

**PREVALENCE OF EXCLUSIVE BREASTFEEDING AND ASSOCIATED
FACTORS AMONG INFANTS AGED 0 – 6 MONTHS IN A PERI-URBAN
SETTLEMENT OF KANGEMI, NAIROBI.**

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DECLARATION

This thesis is my original work and to the best of my knowledge has not been presented for award of a degree in any institution.

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DEDICATION

This thesis is dedicated to my wife Gaudencia, children Yvonne, Vivian, Raymond, Clare, and grandchildren Jabali and T.J.

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LIST OF ACRONYMS

ANC	-	Ante-Natal Clinic
AIDS	-	Acquired immune deficiency syndrome
ARI	-	Acute Respiratory Infection
ART	-	Anti-Retroviral Therapy
BFHI	-	Baby Friendly Hospital Initiative
CHWs	-	Community Health Workers
CDC	-	Centre for Disease Control and prevention
CBO	-	Community Based organisation
DALYs	-	Disability Adjusted Life Years
DMOH	-	District Medical officer of health
EBF	-	Exclusive Breastfeeding
FGD	-	Focus Group Discussion
FHI	-	Family Health International
GOK	-	Government of Kenya
HAZ	-	Height-for-Age Z-score
HCP	-	Health Care Provider
HIV	-	Human Immunodeficiency Virus
HINI	-	High Impact Nutrition Initiative
IYCF	-	Infant and Young Child Feeding
KES	-	Kenya Shillings
KDHS	-	Kenya Demographic Health Survey
KNBS	-	Kenya National Bureau of Statistics
KNH	-	Kenyatta national hospital
KEPSA	-	Kenya Private Sector Alliance
KPHC	-	Kenya Population and Housing Census
MCH	-	Maternal and Child Health
MDGs	-	Millennium Development Goals
MIYCN	-	Maternal Infant and Youth Child Nutrition
SD	-	Standard Deviation
SPSS	-	Statistical Product and Service Solution

USAID	-	United States Agency for International Development.
UNICEF	-	United Nations International Children's Education Fund
UNTH	-	University of Nigeria Teaching Hospital
UON	-	University of Nairobi
WAZ	-	Weight-for-Age Z-score
WHZ	-	Weight-for-Height/length Z-score
WHO	-	World Health Organization

OPERATIONAL TERMS

Breastfeeding on demand — Breastfeeding an infant whenever and as long as the infant wants to breastfeed.

Breast milk substitute — Any food marketed or otherwise represented as a partial or total replacement for breast milk, whether or not it is suitable for that purpose.

Commercial infant formula — A breast milk substitute formulated industrially in accordance with applicable Codex Alimentarius standards to satisfy the nutritional needs of infants up to six months old.

Complementary feeding — Feeding an infant on any other food or fluids in addition to breast milk or a breast milk substitute.

Exclusive breastfeeding — Giving an infant no food or drink except breast milk, not even water or breast milk substitute, with exceptions of drops of syrup containing vitamins, mineral supplements or medicines.

Formula feed — refers to commercial infant formula feed.

Household — A group of persons living in the same compound or dwelling who share same cooking arrangement and are answerable to one household head.

Household size — Total number of people living in the household for three months prior to the study.

Infant — a person from birth to 12 months of age. In this study children aged 0-6 months were considered as infants.

Mixed feeding — Feeding both breast milk and other foods or liquids.

Prelacteal feed — Fluids given to infant at birth before commencement of breastfeeding.

Provider — Refers to all cadres of health care providers (HCPs) involved in the direct provision of health care services at both facility and community levels.

Optimal infant feeding — Infant feeding practice that does not put the child's health at risk. Exclusive breastfeeding is an optimal infant feeding practice.

Sub-optimal infant feeding — Infant feeding practice that puts the child's health at risk e.g. mixed feeding.

Weaning—The transition from exclusive breastfeeding to the cessation of breastfeeding.

ABSTRACT

Background: Exclusive breastfeeding for six months is a key child survival intervention that prevents 13% of all under-five deaths annually and this translates to preventing 11,000 deaths in Kenya annually (Black *et al*, 2008). The information generated from this study will be useful to the Government of Kenya and stakeholders to develop area specific interventions to improve infant and young child feeding (IYCF).

Objective: The main objective of this study was to determine the prevalence of exclusive breastfeeding and the associated factors among infants aged 0–6 months in Kangemi, Nairobi County.

Methodology: The study was conducted in Kangemi, Nairobi City County, Kenya, where sampling with probability proportional to size (PPS) was used to get the number of households per village from the ten villages within Kangemi. The study design was a descriptive cross-sectional study in which a total of 334 mother-infant pairs were sampled. A questionnaire was administered to respondents who were mothers of the studied infants. Anthropometric measurements of weight and height were taken based on standard procedures. Focus Group Discussions (FGDs) were conducted with pregnant mothers during antenatal clinics, mothers of infants 0 – 6 months at Mother and Child Health (MCH) clinics, and mothers at labour wards to explore the factors influencing the practice of exclusive breastfeeding. Key informant discussions were conducted with five Health Care Providers (HCPs) individually in relation to infant and young child feeding practices (IYCF) to establish knowledge and skills on breastfeeding practices. Case studies on five mothers were conducted separately on factors that enabled them to exclusively breastfeed for six months. Statistical Product and Service Solution (SPSS version 17.0) was applied for data analysis. Anthropometric data was analyzed based on a z-score of ≥ -2 or < -3 SD according to WHO recommendations. A chi-square test was used to determine factors influencing exclusive breastfeeding as well as to find associations between exclusive breastfeeding and nutritional status, growth pattern, immunization status and morbidity status at a significance level of 0.05. Logistic regression was performed to ascertain the determinants of exclusive breastfeeding.

Results: Findings showed that more than half (55.8%) of the mothers were 25 years old or younger and nearly a half (44.2%) were over 25 years old. Their mean age was 25 ± 4.4 years. Of the infants studied, over a half (52.7%) were girls and almost a half (47.3%)

were boys. Nearly one-third of the infants (32.5%) were aged 3 – 4 months, 30.7% 1 – 2 months, 26.8% 5 – 6 months and 9.3% less than month. The mean age was 3±1.8 months. The prevalence of exclusive breastfeeding was 45.5% among infants aged 0 – 6 months in Kangemi, Nairobi. The practice of exclusive breastfeeding decreased with the age of the infant. The ages of the infant and the mother-in-law were significantly ($p<0.05$) associated with exclusive breastfeeding. For mothers who exclusively breastfed for six months, availability of the mother, modification of work pattern and self-determination were key to the success of exclusive breastfeeding. More than half (54.5%) of the mothers had supplemented other feeds/fluids with breast milk to their infants at the time of study. Child crying (36.5%) and child thirsty/hungry (34.5%) were the common reasons given by mothers who introduced other feeds/fluids before six months. Growth monitoring of the studied infants indicated a good weight gain (73.1%) for those monitored three months prior to the study. The rates of under nutrition were low where 3.1% of infants were wasted, 9.3% were stunted and 4.5% underweight. Growth pattern and stunting were found to be significantly ($p<0.05$) associated with exclusive breastfeeding. Almost all (93.3%) of the infants had been immunized completely for their age. Assessment of morbidity status indicated diarrhoea (22.1%) to be the common illness experienced by infants two weeks prior to the study. At the health facility, the infant and young child feeding policy and self-assessment tool on the BFHI were available. Nearly a third (32%) of health care providers were trained on IYCF and Baby Friendly Hospital initiative (BFHI.)

Conclusion and recommendations: The prevalence of exclusive breastfeeding was 45.5% which was higher compared to the national level of 32% and to those found in other studies. Strengthening of factors that enable mothers to exclusively breastfeed for six months can contribute to achieving the national target set out in the Maternal Infant & Youth Child Nutrition (MIYCN) strategy of increasing exclusive breast feeding rates from the current 32% to 80% by 2017.

CHAPTER ONE: INTRODUCTION

1.1 Introduction to the study

Infant and young child feeding (IYCF) practices play an important role in reducing early childhood morbidity and mortality, as well as improving early childhood growth and development. Exclusive breastfeeding for six months is the most effective preventive intervention for ensuring child survival and is estimated to prevent 13% of deaths of children under five years old (Black *et al*, 2008). This translates to preventing approximately 11,000 deaths in Kenya annually. Furthermore, appropriate complementary feeding from six months of age is critical for child survival and could prevent a further 6% of all under-five deaths. These two interventions combined could prevent 19% of child mortality (Black *et al*, 2008).

Poor infant feeding practices are known to have adverse consequences on the health and nutritional status of children with consequences to their growth and development both physically and mentally (UNICEF, 1997). Kenya is rated among 22 countries in Africa with poor IYCF practices with a resultant high burden of under nutrition among the under-fives (UNICEF, 2011). The latest Kenya Demographic and Health Survey (KDHS) report showed that nutritional status of children under five in Kenya is poor with 35% stunted, 7% wasted and 16% underweight respectively (KDHS 2008 – 09). Infant feeding practices which according to the UNICEF model (1998) are immediate causes of childhood malnutrition were equally poor. According to the KDHS 2008 – 09 report, only 32% of infants under six months of age were exclusively breastfed (KDHS, 2008 – 09).

The global strategy for IYCF describes essential activities to protect, promote and support appropriate IYCF (National Maternal, Infant and Young Child Nutrition Strategy, 2011 – 2017). It focuses on the importance of investing in this crucial area to ensure children grow to their full potential free from adverse consequences. Increased uptake of exclusive breastfeeding is one of the eleven High Impact Nutrition Interventions (HINI)

prioritized in Kenya for child survival and development. It is envisaged that increased uptake of exclusive breastfeeding will contribute towards reduction of under-five mortality, hence making a vital contribution towards the attainment of the fourth Millennium Development Goal (MGD4). The national target set out in the Maternal, Infant and Young Child Nutrition (MIYCN) strategy is to increase exclusive breastfeeding rates from the current 32% to 80% by 2017 (National Maternal, Infant and Young Child Nutrition Strategy, 2011 – 2017). Exclusive breastfeeding remains low (0.2%) in Nairobi (KDHS, 2008 – 09). This study was set out to investigate factors influencing exclusive breastfeeding among infants 0 – 6 months in an urban low income area in Nairobi with a view to making strong recommendations to improve exclusive breastfeeding.

1.2 Background information

Optimal infant feeding for sustained growth includes initiation of breastfeeding within the first hour of life, exclusive breastfeeding for six months, timely complementary feeding with appropriate foods and continued breastfeeding for two years and beyond (WHO, 2008). The World Health Organization (WHO) defines exclusive breastfeeding (EBF) as providing infants with only “breast milk from the mother or a wet nurse, or expressed breast milk and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines” (WHO/UNICEF, 2003).

Increasing uptake of optimal breastfeeding practices could save an estimated 1.5 million under-five lives annually (Black *et al.*, 2008). This is because breast milk provides optimal nutrition for a growing infant with compositional changes that are adapted to the changing needs of the infant. It contains adequate minerals and nutrients for the first six months of life. Further, it contains immune components, cellular elements and other host-defense factors that provide various antibacterial, antiviral and anti-parasitic protections (WHO, 2001).

Breastfeeding practices for infants and young children worldwide are not optimal. Global monitoring indicates that only 39% of all infants worldwide are exclusively breastfed (Quinn *et al.*, 2005). The overall rate of exclusive breastfeeding for at least six months is

only 37% in the developing world, and 39% in the least developed countries (WHO, 2011). Although breastfeeding rates are very high in developing countries, exceeding 95% in many countries, exclusive breastfeeding is not widely practiced (Administrative Committee on Coordination/Sub-Committee on Nutrition — ACC/SCN, 2000). According to Quinn *et al* (2005), over 10 million children under the age of five die each year in sub-Saharan Africa and South Asia. Majority of these deaths (41%) occur in sub-Saharan Africa and another 34% in South Asia due to poor breastfeeding practices.

The rate of exclusive breastfeeding among children less than six months in sub-Saharan Africa was 35% in 2010 (World Bank, 2012). A major cause of death in infants and young children is inadequate breastfeeding practices in combination with high levels of disease (Quinn *et al.*, 2005). Quinn *et al* found that one in ten children die in the first year of life and one in six dies before the age of five years in Madagascar. In South Africa, the Demographic and Health Survey of 1998 indicated that 10% of children 0 – 3 months were exclusively breastfed and 2% of children 4 – 6 months were exclusively breastfed (WHO, 2003). A study in Eastern Uganda on low adherence to exclusive breastfeeding showed that 7% and 0% practiced exclusive breastfeeding by three and six months respectively (Ingunn *et al.*, 2007).

In Kenya, IYCF practices are sub-optimal. The Kenya Demographic Health Survey (KDHS) 2008 – 9 report indicated that exclusive breastfeeding is not common as only 32% of infants under six months of age are exclusively breastfed (KDHS, 2008 – 09). This showed an improvement of exclusive breastfeeding practice as reported in KDHS (2003) where only 13% of infants below six months of age were exclusively breastfed. According to KDHS (2008 – 09), the median duration of exclusive breastfeeding stands at 0.5 months in Nairobi compared to 0.6 months in KDHS 2003. A study done in the Kibera slum, Nairobi, showed that infants were introduced to complementary feeds at the age of one to twelve months and at an average age of 4.8 months; mostly porridge and water (46.2%) (Ibtisam, 2004). Another study done in Kathonzwani Division, Makueni District indicated that there was poor exclusive breast feeding practice, with 50.6% of children receiving complementary feeds at three months of age (Macharia, 2002).

Among the factors that hinder the practice of exclusive breastfeeding for the recommended first six months of life are poor health systems, community beliefs that delay the initiation of breastfeeding and lack of social support for women in resolving difficulties with breastfeeding (Quinn *et al.*, 2005). Studies in the United States showed that the number of babies being breastfed experienced a "sharp decline" between the ages of two and three months, the time when many women return to work or school and need additional support in order to continue breastfeeding (Li *et al.*, 2003). In a study conducted among mothers at the University of Nigeria Teaching Hospital (UNTH), Enugu, factors that hindered exclusive breastfeeding practices up to six months after delivery were lack of suitable facilities outside the home, inconvenience, conflicts at work, family pressure, ignorance and the need to return to work or school (Uchendu *et al.*, 2009). Uchendu *et al* found that various misconceptions by mothers such as beliefs that breast milk is insufficient or of poor quality, and that the baby does not gain weight adequately or is thirsty adversely affected the willingness of women to practice exclusive breastfeeding. Exclusive breastfeeding was significantly associated with maternal educational level, marital status, child age, and economical status in Ethiopia (Alemayehu *et al.*, 2007) and in Namibia, it was significantly associated with antenatal care attendance, birth order and breast problems (Amadhila, 2005).

In Kenya, findings from a study conducted in Homa Bay showed that the mother's knowledge on infant feeding practices coupled with physical and social support provided influenced infant feeding practices (Oguta, 2002). In a study conducted in Machakos by Ndolo (2008), the mother's age, marital status, occupation and knowledge acquired at the Maternal and Child Health (MCH) were associated with introduction of complementary feeds to infants below six months. Other factors found in another study conducted in Eastleigh, Nairobi, by Reygal (2007) were lack of support and appropriate advice, lack of knowledge, lack of confidence and a low self-esteem. In order to improve breastfeeding practices, it is essential that factors influencing the practice in specific areas are investigated.

1.3 Research Problem

The Kenya National Infant and Young Child Feeding (IYCF) policy guidelines state that infants should be exclusively breastfed for the first six months of life with the introduction of complementary feeds at six months and continued breastfeeding for at least two years to achieve optimal growth and development. Early introduction of other foods/fluids exposes infants to increased risk of infections particularly diarrhoeal diseases, respiratory tract infections coupled with growth faltering. Despite the well documented benefits of exclusive breastfeeding on child survival, growth and development, uptake of exclusive breastfeeding for six months as recommended remains low in Kenya. The general trend indicates a decline in exclusive breastfeeding practice with age, with only 13.2% of infants still exclusively breastfed by six months of age (KDHS, 2008 – 09). This situation is of public health concern and factors contributing to low uptake of exclusive breastfeeding for six months need to be identified and addressed.

Evidence from studies shows that many mothers do not initiate breastfeeding early and do not sustain it for six months. A study conducted in Kibera, a slum in Nairobi, showed that exclusive breast feeding practice was rare with over 65% of mothers reported introducing complementary feeds between day one and five months of the infant's life (Maina, 2006). A two-year prospective study conducted in Kangemi found that by one month, 75% of infants had received complementary feeds/fluids, and by the fourth month, 94% had received complementary feeds/fluids (Muchina and Waithaka, 2010). This study therefore sought to determine factors influencing exclusive breastfeeding practice among mothers of infants aged 0 – 6 months in a low income peri-urban area in Nairobi.

1.4 Justification

Child survival interventions are designed to address the most common causes of childhood deaths that occur (Black *et al.*, 2008). The fourth Millennium Development Goal (MDG-4) aims at reducing under-five mortality rates by two thirds between 1990 and 2015. The MDGs were recently evaluated, and exclusive breastfeeding for six months was considered one of the most effective interventions to achieve MDG-4 (Bryce *et al.*, 2006). A review of child survival interventions in low income settings in 42

countries showed that the promotion, support and protection of breastfeeding is effective in preventing death from diarrhoea, pneumonia and neonatal sepsis (Black *et al.*, 2008).

Exclusive breastfeeding for six months is a key child survival intervention that prevents 13% of all under-five deaths annually and this translates to preventing 11,000 deaths in Kenya annually (Black *et al.*, 2008). Exclusively breastfed infants have 2.5 times fewer episodes of childhood illnesses while those not breastfed are up to 25 times more likely to die from diarrhoea and protein energy malnutrition and three times more likely to die from acute respiratory infections (ARI) than those exclusively breastfed (WHO, 2003).

Despite the government's efforts in fostering optimal infant and young child feeding, practices that include exclusively breastfeeding infants for the first six months of life and uptake of exclusive breastfeeding remain a challenge. At the national level, there has been a notable improvement in exclusive breastfeeding practice of from 13% to 19% (KDHS, 2002 – 03) and then to 32% (KDHS, 2008 – 09). However, this still reflects an overall low uptake of exclusive breastfeeding in the country. While several studies on breastfeeding practices have been conducted in the urban areas of Kenya, including Nairobi, most have focused on knowledge, attitudes and infant feeding practices of mothers. In-depth assessment of factors that have enabled some mothers to breastfeed exclusively for six months has not been done.

This study incorporated case studies of mothers who had exclusively breastfed for six months. This enabled the investigator to interrogate factors that enhance uptake of exclusive breastfeeding in the study area. Further, the study investigated health facility level factors known to influence breastfeeding practices by interviewing Health Care Providers (HCPs) on how they support optimal infant and young child feeding practices. The information generated from the study will be useful to the Government of Kenya and stakeholders to develop area specific interventions to improve IYCF. This could contribute to the achievement of MDG-4 on reducing under-five mortality rate by two thirds by the year 2015.

1.5 Research questions

1. What are the breastfeeding practices among mothers with infants aged 0 – 6 months in the study area?
2. What factors influence exclusive breastfeeding practices among mothers with infants aged 0 – 6 months in the study area?
3. What is the nutritional status of infants aged 0 – 6 months in the study area?

1.6 Objectives

1.6.1 General objective

To determine the prevalence of exclusive breastfeeding and associated factors in Kangemi, a low income setting in peri-urban Nairobi

1.6.2 Specific objectives

1. To determine prevalence of exclusive breastfeeding among infants aged 0 – 6 months
2. To determine factors associated with exclusive breastfeeding among infants aged 0 – 6 months.
3. To determine morbidity pattern of infants aged 0 – 6 months.
4. To assess nutritional status of infants aged 0 – 6 months in the study area.
5. To describe health facility factors related to uptake of exclusive breastfeeding
6. To document success stories of the mothers who have exclusively breastfed for six months

1.7 Conceptual framework

The conceptual frame work indicates the interplay of factors likely to influence breastfeeding practices including maternal factors, socio-demographic factors, social support factors and health facility factors. Maternal factors investigated included the mother's occupation, her attendance of antenatal clinics (ANC), counseling on infant feeding during ANC, the mother's knowledge on infant feeding, spacing and birth order. Socio-demographic factors included age, marital status, religion, household size, the mother's education level and household income. These were the predictor variables whose influence on the practice of exclusive breastfeeding (outcome variable) was

measured. Exclusive breastfeeding has a bearing on the nutritional status, growth and morbidity status of infants as depicted in Figure 1.1.

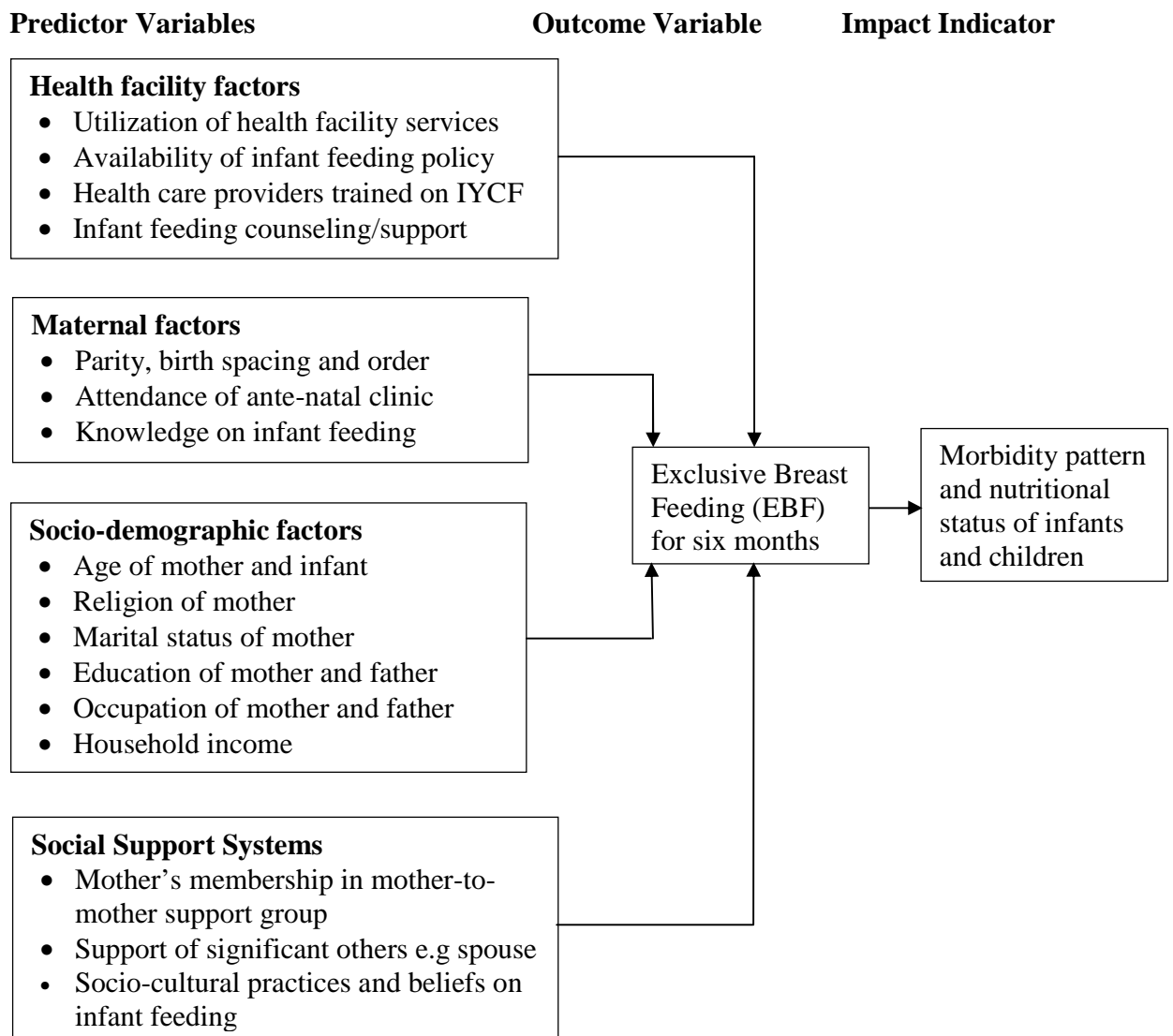


Figure 1.1: Conceptual framework. *Adapted from ACC/SCN (2000) and modified by author*

CHAPTER TWO: LITERATURE REVIEW

2.1 Infant Feeding and Child Nutritional Status

Poor infant feeding practices are known to have adverse consequences on the health and nutritional status of children, which in turn has consequences on the development of the child both physically and mentally (UNICEF, 2005). Breastfeeding is an important determinant of a child's nutritional status that eventually influences his/her growth and development. Child undernutrition is the underlying cause of 3.5 million deaths, 35% of the disease burden in children below five years and 11% of total global daily adjusted life years (DALYs) (Black *et al.*, 2008). According to the World Health Organization, increasing optimal breastfeeding practices could save an estimated 1.5 million infant lives annually. Up to 55% of infants dying from diarrhoeal disease and acute respiratory infections may result from inappropriate feeding practices (WHO, 2011).

Optimal infant feeding for sustained child health and growth includes initiation of breastfeeding within the first hour of life, exclusive breastfeeding for six months, timely complementary feeding with appropriate foods, and continued breastfeeding for two years and beyond (WHO, 2011). There is a strong relationship between breastfeeding practices and the occurrence of malnutrition in children (Muchina and Waithaka, 2010). Inappropriate breastfeeding practices are associated with severe malnutrition and growth faltering in the under-five children (Onayade, 2004).

Childhood malnutrition has significant health and economic consequences, which include increased risk of death, illness and lower cognitive development among others (UNICEF, 2005). Early introduction of foods among breastfeeding children contributes to a higher prevalence of malnutrition. Findings of a study conducted in Ethiopia, showed that the prevalence of wasting (11.4%) and underweight (57.1%) in children aged 6 – 59 months were associated with early introduction of foods below three months (Shibeshi, 2004). A study by Mugo (2008) in Narok District, Kenya, showed that 4% of underweight occurrences in infants aged 0 – 6 months was due to poor infant feeding practices. In Eastleigh, Nairobi, a study among the Somali community by Reygal (2007) showed a correlation between malnutrition and infant feeding practices.

2.2 Benefits of exclusive breastfeeding

Exclusive breastfeeding in an infant's first six months leads to short-term and long-term health benefits. Studies have repeatedly demonstrated that breast milk provides the optimal combination of food and nutrients for infants in the first six months of life. However, the benefits of exclusive breastfeeding are not restricted to infants only. Exclusive breastfeeding also has benefits for mothers, families and communities.

2.2.1 Benefits of exclusive breastfeeding for the infant

Breast milk provides complete and sufficient nutrition for infants below six months of age. Exclusive breastfeeding encourages better growth and development than alternative feeding methods in infants. This is because breast milk contains specific proteins that help an infant's immune system develop properly (Mika, 2011). Not only does breastfeeding positively affect the immediate health and growth of infants it also leads to numerous long-term health benefits . Early complementary feeding correlates with the risks of obesity, diabetes, and childhood leukemia. Furthermore, breastfeeding positively affects a child's mental development (Mika, 2011). According to Mika (2011), studies point to increased cognitive development in the early years of life for breastfed children. Additionally, breastfed children display greater acceptance of new foods and of a wider variety of foods. Exposure to a wider variety of foods ensures that these children continue to receive the full spectrum of nutrients required for healthy, sustained growth.

A meta-analysis of studies conducted in developing countries showed that breastfed children under the age of six months are 6.1 times less likely to die of diarrhoea than infants who are not breastfed (WHO, 2011). Exclusive breastfeeding protects very young infants from diarrhoeal diseases in two ways: first, breast milk contains both immune (specific) and immune (non-specific) antimicrobial factors; second, exclusive breastfeeding eliminates the intake of potentially contaminated food and water. When exclusive breastfeeding is continued during diarrhoea illness, it also diminishes the adverse impact on nutritional status (WHO, 2011).

Evidence shows that breastfeeding reduces the risk of morbidity by protecting the infant from common bacterial and viral infections, many of which can be fatal (Mika, 2011).

Breast milk provides protection against pathogens by providing antibacterial and antiviral substances that stimulate the infant's immune system (Mihirshahi *et al.*, 2007).

2.2.2 Benefits of exclusive breastfeeding for mothers

Mothers who breastfeed establish a close bond with their infant thus strengthening feelings of security in the child at the outset of life. Breastfeeding may substantially reduce the risk of several life-threatening diseases. Women who breastfeed their children experience lower incidences of both breast and ovarian cancer (Mika, 2011). According to Mika (2011), breastfeeding positively correlates to an increase in women's mental health. Mothers who breastfeed tend to have considerably shorter and less physically strenuous postpartum recoveries.

2.3 Trends of exclusive breastfeeding rates

Breastfeeding which could save 1.3 million children's lives globally is often neglected as less than 40% of women worldwide breastfeed exclusively (Adelaja, 2012). The WHO global data bank on breastfeeding that covers 94 countries and 65% of the world's infant population (<12 months), showed that breastfeeding rates are typically low though improving slowly. For example, in the European region, Armenia increased its exclusive breastfeeding rate for infants under four months from 0.7% in 1993 to 20.8% in 1997; Poland increased from 1.5% in 1988 to 17% in 1995; and Sweden increased from 55% in 1992 to 61% in 1993 (WHO, 2003).

In the Eastern Mediterranean Region, the exclusive breastfeeding rate in some countries was high compared to countries in other regions. Egypt and Saudi Arabia had an exclusive breastfeeding rate (under four months of age) of 68% (1995) and 55% (1991), respectively. Pakistan showed an increase in exclusive breastfeeding under four months from 12% (1988) to 25% (1992). In the South American Region, ever-breastfed rates were high in some countries (Chile 97% in 1993, Colombia 95% in 1995, and Ecuador 96% in 1994). However, the rates of exclusive breastfeeding under four months, though high compared to societies in the other regions, showed a slight decrease (Bolivia, 59% in 1989 and 53% in 1994; Colombia, 19% in 1993 and 16% in 1995; and Dominican Republic 14% in 1986 and 10% in 1991 (WHO, 2003).

In the South-East Asia Region, there was an increase in ever-breastfeeding rates, for example in Thailand (90% in 1987 and 99% in 1993). The exclusive breastfeeding rate, though low, increased from 0.2% (1993) to 4% (1996). However, the WHO Global Data Bank showed that rates for exclusive breastfeeding under four months of age were very low in a number of countries in the African Region, such as Central African Republic (4% in 1995), Niger (4% in 1992), Nigeria (2% in 1992), and Senegal (7% in 1993). In other countries, rates for exclusive breastfeeding, showed a gradual increase over years. They include: Benin (13% in 1996 and 16% in 1997), Mali (8% in 1987 and 12% in 1996), Zambia (13% in 1992 and 23% in 1996), and Zimbabwe (12% in 1988 and 17% in 1994). The increase in exclusive breastfeeding rates is mainly due to breastfeeding campaigns and additional Baby Friendly Hospitals and trained breastfeeding counselors (WHO, 2003). In Kenya, the exclusive breastfeeding rate stood at 17% in 1997, 13% in 2003 and has increased to 32% in 2009 (KDHS, 2008 – 09).

2.4 Breast feeding and child survival

Exclusive breastfeeding is the most effective global public health intervention for child survival (WHO, 2003). Sub-optimal breastfeeding, especially non-exclusive breastfeeding in the first six months of life, results in 1.4 million deaths and 10% of disease burden in children younger than five years (Black *et al*, 2008). In developing countries sub-optimal breastfeeding during the first months of life is an important risk factor for infant and childhood morbidity and mortality, especially resulting from diarrhoeal disease and acute respiratory infections (WHO, 2011). A large global disease burden is attributed to sub-optimal breastfeeding accounting for 77% and 85% of the under-five deaths and disability-adjusted life years (DALYs), respectively (Black *et al*, 2008).

In Brazil, infants less than 12 months old who received only powdered milk or cow's milk had approximately 14 times the risk of death from diarrhoeal disease and about four times the risk of death from acute respiratory infection compared to those who were exclusively breastfed. Furthermore, those who received powdered milk or cow's milk in addition to breast milk were found to be at 4.2 times the risk of diarrhoeal death and 1.6

times the risk of death from acute respiratory infection, compared with infants exclusively breastfed (WHO, 2011). The prevalence of diarrhoea and acute respiratory infection in 0 – 3 months old infants in Bangladesh was 14.3% and 31.2% respectively and both illnesses were significantly associated with lack of exclusive breastfeeding (Mihirshahi *et al.*, 2007). According to Mihirshahi *et al.*, the results showed that children, aged 0 – 3 months, who were exclusively breastfed, were less likely to have suffered from diarrhoea or an acute respiratory infection than infants who were not exclusively breastfed.

In Kenya, a study conducted among infants 0 – 24 months old at Kisii District Hospital, indicated the occurrence of various illnesses that were associated with inappropriate infant feeding practices including cough at 37%, fever at 32%, diarrhoea at 3%, the common cold at 1.9% and pneumonia at 1.6% (Obara, 2010). Similarly, findings by Ndolo (2008) in Machakos District showed that diarrhoea at 3.4% and vomiting 2.3% were associated with early introduction of foods due to bottle feeding which compromised proper hygiene. Other ailments attributed to the same included cough 24.7%, the common cold 17.8%, malaria 6.9% and pneumonia 6.3% and fever 4% (Ndolo, 2008).

2.5 Factors influencing exclusive breastfeeding practices

Research shows that exclusive breastfeeding in the first six months of life benefits both the mother and her child. However, considerable challenges hinder effective and sustained breastfeeding in developed as well as in developing nations. Various factors have been found to influence initiation and duration of exclusive breastfeeding. They include socio-demographic factors (education level, monthly household income and parity), biosocial factors (breastfeeding support), cultural factors (beliefs, norms and attitudes towards breastfeeding) and employment policies (Mika, 2011).

2.5.1 Maternal and child factors

A woman's education and social class affects her motivation to exclusively breastfeed. In a study conducted in South Gujarat region in 2008 on mothers with newborn infants who delivered at New Civil hospital, socio-demographic variables like maternal education,

paternal education and socio-economic status had a positive association with exclusive breastfeeding (Chudasama *et al.*, 2009). A higher maternal educational level was noted to favour exclusive breastfeeding. Similar findings were observed by Agampodi *et al* (2009) in their study in Sri Lanka.

Improved maternal education enhances the understanding of mothers and their appreciation of the benefits of exclusive breastfeeding thus empowering them to resist external interferences and pressures (Uchendu *et al.*, 2009). On the other hand, mothers with secondary education and above only exclusively breastfed their children at 0.5% compared to the ones with no education at 0.6% (KDHS, 2008–09). In a case study for urban and rural communities in Garissa, Kenya, maternal nutrition knowledge on breastfeeding practices was significantly ($p < 0.05$) associated with breastfeeding practice (Hassan, 2007). In Nairobi, 65% mothers complied with most of breastfeeding practices as a result of the knowledge acquired on proper breastfeeding practices (Muchina, 2007).

The choice of infant feeding method is influenced by the economic condition of the individual, the family and country (Thairu *et al.*, 2005). Women in higher status jobs are more likely to have access to a lactation room and suffer less social stigma from having to breastfeed or express breast milk at work. In a study conducted in Nigeria at Olabisi Onabanjo University Teaching Hospital, urban/working mothers complained that lack of a crèche in offices hampered their ability to breastfeed exclusively as they had to resume work before six months (Adelaja, 2012). In addition, women who are unable to take an extended leave from work following the birth of their children are less likely to continue breastfeeding when they return to work. In Machakos, Kenya, a study by Ndolo (2008) on factors associated with introduction of complementary foods in infants below six months found that the mother's occupation affected time spent with the child leading to early introduction of foods before six months.

Findings by Ndolo (2008) showed that maternal age, marital status and the mother's knowledge were factors that influenced exclusive breastfeeding practices. The sex of an infant may influence the duration of breastfeeding. In some western societies, boys are

exclusively breastfed slightly longer. In others, females are exclusively breastfed slightly longer (UNICEF, 2005). According to KDHS (2008 – 09), female infants are exclusively breastfed at 1.3% compared to males at 0.6% up to six months. Malnourished and weakened infants who are as a result of painful gasps of acute respiratory infections or by sudden and dreadful draining away of life by diarrhoeal disease may not breastfeed adequately (UNICEF, 2005).

2.5.2 Socio-cultural factors

Cultures across the globe recommend early mixed feeding to supplement breast milk, which is perceived as insufficient for proper infant growth. Long-standing traditions in diverse cultures discourage exclusive breastfeeding, or even using breast milk as a primary food source, because of cultural beliefs that breast milk is an inadequate nutrition source for infants. Ludvigsson (2003) investigated breastfeeding intentions, patterns and determinants among infants visiting hospitals in La Paz, Bolivia. He reported that mothers who were discarding colostrum and using prelacteal feeds attributed to ethnic and cultural factors and using prelacteal feeds were less likely to exclusively breastfeed for a longer duration.

A qualitative study found that women in Cameroon initiated mixed feeding almost immediately after birth, partly due to tradition and partly due to the requirement that women work in the fields which were long distances from their homes making breastfeeding just as unfeasible for these women as for employed mothers in westernized countries (Mika, 2011). A group of mothers surveyed in Langa, South Africa reported no exclusive breastfeeding. Participants in the study indicated that mixed feeding was introduced within an infant's first month of life, based on a belief that breast milk was an incomplete nutrient (Mika, 2011).

Reliance on generational wisdom may discourage breastfeeding. According to Mika (2011), Vietnamese women supplement breastfeeding with water or formula on the basis of the perceived nutritional insufficiency of breast milk. A similar cultural belief was found in Turkey, where more than one-third of mothers in a study reported that they stopped breastfeeding before six months because they felt their milk would not be

sufficient for the infants. Grandmothers in Malawi were likely to give or direct new mothers to give supplementary root infusions to infants based on the belief that breast milk alone would not satisfy an infant's hunger (Mika, 2011).

A study in different localities of an urban area of Dera Ismail Khan City showed that over half (54%) the mothers cited inadequate breast milk as the main reason for discontinuing breastfeeding. Of these mothers, 32% thought that their small breast size was responsible for inadequate milk while the rest attributed this to their poor body nourishment as a result of disease (28%) or poverty. Other reasons cited were babies feeling sick (23%), babies unsatisfied after breast feeding (10%), a short time for breastfeeding (6%), fear of loss of physical attraction (4%) and milk dried up (3%) (Hussain, 2003).

In Nairobi, Reygal (2007) in a study conducted among the Somali community in Eastleigh found that the perception that breastfeeding was painful and inconvenient coupled with perceived poor milk supply contributed to poor infant feeding practices among infants 0–12 months old. Similarly, Ashene (2006) found a significant association between the mother's beliefs and the time of starting complementary feeding of infants in the Eastlands area, Nairobi. A study done in Kibera slum, Nairobi, showed that most mothers (98.2%) breastfed all their children and most mothers (92.6%) did it for up to six months. Furthermore, breastfeeding practice was reported to have been stopped either abruptly (57.9%) or gradually (42.6%) by mothers who gave the reason that the children refused to breast feed or because of the next pregnancy. Many cultures are therefore reluctant to promote exclusive breastfeeding since breast milk on its own is considered inadequate for proper infant growth and development (WHO, 2011).

The most significant factor for mothers to initiate bottle-feeding was the mother's perception of the father's attitude. Freed and Fraley (1993) investigated the accuracy of a woman's assumptions regarding the spouse's attitude toward breastfeeding and found that, generally, husbands had more positive attitudes to breast feeding than what their partners had expected of them. Kessler *et al* (1995) reported that in a group of 133 women, 71% were influenced by the infant's father and 29% by the maternal grandmother.

2.5.3 Social support

Mothers need active support during pregnancy and after not only from their families and communities but also from the health system. The influential position that health workers hold can and should be used effectively to impact the correct knowledge to mothers (UNICEF, 2005). A study that investigated the role of social support networks on improving exclusive breastfeeding practices in Kangemi, Nairobi, found that multiple home visits by community health workers (CHWs) can increase exclusive breastfeeding in some settings (Mukuria *et al.*, 2006).

In peri-urban Mexico City in a study done among mothers and infants, where home visits were made during pregnancy and early post-partum by peer counselors, two-thirds (67%) of mothers practiced exclusive breastfeeding. The results demonstrated that early and repeated contact with peer counselors was associated with a significant increase in breastfeeding exclusivity and duration. The two-fold decrease in diarrhoea demonstrates the importance of breastfeeding promotion to infant health (Lancet, 1999). In a study conducted in Dhaka, Bangladesh that looked at effects of community-based peer counseling on exclusive breastfeeding practices, 70% of women in intervention group were exclusively breastfeeding compared to only 6% in the control group (Haider *et al.*, 2000).

Families and communities are indispensable in the support of IYCF. Evidence has shown that mother-to-mother support groups, lay or peer counselors and community-based workers can be very effective in helping mothers to initiate exclusive breastfeeding up to two years and beyond. Building capacity should therefore be an essential element of efforts to improve Infant and Young Child Feeding (WHO, 2003).

2.5.4 National policies and strategies on IYCF

Safe and appropriate infant and young child feeding for the population is protected through implementation of key policy guidance and strong coordination. The Kenya Government through the Ministry of Public Health and Sanitation (MOPHS) has over the past decade taken measures to strengthen and accelerate support for uptake of IYCF practices. Key among these efforts has been enactment of national policies, strategies and legislation that provide a framework for implementation of programmes seeking to improve IYCF practices in the country. The following is a summary of the key initiatives in place to promote, protect and support uptake of optimal IYCF practices in the country.

2.5.4.1 National policy and strategy

The “*Ten Steps to Successful Breastfeeding*” have been incorporated into the National Policy on IYCF. The National Strategy For Maternal, Infant and Young Child Nutrition 2012 – 2017 provides a strong framework for accelerating action to improve IYCF practices that have proven to play a major role in enhancing the health, nutrition, survival and development of infants and young children. The strategy aims at creating an environment that enables mothers, families and other caregivers in all circumstances to make and implement informed choices about optimal feeding practices for infants and young children. Further, it aims at raising awareness of the main problems facing IYCF, identifying approaches to address these and to provide a framework for essential interventions.

The Maternity Protection Act provides the support women need to help them satisfactorily harmonize their productive and reproductive roles. Kenya has made substantial progress in protecting women during maternity and giving them an opportunity to practice exclusive breastfeeding as stipulated in the employment Act Cap 226. The Act provides for a maternity leave of 12 weeks and an annual leave which totals to 132 days (4 months). It also provides for two weeks paternity leave for a male employee whose wife proceeds on maternity leave.

2.5.4.2 Baby-friendly Hospital Initiative (BFHI)

Exclusive breastfeeding is one of the cardinal components of the Baby Friendly Hospital Initiative (BFHI) which aims at protecting, promoting and supporting breastfeeding for optimal maternal and child health. BFHI is part of the 1990 Innocenti Declaration which states that all governments should create an environment enabling women to practice exclusive breastfeeding for the first six months of life and to continue breastfeeding with adequate complementary foods for up to two years (WHO/UNICEF, 1990).

According to WHO (2003), exclusive breastfeeding initiation and duration rates increase when babies are born in Baby-friendly hospitals. Babies born in BFHI-certified facilities were 28% more likely to be exclusively breastfed when compared to babies born at hospitals in the process of becoming BFHI-certified, or those with no efforts towards certification, and experienced a doubling of average EBF duration from six to twelve weeks (WHO, 2003). BFHI-certified maternity facilities where health care providers (HCPs) received additional breastfeeding training beyond the basic course experienced significant increases in rates of exclusive breastfeeding (WHO, 2003). In some countries where the advantages of breastfeeding have been widely publicized and where the Baby-friendly Hospital Initiative has begun in earnest, breastfeeding rates are actually increasing, e.g. Australia, Canada, China, and USA (WHO, 2003).

In Kenya, BFHI was launched in 1992. There is a national BFHI committee and a committee at every certified BFHI hospital. Further, Kenya through the Ministry of Public Health and Sanitation (MOPHS) has developed Baby Friendly Community Initiative Monitoring Tool and Assessment Protocol. In a study conducted by Sheryl and Miriam in Kenya on exploring the impact of BFHI on trends of exclusive breastfeeding, they found that 69% of maternity hospitals had been certified as BFHI by 2006. The revitalization of BFHI in the national strategy on IYCF has played a role in encouraging mothers to exclusively breastfeed their infants for the first six months. Since its inception, there has been a marked improvement in the proportion of exclusively breastfed infants from 13% in 2003 (KDHS, 2002 – 03) to 32% in 2008 (KDHS, 2008 – 09).

2.5.4.3 Code for Marketing and Breast Milk Substitutes

Kenya is a signatory to the global conventions with a commitment to promote, protect and support optimal IYCF (MOPHS, 2013). The country now has a code legislated into law — the Breast Milk Substitutes (Regulation and Control) Act, 2012. This Act provides for appropriate marketing and distribution of breast milk substitutes with a view to provide safe and adequate nutrition for infants through the promotion of breastfeeding and proper use of breast milk substitutes.

2.5.4.4 Training health care providers on IYCF

Informing pregnant women about the benefits of breastfeeding and showing breastfeeding mothers how to practice and maintain breastfeeding are part of the “*Ten Steps To Successful Breastfeeding*” which promote exclusive breastfeeding (McLeod *et al.*, 2002). Upscaling information on the benefits of exclusive breastfeeding requires greater attention to the quality of counseling and support provided to mothers (WHO, 2006). Studies have shown that inadequate training of health workers, particularly infant feeding counselors, about the benefits of exclusive breastfeeding, lack of culturally sensitive counseling tools and stigma associated with replacement feeding, all make appropriate and effective exclusive breastfeeding counseling difficult (Mika, 2011).

Evidence as indicated by Mahrshahi *et al* (2007) showed that, a larger-scale randomized trial — the Promotion of Breastfeeding Intervention Trial (PROBIT) — was a multicentre study conducted in the Republic of Belarus in which the maternity-care centres were allocated to an exclusive breastfeeding intervention or control. In total, 17,046 mother-infant pairs were enrolled, and 16,491 (96.7%) were followed up to the age of one year. Infants from intervention sites were more likely to be exclusively breastfed at three months (43.3% versus 6.4%; $p < 0.001$). In addition, infants from intervention sites had a significant reduction in the risk of gastrointestinal tract infections in the first year (13.2% versus 9.1%; adjusted OR=0.60 [95% CI, 0.40-0.91]) and significant reduction in respiratory tract illness due to exclusive breastfeeding (adjusted OR 0.69 [95% CI 0.54-0.88]).

A study in Zambia found that the knowledge of mothers on breastfeeding benefits improved after integration of the breastfeeding knowledge and information in the MCH services. Health talks on appropriate infant breastfeeding methods in the antenatal clinic and pre-and post-test counseling were done on discharge from maternity units at growth monitoring clinics and outreach programmes (Kuhn *et al.*, 2004).

In Kenya, WHO/UNICEF recommendations on IYCF were adapted into a Kenyan training package. Findings from a study conducted by Thairu *et al* (2005) showed that nurses, midwives, counselors and nutritionists who provided counseling on benefits of exclusive breastfeeding and other infant feeding methods had poor knowledge. In contrast, a study that provided intensive training and support to infant feeding counselors found appropriate breastfeeding choices made by mothers (Kuhn *et al.*, 2004).

2.6 Summary of literature review

Literature reviewed indicates that while exclusive breastfeeding has a substantive known impact on morbidity and mortality of infants, uptake of this practice remains unacceptably low in Kenya. Various factors influencing exclusive breastfeeding rates in different set-ups have been documented. Most studies have focused on knowledge, attitude and practice. Few studies have however investigated factors that enabled some mothers to successfully breastfeed exclusively for six months. This gap has been addressed in this study by conducting an in-depth assessment of factors that have enabled these mothers to breastfeed exclusively for six months.

CHAPTER THREE: METHODOLOGY

3.1 Study area

The study was conducted in Kangemi in the Nairobi West District, Nairobi City County, Kenya. The district covers an area of 359.7 Km² and it is situated between longitude 36° 40" east and 1° 25" South. It borders Kiambu District to the north, Nairobi North to the east, Kajiado District to the south and Nairobi East to the southwest. The District has three administrative units namely: Westlands, Dagoretti and Lang'ata.

The Nairobi West District in which Kangemi is located is a low income area because most of its residents engage in casual labor such as security services, jua kali and small scale businesses. It has 53% of the population in middle jobs, 6% seeking jobs, 33% economically inactive and 8% unclassified according to Kenya Population and Health Census (KPHC, 2009). The District has a manifestation of poverty indicators as follows: absolute poverty 18.3%, contribution to national poverty 21%, food poverty 22%, urban hardcore poverty 3.6% and the average household income per capita is 9,000 shillings (Nairobi West District Development Plan, 2008–2012)

According to KPHC 2009, the Nairobi West population aged three years old and above attending pre-primary was 32,252; primary 111,979; secondary 40,507; tertiary 14,487; university 19,459; youth polytechnics 992; basic literacy institutions 359 and madrassa 210 (KPHC, 2009).

Kangemi location occupies an area of 4.7 Km² and has a density of 17,348/ Km² (KPHC 2009). The location has 26,859 households and a populations of 80,699 people (Males are 41,745 and Females 38,954). It has three sub-locations namely Gichagi (10,164), Kangemi Central (23,142) and Mountain View (8,439). The villages are Marenga, Kang'ora, Gichagi, Machagucha, Rift Valley, Central, Waruku, NITD (Native Industrial Training Depot), Sodom, Watiti, Mountain View and Gathondeki (KPHC, 2009).

Kangemi has 38 registered public and private learning institutions. The public primary schools in the area are Kangemi, Old Kihumbini and New Kihumbini. The only public secondary school is Kangemi High School (KPHC, 2009). The transition rate from

primary to secondary school is 47%, which is less than the national average of 60%. The low transition is due to the high cost of education and limited number of places in secondary schools. About 50% of the children enter the labour market, the informal sector and vocational institutions (Nairobi West Development plan, 2008 – 2012).

Kangemi has one public health facility — Kangemi Health Centre and two major private facilities namely St. Joseph Mission Hospital and Amurt. The five most prevalent diseases in the area are diseases of the respiratory system 30.1%, Malaria 41.7%, diarrhoea 9.3%, skin diseases 4.9%, and intestinal worms 14%. The percentage of births delivered in the area is 30% in hospitals, 13.5% in health centres, 7.9% in dispensaries, 25.6% in maternity homes and 23% at home (Nairobi West Development plan, 2008 – 2012).

Economically, Kangemi area has both formal and informal sectors. Agriculture contributes 8% to the local economy while self-employment accounts for 50%. Wage employment brings in 24% of local incomes and 8% is sourced from other activities. Kangemi market employs the largest population in the informal sector through the selling of groceries, *mitumba* (secondhand clothes) and the *jua kali* sector (Nairobi West Development plan, 2008 – 2012).

3.2 Study design

The study design was a descriptive cross sectional study aimed at establishing breastfeeding practices and related factors among children aged 0 – 6 months in the Kangemi area, Nairobi County. The study was complemented by a qualitative part including FGDs, key informant interviews and the case studies of five mothers who had successfully exclusively breastfed for six months.

3.3 Study population

The study population consisted of mother-infant pairs for infants aged 0 – 6 months residing within the study area.

3.3.1 Inclusion criteria

Mother-infant pairs who had infants aged 0 – 6months, resided in the study area and consented to participate were included in the study.

3.3.2 Exclusion criteria

The study excluded mother-infant pairs where the infants were twins, and those who were sick. Those who did not consent to participate in the study were also excluded.

3.4 Sample size determination

The sample size was determined based on the Kenyan national prevalence of exclusive breastfeeding of 32% (KDHS, 2008 – 09) and a level precision at 95% level of confidence.

Using the formula by Fisher *et al* (1991), a sample size of 334 was determined:

$$n = \frac{z^2 pq}{d^2}$$

Where:

n = Desired sample size/Minimal sample size

z = Standard normal deviate of 1.96 which corresponds to 95% confidence level

p = Prevalence of characteristic being estimated infants aged 0 – 6 months which is

0.32 (32%), (KDHS, 2008/9)

q = 1-p, expected proportion of mothers with infants aged 0 – 6 months not breastfeeding exclusively (1-0.32 = 0.68)

d = Acceptable error (precisión) of ± 0.05

$$\begin{aligned} n &= \frac{1.96^2 \times 0.32 \times 0.68}{0.05^2} \\ &= 334 \end{aligned}$$

3.5 Sampling procedure

A sampling frame was constructed by carrying out a census on eligible households (households with mother-infant pairs) in the study area. The ten villages of Kangemi,

namely Marenga, Kang’ora, Machagucha, Gichagi, Rift Valley, Central, Waruku, NITD, Sodom and Watiti were used as clusters for sampling purposes, where sampling with probability proportional to size (PPS) was used to get number of households per village based on population of each village. With the total number of households with mother-infant pairs for infants aged 0 – 6 months being $N = 2038$, the minimum sample size being $n = 334$, a multiplier $k = N/n = 0.164$ was applied to determine the number of households for each cluster as shown in Table 3.1 below.

Table 3.1: Number of respondents sampled in each village

Village	Name of village	Number of households	Number of respondents
1	Marenga	238	39
2	Kang’ora	142	23
3	Machagucha	120	20
4	Gichagi	230	38
5	Rift valley	250	41
6	Central	259	42
7	Waruku	117	19
8	NITD	134	22
9	Sodom	255	42
10	Watiti	293	48
Total	10	2038	334

With the aid of Community Owned Resource Persons (CORPs), the study team selected the households with infants aged 0 – 6 months using an Excel generated set of random numbers. The respondent was the biological mother/father who answered questions with respect to the questionnaire and the answers recorded while still in the household. Mothers with infants aged 0 – 6 months residing in the 10 villages above were interviewed until the desired number of mother infant pairs was achieved for each cluster. A similar process continued in the subsequent villages/clusters until the desired number of subjects intended for the study from all the ten villages/clusters was attained.

3.6 Data collection tools and methods

3.6.1 Preparation

Permission was obtained from the area provincial administration through the District Officer (D.O.) in Kangemi. Permission was also obtained from the District Medical Officer of Health Westlands because health care providers from Kangemi Health centre were included in the study.

3.6.2 Data collection

The study was conducted over a period of two months (March and April, 2012). Data was collected using a semi-structured questionnaire, anthropometric measurements, informal group discussions and key informant interviews with health care providers. Case studies of mothers who had breastfed exclusively for six months were done within the community. Discussion guidelines were developed and used for the informal group discussions and key informant interviews (Appendices 3 and 4 respectively).

3.6.3 Questionnaire

A semi-structured pretested questionnaire was used to gather information on socio-demographic characteristics, knowledge and source of information on exclusive breastfeeding, factors influencing exclusive breastfeeding, and socio-cultural practices, beliefs and other factors associated with exclusive breastfeeding. It was organized into five sections:

- i. Socio-demographic information of the mother and household.
- ii. Infant feeding practices.
- iii. Factors influencing infant feeding practices.
- iv. Immunization, growth and morbidity of index child.
- v. Anthropometric measurement of the index child (weight and recumbent length).

The respondent was the biological mother who answered questions as per the questionnaire and answers recorded.

3.6.4 Anthropometric measurements

Anthropometric measurements of weight and height of the index child were taken based on guidelines by Bruce (2001). This was done after administering the questionnaire. To ensure accuracy of measurements, they were taken by a team of research assistants who had previous experience in taking anthropometric measurements.

3.6.4.1 Protocol of taking weight

The weight was taken using a Seca weighing balance. The child was weighed with minimum clothing. The following procedure was used:

- The research assistant placed the scale on an even surface.
- The research assistant took the baby and then requested the mother to remove heavy outer clothing (such as coats and jackets) and any other heavy content.
- The measurer asked her to stand in the middle of the scale with feet slightly apart and the body weight distributed equally on both feet.
- The measurer adjusted the scale to zero
- The research assistant gave the baby to the mother.
- The measurer took the reading to the nearest 0.5 Kg.
- After the measurement was taken, the mother stepped off the scale.

3.6.4.2 Protocol for taking length

Standard Measuring board for taking the length/heights of children was used.

The measuring board was placed on a hard surface like the floor or a steady table.

- The research assistant knelt on both knees behind the base of the board; the measurer also knelt on the right side of the child to be able to hold the foot piece with the hand.
- With the mother's help, the child was laid on the board by supporting the back of the child's head with one hand and the trunk of the body with the other hand and gradually lowering the child on the board.
- The mother knelt on the opposite side of the measurer in order to keep the child calm. The assistant cupped his hands over the child's ears with the arms comfortably straight to place the child's head against the base of the board and the heels firmly on the foot piece.

- The measurer ensured the child was lying straight on the board and the heels were firmly on the foot piece.
- The measurer took the reading to the nearest 0.1 cm.
- The steps were repeated and a second reading was taken.

3.6.5 Focus Group Discussions

Three focus group discussions (FGDs) were conducted on separate days with 10 participants in each group at the health facility (in the Kangemi Health Centre hall — used for trainings and meetings). One was done with pregnant mothers during their Ante Natal Clinic (ANC) visits, another with mothers of infants 0 – 6 months at Mother and Child Health (MCH) clinics and lastly at labour wards. The participants were informed of the study and then invited to participate. Written consent was obtained from the participants. FGDs enabled exploration of factors influencing the practice of exclusive breastfeeding and were useful in verifying information collected by the questionnaires. Using a prepared guide (appendix), probing was done on factors influencing the practice of exclusive breastfeeding. This assisted in identifying factors that influence infant feeding practices in the study area. The discussions were facilitated by the principal researcher as an assistant recorded the responses.

3.6.6 Key Informant Interviews

Discussions were held with five Health Care Providers (HCPs). These were: the Nursing Officer-in-Charge of the facility, the Nutritionist-in-Charge, the nutritionist in MCH, nursing officers-in-charge of the labour ward and MCH. Each of these participants was interviewed individually to investigate facility level initiatives in place to support IYCF.

3.6.7 Case studies

The community health workers (CHWs) identified five mothers in the community who had practiced exclusive breastfeeding for six months (normal deviants) as case studies. The principal investigator conducted interviews with each of the mothers separately. Fac-

tors that had contributed to successful exclusive breastfeeding were discussed with the aid of a discussion guide (Appendix 2).

3.7 Data Quality control

3.7.1 Training of data collection team

The data collection team comprised of four research assistants who were university graduates. They were degree holders of Bachelor of Science in Foods, Nutrition and Dietetics. The study team was recruited based on the experience they had in conducting similar research. A two-day training was conducted by the principal investigator. The training focused on administration of questionnaires, interviewing techniques and taking anthropometric measurements.

3.7.2 Pre-testing of questionnaires

The pre-testing of questionnaires was conducted over a period of three days in Makina village, Kibera slum of Nairobi. A total of 20 households were covered with each research assistant covering five households. The principal investigator and the data collection team conducted the pre-test. This was done to impart practical experience to the team in administering questionnaires and taking anthropometric measurements. Any ambiguities were noted and necessary corrections done in the process of the finalization of questionnaires and procedures after pre-test. The research assistants were retrained after the pretesting of the questionnaires for one day before actual data collection commenced.

3.7.3 Reliability and validity

Quality of data collected was ensured through close supervision of the data collection team daily by the principal researcher. Completed questionnaires were reviewed daily for inconsistent or incomplete responses and corrected before transportation to the office for data entry. Sets of data were entered onto an excel spreadsheet. Data was entered using the Statistical Products and Service Solution (SPSS) Data entry module version 3.0 software which has an inbuilt verification ability to check for range and logistical errors.

Double data entry was done to confirm clean and verified data. WHO Anthro-program software was used to generate z-score values for nutritional indicators (height/age,

weight/age and weight/height) from the raw anthropometric data. They were compared with WHO reference standards. Children were then stratified according to their nutritional status. Nutritional status data is presented using z-score with cut-off point of -3SD for severe malnutrition and -2SD for moderate malnutrition.

3.8 Data analysis

The data was processed and analysed using SPSS version 17.0. Descriptive statistics were summarized in the form of tables and charts. The dependent variable (outcome variable) was exclusive breastfeeding while predictor variables were maternal factors, health facility factors, and social support systems. The associations between exclusive breastfeeding and morbidity patterns and nutritional status were investigated using the Chi-square test at significance level of 0.05. Logistic regression analysis was then performed to identify predictors of exclusive breastfeeding and to control for confounding factors. Data recorded from informal discussion groups and key informant interviews was analyzed based on Atlas-Ti program where information from the discussions was transcribed and key themes noted down. These were then used to support findings from the quantitative analysis.

3.9 Ethical considerations

Approval to carry out the study was obtained from the KNH/UoN Ethics and Research Committee. Permission to collect data was also obtained from the District Commissioner Westlands District and from the District Medical Officer of Health (DMOH) in charge of all the public health facilities in the District and the facility-in -charge of Kangemi Health Centre. Written consent to participate in the study was sought from the respondents before administering questionnaires. Research assistants explained to the respondents the purpose of the research and that the information obtained would be kept confidential and was to be used for research purposes only. The respondents signed the consent forms before the questionnaires were administered.

CHAPTER FOUR: THE RESULTS

4.1 Introduction

This chapter presents the study findings in line with the objectives. Descriptive findings on socio-demographic characteristics of the study households, breastfeeding practices, complementary feeding and reasons, child feeding, immunization and child growth, nutritional status of infants studied and child morbidity status. These are followed by inferential statistics on factors influencing exclusive breastfeeding practices. Findings from both qualitative and quantitative methods are integrated.

4.2 Background characteristics

4.2.1 Socio-economic and demographic characteristics of the mothers

A total of 332 mothers with infants aged 0 – 6 months living in Kangemi were interviewed. As shown in Table 4.1, more than a half of these mothers (55.8%) were of age 25 years or younger and nearly a half (44.2%) over 25 years old. The mean age (\pm SD) of the mothers was 25 ± 4.4 years. Nearly all the mothers (93.1%) were married while 6.9% were single, separated, divorced or widowed. Almost all the mothers (99.4%) were Christians. Two-thirds (66.3%) of the households had four members or less. Less than half (46.7%) of the mothers had primary level education while (40.7%) had completed secondary education. Over a half (54.1%) of the fathers to the index child attained secondary education. Nearly all of the fathers (92.5%) were the main income earners in the household. More than two-thirds (74.2%) of the mothers were housewives, 7.9% were formally employed, another 7.9% were informally employed, and 14.8% self-employed. Over a half (56.8%) of the fathers were employed in the formal sector, 26.8% were informally employed while 14.8% were self-employed. The majority (44.9%) of households had an average monthly income from all sources of above Kenya shillings (KES) 10,000 (US \$ 125).

Table 4.1: Socio-economic and demographic characteristics

Characteristic	Frequency	Percent (%)
Age of mother		
≤ 25 years	184	55.8
> 25 years	146	44.2
Marital status		
Living in union	309	93.1
Not living in union	23	6.9
Religion of mother		
Christian	330	99.4
Muslim	2	0.6
Household size		
≤ 4 members	220	66.3
≥ 5 members	112	33.7
Highest education level of mother		
No education	4	1.2
Primary	155	46.7
Secondary	135	40.7
College/tertiary	38	11.4
Highest education level of father		
Primary	89	28.3
Secondary	170	54.1
College/tertiary	55	17.5
Occupation of mother		
Formal employment	26	7.9
Informal employment	26	7.9
Self-employment	33	10
Housewife	244	74.2
Occupation of father		
Formal employment	180	56.8
Informal employment	85	26.8
Self-employment	47	14.8
None	5	1.6
*Monthly household income		
< KES 2 500	5	1.5
KES 2 501-5 000	48	14.5
KES 5 001-10 000	130	39.2
> KES 10 000	149	44.9

*Monthly household income: < KES 2 500 (US \$ 31), KES 2 501– 5 000 (US \$ 31– 62), KES 5 001 – 10 000 (US \$ 63 – 125), > KES 10 000 (US \$ 125).

4.2.2 Characteristics of study children

Information regarding infants was obtained from mothers and a review of the child's health card. Over a half (52.7%) of the infants were girls while (47.3%) were boys. The mean age (\pm SD) of index children was 3 ± 1.8 months. Nearly a third (32.5%) of the infants were aged 3 – 4 months, 30.7% were aged 1– 2 months, 26.8% were aged 5 – 6 months and 9.3% less than one month old. Most of the infants (74.1%) were either first or second borns.

Table 4.2: Characteristics of study infants

Characteristic	Frequency	Percent (%)
Sex of child		
Male	157	47.3
Female	175	52.7
Birth order		
1 st born	121	36.6
2 nd born	124	37.5
3 rd born and above	86	26
Age of child		
< 1 month	33	9.9
1-2 months	102	30.7
3-4 months	108	32.5
5-6 months	89	26.8

4.3 Breastfeeding practices

4.3.1 Prevalence of exclusive breastfeeding

The study findings showed that overall, almost a half of the mothers (45.5%) were exclusively breastfeeding their infants at the time of the study. The median duration of exclusive breastfeeding was two months. Analysis of breastfeeding by age group however showed a decrease in exclusive breastfeeding rates. It was highest (78.8%) for infants below one month and lowest (19.1%) for those aged 5 – 6 months (Figure 4.1).

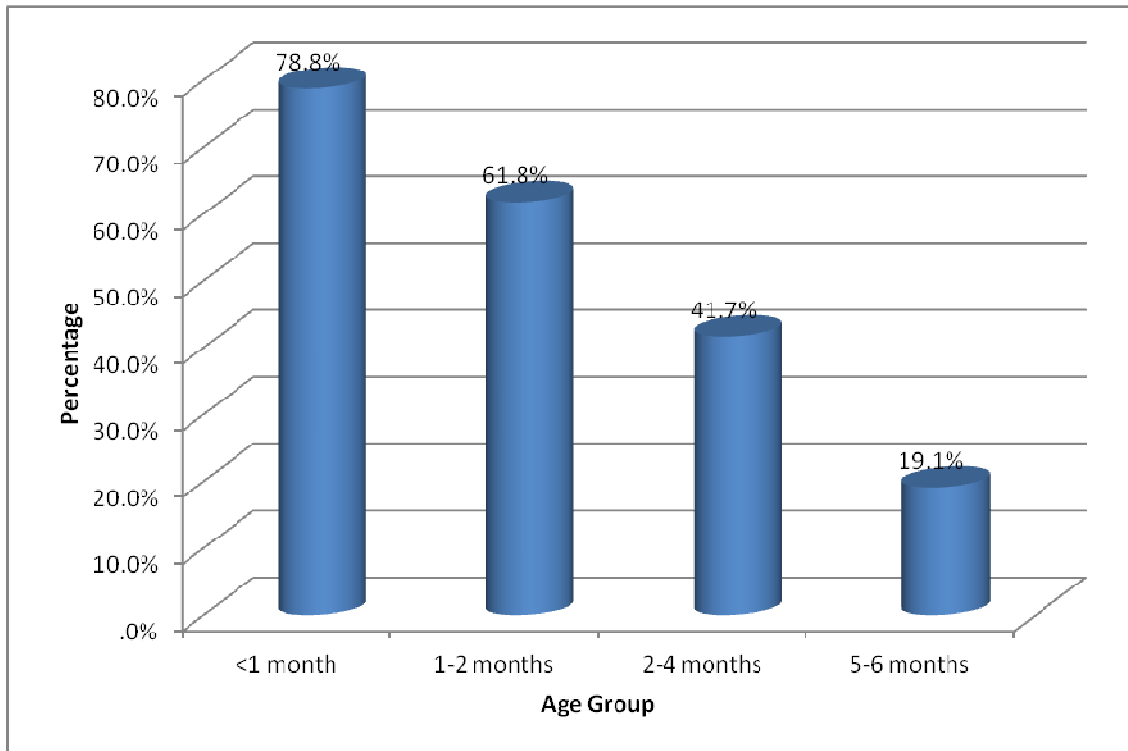


Figure 4.1: Distribution of study infants by exclusive breast feeding

4.3.2 Initiation of breastfeeding

Early initiation ensures that infants receive colostrum which is rich in vitamin A, antibodies, growth factors and antimicrobial factors. The antibodies in colostrum provide passive immunity, while growth factors stimulate the development of the gut. These are passed to the neonate and provide the first protection against infections. Early breastfeeding, if accompanied by maternal-infant skin-to-skin contact, stabilizes the baby's temperature, respiratory rate, and blood sugar level.

Findings in this study showed that over two-thirds (70.8%) initiated within one hour after birth while 21% began breastfeeding later than one hour after delivery. Almost all mothers (97.3%) reported that they had fed their infants colostrum.

4.3.3 Prelacteal feeds

Early initiation of breastfeeding protects the newborn from pre-lacteal feeding practices which deprive the infant of the important immune-protective properties of colostrum. Prelacteal feeds interfere with the establishment of breastfeeding and increase the risk of infection. Majority of the respondents (92.8%) had not given prelacteal feeds. Of those infants who were given prelacteal feeds, about one third (29.2%) were given plain water, 20.8% salty water and a small proportion (8.3%) was given sugar/glucose water. Asked why they gave these prelacteal feeds, a third of the mothers (33%) cited inadequate breast milk as the cause, 16.7% of mothers said that they did so because the baby was crying, 8.3% said that they were advised by a health worker while a small proportion (4.2%) cited traditional beliefs.

4.3.4 Frequency of breastfeeding

Optimal breastfeeding practices include breastfeeding on demand. This entails watching for the cues of hunger from the baby (such as sucking on hands) rather than according to a set schedule. Findings showed that a high proportion of mothers (93.4%) breastfed their infants on demand, while a small proportion (6%) followed a schedule. Over two-thirds of mothers (68.4%) breastfed their infants more than eight times, 24.4% six to eight times, 6.3% three to five times and 0.9% once or twice per day.

4.4 Factors influencing exclusive breastfeeding

This study considered exclusive breastfeeding as the outcome variable in relation to other predictor variables which were grouped into maternal factors, socio-demographic factors and social support factors.

4.4.1 Maternal factors

A chi-square test was utilized to assess the relationship between exclusive breastfeeding and selected maternal factors which included; the mother's occupation, attendance of antenatal clinic (ANC), gestational age at first ANC attendance, number of ANC visits, number of times counseled on infant feeding, the mother's knowledge on recommended introduction of complementary feeds, birth spacing of the index child with the previous child, for those infants who were not firstborns and the birth order.

Table 4.3: Maternal factors influencing breastfeeding

Variable	EBF (n=151) Number (%)	Not EBF (n=181) Number (%)	Statistical test
Occupation of mother			
Formal	11 (7.3)	15 (8.4)	$\chi^2=1.318$, 3df, p=0.725
Informal/casual	11 (7.3)	15 (8.4)	
Self-employment	18 (12)	15 (8.4)	
Housewife	110 (73.3)	134 (74.9)	
Attendance of ANC			
Yes	151 (100)	178 (98.9)	$\chi^2=1.688$, 1df, p=0.502
No	0	2 (1.1)	
Gestation at 1st ANC			
≤ 3 months	21 (14.6)	15 (8.6)	$\chi^2=4.643$, 4df, p=0.321
4 months	25 (17.4)	31 (17.7)	
5 months	35 (24.3)	40 (22.9)	
6 months	34 (23.6)	56 (32)	
> 6 months	29 (20.1)	33 (18.9)	
Birth spacing with previous child			
0 (first born)	51 (34.2)	69 (38.5)	$\chi^2=0.684$, 2df, p=0.711
≤ 24 months	16 (10.7)	17 (9.5)	
>24 months	82 (55)	93 (52)	
Times ANC visits			
1-2 times	21 (13.9)	30 (16.9)	$\chi^2=1.886$, 2df, p=0.389
3-4 times	109 (72.2)	116 (65.2)	
>4 times	21 (13.9)	32 (18)	
Counseled on infant feeding			
None	47 (31.1)	52 (29.5)	$\chi^2=1.981$, 3df, p=0.576
Once	53 (35.1)	73 (41.5)	
2-3 times	39 (25.8)	36 (20.5)	
>3 times	12 (7.9)	15 (8.5)	
Birth order			
1 st born	52 (34.7)	69 (38.1)	$\chi^2=0.699$, 2df, p=0.705
2 nd born	56 (37.3)	68 (37.6)	
At least 3 rd born	42 (28)	44 (24.3)	
Mother's knowledge on age at start of complementary feeding			
< 4 months	19 (12.6)	34 (19)	$\chi^2=2.665$, 2df, p=0.264
4-6 months	94 (62.3)	100 (55.9)	
> 6 months	38 (25.2)	45 (25.1)	

The Chi-square test showed no association between exclusive breastfeeding and maternal factors. However, findings from FGDs with mothers who attended ANC and MCH clinics showed that the mother's occupation, health and nutrition status, breast problems and her beliefs were factors likely to influence breast feeding.

4.4.2 Socio-demographic factors

The relationship between exclusive breastfeeding and selected socio-demographic factors was determined using a chi-square test. Factors assessed included the age of mother and that of the index child, marital status, household size, education level of the mother and father to the index child, the occupation of the mother and father to the index child, and the average monthly household income from all sources as shown in Table 4.4.

Table 4.4: Socio-demographic factors and breastfeeding

Variable	EBF (n=151) Number (%)	Not EBF (n=181) Number (%)	Statistical test
Age of mother			
≤ 25 years	84 (55.6)	100 (55.9)	$\chi^2=0.002$, 1df, p=0.966
>25 years	67 (44.4)	79 (44.1)	
Age of index child			
< 1 month	26 (17.2)	7(3.9)	$\chi^2=51.283$, 3df, p=0.000
1-2 months	63(41.7)	39 (21.5)	
3-4 months	45 (29.8)	63(34.8)	
5-6 months	17 (11.3)	72 (39.8)	
Marital status			
Living in union	143 (94.7)	166 (91.7)	$\chi^2=1.141$, 1df, p=0.285
Not living in union	8 (5.3)	15 (8.3)	
Household size			
≤ 4 members	97 (64.2)	123 (55.9)	$\chi^2=0.509$, 1df, p=0.476
≥ 5 members	54 (48.2)	58 (32)	
Mother's education			
No education	2 (1.3)	2 (1.1)	$\chi^2=4.010$, 3df, p=0.260
Primary	62 (41.1)	93 (51.4)	
Secondary	66 (43.7)	69 (38.1)	
College/tertiary	21 (13.9)	17 (9.4)	
Father's education			
Primary	37 (25.3)	52 (31)	$\chi^2=1.252$, 2df, p=0.535
Secondary	83 (56.8)	87 (51.8)	
College/tertiary	26 (17.8)	29 (17.3)	

Main income earner			
Father	142 (94)	165 (91.2)	$\chi^2=1.594$, 2df, $p=0.453$
Mother	3 (2)	8 (4.4)	
Other	6 (4)	8 (4.4)	
Occupation of mother			
Formal	11 (7.3)	15 (8.4)	$\chi^2=1.318$, 3df, $p=0.725$
Informal/casual	11 (7.3)	15 (8.4)	
Self-employment	18 (12)	15 (8.4)	
Housewife	110 (73.3)	134 (74.9)	
Occupation of father			
Formal	90 (61.2)	90 (52.9)	$\chi^2=2.476$, 3df, $p=0.480$
Informal/casual	34 (23.1)	51 (30)	
Self-employment	21 (14.3)	26 (15.3)	
None	2 (1.4)	3 (1.8)	
Monthly household income			
< KES 2500	2 (1.3)	3 (1.7)	$\chi^2=1.216$, 3df, $p=0.749$
KES 2501-5000	19 (12.6)	29 (16)	
KES 5001-10000	63 (41.7)	67 (37)	
> KES 10000	67 (44.4)	82 (45.3)	

The chi-square test showed that the age of study infants was significantly associated with exclusive breastfeeding ($\chi^2=51.283$, 3df, $p=0.000$). Other socio-demographic factors such as the age of the mother, the marital status, household size, highest education level of the mother and father, the main income earner in the household, occupation of both mother and father and monthly household income had no influence on duration of exclusive breastfeeding.

4.4.3 Social support factors

The majority 273 (83%) of the mothers reported having received support from health workers who provided information on infant and young child feeding practices. Others mentioned were the husband, eight (2.4%), friends, 86 (26.1%), mothers-in-law, 40 (12.2%), neighbours, 38 (11.6%), community health workers 12, (3.6%) and social support groups, one (0.3%). Among these categories, mothers-in-law significantly ($\chi^2=6.660$, 1df, $p=0.010$) influenced the practice of exclusive breastfeeding positively.

Some mothers received information on infant and young child feeding practices by reading pamphlets 12 (3.6%), and through media such as radio 34 (10.3%), television 10 (3%) and newspapers 5 (1.5%).

Findings from FGDs conducted with mothers attending ANC and MCH clinics showed that some husbands and mothers-in-law encouraged mothers to breastfeed exclusively. Participants reported that HCPs supported the practice of exclusive breastfeeding through giving health talks and advice during clinic visits. On the other hand, friends and neighbours were reported to discourage mothers from exclusive breastfeeding citing traditions and cultural beliefs. Further, participants reported that there was no specific support group on breastfeeding apart from mother-to-mother mentors, under the APHIA plus organization, who advise on exclusive breastfeeding for mothers with HIV and AIDS among other things.

4.4.4 Health facility factors

Information on health facility factors known to influence IYCF practices was obtained through key informant interviews with health care providers. It was found that Kangemi Health Centre provides health services to many residents in the area. It was observed that the infant and young child feeding policy that incorporates the “*Ten Steps to Successful Breastfeeding*” was displayed in the MCH clinic and maternity. The guidelines were written in English. Further, a self-assessment tool on the Baby Friendly Hospital Initiative existed in the facility. It was reported that a total of eight (32%) out of the 25 HCPs at the facility had received the six-day training on IYCF and the Baby Friendly Hospital Initiative. These were: seven nurses out of 25 from the maternity wing and MCH as well as the nutritionist. It was reported that health care providers working in the MCH were usually oriented to the infant and young child feeding policy before starting work in departments offering services on infant and young child feeding. It was also reported that nurses and the nutritionist assisted mothers to initiate breastfeeding within an hour after delivery. These health care providers underwent training on lactation management (positioning and attachment skills).

4.4.5 Independent determinants of exclusive breastfeeding

Logistic regression was performed to identify the independent determinants of exclusive breastfeeding. All predictor variables analyzed by chi-square test were used as predictors

in the logistic model. These included maternal factors, infant factors, socio-demographic factors and social support factors. Two logistic regression models were performed; one for all study children and a second one for children aged one month only.

Table 4.5: Results of logistic regression analysis for all infants in the study

Variable	β	Wald's statistic	d.f	p-value	OR
Age of infant	-5.528	29.806	1	0.000	0.575
Sex	0.132	0.151	1	0.698	2.224
Household size	0.850	0.310	1	0.578	1.467
Children under 5	-0.170	0.178	1	0.673	1.860
Mothers age	0.012	0.501	1	0.821	1.118
Mothers education	-0.318	0.663	1	0.160	1.565
Father's education	-0.450	1.109	1	0.292	1.473
Father's occupation	0.483	1.828	1	0.176	3.261
Household income	0.817	4.178	1	0.003	4.731
Counseled on IYCF	-0.806	0.049	1	0.825	1.967
Diarrhoea last 2 weeks	-0.180	0.179		1	0.672
WAZ	0.19	0.021	1	0.884	1.320

Results from logistic regression analysis performed showed that younger children were more likely to be exclusively breastfed ($p=0.000$, $OR=0.575$). Further, mothers from households with high monthly income were more likely to practice exclusive breastfeeding ($p=0.003$, $OR=4.731$). All the other variables were not significantly associated with exclusive breastfeeding.

Table 4.6: Results of regression analysis for infants aged one month

Variable	β	Wald's statistic	d.f	p-value	OR
Sex	-0.767	0.392	1	0.531	0.464
Birth spacing	-0.064	4.404	1	0.036	0.938
Household size	-1.635	5.938	1	0.015	0.195
Children under 5	0.529	0.235	1	0.628	1.697
Mothers age	0.057	0.147	1	0.702	1.058
Mothers education	-0.274	0.063	1	0.802	0.760
Father's education	2.961	5.482	1	0.034	19.324
Father's occupation	-1.712	2.160	1	0.142	0.180
Household income	-2.020	2.824	1	0.093	0.133
Counseled on IYCF	0.846	0.605	1	0.437	2.330
Diarrhoea last 2 weeks	0.110	0.006		1	0.939
1.116					
WAZ	0.260	0.500	1	0.840	1.297

Logistic regression analysis performed for children aged one month showed that the education level of the father had a positive relationship with breastfeeding ($p=0.034$, $OR=19.324$). Household size and birth spacing were inversely related to the practice of exclusive breastfeeding ($p=0.015$, $OR=0.195$ and $p=0.036$, $OR=0.938$ respectively). However, all the other variables had no significant relationship with exclusive breastfeeding.

4.5 Supplementation of breast milk with other feeds/fluids

More than a half (54.5%) of mothers had introduced other feeds/fluids apart from breast milk to their infants at the time of the study. Analysis of feeding practice by age showed that introduction of other feeds and fluids increased steadily with the age of the infants where it was lowest (3.9%) at less than one month and highest (39.8%) among infants aged 5 – 6 months as shown in Figure 4.2.

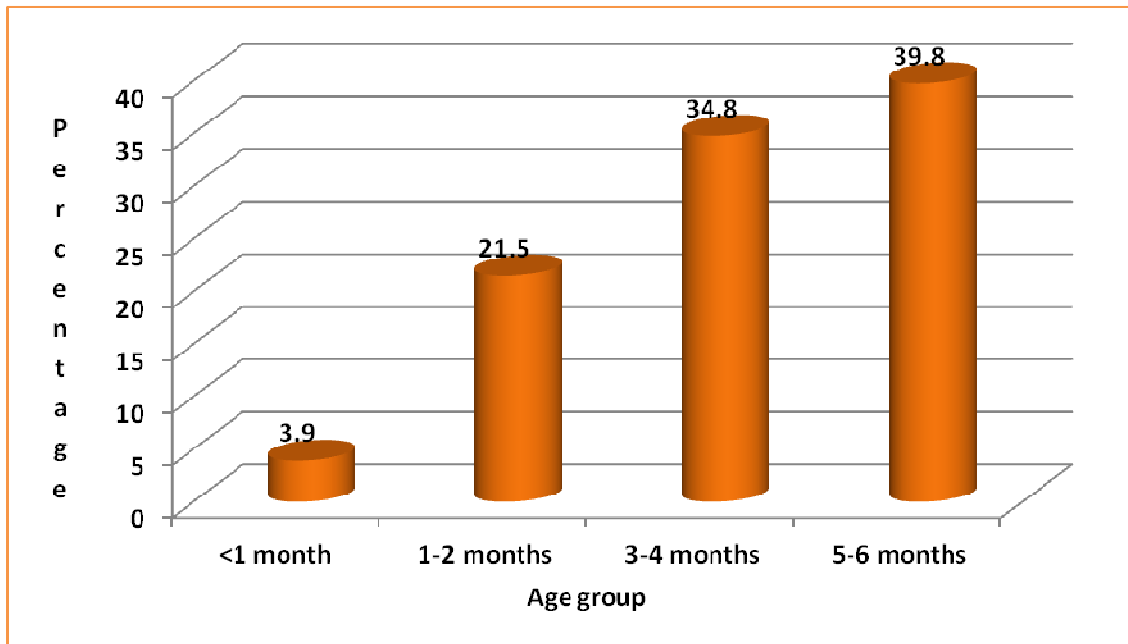


Figure 4.2: Introduction of supplementary feeds

Among mothers who supplemented breast milk with other foods/fluids before six months, child crying (36.5%) and child thirsty/unsatisfied (34.5%) were the main reasons given by mothers. Other reasons given included: personal preference (15.5%), child unwell (10.5%), breast/nipple difficulty (2.8%), advised by health worker (3.3%), infant old enough to start on other foods/fluids (5.5%), child separated from mother (5%), traditional practice (3.9%) and mother unwell (1.7%).

4.6 Child feeding based on 24-hour recall

In the 24 hours prior to the study, almost all (99.1%) of the mothers reported having breastfed the infants. In addition, close to a half (44.2%) had given the infant plain water, over a third (35.4%) porridge, 9.4% sugar water, 4.4% fresh animal milk, 2.7% tinned/powdered milk. The remaining proportion (15.2%) gave salt plus sugar water and gripe water.

Table 4.7: Child feeding based on 24-hour recall

Food/liquid consumed	Frequency	Percent (%)
Plain water	80	24.2
Sugar/glucose water	17	5.2
Fresh animal milk	8	2.4
Tinned/powdered milk	5	1.5
Cow's milk	6	1.8
Porridge	64	19.4
Breast milk	327	99.1
Other	50	15.2

4.7 Immunization and child growth

Information obtained from child health cards indicated that almost all study infants (93.3%) had completed the immunization schedule. However, 4.5% had incomplete immunization for their age and 2.1% had not been immunized.

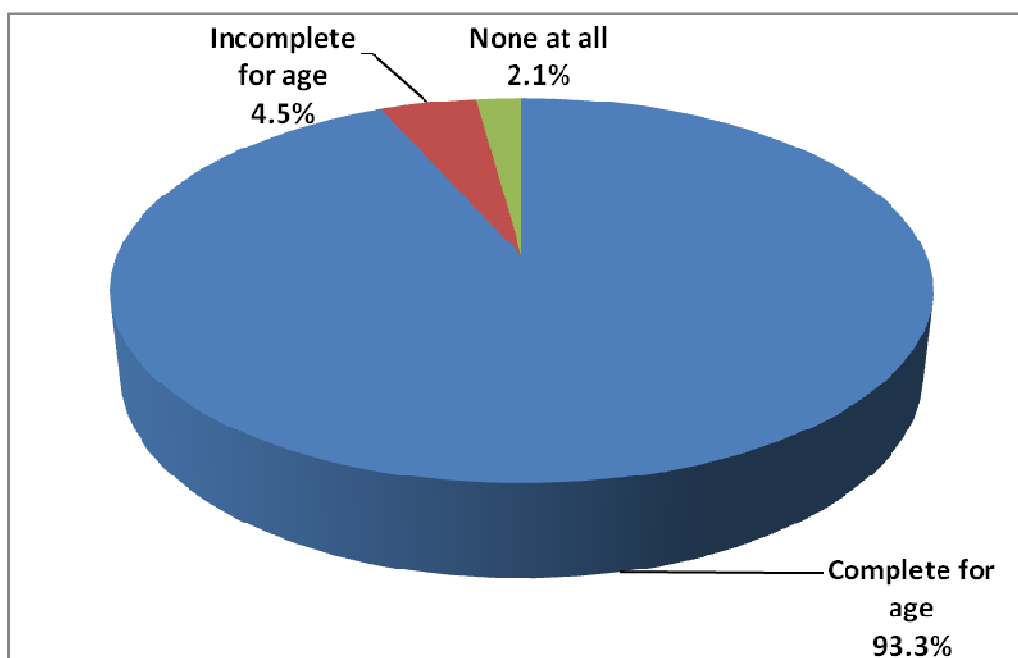


Figure 4.3: Immunization status of study infants

Nearly all the mothers in the study (94%) reported taking their infants to the clinic for growth monitoring regularly, 4% said they did so sometimes while 1.9% never took their children for weighing. Of those infants whose growth was monitored for the previous three months, majority (73.1%) had good weight gain while a low proportion (0.6%) had lost weight. About one quarter (26.3%) of the infants had no change in weight.

Table 4.8: Growth monitoring of study infants

Variable	Frequency	Percent (%)
Child taken to clinic		
Always	302	94.1
Sometimes	13	4
Never	6	1.9
Growth pattern		
Good weight gain	239	73.1
Weight loss	2	0.6
No change	86	26.3

The study findings showed that almost two-thirds (63.8%) of infants who were exclusively breastfed had good weight gain and only one (0.6%) was found to have lost weight. Among those not exclusively breastfed, more than two-thirds (80.9%) had good weight gain and similarly only one (0.6%) had lost weight.

Table 4.9: Growth pattern and exclusive breast feeding

Growth pattern	<u>EBF</u>	<u>Not EBF</u>	Statistical test
	No (%)	No (%)	
Good weight gain	95 (63.8)	144 (80.9)	$\chi^2=12.221$, 2df, $p=0.002$
Weight loss	1 (0.6)	1 (0.6)	
Other	53 (35.6)	33 (18.5)	

A chi-square analysis showed that the pattern of growth was significantly associated with exclusive breastfeeding ($\chi^2=12.221$, 2df, $p=0.002$).

4.8 Nutritional status of infants

The nutritional status of infants was assessed using the indicators of weight-for-height/length, height-for-age and weight-for-age. The weight-for-height/length index measures body mass in relation to body height or length and describes current nutritional status. Infants whose z-scores were less than -2 SD were considered wasted and those with less than -3 SD severely wasted. The height-for-age index is an indicator of linear growth retardation and cumulative growth deficits. Infants who had height-for-age z-score below -2 SD were considered stunted and those with -3 SD severely stunted. Weight-for-age is a composite index of height-for-age and weight-for-height. It takes into account both acute and chronic malnutrition. Infants with weight-for-age z-score below -2 SD were classified as underweight while those with less than -3 SD were considered severely underweight.

Table 4.10 presents the nutritional status of infants as measured by weight-for-length (wasting), Length-for-age (stunting) and weight-for-age (underweight). The study findings indicated that 3.1% of infants were wasted while 3.4% were severely wasted. Findings showed that 8.7% of infants were stunted and 3.3% severely stunted. Further, it was found that 4.8% of infants were underweight while 1.2% were severely underweight.

Table 4.10: Nutritional status of infants

Nutritional status indicator:	Normal	<-2SD	<-3SD
	Number (%)	Number (%)	Number (%)
Weight-for-length	306 (93.6)	10 (3.1)	11 (3.4)
Length-for-age	292 (88.0)	31 (8.7)	11 (3.3)
Weight-for-age	312 (93.9)	15 (4.8)	4 (1.2)

Table 4.11 shows the relationship between exclusive breastfeeding and nutritional indicators namely; weight-for-length, height-for-age and weight-for-age.

Table 4.11: Nutritional status and breast feeding

Variable	EBF (n=151) Number (%)	Not EBF (n=181) Number (%)	Statistical test
Weight-for-length			
<-3 SD	3 (2)	8 (4.4)	$\chi^2=1.520$, 2df, p=0.468
<-2 SD	5 (3.4)	5 (2.8)	
\geq -2 SD	139 (94.6)	167 (92.8)	
Length-for-age			
<-3 SD	9 (6)	2 (1.1)	$\chi^2=6.131$, 2df, p=0.047
<-2 SD	13 (8.6)	18 (9.9)	
\geq -2 SD	129 (85.4)	161 (89)	
Weight-for-age			
<-3 SD	2 (1.3)	2 (1.1)	$\chi^2=0.220$, 2df, p=0.896
<-2 SD	6 (4)	9 (5)	
\geq -2 SD	143 (94.7)	170 (93.9)	

Analysis using the chi-square test showed no association between exclusive breastfeeding with wasting (Weight-for-length) and underweight (Weight-for-age). However, stunting (Length-for-age) was significantly associated with exclusive breastfeeding ($\chi^2=6.131$, 2df, p=0.047).

4.9 Child morbidity status

Assessment of the morbidity status focused on diarrhoea and acute respiratory infection two weeks prior to the study (Table 4.12). Findings showed that 22.1% of infants studied had diarrhoea two weeks prior to the study. Of these, the majority (25%) had diarrhoea for two days, 22% for three days and 15% for a week within the two weeks prior to the study. Further, it was reported that 1.2% of infants had blood in their stool. Slightly over a third (36%) of the children had experienced difficulty in breathing two weeks prior to the study. The difficulty in breathing had been experienced by 17%, 21% and 20% for two days, three days and one week respectively. Among those who experienced difficulty

in breathing, mothers attributed the difficulty to blocked nose (55.3%), coughing (23%) and noisy breathing (14.5%).

Table 4.12: Reported morbidity status two weeks prior to study

Condition	<u>Yes</u>	<u>NO</u>	Total
	No (%)	No (%)	
Diarrhoea	73 (22.1)	258 (77.9)	331
Blood in stool	4 (1.2)	326 (98.8)	330
Difficulty in breathing	119 (36)	212 (64)	331

For infants reported to have had difficulty breathing, nearly a half of their mothers (45.6%) sought medication for their infants with slightly over a half (50.6%) of these seeking medication from a clinic/hospital, less than a half (42.9%) from the chemist and 1.3% got the medicine from traditional healers. More than a half (59.4%) gave prescribed medicines and 28.5% non-prescribed medicines. A low proportion of mothers (6.7%) gave their infants oral rehydration salts (ORS). Only a small proportion of infants (2.4%) had been admitted to a hospital in the previous three months to the study.

4.10 Success stories of mothers who practiced exclusive breastfeeding for 6 months

The study utilized five case studies of positive deviant-mothers who had successfully breastfed for six months. These mothers were identified by the CHWs in the community. In-depth interviews were conducted with these mothers. The interviews investigated factors that enabled these mothers to exclusively breastfeed for six months. Information obtained from the case studies is summarized below:

4.10.1 Case studies

Case 1

Jane (not her real name) was a 32-year old mother of four and married. Her last child was nine months old at the time of the study. Her occupation was hairdressing. After giving birth, she made a decision to quit her job to concentrate on bringing up her child. This gave her the opportunity to exclusively breastfeed her child for the recommended six

months. Her child was often breastfed on demand. She said that she had no problem with milk output because she ate well. To her 'eating well' meant eating traditional vegetables and fruits as well as taking tea, porridge and plenty of water. She said that the child always seemed satisfied after breastfeeding, cried less and slept well. Since the milk supply was a lot, it stained her clothes. She was aware of the practice of expressing breast milk but she did not do it. She related expressing breast milk with mothers who were always away from their children due to busy schedules such as working.

Her neighbours always pressured her to give the child other foods and fluids as they thought her milk was not enough for the child. She kept lying to them that she was giving other foods but she never did. This is because she understood the importance of exclusive breastfeeding.

She was determined to ensure that she exclusively breastfed her child since she had been told by the health workers about the importance of exclusive breastfeeding while she was pregnant and also while attending antenatal clinics. She was also motivated by the fact that she noticed significant differences between her fourth-born child and her other children. Her other children were introduced to other foods and fluids much earlier than six months. They had often got sick and it would take a longer time for them to recover from their sicknesses. This was not the case with the last child. Further, the child's weight improved, which was confirmed from the clinic card, and so she did not have a reason to be worried. In fact, the child looked healthy.

This gave her the needed resolve to push on with the decision to exclusively breastfeed for the recommended six months despite the pressure she received from her husband and neighbours and even the fact that the breast milk constantly stained her clothes.

Case 2

Mary (not her real name) was a 22-year old mother of one, a housewife and married to a self-employed man. Her husband owned a '*boda-boda*' (motor bike transport) business. Since she was with the child all the time, she breastfed the baby exclusively for the

recommended six months. She said that she had so much milk that sometimes she expressed and discarded it to make her breasts less painful. However, she never fed the baby with the expressed milk. She reported that the child wanted to breastfeed most of the time and she breastfed on demand. Frequent breastfeeding ensured the baby was full most of the time hence the baby did not cry too often and too much.

She attributed her ability to manage the exclusive breastfeeding period to the fact that she ate a balanced diet. She fed on porridge, milk, tea, *githeri* (a mixture of maize and beans), *ugali*, greens, meat and eggs. She said that these foods helped her have a high supply of milk. She also had daily intake of fruits such as bananas, oranges and pineapples to mention but a few.

The challenge she encountered was from her neighbours who encouraged her to start early complementary feeding. However, she received a lot of support from her husband and health workers from the Kangemi Health Centre. The health workers emphasized the benefits of exclusive breastfeeding. However, during teething, her child had difficulties breastfeeding although this was only for a short while. The child continued breastfeeding well after this. She attributes her success in practicing exclusive breastfeeding for six months to the support she got from health workers and encouragement by her spouse. She was particularly motivated by the encouragement she received from her husband.

Case 3

Marita (not her real name) was a 26-year old mother married with three children. She was a housewife while her husband was a welder at a local shop. She did not exclusively breastfeed her first two children for six months since she was then working as a casual labourer. The third child however, was exclusively breastfed for six months. According to her, the practice of exclusive breastfeeding had a lot of challenges. Breastfeeding exclusively meant that she must be present at all times to breastfeed on demand and that interfered with some of her engagements outside the home which she sometimes had to cancel. She also did her household chores while the baby was asleep. Sometimes, she felt as if the baby did not get satisfied with the breast milk.

Her family, especially her sisters-in-law did not support her because they felt that the baby did not get satisfied with the breast milk alone. However, she received a lot of support from community health workers who encouraged her to exclusively breastfeed. This gave her enough reason to exclusively breastfeed although she lost considerable weight during this period. She attributed this to the fact that she did not consume any special meals during lactation.

Despite these challenges, she exclusively breastfed her child for six months. Breastfeeding, she opined, was the best option for her. According to her, breastfeeding was cheap and safe. For instance, she said, *“I didn’t want to boil water to feed the baby all the time.”* When she was asked to feed her child on expressed milk, she asserted, *“In our community (Luhya), women express milk only if the baby has died to reduce pain from engorged breasts.”* Therefore, she did not want to feed her child on expressed milk. She delayed getting the injectable contraceptive she had used previously at six weeks to three months post-partum because she believed that it would reduce her breast milk production. She attributed her success in breastfeeding for six months on self-motivation that made her stop working to breastfeed her child exclusively. This is because she understood the importance of breastfeeding for the growth and development of the child.

Case 4

Emma (not her real name) was aged 29 years, married and a mother of two. Her husband was a hawker selling clothes in town while she was a housewife. She reported that she had learnt lessons from other mothers and her first child. She observed that the health of children who were not exclusively breastfed for six months deteriorated with age. They developed problems later, for instance breathing problems and diarrhoea while others refused to eat normally. She noted that after breastfeeding her firstborn child exclusively for six months, the child did not develop any health problems and feeding habits were optimal. She therefore chose to exclusively breastfeed her second child for six months.

She usually woke up as early as 5.30am or 6.00am and attended to her household duties while the baby was still asleep. When the baby woke up, she breastfed her and afterwards

continued with her duties. She said that she was always there for her child. She had never expressed breast milk and in case of travelling, she always travelled with the baby. She observed that sometimes the child had cold or flu which she attributed to the weather and not feeding.

She attributed her success in exclusive breastfeeding to the fact that she ate a balanced diet. She fed on nutritious foods such as whole meal *ugali*, porridge and *mokimo*, and not refined foods. She ensured that she ate fruits of various kinds depending on availability. In so doing, she believed that the baby got sufficient breast milk. Her husband was very positive about exclusive breastfeeding and her mother-in-law always advised on exclusive breastfeeding. Also, the health workers at the health facility (Kangemi Health Centre) advised her on exclusive breastfeeding.

She faced challenges from her sisters and sister-in-law who advised on giving other feeds apart from breast milk. She reported that she ignored family members, friends and neighbours who advised on early introduction of other feeds. She was always firm on exclusive breastfeeding and she was determined to breastfeed her child up to two years. Her advice to other mothers was that they should breastfeed their children exclusively for six months because this is good for growth and development of the baby. She attributed her success to exclusive breastfeed on self-determination, and support from her spouse, mother-in-law and health workers at the facility.

Case 5

Joy (not her real name) was a 32-year old mother of two and separated from her husband. The baby was six months old at the time of the study and she worked as a hairdresser. She reported that she had been advised at the health facility when she had her first child to exclusively breastfeed but she did not do it. Her grandmother had insisted that she should give the baby other feeds as he kept on crying. She therefore started giving the child porridge by the age of four months. She said that as a result, her first child developed problems after she introduced other feeds. She reported that the child had got sick often and experienced diarrhoea and constipation which had caused the child to cry

alot. However, for the second child (a baby boy), she was dedicated to trying out exclusive breastfeeding for six months even with the grandmother's and friends' persistence on introducing other feeds. She maintained that she never got tempted to start giving other feeds to her second child unlike her first child.

She said that she opted to conduct her hairdressing business in her home so that she could exclusively breastfeed her child on demand. Further, she said that she had no problems with milk output and strongly believed that the traditional foods such as pumpkin leaves, mixed with other indigenous vegetables like *nderema* (green vegetables) and *dengu* (green grams) plus taking soya porridge and milk tea increased her milk production. She said that the child was always calm and she maintained that the milk was always sufficient. She said that she experienced breast milk flow which always stained her clothes. She reported that since she did not know that she could express milk' she ensured that she breastfed her child frequently and on demand. She attributed her success to exclusively breastfeeding for six months on self-motivation, past experience and support from health workers at the facility.

4.10.2 Summary of the case studies

Optimal infant feeding fosters the child's health. This includes early initiation of breastfeeding, breastfeeding on demand and exclusive breastfeeding for six months. Therefore, availability of the mother to breastfeed the child is crucial for the first six months of a child's life. Findings from in-depth interviews conducted with mothers who managed to exclusively breastfeed for six months showed that these mothers had self-motivation, self-determination and were housewives. Those who were self-employed modified their working patterns. Support from HCPs, CHWs and significant others like husbands and mothers-in-law promoted the practice of exclusive breastfeeding. Despite the challenges and discouragements from peers that the mothers faced, their determination to exclusively breastfeed for six months played an important role in success.

CHAPTER FIVE:

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the interpretation and discussion of the main study findings relating to breastfeeding practices, factors associated with exclusive breastfeeding, nutritional status, growth and morbidity status of infants in Kangemi.

5.2 Breastfeeding practices

From the study findings, over two-thirds (70.8%) of mothers reported initiating breastfeeding within one hour after birth. This is higher compared with national prevalence level as reported by KDHS (2008 – 09) where 58% of mothers initiated breastfeeding within one hour after birth. In Nairobi, an earlier study conducted by Muchina (2007) showed that majority (74.6%) of mothers initiated breastfeeding within 0 – 1 hour. In contrast to this, a study by Reygal (2007) conducted among Somali community in Nairobi's Eastleigh estate, Kenya, found that 27% of mothers initiated breastfeeding within one hour after birth. On the other hand, Maundu (2007) found 80.7% of mothers in Yatta Division initiated breastfeeding within one hour. In Namibia, almost two-thirds (65.8%) of mothers initiated breastfeeding within 30 minutes (Amadhila, 2005).

The findings of this study showed that nearly all (92.8%) of the newborns were reportedly not given prelacteal feeds before breastfeeding commenced. This is much higher than reported in KDHS (2008 – 09) where 42% of children were given prelacteal feeds. A study by Muchina (2007) in Nairobi found that majority of mothers (79%) did not give any prelacteal feeds to their newborns. Amadhila (2005) also found that nearly all (92.4%) of the babies were not given anything to drink or eat before breastfeeding had begun.

Most mothers (93.4%) who participated in the study breastfed their infants on demand. This is supported by findings from an earlier study conducted by Muchina (2007) in Kenya which found that majority (90.1%) of mothers breastfed on demand. On the other

hand, Reygal (2007) found that a relatively low proportion (38%) of infants were breastfed on demand.

Findings in this study indicated that the prevalence of exclusive breastfeeding was 45.5% among infants 0 – 6 months of age in Kangemi, Nairobi. This prevalence was relatively higher when compared to the national exclusive breastfeeding rate of 32% (KDHS, 2008 – 09). The practice of exclusive breastfeeding however decreased with increasing age of infants. While the proportion of exclusively breastfed infants was high at 1–2 months (41.7%), this decreased with age to (11.3%) at 5 – 6 months. A similar trend was observed at the national level with 52% of children aged 0 –1 month, 34.8% 2–3 months, 13.2% 4 –5 months and 3.6% 6 - 8 months (KDHS, 2008–09). In another study, nearly a half (48.5%) of mothers practiced exclusive breastfeeding for infants aged 0 – 4 months (Amadhila, 2005).

The improved breastfeeding practices can be attributed to support given by health workers through health talks and education during ANC visits where mothers are educated on infant feeding practices. These include infant feeding options, early initiation of breastfeeding, frequency of breastfeeding and the benefits of exclusive breastfeeding.

5.3 Supplementation of breast milk and reasons

The national policy recommends that infants be exclusively breastfed during the first six months of life. From six months, infants should receive complementary foods with continued breastfeeding up to two years of age or beyond. Early supplementation is discouraged because it interferes with breastfeeding. Breast milk is the balanced food for the human infant before the age of six months. Infants who are given other foods/liquids too early may not breast feed vigorously because they may be full and therefore may get fewer nutrients than recommended. This is true in many developing countries where complementary food is often of lower nutritional value than breast milk.

Although the overall practice of exclusive breastfeeding among the study subjects was fairly good, introduction of feeds/fluids to infants started early contrary to recommendations. Findings showed that 3.9% had been introduced to foods/liquids at

one month, 21.5% between 1–2 months, a third (34.8%) 3 – 4 months and over a third (39.8%) between 5 – 6 months. However, this finding was better compared to an earlier study conducted by Muchina and Waithaka (2010) in Kangemi, which showed that 75% of infants had been introduced to foods/liquids by one month and nearly 94% by the fourth month.

The findings of this study had similarities with other studies which reported the same trend. In a study conducted in Eastlands, Nairobi, by Ashene (2006), 31.8% of infants were introduced to foods/liquids at two months and below whereas 68.9% between 2 – 4 months. Muchina (2007) found that 63.4% infants aged below four months were introduced to foods/fluids. In another study done in Machakos District, Kenya, it was found that 51.7% of infants had been introduced to feeds/liquids at three months. According to Ndolo (2008), a mother's occupation affected time spent with the child leading to early introduction of foods/fluids before six months.

The study findings showed that mothers who introduced supplementary feeds early cited child crying as the main reason. Other common reasons given by mothers included the child being thirsty/hungry, personal preference and sickness. These findings agree with those from other studies. In Nairobi, Reygal (2007) found that poor milk supply contributed to early introduction of foods/liquids. In a previous study, an association was found between the mother's beliefs and the time of introducing foods/liquids to infants in the Eastlands area, Nairobi (Ashene, 2006). In Langa, South Africa, belief that breast milk is insufficient led to mixed feeding and in Malawi, grandmothers gave or directed new mothers to give root infusions to infants with the belief that breast milk alone was not enough (Mika, 2011). In Namibia, most (36.5%) mothers introduced complementary foods/liquids because they felt they needed to teach the child to eat, 26.2% felt it was the right age to do so, 18.3% reported insufficient milk and 14.3% did so because they had returned to work after the birth of their child (Amadhila, 2005).

5.4 Factors associated with exclusive breastfeeding

The study findings showed that the age of children was associated ($p < 0.05$) with exclusive breastfeeding. This compares well with findings from other studies. In a study

conducted in Yatta Division, Kitui, the age of the child was found to be related with exclusive breastfeeding practices (Maundu, 2007). These findings suggest that the younger the child the higher the chances of being exclusively breastfed. In Namibia, the age of child was also significantly ($p=0.001$) associated with exclusive breastfeeding (Amadhila, 2005). Other socio-demographic factors such as the age of mother, marital status, religion of the mother, household size, highest education level of the mother and father, main income earner in the household, occupation of both the mother and father and monthly household income did not influence exclusive breastfeeding practice. Similarly, Maundu (2007) found that marital status, household head, education and household income were not related with exclusive breastfeeding. According to Ndolo (2008), the age of the mother and marital status influenced exclusive breastfeeding. On the other hand, Amadhila (2005) found no association between the age of the mother, marital status, level of education and employment with exclusive breastfeeding for infants aged 0 – 4 months in Namibia.

In this study, the attendance of Ante Natal Clinic (ANC) during the previous pregnancy was found not to influence exclusive breastfeeding practice. This differs with findings of a study by Maundu (2007) who found a significant ($p<0.05$) association between ANC attendance and exclusive breastfeeding. Gestation at the first ANC visit, number of times counseled on infant feeding, birth order of index child, birth spacing with the previous child and knowledge of mother on the age at introduction of complementary feeding did not influence exclusive breastfeeding. In Nairobi, Muchina (2007) found that knowledge on proper breastfeeding practices was associated with exclusive breastfeeding practice by mothers. Similarly, Ndolo (2008) found that the mother's knowledge influenced exclusive breastfeeding. However, ANC attendance and breastfeeding education received were found not associated with exclusive breastfeeding in Namibia (Amadhila, 2005).

Findings indicated that a lot of support on exclusive breastfeeding practice for six months was received from health workers (83%). Others who supported exclusive breastfeeding practice were husbands, friends, mothers-in-law and neighbours. Mothers-in-law were found to significantly ($p=0.010$) influence the practice of exclusive breastfeeding. This

may be due to their closeness to their daughters-in-law and their sons and therefore would advise on infant feeding practices. These findings are similar to those found by Ashene (2006) where more than a half (57%) of neighbours, friends and workmates formed the largest bloc advising mothers to start giving other foods by three months of age. In Namibia, Amadhila (2005) found that mothers received support on infant feeding decisions from their spouses (32.3%), their mothers (22.1%) and health workers (7.3%). In a study conducted in Dhaka, Bangladesh, that looked at the effects of community-based peer counseling on exclusive breastfeeding practices, 70% of women in the intervention group were exclusively breastfeeding compared to only 6% in the control group (Haider *et al.*, 2003).

Further, the study findings indicated that mothers received information on exclusive breastfeeding through media such as television and newspapers. Newspapers were found to significantly ($p=0.038$) influence exclusive breastfeeding. Similarly, 32.3% of mothers reported learning about infant feeding through the mass media and 10.3% through print media (Muchina, 2007). These would enlighten mothers more on infant feeding practices.

5.5 Exclusive breastfeeding with nutrition status, growth and morbidity pattern

Findings showed that most (94%) mothers in the study took their children to the clinic for growth monitoring and majority (73.1%) of their infants had good weight gain. The pattern of growth as assessed by growth monitoring was significantly ($p=0.002$) associated with exclusive breastfeeding. This agrees with findings by Muchina (2007) where 88% of children had good growth (positive slope) and significant relationship ($p<0.05$) was found between breastfeeding practices and growth.

The study findings indicated no association between child nutrition with exclusive breastfeeding. This is in tandem with findings from other studies. Muchina (2007) found no association between breastfeeding practices and the three indicators of nutrition status. However, association was found in other studies. In a study done in Narok District, Kenya, among infants aged 0 – 6 months, Mugo (2008) found an association between underweight and poor infant feeding practices. In another study done in Ethiopia, Shibeshi (2004) found that underweight (57.1%) and wasting (11.4%) were associated with early

introduction of foods below three months. A negative relationship was found between underweight and breastfeeding and initiation of breastfeeding (Reygal, 2007).

A low proportion (22.1%) of study infants had experienced diarrhoea in the previous two weeks prior to the study and this was found not to be statistically related with exclusive breastfeeding. This is similar with what Maundu (2007) found that diarrhoea was not significantly associated with feeding practices. However, other studies have shown an association between breastfeeding and morbidity pattern. Findings of a study conducted in Kisii District by Obara (2010) showed that inappropriate infant feeding practices contributed to the occurrence of diarrhoea. In another study in Machakos District, an association was found between diarrhoea and early introduction of feeds/fluids (Ndolo, 2008). Ndolo found that nearly all children who became sick were taken to a health facility for treatment.

5.6 Conclusions

Optimal infant feeding practices are the unparalleled ways of enhancing the health and survival of infants and young children, with exclusive breastfeeding meeting the nutritional needs of infants in the first six months of life. In this regard, this study aimed at determining the prevalence of exclusive breastfeeding and associated factors among infants aged 0 – 6 months in Kangemi, Nairobi and reached the following conclusions:

- The prevalence of exclusive breastfeeding in Kangemi is higher than the national prevalence and also higher than the prevalence of Nairobi County across all the age categories.
- Important factors in the initiation and maintenance of exclusive breastfeeding included household income, the father's education, household size and birth spacing.
- Community and social support especially that of a spouse and mothers-in-law are important factors in initiation and maintenance of exclusive breast feeding for six months.
- Exclusive breastfeeding practice was not related with child nutritional status and morbidity in the study area.

5.7 Recommendations

Although the prevalence of exclusive breastfeeding was higher compared to the national levels, early supplementation is still a challenge. Based on the findings, the following recommendations are made:

1. There is need to advocate for increased social support for breastfeeding mothers in particular from male partners, mothers-in-law and peers. This can be done by adopting a family approach that focuses on creating awareness not just for mothers, but also for fathers and mothers-in-law who are strong household influencers of infant feeding behavior. This will help to curb the challenge of early supplementation.
2. Strengthening the existing support groups for breast feeding mothers and programs that provide peer counseling with a focus on promoting, protecting and supporting breastfeeding will contribute to improved health and nutrition of children in the study area.
3. The Ministry of Health should provide ongoing training of all health care providers and community health workers on IYCF. This will acquaint them with knowledge and skills to provide IYCF education and support to mothers in the study area and contribute to improved uptake of exclusive breastfeeding.
4. There is need to encourage more home visits by community health workers to follow-up and support infant and young child feeding practices in the study area.

These recommendations coupled with operationalization of breast milk substitute's regulation and control Act 2012 will contribute to the achievement of the set national target in the Maternal Infant and Youth Child Nutrition (MIYCN) strategy of increasing exclusive breast feeding rates from the current 32% to 80% by 2017.

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APPENDICES

Appendix 1: Questionnaire

CONFIDENTIAL

UNIVERSITY OF NAIROBI

College of Health Sciences

School of Public Health

Factors influencing infant feeding practices of mothers with infants aged 0 – 6 months in Kangemi, Nairobi.

QUESTIONNAIRE

IFP _____

QUE No. ___/ ___/ ___/

Name of the village _____

Interview date dd/mm/yy ___ ___/ ___ ___/ ___ ___

Interviewer Name _____ No. ___ ___

By

DR. ROBERT AYISI

SCHOOL OF PUBLIC HEALTH

UNIVERSITY OF NAIROBI

Informed Consent Explanation and Consent Form for study participants

I, **Dr. Robert K. Ayisi**, a Masters of Public Health (MPH) student in the School of Public Health, University of Nairobi, am conducting a study on the prevalence of exclusive breastfeeding (EBF) and associated factors among infants aged 0 – 6 months in a Kangemi area, Nairobi.

Purpose

This study seeks to establish factors associated with exclusive breastfeeding among infants aged 0 – 6 months in the study area.

Participation

The study involves an individual and you are required to answer questions presented to you or fill the questionnaire.

Voluntarism

Participation in this study is completely voluntary. If you decide not to participate in this study, there is no penalty for such decision. If you agree to take part in the study, you are free to withdraw from participating in the study at any time. If you decide to participate, you are free to decline answering questions that you are not comfortable with.

Risks

There are no major risks for participating in this study. The procedures for taking anthropometric measurements of weight and height are painless.

Benefits

There are no direct benefits to the institution or mothers for participating in the study. But the results of this study will be utilized for planning future interventions that may benefit the society as a whole.

Confidentiality

The responses you provide will be kept confidential and anonymous. Names will not appear in the questionnaires. Study participants will be assigned codes. The data collected for this study is for education purposes only. In case of publication, no participant’s name will appear in print. Confidentiality of the responses will therefore be strictly adhered to.

Contact

If you have any questions/concern or complaints about the study you are free to contact me on the mobile phone no 0722761884 or the Secretary, Kenyatta National Hospital/University of Nairobi – Ethics and Research Committee – (Tel: 726300-9 or P.O Box 20773, Nairobi).

Any Question

If you have any question regarding what I have explained to you, you are free to ask.

Consent Form for Study Participants

I, (initials) have read or been explained to what the study entails and I have also had a chance to ask questions, and I hereby agree/do not agree to participate in the study.

Study participant Date.....

Signature

Researcher Date.....

Signature

This questionnaire should only be administered to biological mothers of infants aged 0 – 6 months

PART A: CHILD INFORMATION

1. Name of the child _____ (*Write one name*)
2. Child's age (months) ____ Date of birth dd/mm/yy ____ / ____ / ____
3. Gender 1= M 2=F
4. Birth order of the index child ____
5. Birth spacing with the previous child _____ (months)

Socio demographics

(I will start by asking you some questions about yourself and your family)

6. Household size ____
7. Number of children under five years _____
8. Mothers age (*years*) _____
9. Marital status of the mother
 - 1) Married
 - 2) Single
 - 3) Cohabiting
 - 4) Divorced
 - 5) Widow
 - 6) Separated
10. Highest educational level attained by the mother
 - 1) No education
 - 2) Primary complete
 - 3) Primary incomplete
 - 4) Secondary
 - 5) College/tertiary

11. Highest educational level attained by the father (*where applicable*)

- 1) No education
- 2) Primary complete
- 3) Primary incomplete
- 4) Secondary
- 5) College/tertiary

12. Religion of mother

- 1) Christian
- 2) Muslim
- 3) Other (specify)_____

13. Main income earner in the household?

- 1) Father
- 2) Mother
- 3) Other _____

14. Occupation /Employment of the mother?

- 1) Formal employment
- 2) Informal /Casual employment(specify)_____
- 3) Self-employment(specify)_____
- 4) Housewife

15. Occupation /Employment of the father? (*where applicable*)

- 1) Formal employment
- 2) Informal/casual employment(specify)_____
- 3) Self-employment(specify)_____
- 4) None

16. What is the approximate household income from all the sources per month?

- 1) <Kshs 2 500
- 2) Kshs 2 500 – 5 000
- 3) 5 001 – 10 000
- 4) Above 10 000

PART B: INFANT FEEDING PRACTICES

(I am going to ask you questions about feeding of (name of the index child))

17. Is (**name of the child**) currently breastfeeding?

1) Yes

2) No (Skip to Q 26)

18. When did you start breastfeeding (**name of the index child**) after birth?

1) Immediately

2) Between 30 mins and 1 hour

3) More than 1 hour

4) Other/specify _____

19. Before you first breastfed this child, did you give anything else?

1. Yes

2. No (Skip 22)

20. If yes, what did you give? (*Multiple responses*)

1) Plain water

2) Salt water

3) Sugar /Glucose water

4) Other/specify _____

21. Why did you give other feeds before initiating breastfeeding?

1) Baby crying

2) Mother had no milk

3) Advised by health worker

4) Traditional beliefs

5) Religious beliefs

6) Other /specify _____

22. Was the child given colostrums (the first thick yellow milk)?

1) Yes

2) No

23. When do you usually breastfeed (**name of the index child**)?

1) On demand

2) Scheduled time

3) Other /specify_____

24. How often (many times) do you breastfeed your child in a day (*day and night*)?

1) 1 – 2 times

2) 3 – 5 times

3) 6 – 8 times

4) More than 8 times

25. Have you ever given (**name of the index child**) other foods/fluids since birth?

1. Yes

2. No (Skip 28)

26. When did you start giving other foods/fluids? _____ (weeks/months)

27. Why did you start giving (**name of the index child**) other foods/fluids? (*One or two responses*)

1) Infant old enough to start on other foods/fluids

2) Infant no longer wanted breastmilk

3) Breast/nipple difficulty

4) Personal preference

5) Health worker recommendation

6) Family /traditional recommendation or practice

7) Mother unwell

8) Child unwell

9) Child thirsty/unsatisfied

10) Child crying

11) Child separated from mother

12) Other

/specify_____

28. What did you give (**name of the index child**) in the last 24 hours? (*Probe for all foods/drinks given to infant previous 24 hours. Tick where appropriate*).

Foods/Drinks	24 –hour recall			
	Yes	No	Dk	Times
Plain water	1	2	98	— —
Sugar water	1	2	98	— —
Fresh animal milk	1	2	98	— —
Tinned or powdered milk	1	2	98	— —
Cow’s milk	1	2	98	— —
Porridge	1	2	98	— —
Breast milk	1	2	98	— —
Others (specify)_____				— —

PART C: FACTORS INFLUENCING INFANT FEEDING PRACTICES

29. In your opinion at what age should a mother start to feed her child on other foods in addition to breast milk under normal circumstances?(explain that other foods include tea, water, porridge, juices etc- Do not prompt)

- 1) Birth to 3 days
- 2) 3 days – 2 weeks
- 3) 2 weeks – 2 months
- 4) 2 months – 4 months
- 5) 4months – 6 months
- 6) Others/specify_____

30. What are your main sources of information on the infant feeding? (*main two sources*)

- 1) Radio
- 2) Friends
- 3) Health workers
- 4) Husband

- 5) Mother-in-law
- 6) Neighbour
- 7) Pamphlets
- 8) Newspaper
- 9) Television
- 10) Community health workers
- 11) Social support groups
- 12) Others

/specify _____

31. Did you attend the ANC clinic during your last pregnancy?

- 1) Yes
- 2) No (**Skip to part D**)

32. How many times did you attend ANC clinic during the last pregnancy?

- 1) 1 – 2 times
- 2) 3 – 4 times
- 3) Other/specify _____

33. When did you start going to the clinic (at what gestation)? _____ Months

34. What kind of information did you receive on infant feeding practice? (*Multiple responses*)

- 1) Benefits of exclusive breast feeding to the mother
- 2) When to start breastfeeding
- 3) Benefits of exclusive breast feeding to the baby
- 4) How to correctly position and attach the baby on the breast
- 5) Other infant and young child feeding options
- 6) Benefits and risks of other infant and young feeding options
- 7) Other/specify _____

35. How many times were you counseled individually or in group on infant feeding?

- 1) None
- 2) Once
- 3) 2–3 times
- 4) More than three times

36. Were you satisfied that you had enough information to make a decision on how to feed your child?

- 1) Yes, fully satisfied
- 2) Partially satisfied, would have liked more information
- 3) No
- 4) Don't know

PART D: Immunization, Growth and Morbidity (mother)

(I am going to ask you about (name of the child) on immunization, growth and illness)

37. What immunization has the (name of the child) received so far (confirm from the clinic card)

- 1) Complete for age
- 2) Incomplete for age
- 3) None at all

38. Do you take (name of the index child) to the clinic for weighing (confirm with growth monitoring card)

- 1) Sometimes
- 2) Always
- 3) Never

E1. GROWTH

E1.1 Weight on clinic day (Record from **Child health card** ONLY . Kg
if not available, record as 9.99)

E1.2 Growth pattern of last three visits (or last 2 visits if child <2 months old - one response only)

1. GOOD WEIGHT GAIN	2. NO WEIGHT GAIN	3. WEIGHT LOSS	91. OTHER	96. CHILD < 4WKS	99. CARD NOT AVAILABLE

39. Has (**name of the index child**) had diarrhoea on any day in the past two weeks?

1) Yes

2) No (Skip to 43)

3) Don't know

40. On how many days in the past two weeks

1). Days _____

2). Don't know

41. Has (**name of the index child**) had blood in the stool on any day in the past two weeks?

1).Yes

2).No

42. On how many days in the past two weeks?

1). Days _____

2). Don't know

43. Has (**name of the index child**) had difficulty breathing on any day in the past two weeks?

1).Yes

2).No (Skip to 46)

44. On how many days in the past two weeks?

1). Days _____

2). Don't know

45. Why do you say there was difficulty breathing? (*One or more responses*)

1).Coughing

2). Blocked nose/mouth breathing

3). Noisy breathing

4).Fast breathing

5). Chest in drawing

6) Other

46. Did you give your child any medicines in the past 2 weeks?

1) Yes

2) No (Skip to 49)

47. If yes, where did you get the medicine? (*One or more responses*)

- 1) Clinic/hospital
- 2) Private doctor
- 3) Traditional healer
- 4) Chemist
- 5) Other/specify _____

48. What type of medicine? Prompt (*One or more*)

- 1) ORS
- 2) Vitamins
- 3) Prescribed medicines
- 4) Non- prescribed medicines
- 5) Other /specify _____
- 6) Don't know

49. Has (**name of the index child**) been admitted to the hospital at any time in the past 3 months?

- 1) Yes
- 2) No (Skip to Part E)

50. If yes how many times?

- 1) Times _____
- 2) Don't know

51. For what reasons (specify) _____

PART E: ANTHROPOMETRIC MEASUREMENTS (*We will use the electronic scale that enables concurrent measurement of mother and the baby's weight. More accurate and one measure is adequate*).

Name of child _____ Sex: 1 = M 2 = F

Date of Birth dd/mm/yy ___ ___ / ___ ___ / ___ ___

Interview date dd/mm/yy ___ ___ / ___ ___ / ___ ___

Weight (kgs) 1st _____ 2nd _____

Ave. _____

Tolerance (0.5 k.g)

Height /length (cm) 1st _____ 2nd _____

Ave. _____

Tolerance (0.1cm)

Thank you for your participation

Appendix 2: Case study guide

In depth interview with mothers who achieved exclusive breastfeeding for six months.

Biodata:

Age

Marital status

Parity

Occupation (type of work and working pattern)

If married occupation of the spouse

Opening statement

Although exclusive breastfeeding is encouraged, most women have challenges in achieving this:

In your case what were some of these challenges? Probe for:

Time and demands for work

Inadequate milk output

The baby needed to eat more

What did you do to breastfeed exclusively? Probe for:

Modified the work pattern

Work within the home

Express milk enough for the time you are away from the child

Eat well as a mother

Family support system- has time to focus on the baby

Support from community health workers, support groups, lay or peer counselors

Thank you

Appendix 3: Focus Group Discussion (FGD) Guide

1. What are the maternal factors that hinder breastfeeding?
2. Are there cultural practices, taboos or beliefs and religious beliefs associated with breastfeeding? If yes, what are they?
3. Apart from you, who else makes decision on how your baby will be fed?
4. Are there social support groups that promote breastfeeding? If yes, mention them.
5. How do the community members perceive the practice of exclusive breastfeeding?

Thank you

Appendix 4: Health Facility Check List

Existence of written breastfeeding /infant feeding policy that address all the 10 steps to successful breastfeeding in the MCH/maternity services.	Yes	No
Is the summary of the policy posted in languages and written with wording most commonly understood by mothers and staff?	Yes	No
Is the breastfeeding /infant feeding policy available so all the staff who takes care of mothers and babies can refer to it.	Yes	No
Is there existence of self-assessment tool on the Baby Friendly Hospital Initiative	Yes	No

Checklist on the KII Health Care Providers

Health Care Provider 6 day training on IYCF and Baby Friendly Hospital Initiative.	Yes	No
Health Care Provider working in the MCH oriented to breastfeeding /infant policy of the health centre when they start work.	Yes	No
Do staff members working in MCH rotated into positions with these responsibilities	Yes	No
Health Care Provider help mothers initiate breastfeeding within an hour of birth	Yes	No
Health Care Provider training on lactational management (positioning and attachment skills).	Yes	No
What are the community views on non- breastfeeding	Yes	No

Appendix 5: Letter of Authorization



UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
(254-020) 2726300 Ext 44355
Ref: KNH-ERC/A/309

KNH/UON-ERC
Email: uonknh_erc@uonbi.ac.ke
Website: www.uonbi.ac.ke
Link: www.uonbi.ac.ke/activities/KNHUoN



KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi
13th December 2011

Dr. Robert K. Ayisi
School of Public Health
College of Health Sciences
University of Nairobi

Dear Dr. Ayisi

RESEARCH PROPOSAL: "THE PREVALENCE OF EXCLUSIVE BREASTFEEDING AND ASSOCIATED FACTORS AMONG INFANTS AGED 0-6 MONTHS IN A PERI-URBAN SETTLEMENT OF KANGEMI, NAIROBI" (P473/11/2011)

This is to inform you that the KNH/UON-Ethics & Research Committee has reviewed and **approved** your above revised research proposal. The approval periods are 13th December 2011 to 12th December 2012.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimens must also be obtained from KNH/UON-Ethics & Research Committee for each batch.

On behalf of the Committee, I wish you a fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of the data base that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

PROF A N GUANTAI
SECRETARY, KNH/UON-ERC

c.c. The Deputy Director CS, KNH
The Principal, College of Health Science, UON
The Director, School of Public Health, UON
The HOD, Medical Records, KNH
Supervisors: Mrs. Faith Thuita, School of Public Health, UON
Mr. Erastus Njeru, School of Public Health, UON

Appendix 6: Map of Kangemi location

