

**ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG,
EASTERN REGION, GHANA**

**EARLY INITIATION OF COMPLEMENTARY FEEDING AND
ASSOCIATED FACTORS AMONG CHILDREN 6-24 MONTHS OF AGE
IN THE GA SOUTH MUNICIPALITY OF THE GREATER ACCRA
REGION, GHANA**

by

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DEDICATION

This thesis is dedicated to the Almighty God, who has been my help and provider; my lovely wife Freda Kusi; and my adorable sons Ivan and Ian who were so supportive during my course of study.

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DEFINITION OF TERMS

Complementary feeding: Complementary feeding is defined as the feeding process which starts when breastmilk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breastmilk, for healthy growth and development.

Exclusive breastfeeding: Exclusive breastfeeding refers to the practice whereby the child receives only breastmilk, not even water, for the first six months of life for healthy growth and development

Malnutrition: The term is used to refer to a number of conditions, each with a specific cause related to one or more nutrients (for example, protein, iodine or calcium) and each characterized by cellular imbalance between the supply of nutrients and energy on the one hand, and the body's demand for them to ensure growth, maintenance, and specific functions, on the other.

Stunting: Height-for-age Z-scores (HAZ) reflect linear growth retardation and are used to describe long-term nutritional status; stunting is defined as $HAZ < -2$.

Underweight: Weight-for-age Z-scores (WAZ) represent a global measure of malnutrition; and underweight is defined as $WAZ < -2$.

Wasting: Weight-for-height Z-scores (WHZ) reflect more current nutritional status and measure the degree of thinness in a child; wasting is defined as $WHZ < -2$.

Z-scores: A Z-score (or standard deviation score) is defined as the deviation of the value of an individual child from the median value of the reference population, expressed in standard values.

ABBREVIATIONS

ANC	Antenatal care
BMI	Body mass index
CFs	Complementary foods
CF	Complementary feeding
CHO	Community health officer
CHPS	Community-based health planning and service
CI	Confidence interval
cm	centimetres
GDHS	Ghana Demographic and Health Survey
GDP	Gross domestic product
GHS	Ghana Health Service
HAZ	Height-for-age Z-score
IUGR	Intra-uterine growth retardation
Kg/m ²	Kilogram per metre square
LBW	Low birth weight
NCHS	National Centre for Health Statistics
O-Level	Ordinary level
OR	Odds ratio
PAHO	Pan American Health Organization
PNC	Postnatal care
P-value	Probability value
SAM	Severe acute malnutrition
SD	Standard deviation
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

ABSTRACT

Inadequate and inappropriate complementary feeding (CF) are the major factors contributing to excess morbidity and mortality in young children. Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full growth potential.

The study aimed at documenting the prevalence of early initiation of complementary feeding and associated factors among 6-24 months old children in the Ga south municipality. A cross sectional study was conducted on 419 pairs of children and mothers who were selected in 2016 for the study. Convenient sampling was used to select participants both from the child welfare clinics (CWC) and the community.

The socio-demographic characteristics, breastfeeding, complementary feeding practices and Obstetric history of the mothers were taken into consideration. The relationship of time of initiation of CF and other independent variables were analysed using the chi-square test.

Almost 54% of mothers introduced complementary foods to their infants at 6 months of age. However, early initiation of complementary feeding (CF) was quite high, with almost 40% of mothers introducing complementary foods before their children turned 6 months of age. Most participants accessed pre- and postnatal services at health facilities. Less than 20% introduced prelacteal feeds to their infants before discharge from health facilities after delivery.

Health talks, attendance at birth, children in school and mothers occupation were significantly associated with time of initiation of complementary feeding.

Family support, income status, and parity had no significant association with the time of initiation of complementary feeding.

In conclusion, early initiation of complementary feeding was high. Health worker talks and skilled attendance at birth were positively associated with timely initiation of complementary feeding.

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CHAPTER ONE

INTRODUCTION

1.1 Background of study

There has been a lot of progress in improving child survival globally. However, despite the global promise to reduce child deaths by two-thirds from the level recorded in 1990 by 2015, the number of under 5 child deaths decreased only by one-half by 2013, from 12.7 million to 6.3 million. To keep the momentum of these achievements, nearly 180 governments pledged to scale up efforts to accelerate the decline in maternal, neonatal and child deaths (UNICEF, 2014).

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full growth potential. A child who has adequate nutrition performs better in school, grows into a healthy adult and in turn gives his/her children a better start in life. However, for a child to have adequate nutrition, it basically depends on the feeding practices of mothers or caregivers. In developing countries, 146 million children under 5 suffer from undernutrition, which is one of the main causes of malnutrition (UNICEF, 2007).

The World Health Organization (WHO) estimates that malnutrition is an underlying contributor to up to 45% of deaths among children under 5 years of age (WHO, 2014). In Africa, malnutrition continues to contribute to half of the 9.7million annual child deaths and is a leading cause of diseases and disabilities in children (WHO, 2002; UNICEF, 2007).

Reports from various parts of the developing world document the high prevalence of childhood malnutrition (Odunayo, 2006) and the prominent role of malnutrition as a major contributor to death of children under five years (Krishnan *et al.*, 2012).

Inappropriate feeding practices can have profound consequences for the growth, development and survival of infants and children (Saha *et al.*, 2008). Inappropriate complementary feeding practices such as untimely introduction of complementary food,

improper feeding frequency and low dietary diversity of complementary foods have negative effects on children's health (Kapur *et al.*, 2005). Current guidelines for infant feeding, developed by WHO and UNICEF, emphasize exclusive breastfeeding for the first 6 months of life and the subsequent addition of appropriate complementary foods to meet the increasing energy requirements for infant growth (UNICEF/WHO, 2003). Continued breastfeeding is recommended for the first two years and beyond. These guidelines also emphasize the importance of continued feeding during illness in order to maintain the infant's immune and nutritional status (PAHO/WHO, 2003).

Appropriate complementary feeding entails the introduction of complementary foods at 6 months of age, continued breastfeeding up to at least two years and beyond, correct feeding frequency for age, and consumption of a diverse diet (Arimond *et al.*, 2008). Poor breastfeeding and complementary feeding practices have been documented in developing countries, with a 39% prevalence of exclusive breastfeeding in the first 6 months after delivery; the prevalence is far less in Africa, at just 25% (Becquet *et al.*, 2005). Additionally, 6% of infants in developing countries are never breastfed.

Breast milk alone is recommended as the ideal nourishment for infants for about the first 6 months of life. It contains all the nutrients, antibodies, hormones and antioxidants an infant needs to thrive and it protects babies from diarrhoea and acute respiratory infections, stimulates their immune systems, response to vaccination and confers cognitive benefits as well (Oddy, 2001). Continued breastfeeding to two years, accompanied by appropriate complementary feeding, maintains good nutritional status and continues to help prevent diarrhoea (WHO 2003). Besides, proper complementary feeding reduces mortality by 6% in most developing countries, yet the complementary foods given to these infants and young children are usually contaminated and inadequate (WHO, 2008a). Improved breastfeeding practices could save some 1.5 million children lives a year, yet few of the 129 million babies

born each year receive optimal breastfeeding and some are not breastfed at all (WHO, 2008b).

Early introduction of complementary foods before the age of 6 months can lead to displacement of breast milk and increased risk of infections such as diarrhoea, which further contribute to weight loss and malnutrition (Kimani-Murage *et al.*, 2011). In Ghana, 55% of mothers introduced other foods aside breast milk within the ages of 3-4 months (Sika-Bright, 2012), and 38% mothers introduced foods within the 5th and 6th months of their infants' life. Studies in three geographical locations in Ethiopia reported the prevalence of early initiation of complementary feeding at 37%, 43% and 29% respectively (Shumey *et al.*, 2013; Setegn *et al.*, 2012).

For a reduction in under 5 mortality, there is the need for improvement in the feeding practices of children. These feeding practices constitute one of the most neglected determinants of young child malnutrition, in spite of their important role in the growth of children (Childinfo, 2009).

1.2 Statement of problem:

Out of the approximately 10 million annual deaths among under 5 year old children, and over one-third of this mortality is caused by malnutrition related to inadequate complementary feeding (UNICEF 2012). Initiation of safe and nutritionally adequate complementary feeding at 6 month postpartum is crucial to achieve optimal growth, development and health (UNICEF, 2012).

Breastfeeding initiation within the first hour of life is only 36% worldwide-; if this rate is increased to 99%, then 1 million neonatal deaths could be avoided (Edmond *et al.*, 2006). In addition, 1.3 million infants' deaths could be avoided through exclusive breastfeeding for the first 6 months of life (Edmond *et al.*, 2006).

In sub-Saharan Africa, more than one-quarter of children under 5 years of age are underweight; in West Africa, 36% the children under 5 are either moderately or severely underweight (UNICEF, 2008). The proportions of children underweight, stunted and wasted in Ghana are 18%, 22% and 5%, respectively (UNICEF, 2008a). Timely initiation of breastfeeding is still very low in Ghana; 60% of infants are deprived of this important need (UNICEF, 2008).

There is limited data on the prevalence of, and factors associated with, early initiation of complementary feeding among children 6-24 months in the Ga South Municipality. To improve on the gains made from exclusively breastfeeding for 6 months, timely introduction of complementary feeding is essential.

1.3 Rationale of study

Inappropriate complementary feeding practices such as untimely introduction of complementary foods, improper feeding frequency, and low dietary diversity of complementary foods have been shown to increase the risk of underweight and stunting (Kumar *et al.*, 2006), especially among the poor living in urban areas (Muchina, 2010).

Optimal infant and young child feeding has greatest potential impact on child survival (WHO, 2006). Complementary feeding starting at 6 months was third among 15 top ranked child survival interventions (UNICEF, 2006). Complementary feeding interventions alone were estimated to prevent almost one fifth of under 5 child mortality in developing countries (UNICEF, 2012).

There is therefore the need to examine breastfeeding and complementary feeding patterns of mothers in the Ga South Municipality. This study will document the prevalence of early initiation of complementary feeding and its associated factors, and will form the baseline for an intervention study. Furthermore, this research will help to provide scientifically based

information necessary to develop appropriate health messages for optimal infant and young child feeding to a wide range of individuals and stakeholders.

1.4 Research Questions

- At what age do mothers introduce complementary foods to their young children in the Ga South Municipality?
- At what age do mothers start giving water to young children in the Ga South Municipality?
- What foods do mothers give to their young children at the point of introduction of complementary feeding?
- What is the prevalence of early initiation of complementary feeding among children 06-24 months of age in the Ga South Municipality?

1.5 Objectives

1.5.1 General objective:

To estimate the prevalence of early initiation of complementary feeding and assess the factors influencing the practice among 6-24 months children in the Ga South Municipality.

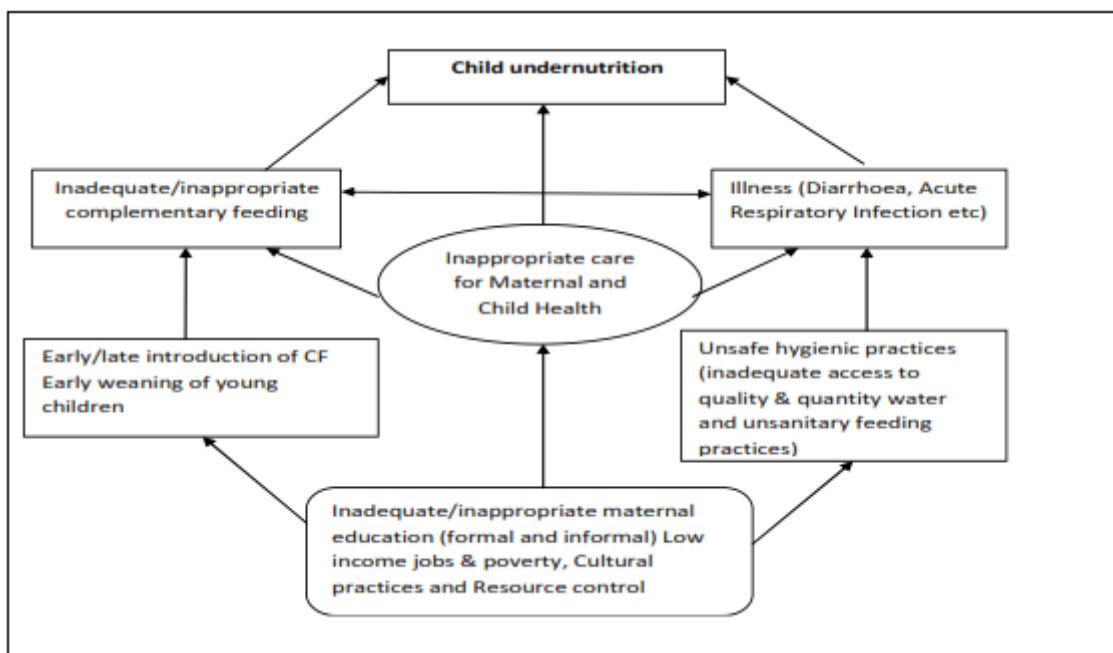
1.5.2 Specific Objectives:

1. To estimate the prevalence of early initiation of complementary feeding among children 6-24 months in the Ga South Municipality
2. To assess the socio-demographic and socio-economic characteristics of all mothers with early initiation of complementary feeding in the Ga South Municipality

1.6 Research Hypothesis

Time of initiation of complementary feeding among children 6-24 months of age in the Ga South Municipality, Ghana is associated with health seeking behaviours of their mothers.

Figure 1.1 Conceptual framework linking child care practices to malnutrition



Source: (UNICEF, 2008)

1.7 Profile of the study area

The Ga South Municipal is one of the 16 District Assemblies in the Greater Accra Region, with Weija as its capital. It was carved from the then Ga West Municipal Assembly in November 2007. The municipal was established by Legislative Instrument (LI) 1867, with the capital at Weija. The original LI was replaced on 15th March, 2013 with a new LI 2134, with its capital still at Weija. The Municipal Assembly has 3 Zonal Councils which operate below the Assembly structure.

1.8.1 Physical and natural environment

The Municipality is largely peri-urban with about 95 identified settlements. About 90% of the total population live in the urban area of the Municipality. There are about 35 urban towns with populations between 5000 and 20,000 persons, and hundreds of satellite communities and hamlets. The southern part of the Municipality, which is about a quarter of the size of the Municipality, is urbanising at a rapid rate, due to its proximity to the Accra Metropolitan Area, improved transportation network, and it serves as a centre between urban Accra and the Kasoa area (MHMT, 2015) which is in the central region. Hence the municipality links two regions: Central and Greater Accra.

1.8.2 Agricultural Sector

Agriculture is a major economic activity in the Municipality and a way of life to those living in the rural areas of the Municipality. There are four agriculture zones, namely Kofi Kwei, Omarkope, Ashifla and Weija.

The agricultural sector can boast of food crops such as cassava, maize, groundnuts, cowpea and vegetables; and cash crops like pineapple, mango, cashew and water melon. . The major livestock reared in the Municipality are small ruminants, cattle, poultry, pigs and micro livestock (rabbits and grasscutters). Obom, Kofi Kwei, Hobor and Omarkope are mainly crop and livestock production areas, and Danchira is mainly a livestock production area.

The main types of farming practices are mixed farming, mono cropping and mixed cropping. The Municipality produces enough food crops to feed the Municipality, although there are about 45% post-harvest losses. The main causes of post-harvest losses are the absence of storage facilities and minimal processing of produce. The main mode of land acquisition is lease hold, freehold, outright purchase and share cropping (MHMT, 2015).

1.8.3 Health

The Municipal Assembly provides health services through the Municipal Hospital and other health service providers under the auspices of the Municipal Health Directorate (MHD). The MHD has divided the Municipality into 6 sub-municipalities for the purposes of health administration; they are the Weija, Mallam, Amanfrom, Kokrobite, Bortianor and Obom sub-municipalities.

The Municipality has challenges in terms of its human resource capacity to deliver quality health services. According to the Municipal annual report (2015), prevalence of underweight among children 0-11 months of age is 12%, 15% among 12-23 months old children, and 13% among 23-59 months old children.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Inadequate complementary feeding practices have a detrimental impact on children's health and growth in the first two years of life (Kabir *et al.*, 2012). This period has been recognized as the 'critical window' for the promotion of optimal growth, health and development of a child (PAHO and WHO 2003). Children may become stunted if they do not receive sufficient quantities of quality complementary foods after six months of age, even if they receive optimum breastfeeding (Black *et al.*, 2008). By ensuring optimal complementary feeding, an estimated 6 % of deaths among children under 5 years of age could be prevented (Black *et al.*, 2003). Inappropriate complementary feeding after 6 months of age is one of the major causes of malnutrition in Ghana. Malnutrition is currently the leading cause of the global burden of disease (Lopez *et al.*, 2002), and is the underlying factor in about 50 % of deaths of children under 5 years of age in developing countries (Black *et al.*, 2003).

2.1 Prevalence of malnutrition

The increased recognition of the relevance of nutrition as a basic pillar for social and economic development placed childhood undernutrition among the targets of the first Millennium Development Goal (MDG), to "eradicate extreme poverty and hunger" (UN, 2002). The specific goal is to reduce by 50% the prevalence of underweight among children younger than 5 years between 1990 and 2015. Childhood underweight is an important public health problem, and its devastating effects on human performance, health, and survival are well established (Chang *et al.*, 2002). A recent study estimated that about 53% of all deaths in young children are attributable to underweight, varying from 45% for deaths due to measles to 61% for deaths due to diarrhoea (Caulfield *et al.*, 2004).

Child growth is internationally recognized as an important public health indicator for monitoring nutritional status and health in populations. Children who suffer from growth retardation as a result of poor diets and/or recurrent infections tend to have more frequent episodes of severe diarrhoea and are more susceptible to several infectious diseases, such as malaria, meningitis, and pneumonia (Tomkins *et al.*, 1989). Studies have demonstrated the association between increasing severity of anthropometric deficits and mortality, and the substantial contribution to child mortality of all degrees of malnutrition is now widely accepted (Pelletier *et.al.*, 1993). In addition, there is strong evidence that impaired growth is associated with delayed mental development, poor school performance, and reduced intellectual capacity (Mendez *et al.*,1999).

Wasting or low weight-for-height is a strong predictor of mortality among children under 5; it is usually the result of acute, significant food shortage and/or disease (UNICEF, 2008). Wasting is the proportion of children under 5 years of age whose weight-for-height falls below -2 and -3 standard deviations (SD) from the median weight-for-height of the WHO/NCHS references (UNICEF, 2008).

Underweight or low weight-for-age is the proportion of children less than 5 years of age falling below - 2 SD (moderate underweight) and -3 SD (severe underweight) of the median weight-for-age of the WHO/NCHS references (UNICEF, 2008). Underweight is reversible and reflects either acute or chronic malnutrition; this implies that weight gain can be adequate even while the process of stunting continues (UNICEF, 2008). Usually, weight faltering concentrates between 3 and 12 months of age; however, after 12 months of age, a child can be stunted and underweight but his/her weight-for-height ratio can improve (WHO, 2006; UNICEF, 2007).

Severe malnutrition, typified by wasting, edema or both, occurs almost exclusively in children (Brabin *et al.*, 2003). Marasmus is defined as severe wasting; marasmic kwashiorkor as severe wasting in the presence of edema; and kwashiorkor as malnutrition

with edema (Brabin *et al.*, 2003). Kwashiorkor originates from the Ga language spoken in Ghana; it implies “the disease that the young child developed when displaced from his mother by another child or pregnancy” (Andersen *et al.*, 1993). Early marasmus, occurring in the first year of life, is frequently associated with contaminated bottle-feeding in urban areas (Andersen *et al.*, 1993).

Malnutrition prevalence, calculated as low weight-for-age among children under 5 years of age in Ghana was 11 % as of 2011; the highest value over the past 23 years was 23% in 1988 (GDHS, 2003). A study conducted in the Manya Krobo District in Ghana revealed that 20% of children under 5 years of age were stunted (Nti *et al.*, 2007). The 1998 Ghana Demography and Health Survey (GDHS) also estimated that among children aged 0-59 months of age, stunting, underweight and wasting were 26%, 25% and 10% respectively (GDHS, 1998; there was no significant improvement when compared to the 2003 GDHS, where stunting increased from 26% to about 30%, underweight reduced to 22%, and wasting improved to 7% (GDHS 2003). This indicates that wasting is more common in the age group 6-24 months and decreases as the child ages; underweight is very minimal for children less than 6 months of age but becomes more pronounced at age 6 months and above, during the normal complementary feeding period (GDHS, 2003).

2.2 Causes of maternal and child undernutrition

Growth faltering begins during pregnancy and progresses after birth until the age of 2 years, and the window of opportunity for catch-up growth through manipulation or intervention is lost when the child is over 2 years of age. However, failures to grow in length-leading to stunting, and failure to grow in weight-leading to underweight, are different processes. Whilst weight growth faltering is largely confined to the period between 4 and 12 months of age, height growth faltering is a continuous process probably starting in the uterus, and continuing from birth to about 2 years. (James *et al.*,2000). Wasting and underweight can be

improved by reducing exposure to infection as well as by improving food intake; height growth faltering, or stunting, goes on during the first 2 years of life even if infections are controlled and food intake improved.

Most of the major factors associated with foetal growth retardation are nutrition-related, and include maternal height, pre-pregnancy weight, maternal birth weight, gestational weight gain and caloric intake (James *et al.*, 2000). In developing countries, the major factors associated with intra uterine growth retardation (IUGR) and/or low birth weight (LBW) are poor gestational nutrition, low pre-pregnancy weight, short maternal stature, and malaria (James *et al.*, 2000).

2.3 Benefits of Breastfeeding

Breastfeeding is the feeding of babies and young children with milk from a woman's breast. Health professionals recommend that breastfeeding begin within the first hour of a baby's life and it be allowed as often and as much as the baby wants (WHO, 2014). It is estimated that more than a million deaths of babies could be prevented globally per year through more widespread breastfeeding. Breastfeeding decreases the risk of respiratory tract infections and diarrhoea (WHO, 2014); this is true both in developing and developed countries. Other benefits of breastfeeding include lower risks of asthma, food allergies, type 1 diabetes, and leukaemia (WHO 2014); it may also improve cognitive development and decrease the risk of obesity in adulthood (Kramer *et al.*, 2012).

Benefits of breastfeeding for the mother include less blood loss following delivery, better uterus shrinkage, weight loss, and less postpartum depression; it also increases the time before menstruation and fertility returns, known as lactational amenorrhea (WHO 2014). Long term benefits may include a decreased risk of breast cancer, cardiovascular disease and rheumatoid arthritis (WHO, 2014). Health organizations including the WHO

recommend exclusive feeding for the first 6 months only through breastfeeding; continued partial breastfeeding until at least 1 to 2 years of age is then advised (WHO, 2014).

Scientific literature demonstrates substantial health, social and economic benefits associated with appropriate breastfeeding (Venneman *et al.*, 2009). A multi-centre cohort study done in India, Ghana and Peru showed that infants who did not receive any form of breastfeeding had a 10-fold higher risk of dying of any cause and a 3-fold higher risk of being hospitalized for any cause compared to those who had been predominantly breastfed (Bahl *et al.*, 2005).

Studies conducted in Nairobi and other urban areas in developing countries have shown that almost all (90%) children below the age of 2 years have ever been breast fed (Muchina, 2010; Singh, 2010; Ochola, 2008). Continued breastfeeding has shown a positive picture in developing countries, with the majority of the children being breastfed for 1 year and above (Owino, 2008). A study among 10,000 infants in rural Ghana revealed that neonatal mortality could be reduced by 24% if 99% of infants initiated breastfeeding on day 1 of life, and by 31% if 99% of infants initiated breastfeeding within the first hour, saving 867,000 and 1,117,000 lives, respectively (Edmond *et al.*, 2006).

In Ghana, the median duration of any breastfeeding is 23 months, and regional differences in breastfeeding prevalence are minimal; the longest duration was 28 months in the Northern Region and the shortest duration was 19 months in Greater Accra Region (GDHS, 2003).

2.4 Benefits of Exclusive breastfeeding

Exclusive breastfeeding, which is giving only breast milk for the first 6 months of life, is crucial to preventing deaths among newborns and infants. This practice can prevent an estimated 1.3 million deaths each year by protecting against diarrhea and pneumonia, and it hastens recovery during illness (WHO, 2008b). Unfortunately, many people are unaware of breast milk's benefits and in many of the world's poorest countries, water and other liquids

are added to the baby's diet for the first months of life, risking infections from harmful bacteria and other pathogens (MOH, 2005).

According to UNICEF, babies naturally follow a process which leads to a first breastfeed. After birth the baby cries with its first breaths; shortly after, it relaxes and makes small movements of the arms, shoulders and head. Rushing or interrupting the process, such as removing the baby to weigh him/her, measuring and bathing may complicate subsequent feeding (UNICEF 2014).

Exclusive breastfeeding (EBF) has reduced infant deaths in developing countries by reducing diarrhoea and infectious diseases; it also reduced HIV transmission from mother to child, compared to mixed feeding (WHO 2014). Infants who were exclusively breastfed from 0-6 months of age in Bangladesh had a significantly lower prevalence of diarrhoea and acute respiratory infection than those infants who were not exclusively breastfed (Mihirshahi *et al.*, 2008). EBF during the first 6 months of life also helps to avoid or reduce exposure to contaminants and displacement of breastfeeding by water or other foods (Gupta *et al.*, 2007).

2.5 Young child feeding recommendations

The infant and young child feeding recommendations (PAHO/WHO, 2003; Dewey and Brown, 2003) are that infants should be exclusively breastfed starting from soon after birth and up to 6 months of age. Starting at 6 months of age, complementary foods should be gradually introduced in the diet, while frequent, on-demand breastfeeding should be continued until 2 years of age or beyond. The quantity, frequency, and variety of complementary foods should be increased as the child gets older (WHO 2003). Diversity in the diet is also recommended to ensure that nutrient needs are met, and it is recommended that meat, poultry, fish, or eggs be eaten daily, or as often as possible (WHO 2003). In Ghana, meal frequency is reportedly low, with 40% of children 18-23 months of age being

fed less than the recommended 3 meals per day (Dewey, 2003). Although low meal frequency may be related to food insecurity and poverty, it is also driven by cultural beliefs that evening meals cause indigestion in young children and therefore should be avoided (GDHS, 2003).

The consistency of foods should also be adapted to infants' requirements and abilities, and responsive feeding should be practiced, applying the principles of psychosocial care in order for children to be able to consume adequate food to meet their nutritional requirements for healthy growth and development (PAHO, 2003). Safe preparation and storage of complementary foods and appropriate feeding during and after illnesses are other key elements of optimal complementary feeding of the young child (PAHO/WHO, 2003).

2.6 Timeliness of complementary feeding

Complementary feeding is defined as the process starting when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk for healthy growth and development (UNICEF, 2003). The target age range for complementary feeding is generally taken to be 6-24 months of age, even though breastfeeding may continue beyond 2 years (WHO/UNICEF, 2003).

Although EBF and appropriate complementary feeding are recommended, there are concerns about low rates and early cessation of breastfeeding. In Ghana, the practice of giving plain water to infants in addition to breastmilk is pervasive and often begins on the day of birth (Davis *et al.*, 2003). This has subsequent adverse implications on health, social and economic well-being of women, children, the community and the environment; it also results in greater expenditure on national health care provision, and may increase inequalities in health (Davis *et al.*, 2003). There are usually issues on pre-lacteal foods/drinks, early weaning, early introduction of complementary foods, low nutrient

quality and quantity of foods, and unhygienic practices all associated with child feeding. It has been reported that some mothers believed they were unable to produce adequate breast milk for their babies (GDHS 2003). For such mothers, the immediate solution was early introduction of complementary foods and drinks before the 6 months recommended duration for exclusive breastfeeding; in addition, mothers/caregivers who are engaged in economic activities practice early weaning in order to increase their productivity and to secure their positions at their jobs (GDHS 2003).

Cultural practices and barriers are common in most societies. For instance, herbs are given to the newborn as a sign of welcome into the human world; this practice is strongly in conflict with international recommendations on exclusive breastfeeding and complementary feeding (Pelto *et al.*, 2002). Notwithstanding this challenge, there is significant improvement over the years with respect to breastfeeding and complementary feeding, even though achievements vary across different countries, regions and communities (Pelto *et al.*, 2002). There is increasing recognition that optimal complementary feeding depends not only on what is fed, but also on how, when, where and by whom the child is fed (Pelto *et al.*, 2002). In a study where 62% of the children were given complementary foods before the age of 6 months (Gupta *et al.*, 2007), 16% of them were classified as wasted and 20% were stunted.

2.7 Frequency of feeding

The minimum recommended feeding frequency, i.e. the number of times a child must be fed with complementary foods, depends on his/her age and whether the child is being breastfed or not. Guidelines for breastfed children are: at 6-8 month, meals of complementary foods should be fed 2-3 times /day, with 1-2 snacks as desired; and at 9-23 month meals of complementary foods should be fed 3-4 times/day, with 1-2 snacks as desired

(PAHO/WHO, 2003). For non-breastfed infants and children 0-23 month, meals should be given 4-5/day, with 1-2 snacks as desired (WHO, 2005).

2.8 Summary of literature review

Appropriate complementary feeding practices can ensure good nutrition status and significantly prevent under 5 mortality (Jones *et al.*, 2003). Nutritional inadequacy of the complementary diet both in quality and quantity is one of the major problems affecting infants and young children in the world today (Nti *et al.*, 2007). Despite the fact that there are various strategies to improve complementary feeding in Ghana (Nti *et al.*, 2007), complementary feeding practices are largely poor with majority of children receiving complementary foods too early, at a lower frequency than recommended and often the diet is limited in diversity.

The review of the literature revealed significant information gaps on factors associated with complementary feeding practices in terms of: time of initiation, dietary diversity and frequency of feeding. There is therefore the need to investigate complementary feeding practices in relation to the early initiation of complementary feeding for children aged 6-24 months in the study area.

CHAPTER THREE

METHODOLOGY

3.1 Study area

The Ga South Municipality is located in the south western part of Accra, the capital of Ghana. It lies within latitudes 5°47'30"N and 5°27'30"N and longitudes 0°31'30"W and 0°16'30"W. The Municipality, with Weija as its capital, has an estimated total population of 565,715 in 156 communities. About 131,690 out of the total population are women in fertile age (WIFA) with 22,629 expected pregnancies and 113,143 children under 5 years (MHMT, 2015). There are 6 health sub-municipalities, 14 community-based health planning services (CHPS) posts, out of which 5 have compounds. All the 6 sub-municipalities provide child welfare clinic (CWC) services at their respective health facilities. The Municipality provides both curative and preventive services to the residents in the communities within the health delivery system (MHMT, 2015). Residents of the Municipality engage in various occupations including fishing, farming and trading, with a few into handicraft works which serves as their source of livelihood.

3.2 Study design

The present study was conducted between December, 2015 to April, 2016 using an analytical cross sectional study design.

3.3 Data collection technique and tools

Primary data was collected by the administration of structured questionnaire, which was made up of both open and close-ended questions. The age of the children were determined using documented evidence of birth date from the child health record booklets and birth certificates. Questionnaires were self- or interviewer-administered for literate and illiterate respondents, respectively.

3.4 Study Population

The study population was mothers with children 6-24 months of age from 3 out of the 6 sub-municipalities who lived in the Municipality during the study period.

3.5 Study variables

Variables were categorized into dependent and independent variables

1. Dependent variable: time of initiation of complementary feeding
2. Independent variables: socio-demographic characteristics of the mother, mothers health service utilization (antenatal care, post-natal care, attendance at birth), feed given at the point of introduction, school enrolment and family support.

3.6 Sampling technique and sample size

Three out of 6 sub-municipalities were selected through balloting as study areas. Participants were drawn from the CWCs and communities within the study area. A total of 150 participants were selected from the 3 CWCs of the study site, with 50 each from the 3 CWC's of the study areas.

Multi-stage sampling was adopted in the community selection. Within each of the selected zones, 2 communities/villages (cluster) were again chosen randomly. Households with eligible children (06-24 months of age) were selected to take part in the study forming the second stage sampling unit. In each of the selected communities (clusters), a central point was identified and from there, a pen was used to give the direction of the first household by spinning. All houses/compounds along that direction were entered looking for potential respondents for the study. In cases, where we had more than one eligible child per household or compound, one of them was randomly selected again to participate in the study by choosing yes/no in order to give each child equal chance of selection. At the end of the

first randomly selected direction, the sampling team returned to the central point and moved in the opposite direction looking for more respondents. The process was repeated until the end of the community was reached. A total of 269 participants were selected from 6 communities.

3.6.1 Sample size

A sample size of 381 participants was determined using the formula, $n = \frac{z^2 p q}{e^2}$, where n denotes the sample size, z =1.96 at 95% confidence level, e denotes a tolerated error margin (5%), p refers to the prevalence of early initiation of complementary feeding = (55%; Sika-Bright, 2014) and (q= 1-p).

$N = \text{minimum sample size, } q = (1-P) = [3.8416 \times 0.55 \times 0.45] / [0.0025] = 380.31 = 381$ participants. Allowing for a 10% non-response rate, the sample size was increased to 419 participants.

3.7 Pre-testing

Pretesting of the data collection tool was done using mothers with children 6-24 months at Bortianor, which had a similar profile to that of the study area. We tested respondents' comprehensibility of the questions, so as to modify areas of ambiguity. Corrections were made where necessary.

3.8 Data handling

Two research assistants were trained on standard data collection procedures. Soft copies of data were stored in password secured, coded files and hard copies were stored under lock

and key in a locker in the office of the principal researcher. The research team had access to data only when permission was granted by the principal researcher.

Data from participants interviewed were doubly-entered into a computer using a platform created in Epi Info (version 7.1.50). Entry, verification and cleaning were run concurrently with data collection.

3.9 Data analysis

Data was analyzed based on the stated objectives using the Epi Info (version 7.1.50). Where appropriate, results are presented as frequency, tables, and histograms.

Chi-square test were used to determine the strength of associations between the dependent and independent variables. The level of statistical significance was set at $p < 0.05$.

3.10 Ethical Considerations

Permission and approval to conduct this study was obtained from the Ga South Municipal Health Management Team and the Ethical Review Committee of the Ensign College of Public Health, Kpong. Informed consent was obtained from all study participants. All procedures used were in accordance with the Helsinki Declaration of 1975. All information provided to the interviewers was strictly confidential and records were securely stored in a locked cabinet. Soft copies of the data were stored in password-protected folders on the researcher's computer. Feedback was sent to the DHMT about findings of the study.

3.11 Limitations of study

A potential limitation in this study is bias due to lack of recall such as time of initiating of breastfeeding. Unmeasured household characteristics, such as occupation of husband, maternal knowledge regarding breastfeeding recommendations, and distance from maternal

employment location could introduce confounding. Also, the survey did not gather dietary information because of limited resources.

3.12 Study assumptions

1. The mothers were truthful in answering the questions asked
2. Children identified as not sick by mothers were assumed to be clinically fit and included in the study.

CHAPTER FOUR

RESULTS

Table 4.1 gives the background characteristics of mothers in the study. The mean age of the respondents was about 30 years. A significant proportion of the respondents were married and very few had no formal education. The main religious denomination of the respondents was Christianity. Majority of the respondents were Ga and self-employed. Most of them earned less than US\$ 125 per month.

Table 4.1 Background characteristics of mothers with children 6-24 months old in the Ga South Municipality

Characteristic	Number of respondents n (%)
Age (years)	
15-19	10 (2.4)
20-24	65 (15.5)
25-29	135 (32.1)
30-34	126 (30.2)
35-39	63 (15.7)
40+	20 (4.7)
Marital status	
Single	79 (18.9)
Married	304 (72.6)
Divorced	5 (1.2)
Widowed	1 (0.2)
Cohabitation	30 (7.2)
Educational Level	
No formal education	35 (8.4)
Primary	64 (15.3)
Middle/JHS	151 (36.0)
SHS	70 (16.7)
Tertiary	82 (19.6)
Vocational	17 (4.1)
Religion	
Christianity	350 (83.5)
Islam	65 (15.5)
Traditional	4 (1.0)
Occupation	
Government worker	23 (5.5)
Private worker (institution)	46 (11.0)
Self-employed (artisans, traders)	287 (68.5)
Unemployed/student	63 (15.0)
Parity	

1-2	309 (73.7)
3-4	105 (25.1)
5 or more	5 (1.2)
Monthly income	
US\$ 125 and more	118 (28.2)
Less than US\$ 125	225 (53.7)
Refusal	76 (18.1)
Ethnicity	
Akan	115 (27.4)
Ada	26 (6.2)
Ga	141 (33.7)
Ewe	81 (19.3)
Northern (all inclusive)	41 (9.8)
Non-Ghanaian	15 (3.6)

Table 4.2: Background characteristics of the children 06-24 months of age in the Ga South Municipality

Characteristics	Frequency n (%)
Sex of child	
Male	208 (49.6)
Female	211 (50.4)
Age in months	
6-8	112 (26.7)
9-11	123 (29.4)
12-17	109 (26.0)
18-24	75 (17.8)
Low birthweight (below 2.5kg)	56 (13.4)

As shown in **table 4.2**, there were almost equal numbers of boys and girls. Majority of the children were in the younger age groups and had normal birth weight. Majority of the children (65%) were breastfed within the first hour of birth (data not shown). A total of 358 had their child health record booklets. The prevalence of moderate underweight was less than 30% and severe underweight about 4% (**table 4.3**). Majority of the children had normal WFA Z-scores, with less than 4% of them being possibly overweight or obese.

Table 4.3 Nutritional status of children 6-24 months of age in Ga South Municipality

Indicator	Frequency n (%)
Severe underweight (below -3SD)	14 (3.9)
Moderate underweight (-2SD to -3SD)	105 (29.3)
Normal (-2SD to 2SD)	226 (63.1)
Possible overweight (2SD to 3SD)	12 (3.4)
Possible obese (above 3SD)	1 (0.3)

Table 4.4 Obstetric history of mothers with children 6-24 months of age in Ga South Municipality

History	Frequency n (%)
Used antenatal care service during last pregnancy	401 (95.9)
Number of antenatal visits	
Less than 4 visits	129 (32.2)
4 and more visits	272 (67.8)
Attendance at birth	
Skilled	372 (88.8)
Unskilled	47 (11.2)
Received health education on exclusive breastfeeding	337 (80.4)
Received postnatal services	348 (83.1)
Number of times received post-natal services	
Less than 2	163 (46.8)
2 or more	185 (53.2)
Child ever breastfed	413 (98.6)
Child attending school	63 (15.0)
Age at which child enrolled in school	
Below 6 months	31 (49.2)
6 months and above	32 (50.8)
Received family support in child care	244 (58.5)

From **table 4.4**, most of the respondents had some antenatal care services, with more than two-thirds of them having 4 or more visits. Most participants received attendance at birth through skilled personnel (either a midwife, nurse or a doctor). Most respondents were educated on the importance of breastfeeding and adequate care for their young ones, and they accessed postnatal care services at a health facility, with more than half of them accessing the services 2 or more times post-partum.

Majority of the mothers had breastfed their children; less than 2% had never breastfed. The mothers had some support in the care of their children, mainly from their relatives. Mothers reported that their relatives helped them to take care of their children.

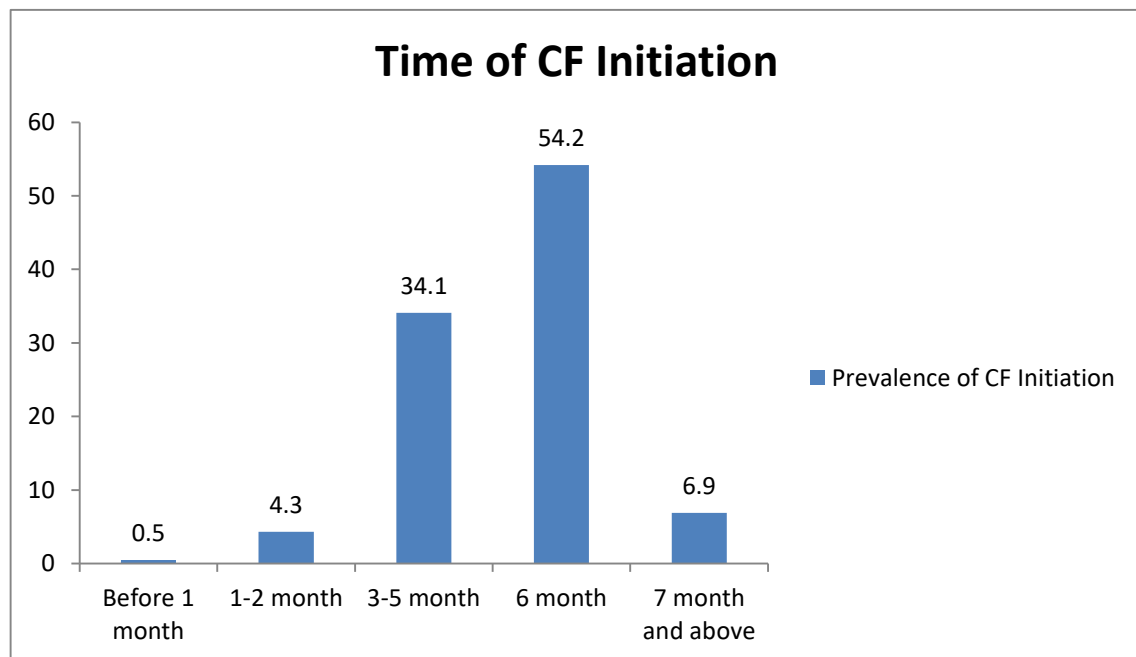
Table 4.5 Pre-lacteal feeding and introduction of complementary feeding among mothers with children 6-24 months of age in Ga South Municipality

Child feeding Practices	Frequency n (%)
Introduction of pre-lacteal feeds before discharge from facility	
Did not give pre-lacteal feed before discharge	339 (81.0)
Don't know	5 (1.2)
Pre-lacteal feed given to infant	
Formula	67 (89.3)
Glucose solution	8 (10.7)
Introduction of water	
0- 3 months	47 (11.2)
4-5 months	115 (27.4)
6 months	227 (54.2)
7 months and above	30 (7.2)

Less than a fifth of the mothers had their children introduced to pre-lacteal feeds before discharge from delivery facilities; and majority of these children were given formula feeds (**table 4.5**). About 39% of respondents gave water to their children before 6 months of age.

The prevalence of early initiation of complementary feeding in the Ga South Municipality was around 39% (**figure 4.1**). More than half of the mothers introduced their children to complementary foods at 6 months of age.

Figure 4.1 Prevalence of complementary feeding initiation in Ga South Municipality



4.1 Type of foods given at introduction of complementary feeding

Majority of respondents (53%) gave fermented corn porridge locally called *koko* at the point of introduction of complementary feeding; a few others gave fortified porridges such as locally blended cereals and grains (*Weanimix*) and family foods. More than a quarter of the respondents fed their babies with formula feeds including Nan 1, Lactogen and Cerelac.

4.2 Association between age of initiation of complementary feeding and independent variables

During multivariate analysis, time of introduction of complementary feeding was significantly associated with postnatal clinic health talk ($p=0.02$), attendance at birth ($p=0.025$), mother's occupation ($p=0.01$) and school enrolment ($p=0.02$). However, there were no significant association with postnatal clinic attendance, nutritional status, family support, income and parity.

Table 4.6 Multivariate Analysis of Time of initiation of CF and associated factors

Independent variables	Time of Initiation of CF	
	X²	P-value
Post- natal health talk	9.8	*0.02
Attendance at birth	5.4	*0.025
Mother's occupation	4.1	*0.01
Family support	2.9	0.239
Income	3.1	0.13
School enrolment	12.8	*0.001
Nutritional status	5.4	0.25
Post-natal attendance	2.3	*0.213

CHAPTER FIVE

DISCUSSION OF RESEARCH RESULTS

5.1 Introduction

This study investigated the prevalence of and factors associated with early initiation of complementary feeding in the Ga South Municipality. The prevalence of early initiation of complementary feeding was 39%, which is different from the prevalence of 55% reported by what was reported by Sika-Bright (2014). Similar research conducted in Ethiopia reported prevalence of 37 and 29% respectively (Agedew *et al.*, 2014). A study in Sri Lanka revealed a lower prevalence of 15% (Shumey, 2013). Higher prevalence of early initiation of complementary feeding could be attributed to occupation of mothers and the perception that breast milk is inadequate to satisfy the water needs of the child (Agedew *et al.*, 2014).

Mothers who did not use postnatal care services were as more likely to initiate complementary earlier than those who received counselling at the postnatal and child welfare clinics; similar to what was reported by (Gupta *et al.*, 2012).

The number of antenatal visits did not have any significant association with time initiation of complementary feeding; however, attendance at birth or delivery by unskilled personnel resulted in a more likelihood for early initiation of complementary feeding

5.2 Background characteristics of respondents

Women, especially the young ones, have higher reproductive health risk and complications during pregnancy and delivery. This may be due to the fact that they are still growing physiologically and nutritional stores may be inadequate for conception, and may account for the low birth weight of their infants. Mothers may also be prone to infections and malnutrition, due to depletion of their inadequate nutrient stores by the growing foetus and this may subsequently affect the provision of needed care for the development of their young ones. Almost a quarter of the mothers in the present study were below 25 years of age

and they may still depend on their family for their basic needs. This may affect productivity, resulting in lower income which may have negative consequences on total quality care of their children.

Most of the respondents had some form of formal education, with one-fifth of them attaining higher education at the tertiary level. Mother's occupations had a significant relationship with time of initiation of complementary feeding ($p < 0.05$), similar to a finding from a study in Ethiopia (Agedew *et al.*, 2014).

The study also revealed a significant relationship between marital status and early initiation of complementary feeding ($P = 0.002$); mothers in co-habitation were likely to early initiate complementary feeding earlier than 6 months of child age, as compared to married women. Mothers who had no formal education initiated complementary feeding earlier than mothers who have attained higher education. This finding is supported by (Agedew. *et al.*, 2014); improved maternal education enhances mother's knowledge and attitude towards appropriate feeding practices.

There was a significant association between respondent's occupation and time of initiation of complementary feeding ($p = 0.01$). Mothers working within the government sector tend to initiate complementary feeding earlier than unemployed mothers because their work schedules may not permit them to exclusively breastfeed for 6 months, and thus solid or semi-solid foods are introduced to meet the child's daily nutrient requirements. Unemployed mothers may have enough time to exclusively breastfeed their children and introduce complementary feeding appropriately at 6 months of child age.

5.3 Nutritional status of children 6-24 months (weight-for-age)

Children under 5 years of age whose weight-for-age Z-scores fall below -2 SD, and children whose weight-for-age Z-scores fall below -3 SD of the median of the WHO/NCHS standards are classified as moderately or severely underweight, respectively (UNICEF, 2008). Underweight is reversible compared to stunting, which is irreversible (UNICEF, 2008). About a third of children in the municipality were underweight. An earlier study in Ghana reported an 18% prevalence of underweight among children (Gyasi, 2008). Our findings are similar to the 35% underweight prevalence reported by UNICEF (2008) but lower than the prevalence of 45% from in a study conducted in India (Kumer, 2006).

5.4 Mothers' obstetric history

Majority of the mothers in our study used antenatal care services during their last pregnancy. Among those who attended antenatal clinic, more than two-thirds had more than 4 visits or follow ups. There was no significant association between antenatal clinic follow ups and time of initiation of complementary feeding; this is similar to the findings from the study by (Agedew. *et al.*, 2014).

Majority of the mothers delivered their babies through the care of skilled attendants.

Mothers who were delivered by unskilled attendants were 2.2 times more likely to initiate complementary feeding earlier than their counterparts who had skilled attendants at delivery. A similar association was found by (Ogunlesi. *et al.*, 2014).

Most respondents received health educational talk during antenatal care visits. There was a significant association between health education and time of initiation of complementary feeding, similar to the findings by Deme *et al.* (2015). There was no association between family support and time of initiation of complementary feeding. Semahegn *et al.* (2014) reported significant association between family support and time of initiation; mothers who

had husband support were 3 times more likely to initiate complementary feeding in a timely manner (OR 2.8, 95% CI 1.6-5.4).

5.5 Continued breastfeeding and introduction of complementary feeding

Almost all the children in the study were breastfed, and some were still breastfeeding on demand. Breastfeeding on demand maintains good nutritional status (UNICEF, 2008). Initiation of breastfeeding within 1 hour after birth is crucial for the establishment of breastfeeding and child survival (UNICEF, 2008). Edmond *et al.* (2007) showed that almost 1.2 million infants can be saved if mothers initiate breastfeeding within the first hour of life. Babies should be breastfed on demand until they are at least 2 years, accompanied by appropriate complementary feeding in order to maintain good nutritional status and prevent all forms of malnutrition (UNICEF 2008).

About a fifth of the children in our study were introduced to pre-lacteal feeds before discharge from a health facility, and about a tenth were given glucose solution. This confirms results from a study by Dewey (2003). More than half of the respondents introduced their children to complementary foods in a timely manner at 6 months of age, based on the global infant and young child feeding recommendations (WHO/UNICEF, 2003). Almost 40% of the mothers introduced complementary feeds or water before 6 months of the infant's life. The proportion of mothers with timely initiation of complementary feeding observed in our study is remarkably lower than reported in the Chinese (90%) and India (58%) population (Guos *et al.*, 2010; Meshram, 2012).

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

Timely initiation of complementary feeding at 6 months in the Ga South Municipality was low, despite the global infant and young child feeding guidelines. The prevalence of early initiation of complementary feeding was almost 40%, and about half of the children were not introduced to complementary foods at the appropriate time. Mothers attended to by unskilled attendants at birth were more likely to initiate complementary feeding early. Family support, income status, and parity were not associated with early initiation of complementary feeding. Some factors such as Post-natal health talk, attendant at birth, mother's occupation and school enrolment were significantly associated with early initiation of complementary feeding.

6.2 Recommendations

6.2.1 Government

- Establishment of baby centres for working mothers at the health facility especially the government workers, will help to improve timely initiation of complementary feeding at 6 months.
- The Ministry of Health (MOH) and governmental agencies need to introduce health education interventions using inter-personal communication to help get family members to understand the recommended feeding practices.

6.2.2 Health worker

- Midwives and nurses must help mothers to initiate breastfeeding within the first hour after delivery. Women who deliver through Caesarean section must also be assisted to breastfeed within 1 hour after the procedure is done.
- Traditional birth attendants should be educated on the importance of early initiation of breastfeeding, and they should assist mothers to initiate breastfeeding early, using inter-personal communication.

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APPENDIX

QUESTIONNAIRE ON EARLY INITIATION OF COMPLEMENTARY FEEDING AMONG 6-24 MONTH OLD CHILDREN IN THE GA SOUTH MUNICIPALITY

Questionnaire number.....

Mothers ID.....Mothers Age.....

Age of child (months).....Sex.....Child's Birth weight.....

Socio-Demographic Data

Marital status 1. Married 2. Single 3. Divorced/Separated 4. Widowed 5. Co-habitation

Educational level 1. Primary 2. Middle/JHS 3. SHS/O level/A level 4. Vocational/Tech
5. Tertiary 6. Never been to school

Occupation 1. Government worker 2. Private worker 3. self-employed 4. Unemployed /student

Monthly Income How much is your monthly income.....

Ethnic group 1. Ga Adagme 2. Ada 3. Krobo 4. Akan 5. Ewe 6. Northern 7. Non- Ghanaian

Religion 1. Christian 2. Moslem 3. Pagan 4. Others, specify.....

Parity How many children do you have?.....

BREAST FEEDING AND COMPLEMENTARY FEEDING

1. Did you attend antenatal care in your last pregnancy? 1. Yes 2. No.

(a). If yes how many times?.....

2. Were you given a talk on the importance of exclusive breastfeeding? 1. Yes 2. No

3. **Attendance at birth** 1. Skilled (Doctor/Midwife/Nurse) 2. Unskilled (TBA, relative)

4. Was your baby put to breast within, 30 minutes after birth? 1. Yes 2. No

5. Was your baby introduced to any form of feed at the hospital before you were discharged after birth?

1. Yes 2. No

If yes what was given?

1. Water 2. Formula Feed 3. Water+glucose 4. Others, specify.....

6. Do you attend post -natal clinic regularly? 1. Yes 2. No

If Yes, how many times

7. Have you breastfed your child before? 1. Yes 2. No

If YES how long?.....Months

8. When did you introduce other foods to your baby in addition to breast milk?.....(months)

9. At what month did you give water to your child?.....(months)

10. What complementary feeds were given at the point of introduction?

1. Formula feed 2. Porridge only (plain koko, etc) 3. Fortified porridge (plus fish, groundnut, mpotompoto etc) 4. Home prepared food (fufu, ampesi, banku, akple etc).

11. Observe growth chart to check for Child's growth status in **Z-scores** and tick accordingly.

1. **Normal** (between -2 to 2) 2. **Moderately Malnourished** (between -2 to -3) 3. **Severely Malnourished** (below -3) 4. **Possible Over weight** (between 2-3) 5. **Possible Obese** (above +3)

12. Does your child eat regularly? 1. Yes 2. No

13. If no what do you do..... 1. Force feed Him 2. Play and sing with him to eat 3. I leave him alone 4. Others, specify.....

15. Is your child attending school? 1. Yes 2. No

If YES , at what age (months) did your child enroll?

16. In your opinion do you think Health workers are supportive enough during Post- natal services?

1. Yes 2. No