FACTORS ASSOCIATED WITH EXCLUSIVE BREASTFEEDING DURATION AMONG LACTATING MOTHERS IN SELECTED HEALTH CENTERS IN NAIROBI COUNTY, KENYA.

BY

BILHA CHELAGAT BITOK

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH (NUTRITION) IN THE SCHOOL OF PUBLIC HEALTH OF MOI UNIVERSITY

2017

DECLARATION

Declaration by the Student

This thesis is my original work and has not been submitted in any organization or institution. It will serve in partial fulfillment for the award of a Master of Public Health degree of Moi University.

Name: Bilha Chelagat Bitok

Registration Number: SPH/PGH/1007/12

Signature: ……. Date: ……

Declaration by supervisors

This thesis has been submitted with our approval as the university supervisors.

Name **Dr. Alice S Lakati (PhD)**

Institution **Amref Health Africa**

Signature ----------

Date ----------

Dr. E. W. Kimani-Murage (PhD)

African Population and Health Research Center (APHRC)

Signature ----------

Date ----------

DEDICATION

To my husband, Peter and daughters Chebet and Chemutai for their love, prayers and continued support, to my mum and sisters for their unfailing encouragement, and to my late dad for his love of education, may he rest in peace.

ABSTRACT

Background: Exclusive breastfeeding (EBF) for six months bestows many benefits to the infant and the mother and is recommended by the WHO. Many infants in Kenya are introduced to mixed feeding earlier than recommended resulting in a low duration of EBF.
Broad objective: To assess the duration of exclusive breastfeeding and investigate the factors influencing the duration of EBF amongst mothers with infants between six and nine months of age in Nairobi.
Methods: A cross-sectional study design was used. Three health facilities in Nairobi County were sampled. A total of 194 mothers with children six to nine months of age were interviewed using an interviewer administered questionnaire with closed and open ended questions. Data analysis was done using the Statistical Package for Social Sciences software (SPSS) version 21. Descriptive statistics were generated, Chi-square test and Fisher's exact test was done for relationships of variables. Logistic regression was done to establish the relationship between EBF and various explanatory variables. P value set at < 0.05 was used to interpret the significance of the statistical tests.
Results: The mean age of the mothers was 27.2 ±5.2 (95% CI 26.450-28.000). Most mothers (82.5%) were married, while 15.5% had never been married. A majority (79.3%) had attained secondary school and above level of education. The median duration of reported EBF based on continuous breastfeeding since birth to six months, was found to be six months. The prevalence of continuous exclusive breastfeeding since birth to six months was 68.0% (95% CI; 60.800-74.700). In bivariate Chi-square and Fisher's exact test analysis, maternal knowledge that breast milk alone can sustain the baby for six months (P-value =0.001), breastfeeding problems which had interfered with breastfeeding (P=0.006) and confidence that breast milk alone would be adequate for six months (P=0.007) had significant associations with EBF duration. In multivariate logistic regression analysis, breastfeeding problems which interfered with breastfeeding (OR: 0.151, 95% CI: 0.042-0.542, P=0.004) and confidence that breast milk alone without even water can sustain the baby for six months (OR: 4.885, 95% CI: 1.592-14.985, P=0.006) were significantly associated with EBF duration. After controlling for pre-lacteal feeding, maternal breastfeeding problems that interfered with breastfeeding (AOR: 0.166, P=0.012), and maternal confidence that breast milk alone can sustain the baby for six months (AOR: 17.641, P=0.018) were retained as predictors for a longer EBF duration.
Conclusion: The median duration of EBF in this study was found to be six months. The factors that influenced the duration of EBF were maternal knowledge that breast milk alone was adequate for the infant for six months, maternal confidence that breast milk alone without even water can sustain the baby for six months and maternal breast problems that influenced breastfeeding.
Recommendations: There is need by health workers in the study area to scale up education of mothers to ensure they fully understand all the EBF practices, it's adequacy for the infant for six months and all the benefits to continue improving maternal confidence in breast milk and breastfeeding promotion information offered by the Ministry of Health to mothers should include more visual aids and demonstrations for mothers on how to cope with breast complications to reduce their interfering with breast feeding.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENTS

My special appreciation is extended to my supervisors Dr. Alice S. Lakati for her encouragement and support and her meticulous attention to detail and Dr. E. W. Kimani-Murage for her encouragement, professional guidance and quick response to issues. My gratitude also goes to my colleagues at Moi University- AMREF for their moral support.

My gratitude is also extended to the management of St. Mary's Mission Hospital, Langata and Karen Health Centers for allowing me to carry out my studies in these facilities.

My special appreciation goes to my husband, children and my mother for financial support and encouragement. Above all, I am grateful to God for his special grace in granting me the ability and resources to undertake this study.

LIST OF ABBREVIATIONS

BF	Breastfeeding
EBF	Exclusive Breastfeeding
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
CHW	Community Health Worker
HIV	Human Immunodeficiency Virus
KDHS	Kenya Demographic and Health Survey
KNBS	Kenya National Bureau of Statistics
IYCF	Infant and Young Child Feeding
TBA	Traditional Birth Attendant
UNICEF	United Nations Children's Fund
WHO	World Health Organization

DEFINITION OF TERMS

Exclusive breastfeeding: Giving the child breast milk only with no additional fluids or solids given except drops or syrups of minerals, vitamins, medicines and oral rehydration solutions (WHO, 2003).

Predominant breastfeeding: Giving infants breast milk but also small amounts of water or water-based drinks but not food-based fluids, or solid food, or non-human milk (WHO, 2003).

Pre lacteal feeds: Fluids given to the infant within the first few days after birth before milk flow is established (WHO, 2008).

Post lacteal feeds: Fluids or food given to the infant after initiation of breastfeeding but before infant attains the six months.

Duration of Exclusive Breastfeeding: The period in months between initiation of exclusive breastfeeding and introduction of other fluids apart from breast milk by the mother.

Mixed feeding: Breastfeeding an infant while also giving non-human milk, or other food-based fluids or solid foods (WHO, 2003).

Physical Complications/problems: Are defined as breast problems such as engorgement, blocked duct, sore or cracked nipples and mastitis experienced by mothers during breastfeeding. It also includes the problem of inadequate milk and refusal by infant to breastfeed (Islam, Khan, & Naila, 2011)

Psychological factors: Are defined as maternal mental factors such as self efficacy, maternal attitude, intention to exclusively breastfeed and influence of social support or lack of it (Meedya et al., 2010)

Maternal Knowledge: Defined as mother's awareness or being informed about the recommendations by the WHO about breastfeeding practices.

Complementary feeding: Giving the infant any food, which may be manufactured or prepared at home, as a complement to breast milk or infant formula when any of the two is insufficient (WHO, 2003).

Colostrum: Yellowish milk secreted from the breast of the mother in the first three days after birth

Maternal self-efficacy on EBF: Mothers confidence of their perceived ability to breastfeed successfully (Meedya et al., 2010)

CHAPTER ONE: INTRODUCTION

Optimal feeding practices for infants and young children are among the most effective interventions to reduce childhood morbidity and mortality. Sub-optimal breastfeeding, particularly non-exclusive breastfeeding, in the infants first six months of life results in 10% of disease burden in children younger than five years (WHO, 2009). Appropriate breastfeeding practices have been demonstrated by scientific literature to provide substantial health, economic and social advantages to individuals (Victora *et al*., 2016), therefore, support of breastfeeding is a global priority (UNICEF, 2011).

1.1 Background Information

Exclusive breastfeeding (EBF) is defined as feeding a child on breast milk only from the mother, or a wet nurse, or expressed milk, without any other solids or liquids being given, with the exception of oral rehydration solutions, syrups or drops consisting of mineral and vitamin supplements or medicines (WHO, 2003). Exclusive breastfeeding is recommended for infants beginning the first hour of life and continued up to six months, for optimal growth, development and health, and to meet the infant's nutritional requirements. Thereafter, complementary foods that are nutritionally adequate, safe and appropriate should be introduced but breastfeeding continued up to two years and beyond (WHO, 2003).

The benefits of exclusive breastfeeding are many and well documented, especially in resource poor settings where early introduction of other milk is of concern due to risk of contamination and over-dilution of the milk which may lead to increased risk of infant morbidity and mortality (Giashuddin & Kabir, 2003).

Human milk must be promoted as the best food for infants as it has anti-infective properties that protect infants from gastro-intestinal and respiratory infections, both of which are major causes of infant deaths in developing countries (UNICEF, 2011).

The protective effect of breast milk has been found to increase with both exclusivity and duration of breastfeeding. Infant mortality and morbidity increases significantly when infants younger than six months are not exclusively breastfed. This was shown from results of a pooled analysis using data from Africa, Asia and Latin America (Matias *et al*., 2012). The duration of EBF largely determines how much this type of feeding has a positive influence on infectious disease prevention, child development and survival (Giashuddin & Kabir, 2003).

Apart from benefits to the infant, EBF of a longer duration also has several maternal benefits which include reducing risk of postpartum hemorrhage (Motee *et al*., 2013), and reduces risk of developing premenopausal ovarian and breast cancer. (Linkages, 2013).

According to estimates provided by UNICEF, the rates of EBF have improved slightly to 37% globally and 32% in Africa generally (UNICEF, 2009a) and higher rates still have been recorded in particular African countries including Rwanda-88%, Malawi-57% and Tanzania-41% (UNICEF, 2009a, 2009b). While this is encouraging, it is however still far below the WHO target of 90% (WHO, 2009). In other African countries, Kenya included the rates of EBF are still lower than that recommended by WHO. In Mauritius for instance the rate of EBF for the first 6 months is only 17.9% (Motee *et al*., 2013).

In Kenya, while the proportion of children 0-6 months of age being exclusively breastfed has risen from 32 percent (Kenya National Bureau of Statistics & ICF Macro, 2010) to 61

percent (Kenya National Bureau of Statistics & ICF Macro, 2014), this still falls below the 90% recommended by WHO (WHO, 2009). The median duration for EBF countrywide is 3.3 months, (Kenya National Bureau of Statistics & ICF Macro, 2014) which is still much lower than the recommended duration of six months. Bearing in mind the various important implications of EBF on the infant, the mother and the society in general, it is imperative that studies continue to determine the factors that contribute to the continued low rates of EBF in most countries, Kenya included.

Various factors have been found to influence the duration of EBF, these include employment status of the mother (Xu *et al*., 2007), knowledge about recommended breastfeeding practices (Cherop, Keverenge-Ettyang, & Mbagaya, 2009), breastfeeding difficulties and age of the mother (Naanyu, 2008), educational and socio-economic status of the mother, and planned duration of EBF (Tan, 2009).

The main purpose of this study was to determine the duration of EBF amongst mothers attending selected health centers in Nairobi and to find out the factors associated with this duration. Of special interest was the role played by maternal knowledge of EBF and its benefits; maternal employment; and psychological and physical complications experienced by breastfeeding mothers, on the duration of EBF.

1.2 Problem statement

Approximately 1.4 million infants die every year globally due to mixed feeding given before six months (Nguyen, 2009). This has been shown by studies which indicated that the risk of morbidity and mortality increase significantly when infants aged six months and lower were not breastfed exclusively or not breastfed at all (Diallo *et al.*, 2009) and (Motee

et al., 2013) . The studies also showed that longer duration of EBF reduced the prevalence of malnutrition among six month old infants (Black *et al*., 2008). Sub-optimal infant feeding practices have been identified in Kenya, especially in urban poor settings, where close to 40% of infants are not breastfed within the first hour after delivery, and only 2% are exclusively breastfed for the first 6 months (Kimani-Murage *et al.*, 2011). This might be the possible cause of high levels of malnutrition reported among urban poor residents, with stunting prevalence close to 50% (Kimani-Murage *et al.*, 2015). Though the exclusive breast feeding rate in Kenya has improved from 32% (Kenya National Bureau of Statistics & ICF Macro, 2010) to 61% (Kenya National Bureau of Statistics & ICF Macro, 2014), the EBF duration is still quite low at 3.3 months countrywide and 3.7 months in urban areas like Nairobi. Prevalence of bottle feeding is also relatively high in the country. This is of public health concern, as introduction of mixed feeding before the age of six months not only increases malnutrition in infants but also significantly increases child morbidity and mortality, especially due to respiratory and gastrointestinal infection (Motee *et al*., 2013).

The low duration of EBF in many countries, Kenya included seems to indicate that the factors associated with the duration of EBF have not been adequately addressed.

1.3 Justification

The World Health Organization recommends that children be breastfed exclusively up to six months of their life to enable them achieve optimal growth, development and health (WHO, 2009). This optimal duration of six months of exclusive breastfeeding was arrived at after many evidence based studies that have shown that this way of feeding using breast milk only without mixing it with any other food or drink even water has certain real

advantages over mixed feeding especially for the infant but also for the mother. These advantages include lower rate of infection with diarrheal and respiratory diseases, increased immunity and therefore reduced morbidity and mortality in children (UNICEF, 2011), (Kramer and Kakuma, 2004) and (Arifeen *et al*., 2001)

However recent data indicate that in the developing world only 43% percent of children aged 0-5 months are exclusively breastfed (UNICEF, 2016) and according to the Kenya Demographic Health Survey 2014, exclusive breastfeeding of children under six months of age was 61% percent, still below the 90 percent recommended by WHO. In Kenya a notable percentage of children below six months of age still receive complementary food contrary to recommendations by WHO, with 2% of children aged 0-1 months, 13% of children aged 2-3 months and 27% of children aged 4-5 months receiving complementary food. Prevalence of bottle feeding is relatively high in the country posing a high risk of infection due to poor hygiene. The median duration of EBF is 3.3 months in the country and that of urban areas like Nairobi is 3.7, (Kenya National Bureau of Statistics & ICF Macro, 2014). It is imperative that the duration of EBF be increased to recommended levels countrywide to reduce the risk of infant morbidity and mortality due to infection resulting from mixed feeding.

The purpose of this study was to assess the duration of exclusive breastfeeding amongst mothers attending selected health centers in Langata, Nairobi and to identify the factors that contribute to this duration. A better understanding of these factors may then be used by stakeholders to improve EBF duration in the county to the recommended levels, as this will vastly impact child health.

1.4 Research questions

i) What is the duration of EBF and what is the prevalence of EBF for six months amongst infants six to nine months of age in Langata Sub-county of Nairobi County?

ii) What are the factors associated with EBF duration among mothers with children six to nine months of age?

1.5 Objectives of the study

1.5.1 Broad objective

To assess the duration of exclusive breastfeeding and investigate the factors influencing the duration of EBF amongst mothers with infants six to nine months of age in selected health centers in Nairobi.

1.5.2 Specific objectives

i) To determine the duration of EBF amongst mothers with infants six to nine months of age.

ii) To establish the prevalence of EBF at six months amongst mothers with children six-nine months.

iii) To assess the level maternal knowledge in relation to the practice of EBF among mothers with children six-nine months of age

iv) To assess the factors associated with EBF duration among mothers with children six to nine months of age.

1.6 Limitations of the study

The study design was cross-sectional hence may have been liable to recall bias because mothers with infants six to nine months were required to provide information on the infants feeding practices from birth to six months of the infants life. To minimize this bias the questionnaire was interviewer administered and the interviewer used prompting questions and allowed time for recall and for mothers to provide as accurate information as possible.

1.7 Assumptions of the study

In this study the assumption was that the study participants gave information that was true to the best of their knowledge.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter underscores the literature that supports the study. It discusses EBF as an essential part of infant feeding practices and gives an account of the determinants that impact on the duration and rates of EBF.

2.1 Exclusive breastfeeding (EBF)

The World Health Organization (WHO) defines EBF as giving infants breast milk only from the mother or wet nurse or expressed milk and no other fluids or solids except drops or syrups of vitamins and mineral supplements or medicines and oral rehydration solutions (WHO, 2003) (WHO,2009). EBF is recommended for the first six months of a child's life starting from the first hour after birth. After these six months, introduction of complementary food that is timely and nutritionally adequate should be done with continued breastfeeding for up to two years and beyond. This is recommended by the WHO and UNICEF for optimum growth, development and health of the infant (WHO, 2003).

EBF for the first six months of life meets all the energy and nutritional requirements of most infants if done correctly. As such no other foods are required. Infants who are exclusively breast fed do not require additional water in the first six months even in hot climates as breast milk has 88% of water. In addition, giving extra fluids displaces breast milk and reduces infant intake of breast milk therefore reducing its production by the mother (WHO, 2009). EBF is especially important in developing countries such as Kenya where access to clean water is limited and therefore early introduction of complementary food increases the risk of diarrheal diseases (WHO, 2000).

2.2 Benefits of exclusive breastfeeding

The benefits of EBF are wide ranging and include not just benefits for the infant and for the mother but also for the society as a whole. EBF has been shown to be the most effective preventive intervention to reduce childhood deaths. EBF up to six months and continued breastfeeding up to 12 months and beyond is one of the most important interventions that would reduce deaths of children less than five years from all causes (UNICEF, 2010). Non-exclusive breastfeeding has been associated with higher morbidity and mortality in a study in Conakry (Diallo *et al.*, 2009). In Dhaka, Bangladesh a study found that infant mortality from diarrhea and pneumonia could reduce by a third if infants were exclusively breastfed for the first four months of their life (Arifeen *et al*., 2001).

It has also become clear that EBF for longer duration is much more beneficial to the infant than EBF for a shorter duration. EBF has been found to reduce the risk of diarrhea in children who were exclusively breastfed for six months compared to those who were exclusively breastfed for three months (Kramer *et al*., 2003). EBF for six months also reduces respiratory illnesses such as pneumonia compared with EBF for 4 months (Chantry, Howard, & Auinger, 2006). In addition, infants who are exclusively breastfed for more than four months have a significantly lower susceptibility to otitis media, middle ear infections and haemophilius influenza type B (Watson, 2013).

Other benefits of EBF to the infant include reduction of chronic diseases and protection against HIV transmission (Xu *et al*., 2007). Evidence also reveals that exclusive breastfeeding up to six months and continued breastfeeding with complementary food to two years and beyond also reduces the prevalence of allergic diseases in children. In addition, breastfeeding particularly EBF has been promoted as a strategy for combating

obesity in childhood, adolescence and adulthood (Binns & Lee, 2012). Furthermore a longer duration of EBF has been reported to be more protective against childhood overweight and obesity as reported by results from a cross-sectional study done in eight European countries showing that EBF for six months was more protective against childhood overweight and obesity than EBF for four and five months (Hunsberger *et al*., 2013). EBF also has a positive influence on the growth and development of infants. Exclusively breast fed infants have been shown to have better neural development and physical growth compared to mix fed or non-breastfed infants (WHO, 2009).

EBF is also beneficial to mothers especially if it is for a longer duration. Two controlled trials in Honduras indicated that EBF for six months compared to four months prolongs the duration of lactational amenorrhea in mothers. In addition there was a higher weight loss in mothers who exclusively breastfed for six months as compared to those who breast fed for four months (Kramer & Kakuma, 2012). EBF of a longer duration also accelerates the recovery of pre pregnancy weight (Hatsu, McDougald, & Anderson, 2008).

EBF for the first six months is also of social and economic advantage. It is the least expensive form of infant feeding. Breast milk substitutes and equipment for feeding and sterilizing are expensive. They are therefore a financial drain on scarce resources in poor households. Mixed feeding may also result in contamination bringing in the added cost of health care due to infections (UNICEF, 2010). Higher duration of total breastfeeding improves intelligence quotient, educational attainment and income in adulthood (Victora et al., 2015)

2.3 Duration of exclusive breastfeeding

The optimal duration of EBF as recommended by WHO and UNICEF is six months, beginning from the first hour of a child's life (WHO, 2003). In spite of this recommendations, the reality all over the world shows a much lower duration of EBF with only very few exceptions.

In Colombia for instance the duration of EBF is 1.8 months (Osorio Castaño & Botero Ortiz, 2012) and in Xinjiang China, the EBF duration is also 1.8 months (Xu *et al*., 2007). A study carried out in Itauna region of Brazil showed the median duration of EBF as 40 days (Chaves, Lamounier, & César, 2007). In contrast, a study carried out at a Surat well baby clinic in Gujarat India, showed the median duration of EBF as being six months (Chudasama, Patel, & Kavishwar, 2008).

In Africa EBF duration is still lower than recommended, in East Ethiopia for instance the median duration for EBF is only 2.3 months according to (Egata, Berhane, & Worku, 2013) while Setegn *et al*. (2012), in Goba District, South-East Ethiopia found the median duration of EBF to be 3 months. And in Ghana the median duration is three months according to Aryeetey and Goh (2013) while in Eritrea it is 2.6 months (Ochola, 2008).

2.3.1 Duration of Exclusive breastfeeding in Kenya

Like many other African countries, the duration of EBF in Kenya is still lower than what is recommended by WHO. According to Kenya Demographic Health Survey 2014, 15% of children less than six months are given complementary food, (Kenya National Bureau of Statistics & ICF Macro, 2014).

The median duration of EBF in Kenya is 3.3 months while in urban centers like Nairobi the median duration of EBF is 3.7 months (Kenya National Bureau of Statistics & ICF Macro, 2014). A study carried out in Kibera an informal settlement classified as a slum showed that the median duration of EBF was one month among hospital-based semi-intensive counseling group and the control group, while the EBF duration among the home-based intensive counseling group, the median duration was three months (Ochola, 2008). Another study in Eldoret in 2002, the mean duration of EBF among first time mothers was found to be 2.4 months (Naanyu, 2008).

2.4 Prevalence of EBF

2.4.1 Globally

Modest improvements have been recorded in EBF prevalence rates among children aged less than six months in developing countries from 33% in 1995 to 39% in 2010, and in West and Central Africa, the prevalence increased from 12% in 1995 to 28% in 2010 (Cai, Wardlaw, & Brown, 2012). In 2005-2009 the rates of EBF in the developing world were estimated at 36% (Anthony, 2011).

The most recent data shows further improvements in the rates of EBF, with an overall rate of 43% globally, 59% in South Asia and 57% in Eastern and Southern Africa, though the rates are still very low in other parts of the world, including West and Central Africa at 29% (UNICEF, 2016) as shown in figure 1 below.

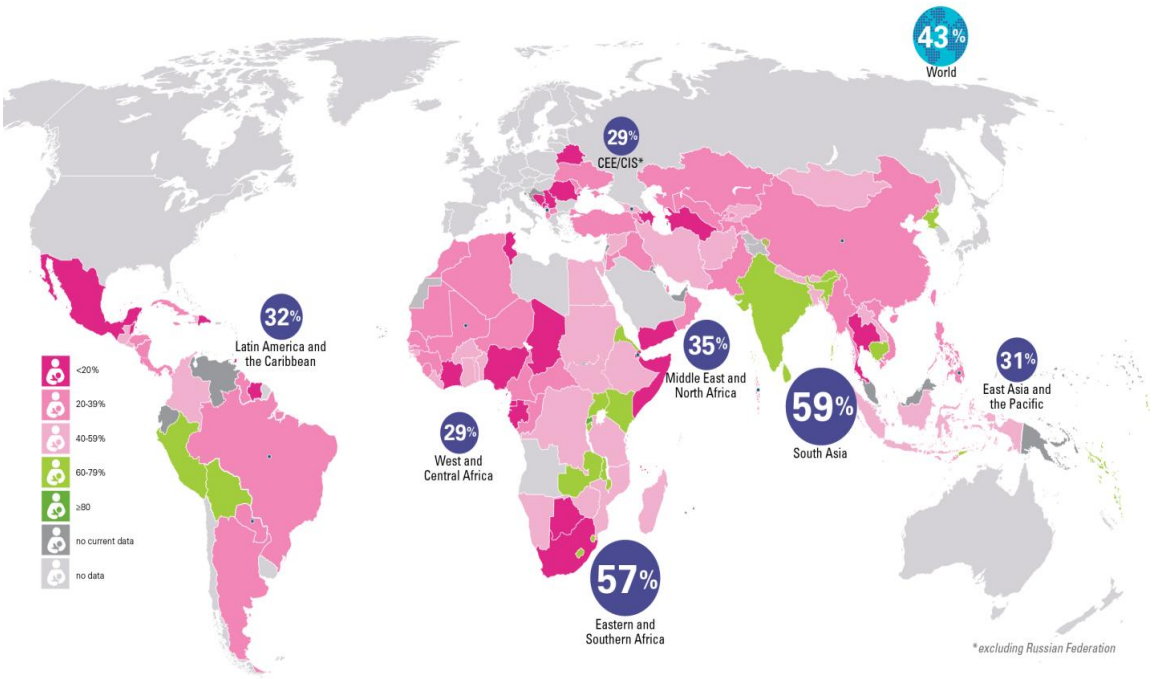


Figure 1: Percentage of infants <0-5 months of age exclusively breastfed, 2015Data Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources, 2010-2016

2.4.2 Prevalence of EBF in Kenya

In Kenya breastfeeding is nearly universal in the child's first month of life at 99.6%, but the proportion breastfed drops to 61% by the time a child is 18-23 months. Exclusive breastfeeding for the first six months of a child's life is 61%. The proportion of children 0-1 month exclusively breastfeeding is 84%, 63% for infants 2-3 months, and drops to 42% for infants 4-5 months. Contrary to recommendations by WHO and UNICEF, 2% of children 0-1 month of age, 13% of those 2-3 months, and 27% of infants 4-5 months are given complementary food (Kenya National Bureau of Statistics & ICF Macro, 2014).

According to the WHO and the UNICEF country profiles, only 13% of infants below six months in Kenya are exclusively breastfed and EBF at 4-5 months is 3% (WHO, 2010). Earlier studies in Nairobi show lower rates of exclusive breastfeeding. A cross-sectional study in selected Health centers in Nairobi found that only a tenth of children were exclusively breastfed up to six months and about 63% of mothers had started giving other food by the fourth month after birth (Muchina, 2010). Another cross sectional survey carried out involving 444 working mothers in Nairobi found that the prevalence of exclusive breastfeeding was 13.3% at three months of a child's age. Early introduction of complementary foods was high with 46.4 percent of mothers introducing other foods within one month of an infant's life (Lakati *et al*., 2002). A longitudinal study in two urban slums in Nairobi carried out between February 2007 and December 2010, showed that initiation of breastfeeding was almost universal and that 85% were still breastfeeding on the 11th month. However, by the age of six months, nearly all the children in the study had been introduced to complementary food (Kimani-Murage *et al*., 2011).

2.5 Factors influencing the duration of EBF

2.5.1 Maternal Knowledge of EBF

Evidence has shown that maternal knowledge of recommended breastfeeding practices is an important factor that determines the duration and prevalence of EBF. According to a study in Tanzania, the duration of EBF is largely associated with knowledge and information about correct breastfeeding practices (Shirima, Gebre-Medhin, & Greiner, 2001) Another study in the same country found a higher prevalence of 63% among mothers with knowledge of international IYCF recommendations compared to 23% among those who did not have this knowledge (Nkala & Msuya, 2011).

Similarly, a randomized controlled trial carried out in Ghana, to determine the effect of lactation counseling on EBF behavior found that mothers in intervention group who were provided with BF and EBF education showed a 39.5% rate of EBF compared to a control group provided with education on other health issues but not on BF who had a 19.6 % rate of EBF (Aidam *et al*., 2005). Setegn *et al*. (2012), found the median duration of EBF in South East Ethiopia was three months and that one of the main barriers to EBF to six months was lack of adequate knowledge by mothers. In their study they found that many mothers considered breast milk as not being adequate or important.

In a study in Kibera Kenya, Ochola (2008) found inadequate knowledge about EBF as one of the main barriers to EBF for six months, the others being long absence of mother from home and cultural perceptions about infant feeding. A cross-sectional study in Nyando District found that mothers who had knowledge of EBF and were aware of the benefits practiced EBF 23 percentage points more than those who had no knowledge of EBF and were therefore unaware of its benefits (Nyanga *et al*., 2012).

2.5.2 Socio-economic factors

According to Matias *et al*. (2012) in Peru, maternal employment was a strong predictor of early EBF discontinuation. Maternal employment significantly reduced the likelihood of breastfeeding at six months, showing that combining exclusive breastfeeding and employment was very difficult for working mothers. Similarly, Xu *et al*. (2007) in Xinjiang China found that mothers going to work and use of pacifiers were negatively associated with the duration of EBF, with the duration of EBF reducing when the mother returned to paid employment.

In Nairobi a cross sectional study involving 444 mothers, showed that early introduction of complementary food was high with 46.4% of mothers introducing these foods before one month. Return to work and breast milk inadequacy were the main predictors for cessation of EBF (Lakati *et al*., 2002).

In addition, studies have shown that family income affects EBF in different ways, for instance, a longitudinal study in Brazil showed a significant association between cessation of EBF at three months and maternal employment and low family income on the other hand (Mascarenhas *et al*., 2006). In contrast a cross-sectional study in Kuala Lumpur, Malaysia, high family income was significantly associated with non-exclusive breastfeeding (Tan, 2009). Generally, income influences breastfeeding practices probably because it influences women's ability to afford feeding supplies like formula milk, feeding and sterilizing equipment and breast milk expressing equipment. Although many studies show that maternal employment decreases breastfeeding, in a study carried out in Australia, paternal employment was found to be positively associated with breastfeeding (Scott *et al*., 2001), probably because this allows mothers to stay home. In contrast a study carried out in California, USA by Heck *et al*., (2006), showed that family income was not predictive of breastfeeding, and neither were maternal or paternal occupation.

The type of maternal occupation is also likely to influence EBF practices, in that women of lower socio- economic status occupation may have more obstacles when it comes to expressing breast milk at work and at home, while women of higher socio economic status occupation may be more likely to have supportive work place or home environments for breastfeeding (Alemayehu *et al.*, 2009)

2.5.3 Socio-demographic Factors

2.5.3.1 Marital Status

A national survey in Canada showed that living with a partner was significantly associated with six months EBF (Al-Sahab et al., 2010). According to this study, the presence of the partner is likely to provide increased support for the mother, which may ease the feeding process and the choice to exclusively breastfed for six months. In contrast, a study in Ethiopia showed women not currently married were two times more likely to exclusively breastfeed their infants than those who were married (Alemayehu *et al.,* 2009)

At the same time, in a survey done by Lande *et al*. (2003) with an aim to describe and evaluate infant feeding practices during the first six months of life in relation to recommendations, and to study infant feeding practices in relation to maternal and infant characteristics, married women were found to exclusively breastfeed for a longer time compared to unmarried women (Lande *et al*., 2003).

In contrast, a study carried out by Dubois and Girard (2003) in Quebec in Canada to investigate the social determinants of initiation, duration and exclusivity of breastfeeding at the population level, no association was found between exclusive breastfeeding and marital status.

2.5.3.2 Education

Research shows that more educated parents (both maternal and paternal) are more likely to search for information on healthy feeding habits for their infants compared to less educated parents. Knowledge of the benefits of breastfeeding has been shown to predict breastfeeding (Chezem, Friesen, & Boettcher, 2003). In a study in Canada, higher level of

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

In a longitudinal cohort study carried out by Jessri *et al*, (2013), a woman's choice to breastfeed exclusively was influenced strongly by maternal education. The study found that women who breastfed exclusively for six months were more likely than women who did not breastfeed exclusively for six months to hold a university post-graduate degree.

Similarly a cross sectional study conducted at a maternity unit of New Civil Hospital, Surat, in India, maternal education was found to be positively associated with decision to exclusively breastfeed (Chudasama, Patel, & Kavishwar, 2009).

2.5.3.3 Maternal Age

The causes of suboptimal breastfeeding are many and interrelated and research identifies age as a distal predictor of exclusive breastfeeding. However, some studies have found maternal age as not having significant association with exclusive breastfeeding. According to Jones *et al,* (2011), mother's age was strongly associated with the likelihood of breastfeeding exclusively for six months. In the study, higher rates of exclusivity were observed among children whose mothers were 30 years of age or older.

Chudasama *et al*. (2009), in a cross sectional study conducted at a maternity unit of New Civil Hospital, South Gujarat India, also found maternal age was negatively associated with decision on exclusive breastfeeding in younger mothers. In this study, there was no association between exclusive breastfeeding and maternal age >20 years but there was a negative association between EBF and mothers <20 years of age. A cross sectional study by Egata *et al*. (2013), showed that maternal age had no significant association with non

EBF in infants aged less than six months. Similarly, in a study done at the Health Centre of Community Oriented Medical Education of Zanjan City, Iran with an aim of examining breast-feeding patterns and the role of some factors on exclusive breast-feeding, EBF was not associated with the mother's age (Koosha, Hashemifesharaki, & Mousavinasab, 2008).

On the other hand a study carried out in urban, suburban and rural areas of Zhejiang China by Qiu *et al*, (2009) showed that mothers who were older than 24 years were less likely to be exclusively breastfeeding on discharge.

2.5.4 Physical problems experienced by Mothers in attaining EBF

In a study carried out to determine the factors associated with cessation of exclusive breastfeeding at the end of six weeks in healthy term and late preterm neonates born in a hospital set up in North India, mothers stated a number of problems that they face with the main one being the perception of not having enough milk. Other problems that the mothers stated were cracked/sore nipples, engorgement of breasts while others had difficulty in giving EBF because of flat/retracted nipples. These problems were shown to be negatively associated with EBF (Suksham *et al*., 2001).

In a cross-sectional study in Western Tanzania in determining the prevalence and predictors of exclusive breastfeeding among women in Kigoma region in Tanzania, 17% of the women reported to have had breast problems such as engorged breasts, cracked nipples and mastitis during breastfeeding. The study established that women who had breast complications were significantly less likely to exclusively breastfeed. According to the study, incorrect attachment and infrequent feeding of babies during breastfeeding were the main causes of breast problems (Nkala & Msuya, 2011).

2.5.5 Psychological factors

The influence of psychological factors on the duration of EBF has been documented by a number of studies which have also shown that these factors can be changed through intervention and experiences to improve EBF duration. For instance, in a systematic review of published peer-reviewed literature to investigate the effect of psychological factors on EBF duration, de Jager *et al*, (2013) found maternal self-efficacy, postpartum depression, anxiety, social support and intention to breastfeed to have influenced EBF duration. Self-efficacy was found to have the biggest psychological influence with a strong positive association being found between self-efficacy and EBF duration.

Maternal anxiety has been found to be negatively correlated with EBF duration, (Clifford *et al*., 2006) while another study showed no correlation between anxiety and duration of EBF, (Akman *et al*., 2008). Social support to the mother, maternal intention to breastfeed, and positive attitude towards EBF have been positively correlated with longer duration of EBF, (Bai *et al*., 2010) and (Scott *et al*., 2006).

2.5.6 Cultural Factors

There is no doubt that cultural beliefs and local traditions are important determinants of breastfeeding practices in different communities. In a study aimed at describing some common beliefs that may discourage breastfeeding in Lebanon, concerns that the mother could potentially harm her infant through breastfeeding were rooted in a number of cultural beliefs including having "bad milk", and transmission of abdominal cramps to infants through breast milk, (Osman, El Zein, & Wick, 2009). In most Sub-Saharan countries including Kenya, breastfeeding is considered a normal cultural practice, and as such initiation of breastfeeding is universal and mothers often breastfed up to two years and

beyond. However in these communities, culture is also a major impediment to EBF (Mukuria *et al*., 2006).

A study carried out in rural Cameroon to identify the extent of mixed feeding and the cultural barriers to exclusive breastfeeding, found that all the women in the survey introduced water and non-breast milk food to their infants before six months of age and more than 38% had given water in the first month of life. Mothers identified cultural factors such as pressure from families to introduce mixed feeding as it was a traditional practice and belief that breast milk was not a complete food as it would not increase weight of infant, to have influenced their decision to introduce mixed feeding to their infants, (Kakute *et al*., 2005). Studies in China by Xu *et al*. (2007), and in Kenya by, Ochola (2008) showed perceived breast milk inadequacy as a reason for discontinuation of EBF. There is need therefore, to identify the cultural factors that negatively influence EBF practices in communities so that they can be addressed.

2.5.7 Summary of literature review and gap in Knowledge

In summary, EBF for infants 6 months of age and below has increased in different parts of the world. EBF has improved from an estimated rate of 34.8% of worldwide (WHO, 2009) to an estimated rate of 43% (UNICEF, 2016). In Kenya EBF rates have also improved to 61% (Kenya National Bureau of Statistics & ICF Macro, 2014) from 32% (Kenya National Bureau of Statistics & ICF Macro, 2010). While this is encouraging, it still falls short of the WHO target of 90%. Studies have shown that EBF duration is influenced by maternal knowledge of EBF practices (Nyanga *et al*., 2012), maternal demographic characteristics (Alemayehu *et al.,* 2009), socio-economic factors (Matias *et al*., 2012) and (Xu *et al*., 2007), cultural factors (Osman, El Zein, & Wick, 2009), psychological

factors (de Jager *et al*, 2013) and maternal breast complications (Nkala & Msuya, 2011), in varying degrees in different set ups. A review of literature has shown that, while information on rate of EBF is available in the country, there's, however paucity of information on duration of EBF and the factors that influence it. This study therefore aimed at assessing the duration of EBF and its determinants amongst mothers with infants six to nine months of age in selected health centers in Nairobi County.

2.6 Conceptual Frame work

Breastfeeding in general is a complex process influenced by psychological and physiological factors in the mother, which, in turn are influenced by a wide range of cultural, socio-economic and environmental factors (Ochola, 2008). The Conceptual Framework below (Figure 2) was used as a guide in investigating maternal knowledge on recommended breastfeeding practices and sources of breastfeeding information, demographic factors such as maternal age, level of education and marital status; socio-economic factors such as type of housing, maternal employment status and item ownership; maternal physical breast problems; maternal psychological factors and cultural factors that included maternal beliefs on breastfeeding practices and their influence on EBF duration and rates.

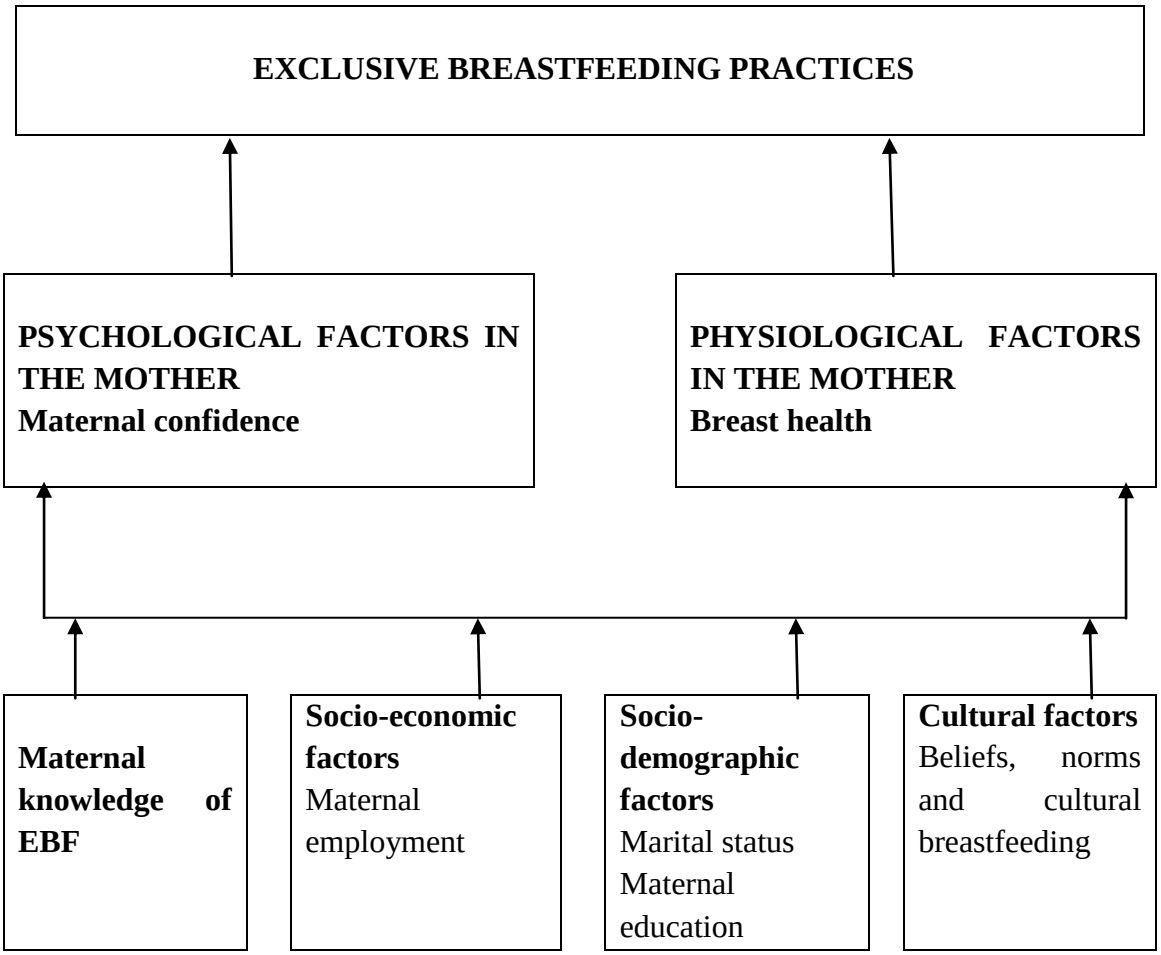


Figure 2: Conceptual Framework on factors associated with exclusive breastfeeding practices

Source: Adopted and modified from (Ochola, 2008)

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter describes the study methodology used, the study design, study area and participants, sampling techniques, as well as the development of study tools and data collection which was done in November to December 2014.

3.1 Study Area

The Study was carried out in Langata Sub-County in Nairobi County, Kenya, at three health facilities, St Mary's hospital, Langata Health Center and Karen Health Center. These three facilities were selected because their clientele have varied socio-economic and cross-cultural characteristics that would improve the study. In addition they are located close to some of the low socio-economic status residences such as Kibera for Langata Health Center and Saint Mary's hospital, and Dagoretti for Karen health Center. The areas have high populations that seek healthcare from public facilities.

Langata Health Center and Karen Health Center are both owned and managed by the local authorities specifically the County of Nairobi. St Mary's Mission Hospital and Langata Health Center are located in Mugumoini Sub-Location.

St Mary's Mission Hospital is owned by Kenya Episcopal Conference-Catholic Secretariat, and has inpatient as well as out-patient services, with a bed capacity of 280. Their services include antiretroviral therapy, curative in-patient therapy, family planning, HIV counseling and testing, immunization and MCH. The hospital serves mainly patients of low to mid lower socio-economic status from the whole County of Nairobi. Most of those of low

socio-economic status come from Kibera, an informal settlement classified as a slum and in close proximity to St Mary's hospital.

The services at Langata Health Center include maternity, child welfare clinic, nutrition department and community strategy unit. The majority of clients served by Langata Health Center are from Kibera and Southlands area of Langata which happens to have an informal settlement called Kijiji that is also classified as a slum.

Karen Health Center is located in Karen which is an area of high socio-economic status. However the clientele at the health center mainly consists of individuals of low socio-economic status from nearby Dagoretti. Services at this health center include Anti-retroviral therapy and HIV counseling and testing; family planning, immunization and growth monitoring in their MCH clinic.

3.2 Study design

The study was a hospital based cross-sectional study (Ulak *et al*., 2012). This design was used to assess the duration of EBF and identify the factors associated with it at a point in time using interviewer administered questionnaires. This study design was selected as it allowed the researcher to capture all the characteristics required from the study population. In addition, considering financial constraints, this was found to be the most appropriate design.

3.3 Study population

The study population comprised of mothers with infants six to nine months old, attending these selected health facilities for immunization and growth monitoring. The estimated quarterly attendance of mothers according to hospital records at St Mary's hospital was

192, Langata Health center was 126, while that of Karen Hospital was 48 mothers. The three hospitals clientele was mainly of low socio-economic status from the whole county of Nairobi but more specifically from Kibera, an informal settlement classified as a slum for St Mary's hospital and Lnagata Health center. For Karen Health center, most of the clientele were from Dagoretti, another informal settlement.

3.3.1 Inclusion criteria

All mothers with children six-nine months old, attending the selected Health facilities for Immunization and growth monitoring.

3.3.2 Exclusion criteria

Mothers with children having congenital malformations that affected breastfeeding were excluded from the study.

Mentally handicapped mothers were also excluded from the study.

3.4 Sample size determination

The sample size was estimated using a formula by Fisher *et al*., (1996) for estimation of single population proportion as cited in Kothari (2004).

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

n = the desired sample size

z = the standard normal deviation at 95% confidence interval-1.96

p = the proportion of the target population estimated to be exclusively breastfeeding.

The national prevalence rate of EBF in Kenya which is 13% (UNICEF, 2009a) was used to estimate the proportion of infants 6-9 months of age exclusively breastfeeding.

q =1-p

e = the level of precision desired – 0.05

$$n = \frac{(1.96)^2(0.13)(0.87)}{(0.05)^2}$$

=174

To correct for any damaged or spoilt questionnaires, an extra 10% of mother infant pairs were interviewed bringing the total sample size to 194.

3.5 Sampling technique

Purposive sampling was used to select three health facilities in Langata Sub- County. Probability proportionate sampling was then used to determine the number of mothers with children six months of age to be studied at each facility.

The average quarterly attendance at the three health centers N= 366, while the minimum required sample size, n=194, therefore the proportionate constant K=n/N = 194/366

K= 0.530

The constant K was then applied to determine the sample size for each clinic, by multiplying the average number of mother infant pairs who attend the selected facility by the constant K.

St Mary's Hospital- 192 x 0.530 = 102

Langata Health Center-126 x 0.530= 67

Karen Health Center- 48 x 0.530= 25

At each clinic a consecutive sampling procedure was used, in that all the eligible mothers with children six-nine months of age visiting each of the selected health facilities was interviewed until the desired sample size for each clinic was attained.

3.6 Data collection, Tools and Instruments

3.6.1 Questionnaire

An interviewer administered questionnaire having both closed and open ended questions was used to collect information on maternal demographic characteristics including age, education, marital status; maternal knowledge on breastfeeding and sources of breastfeeding information; socioeconomic characteristics of mothers (and fathers in some instances) including occupation, income, type of house, rent and ownership of items; cultural factors; maternal psychological factors and physical breastfeeding problems.

During sampling of the mother infant pairs at the facilities, the health care provider on duty helped the researcher and research assistant to identify mothers with children six to nine months of age, after checking their cards. Eligible mothers who were willing to participate in the study were recruited and given an oral description of the study and requested to sign the written consent which had also been described to them orally. The questionnaire was then administered by the research assistant or the investigator.

3.6.2 Quality Assurance

3.6.2.1 Pre-testing of questionnaire

The questionnaire was pretested to improve on reliability and validity. Nine respondents (9), being 5% of the total sample, from Uhuru Camp in Nairobi West, Nairobi County, a health facility with similar characteristics to the ones where the study was conducted were interviewed. This was necessary to facilitate modification and correction of the questionnaire.

3.6.2.2 Validity

A well designed questionnaire, which had been pretested to check on accuracy of the questions, content and language to ensure answers obtained were accurate and true was used. Questionnaires were also checked daily to ensure that they had been appropriately filled.

3.6.2.3 Training of research assistants

Two research assistants were recruited to help in data collection; they were both bachelors' degree holders and fluent in both Kiswahili and English the two languages most widely spoken in the study area. Their training involved the following

- Explaining the research objectives and methodology to them
- Teaching of interviewing and recording skills through demonstrations.
- Going through all the questions in the questionnaire to agree on the standard way of obtaining information from the respondents.
- Teaching the general principals of research and research ethics

3.7 Data Management and Analysis

Data was checked, coded, cleaned and entered into the Statistical Package for Social Sciences (SPSS) version 21.0. Descriptive statistics (Frequencies, percentages, median, means and standard deviation) were used to describe maternal socio-demographic characteristics, socio-economic characteristics, maternal knowledge and sources of breastfeeding information, maternal breast problems, maternal psychological factors, infant feeding practices, exclusive breastfeeding duration and exclusive breastfeeding rates. Median was used to describe maternal age which was not normally distributed.

Chi square test and Fishers exact test were used to determine the relationship between duration of EBF on one hand and independent variables such maternal demographic characteristics; age, marital status, education and socio-economic factors; maternal occupation, maternal income source, husband's occupation, item ownership; cultural factors; maternal knowledge aspects; maternal psychological factors and breast difficulties on the other hand.

P value set at < 0.05 was used to interpret the significance of the statistical tests.

Logistic regression yielding odds ratio was used to establish the relationship between exclusive breastfeeding duration on one hand and maternal knowledge, sources of breastfeeding information, ownership of items, maternal psychological factors, breastfeeding difficulties, and maternal employment on the other hand.

Table 1: Operational definition of variables

Type	Variable Name	Operational definition	Scale of measurement
Background Variables	Age	Age of respondent in years	Numerical
	Marital status	Single, married, separated, divorced, widowed	Categorical
	Education Level	Highest education level attained at the time of interview	Ordinal
	Cultural Factors	Beliefs, norms and cultural breastfeeding practices	Categorical
	Socio-economic indicators	Ownership of certain items such as television and radio that indicate socio economic status	Binary
	Maternal Employment	Mother currently employed	Binary-Yes or No
Dependent Variable/ Outcome variable	EBF Duration	Age in months of infant when other food and drinks other than breast milk are introduced to infant	Numerical
	Prevalence of EBF	Percentage of Children at 1,2,3,4,5 months, who had not been given any other fluids or foods apart from breast milk	Categorical
Independent Variables	Maternal Knowledge of EBF	Maternal awareness or having information on WHO's recommendations on EBF duration, benefits of EBF, and how to position and attach the baby.	Binary- Yes or No
	Physical complications/problems	Whether the mother experienced any breast complications such as engorged breasts, mastitis, sore and cracked and painful nipples or inadequate milk production.	Binary- Yes or No
	Psychological factors	Maternal confidence in EBF, Intention to breast fed exclusively for 6 months and moral support offered to mother.	Binary- Yes or No

3.8 Ethical consideration

Ethical clearance was granted by Moi University Institutional Research and Ethics Committee (IREC). Informed written consent was also obtained from the respondents who took part in the study. The respondents were assured of confidentiality of the information given before obtaining information from them. Respondents were assured that the information obtained would only be used for the purpose of the study, whose findings would be communicated to them through the host health centers.

Approval to carry out the study was also granted by the Chief Officer of Health at the County of Nairobi which manages two of the health facilities in the study, and the management of each of the health facility at each facility.

CHAPTER FOUR: RESULTS

4.0 Introduction

This chapter focuses on the presentation and explanation of the results of the study with regard to the study objectives and research questions. The response rate was 100% as all those who were approached accepted to participate in the study. Based on the responses from the interviewer-administered questionnaire, the findings are presented in sections as;

- Description of Maternal characteristics
- Duration of EBF
- Prevalence of EBF
- Factors associated with EBF

4.1 Maternal Characteristics

4.1.1 Maternal socio-demographic characteristics.

The mean age of the mothers was 27.2 ±5.2 (95% CI 26.45-28.0). Majority (82.5%) of the mothers were married, 15.5% had never been married, the rest were separated or widowed as shown in Table 4. Most of the study participants were young women aged below 30 years old, with a majority (79.4%) having attained secondary school and above level of education (Table 2).

Table 2: Maternal socio-demographic characteristics

Demographic characteristics	N=194	
	N	%
Maternal age (years)		
Median (range)	27(17-41)	
Marital status:		
In Union (Married)	160	82.5
Not in union (Never married, separated, divorced, widowed)	34	17.5
Level of Education		
Diploma College and University	84	43.3
Secondary	70	36.1
Primary and no formal education	13	17.0

4.1.2 Socio-economic characteristics.

Referring to Table 4, over a quarter (28.9%) of the participants were in formal employment, with a few (3%) being students.

An overwhelming majority (91.2%) lived in rented houses while 8% lived in their own houses. For those who lived in rented houses, their monthly rent ranged from KES 800 – 40,000 per month. The average amount paid was KES 10,060 and the median was Kenya Shillings 7500. A majority of the mothers (48.5%) lived in one-roomed houses, while a small proportion (3%) living in 5-roomed houses. Over half (55.7%) of them reported their husbands were in formal employment, 20.1% casual workers, 14.4% self-employed while those whose husbands were unemployed represented only 1% .

The main source of lighting for most homes was electricity (94.8% of the homes), 4% indicated kerosene and 1% candles. Gas was the main source of cooking fuel for 64.4% of the households and 2% of households used firewood. The socioeconomic status of the participants was varied however a majority seemed to have been from low socioeconomic

background as indicated by the one-room mode for the rental houses in which most of them (51.6%) lived. (Table 3)

Table 3: Socio-economic characteristics of the study population

Socio-economic characteristics	**N = 194**	
	n	**%**
Maternal Employment Status:		
Casual	23	11.9
Housewife	48	24.7
Unemployed	24	12.4
Formal Employed	56	28.9
Self Employed	37	19.1
Student	6	3.1
Type of home		
Rented	177	91.2
Own house	15	7.7
Monthly Rent in KES.		
Mean	10060	
Median	7500	
Number of rooms		
1	94	51.6
2	62	34.1
3 and above	26	14.3
Paternal Employment Status		
Casual	39	20.1
Unemployed	2	1.0
Formal Employed	108	55.7
Self Employed	28	14.4
Main Source of Lighting		
Kerosene	7	3.6
Candle	2	1.0
Electricity	184	94.8
Main Source of Cooking Fuel:		
Firewood	3	1.5
Charcoal	71	36.6
Kerosene	54	27.8
Gas	125	64.4
Electricity	7	3.6

Almost half (48.2%) of the participants indicated that their husbands were their source of income, 44% had a salary, 21.5% had their own businesses and 3% of them still depended on their parents for income. *This was a multiple response question where some respondents had more than one source of income.

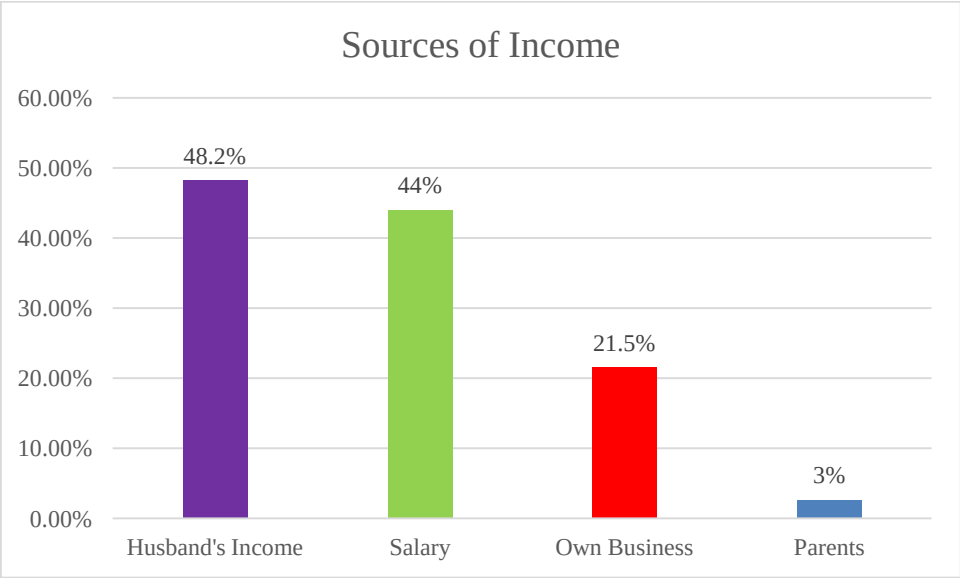


Figure 3: Sources of Income (*100% exceeded because of multiple responses where respondents had more than one source of income)

Most households had a phone (95.3%), a television (79.7%) and a radio (78.6%). Only 10.9% had a car/truck and 3% owned a motorcycle. The socioeconomic status of the participants was varied however a majority seemed to have been from low socioeconomic background as indicated by the 1 room mode for the rental houses in which most of them lived. (Figure 5)

Using Cronbach's Alpha, the α coefficient for the items owned including, phone, television, radio, car and motor cycle, was found to be 0.140 (α=0.140) showing that there was little or no correlation between the items owned.

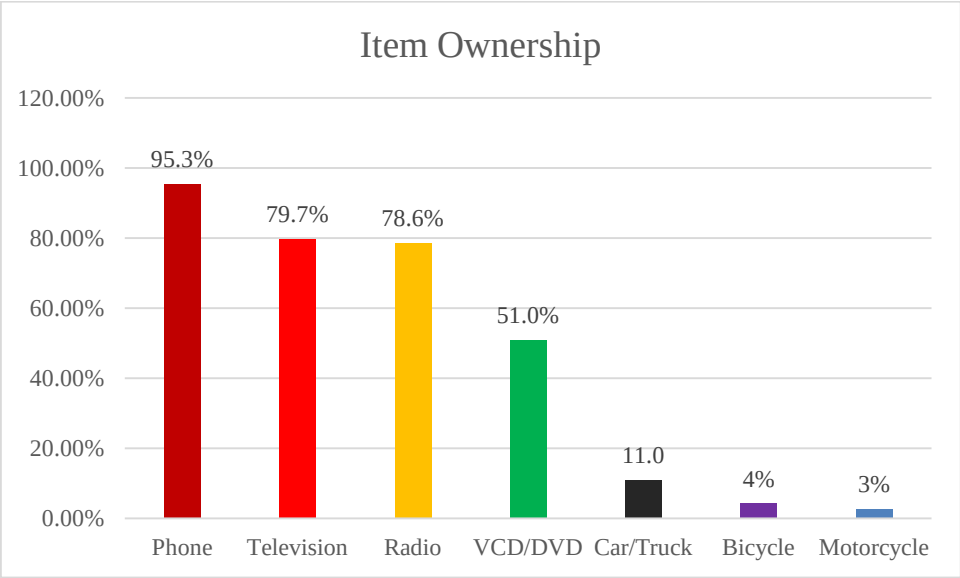


Figure 4: Ownership of items

4.3 Maternal knowledge on exclusive breastfeeding

Overall, the mothers had knowledge on breastfeeding practices. An overwhelming majority of the mothers (98.5%) said that breast milk should be the baby's first food while 93.8% of them stated that colostrum should be fed to the baby. While 53.1% of the mothers said the baby should be put to the breast immediately after birth, 25.3% said that the baby should be put to breast after one hour to allow the mother to rest. Almost all (93.3%) of the mothers knew that exclusive breastfeeding could sustain a baby in a healthy condition for six months, 96.9% knew that breastfeeding protects the baby from illness and 59.8% knew that expressed breast milk is safe to feed to the baby when the mother is away. However, only 29.9% of the mothers said that breastfeeding could protect a mother from getting pregnant (Table 4).

Table 4 : Maternal knowledge on breastfeeding information

Aspects of knowledge	N=194	
	n	%
Breast milk should be baby's first feed	191	98.5
Baby should be put to breast within 1hour of birth	49	25.3
Colostrum should be fed to the baby	182	93.8
Breast milk alone can sustain baby for 6 months	181	93.3
Breastfeeding protects baby from illness	188	96.9
Expressed breast milk should be fed to the baby	116	59.8
Breastfeeding can protect mother from getting pregnant	58	29.9

It would seem majority of the mothers (63.4%) knew that expressed milk should be fed to the infant when the mother is away.

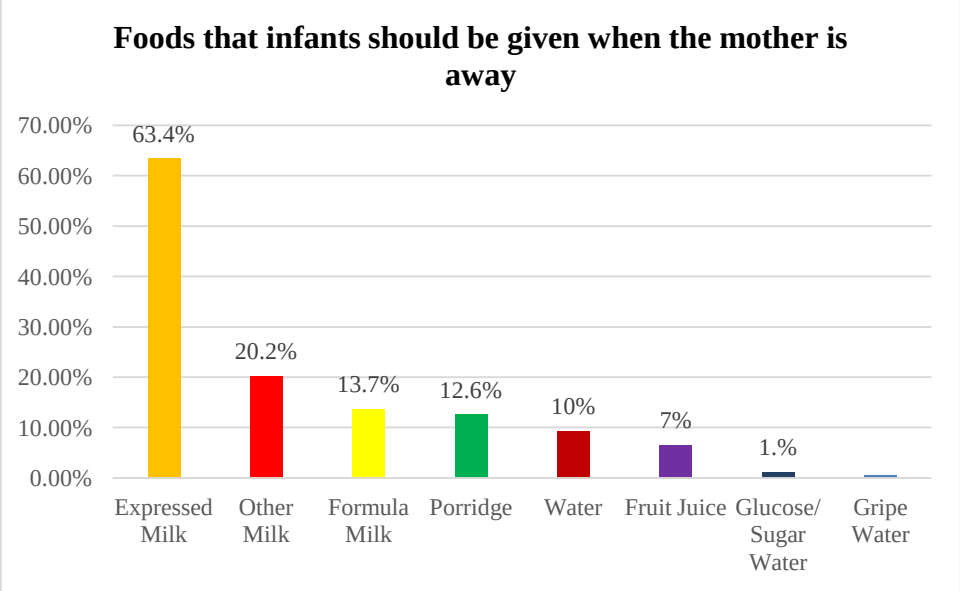


Figure 5: Foods that infants should be given when the mother is away

4.3.1. Sources of breastfeeding information

Majority of the mothers (95.9%) reported to have received counseling on breastfeeding. The results below indicate that majority of the mothers received breastfeeding information from health care providers during antenatal clinics.

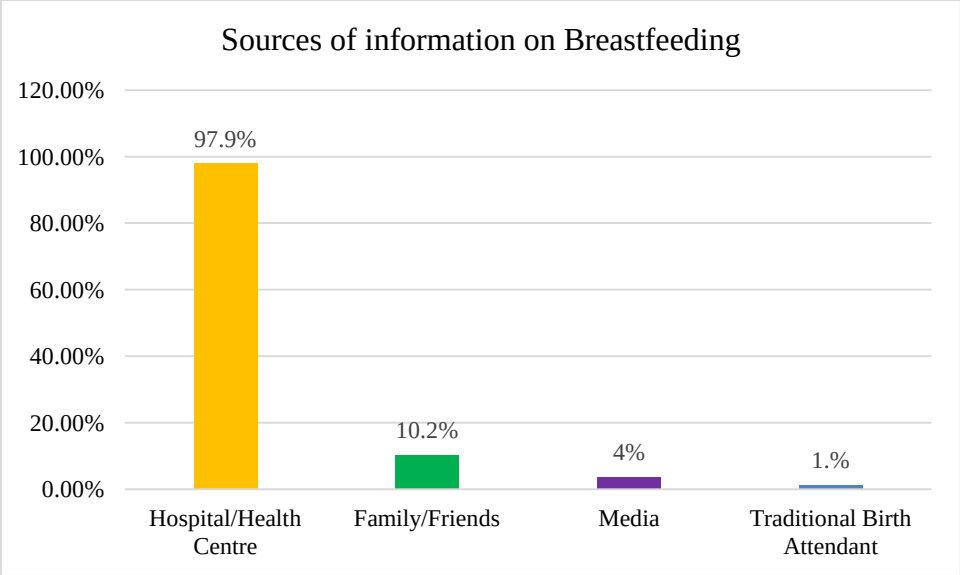


Figure 6: Sources of Information on Breastfeeding

4.3.2 Exclusive breastfeeding practices.

In this study, almost all (99.5%) of the mothers had breastfed their babies. While 66.5% of the mothers breastfed their infants immediately/ within the first hour after birth, 25.8% of them breastfed after the first hour. A majority (93.8%) of the babies were not given anything to drink before they were put to the breast. The reasons given for the 6% who were given something to eat included the baby refusing to breastfeed, mother being too weak, mother recovering due to Caesarian Section procedure, mother not producing milk and baby being unwell (Table 5).

Table 5: Breastfeeding Practices

Breastfeeding Practices		**N=194**
	n	**%**
Ever breastfed the baby	**193**	**99.5**
Breastfeeding initiation:		
Immediately/within first hour	125	66.5
After the first hour	50	25.8
I don't know/remember	7	3.6
Gave pre-lacteal feeds	**11**	**5.7**
Reasons for giving pre-lacteal feeds		
Baby refused to breastfeed	1	0.5
Mother was too weak due to CS	2	1
Mother was not producing milk	1	0.5
Baby was unwell	1	0.5
Gave post-lacteal feeds	**62**	**32**
Reasons for giving post-lacteal feeds +(N=62)		
Baby gets hungry	26	13.4
Mother not producing enough milk	11	5.7
Advised by relatives or friends	1	0.5
Advised by health care providers	6	3.1
To sooth stomach pain	18	9.2
Baby refused to breastfeed	2	1
Had to resume work	5	2.6
In preparation for solid food	1	0.5

*Pre lacteal feeds: Fluids given to the infant after birth before initiation of breastfeeding.

*Post lacteal feeds: Fluids or food given to the infant after initiation of breastfeeding but before infant attains the six months.

Porridge (33.8%) was the most common post-lacteal food, followed by water (32.3%), fruit juice (21.5%) and Gripe Water (13.8%) (Figure 9)

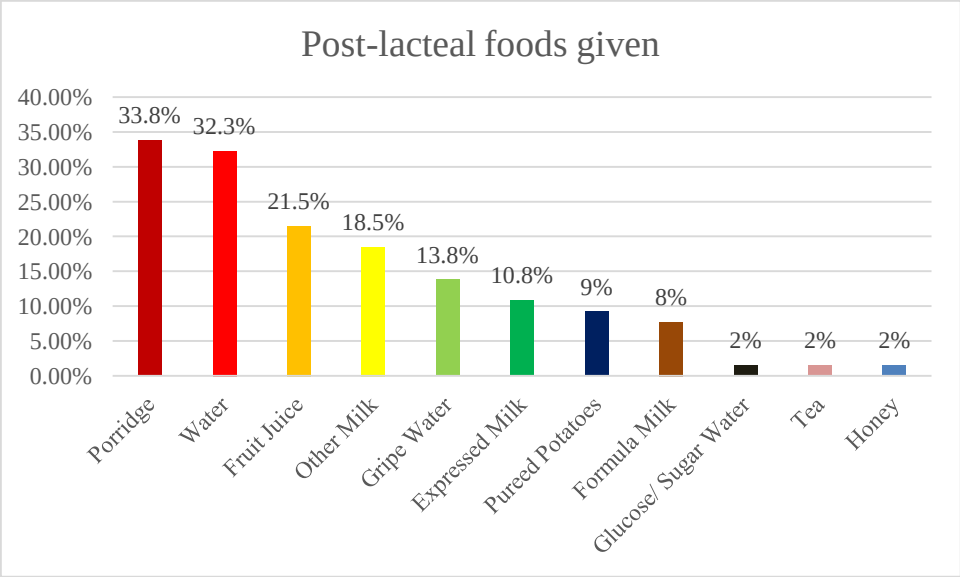


Figure 7: Post-lacteal feeds given to babies

4.4 Physical complications experienced by mothers in attaining EBF

A third of the mothers (29.4%) reported that they experienced breastfeeding complications. The most common complications reported were painful breasts (14.4%), inadequate breast milk (7.2%) and cracked/sore nipples 5.7% (Table 6). Of the mothers who had experienced breastfeeding problems 28% said that the problems had interfered with breastfeeding.

Table 6: Breastfeeding complications among mothers

Breastfeeding complications	N=194	
	n	%
Experienced problems in breastfeeding	**57**	**29.4**
Problems experienced (N=57)		
Pain in breasts	28	49.1
Inadequate breast milk	14	24.6
Baby refusing to breastfeed	5	8.7
Cracked/ sore nipples	11	19.3
Problems interfered with breastfeeding:	16	28
Reduced frequency of breastfeeding	3	19
Introduced other fluids and solids	6	38
Stopped breastfeeding completely	3	19

4.5 Psychological factors experienced by mothers in attaining EBF

A majority of the mothers (93.8%) felt capable and confident to successfully breastfeed their infants a few hours after they were born. Out of these, 79.9% of them had a high level of confidence, 11.3% medium and 3% low. For those who were not confident, most of them gave reasons such as not being prepared to have the baby (50% of them) and feeling too small to breastfeed (42%). Most (92.3%) of the mothers felt that breast milk alone would be adequate for six months, with 81.0% of them rating their confidence as high. Most of them received support on the way they chose to feed their babies (92.3%). The support influenced the mothers positively with 26.2% of them deciding to exclusively breastfeed for six months because of the support they received. A few of the mothers (10%) had more confidence because of the support. They also indicated that the support helped them know how to breastfeed and what diet would suit their babies well.

Most of them (96.9%) had the intention to breastfeed even before the birth of their babies. This decision was mostly influenced by health care providers as indicated by 87.5% of those who had the intention. Table 7 captures the distribution of these sources.

Table 7: Psychological factors related EBF

Psychological factors related EBF	N = 194	
	n	%
Felt capable and confident to breastfeed	**182**	**93.8**
Level of confidence		
High	155	79.9
Medium	22	11.3
Low	6	3.1
Did not feel confident	**12**	**6.1**
Reasons for lack of confidence		
Was not prepared to have the baby	6	50
Felt too small to breastfeed	5	42
Felt confident breast milk only would be adequate for 6 months	179	92.3
Level of confidence		
High	145	81.0
Medium	32	17.9
Low	2	1.1
Received support	**179**	**92.3**
Source of support		
Spouse/partner	12	6.7
Mother in law	4	2.2
Mother	25	14
Relatives/friends/neighbors	21	11.7
Health Care Providers	172	96.1
TBA	1	0.05
Intended to breastfeed exclusively even before birth	**188**	**96.9**
Source of influence of intention		
Spouse/Partner	5	2.6
Mother-in-law	3	1.6
Mother	9	4.8
Relatives/friends/neighbors	5	2.6
Health Care Providers	163	87.5
TBA	1	0.05

4.6 Cultural factors related to EBF

The mothers were asked several questions regarding their communities' cultural beliefs, where a majority (90.7%) of the respondents believed colostrum should be given to the baby; Table 8 captures the distribution of their responses.

Table 8: Cultural Factors related to EBF

In your culture do you believe that:	**N = 194**	
	n	**%**
Colostrum should be given to the baby	176	90.7
Milk alone is adequate for baby aged less than 6 months	153	78.9
A baby below 6 months needs water	69	35.6
Evil eye can affect breast milk	63	32.5
Breastfeeding can be done in public	118	60.8
A baby below 6 months should be given Herbal drinks or mixture	44	22.7
A baby below 6 months should be given anything else other than breast milk	66	34.0

Section 2: Duration of Exclusive Breastfeeding

4.7 Duration of exclusive breastfeeding.

Mothers were asked if the infant had received anything else other than breast milk, since birth. Those who answered in the affirmative were required to give the exact age of infant at which these fluids or foods were introduced. The mothers were therefore required to use recall to provide the duration of continuous EBF since birth. The findings showed that the median duration at which other fluids or foods were introduced was six months and the mean duration was 5.36. The median duration of reported EBF was six months. (Table 9)

Table 9: Duration of exclusive breastfeeding

Age(months)	n	%
1	2	1.0
2	2	1.0
3	14	6.7
4	22	11.3
5	22	11.3
6	132	68

Section 3: Prevalence of EBF

4.8 Prevalence of EBF at 6 months.

The prevalence of continuous EBF since birth was 68.0% (95% CI; 60.8-74.7), in that, out of 194 mothers, 132 reported they had practiced continuous EBF from birth to six months of the infants life, while 62 of the mothers being 32% did not practice EBF.

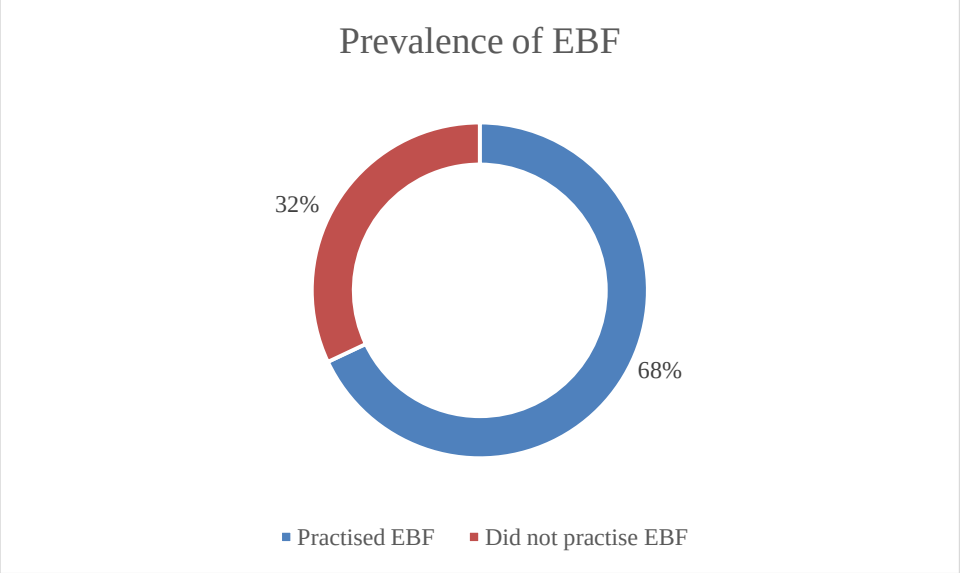


Figure 8: Prevalence of EBF

Section 4: Factors Associated with practicing EBF

4.9 Factors associated with practicing EBF

Analysis was conducted on independent variables to determine their association with EBF duration. 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 EBF duration status were investigated.

Maternal knowledge on breastfeeding practices and its relationship to practicing EBF was examined. The aspects of knowledge that were investigated included; breast milk should

be baby's first feed, timely initiation of breastfeeding, feeding of colostrum, 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.

Maternal health and breastfeeding complications and their association with practicing EBF were also investigated.

4.9.1 Maternal demographic characteristics and their relationship to exclusive breastfeeding

Maternal demographic factors and their association with practicing EBF were investigated. The demographic factors were age, marital status and education. Chi-square and Fisher's test was used to test for significant relationships. The findings of this study showed no significant association between maternal age and practicing EBF (P= 0.705). Marital status was not associated with practicing EBF (P= 0.618). The findings of this study also showed no association between education level and practicing EBF since birth (P= 0.478) (Table 10)

Table 10: Maternal socio-demographic factors and their relationship to practicing EBF

Maternal Socio-demographic factors	EBF Status		Statistical Test
	Yes	No	Fischer's Exact
	n (%)	n (%)	
Marital Status			
Married	111 (69.4)	49 (30.6)	Fisher's exact = 2.189
Never married	1 (100)	0 (0)	df = 3
Widowed	1 (50)	1 (50)	p-value = 0.599
Separated	18 (60)	12 (40)	
Level of Education			
No formal education	1 (100)	0 (0)	
Primary	23 (71.9)	9 (28.1)	Fisher's exact = 3.406
Secondary	50 (71.4)	20 (28.6)	df = 4
College	40 (82.8)	18 (17.2)	p-value = 0.501
University	14 (53.8)	12 (46.2)	
Age - Group			
Less than 25	39 (65)	21 (35)	Fisher's exact = 0.698
25 to 34	75 (68.2)	35 (31.8)	df = 2
35 and above	15 (75)	5 (25)	p-value = 0.705

*There was no significant association between demographic factors and EBF

4.9.2 Maternal socio-economic factors and their relationship to practicing EBF.

Maternal socio-economic factors and their association with practicing EBF 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 practicing EBF. The findings of this study showed no association ($P<0.05$) between maternal socio-economic characteristics with practicing EBF. Information on these variables having insignificant associations is presented below (Table 11).

Table 11: Maternal socio-economic factors and their relationship to practicing EBF

Maternal Socio-demographic factors	EBF Status		Statistical Test
	Yes	No	Fishers exact
	n (%)	n (%)	
Maternal Employment Status			
Casual	13 (56.5)	10 (43.5)	Fischer exact = 6.229
Unemployed	54(69.2)	24 (30.7)	df = 5
Formal Employment	38 (67.9	18 (32.1)	p-value=0.278
Self-Employment	27 (73.0)	10 (27.0)	
Type of House			Fisher's exact = 1.538
Rented	122(68.9)	55 (31.1)	df = 1
Own House	8 (53.3)	7 (46.7)	p-value=0.253
Paternal Employment Status			
Casual	24 (38.5)	15 (61.5)	Fisher's exact = 1.568
Unemployed	2 (100)	0 (0)	df = 3
Formal Employment	75 (69.4)	33 (30.6)	p-value=0.660
Self-Employment	20 (71.4)	8 (28.6)	

*There was no significant association between socio-economic factors and EBF

4.9.3 Maternal knowledge on breastfeeding practices and relationship to practicing EBF

Maternal knowledge on breastfeeding practices and its relationship to practicing EBF was examined. The aspects of knowledge that were investigated included: breast milk should be baby's first feed, timely initiation of breastfeeding, feeding of colostrum, 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 when mother is away, breastfeeding

protects mother from getting pregnant and Semi-solid/solid food to be introduced at six months. Chi-square and Fisher's Test was done to test for significant relationships between knowledge aspects and practicing EBF. Knowledge that breast milk alone without even water can sustain the baby for six months was significantly associated with EBF duration. (Table 12)

Table 12: Maternal knowledge on breastfeeding practices and their relationship to practicing EBF

Maternal Knowledge	EBF Status		Statistical Test
	Yes n (%)	No n (%)	Fisher's exact
Milk being the baby's first food			Fisher's = 0.316
Yes	131(68.6)	60 (31.4)	df = 1
No	1 (50)	1 (50)	p-value = 0.533
Baby being fed on colostrum			
Yes	122(67.0)	60 (33.0)	Fisher's = 2.954
No	6 (100)	0 (0)	df = 2
I don't know	3 (60)	2 (40)	p-value = 0.71
Breast milk alone can sustain baby for 6 months			
Yes	129(71.3)	52 (28.7)	Fisher's = 11.803
No	2 (22.2)	7 (77.8)	df = 2
I don't know	1 (25)	3 (75)	**p-value = 0.001**
Exclusive breastfeeding protects baby from illness			
Yes	127(67.6)	61 (32.4)	Fisher's = 1.1000
No	1 (100)	0 (0)	df = 2
I don't know	1 (50)	1 (50)	p-value = 0.694
Breastfeeding helps mother not to get pregnant			
Yes	45 (77.6)	13 (22.4)	Fisher's = 5.089
No	53 (67.1)	26 (32.9)	df = 2
I don't know	28 (57.1)	21 (42.9)	p-value = 0.078
Expressed milk should be given to babies below 6 months when the mother is away			Fisher's = 0.931
Yes	82 (70.7)	34 (29.3)	df = 1
No	50 (64.1)	28 (35.9)	p-value = 0.350

*Knowledge aspect that breast milk alone can sustain the infant for 6 months was significant p-value=0.001

4.9.4 Physical complications related to breastfeeding and relationship to practicing EBF

Physical factors related to breastfeeding and their relationship to practicing EBF was investigated. The factors included any breastfeeding complications experienced by mothers and whether they had interfered with breastfeeding. Physical complications that had interfered with breastfeeding were found to be significantly associated with EBF duration. The information on these variables is presented on Table 13.

Table 13: Physical complications related to breastfeeding and their relationship to EBF duration

Physical complications related to breastfeeding	**EBF Status**		**Statistical Test**
	Yes	**No**	**Fisher's Exact**
	n (%)	**n (%)**	
Problems experienced in breastfeeding			Fisher's = 0.011
Yes	39 (68.4)	18 (31.6)	df = 1
No	92 (67.7)	44 (32.4)	p-value = 1.000
Problems interfered with breastfeeding			Fisher's= 9.426
Yes	7 (43.8)	9 (56.2)	df = 1
No	36 (83.7)	7 (16.3)	**p-value= 0.006**

*There was significant association between the problems which interfered with breastfeeding and EBF p-value =0.006

4.9.5 Psychological factors related to breastfeeding and relationship to exclusive breastfeeding.

Psychological factors related to breastfeeding and their relationships to practicing EBF were investigated. The factors included feeling capable and confident to successfully breastfeed, the confidence level, whether they felt confident that breast milk alone would be adequate for 6 months, whether they received support on the way they chose to breastfeed, and whether they intended to breastfeed exclusively before birth and their relationship to EBF Duration.

The analysis revealed that out of all the above factors, the only one that had a relationship with practicing EBF was whether they felt confident that breast milk alone would be adequate for six months (Fisher's test; P= 0.007). (Table 14)

Table 14: Psychological factors related to breastfeeding and their relationship to practicing EBF

Psychological factors related to breastfeeding	EBF Status		Statistical Test
	Yes	No	Fisher's Exact
	n (%)	n (%)	
Feeling confident to breastfeed a few hours after birth			Fisher's = 0.011
Yes	124 (68.1)	58 (31.9)	df = 1
No	8 (66.7)	4 (33.3)	p-value = 1.000
Level of confidence			
Low	2 (33.3)	4 (66.7)	Fisher's = 3.296
Medium	16 (72.7)	6 (27.3)	df = 2
High	106 (68.4)	49 (31.6)	p-value = 0.187
Confident that breast milk alone would be adequate for 6 months			Fisher's = 9.006
Yes	127 (70.9)	52 (29.1)	df = 1
No	5 (33.3)	10 (66.7)	**p-value = 0.007**
Receiving any support on the way they chose to breastfeed			Fisher's= 0.004
Yes	121 (67.6)	58 (32.4)	df = 1
No	8 (66.7)	4 (33.3)	p-value = 1.000
Intention to exclusively breastfeed before birth			Fisher's= 0.005
Yes	128 (68.1)	60 (31.9)	df = 1
No	4 (66.7)	2 (33.3)	p-value = 1.000

*There was significant association between confidence that breast milk alone would be adequate for six months and EBF p-value =0.007

4.9.6 Predictors of Exclusive Breastfeeding

Chi-square test and Fisher's exact test were used to determine if there was any significance between the variables and practising EBF. The 3 independent variables that were found to have an association with practising EBF at bivariate analysis level were included in the logistic regression analysis. Logistic regression analysis was employed to determine which variables could best predict the practice of EBF among mothers.

Breastfeeding problems which interfered with breastfeeding was a factor that was associated with the reduction in the likelihood of practicing EBF (OR: 0.151, 95% CI: 0.042-0.542, P=0.004). Mothers who experienced breastfeeding problems such as cracked, painful nipples and mastitis, which had interfered with breastfeeding, were less likely to exclusively breastfeed up to six months compared to those of the mothers who did not experience breastfeeding problems.

Confidence that breast milk alone would be adequate for six months was also a factor significantly associated with practicing EBF (OR: 4.885, 95% CI: 1.592-14.985, P=0.006). Mothers who were confident that breastfeeding alone would be adequate for six months were 4 times more likely to practice EBF compared to mothers who were not confident of adequacy of breast milk for six months. Maternal knowledge that breast milk alone can sustain the baby for six months was not significantly associated with practicing EBF (OR: 0.857, 95% CI: 0.055-13.479, P=0.913) (Table 15)

Table 15: Predictors of EBF

Predictors	**Sig.**	**Odds Ratio**	**95% Confidence Interval for Exp(B)**	
			Lower	**Upper**
Breast milk alone can sustain baby for 6 months	0.913	0.857	0.055	13.479
Problems experienced interfered with breastfeeding	**0.004**	**0.151**	**0.042**	**0.542**
Confident that breast milk alone would be adequate for 6 months	**0.006**	**4.885**	**1.592**	**14.985**

After controlling for pre-lacteal feeding, problems experienced during breastfeeding which interfered with breastfeeding was retained as predictor of EBF. Mothers who experienced breastfeeding problems that interfered with breastfeeding were less likely to practice EBF compared to mothers who did not experience breastfeeding problems. (AOR: 0.166, 95% CI: 0.410-0.672, P=0.012). Confidence that breast milk alone would be adequate for six months was also retained as a factor that could be used to predict the practice of EBF. Mothers who were confident that breastfeeding alone would be adequate for six months were more likely to practice EBF compared to mothers who lacked confidence in adequacy of breast milk for six months (AOR: 17.64, 95% CI:1.641-189.629 , P=0.018) (Table 16)

Table 16: Predictors of EBF after controlling for pre-lacteal feeding

Predictors	Sig.	Adjusted Odds Ratio (AOR)	95% Confidence Interval for Exp(B)	
			Lower	Upper
Problems experienced interfered with breastfeeding	**0.012**	0.166	0.410	0.672
Confident that breast milk alone would be adequate for 6 months	**0.018**	17.64	1.641	189.629*

*At multivariate level, this variable had a wide CI indicating a possibility of a Type 2 Error

4.10 Summary of key findings

The findings of this study showed the following

- The duration of continuous EBF since birth was six months and the prevalence of continuous EBF since birth was 68%.
- There was no significant association between EBF duration and the following factors:
    - Maternal socio-demographic factors such as maternal age, marital status and education level;
    - Maternal socio-economic characteristics such as maternal occupation, maternal income source, and proxy indicators of item ownership;
    - Cultural beliefs of the ethnic group of the mother.
- On bivariate analysis, the following were significantly associated with EBF duration.
    - Knowledge that breast milk alone without even water can sustain the baby for six months

- Maternal confidence that breast milk alone without even water can sustain the baby for six months
- Maternal breastfeeding problems that interfered with breastfeeding.

❖ In multivariate logistic regression analysis the following were associated with EBF duration

- Presence of breastfeeding problems that had interfered with breastfeeding was negatively associated with EBF duration
- Maternal confidence that breast milk alone without even water can sustain the baby for six months, was positively associated with EBF duration.

CHAPTER FIVE: DISCUSSION

The aim of this study was to assess the factors associated with the duration of EBF amongst mothers attending selected health centers. The findings of this study showed that EBF duration was influenced by maternal knowledge that breast milk alone is adequate for the infant for six months, secondly by breastfeeding complications that had interfered with breastfeeding, and thirdly maternal confidence that breast milk alone is adequate for the infant for six months. Other studies have shown that EBF duration is influenced by maternal socio-economic factors such as mothers early return to employment (Lakati *et al* ., 2002), Maternal Knowledge on EBF duration, Mututho (2013) ,maternal breast complications, Nkala and Msuya (2011), maternal intention to breastfeed and confidence in their ability to exclusively breastfeed (Xu *et al*., 2007).

5.1 Characteristics of mothers

This study was carried out in selected health centers in Nairobi County. The study participants level of education was much higher compared to the level of education of women in Nairobi county, where only 24% have attained secondary or higher level of education (Kenya National Bureau of Statistics & ICF Macro, 2014). The employment status of the study participants was 59.9% which compared well with the employment status of women in Nairobi County (65.3%) according to KDHS, 2014 (Kenya National Bureau of Statistics & ICF Macro, 2014).

5.1 Duration of Exclusive Breastfeeding

The reported median duration of EBF in this study appears higher than the current median National duration of 3.3 months and that of urban centers at 3.7 months based on 24 hour recall (Kenya National Bureau of Statistics & ICF Macro, 2014).

Most other studies have also recorded a much lower duration of EBF, for instance in a study carried out in Nairobi City Council Health Centers the mean age for introduction of complementary food was 2.9 months for mothers whose children were already six months while mothers who were practicing EBF at the time of data collection had intended to introduce complementary feeds at the mean age of 4.4 months (Muchina, 2010) and Setegn *et al*. (2012), in Goba District, South-East Ethiopia found median duration of EBF to be 3 months. The increased duration in this population of mothers visiting these health centers could be due to the increased awareness by mothers of the recommended duration of EBF that was demonstrated in this study as majority of the mothers reported to have received counseling on breastfeeding. It would seem that health care providers have played a big role in this increased knowledge of breastfeeding issues by the mothers as a majority of them reported to have received breastfeeding counseling at hospitals/health centers.

The findings of this study also suggest that the high median duration was also influenced by mother's confidence that breast milk alone could sustain the infant for six months. This reported median duration might also have been influenced by social desirability, in that the mothers may have reported that they introduced other foods and liquids to their children at six months because they knew that was the recommended age for introduction of complementary food.

5.2 Prevalence of EBF

Virtually all mothers had breastfed their infants in this study, this agrees with that of KDHS 2014, (Kenya National Bureau of Statistics & ICF Macro, 2014) however, the percentage of reported continuous exclusive breastfeeding since birth up to six months, as recalled by mothers was lower at 68%, though this was still slightly higher than the

national rate of 61% based on 24 hour recall, according to KDHS 2014, (Kenya National Bureau of Statistics & ICF Macro, 2014). This rate also compares favorably with that of a study carried out in Kigoma Municipality in Tanzania where EBF rate was found to be 58% (Nkala & Msuya, 2011), and is a bit lower than that in South-East Ethiopia where the EBF rates in children less than six months was 71.3% (Setegn *et al*., 2012). In contrast, the findings of a study in Molo District in Kenya showed the rate of EBF at six months to be 38% (Mututho, 2013). A longitudinal study in two urban slums in Nairobi carried out between February 2007 and December 2010, showed that by the age of six months, nearly all the children in the study had been introduced to complementary food (Kimani-Murage *et al*., 2011).

5.3 Factors Influencing Duration of EBF

5.3.1 Maternal Socio-demographic factors

The findings of this study showed no significant associations between maternal socio-demographic factors such as maternal age, marital status and education level and EBF duration. These findings are consistent with those of Ochola (2008) and (Koima, 2013) in which they found no correlation between socio-demographic factors age, marital status, and education level and EBF. In contrast to these findings however, literature review has shown evidence of influence of socio-demographic factors on EBF. For instance, a cross sectional study conducted at a maternity unit of New Civil Hospital, Surat in India, maternal education was found to be positively associated with decision to exclusively breastfeed, (Chudasama *et al*., 2009). A national survey among women in Canada found that a higher level of education was an important predictor of BF up to six months, (Al-Sahab *et al*., 2010). According to Jones *et al*. (2011), mother's age was strongly associated

with the likelihood of breastfeeding exclusively for six months. In the study, higher rates of exclusivity were observed among children whose mothers were 30 years of age or older. On the other hand a study carried out in urban, suburban and rural areas of Zhejiang China by Qiu *et al*. (2009) showed that mothers who were older than 24 years were less likely to be exclusively breastfeeding on discharge.

In a study done by Lande *et al*. (2003) in Norway with an aim of describing and evaluating infant feeding practices during the first six months of life in relation to recommendations by WHO, and to study infant feeding practices in relation to maternal and infant characteristics, married women were found to exclusively breastfeed for a longer time compared to unmarried women.

5.3.2 Socio-economic factors

The findings of this study showed no association between maternal socio-economic characteristics such as maternal occupation, maternal income source, house type and proxy indicators of item ownership with EBF duration.

These findings are consistent with those of a study carried out by Mututho (2013) who found no significant association between maternal socio-economic factors and practicing EBF. In contrast, Ochola (2008) in a study in Kibera, Nairobi, found a negative correlation between socio-economic status based on ownership of television and telephone and practicing EBF. This was probably because in absence of knowledge on correct breastfeeding practices, mothers of higher socio-economic status were better able to afford complementary foods as compared to those of lower socio-economic status. In this study almost all mothers had correct knowledge of IYCF practices. Women in Ethiopia with a

wealth Index ranking middle and above were twice more likely to breastfeed exclusively compared to women of lower wealth index (Alemayehu, Haidar, & Habte, 2009).

5.3.3 Maternal knowledge on breastfeeding practices

Overall, the mothers in this study had correct knowledge on breastfeeding practices. These findings are similar to those of a study in Nigeria by Uchendu, Ikefuna, and Emodi (2009) in which more than 90% of the mothers showed adequate knowledge on EBF. The results are also consistent with those of a study in urban Uganda by Petit (2010) where 73% of the participants were knowledgeable on EBF.

Nearly all the mothers in this study knew that breast milk alone could sustain the baby for six months. In contrast, a study by Webb-Girard also amongst urban women in Kenya showed that 77% believed breast milk alone would not be sufficient for the infant for six months (Webb-Girard *et al*., 2012)

Maternal knowledge aspect that breast milk alone without even water can sustain the baby for six months was significantly associated with practicing EBF at bivariate analysis, however the findings of the logistic regression analyses, indicated that there was no significant association between maternal correct knowledge that breast milk alone without even water can sustain the baby for six months and EBF duration. In contrast findings in Ethiopia by Egata *et al*. (2013) showed that low maternal knowledge on breastfeeding practices predicted the practice of non EBF in children below six months. In Morogoro, Tanzania, a study found that maternal knowledge about the importance of colostrum for infants was significantly correlated with duration of EBF in urban and rural mothers (Shirima *et al*., 2001). Nkala and Msuya (2011), found that adequate maternal knowledge on EBF influenced EBF, with mothers who had adequate knowledge having higher rates

than those who did not. The crucial role mothers knowledge plays in longer duration of EBF is further demonstrated by findings of a study by Gijsbers *et al*, (2008) in which higher maternal knowledge in earlier stages of pregnancy was associated with longer duration of EBF. A cross-sectional study in Nyando District in Nyanza, Kenya, found that mothers who had knowledge of EBF and were aware of the benefits practiced EBF 23 percentage points more than those who had no knowledge of EBF and were therefore unaware of its benefits (Nyanga *et al*., 2012).

5.3.4 Physical problems experienced by mothers in attaining EBF

The findings of this study indicated that though there was no correlation between experiencing breastfeeding problems and EBF duration, there was however a significant association between breastfeeding problems that interfered with breastfeeding and EBF duration with mothers who experienced complications that affected breastfeeding being less likely to practice EBF to six months. This would mean that breastfeeding complications had a negative influence on EBF only if they interfered with breastfeeding. Some mothers experienced complications; however these problems had not interfered with breastfeeding and therefore did not interfere with EBF.

These findings partly conform to those of a cross-sectional study in Western Tanzania to determine the prevalence and predictors of exclusive breastfeeding among women in Kigoma region, 17% of the women reported to have had breast problems such as engorged breasts, cracked nipples and mastitis during breastfeeding. The study established that women who had breast complications were significantly less likely to exclusively breastfeed. According to the study, incorrect attachment and infrequent feeding of babies during breastfeeding were the main causes of breast problems, (Nkala & Msuya, 2011).

In a study carried out to determine the factors associated with cessation of exclusive breastfeeding at end of six weeks in healthy term and late preterm neonates born in a hospital set up in north India, mothers stated a number of problems that they face with the main one being the perception of not having enough milk. Other problems that the mothers stated were cracked/sore nipples, engorgement of breasts while others had difficulty in giving EBF because of flat/retracted nipples. These problems were shown to have been negatively associated with EBF, (Suksham *et al*., 2001). Naanyu (2008), in a study in Eldoret also had similar findings that breastfeeding complications had negatively interfered with EBF.

5.3.5 Psychological factors

The findings of this study showed that maternal confidence to successfully breastfeed, social support provided and maternal intention to breastfeed were not associated with duration of EBF, however in bivariate analysis and logistic regression analysis, maternal confidence that breast milk alone without even water can sustain the baby for six months, was associated with EBF duration with mothers who were confident that breast milk alone would be adequate for six months being more likely to breastfeed up to six months (Fisher's exact test; P= 0.007). This agrees partly with findings by O'Brien, Buikstra, and Hegney (2008) in Australia where they found that participants were 1.7 times more likely to continue any breastfeeding for every one point increase in faith in breast milk.

In contrast, a systematic review of literature on factors that positively influence breastfeeding duration up to 6 months, Meedya, Fahy, and Kable (2010), found that a combination of lay and professional support increases the duration of any breastfeeding significantly. They also found that low maternal breastfeeding confidence is associated

with shorter duration of breastfeeding. On the other hand, social support to the mother, maternal intention to breastfeed, positive attitude towards EBF and stated intention to breastfeed have been found to be strong predictors of breastfeeding initiation and have been positively correlated with longer duration of EBF (Bai *et al*., 2010) and (Scott *et al*.,2006).

5.3.6 Cultural Factors

The findings of this study showed there was no significant association between cultural beliefs and EBF duration. These findings are in contrast with those of a study carried out in rural Cameroon to identify the extent of mixed feeding and the cultural barriers to exclusive breastfeeding, which found that all the women in the survey introduced water and non breast milk food to their infants before six months of age and more than 38% had given water in the first month of life (Kakute *et al*., 2005). Nyanga *et al*. (2012), found that the practice of a mother giving water or tea to an infant in addition to the breast milk was common, in her study in Nyando district in Kenya.

In this study, a large percentage (90.7%) of the mothers believed that colostrum should be fed to the baby, in contrast other studies show colostrum was discarded since it was regarded as being harmful, for instance in Nigeria, a study involving rural Yoruba communities, showed that breastfeeding initiation was delayed two to three days to express and discard colostrum which was considered harmful to the infant. In addition newborns were fed water and herbal teas as part of rituals at childbirth. Although breast milk was considered healthy, infants were given water to prevent disease and quench thirst. Beliefs that breast milk alone was not adequate to meet the infant's nutritional needs even for one day were widespread (Davies-Adetugbo, 1997).

5.3.7 Predictors of exclusive breastfeeding

The findings of this study showed that breastfeeding problems that interfered with breastfeeding and confidence that breast milk alone without even water can sustain the baby for six months were retained as predictors to the practice of EBF after controlling for pre-lacteal feeding. These findings are partly in conformity with those of a study in Kibera, Nairobi in which absence of breast health problems was retained as predictor of exclusive breastfeeding (Ochola, 2008) and also those of a study in Molo, Kenya that showed breast complications as a predictor of EBF (Mututho, 2013). In other studies however different factors have been identified as predictors of exclusive breastfeeding. A study in Eldoret found, among others that going back to work by the mother and breast milk being unsatisfying to the infant were barriers to EBF (Cherop et al., 2009). A study in Nigeria in 2003, revealed that household wealth, geopolitical region, antenatal clinic visits, decreased child age and gender were significantly associated with EBF (Agho *et al*., 2011).

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1: Conclusions

Exclusive breastfeeding has been shown to be the optimal way of feeding infants up to six months of their life, as breast milk alone provides sufficient nutrition and optimal health for the infant (WHO, 2009). For this reason, this study sort to determine the duration of EBF in Selected Health Centers in Nairobi. The following conclusions are drawn from the findings of this study;

The median duration of EBF, based on recall of continuous EBF since birth, amongst the mothers visiting the selected health centers in Nairobi was found to be higher than both the national duration and that of Nairobi County which are based on 24 hour recall, and agrees with recommended duration of six months by WHO.

The prevalence of reported exclusive breastfeeding, based on recall of continuous EBF since birth, was 68%, and is slightly higher than the national prevalence of 61% which is based on 24 hour recall, but still falls below what is recommended by the WHO and set national target of increasing exclusive breastfeeding prevalence to 80% by 2017, as per national maternal, infant and young child nutrition strategy 2011-2017, as outlined in the 2012-2017 National Nutrition Action Plan (Ministry of Public Health and Sanitation, 2012).

The factors that influenced the duration of EBF were maternal knowledge that breast milk alone was adequate for the infant for six months, maternal confidence that breast milk alone without even water can sustain the baby for six months and maternal breast problems that influenced breastfeeding.

The predictors of EBF were found to be confidence that breast milk alone without even water can sustain the baby for six months and maternal breast problems that interfered with breastfeeding. Mothers, who were confident that breast milk alone without even water would be adequate for the infant for six months, were more likely to practice EBF for six months. Mothers who experienced breast problems that had interfered with breastfeeding were less likely to practice EBF for six months.

Maternal socio-demographic, socio-economic and cultural factors had no influence on the duration of EBF.

6.2 Recommendations

According to this study, maternal knowledge on breastfeeding issues is high, which seems to suggest that health workers have done a great job of educating mothers on the recommended practices of breastfeeding as this was found to be the main source of BF information, however, the prevalence of EBF is still below the set national target of increasing exclusive breastfeeding prevalence to 80% by 2017, as per national maternal, infant and young child nutrition strategy 2011-2017, as outlined in the 2012-2017 National Nutrition Action Plan (Ministry of Public Health and Sanitation, 2012) based on this, the following recommendations are made:

1. **At facility level**

   There is need by health workers in the study area to scale up education of mothers to ensure they fully understand all the EBF practices, it's adequacy for the infant for six months and all the benefits to continue improving maternal confidence in breast milk, as this would improve the rate of EBF.

2. **At policy level**

   Breastfeeding promotion information offered by the Ministry of Health to mothers should include more visual aids and demonstrations for mothers on how to cope with and reduce breast complications to limit their interfering with breast feeding.

3. **Further research**

   Similar studies should be done at community level to establish factors influencing EBF duration, to influence policy for interventions at community level.

REFERENCES

Agho, K. E., Dibley, M. J., Odiase, J. I., & Ogbonmwan, S. M. (2011). Determinants of exclusive breastfeeding in Nigeria. *BMC Pregnancy and Childbirth, 11*(1), 1.

Aidam, B., Perez-Escamilla, R., Lartey, A., & Aidam, J. (2005). Factors associated with exclusive breastfeeding in Accra, Ghana. *European Journal of Clinical Nutrition, 59*(6), 789-796.

Akman, I., Kuscu, M. K., Yurdakul, Z., Özdemir, N., Solakoğlu, M., Orhon, L., . . . Özek, E. (2008). Breastfeeding duration and postpartum psychological adjustment: role of maternal attachment styles. *Journal of Paediatrics and Child Health, 44*(6), 369-373.

Al-Sahab, B., Lanes, A., Feldman, M., & Tamim, H. (2010). Prevalence and predictors of 6-month exclusive breastfeeding among Canadian women: a national survey. *BMC Pediatrics, 10*(1), 20.

Alemayehu, T., Haidar, J., & Habte, D. (2009). Determinants of exclusive breastfeeding practices in Ethiopia. *Ethiopian Journal of Health Development, 23*(1).

Amadhila, J.-N. (2005). *Factors that Influence Exclusive Breastfeeding in Windhoek District in Namibia.* University of the Western Cape.

Anthony, D. (2011). *The state of the world's children 2011-adolescence: an age of opportunity*: United Nations Children's Fund (UNICEF).

Arifeen, S., Black, R. E., Antelman, G., Baqui, A., Caulfield, L., & Becker, S. (2001). Exclusive breastfeeding reduces acute respiratory infection and diarrhea deaths among infants in Dhaka slums. *Pediatrics, 108*(4), e67-e67.

Aryeetey, R., & Goh, Y. (2013). Duration of exclusive breastfeeding and subsequent child feeding adequacy. *Ghana Medical Journal, 47*(1), 24-29.

Bai, Y., Middlestadt, S. E., Peng, C.-Y. J., & Fly, A. D. (2010). Predictors of continuation of exclusive breastfeeding for the first six months of life. *Journal of Human Lactation, 26*(1), 26-34.

Binns, C., & Lee, S. W. (2012). The Public Health Benefits of Breastfeeding. (13th World Congress on Public Health, Addis Ababa, Ethipia).

Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., De Onis, M., Ezzati, M., . . . Rivera, J. (2008). Maternal and child undernutrition: global and regional exposures and health consequences. *The Lancet, 371*(9608), 243-260.

Cai, X., Wardlaw, T., & Brown, D. W. (2012). Global trends in exclusive breastfeeding. *Int Breastfeed J, 7*, 12.

Chantry, C. J., Howard, C. R., & Auinger, P. (2006). Full breastfeeding duration and associated decrease in respiratory tract infection in US children. *Pediatrics, 117*(2), 425-432.

Chaves, R. G., Lamounier, J. A., & César, C. C. (2007). Factors associated with duration of breastfeeding. *Jornal de Pediatria, 83*(3), 241-246.

Cherop, C., Keverenge-Ettyang, A., & Mbagaya, G. (2009). Barriers to exclusive breastfeeding among infants aged 0-6 months in Eldoret Municipality, Kenya. *East African Journal of Public Health, 6*(1).

Chezem, J., Friesen, C., & Boettcher, J. (2003). Breastfeeding knowledge, breastfeeding confidence, and infant feeding plans: effects on actual feeding practices. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 32*(1), 40-47.

Chudasama, R., Patel, P., & Kavishwar, A. (2008). Factors associated with duration of exclusive breastfeeding. *The Internet Journal of Pediatrics and Neonatology, 9*(1).

Chudasama, R., Patel, P., & Kavishwar, A. (2009). Breastfeeding initiation practice and factors affecting breastfeeding in South Gujarat region of India. *The Internet Journal of family practice, 7*(2).

Clifford, T. J., Campbell, M. K., Speechley, K. N., & Gorodzinsky, F. (2006). Factors influencing full breastfeeding in a southwestern Ontario community: Assessments at 1 week and at 6 months postpartum. *Journal of Human Lactation, 22*(3), 292-304.

Davies-Adetugbo, A. A. (1997). Sociocultural factors and the promotion of exclusive breastfeeding in rural Yoruba communities of Osun State, Nigeria. *Social Science & Medicine, 45*(1), 113-125.

de Jager, E., Skouteris, H., Broadbent, J., Amir, L., & Mellor, K. (2013). Psychosocial correlates of exclusive breastfeeding: A systematic review. *Midwifery, 29*(5), 506-518.

Diallo, F. B., Bell, L., Moutquin, J.-M., & Garant, M.-P. (2009). The effects of exclusive versus non-exclusive breastfeeding on specific infant morbidities in Conakry. *Pan African Medical Journal, 2*(1).

Dubois, L., & Girard, M. (2003). Social determinants of initiation, duration and exclusivity of breastfeeding at the population level: the results of the Longitudinal Study of Child Development in Quebec (ELDEQ 1998-2002). *Canadian Journal of Public Health. Revue Canadienne de Santé Publique, 94*(4), 300.

Egata, G., Berhane, Y., & Worku, A. (2013). Predictors of non-exclusive breastfeeding at 6 months among rural mothers in East Ethiopia: a community-based analytical cross-sectional study. *International Breastfeeding Journal, 8*(1), 8.

Giashuddin, M., & Kabir, M. (2003). Breastfeeding duration in Bangladesh and factors associated with it. *Indian Journal of Community Medicine, 28*(1), 34-38.

Gijsbers, B., Mesters, I., Knottnerus, J. A., & Van Schayck, C. P. (2008). Factors associated with the duration of exclusive breast-feeding in asthmatic families. *Health Education Research, 23*(1), 158-169.

Hatsu, I. E., McDougald, D. M., & Anderson, A. K. (2008). Effect of infant feeding on maternal body composition. *Int Breastfeed J, 3*(18), 107.

Heck, K. E., Braveman, P., Cubbin, C., Chávez, G. F., & Kiely, J. L. (2006). Socioeconomic status and breastfeeding initiation among California mothers. *Public Health Reports, 121*(1), 51.

Hunsberger, M., Lanfer, A., Reeske, A., Veidebaum, T., Russo, P., Hadjigeorgiou, C., . . . Lissner, L. (2013). Infant feeding practices and prevalence of obesity in eight European countries–the IDEFICS study. *Public Health Nutrition, 16*(02), 219-227.

Islam, A., Khan, N. A., & Naila, U. (2011). Breastfeeding; Factors involved in avoidance. *Professional Medical Journal, 18*(1).

Israel, G. D. (1992). *Determining sample size*: University of Florida Cooperative Extension Service, Institute of Food and Agriculture Sciences, EDIS.

Jepkogei, K. W. (2013). *Determinants of adherence to exclusive breast feeding among HIV positive mothers attending child welfare clinic at Pumwani maternity hospital, Nairobi County, Kenya.* Kenyatta University.

Jessri, M., Farmer, A. P., Maximova, K., Willows, N. D., & Bell, R. C. (2013). Predictors of exclusive breastfeeding: observations from the Alberta pregnancy outcomes and nutrition (APrON) study. *BMC Pediatrics, 13*(1), 77.

Jones, J. R., Kogan, M. D., Singh, G. K., Dee, D. L., & Grummer-Strawn, L. M. (2011). Factors associated with exclusive breastfeeding in the United States. *Pediatrics, 128*(6), 1117-1125.

Kakute, P. N., Ngum, J., Mitchell, P., Kroll, K. A., Forgwei, G. W., Ngwang, L. K., & Meyer, D. J. (2005). Cultural barriers to exclusive breastfeeding by mothers in a rural area of Cameroon, Africa. *Journal of Midwifery & Women's Health, 50*(4), 324-328.

Kenya National Bureau of Statistics. (2010). *Kenya Demographic and Health Survey 2008-09*: Kenya National Bureau of Statistics.

Kenya National Bureau of Statistics. (2014). *Kenya Demographic and Health Survey 2014*. Nairobi: Kenya National bureau of standards.

Kimani-Murage, E. W., Madise, N. J., Fotso, J.-C., Kyobutungi, C., Mutua, M. K., Gitau, T. M., & Yatich, N. (2011). Patterns and determinants of breastfeeding and complementary feeding practices in urban informal settlements, Nairobi Kenya. *BMC Public Health, 11*(1), 396.

Kimani-Murage EW, Muthuri SK, Oti SO, Mutua MK, van de Vijver S, Kyobutungi C: Evidence of a Double Burden of Malnutrition in Urban Poor Settings in Nairobi, Kenya. *PLoS One* 2015, 10(6):e0129943.

Koosha, A., Hashemifesharaki, R., & Mousavinasab, N. (2008). Breast-feeding patterns and factors determining exclusive breast-feeding. *Singapore Medical Journal, 49*(12), 1002.

Kothari, C.R.(2004). Research Methodology; Methods and Techniques. New age International Publisher Ltd.

Kramer, M. S., Guo, T., Platt, R. W., Sevkovskaya, Z., Dzikovich, I., Collet, J.-P., . . . Vanilovich, I. (2003). Infant growth and health outcomes associated with 3 compared with 6 mo of exclusive breastfeeding. *The American Journal of Clinical Nutrition, 78*(2), 291-295.

Kramer MS, Kakuma R. The optimal duration of exclusive breastfeeding: a systematic review. *Adv Exp Med Biol* 2004; 554: 63-77.

Kramer, M. S., & Kakuma, R. (2012). Optimal duration of exclusive breastfeeding. *The Cochrane Library*.

Lakati, A., Binns, C., & Stevenson, M. (2002). Breast-feeding and the working mother in Nairobi. *Public Health Nutrition, 5*(6), 715-718.

Lakati, A., Binns, C., & Stevenson, M. (2002). The effect of work status on exclusive breastfeeding in Nairobi. *Asia Pac J Public Health, 14*(2), 85-90.

Lande, B., Andersen, L., Baerug, A., Trygg, K., Lund-Larsen, K., Veierød, M., . . . Aa, E. (2003). Infant feeding practices and associated factors in the first six months of life: the Norwegian infant nutrition survey. *Acta Pædiatrica, 92*(2), 152-161.

Linkages. (2013). Facts for feeding: Recommended practices to improve infant nutrtion during the first six months. Retrieved November 22,, 2013, from http://www.linkagesproject.org

Mascarenhas, M. L. W., Albernaz, E. P., Silva, M. B. d., & Silveira, R. B. d. (2006). Prevalence of exclusive breastfeeding and its determiners in the first 3 months of life in the South of Brazil. *Jornal de Pediatria, 82*(4), 289-294.

Matias, S. L., Nommsen-Rivers, L. A., & Dewey, K. G. (2012). Determinants of exclusive breastfeeding in a cohort of primiparous periurban Peruvian mothers. *Journal of Human Lactation, 28*(1), 45-54.

Meedya, S., Fahy, K., & Kable, A. (2010). Factors that positively influence breastfeeding duration to 6 months: a literature review. *Women and Birth, 23*(4), 135-145.

Ministry of Public health and Sanitation. (2012). *National Nutrition Action Plan 2012-2017* Nairobi: Goverment Printers Retrieved from http://bit.ly/1G8RVz8.

Motee, A., Ramasawmy, D., Pugo-Gunsam, P., & Jeewon, R. (2013). An Assessment of the Breastfeeding Practices and Infant Feeding Pattern among Mothers in Mauritius. *Journal of Nutrition and Metabolism, 2013*.

Muchina, E. N., (2010). Relationship between breastfeeding practices and nutritional status of children aged 0-24 months in Nairobi, Kenya. *African Journal of Food, Agriculture, Nutrition and Development, 10*(4).

Mukuria, A. G., Kothari, M. T., & Abderrahim, N. (2006). *Infant and young child feeding update*: ORC Macro.

Mututho, L. N. (2013). *Factors influencing exclusive breastfeeding among infants less than 6 months in Kasarani informal settlement, Molo District, Kenya.*

Naanyu, V. (2008). Young mothers, first time parenthood and exclusive breastfeeding in Kenya. *African Journal of Reproductive Health, 12*(3).

Nkala, T. E., & Msuya, S. E. (2011). Prevalence and predictors of exclusive breastfeeding among women in Kigoma region. Western Tanzania: a community based cross-sectional study. *Int Breastfeed J, 6*, 17.

Nyanga, N., Musita, C., Otieno, A., & Kaseje, D. (2012). Factors influencing knowledge and practice of exclusive breastfeeding in Nyando district, Kenya. *African Journal of Food, Agriculture, Nutrition and Development, 12*(6).

Nguyen, K. (2009). Nutrition spectrum backgrounder: select interventions and country snapshots. The National Bureau of Asian Research: Centre for Health and Aging.

O'Campo, P., Faden, R. R., Gielen, A. C., & Wang, M. C. (1992). Prenatal factors associated with breastfeeding duration: recommendations for prenatal interventions. *Birth, 19*(4), 195-201.

O'Brien, M., Buikstra, E., & Hegney, D. (2008). The influence of psychological factors on breastfeeding duration. *Journal of Advanced Nursing, 63*(4), 397-408.

Ochola, S. A. (2008). *Evaluation of two counseling strategies improving exclusive breastfeeding among HIV-negative mothers in Kibera Slum, Nairobi, Kenya: a randomized controlled trial.* Stellenbosch: University of Stellenbosch.

Osman, H., El Zein, L., & Wick, L. (2009). Cultural beliefs that may discourage breastfeeding among Lebanese women: a qualitative analysis. *International Breastfeeding Journal, 4*(1), 12.

Osorio Castaño, J. H., & Botero Ortiz, B. E. (2012). Factors associated to the duration of exclusive breastfeeding. *Investigación y Educación en Enfermería, 30*(3), 390-397.

Petit, A. I. (2010). Perception and knowledge on exclusive breastfeeding among women attending antenatal and postnatal clinics. a study from Mbarara hospital–Uganda, August 2008. *Dar Es Salaam Medical Students' Journal, 16*(1), 27-30.

Qiu, L., Zhao, Y., Binns, C. W., Lee, A. H., & Xie, X. (2009). Initiation of breastfeeding and prevalence of exclusive breastfeeding at hospital discharge in urban, suburban and rural areas of Zhejiang China. *Int Breastfeed J, 4*(1), 1746-1753.

Scott, J., Landers, M., Hughes, R. M., & Binns, C. (2001). Factors associated with breastfeeding at discharge and duration of breastfeeding. *Journal of paediatrics and child health, 37*(3), 254-261.

Scott, J. A., Binns, C. W., Oddy, W. H., & Graham, K. I. (2006). Predictors of breastfeeding duration: evidence from a cohort study. *Pediatrics, 117*(4), e646-e655.

Setegn, T., Belachew, T., Gerbaba, M., Deribe, K., Deribew, A., & Biadgilign, S. (2012). Factors associated with exclusive breastfeeding practices among mothers in Goba district, south east Ethiopia: a cross-sectional study. *International Breastfeeding Journal, 7*(1), 17.

Shirima, R., Gebre-Medhin, M., & Greiner, T. (2001). Information and socioeconomic factors associated with early breastfeeding practices in rural and urban Morogoro, Tanzania. *Acta Paediatrica, 90*(8), 936-942.

Suksham, J., Manju, S., & Deepak, C. Factors for Cessations of Exclusive Breast Feeding at End of 6 Weeks in Healthy Term and Late Preterm Neonates Born in a Hospital Set up in North India. *National Journal, 3*.

Tan, K. (2009). Factors associated with non-exclusive breastfeeding among 4-week post-partum mothers in Klang district, Peninsular Malaysia. *Malalysian Journal of Nutrition, 15*(1), 11-18.

Uchendu, U., Ikefuna, A., & Emodi, I. (2009). Factors associated with exclusive breastfeeding among mothers seen at the University of Nigeria Teaching Hospital. *South African Journal of Child Health, 3*(1).

Ulak, M., Chandyo, R. K., Mellander, L., Shrestha, P. S., & Strand, T. A. (2012). Infant feeding practices in Bhaktapur, Nepal: a cross-sectional, health facility based survey. *International breastfeeding journal, 7*(1), 21-30.

UNICEF. (2009a). The state of the world's children 2010. .

UNICEF. (2009b). *Tracking progress on child and maternal nutrition: A survival and development priority*: UNICEF.

UNICEF. (2010). *Improving Exclusive Breastfeeding Practices by using Communication for Development in Infant and Young Child Feeding Programmes*

New York.

UNICEF. (2011). Progress for children, report card on nutrition: number 4. 2006.

UNICEF. (2016). UNICEF Data: Monitoring the Situation of Children and Women. 2014.

Victora, C. G., Horta, B. L., de Mola, C. L., Quevedo, L., Pinheiro, R. T., Gigante, D. P., . . . Barros, F. C. (2015). Association between breastfeeding and intelligence, educational attainment, and income at 30 years of age: a prospective birth cohort study from Brazil. *The Lancet Global Health, 3*(4), e199-e205.

Victora CG, Bahl R, Barros AJ, Franca GV, Horton S, Krasevec J, Murch S, Sankar MJ, Walker N, Rollins NC *et al*: Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet* 2016, 387(10017):475-490.

Watson, B. M. (2013). Ethnicity and Breastfeeding in Kenya.

Webb-Girard, A., Cherobon, A., Mbugua, S., Kamau-Mbuthia, E., Amin, A., & Sellen, D. W. (2012). Food insecurity is associated with attitudes towards exclusive breastfeeding among women in urban Kenya. *Maternal & Child Nutrition, 8*(2), 199-214.

WHO, U. (2008). *Indicators for Assessing Infant and Young Child Feeding Practices: Conclusions of a Consensus Meeting Held 6-8 November 2007 in Washington DC, USA*: World Health Organization (WHO).

WHO, U. (2010). Partners. Indicators for assessing infant and young child feeding practices. Part 3: country profiles. *World Health Organization*.

World Health Organisation. (2003). *Global strategy for infant and young child feeding*: World Health Organization.

World Health Organization. (2000). Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality. Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. *Lancet, 355*(9202), 451-455.

World Health Organization. (2009). Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. *Geneva: WHO*.

Xu, F., Binns, C., Zheng, S., Wang, Y., Zhao, Y., & Lee, A. (2007). Determinants of exclusive breastfeeding duration in Xinjiang, PR China. *Asia Pacific Journal of Clinical Nutrition, 16*(2), 316.

APPENDICES

APPENDIX A: INFORMED CONSENT DOCUMENT

Topic: Factors associated with duration of Exclusive Breastfeeding amongst mothers with children 6-9 months of age visiting Selected Health Centers in Nairobi

Principal Investigator Bilha Chelagat Bitok

Moi University/AMREF School of Public Health

Contact 0722895240

Email ***bitokbilha@yahoo.com***

Description

You are invited to participate in a research study on the Factors Associated with Duration of Exclusive Breastfeeding targeting mothers with infants six months of age. The investigator is a Master of Public Health student from Moi University, AMREF.

Purpose of study

The purpose of this study is to assess the duration of exclusive breastfeeding in Langata Sub-county and to determine the factors that influence this duration.

Procedure

Will involve the administration of a self administered questionnaire

Benefits and risks

The findings of the study will be important in informing health care workers and policy makers on the factors that influence duration of exclusive breastfeeding. This will hopefully help these stakeholders to put in place policies to improve exclusive breastfeeding duration. There are no risks involved in this study.

Confidentiality

All information given will be treated with utmost confidentiality. The participant's name will not be written on the questionnaire.

Voluntary participation

Participation in the study is voluntary. All participants are free to withdraw at any point of the study.

Contact Information

Any questions, concerns, or complaints can be forwarded to the principle investigator through the contacts provided above.

Consent

Having read and understood the purpose, procedure, and benefits of the study, I voluntarily agree to take part in the study:

Signature/Thumb print……..

Name of witness…….

Signature/Thumb print ……..

Date: ……...

APPENDIX B: QUESTIONNAIRE

Questionnaire No.……

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERSITICS

A1. **Age of respondent in years**……

A2. Marital status

□ Married □ Widowed □ Divorced □ Separated □ Never married

A3. Level of Education

□ No formal education □ Primary □ Secondary □ College □ University

SECTION B. SOCIO ECONOMIC STATUS

B4. Maternal Employment status

□ Casual □ Housewife □ Unemployed □ Formal employed □ Self Employed □ Student

B5. Source of Income

□ Salary job □ Own business □ Husband □ Other (Specify)

……

B6 Do you live in a:

□ Rented □ Owned house

B7. If rented, how much rent do you pay per month? KSh……

B8. What is the number of rooms in the house……

B9. Paternal Employment status

□ Casual □ Unemployed □ Formal employed □ Self Employed □ Other, specify.....

B10. What is your main source of lighting?

□Kerosene □Candle □Solar □Electricity

Other, specify.....

B11. What is your main source of cooking fuel?

□ Firewood □ Charcoal □ Kerosene □ Gas □ Electricity □

Other, specify.....

B12. Do you possess the following items? (Tick where appropriate)

a) Radio □ b) Bicycle □ c) Television □ d) Video/VCD/ DVD □ e) Phone □

f) Motorcycle □ g) Car/Track □

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

C13. Did you receive any counseling/information on breastfeeding/infant feeding? □ Yes □ No

C14. If YES, what was the source of the information/counseling?

□ Hospital/health centre □ Traditional Birth Attendant □ Family/friends

□ Media □ Other (Specify)……

C15. When did you receive breastfeeding counseling?

□ Before delivery during antenatal clinics □ At the time of delivery

□ After delivery before leaving the hospital □ During post-natal clinics

C16. Should breast milk be the baby's first food after birth?

□ Yes □ No

C17. The baby should be put to the breast after more than one hour to allow the mother to rest □ Yes □ No

C18. Should the first yellow milk/ colostrum be fed to the baby?

□ Yes □ No

C19. Breast milk alone without even water can sustain the baby for six months

□ Yes □ No

C20. The following are benefits of exclusive breastfeeding (tick yes if you agree)

a) Exclusive breastfeeding protects the baby from illness □ Yes □ No

b) Breastfeeding helps the mother not to get pregnant □ Yes□ No

C21. What should babies below six months be given when the mother is away?

Water □ Expressed milk □ Fruit juice □ Porridge □ Other milk □ Formula milk

□ Gripe water □ Tea □ Glucose/sugar water □ Honey □

Other, specify……

SECTION D: EXCLUSIVE BREASTFEEDING PRACTICES

D22. Have you ever breastfed the baby?

□ Yes □ No

D23. If NO, tick the response that prevented you from breastfeeding the baby,

Baby was ill /unable to suckle □ Baby refused to suckle □

Mother did not want to breastfeed □ Spouse recommended □

Mother was very sick □ No/ little breast milk □

Mother was away □ Other, specify……

D24. If YES, how soon after delivery did you first breastfeed?

□ Immediately/within first hour after birth □ After the first hour □ I don't know/remember

D25. Did your baby receive anything to drink before he/she was first put to the breast?

□ Yes □ No

D26. If YES, what liquid was given?

□ Glucose water □ Plain boiled water □ Formula milk □ other milk □ Medicine

□ Fruit juice □ Gripe water □ Tea

Other, specify.....

D27. What was the reason for giving the baby this liquid?

……
……
……

D28. Did the infant receive anything else other than breast milk, since breast feeding was initiated?

□ Yes □ No

D29. If yes, what liquids/solids were given?

Water □ Expressed milk □ Fruit juice □ Porridge □ Other milk □ Formula milk □ Gripe water □ Tea □ Glucose/sugar water □ Honey □ Puréed potatoes □

Other, specify……

D30. At what age were these solids/liquids introduced to the child?.....

D31. Why did you give the baby these liquids/solids? (Tick all applicable responses)

□ Baby gets hungry □ Mother not producing enough milk
□ Advised by relatives/friends/neighbors □ Advised by health care providers
□ Advised by TBA □ To sooth stomach pain
Other (specify)……

SECTION E: PHYSICAL FACTORS RELATED TO BREASTFEEDING

E32. Have you (mother) experienced any problems in breastfeeding your baby?

□ Yes □ No

E33. If YES, what were the problems experienced?(Tick where appropriate)

□ Inadequate breast milk □ Painful breasts □ Baby refusing to breastfeed

□ Cracked/sore nipples □ Infection of the breast/mastitis

□ Other (specify)……

D34. Have the problems interfered with breastfeeding?

□ Yes □ No

E35. If YES, how did the problem interfere with breastfeeding?

.....

SECTION F: PSYCHOLOGICAL FACTORS RELATED TO EBF

F36. A few hours after the baby was born, did you feel capable and confident to successfully breastfeed your infant? □ Yes □ No

F37. If yes, rate your level of confidence □ Low □ Medium □ High

F38. If no, what were the reasons you were not confident? (Tick where appropriate)

i) I was not prepared to have the baby □ Yes □ No

ii) The previous baby refused to breastfeed □ Yes □ No

iii) I am not well/ I am sick □ Yes □ No

iv) I feel am too small to breastfeed □ Yes □ No

Other, specify.....

F39. Did you feel confident that breast milk alone would be adequate for six months?

□ Yes □ No

F40. If yes, rate your level of confidence

□ Low □ Medium □ High

F41. Did you receive any support on the way you chose feed your infant?

□ Yes □ No

F42. If yes, from whom did you receive the support?

□ Spouse/Partner □ Mother in law □ Mother □ CHW

□ Relatives/friends/neighbors □ Health care providers

□ TBA □ Other (specify)……

F43. How did the support provided influence your chosen method of feeding the infant?

……

……

F44.Before the birth of your baby, did you have the intention of breastfeeding exclusively Yes □ No

F45. If yes, who influenced your intention?

□ Spouse/Partner □ Mother in law □ Mother □ CHW

□ Relatives/friends/neighbors □ Health care providers

□ TBA □ Other (specify)……

SECTION G: CULTURE

G46. In your culture, do people believe that :

i) That colostrum should be given to the baby? □ Yes □ No

ii) Milk alone is adequate for a baby aged less than six months? □ Yes □ No

iii) A baby below six months needs water? □ Yes □No

iv) Evil eye can affect breast-milk? □ Yes □ No

v) Breastfeeding can be done in public? □ Yes □ No

vi) A baby below six months should be given herbal drinks or mixture? □ Yes □ No

vii) That a baby below six months should be given anything else other than breast milk?

□ Yes □ No

If yes, specify what else is given

……

Do you have any other comment?

.....

THANK YOU FOR SHAIRING THIS INFORMATION WITH US

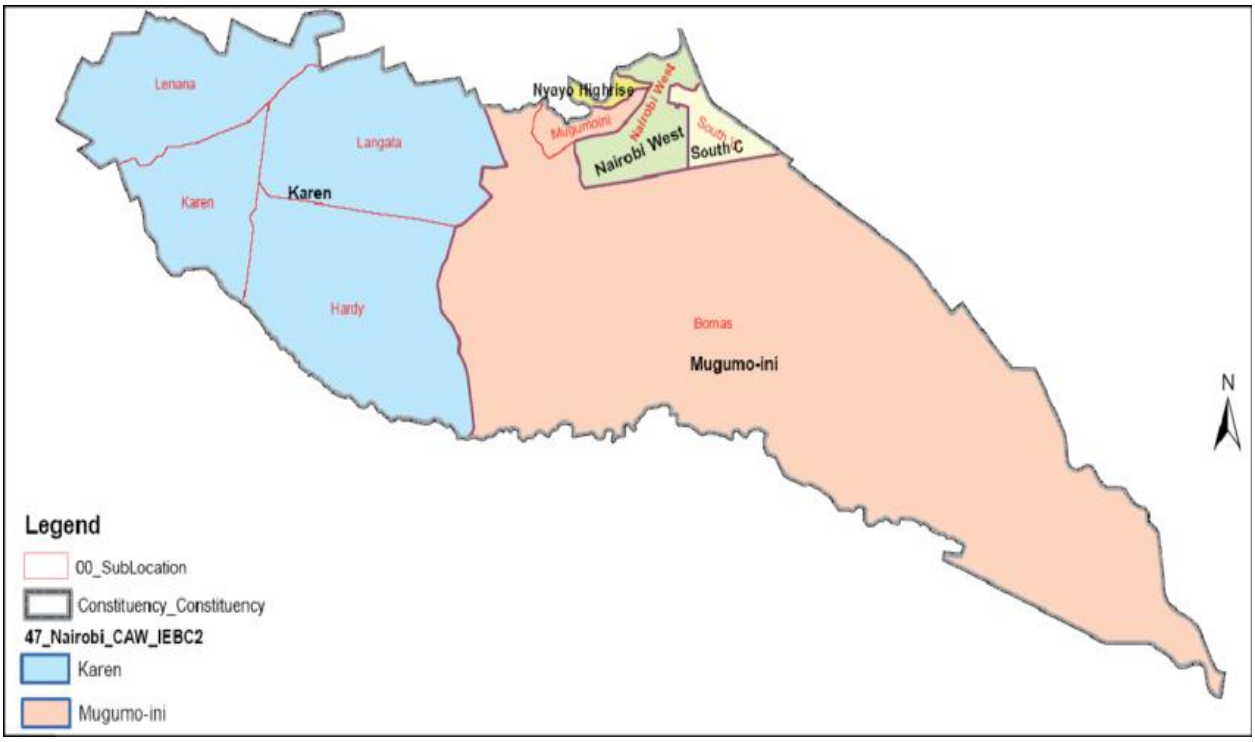
APPENDIX C: WORK PLAN

Activity	Expected Start Date	Expected Completion Date
Proposal development	1st September 2013	20th March 2014
Proposal approved by ethics committees	April 1st 2014	20th April 2014
Data collection	7th May 2014	15th July 2014
Data entry and analysis	16th July 2014	3rd August 2014
Report writing and review of supervisors' corrections.	4th August 2014	4th September 2014
Submission of thesis, defense and correction	5th September 2014	15th November 2014
Award and Graduation	16th November 2014	16th December 2014

APPENDIX D: BUDGET

	ITEM	KSHS
1	Proposal development	10,000
2	Equipment: Software, books, stationary	20,000
3	Data collection and analysis	40,000
4	Report writing	10,000
	Total	80,000

APPENDIX E: MAP OF STUDY AREA



APPENDIX F: ETHICAL APPROVAL LETTER (IREC)

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471//2/3

MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET

Reference: IREC/2014/95
Approval Number: 0001217

10th July, 2014

Bilha Chelagat Bitok,
Moi University,
School of Public Health,
P.O. Box 4606-30100,
ELDORET-KENYA.

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
10 JUL 2014
APPROVED
P. O. Box 4606-30100 ELDORET

Dear Ms. Bitok,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:-

"Factors Associated with Duration of Exclusive Breastfeeding among Mothers with Children Six to Nine Months of Age Attending Selected Health Centres in Nairobi County".

Your proposal has been granted a Formal Approval Number: ***FAN: IREC 1217*** on 10th July, 2014. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 9th July, 2015. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

PROF. E. WERE
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc Director - MTRH Dean - SOP Dean - SOM
Principal - CHS Dean - SON Dean - SOD

APPENDIX G: NAIROBI CITY COUNTY AUTHORIZATION LETTER

NAIROBI CITY COUNTY

COUNTY HEALTH SERVICES

REF.NO: DMOH/LANG/R.5/2014

13TH NOVEMBER, 2014

HEALTH FACILITY INCHARGES
LANGATA & KAREN

RE: REQUEST FOR AUTHORITY TO CARRY OUT A RESEARCH

Bilha Chelagat Bitok has been authorized to carry out a research on **" Factors Associated with Duration of Exclusive Breastfeeding among Mothers with Children Six to Nine Months of Age Attending Selected Health facilities in Nairobi City County"** for one year and expires on 9th July, 2015.

This is therefore to request the Incharges of Langata and Karen Health Centre to accord you the necessary support to make your research successful.

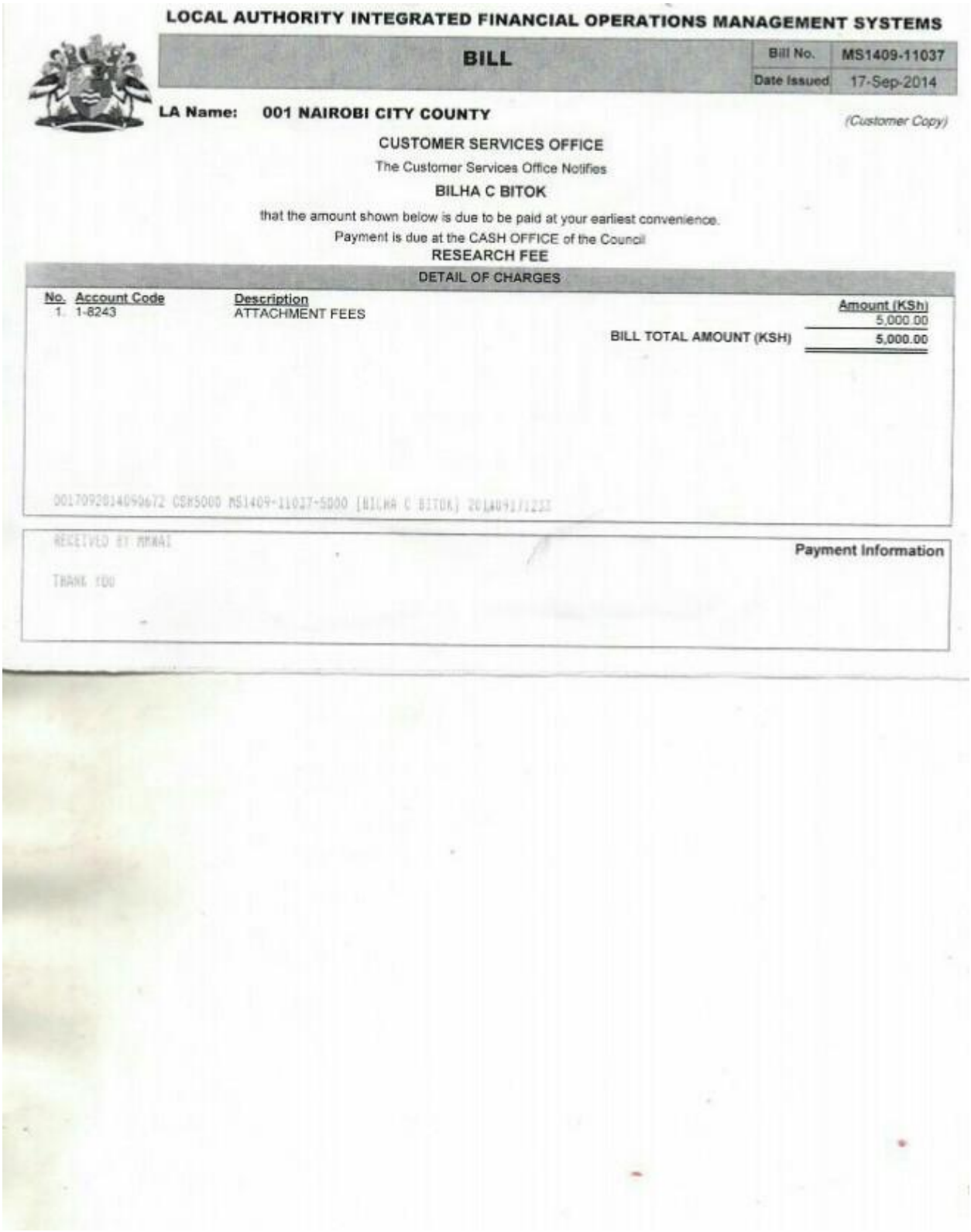
JEAN KABURU
FOR: SUB-COUNTY MEDICAL OFFICER OF HEALTH
LANGATA SUB-COUNTY

c.c. Bilha Chelagat Bitok
Moi University – School of Public Health
P.O.Box 4606-30100
ELDORET

Please accord the bearer of this letter the necessary support

DISTRICT PUBLIC HEALTH NURSE
LANGATA DISTRICT

APPENDIX H: NAIROBI CITY COUNTY PAYMENT RECEIPT



LOCAL AUTHORITY INTEGRATED FINANCIAL OPERATIONS MANAGEMENT SYSTEMS

BILL

Bill No.	MS1409-11037
Date Issued	17-Sep-2014

LA Name: 001 NAIROBI CITY COUNTY

(Customer Copy)

CUSTOMER SERVICES OFFICE

The Customer Services Office Notifies

BILHA C BITOK

that the amount shown below is due to be paid at your earliest convenience.

Payment is due at the CASH OFFICE of the Council

RESEARCH FEE

DETAIL OF CHARGES

No.	Account Code	Description	Amount (KSh)
1.	1-8243	ATTACHMENT FEES	5,000.00
		BILL TOTAL AMOUNT (KSH)	5,000.00

001709201409672 CSH5000 MS1409-11037-5000 [BILHA C BITOK] 20140917233

RECEIVED AT MMAI

THANK YOU

Payment Information