration were identified and corrected during the training session. There was questionnaire administration demonstration among the field assistants. The training lasted for a day.

### **3.8 Quality control**

Questionnaires were pretested on respondents with similar characteristics as those to be recruited in the main study in Adaase CHPS compound CWC session. This was to ensure that questions were well outlined, easily understood and flows logically. The local language was used. The feedback was updated and necessary changes made to improve the questionnaire. Field assistants were trained on how to take anthropometric measurements. The weighing scales were calibrated before use and the questionnaires were vetted on the field to ensure that all responses were valid and errors identified were corrected.

### **3.9 Data processing and analysis**

The data entry and analysis was performed using Stata version 15. Administered questionnaires were collated at the end of each day. Data was edited and coded manually before entering in to computer software. IYCF variables are presented with frequencies, proportions and percentages using tables. The WHO Anthropometry software was used to convert the age, weight and length of the infants to the z-score of growth indices: weight-

for-age, weight-for-length and length-for-age. Infants with Z-scores below -2 standard deviation of the median reference: length-for-age, weight-for-length and weight-for-age were classified as stunted, wasted and underweight, respectively. For test of association between two categorical variables, the chi-square and the binary logistic regression were used.

### **3.10.1 Ethical consideration**

Ethical clearance for this research was obtained from the Ghana Health Service Ethical Review Committee. Permission was also obtained from the Municipal Health Directorate, Obuasi. The participants were recruited into the study based on their decision to participate after the objectives and the methodology of the study has been explained to them. Participation in the study was completely voluntary, no gift was given. However, the privacy and confidentiality of each participant was ensured throughout the study period. Participants were assured that their names will not be written on the questionnaire and that the consent form with the name and signature will not be linked to the questionnaire.

### **3.10.2 Potential risks and discomforts to respondents**

If you decide to partake in this research, we would be discussing your personal practices and experiences concerning feeding practices. You can decide not to answer some questions if you are discomfort. Also, you can withdraw from the study at any time that you deem it so. You can change your responses that you want any time of the interview without any reason.

### **3.10.3 No Costs and Compensation to respondents**

This study will not cost you any money neither will there be any compensation for participating. If you decide to partake in the research, you will give me about 30 minutes of your time for interacting with you.

### **3.10.4 Possible benefits to participants**

There is no direct benefit to both of you partaking in this research. It is also hoped that the information gathered for this research would reveal the current level of recommended IYCF practices for children under two in Obuasi. Strategies would be found to address gaps if there is and this would improve the nutritional status of the under two and the outcome would be a healthy population in the community.

### **3.10.5 Voluntary participation and right to leave the study**

You and your child's participation in this research are completely voluntary. You are not compelled to partake in the study and you can withdraw at any point in time.

### **3.10.6 Confidentiality**

No information shared with me will be disclosed to anyone who is not part of the study team. Moreover, your name will not be attached or identified with the questionnaire. The data gathered will only be used for academic purposes.

### **3.10.7 Rights as Participants**

This research will be reviewed and approved by Ghana Health Service Ethics Review Committee. If you doubt anything about you and your child's rights, you can contact the

GH SERC during working hours through the landline 0302681109/0302679323 or [ghserc@gmail.com](mailto:ghserc@gmail.com)

### **3.10.8 Contacts for Additional Information**

You are encouraged to ask any question at any time of the study. Further questions about this study may be directed to Peter Solaga (0208220205; [youngsola@gmail.com](mailto:youngsola@gmail.com)), Dr. Phyllis Dako-Gyeke (020 7970370; [gyekenay@yahoo.com](mailto:gyekenay@yahoo.com)), GHS-ERC Administrator: Hannah Frimpong: (0243235225; [Hannah\\_frimpong@ghsmail.org](mailto:Hannah_frimpong@ghsmail.org))

## CHAPTER FOUR

### RESULTS

#### 4.0 Introduction

This chapter presents key findings of IYCF practices among mothers in Obuasi in Ashanti region of Ghana. The results of this research are presented as follows: Socio-demographic characteristics of mothers and their children, Breastfeeding practices, Complementary feeding practices, 24 hour food recall of children 6 -23 months ,Nutritional status of children from the anthropometry measurements and association between maternal characteristics, feeding practices and nutritional status of the children.

#### 4: 1 Socio-demographic characteristics of children

Table 4.1 shows that total of 228 mothers with their children under 2 years participated in the study, of which 53.5% of the children were females. All the mothers of these children attended ANC and majority (94.7%) of them were delivered at Hospital/Health centres, 3.9% delivered at maternity home and 1.3% delivered at home. However, out of 199 children with documented birth weights, 15.6% were delivered with low birth weight. Children without birth weight were 12.7%.

**Table 4.1 Socio-demographic characteristics of children (n=228)**

Characteristics	Frequency	Percentage
<b>Child age in months</b>		
0-5	55	24.1
6-8	30	13.2
9 -11	26	11.4
12-23	117	51.3
<b>Child sex</b>		
Male	106	46.5
Female	122	53.5
<b>Place of birth</b>		
Hospital/Health centre	216	94.7
Maternity home	9	3.9
Home/TBA	3	1.3
<b>Birth weight</b>		
Normal Weight	168	73.7
Low birth weight	31	13.6
Unavailable birth weight	29	12.7

#### **4:2 Socio-demographic characteristics of mothers**

Mothers who participated in the study were grouped into ages, between 20-29 years were 48.2% and followed by 43.0% for age group 30-39 years. The youngest mother was 18 years. Mothers who were married or cohabiting was 92.6%. Among the mothers, only 4.0% did not have formal education and 17.1% had completed tertiary education. Most (71.9%) were Akans followed by Dagatis (10.5%) and other ethnic groups were (7.9%). Christians (85.5%) and Muslims (14.5%) were the only two religious groups present. Most (62.3 %) of the mothers were self-employed and apprentice or student was 7.0%. The household size of 3 and 4 were the majority (48.3%).



**Table 4: 2 Socio-demographic characteristics of mothers**

Characteristics	Frequency	Percentage
<b>Age group of mother in years</b>		
≤19	10	4.4
20-29	110	48.2
30-39	98	43.0
≥40	10	4.4
<b>Marital status</b>		
Single	15	6.6
Married	168	73.7
Separated/Divorced	2	0.9
Cohabiting	43	18.9
<b>Educational level</b>		
None	9	4.0
Primary	18	7.9
JHS	98	43.0
SHS	64	28.1
Tertiary	39	17.1
<b>Ethnicity</b>		
Akan	164	71.9
Dagati	24	10.5
Wangara/Frafra/	16	7.0
Ewe/Ga/Dangbe	6	2.6
Other	18	7.9
<b>Occupation of mother</b>		
Salary earner	30	13.2
Self-employed	142	62.3
Unemployed	40	17.5
Apprentice /Student	16	7.0
<b>Religion</b>		
Christian	195	85.5
Muslim	33	14.5
<b>Number of children</b>		
1-2	158	69.3
3-4	54	23.7
5-6	16	7.0

---

**4:3 Breastfeeding practices among mothers**

Most (71.5%) mothers started early initiation of breastfeeding within an hour after delivery. However, children (99.6%) ever breastfed and were also given the colostrum. During the study 76.7% continued to breastfeed. Mothers with children 0 up to 6 months practicing EBF was 58.2% and EBF between ages 4-5 months was 28.6%. Mothers' practicing continued breastfeeding at 1 year was 82.5% and these were children 12–15 months of age who breastfeeding at the time of study and continued breastfeeding at two year was quarter and these were children 20-23 months were breastfeeding during the study. Mothers who stopped breastfeeding before age 18 months were 4.5%. Majority (80.7%) of mothers did not practice breast milk expression and majority (42.9%) started giving water to their children by age three months. Beside, 39.3% of mothers gave water to their children at age 6 months and above.

**Table 4:3 Breastfeeding practices among mothers**

Characteristics	Frequency	Percentage
<b>Breastfeeding initiation</b>		
First 30 minutes	113	49.6
30 minutes to an hour	50	21.9
1 hour to 2 hours	17	7.5
After 2 hour	48	21.1
<b>Exclusive breastfeeding(n=55)</b>		
Yes	23	58.2
No	32	41.8
<b>Currently breastfeeding</b>		
Yes	175	76.7
No	53	23.3
<b>Frequency of breastfeeding</b>		
1 - 7 times	22	12.6
8 - 12times	90	51.4
>12 times	63	36.0
<b>Positioning of baby during breastfeeding</b>		
Good	63	27.6
Fair	70	30.7
Poor	95	41.7
<b>Attachment of baby to breast(0-2 months)(n=30)</b>		
Good	8	26.7
Fair	11	36.7
Poor	11	36.7
<b>Practiced breast milk expression</b>		
Yes	44	19.3
No	184	80.7

Grading positioning and attachment during breastfeeding from observation: Observed all 4 key technics is good, observed 3 key technic is fair and observed 1-2 technics is poor.

#### **4:4 Complementary feeding practices among mothers**

Children who had started complementary feeding at the time of the study 81.6% children had started complementary feeding and 64.0% of all the children within 6-8 months started complementary feeding. The first complementary foods introduced were in this proportion 'koko' (porridge made from fermented corn) and cerelac which were 64.0% and 26.9%, respectively. Beside, 91.3% introduced light food as first food to their children. Children who were ever bottle fed were 70.2% and those who were bottle feeding at the time of study were 23.7%. Out of 186 children who were eating food, 70.6% did not refuse food, 4.8% of mothers did forced their children to eat and 2.2% encouraged their children.

**Table 4:4 Complementary feeding practices**

Characteristics	Frequency	Percentage
<b>Age (months) at which complementary feeding started</b>		
0–3	40	21.5
4–5	29	15.6
6–8	117	62.9
<b>First complementary food given</b>		
Koko	119	64.0
Cerelac	50	26.9
Tom brown	6	3.2
Mashed kenkey	5	2.7
Others	6	3.2
<b>Texture of initial food given</b>		
Light	158	91.3
Semi-solid & solid	15	8.7
<b>Frequency of food eaten per day</b>		
Once	15	8.1
Twice	29	15.6
Thrice	142	76.3
<b>Currently bottle feeding</b>		
Yes	54	23.7
No	174	76.3
<b>Refusal to eat food</b>		
No difficulty	161	70.6
Encouraged child to eat	4	1.8
Stopped and breastfeed	54	23.7
Force the baby	9	4.0

#### **4:5 24 Hour food recall for children**

Mothers responded to types of foods, amount, frequency, texture and snacks given to their children in the previous day to the study. Table 4:5 shows that among the 173 children in the aged 6 - 23 months, majority (69.4%).were breastfeeding. The top three common foods given to children as breakfast were in the proportion koko (38.7%), cerelac (15.6%) and rice (10.4%). The top three common foods for lunch were, rice (27.2%), TZ (solid foodprepared from maize flour) (17.2%) and mashed kenkey (11.6%). For supper, common food included: rice (22.0%), fufu (12.1%) and cerelac (11.0%). Rice was eaten with stew or soup as well as banku and TZ. Those who had at least a 4- star diet at a meal within the day was 12.9% and majority (60.1%) ate 3-star diet and 9.8% ate 1-star (Poor) diet. The children who had the minimum food frequency per day (Good) was 21.4 % and those who had all their food eaten to be solid or semi-solid (Good) was 27.2%. Children whose meals met the quantity (Good) were 28.9% and those who met minimum acceptable diet was 15.6%. Scoring the feeding practices, 44.5% had good and those who had 2 snacks were (Good) was 9.8%.

**Table 4:5 24 Hour food recall for children (n=173)**

Variables	Frequency	Percentage
<b>Currently breastfeeding</b>		
Yes	120	69.4
No	53	30.6
<b>Dietary diversity</b>		
Very good	31	17.9
Good	104	60.1
Fair	21	12.1
Poor	17	9.8
<b>Food frequency</b>		
Good	37	21.4
Fair	100	57.8
Poor	36	20.8
<b>Texture of food</b>		
Good	47	27.2
Fair	69	39.9
Poor	57	32.9
<b>Amount of food</b>		
Good	50	28.9
Fair	36	20.8
Poor	87	50.3
<b>Minimum acceptable diet</b>		
Good	27	15.6
Fair	96	55.5
Poor	50	28.9
<b>Infant feeding score</b>		
Good	77	44.5
Fair	87	50.3
Poor	9	5.2

Infant Feeding Score (IFS) practices were derived from the 24 hour food recall.

*Breastfeeding:* Yes =2 points, No=0 Point. *Dietary Diversity:* 1-star food (Poor) =1 point, 2-star food (Fair) =2 points, 3-star food (Good) =3 points and 4-star food (Very good) =4 points. The highest star meal was used. *Feeding Frequency:* Received minimum food frequency (Good) =2 points and inadequate (Fair) =1 point and No food (Poor) =0 point. *Texture of food:* Each solid/semi-solid meal =1 point. Each light meal = 0 point. The minimum frequency is what was used for scoring. *Amount of food:* All meals met the requirement (Good) =3 point, Two meals met requirement (Fair) =2 point, One meal met requirement (Poor) =1 point and none met the requirement (Poor) =0 point *Snacks:* None (Poor) =0 point, Once (Fair) =1 point and Twice (Good) =2 point. The minimum/maximum score for IFS is 0/16. Grading from scoring of IFS scoring system (0-8) = Poor, (9-11) = Fair and (12 -16) = Good.

#### **4:6 Nutritional status of children from anthropometry measurement**

Table 4.6 shows the findings from the children anthropometry data. Underweight was 7.0%, 6.1% wasted and 7.0% stunted. Among the age group 12 -23 months were most affected, with 9.4% underweight followed by 0-6 months with 5.5%. Considering wasting, children 0-6 months were most 7.3% affected followed by children 12- 23 months with 6.8%. Children 0-6 months had the highest 10.9% stunting, followed by 12- 23 months with 7.7%.

Undernutrition includes being underweight for one's age, too short for one's age (stunted) and dangerously thin (wasted). A child who had any one or more of the undernutrition indicators was categorized into under-nourished and a child who did not



have any was classified as well-nourished. Under-nourished children were 13.6%. However, 0-6 months aged children were majority 16.4% .followed by 15.4% for 12-23 months children.

**Table 4.6: Nutritional status of children from anthropometry**

Indicators	Total sample (N=228) n(%)	Age group of child in months			
		<6 (n = 55) n(%)	06-8 (n = 30) n(%)	09-11 (n = 26) n(%)	12-23 (n = 117) n(%)
<b>Underweight</b>					
Normal	212(93.0)	52(24.5)	29(13.7)	25(11.8)	106(50.0)
Moderate	13(5.7)	1(7.7)	1(7.7)	1(7.7)	10(76.9)
Severe	3(1.3)	2(66.7)	0(0.0)	0(0.0)	1(33.3)
<b>Wasting</b>					
Normal	214(93.9)	51(23.8)	29(13.6)	25(11.7)	109(50.9)
Moderate	11(4.8)	2(18.2)	1(9.1)	1(9.1)	7(63.6)
Severe	3(1.3)	2(66.7)	0(0.0)	0(0.0)	1(33.3)
<b>Stunting</b>					
Normal	212(93.0)	49(23.1)	29(13.7)	26(12.3)	108(50.9)
Moderate	9(3.9)	3(33.3)	0(0.0)	0(0.0)	6(66.7)
Severe	7(3.1)	3(42.9)	1(14.3)	0(0.0)	3(42.9)
<b>Undernutrition</b>					
Two indicators	13(5.7)	4(30.8)	1(7.7)	0(0.0)	8(61.0)
One indicator	17(7.5)	5(29.4)	1(5.9)	2(11.8)	9(52.9)
None indicator	197(86.4)	46(23.4)	28(14.2)	24(12.2)	99(50.3)

#### **4:7 Associations between maternal characteristics and nutritional status of the infants**

There was no significant association between the various maternal characteristics and nutritional status of the children at  $P < 0.05$ . However, the bivariate logistics regression showed that the infants of the mothers who attended primary school are likely to have equal chances of being well-nourished. Furthermore, the bivariate logistics regression showed that the unemployed mothers more likely to have their children more nourished as compared to the children of salary earning mothers (OR=6.00; 95%CI=0.63-56.74; P-value=0.12). The children of the self-employed mothers were less likely to have their children well-nourished as compared to mothers who are salary earners (OR=0.69; 95%CI=0.22-2.14; P-value=0.52). Married mothers had higher chances of having their children well-nourished as compared to the single mothers (OR=1.02; 95%CI=0.22-4.83; P-value=0.52). With children from a family size of two, 84.5% were well-nourished higher than 71.4% of the children from the family size of 7 to 10 were well-nourished. Moreover, those from the family size of 7 to 10 were less likely to be well-nourished (OR=0.46; 95%CI=0.08-2.74; P-value=0.39.) .Table 4:7 below indicates these information. .

**Table 4:7 Associations between maternal characteristics and nutritional status of the infants**

Variable	Nutritional status		Chi square (X <sup>2</sup> )	P-value	OR (95% CI)	P-value
	Under-nutrition	Well-nourished				
<b>Educational level</b>			2.65	0.62		
None	1(11.1)	8(88.9)			1.00	
Primary	1(5.6)	17(94.4)			2.13 (0.12-38.48)	0.61
JHS	17(17.4)	81(82.7)			0.60 (0.07-5.08)	0.64
SHS	8(12.5)	56(87.5)			0.88 (0.96-7.95)	0.91
Tertiary	4(10.3)	35(89.7)			1.09 (0.11-11.15)	0.94
<b>Religion</b>			1.90	0.17		
Christian	24(12.3)	171(87.7)			1.00	
Muslim	7(21.2)	26(78.8)			0.50 (0.20-1.33)	0.17
<b>Occupation of mother</b>			9.40	0.02		
Salary earner	4(13.3)	26(86.7)			1.00	
Self-employed	26(18.3)	116(81.7)			0.69(0.22-2.14)	0.52
Unemployed	1(2.5)	39(97.5)			6.00(0.63-56.74)	0.12
Apprentice /Student	0(0.0)	16(100.0)			1.00	
<b>Marital status</b>			0.62	0.89		
Single	2(13.3)	13(86.7)			1.00	
Married	22(13.1)	146(86.9)			1.02(0.22-4.83)	0.98
Separated/Divorced	0(0.0)	2(100.0)			1.00(0.15-4.31)	
Cohabiting	7(16.3)	36(83.7)			0.79(1.47-28.80)	0.79
<b>Household size</b>			3.25	0.36		
2	9(15.5)	49(84.5)			1.00	
3-4	11(10.0)	99(90.0)			1.65(0.64-4.25)	0.30
5-6	9(17.0)	44(83.0)			0.90(0.33-2.64)	0.83
7-10	2(28.6)	5(71.4)			0.46(0.08-2.74)	0.39

\*Significance at P<0.05

\*OR – Odds ratio from bivariate logistics regression

#### **4: 8 Association between feeding practices and the nutritional status of the infants**

There was no significant association between the various feeding practices and nutritional status of the children at P<0.05. In this bivariate analysis, children with fair food frequency were less likely to be well-nourished compared to those who had a good one

(OR=0.52; 95% CI=0.14-1.90; P-value=0.32). Those who had poor food frequency also were less likely to be well-nourished as compare to those with a good food frequency (OR=0.75; CI=0.16-3.62; P-value=0.72).

Infants who were being breastfed at the time of the study were more likely to be well-nourished compared to those who were not being breastfed. Those who were not being breastfed were less likely to be well-nourished (OR=0.94; 95%CI=0.36-2.46; P-value=0.90). Furthermore, infants who were having a poor snack frequency were 0.56 times less likely to be well-nourished compared to the infants who had a good snacks frequency (OR=0.34; 95%CI=0.10-1.12; P-value=0.07).

Those who had poor dietary diversity were less likely to be well-nourished compared to those who had a very good one (OR=0.90; 95% CI=0.15-5.50; P-value=0.91). Also the odds of infants who took in foods with poor texture were less likely to be well-nourished compared to those who took in foods with good texture (OR=0.96; 95%CI=0.30-2.07; P-value=0.94).

**Table 4:8 Associations between feeding practices and the nutritional status of the infants**

Variable	Under nutrition status		Chi-square (X <sup>2</sup> )	P-value	OR (95% CI)	P-value
	Under-nourished	Well-nourished				
<b>Food frequency</b>			1.21	0.55		
Good	3(8.3)	33(91.7)			1.00	
Fair	15(15.0)	85(85.0)			0.52(0.14-1.90)	0.32
Poor	4(10.8)	33(89.2)			0.75(0.16-3.62)	0.72

<b>Currently breastfeeding</b>			0.02	0.90		
Yes	15(12.5)	105(87.5)			1.00	
No	7(13.2)	46(86.8)			0.94(0.36-2.46)	0.90
<b>Snacks frequency</b>			5.29	0.07		
Good	13(12.3)	93(87.7)			1.00	
Fair	4(8.0)	46(92.0)			1.61(0.59-5.21)	0.43
Poor	5(29.4)	12(70.6)			0.34(0.10-1.12)	0.07
<b>Dietary diversity</b>			0.26	0.97		
Very good	2(11.7)	15(88.2)			1.00	
Good	2(9.5)	19(90.5)			1.27(0.16-10.7)	0.82
Fair	14(13.5)	90(86.5)			0.86(0.18-4.16)	0.85
Poor	4(12.9)	27(87.3)			0.90(0.15-5.50)	0.91
<b>Texture of food</b>			0.02	0.99		
Good	7(12.3)	50(87.7)			1.00	
Fair	9(13.0)	60(87.0)			0.93(0.32-2.68)	0.90
Poor	6(12.8)	41(87.2)			0.96(0.30-2.07)	0.94
<b>Amount of food</b>			0.80	0.67		
Good	13(14.9)	74(85.1)			1.00	
Fair	4(11.1)	32(88.9)			1.40(0.42-4.64)	0.58
Poor	5(10.0)	45(90.0)			1.58(0.53-4.73)	0.41
<b>Minimum acceptable diet</b>			0.14	0.93		
Good	7(14.0)	43(86.0)			1.00	
Fair	12(12.5)	84(87.5)			1.14(0.42-3.10)	0.80
Poor	3(11.1)	24(88.9)			1.30(0.31-5.51)	0.72
<b>IFS</b>			0.10	0.95		
Good	4(13.8)	25(86.2)			1.00	
Fair	10(13.2)	66(86.8)			1.06(0.31-3.68)	0.93
Poor	8(11.8)	60(88.2)			1.20(0.33-4.35)	0.78

\*Significance at P<0.05

\*OR – Odds ratio from bivariate logistics regression

## CHAPTER FIVE

### DISCUSSION

#### 5.0 Introduction

This section presents discussions of the result from a cross sectional study conducted among 228 mothers with children 0-23 months at Obuasi Municipality in Ashanti region

of Ghana. The chapter is presented as follows: demographic characteristics of children and their mothers, breastfeeding practices, complementary practices which includes 24 hour food recall for children 6-23 months and the nutritional status of the children based on anthropometry measurement. Also associations between nutritional status to feeding practices and maternal characteristic from the 24 hour food recall.

### **5.1 Socio-demographic characteristics of mothers and their children**

The results of this study shows that all the mothers attended ANC and 98.7 % delivered at health facility. The low birth weight (weight less than 2.5 Kg) prevalence was 15.6%. By UNICEF's classification, this is medium high class. The global target for low birth rate for 2025 is 10%. The findings of this study show that nine out of ten mothers were in the age bracket of 20 -39 years. This is the healthy age group for delivering. Education provides people with knowledge that can lead to a better quality of life and care of children. The study also shows that a little above half of the mother have not attained at least a secondary school (SHS) education, but it is an improvement in female education in Ghana. Majority of the mothers were employed and household size of 3 to 4 persons had the highest percentage.

### **5.2: Breastfeeding practices**

Optimal breastfeeding practices of infants recommended include: Early initiation of breastfeeding within 1 hour of birth; breastfeeding on-demand; EBF (is feeding a baby with only breast milk and no other foods or drinks until the infant is about 6 months of age). The prevalence of early initiation of breastfeeding within 1 hour in this study was

71.5% of children 0-23 months old. Nevertheless, there was missed opportunity of care since delivery by skilled attendant was very high.

A study conducted at rural area of Navsari district of India showed that 56.4% initiated early breastfeeding. All the children in this study ever breastfed and were fed with colostrum. Mothers who fed their children with colostrum in Bangladesh was two out of three from a similar study (Khan, Hoque, Molla, Islam & Hossan, 2011). Lwelamira (2016) indicated nine out of ten mothers breastfed their new born with colostrum in Morogoro municipality, Tanzania. All children were breastfed in Navsari, India (Gandhi et al., 2014). In United State of America almost (20%) of children never breastfed (Martinez Sullivan & Brumfield, 2016).

At the time of the study, about quarter of the children between 18-23 months were breastfeeding, this is known as continued breastfeeding at 2 years. Two out of five mothers terminated breastfeeding before age 18 months of their child. This is lesser than what was reported by Ghana Statistical Service (2014) which was one in every 2 children.

In this study 58.2% of the under 6 months practiced EBF but within age 4-5 months only 28.6% practiced. Moreover, three out of five children were given water to drink before age 6 months. About quarter of the children were given infant formula and gripe water within the first 6 months of the child's life. EBF was 52% but in 2008 it was 63.0% and EBF within 4-5 months was 36.2% (Ghana Statistical Service, 2014). A study in Gujarat, India reported 36.2% EBF for 6 months (Gandhi et al., 2014). Also a study in Bangladesh reported EBF rate as 41.5% (Khan et al., 2011). No child above 4 months old was exclusively breastfed (Lwelamira, 2016). The global target for EBF for 2025 is to be greater than 50% (WHO, 2014).



Less than one third of mothers of infants under age 2 months were observed not to attach well during breastfeeding and same score recorded for poor positioning demonstrated by all mothers interviewed. Moreover, few mothers faced breastfeeding challenges and among them, soreness in nipple was most (40%) mentioned followed by inadequate breast milk (25.1%), mastitis and breast engorgement was 10% each.

### **5.3 Complementary feeding practices**

The transition from EBF to family food is referred as complementary feeding which starts at six month, since the breast milk alone will not provide adequate calories for the child growth and development. Complementary foods should be given in the recommended amounts, frequency, consistency and using a variety of foods to cover the nutritional needs of the growing child while maintaining breastfeeding. Complementary food must be semi solid or solid, easy-to-eat and digest food. Introducing complementary foods before this age increases the risk of infections and allergies.

Mothers who started complementary feeding at age 6–8 months were 64%. However, in Gujarat, India almost all children 6 -9 months received complementary feeding. Furthermore, in this study, the texture of food initiated were liquid, semi -solid or solid type of complementary foods. Only one out of ten children was given the recommended consistency of food. The initial common foods introduced to the children were koko (cereal porridge) and cerelac which were 64% and 26.9% respectively. A study in Upper Manya district of Ghana by Pagui (2015) also revealed koko and ceralac as initial common food given to the children. (Gandhi et al., 2014). Complementary feeding started in time in 35.8% and complementary food was mainly luta (rice powder mixed with boiled water and sugar only (Khan et al, 2011). Only 27% of children had started

receiving complementary feeding at 6 months of age. Moreover, quantity of food was inadequate (Katara, Patel, Kantharia, Mazumdar & Shah, 2013).

This study revealed that children who were ever fed with bottle with nipple were 72.2%, and those who used it the previous days were 23.7%. However a report compiled by WHO on Demography Health Survey from Ghana, Bangladesh and Dominican Republic reported 12 %, 0.3% and 84% respectively.(WHO, 2008). Khan et al., (2011) also recorded one out of three for bottle feeding in Bangladesh. About 70% of mothers did not face the challenge of refusal of food by their children but those who face refusal, 4% did force their children to eat. Responsive feeding is making eating a happy activity for the child. There were no culture practices that taboo the eating of any food, apart from some religious groups who do not take a particular meat and fish.

#### **5.4: 24 hour food recall of mother's feeding practices for children 6 -23 months**

In this 24 hour food recall, mothers were asked to accurately and completely list all food and drink consumed in the last 24 hours by their children. The type, amount, frequency, texture and the source of food were captured. The dietary diversity (star of food) was derived from the type of food given. The recommended complementary feeding practices are for children 6 -23 months. The feeding practices are age group specific, 6-8, 9-11 and 12-23 months. However, quarter of children under 6 months started complementary feeding were 25.5%. Common food taken for breakfast were : koko (38.7%), cerelac (15.6%) and rice (10.45). Common food eaten as lunch were: rice (27.2%), TZ(solid food prepared from maize flour) (17.3%) and mashed kenkey. Food eaten as supper were rice (22.0%), fufu (12.1%) and cerelac (11.0%). For the preparation of the foods, 71.7% of the

mothers prepared the breakfast themselves, 65.9% prepared their own lunch and for supper 87.3% prepared it themselves.

The dietary diversity was grouped into 4 -star foods (staple, fruits or vegetable, Animal and plant sources of protein). A very good meal contains 4-star. From this study 17.9% children had a very good diet, 60.1% had a good diet of 3-star, 12.1% had fair diet of 2-star and 9.8% ate a poor diet which contained only the staple. Yet, the minimum meal frequency per day recorded one out of five having good frequency and about quarter had all their food being solid or semi-solid or soft .Only quarter of children were receiving minimum meal frequency (Katara, et al, 2013). Minimum daily meal frequency was met by 75% of children and only 18% of children 6–23 months met minimum dietary diversity.( Aguayo, Kang, Dzed, Joshi, Waid, Gupta,Haselow, & West Jr, 2017)

Fifty percent (50%) of the children ate less (Poor) amount of food per meal and 28.9% had the recommended amount. Mothers who did not give snacks (extra food between meals) were three out of five and those who gave two snacks were one out of ten. Biscuits and Banana were the common snacks given.

Minimum acceptable diet is scored by combining breastfeeding, dietary diversity and frequency of food. Those who met minimum acceptable diet were 15.6% for this study. From the GDHS, 2014 reported 13% meeting the minimum acceptable diet and WHO et al (2008) report on Ghana was 27% .The feeding practices deduced from the 24 hour were scored and few (5.2%) had poor, 50.3% had fair ,and 44.5% had good.

### **5.5 Nutritional status of children from the anthropometry measurement.**

The spring hanging scale (SALTER) was used for taking weight of the children. This scale can weigh up to 25 kg and is graduated by 0.1kg increments. The infantometre (Height measuring board) that was used had the following features: Made of wooden board, Length of 90 cm and, Breadth 30 cm, Foldable foot and head plates and instrument accuracy was 0.1cm.

The classification of malnutrition are: underweight (weight-for-age), wasting (weight -for -height) and stunting (height-for-age). To be  $< -3SD$  is classified as severely malnourished and between  $< -2SD$  and  $< -3SD$  is classified as moderately malnourished. From this study the prevalence of under-weight, stunting and wasting were 7%, 7% and 6.1%, respectively. Children between 12- 23 months had the highest underweight rate of 9.4%. Children severely underweight were 1.3%. Children below 6 months recorded the highest (10.9%) stunting. and severely stunted were 3.1%. Wasting rate was highest (7.2%) among children under 6 months and severely wasting was 1.3%. Similar study conducted in Bangladesh reported 43% underweight and 10.3% were severely underweight and common among 12 - 23 months. Stunting rate were 29% and 11.3% severely stunted. About 13.5% children were wasted and among them 2.5% were severely wasted (Khan, Hoque, Molla, Islam, 2011). From this study 86.4% of the children were well-nourished. The prevalence of stunting, underweight and wasting were found to be 33.8%, 12.6% and 8.3% respectively at Adama town in Ethiopia (Wondafrash, Admassu ,Bayissa & Geremew,2018). Seven percent of children were wasted 11.5% were stunted and 9.9% were underweight (Negash, Whiting, Henry, Belachew, & Tewodros, 2015).

### **5.7 Association between maternal characteristics, feeding practices and nutritional status of the children**

Under-nourished is a child who had  $< -2SD$  in any of Weight-for-age, weight-for-height and height-for-age indicators. Well-nourished is a child who had  $> -2SD$  in all of Weight-for-age, weight-for-height and height-for-age indicators.

This study found no association between the nutritional status, feeding practices and maternal characteristics. This could possibly be due to relatively low prevalence of undernutrition and small sample size. A study by Syed & Das (2017) found no significant association between undernutrition and any of socio-demographic characteristics of mothers. A study conducted at Adama town in Ethiopia showed that nutritional status of children of employed mothers is significantly better than that of non-employed mothers (Wondafrash et al., 2018). Also another study showed that having a mother with salaried employment is a benefit for the nutritional status of the child (Negash et al., 2015). Saha & Bhattacharjya (2018) found out that, there was no association between children's nutritional status and feeding practices. No significant association was observed between feeding practices and nutritional status of infants (Laxmaiah, Venkaiah, & Brahmam, 2012). In contrast, undernutrition was associated with infant feeding practices (Gandhi et al., 2014). Similar studies conducted in India by Syed & Das (2017) and in Luweero District, Central Uganda by Nankumbi & Show (2012) also found that IYCF practices were found to be significantly associated with undernutrition.

With regard to minimum acceptable diet, those who scored good had 86.6% of their children well-nourished and those who scored poor also had 88.6% of their children

being well- nourished. Furthermore, the infant feeding score depicts that mothers who have good score had 86.2% of their being well-nourished. However, those who scored poorly had 88.2% of their children well-nourished. Infants with a good Infant Feeding Score (IFS) were less likely to be well-nourished as compared to those with poor IFS (OR=0.83; 95%CI=0.23-3.02; P-value=0.78).

### **Limitations of the study**

The study was purely quantitative and hence was limited in probing further to get to establish the reasons behind some of the feeding practices which the mixed methods approach could have done better. The single 24 hour food recall might not be representative of the usual. This may be due to recall bias where there is the possibility that respondents may not provide accurate answers.

## CHAPTER SIX

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 6.0 Introduction

These study present findings regarding breastfeeding and complementary feeding practices among mothers for children under 2 years. It also identified the type of food, amount, frequency consistency and diet diversification for children 6-23 using the 24 hour food recall. It also tried to determine associations between this food recall and the nutritional status of these children.

#### 6.1 SUMMARY OF FINDINGS

The study revealed that all mothers attended ANC, and almost all delivered at a health facility. The prevalence of early initiation of breastfeeding within 1 hour was not good, since almost all children were delivered at health facility. It was expected to be higher than what was established in this study (missed opportunity). All the children ever breastfed and also given the colostrum. However, 3 out of 5 infants under 6 months of age were exclusively breastfed which is a little higher than the national performance of 1 out of 2 infants. But not encouraging seeing one third of them exclusively breast fed between 4-5 months. Very few mothers practiced breast milk expression. This could contribute to early introduction to complementary feeding. Continued breastfeeding at 1 year was high (4 out of 5), but continued breastfeeding at 2 years is low (1 out of 4). The frequency of breastfeeding per day is high. Generally breastfeeding practices were quite good but do not meet the optimal.

Three out of five children were timely introduced to complementary food at age 6-8 months but very few infants, one out of ten children were given the appropriate texture of food (solid or soft food). Very few (one out of five) children were given 4-star food and one out of ten was given two snacks. Those who met the minimum acceptable diet were about fifteen percent. The use of bottle feeding is quite high and very low practice of breast milk expression.

## **6.2 CONCLUSION**

The information gathered on complementary feeding practices had serious gap which is needed to be bridged. By the assessment of information gathered from the 24 hour food recall, 2 out of five had good score. The complementary feeding practices in this study were suboptimal. The inadequate IYCF practices might be due to lack of knowledge about recommended infant feeding practices. In general the nutritional status was good. No association was found between the indicators used for the 24 hour food recall and the nutritional status of the children.

## **6.3 Recommendation**

- The community health staff in the municipality must apply IYCF skills, knowledge and feeding counseling tools to improve breast milk expression, texture of food and minimum acceptable diet.
- The DHMT should support and promote IYCF practices in the mother-to-mother support groups at the community level.



- The DHMT should engage other stakeholders in providing crèche with attendants trained on IYCF at work places and markets and where mothers can feed their children when on break.

## REFERENCE

- Aguayo, V., Kang, Y., Dzed, L., Joshi, V., Waid, J., Gupta, S. D., ... Jr, K. P. W. (2017). Infant and young child feeding practices and nutritional status in Bhutan.
- Article, P. N. (2008). © 2008 American Society for Clinical Nutrition Appropriate infant feeding practices result in better growth of infants and young children in rural Bangladesh 1 , 2 , 3 Authors.
- Brown, A., Rance, J., & Bennett, P. (2015). Understanding the relationship between breastfeeding and postnatal depression : the role of pain and physical difficulties \*, (November). <https://doi.org/10.1111/jan.12832>
- Chapu, P., & Pagui. (2015). *The association between an infant and young child feeding index, the nutritional knowledge of the care-giver and the nutritional status of children 6-23 months in the Upper-Manyakrobo District.*
- Don, T. (2017). Breast-feeding DOES help mothers bond with babies - because it releases the “love” hormone | Daily Mail Online. Retrieved from <http://www.dailymail.co.uk/health/article-1036151/Breast-feeding-DOES-help-mothers-bond-babies--releases-love-hormone.html>
- Factors, R., Hospital, T., & State, W. N. (2017). Assessment of Maternal Knowledge of Under Five Year ' s Children regards Malnutrition and Related Factors in Kosti and ... Assessment of Maternal Knowledge of Under Five Year ' s Children regards Malnutrition, (March). <https://doi.org/10.24947/baojn/3/1/00127>
- Gandhi, S., Godara, N., Modi, A., & Kantharia, S. (2014). Impact of feeding practices on nutritional status of children in rural area of Navsari district. *International Journal of Medical Science and Public Health*, 3(11), 1338. <https://doi.org/10.5455/ijmsph.2014.020820143>
- Garcia, C. R., Mullany, L. C., Rahmathullah, L., Katz, J., & Thulasiraj, R. D. (2011). Breast-feeding initiation time and neonatal mortality risk among newborns in South India, (December 2010), 397–403. <https://doi.org/10.1038/jp.2010.138>
- Ghana Statistical Service, Ghana Health Service. (2014). Ghana Demographic and Health Survey 2014, 99–102.
- Ghana Statistical Service. (2014). Ghana Demographic and Health Survey. *Studies in Family Planning*, 21(1), 1–5. <https://doi.org/10.1007/s13398-014-0173-7.2>
- Harris, G., & Coulthard, H. (2016). Early Eating Behaviours and Food Acceptance Revisited : Breastfeeding and Introduction of Complementary Foods as Predictive of Food Acceptance, 113–120. <https://doi.org/10.1007/s13679-016-0202-2>
- Helz, K., Soekarjo, D., Wilson, J. S., Myatt, M., Maclaine, A., & Sibson, V. (2010). *Collecting and Using Data: A Step-by-Step Guide INFANT AND YOUNG CHILD FEEDING PRACTICES.*

- Infant and Young Child Feeding A tool for assessing national practices ,. (n.d.).
- Initiative, B. H., Feeding, Y. C., & Feeding, Y. C. (n.d.). Nutrition Promoting proper feeding for infants and young children.
- Katara, P. S., Patel, S. V, Kantharia, S. L., Mazumdar, V. S., & Shah, M. B. (2013). STUDY ON FEEDING PRACTICES AMONG CHILDREN 6 MONTHS TO 2 YEARS AND ITS EFFECT ON THEIR NUTRITIONAL STATUS IN URBAN SLUMS, *4*(3), 475–478.
- Khan, Hoque, Molla, Islam, L. H. (2011). Feeding practices and nutritional status of children under two years of age .
- Kumar, D., Goel, N. K., Mittal, P. C., & Misra, P. (2006). Influence of Infant-feeding Practices on Nutritional Status of Under-five Children, *73*, 417–422.
- Laxmaiah, A., Venkaiah, K., & Brahmam, G. N. V. (2012). Impact of feeding and breastfeeding practices on the nutritional status of infants in a district of Andhra Pradesh , India, 201–206.
- Lm, L., Cl, F. W., & Re, B. (2011). Breastfeeding and the risk for diarrhea morbidity and, 5–6. <https://doi.org/10.1186/1471-2458-11-S3-S15>
- Lwelamira, J. (2016). Feeding practices and nutritional status of infants in Morogoro Municipality , (October 2013). <https://doi.org/10.4314/thrb.v15i3.5>
- Manuscript, A. (2009). NIH Public Access.
- Martinez Sullivan, L., & Brumfield, C. (2016). The First 1 , 000 Days : Nourishing America’s Future.
- Motee, A., Ramasawmy, D., Pugo-gunsam, P., & Jeewon, R. (2013). An Assessment of the Breastfeeding Practices and Infant Feeding Pattern among Mothers in Mauritius, 2013.
- Nankumbi, A., & Show, J. M. (2012). Association between feeding practices and the nutritional status of children 0- 24 months : a casestudy in Luweero District , Central Uganda.
- Negash, C., Whiting, S. J., Henry, C. J., Belachew, T., & Tewodros, G. (2015). Association between Maternal and Child Nutritional Status in Hula , Rural Southern Ethiopia : A Cross Sectional Study Introduction Materials and Methods Result Discussion Conclusion Acknowledgments Author Contributions References, 1–4. <https://doi.org/10.1371/journal.pone.0142301>
- Nutr: L. C. Mullany, J. Katz, Y. M. Li, S. K. Khatry, S., & C. LeClerq, G. L. Darmstadt, and J. Tielschition, A. S. for. (2008). Breast-Feeding Patterns, Time to Initiation, and Mortality Risk among Newborns in Southern Nepal.
- Nutrition, Y. C., & Techniques, A. M. (n.d.). Management of Malnutrition in Children Under Five Years Integrated Management of Acute Malnutrition Diagnosis of Acute Malnutrition Anthropometric Measurement Techniques Share the latest on Mother , Infant and Young Child Nutrition & Malnutrition.

problems and how to solve them ! (n.d.).

Report, T. (2016). WHO ' s Africa Nutrition Report highlights an increase in malnutrition in Africa ., 2015–2017.

Rupert, B., Published, S., & June, T. (2012). Two Thirds Of New Mothers Have Trouble Breast Feeding.

Saha, A., & Bhattacharjya, H. (2018). Feeding practice of infant and young children and their nutritional status among tea worker community of West Tripura district , India : an observational study.

Sinhababu, A., Mukhopadhyay, D. K., Panja, T. K., Saren, A. B., Mandal, N. K., & Biswas, A. B. (2010). Infant-and young child-feeding practices in Bankura district, West Bengal, India. *Journal of Health, Population and Nutrition*, 28(3), 294–299. <https://doi.org/10.3329/jhpn.v28i3.5559>

Smith, E. R., Hurt, L., Chowdhury, R., Sinha, B., Fawzi, W., Edmond, K. M., & Study, N. (2017). Delayed breastfeeding initiation and infant survival : A systematic review and meta- analysis, 1–16.

Syed, Q., Gaidhane, A., & Kogade, P. (2016). Challenges and Patterns of Complementary Feeding for Women in Employment : A Qualitative Study from Rural India, 4(1), 48–53.

Syed, S., & Das, B. (2017). Assessment of nutritional status and its association with feeding practices in children under five years, 4(1), 68–72.

Tt, T. T. (n.d.). The Health Risks of Malnutrition A m i r ( / E c o m m e r c e / C h i l d R e t a i l . a s p x ? c i d = 6 0 9 3 7 .

UNICEF. (2011). Infant and Young Child Feeding: Programming Guide. *Nutrition Section, UNICEF*, (May), 173. [https://doi.org/http://www.unicef.org/nutrition/files/Final\\_IYCF\\_programming\\_guide\\_2011.pdf](https://doi.org/http://www.unicef.org/nutrition/files/Final_IYCF_programming_guide_2011.pdf)

UNICEF. (2013). *Improving child nutrition: The achievable imperative for global progress*. Division of Communication, UNICEF. <https://doi.org/978-92-806-4686-3>

UNICEF. (2017). Improving breastfeeding, complementary foods and feeding practices, (March), 1–2.

UNICEF, World Health Organization, & The World Bank. (2012). UNICEF-WHO-World Bank. Joint Child Malnutrition Estimates: Levels & trends in child malnutrition. *Africa*, 35. <https://doi.org/10.1093/ije/dyr050>

Welfare, F. (2013). GUIDELINES FOR ENHANCING OPTIMAL INFANT AND Ministry of Health and Family Welfare, 1–70. Retrieved from [www.nhsrindia.org](http://www.nhsrindia.org)

WHO. (2004). Guiding principles for feeding infants and young children.

WHO. (2014). Nutrition Global Targets 2025, (October 2013), 2025.

WHO. (2016a). Media centre Infant and young child feeding, (January), 2–7. Retrieved

from <http://www.who.int/mediacentre/factsheets/fs342/en/>

WHO. (2016b). Nutrition: Double burden of malnutrition. *Who*. Retrieved from <http://www.who.int/nutrition/double-burden-malnutrition/en/>

WHO et al. (2008). Indicators for assessing infant and young child feeding practices. Retrieved from [http://www1.paho.org/hq/dmdocuments/2010/Indicators for assessing IYC feeding practices FINAL.pdf](http://www1.paho.org/hq/dmdocuments/2010/Indicators_for_assessing_IYC_feeding_practices_FINAL.pdf)

Wondafrash M , Admassu B, B. Z. and G. F. (2018). Maternal and Pediatric Nutrition Comparative Study on Nutritional Status of under Five Children with Employment Status of Mothers in Adama, 2017–2018. <https://doi.org/10.4172/2472-1182.1000117>

World Health Organization. (2010). Interpretation Guide Nutrition Landscape Information System (NLIS). *Who*, 1–51. <https://doi.org/10.1159/000362780>. Interpretation

World Health Organization. (2015). Nutrition; complementary feeding, 11–13. Retrieved from [http://www.who.int/nutrition/topics/complementary\\_feeding/en/](http://www.who.int/nutrition/topics/complementary_feeding/en/)

## **APPENDICES**

### **Appendix I**

#### **Participant consent form**

TITLE: Infant and young child feeding practices: A study among mothers in Obuasi Municipality.

#### **Introduction**

Good morning and how are you?

My name is Peter Solaga, Masters of public health student of the University of Ghana. I am undertaking a research on infant and young child feeding practices and nutritional status of children 0-23 months in Obuasi. The aim of this research is to assess the child feeding practices and the nutritional status; therefore selected mothers with children between under two years will be involved. You and your child are among chosen ones. The findings of this research would reveal the challenges and gaps in feeding the under two in Obuasi and to find strategies in addressing them and this would improve the nutritional status of the under two with its benefits. If you agree to partake, then the weight and height of your child will be measured. The results of this research would be made available to any interested interviewee.

#### **Potential Risks and Discomforts**

If you decide to partake in this research, we would be discussing your personal practices and experiences concerning feeding practices. You can decide not to answer some questions if you are uncomfortable. Also, you can withdraw from the study at any time that

you deem it so. You can change your responses that you want any time of the interview without any reason.

### **No Costs and Compensation**

This study will not cost you any money neither will there be any compensation for participating. If you decide to partake in the research, you will give me about 30 minutes of your time for interacting with you.

### **Confidentiality**

No information shared with me will be disclosed to anyone who is not part of the study team. Your name will not be attached or identified with the questionnaire for the study. The information that I will collect will only be used for academic purposes.


### **Contacts for Additional Information**

You can contact Peter Solaga, School of Public Health, Legon on the following numbers 0208220205/0547511448 or [youngsola@gmail.com](mailto:youngsola@gmail.com) for any clarification or Dr. Phyllis Dako-Gyeke, School of Public Health, Legon: (0207970370; [gyekenay@yahoo.com](mailto:gyekenay@yahoo.com)) or GHSERC Administrator: Hannah Frimpong: (0243235225; [Hannah\\_frimpong@ghsmail.org](mailto:Hannah_frimpong@ghsmail.org))

### **Certificate of consent**

I have read/explained to me the nature and purpose of the study. I have been given the opportunity to ask any questions about the study and I was content with answers to my questions. I agree voluntarily to participate as a respondent and have the right to withdraw from the study at any time without any intimidation.

\_\_\_\_\_

Full name of participant                      Signature or                                            \_\_\_\_\_

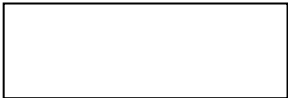
Full name of participant                      Signature or                      Thumb print                      Date

**If participant cannot read the form themselves, a witness must sign here:**

**Declaration by witness**

I was present while the benefits, risks and nature and purpose of the study were read to the participant. All questions were answered and the participant has agreed voluntarily to part take in the study.

\_\_\_\_\_

Full name of witness                                            \_\_\_\_\_

Full name of witness                      Signature of witness or Thumb print                      Date

**Certification by interviewer**

I certify that, the entire study, including the nature, purpose and the potential benefits, have been explained to the above individual to the best of my ability in participating in this study. I confirm that the participant was given the chance to ask questions about the research, and all the questions asked by the participant were answered correctly. I confirm that the consent has been given freely and voluntarily.

\_\_\_\_\_

Name of interviewer                      Signature                      Date



## Appendix II

### Study Questionnaire

#### Infant and young child feeding practices: A study among caregivers in Obuasi municipality

*Investigator's Code.....Date of interview..... Questionnaire No.....*

*Kindly tick/write the appropriate response where applicable*

#### Breastfeeding practices

1. Name of child.....
2. Date of birth of (name of child)..... (Verify from any document available)
3. Age of child in completed months .....
4. What is the sex (name of child)? 1. Male [ ] 2.Female [ ]
5. Did you attend ANC with (name of child) pregnancy? 1Yes [ ] 2.No [ ]
6. Where was the (name of child) delivered? 1. Hospital [ ] 2.Maternity home [ ]  
3.TBA/home [ ]
7. What was (name of child) birth weight .....verify from any document available
8. What is the order of birth of (name of child)? 1. One [ ] 2. Two [ ] 3. Three [ ]  
4. Four [ ] 5. Five [ ] 6 others (specify).....
9. How many children are within 24 months? 1. One [ ] 2. Two [ ] 3.Three [ ]
10. Has (name of child) ever breastfed 1.Yes [ ] 2. No [ ]

11. How long after birth did you first put (name of child) to the breast?

1. Within 30 minutes [ ] 2. 30 minutes to 1 hour [ ] 3. 1 to 2 hours [ ] 4. 2 to 8 hours [ ] 5. 8 to 24 hours [ ] 6. The second to third day [ ] 6. others (specify).....

12. Did you give colostrum (first yellowish milk) to your baby? 1. Yes [ ] 2. No [ ]

13. Is the child currently breastfeeding Yes [ ] No [ ]

14. Did your child breastfed yesterday? 1. Yes [ ] 2. No [ ]

15. How many times have you breastfed the child in the last 24 hours?

1. None [ ] 2. 1-7 times [ ] 3. 8 – 12 times [ ] 4. > 12 times [ ]

16. At what age did you stop breastfeeding the child? Specify..... (Months)

1. <5 [ ] 2. 6 to 11 [ ] 3. 12 to 15 [ ] 4. 16 to 19 [ ] 5. >20 [ ]

17. At what age (months) did you start giving water to your child?

Specify..... (Months)

18. Did you give other liquids before 6 month? 1. Yes [ ] 2. No [ ]

19. If yes, specify .....

20. Did you ever practice breast milk expression it? 1. Yes [ ] 2. No [ ]

21. Mention any breastfeeding difficulty or breast problem you have faced 1 Nothing [ ]

2. Engorgment [ ] 3. Sore nipple [ ] 4. Plugged duct/Mastitis [ ] 5. Not enough breast milk [ ] 6. Other specify.....

22. Observe the signs that show good positioning or demonstrate positioning using the baby dummy (tick all that apply)

1. The baby's body should be straight [ ] 2. The baby's body should be facing the breast [ ] 3. The baby should be close to mother [ ] 4. Mother should support the baby's whole body [ ]

23. Observe the signs of good attachment (tick all that apply) for children (0-2) months

1. Mouth open wide [ ] 2. Lower lip turned out [ ] 3. Baby's chin touching breast [ ] 4. More areola above than below nipple [ ]

### **Complementary feeding practices**

24. Have you started giving foods to the child? 1. Yes [ ] 2. No [ ]

25. At what age did you give your child food ..... (Months)

26. What is the texture of food you gave to your baby? 1. Light [ ] 2. Thick [ ]

27. What food did you first give to your Child?

1. Koko [ ] 2. cerelac [ ] 3. Rice (cooked) [ ] 4. TZ/Akple/Banku [ ] 5. Tom brown [ ]

6. Others (specify).....

28. Did you ever feed the child with a feeding bottle which has nipple? 1. Yes [ ] 2. No [ ]

29. Did you use the feeding bottle yesterday to feed? 1. Yes [ ] 2. No [ ]

30. How many times do you usually give food to your child in a day? 1. Once [ ] 2. Twice [ ] 3. Three to four [ ]

31. What do you do when your child refuses to eat? .....

### **Demographic characteristics of mother**

32. What is your age ..... (Years)

33. What was your highest level of education attained?

1. None [ ] 2.Primary [ ] 3.JHS [ ] 4. S.H.S/vocational / technical [ ] 5.Tertiary [ ]

34. To what religion did you belong?

1. Christian [ ] 2. Moslem [ ] 3. Traditional region [ ] 4. Others (Specify).....

35. What ethnic group do you belong to?

1. Akan [ ] 2. Dagarti [ ] 3.Dagomba 4. Ewe 5. Ga/Adangmr 6, Others

(Specify).....

36. What is your occupation?

1. Government worker [ ] 2. Self-employed [ ] 3. Unemployed [ ] 4.Apprentice/student [ ]

5. Others (specify).....

37. What is your marital status?

1. Single [ ] 2. Married [ ] 3. Divorced/Separated [ ] 4. Widowed [ ] 5.Cohabiting [ ]

38. What is the size of your household?

1. Two [ ] 2. Three [ ] 3. Four [ ] 4. Five [ ] 5. Six [ ] 6.others (specify) .....

### **Anthropometry**

Note: Take two measurements

39. Weight of child (in kg; 1decimal place) 1. [ ] 2. [ ] Average [ ]

40. Height of child (in cm; 1 decimal place) 1. [ ] 2. [ ] Average [ ]

41. W/A ..... 42. W/H..... 43. H/A .....

**24 hour food recall**

Meal of the day	Name of Food	List all the ingredients in the food	Amount of food	Texture of food	No. of star	source
Morning						
Snacks						
Afternoon						
Snacks						
Evening						
Night						

**Note:** 1 cup = 250 ml. Use local cup or bowl to show the amount.

Mothers should not overlook anything consumed by the child.