

**ASSOCIATION BETWEEN FACILITY STATUS – BABY  
FRIENDLY AND NON-BABY FRIENDLY HOSPITALS AND  
INFANT FEEDING PRACTICES**

**BY**

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## DECLARATION

I, Donkoh, Gifty-Margaret do thereby declare that with the exception of cited references, all other information in this document was produced by me through research under the supervision of Professor. Anna Lartey and Dr. Gloria Ethel Otoo, in the department of Nutrition and Food Science, University of Ghana, Legon.

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## DEDICATION

I dedicate this book to My Husband, Alfred Ampah and children Kobina, Maame Ekua and Tuffo Ampah and to my mother, Hannah Forson.



## ACKNOWLEDGEMENTS

Several times I have asked myself how I would get through the day looking at the number of things I have to do, and always conclude 'It is the LORD that gives me the strength to go through each day'. My greatest gratitude goes to the LORD GOD ALMIGHTY, who enables me continuously. Indeed, I am blessed and highly favoured of HIM.

I wish to say thank you to my husband and children who had to miss their wife and mother so she could further her education.

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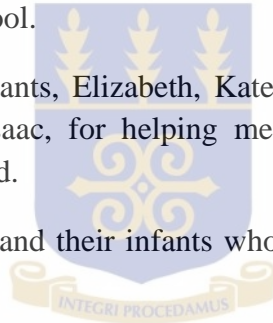
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**LIST OF ABBREVIATIONS**

<b>Abbreviation</b>	<b>Definition</b>
BFH	Baby Friendly Hospital
Non BFH	Non-Baby Friendly Hospital
EBF	Exclusive Breastfeeding
BF	Breastfeeding
BMS	Breast Milk Substitutes
ANC	Antenatal Care Clinic
CDC	Centre for Disease Control
CWC	Child Welfare Clinic
DHS	Demographic and Health Survey
GAR	Greater Accra Region
GDHS	Ghana Demographic and Health Survey
HIV	Human Immunodeficiency Virus
IBFAN	International Baby Food Action Network
IYCF	Infant and young Child Feeding
LAZ	Length-for-age z-score
LI	Legal Instrument
MICS	Multiple Indicator Cluster Survey
TBA	Traditional Birth Attendant
WHO	World Health Organization
WAZ	Weight-for-age z-score
WBT <i>i</i>	World Breastfeeding Trends Initiative
UNICEF	United Nations Children's' Fund

## ABSTRACT

**Introduction:** To protect, promote and support breastfeeding, WHO/UNICEF introduced the Baby Friendly Hospital Initiative (BFHI) to eliminate negative hospital practices that interfere with successful lactation. BFHI has been associated with increased EBF. However in Ghana, no study has been done to assess the impact of the Baby Friendly Hospital Initiative on breastfeeding. This study was done to determine the effect of hospital status – Baby Friendly and Non-Baby Friendly on infant feeding practices and infant growth.

**Methodology:** The study was in two parts – the first was to assess breastfeeding policies of Baby Friendly Hospitals (BFH) and private Non-baby Friendly Hospitals (Non-BFH) to confirm their status. Three BFH and three private Non-BFH were assessed. In all, 165 interviews were conducted (health staff (n=49); pregnant women (n=60); newly delivered mothers (n=56)) using the UNICEF/WHO External Assessment Tool. Data were analyzed with a WHO/UNICEF web analysis tool, designed for this purpose. The second part of the study was to assess the effect of hospital status on BF practices and infant growth at 4 months. A total of 100 mother-baby pairs were recruited from the 6 hospitals (50 mother-infant pairs from BFH and 50 mother-infant pairs from Non-BFH). A semi-structured questionnaire was used to obtain information on maternal and infant characteristics and infant feeding practices in hospital and at home. Anthropometric data (weight and length) were collected during home visits at months 2 and 4. All data were analyzed using SPSS Version 16.0. WHO Anthro (10.4) was used to convert weight, length and age to weight-for-age (WAZ) and length-for-age (LAZ) z-scores. Bi-variate analyses were done to find significant differences in maternal characteristics and hospital

practices and infant WAZ and LAZ at 2 months and 4 months. Logistic regression was done to find the determinants of exclusive breastfeeding (EBF) at 4 months.

**Results:** None of the hospitals passed all the ten steps to successful breastfeeding and code compliance (10+1 steps – the 11<sup>th</sup> step was added during the review of BFHI Materials in 2009), not even the hospitals previously designated as BFHs. Step 4 (early initiation of breastfeeding) and step 5 (show mothers how to breastfeed and maintain lactation) were not met by all the hospitals assessed. There were no significant differences in infant birth characteristics and breastfeeding education given in the two categories of hospitals (BFH vs. Non-BFH). However the BFH had less caesarean section than Non-BFH (12% vs. 40%) and more babies were delivered onto abdomen in spontaneous vaginal delivery (38.6% in BFH vs. 6.7% in Non-BFH). At discharge, significantly more infants delivered in BFH were EBF than those from the Non-BFH (100% vs. 88%,  $p=0.011$ ). However, the significant difference in EBF rates disappeared by 2 months. There were no significant differences in the growth of the infants born in the two categories of hospitals at birth, 2 and 4 months. However, at 4 months, infants born in BFH presented less cold/runny nose (5.1% vs. 23.1%;  $p=0.047$ ).

**Conclusion:** Due to the fact that none of the study hospitals met the Baby Friendly 10+1 Step criteria, this study did not find significant effect on infant growth at 2 and 4 months. Efforts should be made to regularly train hospitals to maintain the Baby Friendly status to realize the full benefits of EBF on infant growth and development.

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Background

Breastfeeding is recommended by the World Health Organization (WHO) as an most appropriate way of feeding infants, and that exclusive breastfeeding (EBF) for the first six months is particularly beneficial for both mothers and their infants (WHO, 2003; WHO, 2009). Exclusive breastfeeding (EBF) for six months reduces incidence of gastrointestinal illnesses, increases length gain and head circumference between 6-12 months and also provides more protection against otitis media and cough (Kramer *et al.*, 2003 and Raisler *et al.*, 1999).

The Baby Friendly Hospital Initiative (BFHI), an initiative promoted by WHO and UNICEF is expected to improve breastfeeding initiation and duration through changes in negative hospital practices that prevent women from breastfeeding successfully. The backbone of this initiative are 10 research-supported actions (The Ten Steps to Successful Breastfeeding), captured in a document titled 'Protecting, promoting and supporting breastfeeding: the special role of maternity services' (WHO, 1989), which provides the guidelines for successfully transforming hospital practices to ones that religiously support mothers and their families to practice EBF within the first 6 months of their infants lives. Practicing any or all of these "Ten steps" have improved exclusive breastfeeding rates at one and three to even six months worldwide (Rosenberg *et al.*, 2008; Cattaneo *et al.*, 2001; Wright *et al.*, 1996).

Exclusive breastfeeding promotion through the Baby Friendly Hospital Initiative has gained popularity due to the immense benefits of exclusive breastfeeding for children and

parents. Since 1993, countries, including Ghana, have been actively promoting exclusive breastfeeding in hospitals and the community (GDHS, 2003). This has been shown to increase early initiation of breastfeeding as well as exclusive breastfeeding rates for children in Ghana. The WHO/UNICEF Joint Statement outlines ten steps that every facility offering maternity services should endeavour to practice: (1) have a written breastfeeding policy that is routinely communicated to all health care staff; (2) train all health care staff in skills necessary to practice this policy; (3) inform all pregnant women about the benefits and management of breastfeeding; (4) help mothers initiate breastfeeding within a half hour of birth; (5) show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants; (6) give new-born infants no food or drink other than breast milk, unless medically indicated; (7) practice rooming-in – allow mother and infant to remain together – 24 hours a day; (8) encourage breastfeeding on demand; (9) give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants and (10) foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic (WHO/UNICEF, 1989). In 2006, the BFHI materials were reviewed to include 3 additional steps: (11) Compliance to the International Code of Marketing of Breastmilk Substitutes; (12) Mother Friendly Practices during Delivery and (13) Support for women with HIV infection (WHO/UNICEF, 2009).

The presence of a comprehensive written hospital policy was associated with improved support from staff and improved breastfeeding outcomes (Rosenberg *et al.*, 2008). Also, conferring Baby Friendly Status on hospitals motivates staff and improves hospital practices in support of breastfeeding, even for infants in the Neonatal Intensive Care Unit

(Merewood *et al.*, 2003). Reductions in the use of pacifiers and dummies have been associated with delivery in a Baby Friendly Hospital (Venancio *et al.*, 2011).

Under Article 6 of the International Code of Marketing of Breast milk Substitutes and Section 3 of Ghana's LI 1667, health workers and the health care system should not be used to promote activities and products of formula producers and/or their distributors (WHO, 1981; Breastfeeding Promotion Regulation, 2000). This is one of the pillars upon which the breastfeeding promotion activities in Ghana have hinged on. Distribution of commercial pack by formula companies reduced the duration of exclusive breastfeeding in a randomized control trial that evaluated effect of distribution of research packs consistent with the recommendations of WHO Code of Marketing of Breast milk Substitutes versus commercial discharge packs provided by formula companies in low income urban women. Follow-up of the women revealed that women who were given the research pack were more likely to prolong breastfeeding, practice partial breastfeeding at 4 months postpartum and delay addition of solid foods in the infants' diet daily. The study concluded that for high risk maternity populations, materials consistent with WHO recommendations should be given to women instead of commercial packs from formula companies (Frank *et al.*, 1987).

In Ghana, training, assessment and designation of health facilities as Baby Friendly started vigorously in 1993 with sponsorship from WHO and UNICEF. By 1998, about 250 health facilities in Ghana had been declared "Baby Friendly" (GDHS, 1998). Currently Ghana ranks 7<sup>th</sup> out of 51 countries in implementation of BFHI (World Breastfeeding Trends Initiative, 2010). In the Greater Accra Region, training of public and quasi-government hospitals that rendered maternity services began after 1993, which led to 37 Military Hospital being designated the first Baby Friendly Hospital in the

country. Since then, other hospitals have been trained, assessed and designated. Currently, 30 hospitals are baby friendly in the Greater Accra Region. There remains more work to be done however, since the region houses the highest number of hospitals delivering maternity services (228), both public and private, rendering the percentage of BFH (13.2%) least among all the regions of the country.

The Ghana Demographic and Health Surveys (GDHS) have consistently reported increasing breastfeeding rates since 1993. Exclusive breastfeeding rate for infants less than 6 months rose from 5% in 1993 to about 50% in 1998, 53% in 2003 and 63% in 2008 (GDHS 1993; 2003; 2008). In 2011 however, exclusive breastfeeding rates for infants less than 6 months reduced to 46.3% (GSS-MICS, 2011). Likewise, the proportion of infants who were put to breast within the first hour of delivery increased from 25% in 1998 to 47.5% in 2003 and to 52.4% in 2008 (GDHS 1993;2003; 2008). Designations of health facilities as Baby Friendly has been on-going in the Greater Accra Region, however the process is very slow due to funding challenges for trainings and assessment. Many Private Hospitals have not joined the BFHI because they are not fully convinced of the benefits and also they perceive high cost for involvement.

## **1.2 Justification for the study**

Since 1993, Ghana has implemented the BFHI and exclusive breastfeeding rates have increased from 5% in 1993 (GDHS, 1993) to 63 % in 2008 (GSS-GDHS, 2008). However, in recent times, the exclusive breastfeeding rates have decreased significantly to 46% (GSS-MICS, 2011). Within the same period, over 250 maternity hospitals and facilities have received Baby Friendly Hospital Accreditation, which should push the exclusive breastfeeding rates even higher. Some reasons that have been attributed to this

situation include lack of or little support from health staff and other factors such as increasing need for mothers to return to work before 6 months after delivery, level of education, increased early supplementation and poor community support for breastfeeding among others (Chien *et al.*, 2007; Dearden *et al.*, 2002; Riva *et al.*, 1999).

<sup>a</sup>Aidam *et al* (2005) studied the effect of lactation counselling on exclusive breastfeeding rates in a randomised controlled trial and concluded that exclusive breastfeeding rates improve when women receive adequate counselling during the antenatal care visits (Aidam, *et al.*, 2009). Also, the number of BFHI Steps experienced by a mother has been positively associated with improved exclusive breastfeeding rates (Chien *et al.*, 2007). This suggests that if all the Baby Friendly Accredited hospitals are fully practicing the ‘Ten Steps to Successful Breastfeeding’ and additional steps, exclusive breastfeeding rates should not be decreasing as is the case in Ghana currently. However, no study has as yet been conducted to determine compliance to the BFHI initiative. In addition, no data exists on the association between practices of existing BFHI accredited facilities and exclusive breastfeeding rates and infant growth in the country.

### **1.3 Rationale**

As already stated, exclusive breastfeeding rates have improved all around the world including Ghana in hospitals where BFHI Accreditation has been awarded. In Ghana, EBF rates increased from 5% in 1993 to 63% in 2008 when hospitals routinely provided breastfeeding support for mothers during prenatal, perinatal and the postnatal periods (GDHS 1993 and 2008). Although many hospitals have so far been designated Baby Friendly, which means that their routines should provide adequate support to mothers to breastfeed successfully, it is not clear if they continue to sustain practices to maintain

their status. This study explores the practices of the Baby Friendly Accredited Hospitals and determines if these practices are in conformity to the BFHI Accreditation they signed onto. It provides data on the extent to which Baby Friendly Hospitals are contributing to the current exclusive breastfeeding situation in the country. Results from this study would help inform policy direction on the current “once Baby Friendly, always Baby Friendly” policy. It would also provide the basis to strengthen the BFHI implementation in Ghana in the entire health sector, not just in the public facilities.

#### **1.4 Research Questions**

Exclusive breastfeeding rates have fallen in Ghana from an impressive 63% in 2008 (GDHS, 2008) to 41% in 2011 (GSS-MICS, 2011), yet the number of Baby Friendly Hospitals have increased from none in 1993 to over 205 by 2008 (GDHS, 2008). Ghana is currently rated 7 on a score of 10 in BFHI implementation (World Breastfeeding Trends Initiative, 2010). Hence the following questions:

1. Are Baby Friendly Accredited Hospitals complying to the “Ten (and additional) Steps Successful Breastfeeding” as enumerated in the BFHI reviewed Materials (WHO, 2009)?
2. What about Hospitals which have not yet received the BFHI accreditation?
3. What are the infant feeding practices of mothers who utilize Baby Friendly accredited and Non-baby Friendly accredited hospitals and
4. Are there any differences in growth of infants born to mothers who deliver in BFH accredited and Non-BFH accredited hospitals?

## **1.5 Objectives of study**

### **1.5.1 Main objective**

To determine the association between delivering in a Baby Friendly Hospital vs. Non-Baby Friendly Hospital and infant feeding practices and infant growth.

### **1.5.2 Specific objectives**

1. To assess breastfeeding policies of selected hospitals – Baby Friendly and Non-Baby Friendly to confirm status using the WHO/UNICEF External Assessment Tool
2. Compare infant feeding practices of women who delivered in the two categories of facilities and to assess association between hospital practices and infant feeding practices at 4 months.
3. To assess effect of delivery in Baby Friendly Hospital vs. non-Baby friendly Hospital on infant feeding practices and growth of infants – weight-for-age z-scores and length-for-age z-scores at 2 and 4 months of age

## CHAPTER TWO

### 2.0 LITERATURE REVIEW

#### 2.1 The Baby Friendly Hospital Initiative

The story of breastfeeding can never be fully told without mentioning the priceless contribution of Dr. Cicely Williams, a Jamaican born paediatrician, who once worked in Ghana and discovered the childhood often fatal disease 'kwashiokor'. In her famous speech "Milk and Murder" in 1939, Dr. Williams's statement "misguided propaganda on infant feeding should be punished as the most miserable form of sedition; these deaths should be regarded as murder" (Young, 1980), began a worldwide movement in support of breastfeeding, which has seen the birth of various breastfeeding advocacy groups including International Baby Food Action Network (IBFAN). With the declining rates of breastfeeding worldwide attributed to promotional activities of baby formula producers and distributors, UNICEF and WHO organized a meeting in 1979, with the main goal of discussing how to regulate promotional activities of these companies and their distributors. The eventual outcome of this meeting was the drafting and adoption of the International Code of Marketing of Breast milk Substitutes, which was passed into Regulation in May 1981.

The Baby Friendly Hospital Initiative is a global effort launched by WHO and UNICEF in 1991 as a way to implement practices spelt out in the Joint WHO/UNICEF Statement (1991) to "protect, promote and support breastfeeding". Subsequent to the launch, a worldwide movement towards training and designations of Baby Friendly Health Facilities/Hospitals began and many hospitals who were implementing the "Ten Steps to Successful Breastfeeding" as stipulated in the Joint Statement were awarded the title "Baby Friendly" after having passed a global assessment of their policies and activities.

Revisions have since been made to the original BFHI implementation materials (including training materials and assessment tools) to include compliance to implementation of the International Code of Marketing of Breast milk Substitutes; care for HIV infected mothers and mother friendly services as the 11<sup>th</sup> to 13<sup>th</sup> Steps (UNICEF/WHO, 2009).

The process of becoming Baby Friendly involves staff trainings and development of hospital policy with clear roles and responsibilities for management and staff. After this, the facility is assessed using the UNICEF/WHO Global Assessment Tool (UNICEF/WHO, 2009) with a laid down procedure that should be followed to ensure adequacy of work done. The facility then receives full baby friendly accreditation upon passing the assessment. The facility may inform the community members and the entire nation with an outdoor ceremony.

## **2.2 Trends in Infant Feeding Practices**

### **2.2.1 Pre-lacteal Feeding**

According to WHO/UNICEF, pre-lacteal feeds are any artificial milk or other drinks given to infants before their first breastfeed (WHO, 2003). Pre-lacteal feeding defined as any feeding done prior to the infants' first breastfeed (WHO, 2003) is common practice, both within the hospital and the community settings. Pre-lacteal feeds are given both for medical and non-medical reasons. UNICEF recommends that pre-lacteal feeds be given to infants only when medically indicated (WHO/UNICEF, 1989). Some reasons given by people who practice this include fear of dehydration, hypoglycaemia or development of jaundice (Amuse and Bunya, 2002). In a retrospective community-based study conducted among 420 new mothers in Bangladesh, 77% of the infants were given pre-lacteal feeds

for reasons such as social custom (55%), insufficient milk (14%), to keep mouth and throat moist and to keep body warm (Ahmed *et al.*, 1996). The researchers found out that the type and duration of pre-lacteal feeding negatively affected the establishment of lactation ( $p < 0.05$ ) and that only 9% initiated breastfeeding within the first 30 minutes after delivery.

### **2.2.2 Breastfeeding among infants less than 6 months**

An international review of trends in infant feeding in developing countries suggests that initiation of food supplements like breast milk substitutes (BMS) and other foods to infants begins as early as half-month postpartum. Marked differences between nations exist, with some showing declines in duration but not in proportions of infants breastfed (e.g. Thailand) (Knodel and Debavalya, 1980), others showing declines in proportions of infants breastfed but not in duration (e.g. Mexico) while others showing declines in both proportions of infants ever breastfed and duration of breastfeeding- e.g. Malaysia (Notzon, 1984).

In Central Caribbean area, intake of BMS begins at most 1 month postpartum in about 58% of infants in Mexico and 75% of infants in Trinidad (Gueri *et al.*, 1978; but in African countries it begins a little later. For instance in Cameroun, 45% of infants are supplemented by age 3-5 months and more than two-thirds of infants are given other feeds besides breast milk around age 2-3 months in Nigeria (Notzon, 1984). The same study revealed that breastfeeding practices declined sharply and continuously from the 1960s up to the 1980s and 1990.

In Taiwan, between 1967 and 1980, the percentage of children who were ever breastfed (any, full or exclusive) declined from 93% to about 50%. In contrast to this decline

however, any breastfeeding rates among children in Thailand was rather high: 90.4% in 1979 among the rural folk, and about 75.6% among the urban folk (Millman, 1982). The opposite however occurred with breastfeeding duration in these two countries. In Malaysia, percentage of children ever breastfed also declined howbeit not drastically from 94.1% before 1950, to about 82% by 1969 and to 74.6% by the 1970s (Millman, 1982).

A national survey in Mexico in 1979 puts the percentage of children 'ever breastfed' at 77.6% from an earlier percentage of 80.3% in 1976. The breastfeeding rates at month 6 was lower than for months 1 and 3, for both 1976 and 1979; declining from 72.7% at month 1, to 61.5% at month 3 and 50.4% at month 6 for 1976 and 76.8% at month 1, to 62.1% at month 3 and then to 52.4% at month 6 for 1979. The percentage of children 'ever breastfed' however was higher in 1979 than in 1976 in Mexico (Notzon, 1984)

Nutrition studies done in five African Countries – Cameroun, Egypt, Liberia, Sierra Leone and Togo showed that nearly all children surveyed had ever been breastfed. Percentages of children 'ever breastfed' ranged from 99.9% in Togo to 89% in Liberia (Popkin *et al.*, 1982).

A review of literature in China by Xu *et al.*, 2009 showed considerable changes in breastfeeding rates over the past forty years. The periods of the review was categorized into before 1990s and during the 1990s and after. Results from the review showed that during the 1950s and 1960s, percentage of children 'ever breastfed' in rural and urban areas was over 80%. These started to decline in the 1970s especially in the larger cities when the use of breast milk substitutes became widespread. In Beijing, a cross sectional survey conducted on breastfeeding revealed that 'any breastfeeding' rates had declined to

55.9% in 1992. Similarly, ‘full breastfeeding’ rates at four months were 35.3% in 1989, 29.3% in 1990, 29.0% in 1991 and 31.5% in 1992 (Xu *et al.*, 2009). In a survey undertaken in 20 provinces in China, exclusive breastfeeding rates at 4 and 6 months were 42.5% and 34.4% in urban areas and 69.65% and 60.35% in rural areas respectively (Xu *et al.*, 2009).

Exclusive breastfeeding trends increased from 2% in 1993 to 63% in 2008 (GDHS, 1993; 2008). However a reduction to 46% is reported by the Multiple Indicator Cluster Survey (MICS) in 2011. Trends of breastfeeding in Ghana are presented in Table 2.1. Median duration of exclusive breastfeeding is 2.7 months (GSS-MICS, 2011)

**Table 2.1: Trends in Breastfeeding in Ghana (2011)**

Indicator	DHS 1993	DHS 2003	DHS 2008	MICS 2011
% Children ever breastfed	97	97	100	NR
% Early initiation rate	NR	46	NR	46
%EBF for 6mos	3	53	63	46
Median duration of any BF	21mos	23mos	21mos	20.5mos
Median duration for EBF	NR	2mos	3mos	2.7mos

EBF: Exclusive breastfeeding NR: Not reported

In the United States of America, data from the National Immunization Survey revealed sharp declines in rates of exclusive breastfeeding between initiation and 2-3 months. Over 70% initiated breastfeeding within the first hour of birth, and 3 months on, only 38% were exclusively breastfeeding (Kaplan and Graff, 2008)

### 2.2.3 Timing and determinants of addition of other foods to breast milk

The timing of introduction of supplements to breast milk may impede exclusive breastfeeding. Varying times have been reported of when infants less than 6 months are introduced to other foods in addition to breast milk.

In a study conducted to determine the prevalence and correlates of the early discontinuation of breastfeeding by mothers to be recruited into the Women, Infants and Children Program (WIC) at Yale New Haven Hospital, 72.7% and 83.6% of women had discontinued breastfeeding by ages 2 months and 4 months respectively. About 17 of the 64 mothers interviewed discontinued exclusive breastfeeding before the 7<sup>th</sup> day and 7 (10.9%) by the 14<sup>th</sup> day (Ertem *et al.*, 2001). Mother's level of education, being of Puerto Rican ethnicity, feeding intent, feeling less confident to breastfeed and belief that babies enjoy formula, ranked highest among the factors that predicted discontinuation of exclusive breastfeeding before the first 2 weeks. Being a young mother (<20yrs) predicted early discontinuation of exclusive breastfeeding before 2 weeks ( $p < 0.05$ ), but single marital status did not (Ertem *et al.*, 2001).

However, at 2 months, single marital status (RR = 1.74,  $p < 0.01$ ) in addition to lack of confidence to breastfeed (RR = 11.70,  $p < 0.01$ ) ranked highest in determining discontinuation of exclusive breastfeeding. Being a young mother (<20yrs) was significant both in determining early discontinuation of exclusive breastfeeding at 2 weeks and 2 months ( $p < 0.05$ ) (Ertem *et al.*, 2001).

In a study among women who delivered in Perth's major maternity hospital, Scott *et al.*, (2006), monitored the breastfeeding rates and identified changes in breastfeeding practices, and the determinants of breastfeeding in the Perth Infant Feeding Study

(PIFSII). The prevalence of any breastfeeding declined from 93.8% at discharge to 45.8% at 6 months (95% CI). Breastfeeding problems before or at 4 weeks and age of introduction of pacifier were the major determinants of reduction in full breastfeeding rates

Forster *et al.*, (2006) used pooled data from a randomized controlled trial that evaluated the effect of two mid-pregnancy educational interventions to describe and present factors associated with any breastfeeding at 6 months postpartum. Women booking as public patients and having their first child were randomly assigned to a Control Group or to one of two intervention groups –one that was receiving education on practical aspects of breastfeeding using a pre-tested tool or one in which family attitudes to BF were explored. Factors that were positively associated with any breastfeeding at 6 months were a very strong desire to breastfeed (AOR = 2.18, 95% CI 1.45-3.29), mother herself having been breastfed (AOR 1.73, 95% CI 1.19-2.54), being born in an Asian country (AOR 1.57, 95% CI 1.57-5.36) and older maternal age (AOR 1.58, 95% CI 1.35-1.86). The factors that were negatively associated with any breastfeeding were woman having no intention to breastfeed for six months or more (AOR 0.41, 95% CI 0.25-0.67), baby receiving formula while in hospital (AOR 0.43, 95% CI 0.30-0.62) and not attending childbirth education (AOR 0.46, 95% CI 0.29-0.71). Other factors negatively associated were mother smoking 20 or more cigarettes per day before becoming pregnant, maternal obesity and mothers own reported anxiety in the first six months (Forster *et al.*, 2006).

#### **2.2.4 Effects of introduction of other foods on infant growth**

Cohen *et al.* (1994) evaluated whether starting complementary feeding earlier than 6 months have any advantages among infants in Honduras. In this study, mothers who had

breastfed exclusively for 4 months were randomized to one of three groups a) continued breastfeeding (EBF) till 6 months; b) introduction of complementary foods with unrestricted breastfeeding till 6 months (SF) and c) introduction of complementary foods with maintenance of baseline nursing frequency (SF-M) till 6 months. The results showed that intake of other foods displaced breast milk. At 4 -6 months, breast milk intake remained unchanged among the EBF infants, but significantly ( $p < 0.001$ ) reduced in the SF group and the SF-M group. There was no significant difference in infant growth between the groups.

Though other studies have found negative association between not EBF for 6 months and infant growth, Thiombiano-Coulibaby *et al.*, 2004 found otherwise. A cross-sectional survey to assess the effects of early extra fluid and porridge intake on 5-month old infants in Burkina Faso found no significant association between early feeding and stunting and wasting. Stunting rates were higher in rural than urban Burkina Faso. However, these associations were found with infant birth weight and maternal height, and not on extra fluid intakes. Fluid intake was found to be inversely associated with BM intakes, which however remained high (776 and 835g/day for rural vs urban). Predominant BF could therefore have accounted for the lack of difference observed (Thiombiano-Coulibaly *et al.*, 2004).

### **2.2.5 Use of Bottles, Teats and Pacifiers/Dummies**

To determine the effects of artificial teats (bottles and dummies) and cups on BF in pre-term infants, Collins *et al.*, (2004) randomized 319 preterm infants to one of four groups – cup/no dummy; cup/dummy; bottle/dummy and bottle/no dummy to administer any feeds prescribed, including breast milk. Two groups could give dummies to their infants

and two could not. Use of cup to feed pre-term infants when indicated increased the rate of full breastfeeding at discharge compared to feeding with a bottle (OR = 1.73, 95%CI 1.04-2.88). Any breastfeeding rate at 3 and 6 months were higher for women who fed their infants with cup during the hospital stay than those who fed with bottles (42% and 31% vs 36% and 24% respectively) (Collins *et al.*, 2004). The reason for this observation was given as the fact that bottle feeding presents immediate and consistent availability of milk to the infants rather than suckling action. No significant differences were found in any breastfeeding rates for infants randomized to use pacifiers compared to those who did not use pacifiers at 3 (0.99, 0.56 to 1.77,  $p = 0.98$ ) and 6 months (1.23, 0.66 to 2.30,  $p = 0.51$ ) months after discharge (Collins *et al.*, 2004). The study attributed the lack of difference to poor compliance to randomized treatment.

Riva *et al.* (1999) examined the factors associated with initiation and duration of breastfeeding among 996 Italian infants. They found that the use of pacifiers during the first month of life had a negative association with total duration of breastfeeding; (RR=1.30, 95% CI (1.18 – 1.50)) as well as duration of exclusive breastfeeding (RR = 1.42, 95% CI (1.24 – 1.62)).

A cross sectional survey to determine breastfeeding patterns and associated factors found that exclusive breastfeeding was positively associated with no bottle or pacifier use (Koosha *et al.*, 2008). Predictors of exclusive breastfeeding were non-pacifier use (OR = 2.62, 95%CI 1.31-5.2), demand feeding (OR = 2.6, 95%CI 1.14-6.16), more than 8 feeds per day (OR = 2.25, 95%CI 1.35-3.75), parity of 2 or less and birth weight between 2.5 – 4kgs (Koosha *et al.*, 2008)

Though some studies have found negative associations between use of bottles and/or pacifiers and duration and exclusivity of breastfeeding, Schubiger *et al.* (1997), found otherwise. In the Schubiger study, a total of 602 infants were randomly assigned to two groups: i) UNICEF group where supplements if medically indicated were administered with cup and spoon: and ii) Standard group, where supplements were offered with a bottle without restrictions. All infants had access to pacifiers without restriction. No statistically significant differences were found between both groups with regards to breastfeeding rates at 5 days, 2, 4 and 6 months. Among the UNICEF group, 100%, 88%, 75% and 57% breastfeeding rates at day 5, months 2, 4 and 6 compared with 99.3%, 88%, 70% and 55% among the standard group for the various ages respectively were observed. Their results suggest that giving of supplements with bottles or pacifier use do not have any negative effect on breastfeeding duration. The researchers stated that the UNICEF group violated a lot of the study protocols for example, infants who had medical indications for supplementation were given such from bottles and they also received higher volumes of supplements than required, suggesting that the procedures may not have differed much between groups (Schubiger, 1997).

### **2.2.6 Promotion and/or Use of Commercial Formula in Health Facilities**

Since the International Code on Marketing of Breast milk prohibits public advertising including TV and billboards for infant formula and related products, promotion of formula is done in the health facilities through health professionals. Concerns have been raised about the reasons why this practice still exists. A study on promotion of formula and infant feeding practices in Sri Lanka showed that selection of a particular brand of infant formula depended much on medical practitioners' advice and also advice from pharmacy staff (Weisjundra, 2009). A strong positive association was found between

medical staff advice on formula and mothers/caregivers choice of formula brand ( $R = 0.920$  and  $R^2 = 0.84$ ). The author concludes “*reaching health care professionals, indirect promotion and mass media advertising should be the main focus of industry players if they want to reach the right market*” (Weisjundra, 2009).

According to Greer *et al.*, between 1929 and 1932, the American Medical Association required formula companies to advertise only to the medical profession, since they believed that instructions for use of formula should be in the domain of the physician. However, companies like Nestle began mass media advertising, quickly followed by others like Bristol Myers, Mead Johnson and Gerber Products. The rising concern for the medical association was that if companies reached mothers by themselves, they would be taking the ‘job’ from the medical profession, which could lead to a reduction in the financial support for their scientific meetings and medical research among others (Greer *et al.*, 1991). This suggests that the medical association was more interested in their support which would dwindle and not necessarily that breastfeeding would be jeopardized by uncontrolled advertising from formula companies.

The use of health systems and staff to promote formula has undoubtedly had negative influence on breastfeeding in the areas of initiation, duration and EBF. Company-produced infant feeding information, distribution of free formula samples at hospital discharge and non-medically indicated use of formula with breastfeeding infants have negative impact of EBF (Kaplan and Graff, 2008).

Comparing the effect of formula-produced materials about infant feeding on breastfeeding initiation and duration, Howard *et al.*, (2000) found that breastfeeding initiation and rates at 2 weeks were same in the two experimental groups. However,

women who received discharge packs (with formula-company produced materials) were more likely to cease breastfeeding before hospital discharge (RR =5.80, 95%CI) and before 2 weeks (OR = 1.91, 95%CI). Significantly, for women who were not certain of their breastfeeding intentions exposure to commercial intervention shortened their experience of exclusive breastfeeding (Hazard ratio= 1.53, 95%CI) as well as ‘full’ breastfeeding (Hazard ratio = 1.75, 95%CI).

The evidence of negative associations between formula feeding within the health facility and breastfeeding rates and duration has been reported by other studies. Forster *et al.* (2006) analyzed pooled data from three-arms of a randomized controlled trial that assessed factors associated with breastfeeding at six months postpartum in a group of Australian women, and concluded that receiving formula in the hospital had a negative association with any breastfeeding at six months (AOR 0.43, 95% CI 0.30-0.62).

### **2.3 BFHI Status and Breastfeeding Rates**

Changing hospital practices to that stipulated in the Baby Friendly Hospital Initiative has led to improved breastfeeding outcomes in most countries where maternity facilities have signed onto the initiative (Venancio *et al.*, 2011; Mydlilova, *et al.*, 2009; Rosenberg *et al.*, 2008; Merewood *et al.*, 2003). Exploring the association between the ‘Ten Steps’ in the BFHI and breastfeeding at 2 days and 2 weeks, Rosenberg *et al.* (2008) concluded that implementing not one, but more than one if not all of the ten steps produce better outcomes on breastfeeding. The higher the hospital scored in the Support scores (out of 100 points), the better the breastfeeding outcomes at 2 days and 2 weeks.

A retrospective study in the Czech Republic, which compared the type of infant feeding mothers practice in baby friendly and non-baby friendly hospitals from 2000 to 2006

found that exclusive breastfeeding rates decreased in the two periods for both Baby Friendly and Non-Baby Friendly Hospitals but the risk of not being exclusively breastfed was found to be higher when a mother delivers in a non-baby friendly hospital (unadjusted OR = 1.57, 95% CI (1.47-1.68) for year 2000, vs. OR = 1.36, 95% CI (1.3-1.42) for year 2006) (Mydlilova *et al.*, 2009)

A cross-sectional survey to determine the factors associated with exclusive breastfeeding among per-urban women in Ablekuma in the Greater Accra Region of Ghana reported that delivering in a public hospital increased exclusive breastfeeding rates compared to delivering in a private clinic or maternity home (<sup>b</sup>Aidam *et al.*, 2005). Delivering in a polyclinic or public hospital increased the likelihood of EBF about twofold (OR=1.96, 95% CI, 1.08-3.54), compared to delivering in a private clinic/maternity home/Traditional birth attendant (TBA). Other factors associated with EBF were mothers' pre-planned intention to EBF before delivery and positive attitudes towards breastfeeding (<sup>b</sup>Aidam *et al.*, 2005).

### **2.3.1 Hospital Policies and Breastfeeding**

Rosenberg *et al.* (2008) in a bivariate analysis showed that having a hospital breastfeeding policy (Step 1) and staff training (Step 2) were each associated with breastfeeding at 2 weeks. However, multivariate analysis left only having a written breastfeeding policy that can be routinely communicated to staff associated with exclusive breastfeeding at 2 weeks;  $p=0.05$ .

Examining factors perceived to promote or hinder BFHI accreditation in Australia, Walsh *et al.* (2011) found that staff's understanding and personal views are often in opposition to BFHI aims. However, strong management support and development of specific

breastfeeding policy with detailed protocols for adherence could provoke the required support from staff for implementation of BFHI.

### **2.3.2 Staff Training and Breastfeeding Rates**

Gupta and Mathura (2002) reported that 9 months after training, staff showed 'remarkable improvement regarding initial mother-infant contact, attachment at the breast and reduced use of pre-lacteal feeds and supplements' in the hospitals where BFHI training had taken place. Westphal *et al.* (1995) assessed breastfeeding training for health professionals and resultant institutional changes in eight institutions in Brazil. Results from this study showed that changes had occurred in institutions whose staff had attended the breastfeeding training course, particularly for steps 2 and 10, but such changes had not occurred in institutions whose staff had not attended the training. In addition, the trained group which was trained ranked higher in the ten-step score test than the untrained control group. All trained institutions agreed unanimously that it is easier to introduce new programs that would support breastfeeding. Early initiation rates improved and use of supplements reduced drastically when the Chittaranjan Hospital of Calcutta National Medical College in India was awarded the Baby Friendly Hospital Status (Dasgupta *et al.*, 1997). However the authors concluded that staff training needed to be intensified and more emphasis placed on supporting first time mothers as only 54% of pregnant women who attended the antenatal clinic were given any information on breastfeeding, emphasizing the need to strengthen implementation of step 3 (antenatal education).

### **2.3.3 Compliance to BFHI Status and Breastfeeding**

Once a facility has been given the Baby Friendly accreditation, it becomes imperative for management to ensure continuous compliance to the ‘Ten Steps to Successful Breastfeeding’ signed onto. To ensure this, re-assessments are carried out for continuous compliance to the ‘ten Steps’ and a good rating of compliance assures continuous high quality support for mothers and their infants.

A reassessment of 172 Baby friendly accredited hospitals in Brazil, revealed that adherence to the BFHI 10 steps was high among all the facilities (91% to 99%) with about 82% of the facilities adhering to all 10 steps (Moura De Araujo and Schmitz, 2007). The results further showed that steps 3 (antenatal education) and 2 (staff training) had the lowest adherence rates. The steps most adhered to in this study were steps 7 (rooming-in) and 9 (avoidance of teats and pacifiers) (Moura De Araujo and Schmitz, 2007). Rosenberg *et al.* (2008) assessed compliance of 57 birthing hospitals in Oregon to the ten steps to successful breastfeeding, with the aim of associating practice of the ten steps to breastfeeding at 2 days and 2 weeks. Overall the hospital scores ranged from 49.4 to 98.2, out of a possible total score of 100. Compliance with individual steps ranged from 5.3% for step 2 to 93% for steps 4 (breastfeeding initiation) and 8 (demand feeding). The study also reported that increases in overall hospital scores were associated with significant increases in breastfeeding rates at 2 days and 2 weeks postpartum.

Outdated practices by midwives and passive resistance to the BFHI 10 Steps were identified by nurses on Graduate Midwifery Program in Australia as major stumbling blocks to compliance to UNICEF/WHO’s Ten Steps. The steps most not adhered to were 4 (BF initiation), 5 (BF support), 6 (avoidance of pre-lacteal feeds) and 9 (avoidance of

teats and pacifiers). Midwife preceptors (teaching newly graduated midwives) in the BFH were reluctant to support mothers to initiate BF but quick to give pre-lacteal feeds from feeding bottles. Even for step 7 (rooming-in) that was widely practiced, midwives found reasons, including the need for phototherapy to separate infants from their mothers (Reddin *et al.*, 2007). The students were in internship in 3 Hospitals – 2 Baby Friendly and 1 Non-Baby Friendly.

### **2.3.4 Breastfeeding education on Breastfeeding rates**

Educating pregnant women could go a long way to convince mothers about the need for breastfeeding (Step 3), and missing this period may pose serious challenges for breastfeeding especially for first time mothers (WHO/UNICEF, 1989). In addition, continuous support and education after delivery may boost mothers' confidence and willingness to continue to practice the recommended age-appropriate feeding practice. A study in KEM Hospital, India reported that continuous advice during the well child clinic contributed more to the high rates of exclusive breastfeeding observed (Parekh *et al.*, 2004).

### **2.3.5 BFHI Status and Breastfeeding Rates**

Many studies have confirmed improved breastfeeding rates and duration in facilities where the 'Ten Steps' are practices, but especially for steps 3 (antenatal education), 4 (BF initiation), 5 (show mothers how to BF), 6 (avoidance of pre-lacteal feeds), 7 (rooming-in) and 8 (BF on demand) (Moura De Araujo and Schmitz, 2007; Dasgupta *et al.*, 1997; Wright *et al.*, 1996). In a study to determine the relationship between rooming-in and breastfeeding variables in Japan's Okayama National Hospital, it was found that infants rooming-in were frequently breastfeeding compared to infants who were not (Yamauchi

and Yamanouchi, 1990). This led to significantly less supplementation with breast milk substitutes to infants rooming-in than those not rooming-in ( $p < 0.01$ )

An impact assessment conducted in the University Medical Centre in Tucson, Arizona compared breastfeeding rates before and after the facility's policies and practices were changed to conform to the BFHI's Ten Steps to Successful Breastfeeding. Before the intervention, early initiation rate was 24.8%, about 47% received formula in the hospital and exclusive breastfeeding rate was 23.8% (Wright *et al.*, 1996). Mothers receiving help with breastfeeding was 61.3%. After the hospital staff were trained and policies were drawn to guide facility practices, early initiation rate increased from 24.8% to 63.2%, ( $p < 0.001$ ), the percentage of infants given formula with bottles reduced from 46.7% to 27.9% ( $p < 0.05$ ) and mothers who received help with breastfeeding increased from 61.3% to 81.9% ( $p < 0.001$ ) (Wright *et al.*, 1996). However, exclusive breastfeeding rate at 4 months rather declined from 23.8% to 12.4% ( $p < 0.01$ ) between the two time periods, after data on children misclassified as BEF at month 4 were discarded (Wright *et al.*, 1996).

Broadfoot *et al.* (2004) observed that being born in a hospital that held the Baby Friendly Status Award increased the chance of being breastfed. An observational study to examine the effect of BFHI on breastfeeding rates in Scotland confirmed that children born to hospitals with BFHI award were 28% more likely to be breastfed at 7 days post-delivery compared to those born to non-award hospitals (Broadfoot *et al.*, 2004). Longer duration of breastfeeding has also been associated with being born in a Baby Friendly accredited hospital compared to a non- accredited hospital in The Republic of Belarus (Kramer *et al.*, 2001).

Four steps, out of the ten – steps 6 (avoidance of pre-lacteal feeds), 7 (rooming-in), 9 (avoidance of teats and pacifiers), 10 (mother-to-mother support) and code compliance were associated with full breastfeeding at months 1 and 4. Regression analyses showed reduced full breastfeeding rates at month 1 for infants who received formula in the hospital while full breastfeeding at month 4 was significantly common among women who roomed-in more than 60% of the time ( $p < 0.05$ ) and among those who did not receive gift packs that had formula ( $p < 0.04$ ) (Wright *et al.*, 1996).

Step 9 in the BFHI's Ten Steps forbids health workers to give teats and pacifiers to breastfeeding infants and this is supported by the International Code of Marketing of Breast milk Substitutes "Article 2", which puts bottles, teats and pacifiers under the scope of items that should not be promoted within the health delivery system (WHO/UNICEF, 1989; WHO/UNICEF, 1981).

Early breastfeeding initiation and EBF rates increased when women who delivered in Baby Friendly Hospitals in Taiwan experienced more BFHI's ten steps (Chien *et al.*, 2007). This cross-sectional study which examined the association between number of BFH practices experienced by mothers and breastfeeding initiation and duration found that 50-80% of women who were EBF at discharge experienced 7-10 of the ten steps compared to less than 10% EBF among women who experienced 4 or less steps. At months 1 and 3, EBF rate was about 45% and about 35% for women who experienced 7-10 of the ten steps compared to about 20% and 18% for women who experienced 4 or less steps at the two time points (Chien *et al.*, 2007).

One of the important steps in the 'ten steps to successful breastfeeding' is allowing mother and baby to remain together in skin-to-skin contact for the first one hour or more

after birth and initiating breastfeeding within the first 30 minutes (WHO, 1981). In a comparative study of two groups of mothers who delivered in the Obstetrics and Gynaecology Department of Calcutta National Medical College before and after the facility gained baby friendly accreditation, early initiation rate increased from 1.5% to 14.3% (Dasgupta *et al.*, 1997). Further, pre-lacteal feeding incidence declined from 100% to 33% and also incidence of supplementary feeding for breastfed infants also declined from 46% to 19%. Initiation of breastfeeding within 1 hour of birth increased in the University Medical centre in Tucson from 24.8% in 1990 to 63.2% in 1993 after the facility was trained and signed on to BFHI (Wright *et al.*, 1996)

## **2.4 Community Support and Success of Breastfeeding**

### **2.4.1 Effect of Peer Counselling on EBF Rates**

Aidam *et al.* (2005<sup>a</sup>) conducted a randomized controlled trial in pregnant women assigned to 2 intervention groups: i) Group 1 to receive peer counsellor visits prenatally, perinatally and postnatally ii) Group 2 to receive peer counsellor visits only perinatally and postpartum and Group 3 - a control group who would be visited throughout pregnancy, perinatal and postpartum, however the information pack did not include breastfeeding. EBF rates were significantly higher in GP 1 (92%) and GP 2 (88%) compared to GP 3 (66%) at 3 months of infants' age ( $p = 0.004$ ). by month 6, the significant differences among all three groups were even stronger with EBF rates being 90% for GP 1; 80% for GP 2 and 55% for GP 3 ( $p=0.001$ ). The study found no additional effect of prenatal breastfeeding education on EBF rates. (<sup>a</sup>Aidam *et al.*, 2005), and therefore concluded that additional home support during the pre-natal period is not needed in the context of strong routine pre-natal education within the health service system (<sup>a</sup>Aidam *et al.*, 2005).

Early and repeated contact during pregnancy and immediate postpartum by trained peer counsellors was shown to increase duration of exclusive breastfeeding (Haider *et al.*, 2000; Morrow *et al.*, 1999). Limitation of breastfeeding promotion at health facilities do not fully guarantee longer duration of exclusive breastfeeding at home. Increasingly, it is becoming evident that community and/or family support is essential in encouraging breastfeeding mothers to continue doing so even in the face of obvious challenges, like persistent babies crying, perceived as ‘not enough milk’ and mothers returning to work before child is six months.

In the Ibulanku Sub County of Uganda, a descriptive study was undertaken to assess the feasibility of training community women as peer counsellors for promotion of exclusive breastfeeding. Fifteen women aged 25-35 years were selected from the communities, trained as peer counsellors and given the mandate to support women who deliver in their communities to practice exclusive breastfeeding. Evaluation of the programme revealed that the counsellors were well accepted by the community. Breastfeeding women were comfortable with their own peers and husbands welcomed the idea of peer counsellors helping their wives with breastfeeding (Nankunda *et al.*, 2006).

#### **2.4.2 Community Support and EBF Rates**

Community support received by mothers and caregivers helps sustain good breastfeeding behaviour and improves exclusive breastfeeding rates (Aidam *et al.*, 2005). Community support for breastfeeding through participating in activities of mother-to-mother support groups and other community initiatives that promote health may increase duration of exclusive breastfeeding. Mother-to-mother support groups are formed in fulfilment of the 10th Step in the “Ten Steps to Successful Breastfeeding”. Formation of mother-to-mother

support groups is done by the health staff in charge of the child welfare clinic services (CWC) within the communities in which they operate. These are supposed to be managed by community members who are experienced and respected (WHO/UNICEF, 2006)

In a randomized controlled trial, where mother-new-born pairs were randomly assigned to a standard care group (defined as standard care and standard length of hospitalization) or an experimental group (defined as standard hospital care with early discharge and home support from nurses who were lactation consultants), more mothers in the experimental group were found to be exclusively breastfeeding at follow-up ( $p=0.02$ ), compared with the control group at 2 weeks. The authors argue that lactation support at home appears to facilitate positive breastfeeding outcomes for mothers whose infants were born at term (MacKeever *et al.*, 2002).

## **2.5 BFHI Status and Infant Growth and Morbidity**

BFHI practices should improve infant growth when staff support meets mother's needs and willingness to cooperate. Yamauchi and Yamaouchi (1990) established that better weight gains were made by children who roomed-in with their mothers by day 7 ( $39.93 \pm 21.4\text{g/day}$ ) compared to those who were not rooming-in with their mothers ( $31.4 \pm 15.3\text{g/day}$ ), and concluded that frequent suckling which led to increased energy intake and less crying may have contributed to the weight gain.

Interesting results were realized using the isotope dilution method to determine the breast milk and non-breast milk intakes among children born to the St John's Medical College Hospital in Bangalore, India, a Baby Friendly Hospital. Samuel *et al.* 2012 found declines in the height-for-age z-score (HAZ) and head circumference-for-age z-score (HCZ) among the exclusively breastfed infants from birth till 6 months; but an increase in

weight-for-height z-score (WHZ) within the same time period. The researchers found that at 6 months, 20% of the infants were underweight and stunting had increased from 2% at month 1 to 16% at month 6. (Samuel *et al*, 2012). A possible explanation to the observations above was that mothers' report of duration of exclusive breastfeeding did not agree with results for breast milk and non-breast milk intakes determined using the isotope dilution method. Infants were receiving other liquids as early as 1 month postpartum, although no mother reported introducing other foods at 1 month. The isotope dilution measurement showed that 44% of infants had received other foods and that only 56% were exclusively breastfeeding at 1 month. (Samuel *et al*, 2012).

However breast milk intake significantly correlated with weight-for-age z-score (WAZ) (month 1:  $r = 0.56$ ,  $p < 0.001$ ; month 3:  $r = 0.60$ ,  $p < 0.001$ ) and weight-for-height z-score (month 1:  $r = -0.59$ ,  $p < 0.001$ ; month 3:  $r = 0.58$ ,  $p < 0.001$ ), while non-breastmilk intake correlated negatively with WHZ ( $r = -0.33$ ,  $p = 0.02$ ) at month 3 but positively correlated with WAZ and HAZ:  $-r = 0.37$ ,  $p = 0.01$  and  $r = 0.30$ ,  $p = 0.30$  respectively (Samuel *et al.*, 2012)

In Belarus, a multicenter randomized control trial showed that exclusive breastfeeding reduced the risk of gastrointestinal tract infections (GIT) by 40% and atopic eczema by 46% (Kramer *et al.*, 2001). According to Scariati *et al.* (1997), more infants on formula only were likely to have diarrhoea and ear infections, compared to infants on breast milk only within the first six months and that the more breast milk an infant receives the less risk of morbidity.

This review shows that being Baby Friendly improves staff knowledge and support given to pregnant women and breastfeeding mothers to ensure successful lactation. In addition

positive associations have been found between BFHI Status and exclusive breastfeeding rates and infant growth. Diarrheal illnesses are few in exclusively breastfed infants and rapid recovery from otitis media and acute respiratory illnesses have also been associated with exclusive breastfeeding compared to non-exclusive breastfeeding (Kramer *et al*, 2001; Scariati *et al*, 1997).

## **CHAPTER THREE**

### **3.0 METHODOLOGY**

#### **3.1 Study Setting and Design**

##### **3.1.1 Study Setting**

The study was carried out in Tema and Ashaiman, 2 out of the 15 administrative areas of the Ghana Health Service in the Greater Accra Region. Tema is generally considered as an urban and high income earning area. Ghana's first President, Dr. Kwame Nkrumah built Africa's largest man-made off-shore deep water harbour in Tema. Tema is considered the major industrial centre of the country, home to the country's only oil refinery and largest cement producing factory. There are 4 public health facilities and over 60 private health facilities, including 2 Fertility Hospitals. The socio-economic status of the about 402,000 population in Tema is generally deemed average. Residential areas are largely planned, with pockets of slum areas, especially for inhabitants living on the coastal areas. There is a good distribution of health facilities, although more private than public. The largest public hospital, Tema General Hospital is in Tema.

Ashaiman Municipal is a highly populous commercial town, carved out of Tema Metropolis in 2008, and is considered a low income peri-urban settlement. Most inhabitants of Ashaiman are small traders or workers. Ashaiman has only 1 public health facility – Ashaiman Polyclinic, although there are several privately owned clinics.

Most households in Ashaiman depend on public toilets. Access to water and electricity however are generally satisfactory. The use of health facilities within the Ashaiman and Tema environs is not restrictive. Inhabitants are free to access health wherever they want,

although most Ashaiman inhabitants tend to use the major Government Hospital – Tema General Hospital.

### **3.1.2 Study Design**

This cross-sectional study is in two parts: the first was an assessment to determine the extent of compliance by the Baby Friendly Hospitals and to assess the BF practices of the Non-Baby friendly Private facilities.

The second part is a longitudinal study to determine the effect of Baby Friendly Hospital Status on breastfeeding practices of mothers and infant growth at 2 and 4 months postpartum.

## **PART I**

### **3.2 Assessment of Facilities**

#### **3.2.1 Selection of Baby Friendly Facilities**

Three (3) Baby Friendly facilities within the Tema and Ashaiman Districts were selected as the study sites. Tema General Hospital was designated baby friendly in 2008. Tema Polyclinic and Ashaiman Polyclinic received accreditation as Baby Friendly Hospitals in 2011. These are the only hospitals so far accredited with the status of baby friendly in the Tema/Ashaiman Districts. These hospitals have passed the UNICEF Global Assessment and were awarded Baby Friendly Hospital Status after implementing the “Ten Steps to Successful Breastfeeding”. Heads of these hospitals were approached and discussions held with them and their management about the intention to use their facilities as sites to conduct the research. Approval was given and letters of introduction sent to them before work began.

### 3.2.2 Selection of Non-Baby Friendly Facilities

A list of all hospitals and health facilities within the Tema and Ashaiman Districts was obtained from the health directorates. The list from Tema comprised 61 private clinics and Ashaiman had 19 private clinics. None of these had been assessed for BFH status nor been trained on the ten steps. Two hospitals in Tema were excluded from the sampling frame because they were fertility centres. Three hospitals were randomly selected from the list to represent the private Non-Baby Friendly Hospitals. The names of the hospitals were written down on pieces of papers, placed in a box and the number needed drawn from it one after the other. The box was shaken after each drawing. Written approvals were sought from each of the study hospitals.

### 3.2.3 Assessment of BFH Status

Two UNICEF trained assessors conducted the assessment on all six (6) selected hospitals (Table 3.1). The assessors are trained and have conducted such assessments all over the country. The hospitals were briefed on the objective of the study.

**Table 3.1 Hospitals Participating in the Study**

Baby Friendly Hospitals	Non-Baby Friendly Hospitals
1. Tema General Hospital	1. Narh-Bita Hospital
2. Tema Polyclinic	2. Raphal Medical Centre
3. Ashaiman Polyclinic	3. New Crystal Health Services

The two national assessors were provided with the location of each hospital, the contact person and information on their antenatal and postnatal clinic days to facilitate data collection. Upon reaching the hospital, they visited the contact person who then

introduced them to the person in charge of maternity services. The assessors were also introduced to the maternity and other staff that would need to be interviewed.

Data were collected using the global assessment tool developed by WHO/UNICEF (2009) which is based on the ‘Ten Steps’ (Table 3.2) with an additional step on Compliance to the International Code of Marketing of Breast milk Substitutes. Code Compliance was added as 11<sup>th</sup> step during the BFHI materials review in 2005 (WHO/UNICEF, 2009).

**Table 3.2: The Ten Steps to Successful Breastfeeding (WHO, 1989)**

<ol style="list-style-type: none"><li>1. Have a written breastfeeding policy that is routinely communicated to all health care staff</li><li>2. Train all health care staff in skills necessary to practice this policy</li><li>3. Inform all pregnant women about the benefits and management of breastfeeding</li><li>4. Help mothers initiate breastfeeding within a half hour of birth</li><li>5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants</li><li>6. Give newborn infants no food or drink other than breastmilk, unless <i>medically</i> indicated</li><li>7. Practice rooming-in – allow mother and infant to remain together – 24 hours a day</li><li>8. Encourage breastfeeding on demand</li><li>9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants</li><li>10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic</li><li>11. Code Compliance</li></ol>
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The WHO/UNICEF Assessment Tool (WHO/UNICEF, 2009) used describes how to conduct the interviews as well as the number of respondents that should be selected that would be enough for analysis. All the respondents interviewed during the assessment were selected through convenience sampling.

#### **a. Staff**

The following categories of staff were interviewed in each hospital: head of the maternity unit (or the in-charge - 1), midwives and other clinical staff and non-clinical staff like cleaners and security men working in the maternity unit (Table 3.3). The list of staff in the facility was obtained by the assessment team and all staff at post during the time of the assessment were interviewed. If required, some critical staff who were not on duty at the time of the interviews were recalled to work to enable the team interview them.

#### **b. Pregnant women**

Ten pregnant women of gestation age  $\geq 28$  weeks were conveniently selected to partake in the interviews. These pregnant women had come for antenatal care services in the selected hospitals during the period of the study. This number is the minimum number of mothers that should be interviewed according to the guidelines in the WHO/UNICEF Assessment Tool (WHO/UNICEF, 2009). The women were informed about the study by the head of maternity or her representative. For BFHI assessments, head of hospital consent covers all interviews to be conducted within the hospital premises; however permission was sought from all pregnant and lying-in women before the interview was done. Participants are free to opt out before or during the interview. In total, 60 pregnant women were interviewed in all 6 facilities (Table 3.3).

### **c. Lying-in Mothers**

Within the period of the hospital assessments, all newly delivered mothers who were soon to be discharged were interviewed on staff delivery practices and support for breastfeeding given by any staff while they were on admission. Questions asked included early initiation of breastfeeding, infant-baby contact immediately after delivery, staff support to mothers on positioning and attaching babies to the breast and whether mothers had been taught how to express milk by hand. According to the guidelines for sample selection in the WHO/UNICEF Assessment Tool (WHO/UNICEF, 2009) a total of 90 mothers were to be interviewed, however, 56 mothers responded to the request for interviews during the period of the assessments (Table 3.3)

### **d. Mother-to-mother support groups**

The assessment tool allows interviewers to ask the mothers soon to be discharged whether they had been told where to seek help with breastfeeding challenges after discharge. In addition, heads of the selected hospitals maternity units were asked if they had formed mother-to-mother support groups, to which they refer their clients upon discharge. Where such mother support groups existed, arrangements were made for a meeting between the assessors and the support group. One hundred and sixty-five (n=165) staff and women were interviewed using the WHO/UNICEF Assessment Tool (WHO/UNICEF, 2009).

**Table 3.3: Number of Hospital staff, pregnant women and lying-in mothers interviewed by Assessors**

. Facility	Clinical Staff	Non-clinical staff	Pregnant women	Lying-in mothers
<b>Baby Friendly Hospitals (BFH)</b>				
1. Tema General Hospital	10	4	10	15
2. Tema Polyclinic	6	5	10	10
3. Ashaiman Polyclinic	4	2	10	10
	20	11	30	35
<b>Non-Baby Friendly Hospital (Non BFH)</b>				
4. Narh-Bita Hospital	4	2	10	7
5. Raphal Medical Centre	2	4	10	4
6. New Crystal Health Serv.	3	3	10	10
	9	9	30	21
<b>Total</b>	<b>29</b>	<b>20</b>	<b>60</b>	<b>56</b>

### 3.2.4 Analysis of Data

The UNICEF Online Analysis Tool (WHO/UNICEF, 2009) was employed to analyze information obtained. Responses from individual questionnaires were entered into the analysis tool. The summaries were generated as percentages in Table of Results.

## PART II

### 3.3 Effect of Hospital Status (BFHI vs. non BFHI) on Mothers Breastfeeding Practices and Infant Growth at 2 and 4 months of age

#### 3.3.1 Sample Size Determination

Sample size determination was based on analysis of pooled Demographic and Health Survey data from 14 developing countries (Abraham and Labbok, 2009), in which a 20% increase in EBF rates were observed for infants at 5 months after the implementation of BFHI. A 30% difference in EBF rates at 4 months were observed among women who delivered at BFH compared to those who delivered in a non BFH.

Assuming a difference of 30% in exclusive breastfeeding rate at 4 months between mothers who delivered in BFH versus non BFH, the sample size was calculated using the formula by Jekel *et al.*, 2001:

$$N = (Z_{\alpha} + Z_{\beta})^2 * 2 * P(1-P) / (d)^2$$

Where:

N = sample size required per group

$Z_{\alpha}$  = the critical probability value for 95% Confidence Interval (1.96)

$Z_{\beta}$  = 0.84 is the required power (beta) or Z value for 1-beta (0.80 power has Z-value of 0.84)

P = average EBF probability

d = the difference to be detected (0.3)

Then  $N = (1.96 + 0.84)^2 * 2 * 0.3(1-0.3) / 0.3^2 = 36 + 10\% \text{ attrition} = 40$  per group. Total number of women was increased to 50 women per group to allow for 25% attrition. Thus 50 mother-infant pairs were recruited from BF Hospitals and another 50 mother-infant pairs from non BF Hospitals.

In all, 100 mothers with children aged 2 days to 1 week were recruited from a total of 6 hospitals. Table 3.4 shows the Baby Friendly Status categorization of the hospitals and number of mothers recruited from each hospital.

**Table 3.4: Number of Respondents recruited by Hospital status**

Category	Hospitals	Number recruited
BFH Status	Tema General Hospital	25
	Tema Polyclinic	12
	Ashaiman Polyclinic	13
Total		<b>50</b>
Non BFH Status	Narh-Bita Hospital	23
	Raphal Medical Centre	13
	New Crystal Health Services	14
Total		<b>50</b>

### 3.3.2 Training and Data Collection

Two data collectors, (a technical nutrition officer and a senior high school graduate working with Ghana Health Service as a Health Promotion Assistant) were hired and trained to do data collection. Prior to data collection, the field workers were trained 1 day on how to administer the questionnaire (Appendix 1) in the local language (Twi), to take infant weight (using electronic scale – Model LK6029, Germany) and length using UNICEF length mat (Model 2101821009, Germany) and head circumference. Infants' dates of birth were retrieved from child health records.

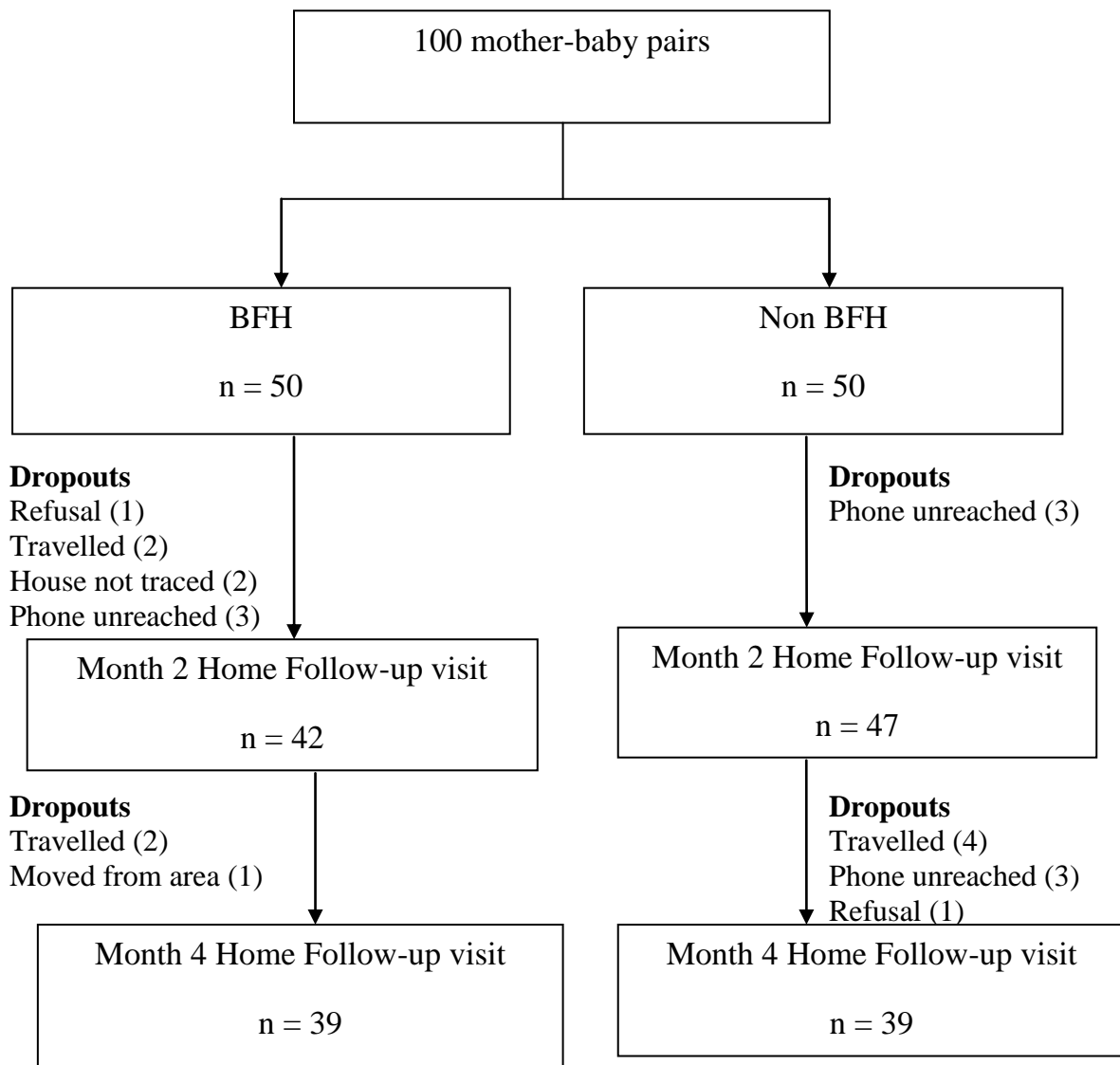
The structured questionnaire (Appendix 1) was used to obtain information on maternal and infant background characteristics, at recruitment when infant was about 2 days to 1 week old. Mothers and their children were followed up at home at 2 months and 4 months. During each visit, the following information were collected: breastfeeding practices, infant weight, length and head circumference. To be eligible, participants must

meet the following criteria: they should have delivered a baby of gestational age  $\geq 37$  weeks, not admitted to sick babies unit, live in the study area for the entire study period and be willing to attend child welfare clinic services in the facility where she delivered.

Mothers who met the above criteria were informed about the study and invited to be participants. The baseline questionnaire (Appendix 1) was filled with the participant. All who accepted signed an informed consent form (Appendix 2). Information was also collected on directions to the home. This is to enable subsequent home visits when the infant turned 2 and 4 months.

### **3.3.5 Enrolment Profile of Study Participants**

Figure 1 shows the enrolment profile of the study participants. Out of 100 mothers enrolled, 11 were lost to follow-up by 2 month. The reasons for drop out were refusal (1), travelled out of the region (2) house not traced (2) and phones unreachable (6). By 4 months, another 11 were lost to follow-up. The reasons were travelled (6), moved from area (1), phone unreachable (3) and refusal to continue study (1). A total of 78 completed the study, 39 each from BFH and Non-BFH. (Figure 3.1).



**Figure 3.1: Enrolment Profile of Study participants**

### 3.3.6 Data collection

#### 3.3.6.1 Socio-demographic information:

A semi structured questionnaire (Appendix 1) was used to collect information on age, parity, house ownership and household ownership of items, education and occupation. Respondents were asked to estimate earning per month. Educational level was ranked as high (secondary education and higher) and low (JHS, primary and no formal education).

### 3.3.6.2 Facility Practices

Information on facility practices that support breastfeeding were obtained from all respondents. Respondents were asked to recollect three things they had heard on breastfeeding when they attended antenatal clinics for their last pregnancy. Questions were asked about the type of delivery (vaginal or caesarean), their breastfeeding experiences after the delivery of their infants, including early skin-to-skin contact, initiation of breastfeeding, giving of pre-lacteal feeds and health staff support to position and attach infants to the breast.

### 3.3.6.3 Follow-up Home visit at 2mos and 4mos of infant age

At months 2 and 4, mothers were contacted by telephone to determine a suitable time to conduct follow-up interviews and take infants anthropometric measurements. A questionnaire (Appendix 3) was used to collect information from mothers on what information they were given at child welfare clinics. This was used to assess the relevance of the information to exclusive breastfeeding. Seventy percent of the interviews were conducted in the homes of participants at month 2, and 90% of interviews were conducted in the homes of the participants at month 4.

The following Anthropometric measurements were taken after the interview.

**Weight:** Infant's weight was taken with a SECA Electronic Tare Scale. Mother first stood on the scale after which the scale was tared. The infant was then handed over to the mother while she is still on the scale and the infant's weight was taken. Efforts were made to weigh all infants almost naked.

**Length:** Recumbent length measurements of the infants were taken on a length mat. Measurements were taken twice.

**Head Circumference:** Head circumference was taken using a non-stretch tape following WHO procedures (de Onis *et al.*, 2006)

### **3.4 Data Management**

#### **3.4.1 Quality Control**

All questionnaires were checked for completeness and accuracy after the days' work. Where some information required needed to be obtained before follow-up, the respondent was called on phone and information obtained.

#### **3.4.2 Data Entry/Analysis**

All questionnaires were coded and entered into SPSS Statistical Software version 16. Descriptive statistics were run for maternal background characteristics. Cross tabulations were used to categorize variables according to the facility status. Frequencies and percentages were used to present results of maternal background characteristics and facility practices.

For mothers who were exclusively breastfeeding at months 2 and 4, logistic regression was used to determine which practice of the health facilities (as independent variables) were associated with exclusive breastfeeding (as the dependent variable). Exclusive breastfeeding was defined as giving only breast milk and no other solids or liquids, except for prescribed medicines and vitamin drops; and non-exclusive breastfeeding was defined as giving other liquids or solids in addition to breast milk in the first six months of an infants' life (WHO, 2003). Exclusive breastfeeding was assessed in two ways – not feeding any liquids or solids in the past 24 hours (based on 24-hr recall) and in the past 1 month, based on food frequency questionnaire of common foods. The primary outcome, exclusive breastfeeding rate was regressed against facility status (baby friendly or non-

baby friendly) and facility practices as spelt out in Steps 4 (early initiation of breastfeeding), 5 (position and attachment/ expression of milk), 6 (pre-lacteal feeding), 8 (demand feeding) and 9 (teats and pacifier use) as well as maternal age and parity. The definition of variables in the regression analysis is presented in Table 3.5.

**Table 3.5: Definition of Variables in the Logistic Regression Analysis on Determinants of EBF at 4 months**

Category	Variable	Coding
Dependent variable	EBF	0 – Not EBF, 1 - EBF
Independent variable		
<b>Status of Facility</b>	Status of Facility	0 – Not BFH, 1 – BFH
<b>Facility Practices</b>	Type of delivery	0 – Caesarean, 1 - SVD
	Time of initiation of breastfeeding	1 – within 30 minutes, 2 - after 30 minutes
	Support to position and attach after delivery	0 - No Help 1 - Received help
	Encouraged to breastfeed	0 – Not encouraged, 1 – Encouraged
	Pre-lacteal feeding	0 – Did not receive 1 - Received
	Discourages pacifier use	1 – did not discuss dangers of pacifier use, 2 Discussed
	Teaching on hand expression of breast milk	1 – Taught, 2 - Was not taught
<b>Maternal factors</b>	Age	1 – Less than 30 years, 2 – 30 years and more
	Level of education	1 – low education, 2 – high education

EBF: Exclusive breastfeeding; BFH: Baby Friendly Hospital; SVD: Spontaneous vaginal delivery; High in maternal education rankings refers to up to secondary and tertiary education; Low: Junior High School; <sup>d</sup>Pre-lacteal feeds refers to any liquid or solid food given to Bf infants before their first breastfeed

Weights and lengths were converted to z-scores using WHO Anthro v 10.4. Means and standard deviations were calculated for weight-for-age z-scores (WAZ), weight-for-

height z-scores (WHZ) and length-for-age z-scores (LAZ). Students T-test was used to examine statistical differences in infant growth between those born in BFH and those born in non BFH at 4 months of age. Chi square tests were used to detect any association between facility status and infant growth.

Out of the 100 women who were recruited in month 0, 10 (10%) were lost to follow-up during the follow-up for interviews in month 2. These women have been included in the analysis for background characteristics and facility practices that support breastfeeding including antenatal education on breastfeeding and practices during and after delivery

### **3.5 Ethical Considerations**

The study protocol and procedures were approved by the Institutional Review Board of Noguchi Memorial Institute for Medical Research, University of Ghana. Permissions were sought in writing from each hospital prior to the start of the study.

The consent form were read and explained to mothers before the interview began. All mothers who accepted to be part of the study were given the consent form to sign or thumbprint as proof for accepting to be part of the study.

## CHAPTER FOUR

### 4.0 RESULTS

The first part of the results present outcome of the assessment of the hospitals regarding their BFHI status. The second part present the results of the effect of type of delivery facility (BFH and Non-BFH) on infant and young child feeding (IYCF) practices and child growth at 4 months.

#### PART I

##### 4.1 Assessment of Hospitals for BFHI Status

Three hospitals with BFH Status - Tema General Hospital, Ashaiman Polyclinic and Tema Polyclinic and three hospitals that did not have BFH Status (Narh-Bita Hospital, Raphal Medical Centre were assessed on the 10+1 steps. Table 4.1 presents the results of the assessment.

**Table 4.1: Assessment of Hospitals for Baby Friendly Steps Compliance**

Step	Baby Friendly (BFH)			Non-Baby Friendly (Non-BFH)		
	A	B	C	D	E	F
1. Have written BF Policies that is routinely communicated to all staff	X	X	X	X	X	X
2. Train all health care staff in skills necessary to implement this policy	√	√	√	X	X	X
3. Inform all pregnant women about the benefits and management of BF	√	X	X	X	X	X

Key: X = Fail, √ = Pass, A= Tema General Hospital; B = Tema Polyclinic; C = Ashaiman Polyclinic; D = Narh-Bita Hospital; E = Raphal Medical Center; F = New Crystal Health Services-

**Table 4.1 cont'd: Assessment of Hospitals for Baby Friendly Steps Compliance**

Step	Baby Friendly (BFH)			Non-Baby Friendly (Non-BFH)		
	A	B	C	D	E	F
4. Help mothers initiate BF within a half-hour after birth	X	X	X	X	X	X
5. Show mothers how to BF and to maintain lactation even if they are separated from their infants	X	X	X	X	X	X
6. Give new-born infants no food or drink other than BM, unless <i>medically</i> indicated	X	√	√	X	√	√
7. Practice rooming-in - allow mothers and infants to remain together 24-hours a day	√	√	√	√	√	√
8. Encourage BF on demand	√	√	√	X	√	X
9. Give no artificial teats or pacifiers (also called dummies or soothers) to BF infants	√	√	√	X	√	√
10. Foster the establishment of BF support groups and refer mothers to them on discharge from the hospital or clinic	√	√	√	X	X	X
11. Code Compliance	√	√	√	X	X	√

Key: X = Fail, √ = Pass, A= Tema General Hospital; B = Tema Polyclinic; C = Ashaiman Polyclinic; D = Narh-Bita Hospital; E = Raphal Medical Center; F = New Crystal Health Services-

For step 1, having a written BF policy that is routinely communicated to staff, none of the hospitals met this. Even though the BFH had written policies, none of them had the policies translated into the prevailing local language within the district and thus the failure. On step 2, (training of health staff in skills necessary to implement this policy), all the Baby Friendly Hospitals confirmed having done this, as recent as November 2012. Not surprising, none of the Non-BFH had done this training for their staff. On step 3,

informing pregnant women about the management of BF, only one BFH met this criterion. None of the hospitals, whether BFH or Non-BFH met step 4 (helping mothers to initiate BF within 30mins after birth) and step 5 (show mothers how to breastfeed). It is evident that even the so-called BFH had reverted to old practices and did not do much in supporting mothers to breastfeed.

One step 6, not giving new-borns any food or drink other than breast milk, unless medically indicated, two BFH and 2 Non-BFH met this criterion. One BFH was actually giving new-borns pre-lacteals feeds (glucose solution and infant formula), without any written medical indication for it. No surprisingly, all the study hospitals irrespective of the BFH status met step 7 (rooming-in). This practice enables mothers and their new-borns too stay in the same room. Encouraging BF on demand (step 8) was practiced by all 3 BFH and one Non-BFH. All hospitals but one Non-BFH, met the criterion of giving no teats and pacifiers. Step 10 involving the establishment of BF support groups was met by all three BFHs.

On step 11, compliance to the Marketing of BMS Code, which is enshrined in Ghana's LI 1667 was adhered to by all 3 BFH and one Non-BFH.

From this assessment, it was evident that none of the BFH was fully compliant to all the steps.

## **PART II**

### **4.2 Effect of BFH Status on Infant Feeding and Child Growth**

#### **4.2.1 Demographic and Socioeconomic Characteristics of Participants**

In all, 50 mothers who delivered in a BFH – designated hospital and another 50 who delivered in a Non-BFH were recruited at birth for this part of the study. Table 4.2 shows a comparison of the background characteristics of these two groups of mothers. Statistically significant differences were observed in occupation, where mothers who delivered in BFH were mainly traders or artisans compared to those who delivered in Non-BFH, who were more of professionals.

Both categories of mothers differed significantly in income, in ownership of mobile phones and in possession of private vehicles. In general, it appears mothers who delivered in the Non-BFH (which were mainly private hospitals) were socioeconomically better off.

No statistically significant differences were found in infant characteristics for mothers who delivered in BFH vs. Non-BFH (Table 4.3). There was an almost equal distribution of males and females among the infants born to the study participants. Many of the infants born to mothers in the two categories of facilities were between 37-38 weeks.

**Table 4.2: Background Characteristics of Mothers by Hospital Category**

Variable	Hospital Category		p-value
	BFH	Non-BFH	
	(N =50) n (%)	(N=50) n (%)	
<b>Age (yrs)</b>			
< 25	4 (8.0)	1 (2.0)	
25-35	28 (56.0)	34 (68.0)	
> 35	18 (36.0)	15 (30.0)	0.264
<b>Educational level</b>			
Up to primary	10 (20.0)	9 (18.0)	
Secondary	36 (72.0)	34 (68.0)	
Tertiary	4 (8.0)	7 (14.0)	0.668
<b>Occupation</b>			
Artisans	13 (26.0)	15 (30.0)	
Traders	28 (56.0)	15 (30.0)	
Professional <sup>b</sup>	3 (6.0)	10 (20.0)	
Others <sup>c</sup>	6 (12.0)	10 (20.0)	<b>0.034</b>
<b>Mothers' income (GH¢)</b>			
< 100	21 (42.0)	11 (22.0)	
100 - < 400	20 (40.0)	26 (52.0)	
400 - < 1,000	1 (2.0)	5 (10.0)	
Not disclosed	8 (16.0)	8 (16.0)	<b>0.002</b>
<b>Parity</b>			
Primi parity	16 (32.0)	20 (40.0)	
Multi parity	34 (68.0)	30 (60.0)	0.197
<b>Type of residence</b>			
Own house	28 (56.0)	22 (44.0)	
Rented	22 (44.0)	28 (56.0)	0.277
<b>Ownership of</b>			
Radio	41 (82.0)	43 (86.0)	0.388
Television	43 (86.0)	47 (94.0)	0.160
Fridge/Freezer	34 (68.0)	41 (82.0)	0.100
Telephone	42 (84.0)	48 (96.0)	<b>0.031</b>
AirCon/Fan	41 (82.0)	44 (88.0)	0.388
Internet	9 (18.0)	13 (26.0)	0.281
Computer	14 (28.0)	21 (42.0)	0.173
<b>Mode of transport</b>			
Private car	8 (16.0)	16 (32.0)	
Public transport	42 (84.0)	34 (68.0)	<b>0.056</b>

Chi-square test; <sup>b</sup> Professional includes bankers, teachers and nurses <sup>c</sup>others include housewives and unemployed; BFH- Baby Friendly Hospital; Non-BFH – Non Baby Friendly Hospital ( $p < 0.05$ ); ( $p < 0.001$ )

**Table 4.3: Infant Characteristics**

Variable	Hospital Category		<i>p</i> -value
	BFH (N =50) n (%)	Non-BFH (N=50) n (%)	
<b>Infant Sex</b>			
Males	24 (48.0)	28 (56.0)	
females	26 (52.0)	22 (44.0)	0.346
<b>Gestation at birth</b>			
37-38 weeks	29 (58.0)	27 (54.0)	
≥39 weeks	21 (42.0)	23 (46.0)	0.680
<b>Birth Weights</b>	3.14 ± 0.42	3.18 ± 0.43	0.628
<b>Length at birth</b>	50.32 ± 3.99	49.42 ± 3.38	0.243

Chi-square test for categorical variables and <sup>t</sup>-test for continuous variables; BFH – Baby Friendly Hospital; Non-BFH – Non-Baby Friendly Hospital

#### **4.2.2 Antenatal Practices that Support Breastfeeding**

Over 90% of mothers from both categories of hospitals attended antenatal clinic 4 or more times during their pregnancy, fulfilling the national recommendation for antenatal attendance. There were no differences in antenatal education practices, teaching mothers how to correctly position and attach their infants to the breast and informing them about early initiation of breastfeeding (Table 4.4). It appears mothers were equally exposed to breastfeeding messages irrespective of the type of hospital they delivered in.

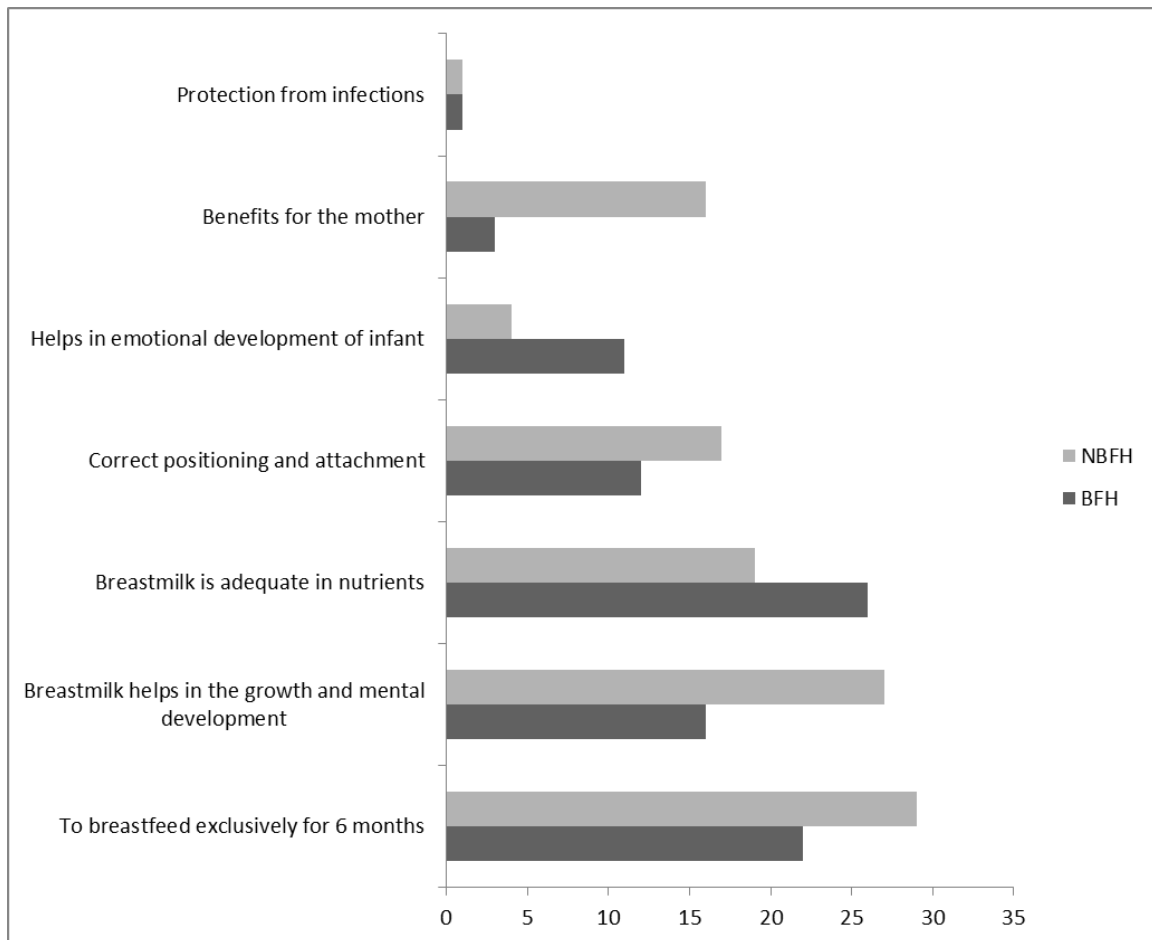
**Table 4.4: Mothers' Report of Breastfeeding Education at Antenatal Clinics**

Variable	Hospital Category		<i>p</i> -value
	BFH	Non-BFH	
	(N =50) n (%)	(N=50) n (%)	
<b>No. of ANC attendance</b>			
1-3	5 (10.0)	3 (6.0)	0.715
4+	45 (90.0)	47 (94.0)	
<b>Education on breastfeeding given</b>			
Yes	48 (96.0)	45 (90.0)	0.436
No	2 (4.0)	5 (10.0)	
<b>Mothers taught how to position and attach their babies</b>			
Yes	46 (92.0)	44 (88.0)	0.741
No	4 (8.0)	6 (12.0)	
<b>Were you told your baby would need to breastfeed immediately after delivery</b>			
Yes	43 (86.0)	39 (78.0)	0.436
No	7 (14.0)	11 (22.0)	

Chi square test; BFH – Baby Friendly Hospital; Non-BFH – Non-Baby Friendly Hospital

#### 4.2.3 Breastfeeding Topics Discussed during Education at ANC

Mothers reported that they received information on exclusive breastfeeding for 6 months, adequacy of breast milk as food and breast milk's role in the development of the infant. Generally, more mothers who attended Non-BFH reported receiving breastfeeding information compared to those who attended BFH (Figure 4.1). Both categories of hospitals emphasized the need to breastfeed exclusively for 6 months. Although more mothers who delivered in Non-BFH reported being told about the benefits of Breastfeeding.



BFH – Baby Friendly Hospital; NBFH – Non-Baby Friendly Hospital

**Figure 4.1: Most Frequently discussed Topics on Breastfeeding at ANC as Reported by Mothers**

#### 4.2.4 Hospital Practices during Delivery

There were significant differences ( $p=0.003$ ) in mode of delivery among the two groups of women (Table 4.5). Eighty-eight (88%) percent of the respondents of BFH delivered by spontaneous vaginal delivery (SVD) compared to 60% in the Non-BFH. Conversely, more women were delivered by caesarean section (CS) in the Non-BFH, than in BFH. For all infants born through SVD a higher number (38%) were put on the mothers' abdomen after delivery in the BFH as preparation to initiate breastfeeding, compared to infants born in the Non-BFH ( $p=0.005$ ) (Table 4.5)

**Table 4.5: Mothers' Report of Hospital Practices during Delivery by Hospital Type**

Variable	Hospital Category		<i>p</i> -value
	BFH	Non-BFH	
	(N =50)	(N=50)	
	n (%)	n (%)	
<b>Type of delivery</b>			
<b>SVD</b>	44 (88.0)	30 (60.0)	
<b>CS</b>	6 (12.0)	20 (40.0)	<b>0.003</b>
	N=44	N=30	
	n (%)	n (%)	
<b>Were Babies delivered onto abdomen during SVD</b>			
Yes	17 (38.6)	2 (6.7)	<b>0.005</b>

Chi square test; SVD: Spontaneous Vaginal Delivery CS: Caesarean Section; ( $p < 0.05$ )

#### 4.2.5 Hospital Practices after Delivery

Twelve percent (12%) of women who delivered in BFH and 40% of mothers who delivered in Non-BFH initiated breastfeeding within the first 30 minutes after birth. Significant differences ( $p = 0.012$ ) were found in the time of initiation of breastfeeding between women attending the two categories of hospitals (Table 4.6). Significantly, more women received support to position and attach if they delivered in non-baby friendly hospitals vs. in baby friendly hospitals ( $p = 0.016$ ) (Table 4.6). Also more infants were given pre-lacteal feeds in the non-baby friendly hospitals compared to the baby friendly hospitals ( $p = .037$ ) (Table 4.6).

**Table 4.6: BF Support given by Staff to Mothers after Delivery**

Variable	Hospital Category		<i>p</i> -value
	BFH	Non-BFH	
	N (50)	N (50)	
	n (%)	n (%)	
<b>Time of initiation of breastfeeding (SVD)</b>	n = 44	N = 30	
Within 30 mins	6 (12.0)	20 (40.0)	
Within 1 hr	29 (58.0)	18 (36.0)	
More than 1 hour	15 (30.0)	12 (24.0)	<b>0.012</b>
<b>Received support to breastfeed after delivery</b>	40 (80.0)	47 (94.0)	0.071
<b>Kind of support</b>			
Taught to position and attach my baby	40 (80.0)	46 (92.0)	<b>0.016</b>
They helped feel comfortable	33 (66.0)	42 (84.0)	0.063
Staff encouraged me to breastfeed	39 (78.0)	47 (94.0)	0.257
<b>Did staff educate you about dangers of pacifier use</b>			
Yes	8 (16.0)	3 (6.0)	0.200
<b>Has your child received any pre-lacteal feeds</b>			
Yes	3 (6.0)	11 (22.0)	<b>0.037</b>
No	40 (80.0)	29 (58.0)	
Don't know	7 (14.0)	10 (20.0)	

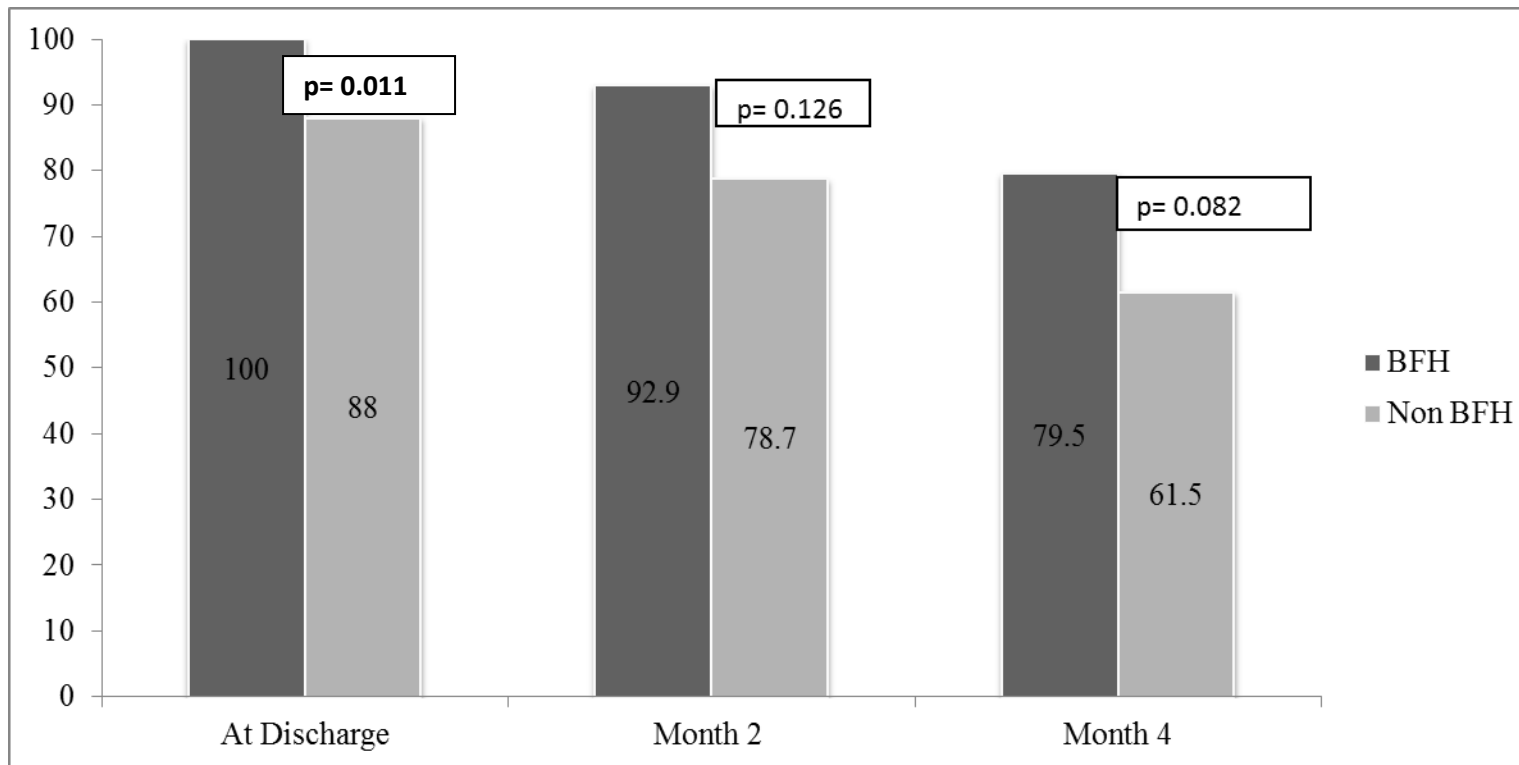
Chi-square test; ( $p < 0.05$ )

### 4.3 Association between Hospital BFHI Status, Hospital Practices and Infant Feeding (IF) Practices

#### 4.3.1 Infant Feeding Practices

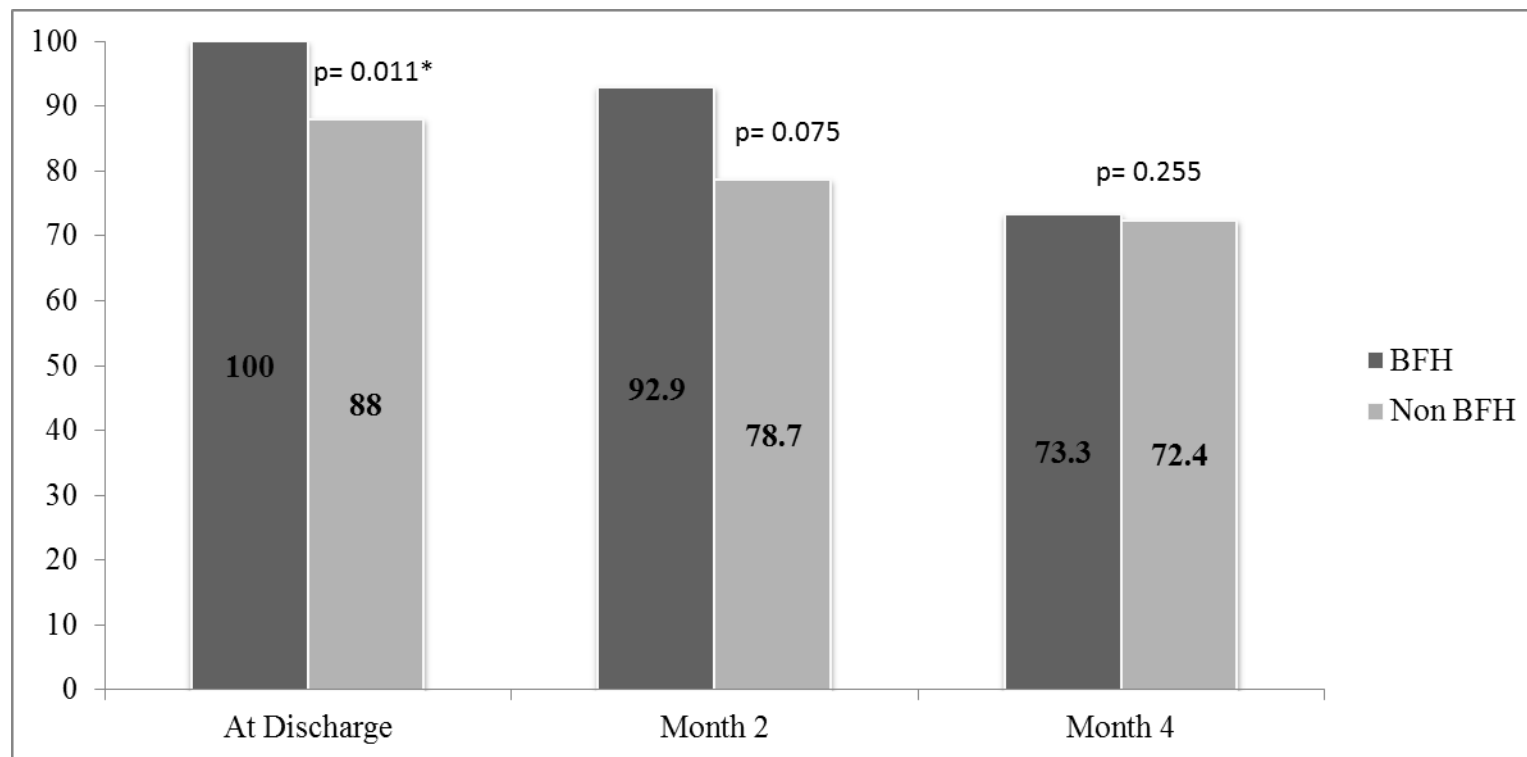
Mothers with complete data on infant feeding practices and anthropometric data were 89 and analyses done were based on this sample at month 2. At month, 4 infants-mother pairs with complete feeding data were 78 and analyses were done based on this sample.

Figures 4.2a and 4.2b present the EBF rates at discharge, 2 months and 4 months for mothers utilizing the two types of hospitals – BFH and Non-BFH. Exclusive breastfeeding rates declined from birth till 4 months for the two groups of mothers: 100% at discharge, 92.9% at month 2 and 79.5% at month 4 for BF Hospitals mothers; and 88% at discharge, 78% at month 2 and 61% at month 4 for non BF Hospitals mothers (Figure 4.2a). No significant differences ( $p=0.011$ ) were found in exclusive breastfeeding rates at months 2 and 4 between infants born in BFH and Non-BFH. At discharge, the EBF prevalence was significantly higher among mothers who delivered in BFH than in Non-BFH, but by 2 months, the difference disappeared. Irrespective of the method by which EBF was determined (either by no liquids or foods in the past-24 hours or past 1 month), significant differences were noted between the two categories of mothers only at discharge.



**Figure 4.2a: Percentage of Women Exclusively Breastfeeding at Discharge, 2mos and 4mos by BFH Status**

Exclusive BF status determined as not feeding any liquids or foods except breast milk in the past 24 hours; ( $p < 0.05$ )



**Figure 4.2b: Percentage of Women Exclusively Breastfeeding at Discharge to Month 4 by BFH status**

Exclusive BF status determined as not feeding any liquids or foods except breast milk in the past 1 month; ( $p < 0.05$ )

#### 4.4 Infant Growth (Weight and Length) by Hospital Type

The children from mothers who delivered in the two categories of hospitals were followed up and growth was assessed at 0, 2 and 4 months. Table 4.7 presents the mean weight-for-age (WAZ) and length-for-age (LAZ) z-scores and the prevalence of underweight and stunting. No significant differences were observed in WAZ, LAZ and in the prevalence of underweight and stunting between the two groups at any time point (at discharge, month 2 or at month 4).

**Table 4.7: Infant Weight-for-age and Length-for-age Z-scores and Prevalence of Wasting and Stunting by BFH Status**

	N	Hospital Category		<i>p</i> -value
		Means ± SD	Means ± SD	
		BFH	Not BFH	
<b>WAZ</b>				
Month 0 (Discharge)	100	-0.4564 ± 1.0018	-0.1669 ± 0.8245	0.628
Month 2	89	0.1315 ± 1.3188	-0.0633 ± 1.2344	0.537
Month 4	78	-0.0912 ± 1.0695	-0.0006 ± 1.1860	0.700
<b>LAZ</b>				
Month 0 (Discharge)	100	0.0200 ± 1.5767	0.5213 ± 1.9648	0.243
Month 2	89	1.0398 ± 2.6638	0.1830 ± 2.1396	0.156
Month 4	78	1.1162 ± 1.5051	0.5153 ± 1.6418	0.298
<b>Underweight</b>				
		N = 42	N = 47	
Month 2	89	n (%)	n (%)	
		4 (9.5)	2 (4.2)	0.388
Month 4	78	N = 39	N = 39	
		n (%)	n (%)	
		2 (5.1)	3 (7.7)	0.094
<b>Stunting</b>				
Month 2	98	N = 42	N = 47	
		n (%)	n (%)	
		3 (7.1)	6 (12.7)	0.121
Month 4	78	N = 39	N = 39	
		n (%)	n (%)	
		3 (7.7)	6 (15.4)	0.121

T-Test, WAZ: Weight-for-age z-score; LAZ: Length-for-age z-score

#### 4.5 Reported incidence of illness among infants by hospital type

Table 4.8 summarizes mothers' report of illness their children had in the past week prior to the visit at month 4. Fever, diarrhoea and cough prevalence in the past 1 week were not significantly different among the two categories of infants, except runny nose which was significantly ( $p = 0.047$ ) higher in infants born in Non-BFH (Table 4.8).

**Table 4 8: Reported Prevalence of Illness among Infants at month 4 by Baby Friendly Status**

Variable	Hospital Category		<i>p</i> -value
	BFH	Non-BFH	
	N = 39	N = 39	
	n (%)	n (%)	
Fever <sup>bc</sup>			
Yes	1 (2.6)	5 (12.8)	0.200
Diarrhoea			
Yes	2 (5.1)	0 (0.0)	0.240
Cold/Runny nose <sup>bc</sup>			
Yes	2 (5.1)	9 (23.1)	<b>0.047</b>
Cough			
Yes	3 (7.7)	1(2.6)	0.358

Chi-square test; <sup>b</sup>1 mother reported both cold and fever in BFH; <sup>c</sup>3 mothers reported fever and cold/runny nose in non BFH; ( $p < 0.05$ )

#### 4.5 Determinants of EBF at 4 months

Although none of the associations were significant, delivering in a BFH, infant not receiving pre-lacteal feeds and spontaneous vaginal delivery increased chances of practicing exclusive breastfeeding two-fold, compared to mothers without these characteristics. A mother is about 1.5 times more likely to practice exclusive breastfeeding if she receives support to position and attach her infant to the breast. Also,

a mother is less likely to breastfeed if she does not receive encouragement to do so and if she initiated breastfeeding after 30 minutes post-delivery (Table 4.9). Younger mothers (less than 30 years) and mothers with low education (up to JHS) level were also less likely to exclusively breastfeed at 4 months (Table 4.9).

**Table 4.9: Determinants of Exclusive Breastfeeding rate at Months 4 (24-hr recall)**

Variable	n	AOR <sup>a</sup>	95%CI	<i>p</i> -value
<b>Status of facility</b>				
Not-Baby Friendly	42	1.000		
Baby Friendly	36	2.219	0.712 – 6.801	0.167
<b>Type of delivery</b>				
Caesarean Section	20	1.000		
Spontaneous vaginal delivery	58	2.533	0.331 – 20.342	0.382
<b>Encouragement to breastfeed on demand</b>				
Did not receive encouragement	7	1.000		
Received encouragement	71	2.613	0.330 – 20.900	0.365
<b>Time of initiation of breastfeeding</b>				
Within 30 mins	36	1.000		
More than 30 mins	42	0.822	0.214 – 3.101	0.703
<b>Support to position and attach</b>				
Received after delivery	68	1.000		
Did not receive support	7	0.594	0.193 – 12.811	0.678
<b>Pre-lacteal feeds<sup>d</sup></b>				
Received pre-lacteal feeds	11	1.000		
Did not receive pre-lacteal feeds	66	2.069	0.503 – 8.573	0.321
<b>Staff discussed dangers of use of pacifiers</b>				
Discussed	8	1.000		
Not discussed	70	0.558	0.110 - 2.892	0.487
<b>Shown how to express milk by hand</b>				
Not shown	37	1.000		
Shown	41	0.957	0.298 – 3.0736	0.941

<sup>a</sup>AOR: Adjusted Odds Ratio; <sup>a</sup>High in maternal education rankings refers to up to secondary and tertiary education; <sup>b</sup>Low: Junior High School; <sup>d</sup>Pre-lacteal feeds refers to any liquid or solid food given to Bf infants before their first breastfeed; CI - Confidence Interval; Hosmer-Lemeshow goodness of fit parameters:  $\chi^2_8 = 7.467$ ,  $p = 0.825$ .

**Table 4.9 cont'd: Determinants of Exclusive Breastfeeding rate at Months 4 (24-hr recall)**

Variable	n	AOR <sup>a</sup>	95%CI	<i>p</i> -value
<b>Maternal factors</b>				
<b>Age</b>				
30 years and above	28	1.000		
Less than 30 years	50	0.654	0.219 – 1.954	0.447
<b>Education</b>				
High <sup>b</sup>	60	1.000		
Low <sup>c</sup>	17	0.760	0.203 – 2.847	0.683

<sup>a</sup>AOR: Adjusted Odds Ratio; <sup>a</sup>High in maternal education rankings refers to up to secondary and tertiary education; <sup>b</sup>Low: Junior High School; <sup>d</sup>Pre-lacteal feeds refers to any liquid or solid food given to Bf infants before their first breastfeed; CI - Confidence Interval; Hosmer-Lemeshow goodness of fit parameters:  $\chi^2_8 = 7.467$ ,  $p = 0.825$ .

## CHAPTER FIVE

### 5.0 DISCUSSION

#### 5.1 Assessment of Hospital Compliance to ‘Ten Steps’ to Successful Breastfeeding

None of the Baby Friendly Hospitals (BFH) passed all of ten steps to successful breastfeeding as stipulated in the UNICEF/WHO Joint Statement (WHO, 1989). All the BFH had average of 60% pass out of 100% (i.e. 6 steps out of 10+1 possible pass rate) and also Code Compliance. Steps 1 (policies), 3 (BF Education at ANC), 4 (BF initiation), 5 (showing mothers how to breastfeed) and 6 (avoidance of pre-lacteal feeding) were the steps most not adhered to. These results compare with those of Moura De Araujo and Schmitz (2007), Rosenberg *et al.*, 2008 and Merten and Ackerman-Liebrich, (2004). In their studies, poor compliance to steps 1, 2 (training of staff), 3, 4, 5, 6 and 7 were observed. These results indicate that when left un-monitored, Baby Friendly Hospitals gradually slip from practicing all the steps that got them accredited. It was observed in this study that written policies were not translated into predominant languages within the catchment area. This study shows that all the hospitals previously accredited as Baby Friendly, had actually lost that status in practice as none of them met all the 10+1 steps.

Midwives do not place infant in skin-to-skin contact with the mother immediately after delivery and no support is offered to mothers to initiate breastfeeding within that time. It is not surprising that during the follow-up to assess infant feeding practices of women who delivered in these BFH only 12% of them initiated breastfeeding within 30mins after delivery. WHO/UNICEF (2009) recommends that infants be placed in skin-to-skin

contact with mothers immediately after delivery and BF should be initiated within this period with support from staff (WHO 1989; 2003, 2009). In all the BF hospitals assessed, mothers who had delivered were not supported to position and attach their infants to the breast after delivery, and none of them had been taught to express her breast milk by hand. Late initiation of BF may lead to early supplementation, usually fed from a bottle which could subsequently result in reduced duration of EBF (Forster *et al.*, 2006; Ertem *et al.*, 2001). Poor attachment to the breast could lead to reduced milk intake, infant crying resulting in concerns of 'not enough milk' and mothers feeling less confident to breastfeed (Ertem *et al.*, 2001; Scott *et al.*, 2006). Outdated practices and passive compliance with BFHI practices have been cited among Australian nurses (Reddin *et al.*, 2007) and the situation may not be entirely different in hospitals participating in this study.

Rooming-in (Step 7), discouraging use of pacifiers and teats on the wards (Step 9) and encouraging breastfeeding on demand (Step 8) were fully complied with by all the BF hospitals. In Ghana, it is far easier for hospitals to comply with step 7 than other steps due to limited space and inadequate staff capacity to manage nurseries. Some studies have reported non-compliance to step 7 and the reasons given were phototherapy for baby or the need to give mother rest after going through caesarean section (Reddin *et al.*, 2007 and Merten and Ackerman-Liebrich, 2003).

All BFH passed the step on Code compliance. The hospitals do not distribute discharge packs stuffed with formula promotion items. Ghana has come a long way in implementing the recommendations of the International Code of Marketing of Breast

milk Substitutes (WHO/UNICEF, 1981) and with active promotion of the Legal Instrument (Ghana BPR, 2000), protecting and promoting breastfeeding, the days of distribution of discharge packs are long over. Discussions with nursing mothers during the interviews revealed that some midwives subtly promote use of commercial infant formula within the hospitals by prescribing brands to be purchased by mothers and even selling to mothers whose infants they perceive as requiring it (personal conversation of researcher). Efforts must be made to completely stem out this practice from the health delivery system.

Private non-baby friendly facilities failed most of the steps. All three passed step 7 (rooming-in- allowing mother and baby to stay together 24-hours a day); 2 passed step 6 (avoidance of pre-lacteal feeds), 2 passed step 8 (encourage demand breastfeeding) and 2 passed step 9 (avoidance of teats and pacifiers). It should be noted that these steps may require little effort to implement, especially when infants are given to their mothers early enough to begin BF. It may be concluded that the staff of the BFHs assessed did not have the will and not necessarily the capacity to implement the ‘ten steps’ but the Non-BFH lack the capacity to do so, as they have never been trained.

## **5.2 Morbidity among Infants born in the BFH and Non-BFH Facilities**

Occurrence of fever, diarrhoea and cough in the week preceding the home visits at month 4 were not different between the two groups (BFH and Non-BFH), but occurrence of cold/runny nose was ( $p = 0.047$ ), indicating that more children born in the Non-BFH had cold/runny nose compared to those born in the BFH. Cold/runny nose maintained significant occurrence among infants who were not EBF at the time of the visits. Reduced

risk of morbidity (diarrhoea and ear infections) was reported by Kramer *et al.* (2001) and Scariati *et al.* (1997) among EBF infants. Our study did not find any occurrence of ear infections among the two groups and also found no significant difference in occurrence of diarrhoea. Most mothers however did not associate feeding practices with occurrence of illness in their infants, except one mother from the Non-BFH who mentioned that she was certain adding other foods to the breast milk made her infant sick.

### **5.3 Comparison of Infant Feeding Practices among Infants born in BFH and Non-BFH Facilities**

EBF rates declined from discharge to month 4 in all the groups assessed. In the BFH, EBF rate at discharge was 100%, declining to 92.9% in month 2 and further declining to 79.5% at month 4. In the Non-BFH, EBF at discharge was 88%, declined to 78.8% in month 2 and at month 4, was 61.3%. At month 4, a difference in EBF rate of 18% was observed between BFH and Non-BFH. The higher EBF rate observed at month 4 in the BFH could be due to the fact that the BFH have policies, posters and other materials on BF displayed in all areas and may have provided some information to mothers who delivered there. A proposed difference of 30% (Abrahams and Labokk, 2009) was expected at the beginning of the study. Xu *et al.* (2009) reported 42.5% EBF rates among infants at 4 months, declining to 34.4% at 6 months in urban China, while rates of 76.8%, 62.1% and 52.4% at months 1, 3 and 6 respectively were reported by Notzon (1984) in Mexico. In Ghana, EBF among infants less than 6 months was 53% in 2003 (GDHS, 2003), 63% in 2008 (GDHS, 2008) and 46% in 2011. The introduction of BFHI in 1993 sharply improved EBF rates but with time, declines are being observed due to poor

monitoring of BFHI Status. In GSS-MICS (2011), EBF rate for Greater Accra Region was 23% for infants under 6 months. Comparatively, the EBF rates observed for infants in this study is high; however inferences may be made to the possible decline by 6 months. This study covers only 2 of the 15 Districts of the Greater Accra Region and 3 out of 30 BFH and may not be representative of all districts in the region.

Early initiation rates were very low (12%) in BFH, but high in Non-BFH (40%). Pre-lacteal feeding of infants was significantly higher in Non-BFH – 22% compared to BFH - 6%. Various reasons have been given to justify pre-lacteal feeding, including fear of dehydration, hypoglycaemia or jaundice (Akuse and Obinya, 2002), or just fulfilling social custom or concerns of insufficient milk (Ahmed *et al.*, 1996). Whatever the reasons, they are unacceptable unless they are related to medical emergencies (WHO/UNICEF, 1989). Pre-lacteal feeding has been negatively associated with establishment of lactation (Ahmed *et al.*, 1996). Late initiation of BF may lead to infant crying and fussing at the breast eventually when mother is ready to feed. Often misinterpreted by mothers as lack of BM, they request midwives to make some feeds for their infants. Similarly, midwives find crying infants disturbing and offer ‘something’ to quieten them.

Compliance to the International Code (Step 11) is high among all the BFH. This could be attributed to the fact that during meetings with nurses and trainings even if they are not related to BF, the code is discussed, to ensure that there is not undue pressure on staff to use the health system to promote breast milk substitutes..

The situation of all BFH in Ghana may not be different from what our study found. Evidence of this may be the declining EBF rates country-wide, currently at 46% (GSS-MICS, 2011) from an impressive 63% in 2008 (GDHS, 2008). Funding for training and assessment for BFHI and monitoring of BFH have come primarily from UNICEF who with time have shifted focus to improving the poor complementary feeding practices as the malnutrition situation of children under five years remain unchanged between 2008 and 2011 (GSS-MICS 2011; GDHS, 2008).

#### **5.4 Association between Hospital Practices and EBF rates**

The EBF rates reported at month 4 was 79.5% and 61.5% (based on 24-hr recall) for infants born in BFH vs. Non-BFH and were not significantly different. This was primarily because BFH did not differ from the Non-BFH in BF practices. Failing most of the steps in the ‘ten steps’ brought them almost to the status of not being Baby Friendly.

Many studies (Westphal *et al*, 1995; Dasgupta *et al*, 1997; Moura de Arajo and Schmitz, 2007; Rosenberg *et al.*, 2008) have reported positive changes in hospital practices and significant increases in EBF rates before and after designation of hospitals as Baby Friendly. Westphal *et al.* (1995) observed that staff who attended a breastfeeding training course were imparting the knowledge to other staff (step 2) and that breastfeeding support groups were being formed and mothers referred to them upon discharge (step 10) compared to those who did not get trained. Dasgupta *et al.* 1997) also found that supplement use reduced significantly and early BF initiation rates improved significantly when hospitals in India were awarded the BFHI status. In our study, breastfeeding initiation rates were low (12%) in the BFH, compared to the Non-BFH (40%);  $p=0.012$ .

The poor translation of breastfeeding knowledge from antenatal care clinic (ANC) breastfeeding education sessions (i.e. 92% of mothers in BFH vs. 88% mothers in Non-BFH were educated on position and attachment; and 86% of mothers in BFH vs. 78% of mothers in Non-BFH were told their babies would need to breastfeed immediately after delivery) underscores the observation by Parekh *et al.* (2004) that ANC breastfeeding education does little to improve BF rates. In their study, continuous BF education during the child welfare clinics contributed to high EBF rates (Parekh *et al.* 2004).

Analysis of the hospital practices that support breastfeeding - early initiation of BF (Step 4), showing mothers how to breastfeed (Step 5), non-use of pre-lacteal feeds during hospital stay (Step 6), encouragement to BF on demand (Step 8) and education on the avoidance of teats and pacifiers (Step 9) showed no significant associations with EBF at 4 months in our study. However these practices have all been associated with improved EBF rates in other studies (Yamauchi and Yamanouchi, 1990; Wright *et al.*, 1996; Dasgupta *et al.*, 1997; Rosenberg *et al.*, 2008). A possible explanation maybe that these 3 BFH which are the main government hospitals within the Tema-Ashaiman Districts are usually overwhelmed with clients, and therefore health care personnel have little time to support mothers with infant feeding practices after discharge. Of particular note is Tema General Hospital, which is the main referral site for most hospitals within the northern part of the Greater Accra Region. Secondly, the high staff turnover (due to constant influx of student nurses on practicum) could result in loss of skills as trained staff move out upon completion of practicum and a new set of untrained students staff take over.

Thirdly, ineffective external and internal monitoring mechanisms to ‘police’ staff after award of the BFHI status. Merten and Ackerman-Lieblich, (2003) found wide variations in the practices of recently monitored and not-recently monitored BFH in Switzerland and concluded that simply receiving the status of BFHI did not guarantee compliance to all the steps over time.

Although our analysis showed non-significant associations, there was general tendency for mothers who delivered in BFH to have higher likelihood of doing EBF at 4 months. Other studies have reported that being born in a BFH increased the chances of being EBF and for longer duration (Venancio *et al.*, 2011; Broadfoot *et al.*, 2004; Kramer *et al.*, 2001). However in our study, duration of EBF was not assessed.

It must be mentioned that results from interviews with mothers on some of the practices of BFH did not agree with results from the assessment of compliance. For example, 80% of women in BFH mentioned that they were supported to position and attach their infants to the breast, but all the BFH failed this step (Step 5) in the assessment for compliance. There is the potential of over estimation with mothers’ interviews. In many studies (Rosenberg *et al.*, 2008; Dasgupta *et al.*, 1997; Wright *et al.*, 1996; Westphal *et al.*, 1995) reported EBF rates were assessed before and after hospitals were awarded BFHI Status.

It is not uncommon for public sector health staff to work part time at private hospitals, thus importing skills acquired through in-service training from the government hospitals - especially for critical staff such as midwives. This practice may have minimized the differences in services provided in the BFH and Non-BFH.

## 5.5 Comparison between Hospital Status and Infant Growth

Our study did not find significant differences between growth of children born in the two categories of hospitals. The mean WAZ and LAZ compared at discharge, at month 2 and month 4 were not significantly different, indicating that in this study, BFHI status (BFH vs. Non-BFH) did not affect growth. Thiombiano-Coulibaby *et al.* (2004) did not find any significant difference among 5-month old infants who had received other foods in addition to breastmilk and those who had not in Burkina Faso. In their study, BM intakes were very high even in the presence of other fluids, and this may explain the no effect found. Samuel *et al.* (2012) reported no significant association between BFHI status and infant growth, even though higher breast milk intakes was associated with WAZ. Infants who were reported to be EBF by their mothers were found to be receiving other food when their breast milk intakes were estimated with the isotope dilution method. Yamauchi and Yamaouchi, (1990) however found higher weight gains and EBF for infants born in BFH.

There are several reasons why no growth effect was seen in our study between children born in the two categories of hospitals. First the hospital practices in the two categories of hospitals were basically the same. The BFHs have not maintained their Baby Friendly status. In fact none of them passed the assessment as they have defaulted in many of the Baby Friendly steps. So in reality, their practices are not different from the Non-BFH. Rosenberg *et al.* (2008) and Reddin *et al.* (2007) found non-compliance to the ten steps among Baby Friendly Hospitals in Oregon and Australia. However, these studies did not compare BFH and Non-BFH.

Secondly, support for breastfeeding in the BFH was not different from the Non-BFH. As a result, there was no impact on the BF practices of the mothers who delivered in the two hospital types. Differences in BF were seen only at discharge, where significantly more mothers who delivered in BFH were practicing EBF compared to those from the Non-BFH. By 2 months, the difference was no longer significant. Mothers who enjoyed more of the ten steps at delivery were more likely to practice EBF at 3 months (Chien *et al.*, 2007), and this way have positive impact on growth. Thirdly, after discharge, the infant feeding practices of the mothers from the two categories of hospitals were not different and thus the lack of growth effect.

A limitation to this study may be the potential over estimation of factors during interviews with prepared checklists because of biases of respondents. Secondly, sample sizes within each group, and from each hospital were not large enough to allow for estimations of statistical differences. Thirdly, possible cross-over of staff between the two categories of hospitals may influence practices that pertain. Therefore absence of associations in this study should be interpreted with caution.

## CHAPTER SIX

### 6.0 CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 Conclusions

The overall aim of this study was to find any difference in practices of BFH and Non-BFH that were associated with EBF of infants delivered in there and differences in growth of infants born in these two categories of hospitals. Based on the findings of this study, the following conclusions are made.

It is evident from this study that when hospitals are confirmed Baby friendly, it is important that consistent efforts are made at regular re-training, else they would not be able to maintain their status. As was seen with the results of the assessment, none of the hospitals previously designated Baby Friendly passed all the “Ten Steps to Successful Breastfeeding”.

The effect of BFH status on infant feeding was only seen at the time of discharge when EBF rates were significantly higher. By two months, there were no significant differences in infant feeding practices by hospital status. Not surprising, no effect on EBF at 4 months or on growth at 2 and 4 months of infant age in relation to place of delivery was found.

However, at 4 months of age, infants born in BFHs presented with significantly lower occurrence of cold/runny nose compared to those delivered in Non-BFH. Although not significant, children born in BFH were twice likely to be EBF at 4 months.

It is likely that the benefits of BFH effect would have been realized better if hospitals had continued to maintain their BFH status and given better support to mothers after discharge on their infant feeding practices.

## **6.2 Recommendations**

Scheduled monitoring of all BFH in the Greater Accra Region should be undertaken and discussions should begin at the national level on how to get hospitals to maintain their BFHI status.

While efforts are being made by all stakeholders to improve monitoring of BFH accredited hospitals, health staff should be engaged more on the issue of promotion of breast milk substitutes to ensure they are equipped to overcome the subtle pressure from companies.

Private hospitals and maternity clinics/homes should be actively engaged on the BFHI. Since this is a national health policy, they should not have the option to sign on to it or not. It may be good to add BFHI accreditation to the list of requirements for health facility certificate renewals.

Efforts to strengthen pre-service competencies of nurses in nutrition currently underway should be supported to ensure capacity is built for immediate service delivery. This is to ease government of the cost of organizing refresher courses for nurses, which is eventually reduced to a piece-meal approach.

Hospitals should be encouraged to set aside time to hold review meetings on the BFHI to improve staff practices.

It is recommended that this study be repeated with hospitals that are truly Baby Friendly and comply with the 10+1 steps, to bring out the benefits on infant feeding practices and infant growth.

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## APPENDICES

### SURVEY INSTRUMENTS

#### Appendix 1: Survey Questionnaire

#### DEPARTMENT OF NUTRITION AND FOOD SCIENCE

#### UNIVERSITY OF GHANA

#### ASSOCIATION BETWEEN HEALTH FACILITY PRACTICES - BABY FRIENDLY (BF) AND NON-BABY FRIENDLY (NBF) AND INFANT FEEDING PRACTICES: STUDY QUESTIONNAIRE

Interviewer code: .....

.

Questionnaire No.: ---- ----

--	--	--

Date of interview (dd/mm/yy): ----/----/----

--	--	--

Name of facility.....

Status:           Baby friendly           [ 1 ]   Non-Baby friendly           [ 2 ]   **FACCD**

--

### MATERNAL INFORMATION

#### Socio-demographic data

1. What is your name? .....

2. What is/are your contact numbers? .....

3. Which community do you live in? .....

4. How old are you (completed years) .....**AGYR**

--	--	--

5. Which religion do you belong to? 1 = Christian   2 = Islamic   3 = Traditional

4 = Others (specify).....

**REL**

--

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

**NOCHDN**

--	--	--

7. What was your highest level of education? .....

**1**= None    **2** = Primary school    **3** = Junior secondary/Middle school  
**4** = Vocational/Senior Secondary    **5** = University/polytechnic    **LEDU**

8. What work do you do?

**1** = Farming    **2** = Fish monger    **3** = Artisan (seamstress, hair dresser)    **4** = Trader  
**5** = Professional (Teacher< banker< office worker, PLS SPECIFY.....)    **WK**

9. How much on average do you earn per month? [1] GHC < 100 [2] 100 - < 200 [3] GHC  
 200 - <400 [4] GHC 400-600 [5] GHC > 600-1,000 [6]GHC > 1,000

**AVGERN**

10. a. Are you insured under the NHIS? [1] YES    [2] NO

**NHIS**

b. HIS card valid?    YES [1]    NO [2]

**NHVAL**

11. What type of house do you stay in?    **1** = Own house    **2** = Rented apartment  
**3** = Government estate    **4** = Other (specify).....

**HSETYP**

12. How many rooms are available to you in the house? .....

**ROAVAI**

13. How many people are in your household? .....

**NOHSE**

14. Do you have any of the following items in your home? (Answer **1** = NO or **2** = YES)

ITEM	YES/NO		QUANTITY	
	1 = NO	2 = YES		
<b>Radio</b>				RAD <input type="checkbox"/>
<b>Television</b>				TV <input type="checkbox"/>
<b>Fridge/Freezer</b>				FRFR <input type="checkbox"/>
<b>Telephone</b>				TEL <input type="checkbox"/>
<b>Air conditioner/ Fan</b>				FAC <input type="checkbox"/>
<b>Internet facility</b>				INT <input type="checkbox"/>
<b>Computer (Desktop/Laptop)</b>				COMP <input type="checkbox"/>

15. What is your mode of transport? **1** = Private Car    **2** = Motor bike    **3** = Public  
 transport    **4** = Bicycle

**MOTRANS**

**Information about facility status (for BFHI facilities only)**

16. Does the facility accept NHIS cards? YES [1] NO [2] **FAUNHIS**

17. Do you know about the hospitals' breastfeeding policies?

[1] Teaches about breastfeeding **TABTBF**

[2] Puts babies to breast immediately after it is born? **BFDEL**

[3] Helps mothers to position and attach babies to breast? **HFBF**

[4] Does not give any food/liquid to baby before first breastfeed? **FDLIQ**

[5] Promotes exclusive breastfeeding day and night? **PRMEBF**

[6] Discourages use of formula before 6 months **DISFOR**

[7] Encourages you to join a mother support group? **MTMSG**

18. If yes to any of the above, how did you know?

[1] I saw their policy pasted at the ward [2] Staff told me **KNOW16**

19. Can you remember one thing you were told or you read?

-----  
20. Have you heard the term 'Baby Friendly Hospital? YES [1] NO [2] **HDBFHI**

21. If YES, do you know what it means? YES [1] NO [2] **YES17**

**Antenatal history (For Current Child)**

22. a. How many times did you attended ANC? [ ] 1-3 [ ] 4 or more

**NOANC**

b. Confirm from ANC card if available

23. Did the health staff give any information about breastfeeding?

YES [1] NO [2] **INFOBF**

24. Please tell me 3 things they said about breastfeeding

-----  
-----  
-----  
-----

25. Were you told that your baby would need to breastfeed a short while after delivery?

YES [1] NO [2]

**TOLDEI**

26. Have been taught how to position and attach your baby during breastfeeding?

YES [1] NO [2]

**TPAA**

**Feeding choice of mother**

27. What is the birth order of this infant? .....

**BIROD**

28. How did you feed the older children from birth – 6 months (*for multiparous mothers only*)

[1] Breast milk only

**BMO**

[2] Breastmilk and Formula

**BMF**

[3] Formula only

**FOR**

[4] Other, please specify .....

**OTH**


29. How do you intend to feed this baby in the first 6 months (*for all participants*)?

[1] Breast milk only

**BMO**

[2] Breastmilk and Formula

**BMF**

[3] Formula only

**FOR**

[4] Other, please specify .....

**OTH**


30. What influenced the decision of your feeding choice? (to pre-code after pre-testing)

.....

.....

.....

**Hospital practices after delivery**

31. Type of delivery [ 1 ] Vaginal delivery (*move to ques 31*) [ 2 ] Caesarean (*move to ques 33*)

**TYPDEL**

*For vaginal delivery*

32. Was the baby delivered onto your abdomen YES [1] NO [2] **BDELAD**

33. How long did it take for you to put baby to breast after it was born?

Within 30 mins [1] within 1 hour [2] within a day [3] after 1 day [4] **TIMBBFVD**

*For caesarean section only*

34. Did you receive anesthesia during delivery? YES [1] NO [2] **RECANES**

35. What type of anesthesia did you receive?

[1] Fully asleep [2] Epidural	<b>TYPANES</b>	<input type="checkbox"/>
36. How long after birth did you first put baby to the breast?		
Within 30 mins [1] within 1 hour [2] within a day [3] after 1 day [4]	<b>TIMBFCS</b>	<input type="checkbox"/>
<i>For all participants</i>		
37. Did you receive any support from the staff to breastfeed?		
YES [1] NO [2]	<b>SUPBF</b>	<input type="checkbox"/>
38. What kind of support did you receive from the health worker (tick as many as applicable)		
[1] I was taught how to position and attach my baby	<b>SUPPA</b>	<input type="checkbox"/>
[2] They helped me to sit comfortably	<b>SUPSC</b>	<input type="checkbox"/>
[3] They helped me to lie comfortably	<b>SUPLC</b>	<input type="checkbox"/>
[4] Health staff made some beverage for me to drink	<b>SUPBEV</b>	<input type="checkbox"/>
[5] Encouraged me to breastfeed often	<b>DEMFD</b>	<input type="checkbox"/>
39. Did your child receive any food/liquid before you first breastfed?		
YES [1] NO [2] I DON'T KNOW [ 8 ]	<b>PREFDS</b>	<input type="checkbox"/>
40. If YES, what was the baby given?		
[1] Formula	<b>FOR38</b>	<input type="checkbox"/>
[2] Glucose solution	<b>GLU38</b>	<input type="checkbox"/>
[3] Water	<b>WAT38</b>	<input type="checkbox"/>
[4] Any other, please specify .....	<b>OTH38</b>	<input type="checkbox"/>
41. Have you been taught how to express your breastmilk by hand?		
YES [1] NO [2]	<b>EXPMLK</b>	<input type="checkbox"/>
42. Has any staff talked to you about use of pacifier and teats?		
YES [1] NO [2]	<b>TEPAC</b>	<input type="checkbox"/>

**SECTION B****INFANT INFORMATION AT HOSPITAL CONTACT**

1. Infant's date of birth (dd/mm/yy)	<b>INFDOB</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
2. Gestation at birth (wks)	<b>GEST</b>	<input type="text"/>	<input type="text"/>					
3. Mode of delivery? [1] Vaginal [2] Caesarean	<b>MODEL</b>	<input type="text"/>						
4. How are you feeding your infant now? [1] Breastfeeding [2] Other	<b>FEDINF</b>	<input type="text"/>						

**INFANT ANTHROPOMETRY**

5. Weight <b>CHDWGHT</b>	<input type="text"/>	<input type="text"/>
6. Length <b>CHDLGTH</b>	<input type="text"/>	<input type="text"/>
7. Head circumference <b>CHDHDC</b>	<input type="text"/>	<input type="text"/>

**Appendix 2: Study Informed Consent Form****DEPARTMENT OF NUTRITION AND FOOD SCIENCE****UNIVERSITY OF GHANA****TITLE: ASSOCIATION BETWEEN HEALTH FACILITY PRACTICES – BABY FRIENDLY (BF) AND NON-BABY FRIENDLY (NBF) AND INFANT FEEDING PRACTICES****INFORMED CONSENT FORM**

**Principal Investigator:** Gifty-Margaret Donkoh

**Address:** Department of Nutrition and Food Science - University of Ghana, Legon

**General Information about Research**

Dear Respondent,

You are being invited to participate in a study that seeks to find out how the practices of Baby Friendly Hospitals influence the breastfeeding practices, such as exclusive breastfeeding for 4 months. Information from this study will help health facilities who are not promoting breastfeeding through negative practices to change to accepted practices and to encourage those with good breastfeeding practices.

**Description of procedures**

If you agree to be part of this study, you will be asked some questions about yourself like your age, marital status, and educational background, number of children, income and about your household. You would also be asked about antenatal history for the child you just delivered, how you intend to feed the child and some practices of health staff that

helped your decision to or not to breastfeed. This interview should take about 35-40 minutes.

After the initial interview at the hospital, you will be visited in your home twice: when your child turns 2 months and 4 months. During this visit, you would be asked questions relating to how you are feeding your infant and the support you are receiving to do this. In addition, your infant's weight, length and head circumference will be measured.

### **Possible Risks and Discomforts**

You and your baby would not be exposed to any physical hurt/pain. However, time spent during the interview and to receive telephone calls from the research team may pose some inconvenience to you. In addition, some of the questions you would be asked may be personal and may intrude into your privacy.

You are however free to refuse to answer any questions you are uncomfortable with and even stop the interview anytime you so wish.

### **Possible Benefits**

You may not personally benefit from participating in this study, however knowledge gained from this research will be useful to society as a whole.

### **Confidentiality**

Please be assured that all information obtained from you including your personal information would be kept strictly confidential. Only the research team would be allowed access to it and it would be used for research purposes only. You would be identified by a code in the follow up period and your consent form would be kept separate from the data. However the data would be used in presentations and/or reports but your identity would not be revealed even in these instances.

You should also know that the Institutional Review Board (IRB) of the Noguchi Memorial Institute of Medical Research may inspect study records as part of its auditing program, but these reviews will only focus on the researcher and not on your responses or involvement. The IRB is a group of people that review research studies to make sure they are safe for participants.

### **Compensation**

At the end of the study, you will be given three cakes of sunlight soap in appreciation for your time.

### **Voluntary participation and Right to Leave the Research**

Participation in this research is voluntary. You are free to decide whether to be in this study or not. If you decide to participate but later change your mind, you may withdraw your participation without any penalty.

### **Additional costs**

There would be no cost to you while you participate in this study. If you agree to participate, the research team would provide the questionnaires and interviews would be conducted in the health facility. Subsequently, the information would be collected through home visits, which the research team will make at their cost.

### **Contacts for Additional Information**

If you have further questions or concerns relating to your participation in this study you may contact the Principal Investigator (Gifty-Margaret Donkoh) on telephone number 0249478094 or 0267779502 or by e-mail at [gmkukua@yahoo.com](mailto:gmkukua@yahoo.com) and we would be glad to offer help. You may also contact Professor Anna Lartey (Supervisor) on telephone number 0244237188.

## Your rights as a Participant

This research has been reviewed and approved by the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline number 0302916438 or email addresses: [nirb@noguchi.mimcom.org](mailto:nirb@noguchi.mimcom.org) or [HBaidoo@noguchi.mimcom.org](mailto:HBaidoo@noguchi.mimcom.org).

## VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title, **Association between facility practices – Baby Friendly and Non-Baby Friendly and Infant Feeding Practices** has been read and explained to me. I have been given an opportunity to have questions about the study answered to my satisfaction. I agree to participate as a volunteer.

Date \_\_\_\_\_ Name and signature or mark of volunteer.....

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

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered to the volunteer's satisfaction and the volunteer has agreed to take part in the research.

Date \_\_\_\_\_ Name and signature of Witness.....

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this study have been explained to the above individual.

**Appendix 3: Follow-up Form**

**ASSOCIATION BETWEEN HEALTH FACILITY PRACTICES - BABY FRIENDLY (BF) AND NON-BABY FRIENDLY (NBF) AND INFANT FEEDING PRACTICES: STUDY QUESTIONNAIRE**

**SECTION C**

**FOLLOW-UP INTERVIEW ON BREASTFEEDING/INFANT FEEDING PRACTICES**

Date of interview (dd/mm/yy): ...../...../.....

Name of interviewer .....

Time of interview .....

Place of interview [1] In the home [2] Outside home

Place of delivery (interviewer should code): Name .....

Code [1] = Baby Friendly [2] Non-Baby Friendly

**FACCD**1. How old is your child today ( *in completed months*) ..... **CHDAGE**

2. Did you attend PNC/CWC (underline appropriate place)? YES [1] NO

[2]

**SENMDW**

3. If YES, did you discuss any of the following? 1 = YES 2 = NO

a. Support at home	<b>MUMSUP</b>	<input type="checkbox"/>	<input type="checkbox"/>
b. Bleeding after delivery	<b>BLEED</b>	<input type="checkbox"/>	<input type="checkbox"/>
c. Your nutrition	<b>MUMNUT</b>	<input type="checkbox"/>	<input type="checkbox"/>
d. Baby cord	<b>BCORD</b>	<input type="checkbox"/>	<input type="checkbox"/>
e. Breastfeeding	<b>BRFED</b>	<input type="checkbox"/>	<input type="checkbox"/>
f. Baby/mother led feeding	<b>BMLED</b>	<input type="checkbox"/>	<input type="checkbox"/>
g. Baby sleeping with you	<b>BSLEP</b>	<input type="checkbox"/>	<input type="checkbox"/>

h. Sleeping under ITN	<b>SLITN</b>	
g. Rest for yourself	<b>RESMO</b>	
h. Belonging to a Mother-to-mother support group?	<b>MTMSG</b>	

4. Are you currently breastfeeding? YES [1]      NO [2]      **CURBF**

5. In the **past 24 hours** have you given any of these to your child?

**1 = NO      2 = YES**

a. Breast milk	<b>BM</b>	
b. Water	<b>WAT</b>	
c. Fruit juice	<b>FJC</b>	
d. ORS solution	<b>ORS</b>	
e. Glucose solution	<b>GLU</b>	
f. Porridge (koko)	<b>POR</b>	
g. Formula	<b>FOR</b>	
h. Mpotompoto	<b>MPO</b>	
i. Ice kenkey (mashed kenkey)	<b>MASHKE</b>	
j. Rice	<b>RIC</b>	
k. Yam	<b>YM</b>	
l. Others (specify)	<b>OTH</b>	

6. In the **past 1 month** have you given any of these to your child/children?

**1 = NO      2 = YES**

m. Breast milk	<b>BM</b>	
n. Water	<b>WAT</b>	

o. Fruit juice	<b>FJC</b>		
p. ORS solution	<b>ORS</b>		
q. Glucose solution	<b>GLU</b>		
r. Porridge (koko)	<b>POR</b>		
s. Formula	<b>FOR</b>		
t. Mpotompoto	<b>MPO</b>		
u. Ice kenkey (mashed kenkey)	<b>MASHKE</b>		
v. Rice	<b>RIC</b>		
w. Yam	<b>YM</b>		
x. Others (specify)	<b>OTH</b>		

8. Has your child suffered any of these before?

a. Fever	<b>FEV</b>		
b. Diarrhea	<b>DIA</b>		
c. Vomiting	<b>VOM</b>		
d. Cold/runny nose	<b>CRNSE</b>		
e. Ear pain	<b>EPN</b>		
f. Cough	<b>CGH</b>		

9. In your opinion, why did you child have any of these diseases?( to pre-code after pre-testing)

.....  
 .....  
 .....

#### ANTHROPOMETRY

10. Weight	<b>CHDWGHT</b>		
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11. Length	<b>CHDLGTH</b>		
12. Head circumference	<b>CHDHDC</b>		

END. Thank you for your time.