

**FACTORS INFLUENCING EXCLUSIVE BREASTFEEDING AMONG INFANTS
LESS THAN 6 MONTHS IN KASARANI INFORMAL SETTLEMENT, MOLO
DISTRICT, KENYA**

BY

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SCIENCE (FOODS, NUTRITION AND DIETETICS) IN THE SCHOOL OF
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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University or any other award.

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DEDICATION

To Moses, my husband and our son Alex for their love, encouragement and support throughout my study.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of variance
BFHI	Baby Friendly Hospital Initiative
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
EBF	Exclusive breastfeeding
FGD	Focus group discussion
HIV	Human Immunodeficiency Virus
KDHS	Kenya Demographic and Health Survey
KNBS	Kenya National Bureau of Statistics
TBA	Traditional birth attendant
UN	United Nations
UNICEF	United Nations Children's Education Fund
WABA	World Alliance for Breastfeeding Action
WHO	World Health Organization

ABSTRACT

The health benefits of exclusive breastfeeding on survival, growth and development of a child as well as health and well being of a mother are well documented. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) are among organizations promoting exclusive breastfeeding for the first six months. Factors influencing breastfeeding have been well researched but there is paucity of data on factors influencing exclusive breastfeeding practices. This study aimed to establish the prevalence and identify the factors influencing the practice of exclusive breastfeeding among infants in an urban slum in a rural district. This community based cross sectional analytical study was carried out in Kasarani informal settlement in Molo District, Kenya among 171 randomly selected mothers with infants less than 6 months old. Data were collected using researcher-administered questionnaires and a focus group discussion guide. Six focus group discussions were held at the end of the study with traditional birth attendants, grandmothers, fathers, mothers practicing and those not practicing exclusive breastfeeding. The dependent variable was exclusive breastfeeding rate defined as continuous exclusive breastfeeding since birth and exclusive breastfeeding based on 24 hour-recalls. Data analysis was done using statistical package for social sciences (SPSS) software version 17.0. The rate of continuous exclusive breastfeeding since birth was 38.0% (95% CI; 30.7-45.3) while the rate based on 24 hour recall was 56.7% (95% CI; 49.3-64.2). In univariate analyses, infant age and infant morbidity, maternal morbidity, maternal breast health and maternal knowledge on breastfeeding issues had significant associations with exclusive breastfeeding. Maternal knowledge aspects included; mothers correct knowledge on duration of exclusive breastfeeding (Odds Ratio [OR]: 2.61; 95% CI: 1.345-5.069; P=0.005) and OR: 3.418; 95% CI: 1.807-6.465; P<0.001); maternal knowledge that breastfeeding protects the mother from getting pregnant (OR: 2.092; 95% CI: 1.072-4.084; P=0.030) and (OR: 1.445; 95% CI: 0.755-2.767; P=0.266) and mothers knowledge that semi-solid/solid foods should be introduced to the infants at six months of age (OR: 2.683; 95% CI: 1.142-6.306; P=0.024) and (OR: 3.102; 95% CI: 1.450-6.634; P=0.004). In the logistic regression analyses, infant morbidity (Adjusted Odds Ratio [AOR]: 2.45, 95% CI: 1.23-5.08, P=0.01) for continuous EBF since birth and (AOR: 3.94, 95% CI: 1.90-8.20, P=<0.01) for EBF based on 24 hour recall was retained as the strongest predictor of exclusive breastfeeding. Mother's experience of breastfeeding complications (AOR: 2.42, 95% CI: 0.98-5.97, P=0.05 and (AOR: 2.67, 95% CI: 1.89-6.01, P=0.02) was the second predictor of exclusive breastfeeding having controlled for age of child. Exclusive breastfeeding rate in Kasarani informal settlement was below the level recommended by WHO (90%) although higher than the Kenya national rate (32%). The study findings indicated that infant morbidity and maternal breast health are important factors to consider in the messages on the promotion of exclusive breastfeeding as they are critical for its practice. Negative attitudes and beliefs on exclusive breastfeeding should be addressed as they also affect exclusive breastfeeding. Additionally, there is need to improve on strategies, education and training on information concerning exclusive breastfeeding in order to reach mothers with low knowledge on the benefits and optimal duration of exclusive breastfeeding. Ministry of Public Health and Sanitation should review the implementation of BFHI in the health facilities.

CHAPTER ONE: INTRODUCTION

1.1 Background information

Breastfeeding is an unequalled way of providing ideal nutrition for the healthy growth and development of infants. The global public health recommendation is that infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health (WHO, 2003). Exclusive breastfeeding in the first six months of life stimulates babies' immune systems and protects them from diarrhea and acute respiratory infections, two of the major causes of infant mortality in the developing world and improves their responses to vaccination (UNICEF, 2006).

Exclusively breastfed infants obtain most of the nutrients required to support growth until six months. Vitamin D which is insufficient in breast milk is supplemented by exposure to sunlight for the skin to synthesize it while iron and zinc are supplemented by prenatal stores (Butte, Lopez-Alacorn and Garza, 2002). Exclusive breastfeeding during the initial months of life and continued breastfeeding through at least the first year of life is associated with substantial reduction in the burden of infections (Fisk *et al.*, 2010; Arifeen *et al.*, 2001; Brown *et al.*, 1989). Breastfeeding reduces the mother's risk of fatal postpartum hemorrhage, the risk of breast and ovarian cancer, and of anemia, and by spacing births, breastfeeding allows the mother to recuperate before she conceives again (Leon-Cava *et al.*, 2002). In many Sub-Saharan Africa societies, exclusive breastfeeding is considered by far the best feeding option for women of unknown HIV status and for most HIV positive mothers, although it is challenged by low acceptability and feasibility (Cames *et al.*, 2009).

The rates of exclusive breastfeeding have improved over the recent past, with the global rate at 37% (UNICEF, 2009c and UNICEF, 2011a). However in all regions the percentage of infants under six months receiving the benefits of exclusive breastfeeding is less than 50% (UNICEF, 2011b). In the developing world, less than 40 % of infants under 6 months old receive the benefits of exclusive breastfeeding. The rate is particularly low in Africa, where less than one third of infants under 6 months old are exclusively breastfed (UNICEF, 2009a). There has been a major increase in exclusive breastfeeding in 19 African countries including Rwanda (88%), Tanzania (41%) and Malawi (57%) among others (UNICEF, 2011c and UNICEF, 2009b). In Kenya however, rates of exclusive breastfeeding remain low with only 32% of infants below six months being exclusively breastfed (KNBS and ICF Macro, 2010).

Studies have identified various factors that influence breastfeeding practices such as inadequate knowledge of the health benefits of breastfeeding (Ochola, 2008; LINKAGES, 2004); inadequate antenatal counseling on breastfeeding (Dhandapany *et al.*, 2008) and belief that breast milk is insufficient (Savage, Canahuati and Osorno, 2004). A range of maternal and child health attributes such as marital status, economical status and child age also influence the practice of exclusive breastfeeding (Alemayehu, Haidar and Habte, 2009). To make better feeding choices, mothers need specific, culturally appropriate, information that responds to their constraints and concerns (LINKAGES, 2004).

1.2 Problem statement and justification

Approximately 1.5 million young infants die each year as a result of lack of knowledge about exclusive breastfeeding benefits and improper infant and young child feeding practices (Nguyen, 2009). The World Health Organization (WHO), United Nations Children's Fund (UNICEF) and other organizations promote exclusive breastfeeding as one of the key effective low-cost interventions to enhance child survival. Numerous awareness campaigns have been launched by national governments, multilateral organizations, and non-governmental and private sector organizations across the globe to educate mothers and families about the benefits of exclusive breastfeeding and with aim to encourage the practice (Nguyen, 2009).

Such initiatives include Baby Friendly Hospital Initiatives (BFHI) and establishment of work place breast feeding facilities. These efforts have achieved different levels of success. The BFHI for example, does promote exclusive breastfeeding in the health facility but does not sustain it at community level. In reality many mothers are unable to practice exclusive breastfeeding as advocated (Dhandapany *et al.*, 2008) and there is paucity of scientific data on reasons why exclusive breastfeeding is not practiced optimally. While there is a large body of published material on the factors affecting breastfeeding, there are few studies documenting factors influencing exclusive breastfeeding. To improve exclusive breastfeeding, factors influencing its practice have to be identified in order to target these in programme implementation. In Kenya the determinants of exclusive breastfeeding especially in resource- poor settings have not been fully investigated. This study therefore obtained information which would lead to a

better understanding of factors influencing exclusive breastfeeding practice in Kasarani a resource poor informal settlement in Molo district.

1.3 Purpose of the study

The aim of the study was to investigate exclusive breastfeeding practices and identify the factors influencing the practices among mothers of infants 0 < 6 months in Kasarani informal settlement.

1.4 Objectives of the study

The objectives of this study were to;

- i. Establish socio-demographic, socio-economic characteristics and contextual factors of mother with infants 0<6 months old in Kasarani informal settlement Molo district.
- ii. Determine the characteristics of infants 0<6months in Kasarani informal settlement Molo district.
- iii. Determine the prevalence of exclusive breastfeeding among infants 0 < 6 months old in Kasarani informal settlement Molo district.
- iv. Establish maternal knowledge, attitudes and beliefs on exclusive breastfeeding in Kasarani informal settlement Molo district.
- v. Establish the factors associated with exclusive breastfeeding in Kasarani informal settlement Molo district.

1.5 Hypothesis

HO₁: The prevalence of exclusive breastfeeding for infants 0 < 6 months old in Kasarani informal settlement is significantly lower than the WHO recommended level of ninety percent (90%).

HO₂: Infant characteristics (age, sex and morbidity) have no significant association with exclusive breastfeeding practice of infants 0<6 months old in Kasarani informal settlement.

HO₃: Maternal characteristics and contextual factors have no significant associations with the practice of exclusive breastfeeding of infants 0< 6 months old in Kasarani informal settlement.

HO₄: Maternal knowledge, attitudes and beliefs have no significant associations with the practice of exclusive breastfeeding of infants 0< 6 months old in Kasarani informal settlement.

1.6 Significance of the study

This study has generated information on factors influencing exclusive breastfeeding practices in a poor-resource setting. The findings will be useful to the Ministry of Public Health and Sanitation (MOPHS) and other organizations working in child survival programmes to design interventions to improve the practice of exclusive breastfeeding in the area and other similar circumstances. The findings will also be useful as a contribution to the ongoing research efforts on exclusive breastfeeding and child survival.

1.7 Delimitation of the study

The study was only carried out in Kasarani informal settlement, an urban slum in a rural district. The results can only be generalized to other areas with similar characteristics.

1.8 Limitations of the study

The study being cross-sectional, data collected did not reveal whether the reported infant feeding practices varied from one day to another.

1.9 Conceptual framework for the study

This study adopted Ochola's conceptual framework (Figure 1.1) on factors associated with exclusive breastfeeding practices (Ochola, 2008).

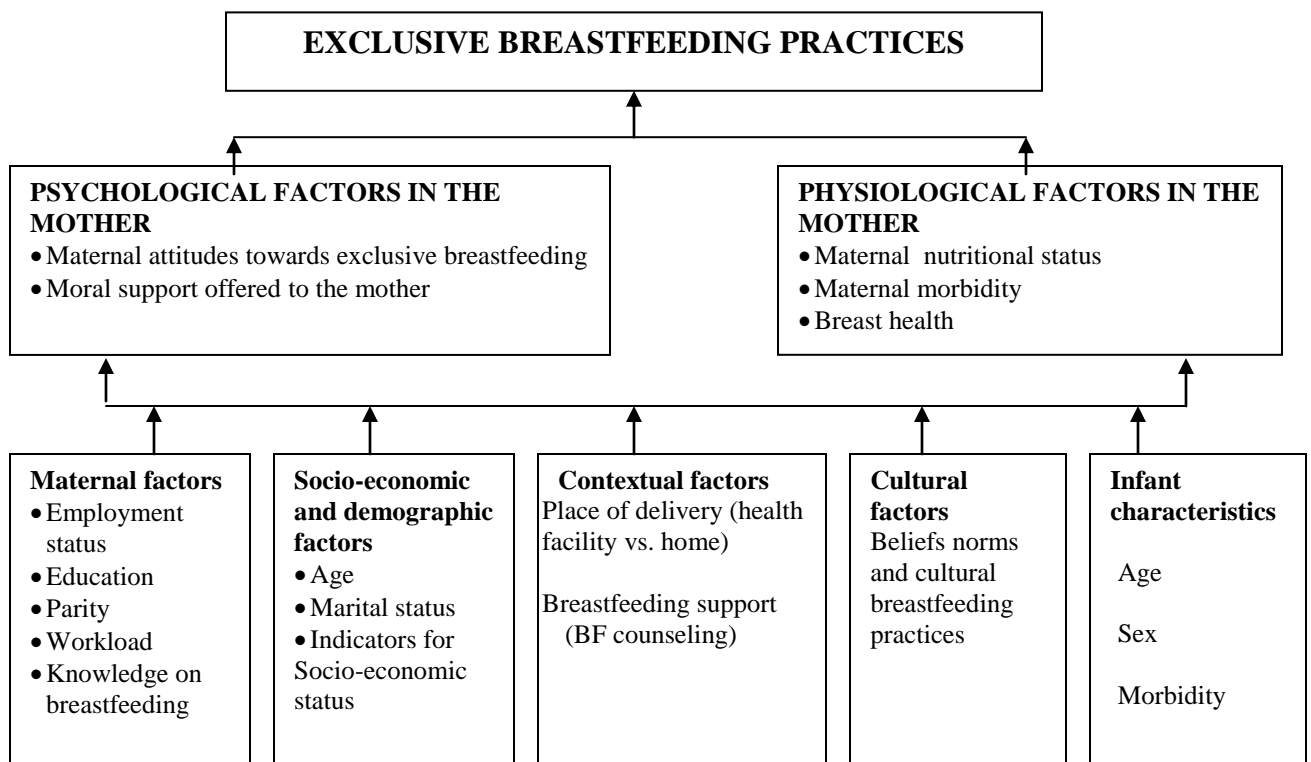


Figure 1.1: Conceptual Framework on factors associated with breastfeeding practices.

Source: Adapted from Ochola (2008).

Breastfeeding is a complex process governed by psychological and physiological factors which are in turn conditioned by a wide spectrum of environmental, socio-economic and cultural factors (Obermeyer and Castle, 1997). These factors affect breastfeeding and exclusive breastfeeding rates in different directions and to varying degrees depending on culture (Aidam *et al.*, 2005). While there is a large body of published material on the factors affecting breastfeeding, there are few studies documenting factors influencing exclusive breastfeeding. A fundamental limitation of research in this area is lack of a conceptual or theoretical base to guide researchers in planning their studies or to assist readers to interpret results in a broad context (Hector, King and Web, 2005).

Furthermore there are limited studies especially in Kenya that have investigated the factors associated with exclusive breastfeeding. For this study, the framework was used as a guide to investigate the maternal demographic characteristics (education, age and marital status), knowledge on breastfeeding, maternal morbidity, socio-economic factors (occupation, income source and item ownership) and contextual factors (place of delivery, type of delivery, breastfeeding support (breastfeeding counseling and sources of information) and attitudes and beliefs about breastfeeding practices.

1.10 Operational definition of terms

Appropriate health seeking behavior- seeking prompt and appropriate care and treatment for illnesses

Contextual factors - place of child delivery, type of child delivery, breastfeeding support from family and breastfeeding support programmes/counseling.

Cultural factors – population beliefs, norms and local myths about breastfeeding and infant feeding practices.

Exclusive breastfeeding-this means an infant is fed only on breast milk (including milk expressed from a wet nurse) and allows for medicine, oral rehydration, drops or syrups (vitamins and syrups) (WHO, 2008).

Informal settlement / slum- Living conditions in which a household lacks one or more of these conditions; access to improved water, access to improved sanitation facilities, sufficient living area-not overcrowded, structural quality/durability of dwellings and security of tenure (World Bank, 2008).

Maternal factors - education, knowledge on breastfeeding, morbidity and breast health.

Socio-economic factors - defined by income, occupation and proxy indicators such as ownership of items.

Partial breastfeeding- an infant receives breast milk and any food or liquids including non-human milk and formula (WHO, 2008).

Predominant breastfeeding – an infant receives breast milk (including milk expressed from a wet nurse) as the predominant source of nourishment and allows water and water-based drinks, fruit juice, ritual fluids, oral rehydration salts, drops or syrups (vitamins, minerals and medicine) (WHO, 2008).

Pre-lacteal foods – non-breast milk feeds given before breastfeeding is initiated (WHO, 2008).

Post –lacteal feeds- non-breast milk fluids and foods given after breastfeeding has been initiated

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Benefits of breastfeeding to the infant

Breast milk is a living substance that fulfills all of a baby's nutritional and fluid requirements in the first six months of life (Sockol, Aguayo and Clark, 2007). Infants do not need water or other liquids such as herbal teas to maintain good hydration even in hot climates (LINKAGES, 2004). Colostrum which is the first milk is the baby's first immunization. It has high levels of antibodies, vitamin A, other protective factors which strengthen the infants' immune system and reduce the chances of death in the neonatal period (Kroeger, 2003) A multi-centre cohort study done in India, Ghana and Peru between 1995 and 1997 showed that infants who were not breastfed had a 10-fold higher risk of dying of any cause and a 3-fold higher risk of being hospitalized for any cause compared to those who had been predominantly breastfed (Bahl *et al.*, 2005).

According to Venneman *et al.*, (2009), breastfeeding reduces the risk of sudden infant death syndrome by up to 50% at all ages through infancy while a 15-year old cohort study hypothesized breastfeeding was associated with protection against maternally perpetrated child maltreatment, particularly child neglect (Strathearn *et al.*, 2009). Association between breastfeeding and a number of chronic or non communicable diseases including allergies, obesity, diabetes, hypertension, cancer, and Crohn's disease have been observed by various studies (Leon-Cava *et al.*, 2002). Findings of systematic reviews and meta-analyses suggest there is a protective effect against overweight and obesity from breastfeeding; this effect is more important against obesity than against

overweight (Horta *et al.*, 2007). During the World Breastfeeding Week (2009), breastfeeding was endorsed as a lifeline and a shield that protects infants in emergencies.

2.2 Benefits of breastfeeding to the mother

Initiation of breastfeeding immediately after delivery stimulates the release of oxytocin, a hormone that helps to contract the uterus, expel the placenta and reduce postpartum bleeding while in the longer term, mothers who breastfeed tend to be at lower risk of premenopausal breast and ovarian cancer (Leon-Cava *et al.*, 2002). Women, who practice exclusive breastfeeding, have 98% protection against pregnancy during the first six months after giving birth (Esterik and Buttler, n.d). This is true for women who meet the criteria for lactation amenorrhea method of baby fully or nearly fully breastfeeding, absence of menses and baby less than six months old (LINKAGES, 2001).

2.3 Benefits of exclusive breastfeeding

Studies across the world have revealed enormous benefits of exclusive breastfeeding for both the infants and the mothers. A study carried out in Chittagong, Bangladesh by Mahrshahi *et al.* showed that infants who were exclusively breastfed from 0-6 months had a significantly lower prevalence of diarrhea and acute respiratory infection than those infants who were not exclusively breastfed (Mahrshahi *et al.*, 2008). Exclusive Breastfeeding Reduces Risk of Mother-to-Child HIV Transmission. For the first 6 months of life exclusive breastfeeding remains the most appropriate option for many HIV-infected mothers in sub-Saharan Africa, although its acceptability and feasibility need to be improved by promoting it as the best feeding option for all infants (Cames *et*

al., 2009). In a study carried out by Illiff *et al.* in Harare Zimbabwe between 1997 and 2000, mixed breastfeeding quadrupled mother-to-infant HIV transmission and was associated with a three times greater risk of transmission and death by age 6 months when compared to exclusive breastfeeding (Illiff *et al.*, 2005). In the same study, predominant breastfeeding was associated with a 2.6 fold increase in HIV transmission as compared to exclusive breastfeeding. Moreover, flash heated expressed breast milk from a HIV positive mother can be utilized for replacement feeding as it is free from active HIV, safe, nutritious, affordable, available and protective (Ballard, 2009). Exclusive breastfeeding promotes weight loss during the postpartum period hence protecting the mother against maternal overweight/obesity and also facilitates rapid return to pre-pregnancy weight (Hatsu, McDoougald and Anderson, 2008).

2.4 Global picture on status of exclusive breastfeeding

Exclusive breastfeeding for infants less than six months old has increased in all but one developing region (UNICEF, 2009d). In the developing world as a whole, progress has been modest, from 33% around 1995 to 37% around 2008 a relative increase of about 16% (UNICEF, 2011c and UNICEF, 2009a) and currently stands at 36% (UNICEF, 2011a). South Asia, East Asia / Pacific and Eastern / Southern Africa are regions with the highest levels of exclusive breast feeding (44%, 43% and 39%) (UNICEF, 2009e and UNICEF, 2011a). The rates of exclusive breastfeeding are particularly low in West and Central Africa (23%), East Asia and Pacific (28%), Central and Eastern Europe/Commonwealth of Independent States (CEE/CIS) with 29% (UNICEF, 2011b) as shown in Figure 2.1.

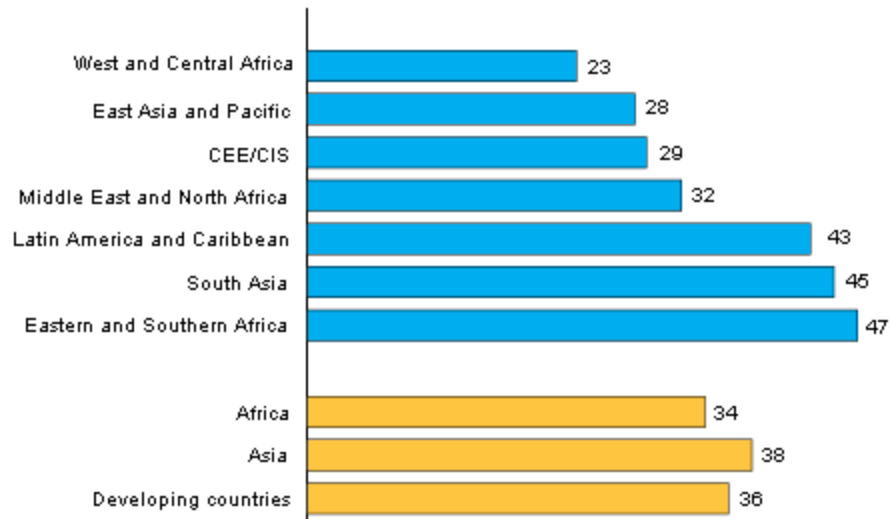


Figure 2.1: Percentage of infants under the age of six months who are exclusively breastfed, 2005–2009

Source: UNICEF global databases 2010, from MICS, DHS and other national surveys in UNICEF (2011b)

In China, the rates of any breastfeeding since mid-1990s in the majority of the cities and provinces are above 80% at four months but very few reached the national target of exclusive breastfeeding of 80% (Xu *et al.*, 2009). Findings of an infant feeding survey in the UK showed that breastfeeding initiation rates were high at 76%, and at one week 45% were still exclusively breastfeeding but at six months this dropped to less than 1% (Scientific Advisory Committee on Nutrition, 2008).

2.5 Status of exclusive breastfeeding in Kenya

Initiation of breastfeeding is universal with 99% of children under six months being breastfed and the duration is also long with 53.6% of children 20-23 months old still breastfeeding (KNBS and ICF Macro, 2010). Exclusive breastfeeding is however not

common. There has been an increase in exclusive breastfeeding rates from 13% in 2003 (KNBS and ICF Macro, 2010) to 32% of children below 6 months exclusively breastfeeding and at six to eight months the prevalence is 3.6% (KNBS and ICF Macro, 2010) from 3.2% in 2003. In 2007, the Kenyan government established a comprehensive infant and young child feeding (IYCF) programme (UNICEF, 2009a), and this together with efforts by other agencies may have contributed to the increase. The prevalence has yet to reach the WHO goal of 90% and is below the global prevalence currently at 37%. Exclusive breastfeeding rate in Kenya is among the lowest in East Africa region where prevalence is 47% (UNICEF, 2011).

2.6 Factors influencing the practice of exclusive breastfeeding

2.6.1 Maternal factors

There is evidence showing that maternal characteristics such as education influence breastfeeding practices. In Tanzania according to Shirima, Gabre-Medhin and Greiner (2001) duration of exclusive breastfeeding is mainly associated with information and knowledge about breastfeeding. Maternal level of education has also been reported to be positively associated with initiation, exclusiveness and duration of breastfeeding (AL Sahab *et al.*, 2010; Alemayehu, Haidar and Habte, 2009).

In a study by Alemayehu *et al.* in Ethiopia in 2005 exclusive breastfeeding was associated significantly with, current marital status, and economical status (Alemayehu *et al.*, 2009). In Kenya limited knowledge about exclusive breastfeeding, pressure from family and friends to introduce complementary foods and excessive demands on maternal

time against other competing responsibilities have been shown to negatively influence the practice of exclusive breastfeeding (Ochola, 2008).

Other maternal characteristics that have shown significant associations with exclusive breastfeeding include maternal age, higher parity and experience of breastfeeding problems. For example in a prospective cohort study in Nigeria in 2006/2007, older maternal age and higher parity were significantly associated with exclusive breastfeeding (Ukegbu et al., 2011) while in Western Tanzania, Nkala and Msuya in 2010 established that women who had no problems related to breasts were more likely to exclusively breastfeed (Nkala and Msuya, 2011). Maternal characteristics vary widely within different contexts. While there is limited data on factors influencing exclusive breastfeeding in Kenya, review of available literature did not reveal any study showing the influence maternal characteristic may have on exclusive breastfeeding in the study area.

2. 6.2 Socio-economic factors

According to Xu *et al.*, (2007) mother's return to paid employment was negatively associated with 'exclusive breastfeeding' duration in china. In contrast, no association was observed regarding, place of residence and current employment of women in a study among women who delivered at a maternity unit in government medical college and hospital in India (Chudasama, Amin and Parikh, 2009). While in Kenya mothers from higher socio-economic status were less likely to exclusively breastfeed based on ownership of television and telephones (Ochola, 2008), in Tanzania findings of a study

by Shirima *et al* between 1998 to 1999 showed that socio-economic factors had no significant association with exclusive breastfeeding (Shirima, *et al.*, 2001). However, there is no consistency in the way the factors influence exclusive breastfeeding practices in different communities. There is therefore need to identify factors influencing exclusive breastfeeding in different set-ups in order to develop context specific interventions to promote exclusive breastfeeding (Ochola, 2008).

2.6.3 Contextual factors

A study in San Paulo Brazil by Venancio and Monteiro, (2006) in 1999 showed that the place of delivery was not associated with exclusive breast-feeding. These findings contrast those of a Mauritius study by Jahangeer *et al.* where public health institutions have adopted the (BFHI), thereby encouraging proper breastfeeding initiation and successful exclusive breastfeeding for 6 months (Jahangeer, Khan and Khan, 2009). In Canada in 2006 in a study by Al Sahab *et al* delivering at home was positively associated with exclusive breastfeeding while caesarean birth was negatively associated with exclusive breastfeeding (Al Sahab *et al.*, 2010). As stipulated by the study, pain and discomfort associated with caesarean section may prevent the mother from breastfeeding.

2.6.4 Cultural factors

In India, the belief that mother's milk is not ready until 2-3 days postpartum delays initiation of breastfeeding while colostrum is generally discarded (Bandyopadhyay, 2009). Among Lebanese women concerns that the mother could potentially harm her infant through breastfeeding were rooted in a number of cultural beliefs among them

having an inherited inability to produce milk, having "bad milk", and transmission of abdominal cramps to infants through breast milk (Osman, Zein and Wick, 2009). Other obstacles to exclusive breastfeeding include the perception of insufficient breast milk, fear of dying or becoming too sick to breastfeed, (Fjeld *et al.*, 2008). These findings agree with those of many studies in China (Xu *et al.*, 2009) and in Kenya (Ochola, 2008) which have shown perceived breast milk insufficiency as a reason for discontinuing exclusive breastfeeding. From most of the studies, cultural practices do not agree with exclusive breastfeeding for 6 months. There is need to identify the cultural factors that may negatively affect exclusive breastfeeding in different communities so that they can be addressed during promotion of appropriate breastfeeding practices.

2.7 Promotion, support and protection of breastfeeding

Protection, promotion and support of breastfeeding has routes in a joint UNICEF-WHO meeting (1979) on Infant and young child feeding during which an International Code on the marketing of infant formula and other breast milk substitutes was recommended and later adopted in 1981 by World Health Assembly (Sockol *et al.*, 2007). In 1990 the Innocenti Declaration was adopted and called for all women to be enabled to practice exclusive breastfeeding for all infants (UNICEF, 2005). The (BFHI) has had a measurable impact on increasing exclusive breastfeeding with 19 000 facilities in 150 countries being designated as Baby-Friendly (UNICEF/WHO, 2006). The impact however, is mainly at the health facility and is not sustained beyond it (Braun *et al.*, 2003; Coutinho *et al.*, 2005).

Community-based strategies for promotion and support of breastfeeding have had significant beneficial effects on the rates of exclusive breastfeeding. The challenge is to implement them on large scale and sustain change and commitment (WHO, 2008a). World Breastfeeding Week was first celebrated in 1992 and it is currently observed in over 120 countries by UNICEF and its partners, including WABA and WHO with the aim of promoting exclusive breastfeeding for the first six months. WABA's advocacy package and website (UNICEF-Press centre, 2008) are also initiatives that have contributed to protection, promotion and support of breastfeeding.

2.8 Summary of literature review

In summary, exclusive breastfeeding for infants less than six months old has increased in different regions of the world (UNICEF, 2009d) less so in Sub-Sahara Africa. The increase however, falls short of the WHO's recommendation of exclusive breastfeeding for six months. Studies have shown that maternal characteristics, socio-economic factors, contextual factors and beliefs and norms about breastfeeding practices influence exclusive breastfeeding in varying magnitude in different set ups. A search of literature however revealed that there is limited information on the factors that influence exclusive breastfeeding practices in Africa as well as in Kenya. This study therefore aimed to investigate breastfeeding practices and identify the factors influencing the practices among mothers of infants 0<6 months in Kasarani informal settlement, Molo district, Kenya.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research design

The study was a community based cross-sectional analytical study (Katzenellenbogen *et al.*, 2002) designed to establish the rate of exclusive breastfeeding and identify the factors associated with the practice.

3.2 Variables

3.2.1 Dependent variable

The dependent variable for the study was exclusive breastfeeding rate which was defined as continuous exclusive breastfeeding since birth and exclusive breastfeeding as assessed by 24 hour recalls.

3.2.2 Independent variables

The independent variables included maternal socio-demographic demographic characteristics as determined by; age in completed year, marital status and education level. Maternal socio-economic characteristics as determined by occupation, income sources, housing type (if rented, owned and construction materials), amount of rent paid and ownership of selected items (radio, television, mobile phone, video/ DVD player). Another independent variable was maternal health characteristics as determined by maternal morbidity on a two week recall and breast health determined by presence of breastfeeding complications.

Other independent variables included; maternal knowledge on breastfeeding practices, and sources of breastfeeding information. Contextual factors were determined by delivery

history of the mother which included; place of delivery whether home or health facility and birth type whether normal or caesarean. Infant characteristics were determined by; infant age in completed months, infant sex and infant morbidity assessed on a two week recall.

3.3 Study location

The study was carried out in Kasarani informal settlement located in Elburgon. Elburgon is one of the ten administrative divisions of Molo district. By the time of data collection, Elburgon had an estimated total population of 72,383 out of the 523,604 total population of Molo district (Personal communication from Molo District Statistics Office, Nakuru, 2008) and agriculture is the main economic activity. Kasarani informal settlement in Elburgon location is the largest (5 km²) of the four informal settlements within the division with an estimated population of 15,000 and 5000 households (Personal communication from Assistant Chief's Office, 2009).

Living conditions in this settlement match those of a 2002 UN Conference definition of a slum household as a group of individuals living under one roof lacking one or more of these conditions; access to improved water, and sanitation facilities and sufficient living area (World Bank, 2008). Most of the houses in Kasarani informal settlement are semi-permanent with no electricity or tapped water. By the time of data collection, most of the residents depended on casual work by either working in farms, doing domestic work or working in a timber factory (Timsales Company limited) located within the division which accommodated only a few people.

3.4 Target population

The target population was mothers with their infants $0 < 6$ months old residing in Kasarani informal settlement. The number of mothers was estimated to be 290 although after enumeration during the study the number obtained was 220.

3.4.1 Inclusion criteria

All mothers with infants $0 < 6$ months old, willing to participate in the study and were resident in Kasarani informal settlement for at least 6 months before the study were given a chance to be included in the study.

3.4.2 Exclusion criteria

HIV positive mothers with infants $0 < 6$ months old, not breastfeeding their infants and willingly disclosed this information, were excluded from the study.

3.5 Sampling techniques

Molo district was selected as a typical rural district. Kasarani informal settlement is the largest within Elburgon division and has eight villages. All the mothers within these villages with infants $0 < 6$ were enumerated to establish a sampling frame (Figure 3.1). The 171 mothers who participated in the study were selected using simple random sampling by use of random table numbers (Katzenellenbogen *et al.*, 2002).

Sampling techniques

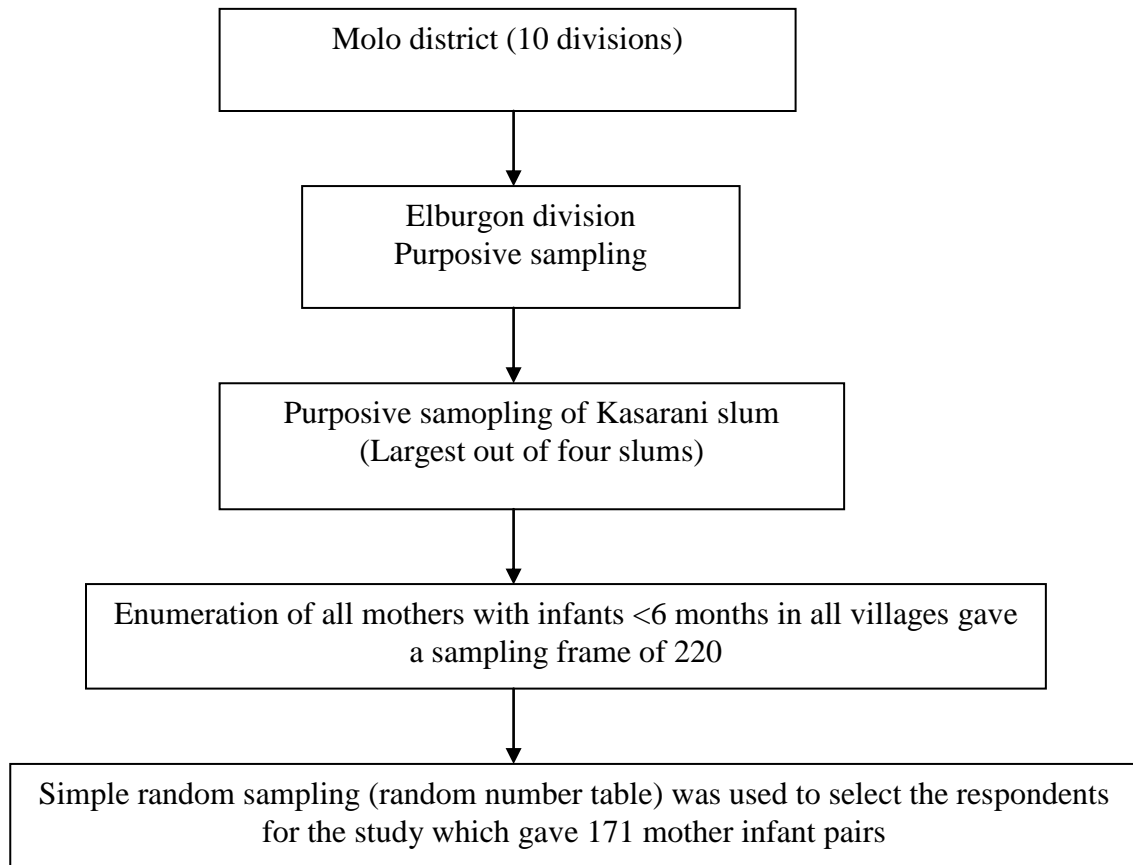


Figure 3.1: Flow chart on the sampling procedure.

Source: Author

3.6 Sample size determination

The final sample size for the study was 171 mothers with their infants 0< 6months old.

The sample size was calculated using a formula by Cochran (Israel, 1992);

$$no = \frac{Z^2 pq}{e^2}$$

no = the desired sample size

Z = the standard normal deviate at 95% confidence level (1.96)

P = the estimated proportion of the target population estimated to be exclusively breastfeeding

The Kenya national prevalence rate of 32% (KNBS and ICF Macro, 2010), was used to estimate the proportion of infants 0 < 6 months, receiving exclusive breastfeeding in Kasarani informal settlement.

$$q = 1-p$$

e = desired level of precision (0.05)

$$no = \frac{(1.96)^2(0.32)(0.68)}{(0.05)^2} = 334$$

Finite population correction was done to produce a sample size that is proportional to the population therefore the sample size was calculated as;

$$n = \frac{no}{1 + \frac{(no-1)}{N}} \quad \text{where } no = \text{desired sample size}$$

N = the estimate of the population size

$$n = \frac{334}{1 + \frac{(334-1)}{290}} = 155$$

Due to the possibility of non - response 10% was added to make a sample of 171.

Members of the focus group discussions were purposively selected to take part in the study and were not part of the main sample. The FGDs were held with TBAs, fathers, grandmothers, mothers practicing and those not practicing exclusive breastfeeding. Each group consisted of 6-12 members.

3.7 Research instruments

3.7.1 Questionnaire

A questionnaire with both closed and open ended questions was used to collect information on infant characteristics (sex and age), maternal demographic characteristics (age, education and marital status), maternal socio-economic characteristics (occupation,

income, house type, rent and ownership of items), maternal knowledge on breastfeeding, sources of breastfeeding information, maternal delivery experience, infant feeding practices, infant morbidity, maternal morbidity and breastfeeding complications. The questionnaire was adopted from a face-validated one used in a study in a low-resource urban setting by Ochola (2008) and modified for this study.

3.7.2 Focus group discussion guide

A focus group discussion (FGD) guide was used to elicit information on infant feeding practices with special focus on attitudes and beliefs on exclusive breastfeeding and factors influencing the practice of exclusive breastfeeding. This information was intended to provide an in-depth understanding of infant feeding practices as well as offer an understanding or explanation of the quantitative findings.

3.7.3 Pre-testing of instruments

In order to pre-test the questionnaire on the length, content, question wording, and language, eight respondents (5% of the total sample) from Kasarani, Turi an area with similar characteristics with the target population were interviewed. This was necessary to facilitate modifications on the questionnaire by correcting mistakes. This also ensured that the researchers conducted the interviews in a standardized way.

3.7.3.1 Reliability

The study adopted a face-validated questionnaire used for in a study by Ochola (2008). The questionnaire was revised by two supervisors and the recommended modifications to

specific items were done to suit the study objectives. The questionnaire was subjected to a pre-test before its use in actual data collection.

3.7.3.2 Validity

The research assistants were trained in a standardized way of asking questions and recording responses which was ascertained during the pre-testing of the instruments. All the questionnaires were checked daily to ensure that they were appropriately filled. Any missing data was confirmed before the start of the next day's interviews. Data from the interviews was triangulated with data from the focus group discussions.

3.8 Selection and training of research assistants

Three research assistants were recruited to participate in data collection. The research assistants were selected from those residing in the study area and having a minimum of secondary level education, fluent in both English and Kiswahili and had an understanding of local language. The research assistants were taken through a one day training which entailed:

- Explaining the objectives and methodology without disclosing the research hypotheses.
- Training on interviewing and recording skills.
- Reading through all the questions and agreeing on a standard way of asking them in Kiswahili/local language.

The research assistants were exposed to a practical experience in conducting the interviews during the pre-testing of the questionnaires. The responses recorded by the

research assistants were compared with those recorded by the investigator herself and appropriate advice given to the assistants on areas they needed to improve.

3.9 Data collection techniques

Data collection for this study was done between 11th November and 11th December 2010. All the mothers selected to participate in the study were given a home visit by either the researcher or a research assistant. During the visit, signed or thumb print consent was sought from the mother then a questionnaire administered to them. Six focus group discussions were conducted at the end of the study after all the quantitative data had been collected.

3.9.1 Quantitative data

Quantitative data was collected by administering a questionnaire only once to mothers during the home visits. The researcher or any of the two research assistants asked the questions to the mothers and recorded the responses as given by the mothers. The interviews lasted between 15 to 25 minutes. Translation of the questions into local language was done where necessary.

3.9.2 Qualitative data

Qualitative data was collected using focus group discussions. Data from FGDs was necessary to provide information on attitudes and beliefs on exclusive breastfeeding as well give explanations on quantitative data. Six focus group discussions were held at the end of the study. The first FGD was held with traditional birth attendants who were identified through mothers who delivered at home assisted by a TBA. One FGD was held

with grandmothers, fathers and mothers who practiced exclusive breastfeeding. Two FGDs were also done with mothers who did not breastfeed exclusively in the study population.

The groups consisted of 6-12 persons per group purposively selected to provide information. Members of the focus group discussions were recruited with the help of the village elders. The discussions lasted between 60 – 90 minutes and were all held in a convenient venue for all the participants of the particular FGD. The researcher facilitated all the FGDs assisted by a recorder and an observer. All FGDs were tape recorded with consent from all the participants and they conducted using the following procedure:

1. The researcher introduced herself and the two research assistants who took the role of a recorder and observer and then allowed the participants to introduce themselves.
2. The researcher then explained the objectives of the meeting to the participants and welcomed them to freely participate.
3. The researcher then sought from the participants consent to tape record the proceedings of the discussion and assured the respondent of confidentiality of the information they gave.
4. The facilitator (researcher) started off the discussion by asking the first question on the focus group discussion guide. The guide was closely followed although the discussion was allowed to flow naturally.
5. Shy participants were encouraged to participate while the facilitator tried to control the very outspoken participants.

6. At the end of the discussion the facilitator thanked the participants for their participation and assured them that the information given would be treated with confidentiality.
7. The team did an evaluation of each focus group discussion immediately after the discussion.

3.10 Data analysis

3.10.1 Quantitative data analysis

Data was checked, coded, cleaned and entered into SPSS software for analysis. All the analysis of quantitative data was done using the Statistical Package for Social Sciences (SPSS) version 17.0. Descriptive summary statistics such as frequencies, percentages, means, standard deviation and median were used to describe infant characteristics (age, sex and morbidity), maternal demographic characteristics, socio-economic characteristics, infant feeding practices, exclusive breastfeeding rates, maternal morbidity and breast health, maternal knowledge, sources of breastfeeding information and maternal delivery history. Median was used to describe the infant's and maternal age since the data was not normally distributed. In reporting exclusive breastfeeding rate, infant age is disaggregated as 0, 1, 2, 3, and 4 and 5 months as recommended by WHO (2008) on indicators of infant and young child feeding.

T-test was used to compare means in knowledge score for the exclusive breastfeeding and non-exclusive breastfeeding groups. Chi-square test was used to establish significant associations between infant age, maternal demographic characteristics (age, marital status

and education); socio-economic characteristics (occupation, income and house type) and EBF. ANOVA was used to test for significant differences in the mean knowledge scores for mothers in different age categories, marital status, different occupations and education levels.

Logistic regression yielding odds ratio was used to establish the relationships between the exclusive breastfeeding and infant gender, infant morbidity, maternal morbidity, breastfeeding complications, ownership of items, contextual factors; knowledge aspects on breastfeeding issues, sources of breastfeeding information and receipt of counseling. A p value of < 0.05 was used as the criterion for statistical significance.

3.10.2 Qualitative data analysis

Data from focus group discussions was transcribed, responses arranged in general categories identified in the discussion guide then coded. Common themes were identified, inferences made from each theme and conclusion drawn then triangulated with the data from the questionnaire.

3.11 Logistical and ethical consideration

Clearance to obtain a research permit for the study was sought from Kenyatta university graduate school. Research permit authorizing the carrying out of the research was obtained from the National Council of Science and Technology. Clearance was also obtained from the district commissioner, district education officer and district medical officer of health, Molo district. The researcher also reported to the area chief in charge of Elburgon location where Kasarani informal settlement lies. Four village elders were

included in the research team to assist in identification, enumeration of respondents and guiding the team through the villages to the homes of the respondents. Informed written or thumb print consent was sought from the respondents who were selected to take part in the study. Confidentiality was assured before carrying out the research. The names of the respondents were included in the questionnaires only for reference during the interviews. All the respondents were also assured that the information they gave would only be used for purposes of research and that findings will be communicated to them.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Characteristics of the study population

4.1.1 Maternal demographic characteristics

The median age of the mothers was 25 years (range 14-45). Majority (82.5%) of the mothers were married, 12.9% were single, 12.9% widowed while 1.8% were separated. The majority of the mothers (71.9%) had upper primary school education, 8.8% had lower primary education and 15.8% secondary school education (Table 4.1).

Table 4.1: Maternal socio-demographic characteristics

Demographic characteristics	N=171	
	n	%
Maternal age (years)		
Median (range)	25(14-45)	
Marital status:		
Married	141	82.5
Single	22	12.9
Widow	5	2.9
Separated	3	1.8
Education:		
primary education	138	80.7
Secondary school level	27	15.8
No formal education	5	2.9
Diploma level	1	0.6

On the whole, the study participants were young women below 35 years old with low levels of education most attaining primary level education only. High poverty level in the settlement was reported during the FGDs as the leading cause of early school dropout by most of the girls and subsequently leading to early marriages.

4.1.2 Socio-economic profiles of the households

Over two-fifths of the participants (44.4%) were housewives, 21.6% were casual workers and the rest (1.2%) had regular jobs or were self employed (14.0%). However, 18.7% of the mothers were still living in their parents' homes and had no specific occupation. More than half (53.5%) of the participants depended entirely on their spouses for income, 9.4% had their own businesses while 36.3% depended on other sources such as casual jobs and support from parents which was an important source of income for the participants living in their parents' homes (Table 4.2). Over half (56.0%) of the married women reported their husbands were casual workers while those in self employment were 24.8% and those regularly employed were 12.8%. The main source of income for most husbands was casual labour (59.6%) though a few depended on their own businesses (24.1%) and 13.5% on salaried jobs.

Majority (71.9%) of the study participants lived in rented houses, 20.5% owned houses while 7.6% were living with their parents. The mean number of rooms per house was 2 (SD 1.01). Mean rent paid was Kenya shillings 416.05 (SD 316.93). Most of the houses were semi-permanent in nature and all the roofs were made of iron sheets. The walls were mainly made of timber (89.5%), with a few made of cement and stones (5.3%), mud and wooden poles (4.1%) and iron sheets (1.2%). Nearly all (90.6%) households used kerosene for lighting and 9.4% used electricity. Charcoal was the main source of cooking fuel for 73.1% of the households while 25.1% of households used firewood (Table 4.2).

Table 4.2: Socio-economic characteristics of the study population

Socio-economic characteristics	N=171	
	n	%
Maternal occupation:		
Housewife	76	44.4
Casual worker	37	21.6
No occupation**	32	18.7
Self employed	24	14.0
Husband's occupation:		
Casual worker	79	56.0
Self employed	35	24.8
Formal employment	18	12.8
Maternal income sources ⁺		
Husband	137	53.5
Own business	24	9.4
Other sources	93	36.3
Husband's income sources:		
Casual work	88	62.4
Self employment	34	24.1
Salaried job	19	13.5
House type:		
Rented	123	71.5
Own house	35	20.5
Number of rooms: Mean (sd)	2 (1.0)	
Rent per month in KSh [*] :Mean (sd)	416.05 (316.93)	
House construction materials:		
Iron sheet roofs	171	100.0
Timber walls	153	89.5
Cement and stone walls	9	5.3
Mud and wooden poles walls	7	4.1
Earthen floor	136	79.5
Cemented floor	34	19.9
Ownership of items:		
Radio	127	74.3
Bicycle	48	28.1
Television	41	24.1
Video/Dvd/Vcd	15	8.8
Mobile phone	101	59.1
Motorcycle	3	1.8
Car	2	1.2
Land	13	7.6
Cows	3	1.8
Goats	2	1.2
Sheep	10	5.8
Chicken	23	13.5
Source of lighting:		
Kerosene	155	90.6
Electricity	16	9.4
Cooking fuel:		
Charcoal	125	73.1
Firewood	43	25.1

*KSh (Kenya Shillings): approximately KSh 80= 1 US \$ (December 2010); ⁺ Multiple responses;

**mothers living in parents' homes with no occupation.

Generally most of the women at Kasarani informal settlement lived in poverty conditions characterized by poor housing conditions and crowding. Majority were living in rented rooms, with low quality construction materials and low levels of hygiene. There were few or no notable livestock in the settlement. With exception of the radio and mobile phones many households did not own items such as television sets, video player, bicycle and land which could be attributed to high levels of poverty. Many women were involved in unpaid household work and mostly depended on casual work and their husbands to cater for their financial needs.

4.2 Delivery history of the mother

Half of the mothers (50.9%) reported to have delivered their babies at the health facility a few kilometers from the study site while the rest (49.1 %) had their babies delivered at home (Table 4.3).

Table 4.3: Delivery history

Delivery	N=171	
	n	%
Place of delivery:		
Health facility	87	50.9
Home	84	49.1
Type of delivery:		
Normal	160	93.6
Cesarean	11	6.4

Findings of this study compare to those of a study in Kibera by Ochola where, 44.3%, 78.4% and 53.0% of the mothers from three study groups gave birth at the health facility (Ochola, 2008). The overall rate of health facility deliveries in Kenya is 43 % (KNBS and ICF Macro, 2010) which is lower compared to the rate in the present study of 50.9 %. A

lower rate of home deliveries (24.4%) was reported in Nepal (Chandrashekhar *et al.*, 2007).

Findings from focus group discussions revealed that most mothers who gave birth at home did so because they could not afford to pay for the cost charged at the health facility, the delivery occurred too fast or because they had done it with other children. According to the Kenya Demographic and Health Survey 2008-09 Report, women who delivered at home gave similar reasons. Additionally, findings from FGDs revealed that many mothers did not attend antenatal clinics regularly and therefore may not be aware of the importance of delivering in a health facility. Nearly all of the mothers (93.6%) had a normal vaginal delivery while 6.4% went through a cesarean section (Table 4.3). Similarly, the 2008-09 KDHS indicates that 6% of births in Kenya are delivered by cesarean section (KNBS and ICF Macro, 2010).

4.3 Maternal health characteristics

4.3.1 Maternal morbidity

Thirty six mothers (21.1%), reported to have been unwell two weeks prior to the interviews. (Table 4.4)

Table 4.4: Maternal morbidity

Maternal health	N=171	
	n	%
Maternal morbidity		
Mothers reported unwell	36	21.1
Prevalence of illnesses		
Common cold/flu	21	12.3
Backache	5	2.9
Others	10	5.8

The main illnesses suffered by the mothers were common cold/flu (12.3%) and backache (2.9%) (Table 4.4). In a study at Kibera, the main illnesses mothers suffered from included; back pain, malaria, headaches and flu (Ochola, 2008).

4.3.2 Breastfeeding complications among mothers

At least 26.3% of the mothers reported that they experienced breastfeeding complications. The most common complications reported were painful breasts (49.0%), inadequate breast milk (17.6%) and baby refusing to breastfeed 15.7% (Table 4.5). Of the mothers who had experienced breastfeeding problems 79.5% said that the problems had interfered with breastfeeding where the majority of these mothers (71.4%) reduced the frequency of breastfeeding, some introduced fluids or solids (25.7%) while others (2.9%) stopped breastfeeding completely among other effects (Table 4.5).

Table 4.5: Breastfeeding complications among mothers

Breastfeeding complications	N=171	
	n	%
Experienced problems in breastfeeding	45	26.3
Problems experienced ⁺ (N=45)		
Pain in breasts	25	49.0
Inadequate breast milk	9	17.7
Baby refusing to breastfeed	8	15.7
Other problems	9	17.6
Problems interfered with breastfeeding:	35	79.5
Reduced frequency of breastfeeding	25	71.4
Introduced other fluids and solids	9	25.7
Stopped breastfeeding completely	1	2.9

⁺ Multiple responses

The prevalence of breastfeeding complications in Kasarani is higher compared to that reported in Kibera Kenya (Ochola, 2008). In a study by Naanyu in 2002 in Eldoret, Kenya 44% of all the mothers in the study reported to have experienced breastfeeding difficulties (Naanyu *et al.*, 2008). In a study by Nkala and Msuya (2010) among women with infants 6-12 months in Western Tanzania, 17% of the women reported to have had breast problems during breastfeeding such as engorged breasts, cracked nipples and mastitis (Nkala and Msuya, 2011). In Nepal, the most common problems reported were inverted nipples/cracked or sore nipples (27.5%), baby too tired to feed (11.6%) and 9.6% difficulty in expressing milk (Chandrashekhar, 2007).

4.4 Infant characteristics

4.4.1 Infant sex and age

A total of 171 infants were included in the study. The median age of the infants was 2 months (range 0-5). Male and female gender was almost equally represented in the study with 50.9% of infants being males and 49.1% females (Table 4.6).

Table 4.6: Infant characteristics

Infant characteristics	N=171	
	N	%
Infant gender:		
Male	87	50.9
Female	84	49.1
Infant age (months)		
Median (range)	2 (0-5)	

4.4.2 Infant morbidity

Infant morbidity status was determined based on a two week- recall. Slightly less than half (46.2%) of the infants were reported to have been sick. Of those infants reported to have been sick, (61.4%) suffered from acute respiratory infections (ARIs) characterized by common cold and cough; 12.9% had fever while 4.6% and 5.8% had diarrhea and vomiting respectively (Table 4.7).

Table 4.7: Prevalence of morbidity among the infants

Infant health	N=171	
	n	%
Infant morbidity:		
Sick	79	46.2
Not sick	92	53.8
Prevalence of common illnesses ⁺ (N=171)		
Acute respiratory infections (ARIs)	105	61.4
Fever	22	12.9
Diarrhea	8	4.6
Vomiting	10	5.8
Malaria	1	0.6
Others	3	1.8
Sought assistance for sick child:(N=79)	63	79.7
Never sought assistance for sick child	16	20.3
Where assistance was sought (N=63)		
Public health facility	55	87.3
Private health facility	1	1.6
Drugs from a chemist	4	6.3
Relatives	1	1.6
Others	2	3.2
Reason for not seeking assistance:(N=16)		
Condition not serious	10	62.5
Lack of money	6	37.5

⁺ **Multiple responses.**

In the current study, most mothers (79.7%) sought assistance for their sick infants. The majority (87.3%) sought assistance from the public health clinic while 6.3% bought drugs from a chemist; 1.6% visited a private health clinic and 1.6% sought help from relatives. About one-third (37.5%) of the mothers who never sought medical care for their infants cited lack of money as the reason for not doing so while the majority (62.5%) perceived the condition as not serious (Table 4.7).

In Kenya, according to the results of the Kenya Demographic and Health Survey of 2008-09, the prevalence of ARIs for infants < 6 months was 4.7%, fever 19.9% and diarrhea 13.0% for infants less than six months. The percentage of those who sought assistance or treatment for ARIs was 58.8%, fever 52% and 35.8% for diarrhea (KNBS and ICF Macro, 2010).

Overall in the current study, the mothers had appropriate health seeking behavior as most sought assistance from public health facility. This could be attributed to the presence of a public health facility which is located about four kilometers from the study site where mothers sought treatment for their infants at minimal charges. Appropriate health seeking behavior is important. Seeking prompt and appropriate care and treatment of illnesses is an important measure to reduce infant mortality due to infections such as acute respiratory infections (ARIs).

4.5 Feeding practices among infants 0<6 months old in Kasarani informal settlement

During the study information on infant and young child feeding practices was collected with a main focus on exclusive breastfeeding. Data was collected on timely initiation of breastfeeding, giving of colostrum, giving of pre-lacteal feeds and post-lacteal feeds. Exclusive breastfeeding rate was defined as continuous exclusive breastfeeding since birth and exclusive breastfeeding as measured using the 24 hour recall. However, using the 24 hour recall causes the proportion of exclusive breastfeeding to be overestimated, as some infants given other liquids irregularly may not have received them the day before the interview (WHO, 2008). Therefore, the continuity of exclusive breastfeeding practice since birth was also assessed. The exclusive breastfeeding rate is further reported for children 0-1 month, 1-2 months, 2-3 months, 3-4 months and 4-5 months as recommended by WHO (2008).

4.5.1 Infant feeding practices since birth

Table 4.8 presents information on infant feeding practices since birth. All the mothers in the study breastfed their infants after birth and the rate of timely initiation of breastfeeding (within 1 hour of birth) was 64.3%. This rate is slightly higher than that (58.1%) reported by the Kenya demographic and health survey of 2008-09 and that reported by Ochola (2008), of 30.2% for the mothers from the control group, 43.1% for the mothers from facility-based semi-intensive counseling group and 34.3% for mothers from home-based intensive counseling group in Kibera Kenya.

Table 4.8: Infant feeding practices since birth

Breastfeeding practices	N=171	
	n	%
Breastfeeding initiation:		
Within 1 hour	110	64.3
After 1 hour	61	35.7
Gave colostrum	150	87.7
Gave pre- lacteal feeds:	10	5.8
Pre-lacteal feeds given (N=10)		
Plain boiled water	5	50.0
Glucose water	3	30.0
Formula milk	2	20.0
Reason for giving pre-lacteals (N=10)		
Delayed milk production	6	60.0
Baby unwell	2	20.0
Other reasons	2	20.0
Gave post-lacteal feeds:		
Yes	106	62.0
No	65	38.0
Post-lacteal feeds given ⁺ (N=106)		
Plain boiled water	71	35.7
Glucose water	26	13.1
Porridge/Cereal	38	19.1
Non-maternal milk	19	9.5
Tea/ Juice	10	5.0
Mashed vegetables/ Fruits	7	3.5
Formula	1	0.5
Others	27	13.6
Reasons for giving post-lacteals ⁺ (N=106)		
Sooth stomach pain	54	29.8
Baby gets hungry	44	24.2
Advised by relatives	35	19.2
Mother not producing enough milk	17	9.3
Advised by health care providers	5	2.7
Advised by TBA	2	1.1
Other reasons	25	13.7

+ Multiple responses

Although most of the mothers (87.7%) reported that they had given colostrum to their infants during the first three days post partum, 5.8% admitted to having given pre-lacteal feeds. In Nepal high rates of breastfeeding initiation and giving of colostrum were reported at 72.7% and 86.2% respectively while that of giving pre-lacteal feeds was 13% (Chandrashekhar, 2007). In a study by Ochola (2008), pre-lacteal feeds such as glucose water, plain boiled water and salt solution were given by relatively smaller percentages of mothers. In other informal settlements in Kenya, two in five of the children were given something to drink other than the mothers' breastmilk within three days following delivery (Kimani-Murage *et al.*, 2011). Overall in Kenya, 42% of children are given pre-lacteals (KNBS and ICF Macro, 2010).

These findings are in agreement with the Kenyan data on the practice of pre-lacteal feeding. The most commonly given pre-lacteal feeds were; plain boiled water (50.0%) of the mothers, glucose water (20.0%) and formula milk (20.0%) (KNBS and ICF Macro, 2010). More than half (60.0%) of the mothers who had given pre-lacteal feeds cited delayed milk production as the reason for giving the feeds while the others gave because the baby was unwell (20.0%) or for other reasons (20.0%) as shown in Table 4.8.

About two-thirds (62.0%) of the mothers had given post lacteal feeds to their infants. The most common post-lacteal feeds were; plain boiled water (35.7%), porridge/cereals (19.1%) and glucose water 13.1% (Table 4.8). Many mothers (29.7%) gave post-lacteals to sooth stomach pain, 24.2% gave because they believed the baby was hungry while (19.2%) were advised by relatives and peers to do so among other reasons. Giving of post

lacteals before achieving six month exclusive breastfeeding is a common practice as reported by other studies. Findings of a study in Kibera, Kenya showed that over one-quarter of mothers had given post lacteal feeds to their infants (Ochola, 2008). In a study carried out in Nepal, 12.7% of mothers had introduced complementary feeds before 2 months (Chandrashekhar *et al.*, 2007) while Vafee *et al.* (2010) reported that almost 43% of children had some substitutions like family food or baby formula instead of their exclusive breastfeeding until the 6th month.

4.5.2 Infant feeding practices based on a 24 hour-recalls

Among the 171 mothers who participated in the study, 99.4% breastfed their infants as measured by a 24-hour recall. In Kenya, supplementation of breastmilk starts early with 60% of children aged 4-5 months being given complementary food (KNBS and ICF Macro, 2010). In the current study, about half (48.0%) of the mothers gave liquids / fluids to the infants while 24.6% gave semi-solid or solid food. Plain boiled water (52.8%); other non maternal milk (23.6%); glucose water (11.2%), formula milk (3.4%) and other liquids (9.0%) such as tea and fruit juices were the most common liquids given to the infants. Mothers who gave semi-solid / solid foods mostly gave porridge (66.1%); mashed vegetable / fruits (26.1%); snacks such as cakes or mandazi (2.9%) and (2.9%) *ugali* (Table 4.9). The main reasons for giving liquids and solid foods included; to sooth stomach pain, the baby cried because of hunger and because of pressure from relatives and friends to do so.

Table 4.9: Infant feeding practices based on 24 hour- recalls

Breastfeeding practices	N=171	
	n	%
Baby breastfed in the last 24 hours:	170	99.4
Given liquids / fluids:	82	48.0
Liquids/fluids given ⁺ (N=82)		
Plain boiled water	47	52.8
Other non maternal milk	21	23.6
Glucose water	10	11.2
Formula milk	3	3.4
Other fluids	8	9.0
Reasons for giving liquids / fluids ⁺ (N=82)		
Sooth stomach pain	31	25.4
Baby gets hungry	26	21.3
Advised by relatives / friends	20	16.4
Advised by health care providers	11	9.0
Mother not producing enough milk	10	8.2
Other reasons	24	19.7
Given semi-solid / solid food	42	24.6
Semi-solid/solid foods given ⁺ (N=42)		
Porridge / cereals	37	66.1
Mashed vegetables/fruits	15	26.7
Snacks	2	3.6
Ugali	2	3.6
Reasons for giving semi-solid / solid foods ⁺ (N=42)		
Baby gets hungry	37	52.1
Mother not producing enough milk	13	18.3
Advised by relatives/friends	11	15.5
Advised by health care providers	3	4.2
Other reasons	7	9.9
Breastfeeding status		
Exclusive breastfeeding	97	56.7
Predominant breastfeeding	31	18.1
Partly breastfeeding	42	24.6
Non- breastfed	1	0.6

⁺ Multiple responses

4.5.3. The prevalence of continuous exclusive breastfeeding since birth

Continuous exclusive breastfeeding since birth rate was 38.0% (95% CI; 30.7-45.3) (Figure 4.1). The prevalence of continuous exclusive breastfeeding since birth was 66.7% (95% CI; 59.6-73.8) at 0-1 month, 42.3% (95% CI; 34.9-49.7) at 1 month, 43.3% (95% CI; 35.9-50.7) at 2 months, 38.9% (95% CI; 31.6-46.2) at 3 months, 21.7% (95% CI; 15.2-27.9) at 4 months and 17.1% (95% CI; 11.5-22.7) at 5 months (Figure 4.2). The proportion of infants exclusively breastfeeding at 0-3 months was 49.5% (95% CI: 40.1-59.0). The confidence intervals are very wide due to the relatively small sample sizes within the age categories. A similar trend in continuous exclusive breastfeeding since birth is observed in Nigeria where exclusive breastfeeding rate at birth was 20%, at 2 months 19%, at 4 months 13% and at 5 months only 4% (Agho *et al.*, 2011).

4.5.4. The prevalence of EBF based on 24 hour recall

Based on the '24- hour recalls' definition, the prevalence of exclusive breastfeeding was 56.7% (95% CI; 49.3-64.2) as shown in Figure 4.1. The prevalence of exclusive breastfeeding was 84.8% (95% CI; 79.4-90.2) at 0-1 month, 73.1% (95% CI; 66.5-79.8) at 1 month, 70.0% (95% CI; 63.1-76.9) at 2 months, 55.6% (95% CI; 48.2-63.1) at 3 months, 30.4% (95% CI; 23.5-37.3) at 4 months and 29.3% (95% CI; 22.5-36.1) at 5 months (Figure 4.2). The prevalence of exclusive breastfeeding at 0-3 months was 72.9% (95% CI; 64.5-81.3). The confidence intervals are very wide due to the relatively small sample sizes for the age categories.

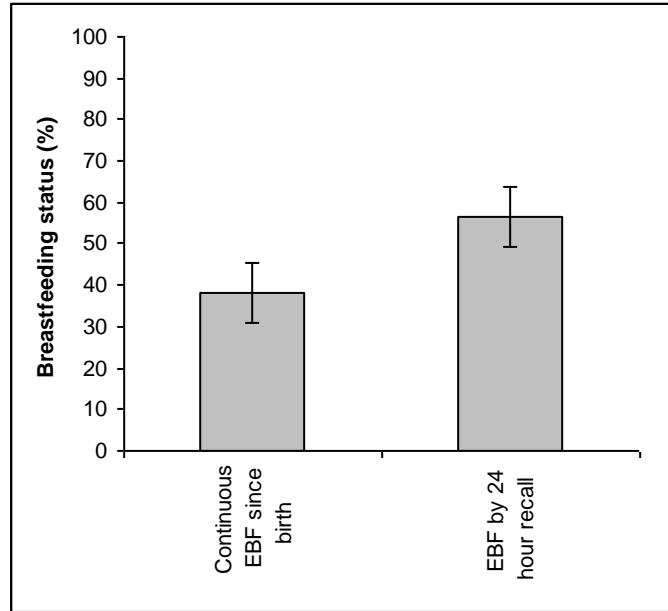


Figure 4.1: Since birth Exclusive Breastfeeding (EBF) rate and EBF based on 24 hour recall.

The findings are comparable to those of KNBS and ICF Macro (2010) in which the exclusive breastfeeding rates as determined by 24-hour recalls were 51.8% at 0-1 month, 34.8% at 2-3 months, 13.2% at 4-5 months and 42.9% at 0-3 months. Similarly in a study in Nigeria in 2003, the exclusive breastfeeding rate was 26.1% at 0-1 month, 18.5% at 2-3 months, 7.1% at 4-5 months and 21.9% at 0-3 months (Agho *et al.*, 2011).

About one fifth (18.1%) of the mothers were practicing predominant breastfeeding while 24.6% were partly breastfeeding. Encouragingly, it is only 0.6% of the mothers who did not breastfeed their infants at all in the 24 hours prior to the interview (Table 4.9). These findings indicate that most of the mothers stop exclusive breastfeeding at 3 months of age. Figure 4.2 shows a distribution of continuous EBF since birth rate and the EBF rate by 24hour recall by age of the infant.

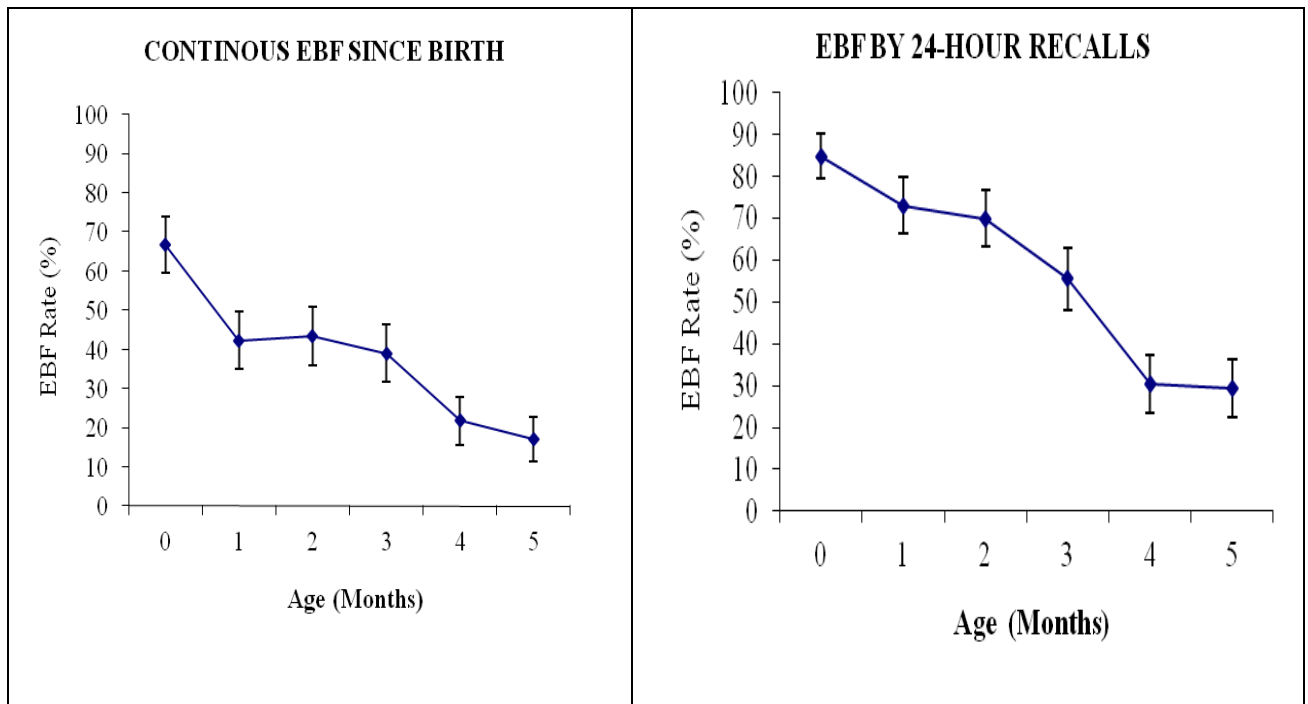


Figure 4.2: Since birth Exclusive Breastfeeding (EBF) rate and EBF based on 24 hour recall by infant age.

Overall, the rate of exclusive breastfeeding for infants 0<6 months at Kasarani informal settlement is higher than the national rate of 32% (KNBS and ICF Macro, 2010). However this rate is far from reaching the recommended level of 90% by WHO/UNICEF for exclusive breastfeeding of all infants less than six months. There is a wide variation in the exclusive breastfeeding rates as determined by the two definitions in this study. This is because the 24 hour recall does not account for feeding practices beyond the previous 24 hours and therefore giving an exaggerated rate of exclusive breastfeeding (WHO, 2008).

4.6 Maternal knowledge on breastfeeding issues

Overall, the mothers were knowledgeable on breastfeeding. Almost all the mothers (99.4%) said that breastfeeding should be the baby's first feed while 95.3% of them stated that colostrum should be fed to the baby. While 55.6% of the mothers said the baby should be put to the breast immediately after birth, 44.4% said that the baby should be put to breast after one hour to allow the mother to rest. More than half (58.5%) of the mothers knew that exclusive breastfeeding could sustain a baby in a healthy condition for six months, 85.4% knew that breastfeeding protects the baby from illness and that semi-solid / solid food should be introduced to the baby at six months (78.4%). However, it is only 33.3% and 38.6% of the mothers who knew that breastfeeding could protect a mother from getting pregnant and that expressed breastmilk is safe to feed to the baby when the mother is away respectively (Table 4.10).

Table 4.10: Maternal knowledge on breastfeeding information

Aspects of knowledge	N=171	
	n	%
Breastmilk should be baby's first feed	170	99.4
Baby should be put to breast within 1 hour of birth	95	55.6
Colostrum should be fed to the baby	163	95.3
Breast milk alone can sustain baby for 6 months	100	58.5
Breastfeeding protects baby from illness	146	85.4
Expressed breast milk should be fed to the baby	66	38.6
Breastfeeding protects mother from getting pregnant	57	33.3
Semi-solid/solid food to be introduced at six months	134	78.4

Similarly, in Uganda in a study by Petit (2008), majority (73.8%) of the respondents were knowledgeable about exclusive breastfeeding. The findings are also consistent with those of Uchendu, *et al.* (2009) in Nigeria, where more than 90% of mothers had adequate knowledge on exclusive breastfeeding and those of Amosu *et al.* (2011) where 96.5% of the respondents were aware of the benefits of breastfeeding. Maternal knowledge that breastmilk should be baby's first feed, that colostrum should be fed to the baby and the protective effects of breastmilk on baby's health were particularly high. Findings by Shirima *et al.* (2001) showed that mothers had satisfactory knowledge on importance of colostrums.

Over half of the mothers (58.5%) knew that exclusive breastfeeding can be practiced for six months and that complementary feeding should be introduced at 6 months. The findings however contrast with those of a study by Webb-Girard *et.al* in done among women in urban Kenya where 77% of them believed that breastmilk alone would be insufficient for the first six months (Webb-Girard *et al.*, 2010). Knowledge that expressed breastmilk should be fed to the baby and that breastfeeding could protect a mother from getting pregnant was low (33.3%) among the study mothers. This finding is corroborated with findings from FGDs where most participants said they were not aware that breast milk could be expressed and fed to the baby while some viewed the practice as unhygienic. Additionally, during the interviews many mothers confessed to have conceived while still breastfeeding and similar sentiments were echoed during FGDs.

A study carried out in Malaysia also reported low knowledge by the respondents of the practical aspects of breastfeeding including instructions to exclusively breastfeed for six months, not to give water after every feeding and how to detect whether the baby has received sufficient milk. The same study reported that respondents lacked adequate knowledge of dealing with problems of breastfeeding such as breast engorgement or the storage and use of expressed breastmilk (Ismail and Sulaiman, 2010).

4. 6. 1 Maternal knowledge score on breastfeeding information

Knowledge score was calculated for all mothers on issues of breastfeeding. The mothers who got the answer correctly scored 1 for each of the eight aspects that were asked while those who did not answer correctly scored 0. The mean knowledge score for all mothers was 5.46 (SD 1.4) with a minimum score of 2 and a maximum score of 8. Overall, the mothers had good knowledge on breastfeeding issues. Knowledge score was also calculated for mothers in different age categories, marital status, education levels and occupation. An analysis of variance (ANOVA) was done to establish any significant differences among them.

There was no significant difference in knowledge score among mothers < 25 years, 25-< 35 years and those who were 35 years and above (ANOVA, P= 0.137). There was also no significant difference in knowledge score for mothers in different marital status (ANOVA, P=0.65) and mothers in different occupations (ANOVA, P=0.16). However, there was a significant difference in the knowledge score among mothers who had lower primary, upper primary, secondary education and those who had no formal education

(ANOVA, $P=0.024$). The mothers who had secondary school education had the highest score (6.14) as shown in Table 4.11. This indicates that higher education level of the mother may facilitate better understanding of breastfeeding information.

Table 4.11: Maternal knowledge score on breastfeeding information

Characteristic	N=171			
	N	Mean	Std deviation	ANOVA; p
<u>Maternal age</u>				
<25 years	78	5.23 ^a	1.43	0.137
25-< 35 years	73	5.68 ^a	1.32	
35 years and above	20	5.50 ^a	1.50	
<u>Marital status</u>				
Widow	5	5.00 ^a	1.58	0.645
Single	22	5.23 ^a	1.54	
Married	141	5.50 ^a	1.39	
Separated	3	6.00 ^a	1.00	
<u>Education level</u>				
No formal education	5	6.00 ^a	1.58	0.024
Lower primary (std 1-4)	15	5.20 ^a	1.32	
Upper primary (std 5-7/8)	123	5.31 ^a	1.33	
Secondary education	28	6.14 ^a	1.56	
<u>Occupation</u>				
Housewife	76	5.24 ^a	1.33	0.160
Other	32	5.41 ^a	1.66	
Casual worker	37	5.62 ^{a,b}	1.52	
Self employed	24	5.83 ^{a,b}	1.09	
Formal/regular job	2	7.00 ^b	1.41	
				<u>T-test; p</u>
Non- EBF group	74	5.04	1.418	0.001
EBF 24 hour group	97	5.77	1.311	
Continuous EBF since birth				
No	106	5.25	1.479	0.012
Yes	65	5.80	1.202	

Means followed by similar superscripts are not significantly different at $p < 0.05$ using

Duncan's multiple range tests while means followed by different superscripts are significantly different.

A significant difference was also observed in the knowledge score of mothers who practiced exclusive breastfeeding and those who did not (ANOVA, $P=0.01$) for continuous exclusive breastfeeding since birth and (ANOVA, $P=0.01$) exclusive breastfeeding as determined by 24 hour recall. This difference in the knowledge score between the mothers who practiced exclusive breastfeeding and those who did not indicate that the mothers who chose to EBF had better information regarding infant feeding. Similar findings were observed during the FGDs where mothers who were exclusively breastfeeding seemed to be better informed on breastfeeding as compared to their counterparts who did not practice exclusive breastfeeding.

4.6.2 Sources and content of breastfeeding information

Majority of the mothers (80.1%) reported to have received counseling on breastfeeding. The main source of breastfeeding counseling was the health facility (ANC) for (74.2%) of the mothers. The rest (12.6%) received breastfeeding information from family / friends / relatives, (7.3%) from media and (5.3%) from other sources such as the church (Table 4.12). In a study carried out by Webb-Girard *et al* in Nakuru, Kenya, 64% of women reported to have received infant feeding counseling (Webb-Girard *et al.*, 2010). Health care providers play an important role in breastfeeding practices by counseling during the antenatal and postnatal visits. In the present study, among the mothers who reported to have received information from the health facility, 61.8% of them got the counseling during antenatal clinics (ANC); 20.4% during post natal clinics; 14.5% after delivery before leaving the hospital and 3.3% at the time of delivery although some of the mothers reported to have received counseling on more than one occasion. During counseling

sessions, 66.3% of the study mothers reported to have been told to breastfeed exclusively for six months while 12.6% said they were told to initiate breastfeeding within one hour postpartum. Some mothers (11.4%) were taught about how to maintain cleanliness during breastfeeding while others (9.1%) said they were told to breastfeed a baby for at least thirty minutes (Table 4.12).

Table 4.12: Sources and content of breastfeeding information

Breastfeeding information	N=171	
	n	%
Received information on breastfeeding	137	80.1
Source of breastfeeding information ⁺ (N=137)		
Hospital or health facility	112	74.2
Family/friends/relatives	19	12.6
Media	11	7.2
Other sources	8	5.3
Traditional birth attendants	1	0.7
Time of counseling in health facility/hospital ⁺		
During Antenatal clinic	94	61.8
During post-natal clinic	31	20.4
After delivery before leaving hospital	22	14.5
At the time of delivery	5	3.3
Content of counseling sessions ⁺		
Exclusively breastfeed for six months	116	66.7
Initiate breastfeeding within 1 hour	22	12.6
Cleanliness during breastfeeding	20	11.5
Breastfeed baby for at least 30 minutes	16	9.2

⁺ **Multiple responses**

Important to note are the low proportions (17.8%) of mothers receiving breastfeeding counseling at the time of delivery and after delivery before leaving the hospital. This indicates a need to re-evaluate the promotion and support of exclusive breastfeeding at the health facilities level. Similar findings were reported in Morogoro, Tanzania where

out of the 35% of rural and 86% of the urban mothers delivered at a health facility, its only 17% and 41% respectively who were given information about breastfeeding before discharge (Shirima *et al.*, 2001). This indicates a need for a re-emphasis on the implementation of Baby Friendly Hospital Initiative (BFHI) which requires every maternity to practice the ten steps of successful breastfeeding.

Findings from the FGDs revealed that most of the mothers were not satisfied with the content of breastfeeding counseling offered at the public health facility that most of them visited. It may be important to educate other stakeholders on IYCF a perception that was echoed by respondents in FGDs where most felt that breastfeeding counseling should be brought to the community level and should involve the fathers, grandmothers, employers and the community at large. Similar sentiments were reported in a study by Ochola (2008) in Kibera Kenya.

Additionally, it is notable that a high proportion of mothers get information regarding infant feeding from relatives, friends and peers. This finding is similar to the findings of the FGDs during which the respondents reported that members of the community such as grandmothers and traditional birth attendants are important sources for breastfeeding information. This indicates that apart from the mothers, other members of the community may need to be included in breastfeeding promotion education so that they can pass on the right information to the mothers regarding infant and young child feeding.

4.7 Attitudes/perceptions and beliefs on breastfeeding

A total of six focus group discussions (FGDs) were conducted at the end of the study. Two FGDs were conducted with mothers who were not practicing exclusive breastfeeding while one FGD was conducted with mothers practicing exclusive breastfeeding. Other FGDs were held with grandmothers, fathers and traditional birth attendants. Information from the FGDs was analyzed for common themes emerging from the discussion. The discussions were guided by the questions in the focus group discussion guide. The findings are presented separately for each group.

4.7.1 Attitudes/perceptions and beliefs of mothers practicing exclusive breastfeeding

4.7.1.1 Sources and content of breastfeeding information in Kasarani community

Most of the mothers said that they got information regarding breastfeeding from the health facility. Some got information from their own mothers or mother in-laws, relatives, friends, media and TBAs. The mothers reported that they had received various messages regarding breastfeeding. Some of the messages they received included the message that *'one should breastfeed on one breast until it is emptied then change to the other'* as said by one mother while another said, *'I was told to clean the breasts before breastfeeding.'* Other messages that the mothers received included the message that a mother should breastfeed within thirty minutes time after delivery; breastfeed frequently as long as the child demands; breastfeeding helps the child to grow strong; breastfeed exclusively for six months; and when the child hiccups give breast milk instead of water.

4.7.1.2 Mothers' perceptions on the messages received

The mothers reported that they concurred with messages given regarding breastfeeding counseling. Some mothers reported that they were already realizing some of the benefits of exclusive breastfeeding. One mother however said, *'I am not sure i will breastfeed exclusively for six months because my baby cries a lot.'*

4.7.1.3 Mothers' understanding of the exclusive breastfeeding concept

Mothers in this group seemed to have a good understanding of the concept of exclusive breastfeeding and stated that it meant giving the baby only breast milk without even water for six months. Some mothers reported that they had practiced exclusive breastfeeding with their older children.

4.7.1.4 Mother's knowledge of benefits of exclusive breastfeeding

The mothers gave the benefits of exclusive breastfeeding from their own understanding and also from what they had learnt from the hospital as follows: *'Mother's milk is more important to the baby than any other food as it contains all the nutrients that a baby needs for six months.'* as said by one mother. Other benefits that the mothers gave were; breastfeeding helps the baby not to get many diseases; breast milk is safer and hygienic and is always available; breastfeeding helps a mother not to get pregnant although not always; and that breast milk makes the baby to grow healthy and strong.

4.7.1.5 Exclusive breastfeeding practices in Kasarani community

The mothers believed that exclusive breastfeeding for six months, was not a common practice in Kasarani although the number of mothers practicing exclusive breastfeeding was on the increase.

4.7.1.6 Mothers' Suggestions on how to encourage exclusive breastfeeding practice in Kasarani

The mothers felt that it was important to encourage all the mothers to breastfeed their infants exclusively for six months so that they can get all the benefits of breastfeeding. The mothers suggested that there is need to encourage those who give casual jobs to allow mothers to carry their babies to the work places so that they can be able to breastfeed. Mothers should be educated on exclusive breastfeeding benefits through seminars at the community level since many do not even attend antenatal clinics. Another suggestion was that *' the government should initiate employment opportunities for the members of the community in order to make food available for families hence mothers can be able to settle down and breastfeed exclusively'* as said by one of the mothers. The nurses at the health facility should be friendly and more thorough during the counseling session so that many women can be able to understand what exclusive breastfeeding means.

4.7.1.7 Expressing and handling of expressed breast milk

Many women in this group were aware that breast milk could be expressed and fed to the baby when the mother was away and some knew how to store and heat the milk. However many said that they had never tried to express breast milk and thought that it

would be difficult to get enough milk to last the baby a whole day when the mother is at work.

4.7.2 Attitudes/perceptions and beliefs of mothers not practicing exclusive breastfeeding

4.7.2.1 Sources and content of breastfeeding information in Kasarani community

Most of the mothers reported that they got breastfeeding information from the health facility, parents, media, friends, relatives and their peers. These are some of the messages that mothers said they got regarding breastfeeding: they should introduce food when the child is six months old, meanwhile just breastfeed; they should clean the breasts before putting the child to the breastfeed; they should breastfeed for at least fifteen minutes on each breast; and that when a child is born it should be put to the breast after 30 minutes.

4.7.2.2 Mothers' perceptions on the messages received

The mothers said that they only agreed with some messages regarding breastfeeding. Some said they did not believe that exclusive breastfeeding for six months was practical while for some it was. Many felt that a child could not survive without water.

4.7.2.3 Mothers' understanding of the exclusive breastfeeding concept

Most of the mothers seemed to understand the meaning of exclusive breastfeeding although they had already introduced other fluids or foods to their infants before they attained six months.

4.7.2.4 Mothers' understanding of benefits of exclusive breastfeeding

According to the participants there are several benefits of breastfeeding a baby exclusively. *'A child who is breastfeeding recovers faster from illness when they get sick'* as one mother reported while another said *'breastfeeding promotes love connection (bonding) between a mother and child'*. Breast milk is readily available and needs no time to prepare; it makes the baby to grow healthy; and it is a complete food for the baby with all the necessary nutrients.

4.7.2.5 Exclusive breastfeeding practices in Kasarani community

The mothers when asked if exclusive breastfeeding was a common practice in Kasarani they said that it was not and gave various reasons why it was not happening.

4.7.2.6 Mothers' suggestions on how to encourage exclusive breastfeeding practice in Kasarani

Although all the mothers in this group had introduced other fluids or solids to their infants, they were in agreement that a lot could be done to promote exclusive breastfeeding practice in Kasarani. The mothers felt that there was need to encourage men to support their wives so that they can be able to concentrate on the child and therefore breastfeed exclusively. Assisting households improve their socio-economic status would encourage women to breastfeed exclusively as one mother said *'There is a lot of poverty in Kasarani and if only women could get ways of earning a living then they would be able to settle down and breastfeed properly.'* The employers should allow mothers to carry their babies to work so that they can continue breastfeeding.

4.7.2.7. Expressing and handling of expressed breast milk

When the mothers were asked if it was appropriate to express breast milk and leave for the child there were mixed reactions that elicited different responses. Some mothers believed milk could be expressed and given to the baby only if the baby was too ill to breastfeed while others did not know that milk could be expressed and thought that they would not be able to express. Some mothers felt it was unhygienic to put human milk in utensils while others felt that since many mothers do not get enough food to eat they would not be able to get enough milk to last the baby until evening when they come from work. Some of the mothers did not know how to store expressed breastmilk to avoid contamination or even how to warm it for the baby when it got cold.

4.7.3 Attitudes/perceptions and beliefs of grandmothers

4.7.3.1 Sources and content of breastfeeding information in Kasarani community

When asked about the sources of breastfeeding information, the participants cited the hospital/clinics as the most important source of information on infant feeding. The grandmothers agreed that they are also a source of information to their daughters and daughter in-laws. The TBAs who assisted some mothers to deliver gave advice to the mothers on how to breastfeed or feed the infant. One member mentioned the community health workers as a source of information although majority of the grandmothers did not seem to agree with this. Although the media (radio) was mentioned as an important source of information, some members said that most of the programmes pass when they are working in the farms and so they do not listen.

The participants were asked to mention some of the messages that mothers got regarding breastfeeding and some of the messages they gave were that infants should be breastfed for six months without introducing other fluids/liquids or solids; HIV positive mothers should breastfeed exclusively for six months; mothers who are working are told how to express store and warm milk; the mothers should give the first milk (colostrum) to the baby. One grandmother said the baby should be put to the breast immediately after birth while another had this to say *‘Every mother has enough milk to breastfeed her child for six months and those who think that they do not have enough milk should know that it is psychological.’*

Other messages were that a mother should clean her breasts before breastfeeding her child especially if she had been away from the child for long; when breastfeeding a mother should sit still, concentrate on the baby and ensure the baby gets enough milk; the mother should feed well in order to produce enough milk for the baby; and that if a mother gets pregnant while still breastfeeding she should not stop breastfeeding her baby.

4.7.3.2 Grandmothers’ perceptions on the messages received

The grandmothers unanimously agreed with the messages given. Nonetheless, some participants said that it was very difficult to breastfeed for six months without giving the child even water.

4.7.3.3 Grandmothers' understanding of the exclusive breastfeeding concept

Although the grandmothers agreed with the message that solid food should be introduced at six months of age, many did not have a clear understanding of the exclusive breastfeeding concept. Most of them talked of the feeding practices they practiced themselves which are not up to date with the current infant and young child feeding practices guidelines. Many mothers take advice from their parents as they regard them as experienced and therefore wrong advice on infant feeding is likely to result in improper infant and young child feeding practices.

4.7.3.4 Grandmothers' understanding of benefits of exclusive breastfeeding

Most of the grandmothers were not well versed with the concept of exclusive breastfeeding. However, many of them were aware of the benefits of breastfeeding a baby and they shared some of them. Breast milk is complete and contains all the nutrients that the child needs. Breastfeeding helps in fighting diseases. One grandmother said, 'I have *brought up thirteen children, breastfed them for six months each and they never used to get sick.*' Breastfeeding enables the baby to grow faster and stronger; promotes healthy brain development and breastfeeding also restores a woman's shape. Breastfeeding promotes mother and child bonding. '*The child understands the mother and learns about the mothers likes and dislikes when breastfeeding*' as one grandmother said.

4.7.3.5 Exclusive breastfeeding practices in Kasarani community

The grandmothers believed that exclusive breastfeeding was not common among the mothers in Kasarani community. This agreed with the shared by the mothers who were breastfeeding exclusively and those not breastfeeding exclusively.

4.7.3.6 Grandmothers' suggestions on how to encourage exclusive breastfeeding practice in Kasarani

The following are some of the suggestions that the grandmothers gave on what can be done to encourage mothers in Kasarani to breastfeed their babies exclusively for six months. Since grandmothers viewed themselves as an important part of bringing up children, they felt that they should also be trained on infant feeding practices so that they can pass on the right information to the young mothers. The grandmothers believed that it is important to encourage mothers to attend antenatal clinics so that they can be taught proper infant and young child feeding practices.

The whole community should be sensitized on breastfeeding issues then the community will support mothers to breastfeed exclusively. Breastfeeding counseling should be brought to the community level so that those who do not attend the counseling sessions at the hospital can be reached. Additionally, there should be economic empowerments of the community to reduce the poverty levels that make the mothers leave their infant too early and also as one grandmother said, *'parents should be encouraged to support their daughters who get pregnant outside wed-lock to feed their children properly.'*

4.7.3.7 Expressing and handling of expressed breast milk

When the participants were asked if it was appropriate to express breast milk and give it to the baby when the mother is away, many disagreed and said it was inappropriate.

Many said that they were not aware that breast milk can be expressed and that the hygiene standards in many homes were too low for handling of expressed breast milk.

However, one participant said that:

It is possible to express breast milk when it is very important. I was taught to express breastmilk at the hospital when i gave birth to underweight twins who were not able to breastfeed. I fed them on the expressed milk until they were able to breastfeed.

4.7.4 Attitudes/perceptions and beliefs of fathers

4.7.4.1 Sources and content of breastfeeding information in Kasarani community

Asked about the sources of breastfeeding information the fathers talked of the health facilities, relatives and friends, elderly women in the village, maternal mothers or mothers' in-law. These are some of the messages that mothers get regarding infant feeding although one participant said that women mostly do not tell them what they are told about infant feeding. The child should breastfeed for the first six months before introducing other foods; the mother should eat a balanced diet in order to produce enough milk for the infant; and that the mother should ensure hygienic handling of the baby's food.

4.7.4.2 Fathers' perceptions on the messages received

Asked if they concurred with these messages the participants said that they agreed with most of them but they did not believe that it was possible to breastfeed a baby exclusively for six months.

4.7.4.3 Fathers' understanding of the exclusive breastfeeding concept

Many fathers knew that infants should be breastfed for six months but did not know exactly what exclusive breastfeeding entailed. According to them breastfeeding should be done the way the mothers are taught at the health facility.

4.7.4.4 Fathers' understanding of benefits of exclusive breastfeeding

According to the participants breastfeeding makes a child very strong and a baby who is breastfed well suffers minimal illnesses.

4.7.4.5 Exclusive breastfeeding practices in Kasarani community

The facilitator explained the meaning of exclusive breastfeeding for six months to the participants then asked them if it was a common practice in Kasarani. The participants said that exclusive breastfeeding was not a common practice and those who did it, did not go beyond three months.

4.7.4.6 Fathers' Suggestions on how to encourage exclusive breastfeeding practice in Kasarani

The fathers said that in order to ensure that all the babies are breastfed exclusively it is important to encourage the husbands to be supportive of their wives when they give birth; and that bringing community education on infant feeding practices to the community level would greatly help mothers to breastfeed exclusively for six months.

4.7.4.7. Expressing milk and handling of expressed milk

When the fathers were asked if it is appropriate to express breast milk for the baby, all seemed surprised and many said they had never heard of it. Some said since most mothers eat poorly and work too hard, they would not get enough milk to express and leave for the baby. One participant believed that expressing milk would cause disagreement at home while another said, *'I think it would be historic if expressed breast milk was used to feed a child at home.'*

4.7.5 Attitudes/perceptions and beliefs of traditional birth attendants (TBAs)

4.7.5.1 Sources and content of breastfeeding information in Kasarani community

The traditional birth attendants viewed themselves as an important source of infant feeding/ breastfeeding information for the Kasarani community and especially for mothers that they helped to deliver. However they said that some mothers got information from the health facility, their peers and family members. According to the TBAs, some of the messages that the mothers got regarding breastfeeding were as reported by one TBA, *'when we assist a mother to give birth, we tell her that she should visit the health facility*

immediately after giving birth so that her breast health can be examined.' Mothers are told how to hold the baby while breastfeeding; they should breastfeed the child within one hour after delivery; the child should be breastfed for six months without giving food but water can be given; HIV positive mothers should breastfeed exclusively; and that the mother should ensure she is at peace while breastfeeding so that the milk can flow properly.

4.7.5.2 TBAs perceptions on the messages received

When asked if participants agree with the messages they get regarding infant feeding/breastfeeding they unanimously said that they only agreed with some. Most of them thought that exclusive breastfeeding for six months was not practical and argued that a child needs water to quench thirst, clear hiccups and sooth stomach pain. One TBA asked *'why should a mother breastfeed for six months without giving anything else and initially this was not like this?'*

4.7.5.3 TBAs' understanding of the exclusive breastfeeding concept

One TBA was well aware of the meaning of exclusive breastfeeding for six months; some were not very sure while another participant did not understand why the infants had to be fed differently from how they were fed traditionally.

4.7.5.4 TBAs' understanding of benefits of exclusive breastfeeding

Many of the participants were aware of the benefits of breastfeeding especially to the child and this is what they said: breastfeeding protects the child from getting sick; breast

milk is natural food for the infant and contains all the required nutrients for baby; and additionally as one TBA said, *'breastfeeding delays the return of menstrual periods hence reducing the chances of the mother conceiving though this does not happen for all mothers.'*

4.7.5.5 Exclusive breastfeeding practices in Kasarani community

According to the traditional birth attendants, exclusive breastfeeding was a rare practice among mothers in Kasarani community although a few mothers had now embraced the practice.

4.7.5.6 TBAs' suggestions on how to encourage exclusive breastfeeding practice in Kasarani

This is what the TBAs had to say on how exclusive breastfeeding practice can be improved in Kasarani: they believed that breastfeeding counseling should be brought to the homes since many mothers have no time to attend the counseling sessions at the health facility and this would help in improving the practice. Additionally, women should be economically empowered in order to curb the high poverty levels that prevent them from settling down to breastfeed their infants exclusively.

4.7.5.7. Expressing and handling of expressed breast milk

Asked about expressing of breast milk, one TBA said, *'it is a taboo to express human milk and feed to a child.'* While the others thought it was not possible to express breastmilk.

4.7.6 Summary of the main findings and common participant agreements among all the study groups

In summary, the main sources of breastfeeding information for the Kasarani community include the health facility mainly the sub-district hospital in the division, TBAs, family, friends and media. The most common messages given to mothers are to breastfeed exclusively for six months and to initiate breastfeeding within one hour after delivery. In all groups the participants said that they concurred with most of the messages that are passed to the mothers regarding breastfeeding except expressing of the breast milk which according to most participants is not right. The participants also felt that although exclusive breastfeeding was good, it was not practical for six months. According to the participants, exclusive breastfeeding has many benefits especially to the infant which include; protecting the infant from illnesses, providing all the nutrients the infant requires and promoting bonding between mother and child. In most groups, the participants were in consensus that exclusive breastfeeding practice is not common in Kasarani and cited the major hindrances as poverty since mothers have to leave their infants at home as they went to do casual work in order to feed their families. However the participants suggested that bringing breastfeeding counseling to the community level and empowering women economically so that they have enough food and time for their children would help to encourage the practice of exclusive breastfeeding in Kasarani as presented in Table 4.13.

Table 4.13: Summary of the main findings on attitudes/perceptions and beliefs on exclusive breastfeeding and common agreements among the study groups

Main areas of focus for FGDs	Main and common findings on attitudes/perceptions and beliefs among the study groups
Sources of breastfeeding information	<ul style="list-style-type: none"> • Health facility mainly public; Family, friends and peers; Media and Traditional birth attendants
Messages regarding breastfeeding	<ul style="list-style-type: none"> • Exclusively breastfeed for six months • Initiate breastfeeding within 1 hour after birth • Clean the breasts before breastfeeding • Breastfeed the baby on demand • Breastfeed a baby for 30 minutes • Breastfeeding mothers should eat a healthy diet
Benefits of exclusive breastfeeding	<ul style="list-style-type: none"> • Breast milk is natural food for babies that contains all nutrients • Breastfeeding protects babies from illnesses and promotes quick recovery from illnesses • Breast milk is safe, hygienic and always available • Exclusively breastfed infants grow healthy and strong • Breastfeeding enables mother and child to bond • Breast feeding delays pregnancy in some women
Exclusive breastfeeding practices in Kasarani	<ul style="list-style-type: none"> • EBF not commonly practiced
Factors encouraging mothers to practice exclusive breastfeeding for six months	<ul style="list-style-type: none"> • Supportive husband, parents and friends • Having breastfed exclusively another child • Having adequate breast milk • Attending counseling sessions at the hospital • Mother being available always • Economically stable mothers have enough to eat and are able to breastfeed exclusively • Benefits especially to the baby
Factors discouraging mothers from practicing exclusive breastfeeding for six months	<ul style="list-style-type: none"> • Belief that some mothers have inadequate milk • High levels of poverty in Kasarani • Unsupportive husbands who drink a lot • Lack of knowledge on exclusive breastfeeding benefits • Employers do not allow casual workers to carry their babies to work • Exclusive breastfeeding is time consuming and a mother has many tasks to perform • Conceiving within six months after giving birth • Mothers give in to pressure from family and peers to introduce fluids and food. • Many infants need water to sooth stomach pain
Suggestions on how exclusive breastfeeding can be improved in Kasarani	<ul style="list-style-type: none"> • Educate mothers and the whole community on benefits of exclusive breastfeeding • Bring breastfeeding counseling to the community level • Encourage employers to allow casual workers to carry their babies to the place of work • Government to initiate employment opportunities for the community so that mothers can settle down and breastfeed
Expressing and handling of expressed breast milk	<ul style="list-style-type: none"> • Inappropriate to express human milk • Mothers may not get enough milk to express • Hygiene standards low in Kasarani to handle expressed breast milk

4.8 Factors associated with exclusive breastfeeding practices

Univariate analyses were conducted on independent variables to determine their association with exclusive breastfeeding. The analyses were done for both continuous exclusive breastfeeding since birth and exclusive breastfeeding as determined by 24 hour recall. Maternal demographic characteristics; age, marital status, education and socio-economic factors, maternal occupation, maternal income source, husband's occupation, item ownership and their association with exclusive breastfeeding status were investigated.

Maternal knowledge on breastfeeding practices and its relationship with exclusive breastfeeding was examined. The aspects of knowledge that were investigated included; breast milk should be baby's first feed, timely initiation of breastfeeding, feeding of colostrums, breast milk alone can sustain a baby for 6 months, breastfeeding protects a baby from illness, expressed breast milk should be fed to the baby, breastfeeding protects mother from getting pregnant and Semi-solid/solid food to be introduced at six months. Contextual factors which included place of delivery and type of delivery and their association with exclusive breastfeeding status were also investigated. Maternal health and breastfeeding complications and their association with exclusive breastfeeding were investigated.

Results of univariate analyses showed the following independent variables had significant associations with continuous exclusive breastfeeding since birth and exclusive breastfeeding based on 24 hour recall definitions; maternal knowledge on breastfeeding

practices, maternal morbidity and breastfeeding complications and infant age and morbidity.

4.8.1 Maternal socio-demographic characteristics and their relationship with exclusive breastfeeding

Maternal demographic factors and their association with exclusive breastfeeding status were investigated. The demographic factors were age, marital status and education. Chi-square test was used to test for significant relationships. Analyses were done for both continuous exclusive breastfeeding since birth and exclusive breastfeeding as determined by 24 hour recall. The findings of this study showed no significant associations between maternal age and continuous EBF since (chi-square test; P= 0.09) and exclusive breastfeeding as determined by 24 hour recall (chi-square test; P= 0.05) (Table 4.14).

Table 4.14: Maternal demographic characteristics and their relationship with exclusive breastfeeding

Characteristic	N=171			
	Continuous EBF n (%)	Chi-square test; p, value	EBF (24-hr recall) n (%)	Chi-square test; p, value
Maternal age				
< 25 years	23 (29.5)	0.097	39(50.0)	0.053
25-< 35 years	32 (43.8)		42 (57.5)	
35 years and above	10 (50.0)		16 (80.0)	
Marital status				
Married	54 (38.3)	0.702	81 (57.4)	0.858
Single	7 (31.8)		12 (54.5)	
Widow	2 (40.0)		2 (40.0)	
Separated	2 (66.7)		2 (66.7)	
Education				
No formal education	0	0.189	2 (40.0)	0.628
Lower primary (1-4)	6 (40.0)		10 (66.7)	
Upper primary (5-7/8)	51 (41.5)		71 (57.7)	
Secondary education	7 (25.9)		13 (48.1)	

However findings from the focus group discussions indicated that the age of the mother influences her exclusive breastfeeding practices. Grandmothers, in an FGD felt that the young mothers choose the wrong type of foods and hence they do not get enough milk to feed their babies. Additionally as one grandmother said, teenage mothers are not able to breastfeed properly. One grandmother gave a case of a fourteen year old girl who gave birth and refused to breastfeed her baby. Her breast became infected and eventually her nipples got severed and had to be cut off hence the child had to stop breastfeeding before six months.

Marital status was not associated with continuous EBF since birth (chi-square test; $P=0.70$) and exclusive breastfeeding as determined by 24 hour recall (chi-square test; $P=0.86$). The findings of this study also showed no association between education level and continuous EBF since birth (chi-square test; $P=0.19$) and exclusive breastfeeding as determined by 24 hour recall (chi-square test; $P=0.63$) (Table 4.14). The findings of this study are consistent with those of by Ochola (2008) in which demographic characteristics did not indicate any association with exclusive breastfeeding.

Contrary to the findings of this study, a search of literature provides evidence on the influence of maternal demographic characteristics on exclusive breastfeeding. In studies across the world high level of maternal education has been associated with better exclusive breastfeeding practices (Al Sahab *et al*, 2010; Fadness *et al.*, 2009; Venancio and Monteiro, 2006). Higher levels of education as the authors stipulate allow the mothers to make better informed decisions regarding infant feeding choices In Canada

also, years of education was a significant predictor of 6-month exclusive breastfeeding (Al Sahab *et al.*, 2010).

In a study among HIV-positive women in Uganda, well educated mothers, breastfed for a substantially shorter time than their less well-educated peers (Fadnes *et al.*, 2009). Maternal age and marital status are also among specific factors known to influence breastfeeding practices across the world (Anderson, 2005, Venancio and Monteiro, 2006). In Ethiopia according to Alemayehu *et al.* (2009), women not currently married were two times more likely to breastfeeding their child exclusively than those married (OR=5.0,95% CI=3.5-7.1). In Nigeria maternal age has been associated with rates of exclusive breastfeeding (Agho *et al.*, 2011; Uchendu, Ikefuna and Emodi, 2009).

4.8.2 Maternal socio-economic factors and their relationship with exclusive breastfeeding

Maternal socio-economic factors and their association with exclusive breastfeeding were investigated. The socio-economic factors were maternal occupation, maternal income source and proxy indicators of item ownership (radio, television, video and mobile phone). Chi- square test was used to test for significant association between maternal occupation, maternal income source, house type and continuous exclusive breastfeeding since birth and exclusive breastfeeding as determined by 24 hour recall. Logistic regression was used to test for significant relationships between item ownership (radio, television, video and mobile phone) and continuous exclusive breastfeeding since birth and exclusive breastfeeding as determined by 24 hour recall. The findings of this study showed no association between maternal socio-economic characteristics with exclusive

breastfeeding. Information on these variables having insignificant associations is presented in (Table 4.15a) and (Table 4.15b).

Table 4.15a: Maternal socio-economic factors and their relationship with exclusive breastfeeding

Characteristic	N=171			
	Continuous EBF n (%)	Chi-square test; p	EBF (24-hr recall) n (%)	Chi-square test; p
Maternal occupation				
Casual workers	17 (45.9)		22 (59.5)	
Housewife	23 (30.3)		36 (47.4)	
Self employed	11 (45.8)		15 (62.5)	
Formal job	1 (50.0)		1 (50.0)	
Other	13 (40.6)	0.439	23 (71.9)	0.186
Husbands occupation				
Casual worker	28 (35.4)		45 (57.0)	
Formal job	6 (33.3)		9 (50.0)	
Self employed	16 (45.7)		21 (60.0)	
Other	4 (44.4)	0.701	6 (66.7)	0.844
Maternal income source				
Salaried job	53 (39.0)		79 (58.1)	
Husband	2 (33.3)		2 (33.3)	0.684
Own business	9 (33.3)	0.923	15 (55.6)	
Other	1 (50.0)		1 (50.0)	
Husbands income source				
Salaried job	7 (36.8)		10 (52.6)	
Own business	15 (44.1)		20 (58.8)	
Casual work	32 (36.4)	0.725	51 (58.0)	0.898
House type				
Rented house	50 (40.7)		74 (60.2)	
Own house	11 (31.4)		17 (48.6)	
Other	4 (30.8)	0.523	6 (46.2)	0.344

Results of logistic regression analyses showed no significant association between ownership of radio and continuous EBF since birth (OR: 1.26; 95% CI: 0.61-2.57;

P=0.54) and exclusive breastfeeding as determined by 24 hour recall (OR: 1.13; 95% CI: 0.57-2.25; P=0.74). There was no significant association between ownership of a television and continuous EBF since birth (OR: 0.71; 95% CI: 0.34-1.50; P=0.37) and exclusive breastfeeding as determined by 24 hour recall (OR: 0.98; 95% CI: 0.48-1.99; P=0.96). Ownership of a video and a phone were also not associated with exclusive breastfeeding (Table 4.15b).

Table 4.15b: Maternal socio-economic factors and their relationship with exclusive breastfeeding status

Independent variable	Continuous EBF since birth			Exclusive breastfeeding (24 hour recalls)		
	Odds ratio	95%CI	p value	Odds ratio	95%CI	p value
Owned radio	1.26	0.61-2.57	0.54	1.13	0.57-2.25	0.74
Owned television	0.71	0.34-1.49	0.37	0.98	0.48-1.99	0.96
Owned video	0.81	0.27-2.49	0.72	1.61	0.52-4.91	0.41
Owned phone	0.87	0.46-1.62	0.66	1.07	0.58-1.98	0.82

Findings of this study are consistent with those of a study carried out in India in which socio-economic status was not associated with exclusive breastfeeding (Chudasama *et al.*, 2009). In contrast to the findings of the present study, study by Ochola (2008) in Kibera, Kenya found a positive relationship between socio-economic status based on ownership of television and exclusive breastfeeding (OR: 4.32; 95% CI: 1.39-13.43; P=0.011). Similarly, in one study Venancio and Monteiro (2006) found that exclusive breastfeeding is positively associated with socio-economic status with exclusive breastfeeding being more prevalent among women with higher incomes while in another study, economic status was identified as one of the key factors influential in breastfeeding decision

making (Henry *et al.*, 2010). In Ethiopia, women in the wealth index ranking middle and above were two times more likely to exclusively breastfeed than the reference category ($P= 0.001$) (Alemayehu *et al.*, 2009). Findings of this study support the hypothesis that maternal socio-economic factors have no association with exclusive breastfeeding practice in the study community.

As it emerged from the FGDs, poverty negatively influenced exclusive breastfeeding. There was a common belief that poverty makes many women to lack enough food to eat so that they can get enough milk to be able to breastfeed exclusively. Some mothers have to go work far from home and they leave their children at home and therefore the babies have to feed on other foods. Mothers who are economically stable are able to breastfeed their infants since they do not have to leave their babies to fend for their families. As one participant said, '*Poverty levels are so high in Kasarani such that the mother has always to be on the move searching for food and therefore she does not get enough time to breastfeed her baby.*'

4.8.3 Contextual factors; delivery place and delivery type and their relationship with exclusive breastfeeding

Contextual issues; place of delivery home or health facility and type of delivery; normal delivery or caesarian delivery were investigated to establish their influence on exclusive breastfeeding. The results of logistic regression showed no significant associations between the place of delivery and continuous exclusive breastfeeding since birth (OR: 1.11, 95% CI=0.06-2.06, $P=0.76$) and exclusive breastfeeding as determined by 24 hour recall (OR: 1.25, 95% CI=0.68-2.30, $P=0.47$). There was also no association between the

type of delivery and continuous exclusive breastfeeding since birth (OR: 0.49, 95% CI=0.14-1.67, P=0.25) and exclusive breastfeeding as determined by 24 hour recall (OR: 0.76, 95% CI=0.21-2.61, P=0.47). The information on contextual factors and exclusive breastfeeding is presented in (Table 4.16).

Table 4.16: Contextual factors; delivery site and delivery type and their relationship with exclusive breastfeeding

Independent variable	Continuous EBF since birth			Exclusive breastfeeding (24 hour recalls)		
	Odds ratio	95%CI	P value	Odds ratio	95%CI	p value
Delivery site						
Hospital						
Home	1.112	0.600-2.063	0.736	1.252	0.683-2.295	0.468
Delivery type						
Normal						
Caesarian	0.487	0.142-1.665	0.251	0.735	0.207-2.610	0.634

These findings are in agreement with those of a study carried out in Kibera Kenya which showed no association between contextual issues and maternal exclusive breastfeeding practices (Ochola, 2008) and in Sao Paulo, Brazil where mode of delivery was not significantly associated with exclusive breastfeeding (Venancio and Monteiro, 2006). Studies in other settings have reported different results regarding contextual issues. In Mauritius, place of delivery was negatively associated with exclusive breastfeeding while mothers undergoing caesarean section were less likely to practice exclusive breastfeeding for six months (Jahangeer *et al.*, 2009). In china, method of delivery was also significantly associated with exclusive breastfeeding duration (Xu *et al.*, 2007).

Findings by Al Sahab *et al.* (2010) showed that in Ethiopia, place of delivery and type of delivery was related to exclusive breastfeeding duration and status respectively. Mothers giving birth at home were 5 times more likely to exclusively breastfeed than mothers giving birth at hospitals while vaginal delivery was found to increase the EBF rates at six months by 25% as compared to caesarean delivery (OR 1.25, 95%CI = 1.01-1.53). Similarly in Nepal mothers who had a vaginal delivery were more likely to breastfeed exclusively than those who delivered by caesarean section (OR 7.6, 95% CI=1.7-34.1) (Chandrashekhar *et al.*, 2007). In the present study the proportion of women delivering by caesarean section was rather low (6.4%).

Findings of the FGDs revealed that other contextual factors that influenced exclusive breastfeeding in the study area were support and receipt of breastfeeding counseling. Encouragement from supportive husbands, mothers and mothers' in-law and other family members enabled the mothers to exclusively breastfeed while lack of support for example by drunkard husbands disturbs the peace of the mother such that she cannot be able to breastfeed properly. Some mothers said they were encouraged to breastfeed the baby exclusively after attending counseling sessions at the health facility. Additionally lack of support from employers for working mothers hindered exclusive breastfeeding. Some employers in the study area do not allow women to carry their babies to the place of work thus babies have to be left at home while others do not give maternity leave to women when they give birth, thus on return to work the mothers have to introduce complimentary foods to the baby earlier than required.

4.8.4 Maternal morbidity and breastfeeding complications and their relationship with exclusive breastfeeding status

Univariate analyses were done to establish whether there are significant associations between maternal illness and breastfeeding complications and exclusive breastfeeding practices. Findings from this study revealed that presence of maternal illnesses was significantly associated with continuous exclusive breastfeeding since birth (OR: 3.12; 95% CI: 1.28-7.62; P=0.01) and exclusive breastfeeding as determined by 24 hour recall (OR: 2.17; 95% CI: 1.03-4.57; P=0.04) as presented in Table 4.17.

Table 4.17: Maternal morbidity and breastfeeding complications and the relationship with exclusive breastfeeding

Independent variable	Continuous EBF since birth			Exclusive breastfeeding (24 hour recalls)		
	Odds ratio	95%CI	p value	Odds ratio	95%CI	p value
Maternal illness	3.12	1.28-7.62	0.012	2.17	1.03-4.57	0.043
Breastfeeding problems	3.82	1.65-8.86	0.002	4.27	2.06-8.88	<0.001

A significantly higher proportion of mothers who reported to have been sick confessed to have given liquids or solid foods to the child after initiating breastfeeding. The sick mothers had a lower EBF rate as determined by the 24-hour recalls compared to the ones who were not sick. In a study among HIV-infected and uninfected women in Lusaka Zambia, maternal systemic illness was associated with shorter duration of exclusive breastfeeding (Chisenga *et al.*, 2005). This study however did not consider HIV status and its relationship with exclusive breastfeeding.

The presence of breastfeeding complications (pain in breasts, inadequate breast milk, baby refusing to breastfeed and other problems) was also related continuous exclusive breastfeeding since birth (OR: 3.82; 95% CI: 1.65-8.86; P=0.002) and exclusive breastfeeding as determined by 24 hour recall (OR: 4.27; 95%; CI: 2.06-8.88 P=<0.01). Additionally as it emerged from the FGDs, HIV positive mothers are likely to choose not to exclusively breastfeed for fear of infecting their baby through the breastmilk.

In a study by Ochola (2008), the presence of breastfeeding complications was related to the practice of exclusive breastfeeding; at 1month (chi-square test; P=0.023); 3 months (chi-square test; P<0.00001); 4 months (chi-square test; P<0.00001) and 5months (chi-square test; P<0.004). The findings are also in conformity with those of a study in Eldoret Kenya in 2002 by Naanyu *et al* (2008) in which breastfeeding difficulties had a negative association with exclusive breastfeeding.

In Tanzania in a study by Nkala and Msuya (2011) 17% of the women in the study who reported to have had breast problems during breastfeeding were significantly less likely to exclusively breastfeed compared to their counterparts who reported absence of pathological breast problems (AOR= 6.6) Islam *et al.* (2011), in a study involving two study groups, identified mothers sickness (pain at the operated site), cracked nipples and mastitis, breast abscess and inverted nipples as some of the causative factors involved in avoidance of breastfeeding. As it emerges from this and other studies, mothers need to be educated on how to overcome problems faced during breastfeeding so that they can be able to achieve the six months exclusive breastfeeding as recommended by World Health Organization.

4.8.5 Infant characteristics and their relationship with exclusive breastfeeding

Infant characteristics; age and sex were investigated to establish their relationship with exclusive breastfeeding. Binary logistic regression was used to test for significance association between infants' gender and exclusive breastfeeding while a chi-square test was used to test for association between infant age and exclusive breastfeeding defined using both definitions. Results of logistic regression analyses did not reveal any significant association between infants' gender and continuous exclusive breastfeeding since birth (OR: 1.36, 95% CI= 0.73-2.52, p=0.33) and exclusive breastfeeding based on 24 hour recall (OR: 1.52, 95% CI; 0.83-2.79, p=0.18). As expected the infants' age was significantly associated with exclusive breastfeeding (Chi-square test, p= <0.01) using both exclusive breastfeeding definitions (Table 4.18).

Table 4.18: Infant characteristics and their relationship with exclusive breastfeeding

Characteristic	N=171					
	EBF (history) n (%)	Chi-square test;	P value	EBF (24-hr recall) n (%)	Chi-square test;	P value
Infant age* (months)						
0-1	33 (55.9)	18.391	<0.001	47 (79.7)	32.910	<0.001
2-3	20 (41.7)			31 (64.6)		
4-5	12 (18.8)	16.105	<0.001	19 (29.7)	30.459	<0.001
0-3	53 (49.5)			78(72.9)		

* Infant age is disaggregated as recommended by WHO (2008).

As the child advances in age the rates of exclusive breastfeeding tend to decrease. While at 1 month 55.9% of infants were continuously exclusive breastfeeding since birth, at five months the rate had gone down to 18.8%. Similarly, when determined by 24 hour recalls,

a similar trend was observed with the rate dropping from 79.7% at 1 month to 29.7% at five months (Table 4.18).

The findings agree with those of Alemayehu *et al.* (2010) in Ethiopia where infants less than two months of age were five times more likely to be on exclusive breastfeeding than infants aged four to six months (OR, 5.0, 95% CI =3.5-7.1). In Nigeria also, increasing age of the infant was associated with significantly less exclusive breastfeeding (AOR=0.65, 95% CI=0.51-0.82) as reported by Agho *et al.* (2011). Findings of this study support the hypothesis that infant gender is not associated with exclusive breastfeeding while the hypothesis that infant age is not significantly associated with exclusive breastfeeding is rejected.

4.8.6 Infant morbidity and the association with exclusive breastfeeding practices

Several studies have documented the health benefits of exclusive breastfeeding. Exclusive breastfeeding during the first six months of life protects against lower respiratory tract infection, otitis media, gastroenteritis, diarrhea, wheezing and allergies (Naser, Hamed and Kanoa, 2011; Fisk *et al.*, 2010; Qanadelo, 2010; Duijts, Ramadhan and Moll., 2009). According to Diallo *et al.* (2009), the risk of morbidity is reduced by close to 70% when a child is exclusively breastfed. In a study in Canada mothers who had their babies admitted to neonatal intensive care unit after birth were less likely to achieve 6-month exclusivity of breastfeeding (Al Sahab *et al.*, 2010). In Kibera Kenya, non- exclusively breastfed infants had a significantly higher prevalence of common cold, fever, diarrhea and vomiting compared to exclusively breastfed (Ochola, 2008).

In conformity with scientific evidence, presence of morbidity was significantly negatively associated with exclusive breastfeeding in the current study. The infants who had been exclusively breastfed continuously since birth were less likely to have fallen sick (OR: 3.15, 95% CI: 1.63-6.10, P=0.001). Similarly, based on the 24 hour recall, the infants who were not exclusively breastfed were 4 times more likely to have fallen sick (OR: 4.39, 95% CI: 2.29-8.33, P= < 0.001) compared to those who had been exclusively breastfed as shown in Table 4.19.

Table 4.19: Infant morbidity and the association with exclusive breastfeeding practices

Independent variable	Continuous EBF since birth			Exclusive breastfeeding (24 hour recalls)		
	Odds ratio	95%CI	P value	Odds ratio	95%CI	p value
Infant sick						
Yes						
No	3.15	1.63-6.10	0.001	4.39	2.29-8.33	< 0.001

Findings of the FGDs support these findings that exclusively breastfed infants are healthy and those children who are introduced to food early get sick often. One mother had this to say. *‘My child whom introduced to complementary foods at two months used to get sick so often compared to the current baby who is breastfeeding exclusively.’*

Findings of the present study add to the evidence base showing that exclusive breastfeeding is beneficial in infant’s health and point to a need to promote interventions aimed at promoting the practice of optimal exclusive breastfeeding as a measure to reduce infant morbidities in the community. Based on the findings of this study, the

hypothesis that infant morbidity is not significantly associated with exclusive breastfeeding is rejected.

4.8.7 Maternal knowledge on breastfeeding practices and relationship with exclusive breastfeeding

Maternal knowledge on breastfeeding practices and its relationship with exclusive breast feeding using both definitions was examined. The aspects of knowledge that were investigated included; breast milk should be baby's first feed, timely initiation of breastfeeding, feeding of colostrums, breast milk alone can sustain a baby for 6 months, breastfeeding protects a baby from illnesses, expressed breast milk should be fed to the baby, breastfeeding protects mother from getting pregnant and Semi-solid/solid food to be introduced at six months. A logistic regression was done to test for significant relationships between knowledge aspects and continuous EBF since birth and exclusive breastfeeding as determined by 24 hour recall.

Additionally, a T-test was done to investigate significant difference in knowledge score for mothers who practiced exclusive breastfeeding either continuously since birth or as assessed by 24 hour recall and those who did not practice exclusive breastfeeding. Mothers who practiced exclusive breastfeeding continuously since birth had a significantly higher knowledge score on breastfeeding issues compared to their counterparts who did not (T-test, $P=0.001$). There was also a significant difference in knowledge score of mothers who practiced exclusive breastfeeding as determined by 24 hour recall and those who did not practice exclusive breastfeeding (T-test, $P=0.01$) as shown in Table 4.20.

Table 4.20: Maternal knowledge score on breastfeeding issues

Characteristic	N=171			
	n	Mean score	Std deviation	T-test; p
Continuous EBF since birth				
No	106	5.25	1.48	
Yes	65	5.80	1.20	0.012
Non- EBF (24 hour recall) group	74	5.04	1.42	
EBF based on 24 hour recall group	97	5.77	1.31	0.001

The results of univariate analyses showed that maternal correct knowledge on duration of exclusive breastfeeding, breastfeeding delays pregnancy and knowledge that semi-solid/solid food should be introduced at six months were significantly associated with exclusive breastfeeding. Mothers with correct knowledge on duration of exclusive breastfeeding were 2 times (OR: 2.611; 95% CI: 1.345-5.069; P=0.005) more likely to have practiced exclusive breastfeeding continuously since birth and 3 times (OR: 3.418; 95% CI: 1.807-6.465; P=0.001) more likely to practice exclusive breastfeeding as determined by 24 hour recall compared to the mothers who did not have correct knowledge on duration of exclusive breastfeeding (Table 4.21).

Maternal knowledge that breastfeeding protects the mother from getting pregnant was only significantly associated with exclusive breastfeeding as defined by 24 hour recalls (OR: 2.09; 95% CI: 1.07-4.08; P=0.03). Additionally mothers who knew that semi-solid/solid foods should be introduced to the infants at six months of age were 2 times (OR: 2.683; 95% CI: 1.142-6.306; P=0.024) have practiced exclusive breastfeeding

continuously since birth and 3 times (OR: 3.102; 95% CI: 1.450-6.634; P=0.004) more likely to have practiced exclusive breastfeeding as determined by 24 hour recall compared to the mothers who did not have correct knowledge on the appropriate age of introduction of solids and semi-solid foods.

The findings of the logistic regression analyses indicated that though not significant, the mothers who knew that colostrums should be given to the baby were more likely to practice exclusive breastfeeding (OR: 4.525; 95% CI: 0.544-37.653; P=0.163) and (OR: 2.271; 95% CI: 0.525-9.823; P=0.273) respectively using both definitions (Table 4.21).

Table 4.21: Maternal knowledge on breastfeeding issues and relationship with exclusive breastfeeding

Independent variable	Continuous EBF since birth			Exclusive breastfeeding (24 hour recalls)		
	Odds ratio	95%CI	p value	Odds ratio	95%CI	p value
Maternal correct knowledge on duration of EBF	2.611	1.345-5.069	0.005	3.418	1.807-6.465	0.001
Maternal knowledge that BF protects against pregnancy	1.445	0.755-2.767	0.266	2.092	1.072-4.082	0.030
Maternal knowledge that semi solid/solid food should be introduced at six months	2.683	1.142-6.306	0.024	3.102	1.450-6.634	0.004

Findings of this study are in agreement with those of studies carried out in other settings. In another area in Kenya comparable the present study site, Ochola (2008), reported that maternal knowledge on duration of breastfeeding was associated with exclusive breastfeeding. In Morogoro Tanzania, maternal knowledge about the importance of

colostrums for the baby was significantly correlated with the duration of exclusive breastfeeding and predominant breastfeeding among the rural and urban mothers respectively while satisfactory knowledge about the maintenance of breastfeeding was significantly associated with exclusive and predominant breastfeeding in the urban area (Shirima *et al.*, 2001). In another study in a different region in Tanzania, adequate knowledge of exclusive breastfeeding influenced the prevalence of exclusive breastfeeding; the higher the level of adequate knowledge of EBF among the women, the higher the prevalence of exclusive breastfeeding (Nkala and Msuya, 2011).

The importance of mother's breastfeeding knowledge is further confirmed by findings of a study by Gijsbers *et al.* (2008) in which a higher knowledge level early in pregnancy was associated with a longer duration of exclusive breastfeeding. In Iran, the mother's awareness about the criterion of milk adequacy had a significant relationship with exclusive breastfeeding up to 6th month ($p < 0.001$) as reported by Vafee *et al.*, (2010). As stated by Jahangeer *et al.* (2008), lack of proper information on breastfeeding sometimes acts as a barrier to its practice though women are strongly determined to breastfeed. As revealed by the findings of this study, adequate knowledge on exclusive breastfeeding is critical for its practice. It is therefore important to improve on strategies, education and training on information concerning exclusive breastfeeding in order to be able to reach mothers with low knowledge on the benefits and optimal duration of exclusive breastfeeding. Further research should be done on the kind of content given during breastfeeding counseling health facilities to find out how well key breastfeeding messages are transferred from the health service personnel to the community.

4.8.8 Breastfeeding counseling and sources of information and their association with exclusive breastfeeding

Findings of the logistic regression analyses revealed that having received counseling on breastfeeding practices was not associated with continuous exclusive breastfeeding since birth (OR: 1.920; 95% CI: 0.834-4.424; P=0.125) and exclusive breastfeeding based on 24 hour recall (OR: 1.044; 95% CI: 0.490-2.224; P=0.912). The findings did not also show any association between sources of breastfeeding information whether health facility or other sources and continuous exclusive breastfeeding since birth (OR: 2.000; 95% CI: 0.774-5.169; P=0.152) and exclusive breastfeeding based on 24 hour recall (OR: 1.554; 95% CI: 0.651-3.711; P=0.321) as presented in Table 4.22.

Table 4.22: Breastfeeding counseling and sources of information and their association with exclusive breastfeeding

Independent variable	Exclusive breastfeeding (history)			Exclusive breastfeeding (24 hour recalls)		
	Odds ratio	95%CI	p value	Odds ratio	95%CI	p value
Received BF counseling	1.92	0.83-4.42	0.12	1.04	0.49-2.22	0.91
Counseling at hospital	2.00	0.77-5.17	0.15	1.55	0.65-3.71	0.32

In a study among women in urban Kenya, receipt of counseling was not associated with attitudes and beliefs towards exclusive breastfeeding (Webb-Girard *et al.*, 2010). In Morogoro Tanzania, while no association was found between information about breastfeeding given at different contacts with a health facility and the duration of either

exclusive or predominant breastfeeding in the rural area, in the urban area the mothers who received information about breastfeeding from the health service personnel at an antenatal clinic breastfed exclusively and predominantly for a longer period (Shirima *et al.*, 2001). In the present study, out of the mothers who reported to have received counseling at the health facility it is only 17.5% of mothers who received counseling at the time of delivery. During delivery and immediate post-partum is a critical time for the mothers to be counseled and supported to initiate and continue exclusive breastfeeding. As indicated by this study is important to re-evaluate the messages that the mothers receive during counseling to ascertain the content of the messages.

4.8.9 Predictors of exclusive breastfeeding

The factors that were significantly associated with EBF in univariate analysis were subjected to logistic regression analysis. A nominal logistic regression was used to determine the strength of association between independent variables and continuous exclusive breastfeeding since birth and exclusive breastfeeding based on 24 hour recall. The independent variables included in the analysis were infant morbidity, maternal morbidity, maternal breastfeeding complications, maternal knowledge aspects including; maternal knowledge on duration of exclusive breastfeeding, knowledge that breastfeeding delays pregnancy and maternal knowledge that semi-solid/solid foods should be introduced at six months.

After controlling for infant age in the analyses; infant morbidity, maternal breastfeeding complications and maternal knowledge on duration of exclusive breastfeeding were retained as the predictors of exclusive breastfeeding defined by both definitions. The

strongest predictor for exclusive breastfeeding was infant morbidity (Adjusted Odds Ratio [AOR]: 2.45, 95% CI: 1.23-5.08, P=0.01) for continuous EBF since birth and (AOR: 3.94, 95% CI: 1.90-8.20, P=<0.01). The second predictor of exclusive breastfeeding was maternal breastfeeding complications. Mothers who reported to have experienced breastfeeding complications were less likely to have practiced exclusive breastfeeding continuously since birth (AOR: 2.42, 95% CI: 0.98-5.97, P=0.05) as presented in Table 4.23.

Table 4.23: Logistic regression analyses

Independent variable	Exclusive breastfeeding (history)			Exclusive breastfeeding (24 hour recalls)		
	AOR**	95%CI	p value	AOR	95%CI	p value
Infant morbidity	2.48	1.23-5.08	0.01*	3.94	1.90-8.20	<0.01*
Maternal morbidity	2.33	0.89-6.15	0.09	1.41	0.58-3.41	0.44
Breastfeeding complications	2.42	0.98-5.97	0.05*	2.67	1.19-6.01	0.02*
Correct knowledge of duration of EBF	1.62	0.74-3.55	0.23	2.27	1.03-4.98	0.04*
Knowledge that EBF delays pregnancy	1.16	0.57-2.41	0.688	1.75	0.79-3.82	0.16
Knowledge that semi-solid/solid food be introduced at 6 months	2.07	0.77-5.55	0.15	2.23	0.88-5.63	0.09

**AOR= Adjusted Odds Ratio * Significant associations.

Similarly based on the 24 hour recall definition, mothers who had experienced breastfeeding complications were less likely to do exclusive breastfeeding (AOR: 2.67, 95% CI: 1.89-6.01, P=0.02). Correct knowledge on duration of exclusive breastfeeding

was only significantly associated with exclusive breastfeeding as defined using 24 hour recall (AOR: 2.27, 95% CI: 1.03-4.98, P=0.04) as presented in table 4.23. Findings of this study are in conformity with those of a study in Kibera, Nairobi in which absence of breast health problems and correct knowledge about breastfeeding duration were retained as predictors of exclusive breastfeeding (Ochola, 2008).

Additionally as it emerged from the focus group discussions, negative attitudes and beliefs negatively influenced exclusive breastfeeding and other infant feeding practices. Viewing expressing of breast milk as a taboo denied the mothers the opportunity to express and leave breastmilk for their infants as they left their homes to go to work. Another common belief was that mothers do not have adequate breastmilk to sustain their infants for six months and also the belief that the child must take water to quench thirst and stop hiccups. It was also a common belief that when infants cry a lot even after breastfeeding the child is either hungry or has stomach pains and once given something else they calm down. Some mothers believed that breastfeeding would cause their so breasts to sag or lose shape while others believed if they conceived while the child was still breastfeeding they had to stop breastfeeding.

Studies in other contexts have identified different factors as predictors of exclusive breastfeeding. In a study in Eldoret, reported barriers to EBF were among others; breastmilk unsatisfying to the infant and mother resuming to work, which were attributed to inadequate breastfeeding knowledge among mothers (Cherop, Kaverenge-Ettyang and Mbagaya, 2009). A study in Peninsular Malaysia by Tan in 2006, identified area of

residence, maternal ethnicity, occupation, smoking status, parity, husbands support for breastfeeding and bed-sharing practice to be associated with exclusive breastfeeding (Tan, 2011). A study by Agho *et al* in Nigeria in 2003, revealed decreased child age in months, geopolitical region, antenatal clinic visits, household wealth and gender as factors significantly with EBF (Agho *et al.*, 2011).

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of findings

This study was a community based cross sectional study aimed at establishing the prevalence and identifying the factors that influence exclusive breastfeeding practice among infants 0<6 months old in Kasarani informal settlement in Molo district. Quantitative data was collected using researcher-administered questionnaires while qualitative data were collected from focus group discussions to elicit information on the attitudes/perceptions and beliefs on exclusive breastfeeding.

The rate of continuous exclusive breastfeeding since birth was 38% while the rate of exclusive breastfeeding based on 24 hour recall was 56.7% in the study area. The difference in the two rates implies that although many mothers initiate exclusive breastfeeding, it is only a small percentage of the mothers that adhere to the practice for the recommended duration of the first six months of an infant's life. Following the findings on the low rate of exclusive breastfeeding in the study area, the hypothesis that the prevalence of exclusive breastfeeding in Kasarani informal settlement is significantly lower than the level recommended by World Health Organization of 90% was not rejected.

In this study, results of the univariate analysis showed that maternal morbidity and breastfeeding complications, maternal knowledge and infant age and morbidity had significant associations with exclusive breastfeeding. Maternal socio-demographic, socio-economic and contextual factors had no significant association with exclusive

breastfeeding. Maternal morbidity and presence of breastfeeding complications were negatively associated with exclusive breastfeeding. The implication of this finding is that mothers need to be counseled on how to deal with their health conditions so as not to interfere with exclusive breastfeeding.

Mothers who had correct knowledge on duration of exclusive breastfeeding, knowledge that semisolid/solid food should be introduced at six months and knowledge that breastfeeding delays pregnancy were more likely to practice exclusive breastfeeding. This finding confirms that maternal knowledge on breastfeeding and infant feeding practices is critical to appropriate infant feeding practices.

Advanced infant age and presence of infant morbidity were negatively associated with exclusive breastfeeding. The implication of this finding is that mothers should be counseled on the need to seek prompt and appropriate care for sick infants in order to ensure infant feeding is not affected as well as prevent mortality. Additionally, negative attitudes and beliefs affect exclusive breastfeeding negatively and it is imperative that they should be addressed. In the logistic regression, the greatest predictor of exclusive breastfeeding was infant morbidity. Other predictors were breastfeeding complications and maternal knowledge on duration of exclusive breastfeeding.

These findings support the hypothesis that maternal socio-demographic characteristics, socio-economic and contextual factors are not significantly associated with exclusive breastfeeding; whereas the hypotheses that maternal health characteristics, maternal

knowledge and attitudes and beliefs are not significantly associated were rejected. The findings of this study also reject the hypothesis that infant morbidity is not significantly associated with exclusive breastfeeding.

5.2 Conclusions

The exclusive breastfeeding rate in Kasarani informal settlement falls way below the level recommended by WHO. The highest rates of exclusive breastfeeding are observed up to 3 months then they decline to very low rates at 5 months. For the majority of the infants, exclusive breastfeeding stops at around 3 months.

From the findings of this study, factors that influenced exclusive breast feeding in the study community included; Infant age; Infant health; maternal morbidity; maternal experience of breastfeeding complications; maternal correct knowledge on duration of exclusive breastfeeding; maternal knowledge that breastfeeding delays pregnancy; maternal knowledge that semi-solid and solid foods should be introduced at six months and attitudes and beliefs regarding exclusive breastfeeding practices.

The strongest predictor of exclusive breastfeeding in the study community was infant morbidity. Those children who were ill were less likely to receive exclusive breastfeeding. Maternal experience of breastfeeding complications was also a predictor of exclusive breastfeeding in the study community. Mothers who experienced breastfeeding complications were less likely to exclusively breastfeed their infants. Maternal correct knowledge on duration of exclusive breastfeeding was also a predictor of exclusive

breastfeeding in the study community. Mothers who had correct knowledge on duration of exclusive breastfeeding were more likely to breastfeed their infants exclusively.

5.3 Recommendations

5.3.1 Recommendations for policy

- i. Ministry of Public Health and Sanitation should review the efficiency of the implementation of BFHI in the health facilities. From this study a large percentage of mothers received breastfeeding information from the health facility.
- ii. Breastfeeding promotion messages for mothers offered by the Ministry of Public Health and Sanitation through the health facilities should emphasize the importance of prompt health seeking behavior as maternal and child morbidity influenced the practice of EBF; correct knowledge on breastfeeding issues particularly the health benefits of exclusive breastfeeding.

5.3.2 Recommendations for practice

- i. Negative attitudes and beliefs regarding exclusive breastfeeding should be addressed especially in breastfeeding messages and during counseling on infant feeding by the nutritionists, health and community health workers. In this study expressing of breastmilk was viewed as a taboo. It was a common belief that poverty constrains exclusive breastfeeding.

- ii. There is need to encourage and support community based strategies for the promotion of exclusive breastfeeding so that nutritionists, health workers and community health workers can reach more mothers with the knowledge on benefits and correct duration of exclusive breastfeeding. Correct knowledge on exclusive breastfeeding among the study population positively influenced the practice of exclusive breastfeeding. Innovative strategies are required to help mothers complete 6 month exclusive breastfeeding.
- iii. Strategies adopted by the health workers and NGOs to promote exclusive breastfeeding should also target all grandmothers, fathers and traditional birth attendants as they play a key role in influencing mothers to either exclusively breastfeed or not.

5.3.3 Recommendations for research

As a follow up of this study, the following suggestions for further research are made

- i. A study on factors influencing continued exclusive breastfeeding up to 6 months in the study community. This will help in identifying ways of curbing the decline of exclusive breastfeeding especially from three months to six months.
- ii. Additional research is required to establish ways of improving breastfeeding counseling at the health facility level in order to make it more effective and also identify ways to sustain optimal infant feeding practices in the community.

- iii. Similar studies should be done in other contexts to establish factors influencing exclusive breastfeeding in order to target context specific interventions.

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APPENDIX I: Questionnaire for the interview schedule

**FACTORS INFLUENCING EXCLUSIVE BREASTFEEDING PRACTICE
AMONG INFANTS 0-6 MONTHS IN KASARANI INFORMAL SETTLEMENT,
MOLO DISTRICT**

ADMINISTRATIVE DETAILS

Questionnaires ID NO..... Village name.....

Name of the interviewer..... Name of Respondent.....

Date of interview..... Time started..... Time finished.....

Questionnaire checked.....

SECTION A: BABY'S BIODATA

A1. Child's ID NO..... A2. Name of baby.....

A3. Sex: 1- Male [] 2-Female []

A4. Date of birth..... A5. Age of baby in weeks/Months.....

SECTION B: DEMOGRAPHIC CHARACTERISTICS OF THE HOUSEHOLDS

B1. Age of mother in completed years.....

B2. Marital status

1- Married [] 4- Divorced []

2- Single [] 5- Separated []

6- Widow []

B3. Level of education

1- No formal education [] 5- secondary level education []

2- Adult education only [] 6-Certificate level training []

3- Completed primary []

7-Diploma level education []

4- Not completed primary []

8- Degree level education []

B4. What is your occupation?

1- Casual worker []

2- Housewife []

3- Formal/regular job (specify type of job).....

4- Self-employed (specify).....

B5. What is your husband's occupation?

1- Casual worker []

2- Formal/regular job (specify type of job).....

3- Self-employed (specify).....

SECTION C: SOCIO-ECONOMIC CHARACTERISTICS OF THE HOUSEHOLDS

C1. What are your sources of income?

1- Salaried job []

2- Husband []

3- Own business []

4-Other (specify)

C2. Do you live in a:

1- Rented house []

2- Owned house []

C3. What is the number of rooms in the house?rooms.

C4. If rented, how much rent do you pay per month? Ksh.....

C5. Evaluation of the type of living conditions:

Wall made of;

- | | | | |
|------------------------|--------|------------------|--------|
| 1- Iron sheets | [] | 4-Burnt bricks | [] |
| 2-Mud and wooden poles | [] | 5-mud and cement | [] |
| 3-Cement/stone blocks | [] | 6-timber | [] |
| 7-Other (specify)..... | | | |

Roof made of;

- | | |
|-----------------------|--------|
| 1- Iron sheets | [] |
| 2- Tiles | [] |
| 3- Grass thatched | [] |
| 4-Other specify)..... | |

Floor made of;

- | | |
|------------------------|--------|
| 1-Earthen | [] |
| 2-Cement | [] |
| 3-Other (Specify)..... | |

C6. What is your main source of lighting?

- | | | | |
|-----------------------|--------|----------|--------|
| 1- Kerosene | [] | 3-Candle | [] |
| 2- Electricity | [] | 4- Solar | [] |
| 5-Other Specify)..... | | | |

C7. What is your main source of cooking fuel?

- | | |
|----------------|--------|
| 1- Firewood | [] |
| 2- Charcoal | [] |
| 3- Kerosene | [] |
| 4- Gas | [] |
| 5- Electricity | [] |

6- Other (specify).....

C8. Do you possess the following items?

- | | | | |
|-------------------------|--------|-------------------------|--------|
| 1-radio | [] | 5- Phone | [] |
| 2- Bicycle | [] | 6- Motorcycle | [] |
| 3- Television | [] | 7- Car/truck | [] |
| 4 - Video/Vcd/Dvd | [] | 8- Oxen/donkey cart | [] |
| 9-land | [] | (how many acres?) | |
| 10- Cows | [] | (how many?) | |
| 11-goats | [] | (how many?)..... | |
| 12-sheep | [] | (how many?)..... | |
| 13-chicken | [] | (how many?)..... | |
| 14-Other (specify)..... | | | |

SECTION D: SOURCE OF BREASTFEEDING INFORMATION/ COUNSELING

D1. Did you receive any counseling/information on breastfeeding/infant feeding?

- | | | | |
|-------|--------|-------|--------|
| 1-Yes | [] | 2- No | [] |
|-------|--------|-------|--------|

D2. If YES, what was the source of the information/counseling?

- | | |
|---|--------|
| 1-Hospital/ health centre | [] |
| 2-Traditional birth attendant | [] |
| 3-Family/friends/relatives | [] |
| 4-Media (radio, television, newspapers, magazines and internet) | [] |
| 5-Other (specify)..... | |

D3. When did you receive breastfeeding counseling? (**To be addressed to the mothers who got the counseling from the health facility/hospital**)

- 1-Before delivery during antenatal clinics []
- 2-At the time of delivery []
- 3-After delivery before leaving the hospital []
- 4-During post-natal clinics []

SECTION E: DELIVERY EXPERIENCE AND EARLY BREASTFEEDING PRACTICES

E1. Where was the index child born?

- 1- Home []
- 2- Health facility []
- 3- At a TBA's house []

E2. What kind of delivery?

- 1- Normal []
- 2- Cesarean []
- 3- Elective cesarean []

E3. Did you breastfeed the baby?

- 1-Yes [] 2- No []

If yes go to E5

E4. If NO, Why not?.....

E5. If YES, how soon after delivery did you first breastfeed?

- 1-Immediately/within first hour after birth []

- 3-Formula milk [] 7-Mashed vegetables/fruits []
- 4-Juice/tea []
- 8-Other (specify).....

E12. Why did you give the baby these liquids/solids? (Tick all applicable responses)

- 1- Baby gets hungry []
- 2- Mother not producing enough milk []
- 3-Advised by relatives/friends/neighbors []
- 4-Advised by health care providers []
- 5-Advised by TBA []
- 6-To sooth stomach pain []
- 7-Other (specify).....

E13.Are you still breastfeeding the baby?

- 1-Yes [] 2- No []

SECTION F: BREASTFEEDING PRACTICES BASED ON A 24-HOUR RECALL

F1. Has the baby breastfed in the last 24 hours?

- 1-Yes [] 2- No []

If NO go to question F2 and F3

F2. Why did you not breastfeed your baby?

- 1-The baby has been unwell []
- 2- Had to go back to work []
- 3- Mother unwell []
- 4-Other reason (specify).....

F3. Do you intend to resume breastfeeding?

- 1-Yes []
- 2- No []
- 3-Not sure []

F4. Have you given the baby any liquid/s in the last 24 hours?

- 1-Yes []
- 2-No []
- 3-Not sure []

F5. If yes, what liquids/s have you given?

- 1- Glucose water [] 2- Plain boiled water []
- 3- Formula milk [] 4-other milk []
- 5- Medicine []
- 6-Other (specify).....

F6. Why did you give the baby these liquids/solids? (Tick all applicable responses)

- 1- Baby gets hungry []
- 2- Mother not producing enough milk []
- 3-Advised by relatives/friends/neighbors []
- 4-Advised by health care providers []
- 5-Advised by TBA []
- 6-To sooth stomach pain []
- 7-Other (specify).....

F7. Have you given the baby any solid or semi-solid foods in the last 24 hours?

- 1-Yes [] 2-No []

F8. If YES, name the foods given.

.....

F9. Why did you give the baby the foods? (Tick all applicable responses)

- 1- Baby gets hungry []
- 2- Mother not producing enough milk []
- 3-Advised by relatives/friends/neighbors []
- 4-Advised by health care providers []
- 5-Advised by TBA []
- 6-To sooth stomach pain []
- 7-Other (specify).....

F10. Breastfeeding status of the baby (**to be determined from the information given above based on the previous 24 hours and the definitions below**)

- 1-Exclusive breastfeeding []
- 2-Predominant breastfeeding []
- 3-Partly breastfed []
- 4-Non-breastfed []

DEFINITIONS OF FEEDING STATUS

Exclusively breastfed Fed only on breastmilk including medicine and oral rehydration

Predominantly breastfed Fed on breastmilk water, sweetened water, juices and other fluids.

Partly breastfed Fed on breastmilk and complementary foods (milk, porridge, semi-solids or solids).

Non-breastfed Not fed on breastmilk.

G6. Is the baby on treatment at present?

1-Yes [] 2-No []

G7. Has the illness interfered with the baby's breastfeeding?

1-Yes [] 2- No []

If YES go to question G8

If NO go to question G9

G8.How has the illness of the BABY affected breastfeeding?

.....

G9. Have you (mother) experienced any problems in breastfeeding your baby?

1-Yes [] 2-No []

If YES go to question G10 to G12

If NO go to question G13

G10. What problems have you experienced?

1-Inadequate breastmilk []

2-Baby refusing to breastfeed []

3-Pain in breasts []

4-Other (specify).....

G11. Have the problems interfered with breastfeeding?

1-Yes [] 2- No []

G12. How have the problems interfered with breastfeeding?

.....

G13. Have you (mother) been sick in the last two weeks?

1-Yes [] 2-No []

G14. If YES, what were you suffering from?

.....

G15. Did/ has the illness interfered with breastfeeding of the baby?

1-Yes [] 2-No []

G16. If YES, how did the illness affect breastfeeding?

.....

SECTION H: MATERNAL KNOWLEDGE, ATTITUDES AND BELIEFS ON EXCLUSIVE BREASTFEEDING

Read the statement to the mother and indicate her response in the appropriate box.

	YES	NO
H1. Breastfeeding should be the first feed a baby is given after birth.	[]	[]
H2. The baby should be put to the breast after more than one hour to allow the mother to rest	[]	[]
H3. The first yellowish milk/colostrum should be fed to the baby	[]	[]
H4. Breastmilk alone without even water can sustain the baby for six months	[]	[]
H5. Breastfeeding protects the baby from illnesses	[]	[]
H6. Expressed breastmilk should be fed to the baby when the mother is away	[]	[]
H7. Breastfeeding helps the mother not to get pregnant	[]	[]
H8. Semi-solid/solid foods should be introduced to the baby at six months of age	[]	[]

APPENDIX II: Focus group discussion guide

1. What are the sources of infant feeding information in this community?
2. What are some of the messages that you get regarding breastfeeding?
3. Do you agree/concur with these messages? If no, why?
4. From your understanding, what are the benefits of breastfeeding?
5. Do you believe that a baby can be fed on breast milk alone without even water for the first six months?
6. Is exclusive breastfeeding a common practice in this community?
7. What are the factors that encourage mothers to practice exclusive breastfeeding for six months?
8. Why do some mothers choose not to practice exclusive breastfeeding?
9. Do you have suggestions on what can be done to encourage mothers to practice exclusive breastfeeding for six months in this community?
10. Is it appropriate for a mother to express milk for the baby?
11. How should the expressed milk be heated before giving it to the baby?

