COMPLIANCE TO EXCLUSIVE BREASTFEEDING OF CHILDREN BY MOTHERS SEEKING FOR MATERNAL/CHILD HEALTH SERVICES IN MATHIRA SUB-COUNTY HOSPITALS, NYERI COUNTY, KENYA

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DECLARATION

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

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DEDICATION

I dedicate this work to my late father and mother whose parental guidance and
encouragement has enabled me to reach this far. They taught me that hard work, patience and perseverance pays.
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ABBREVIATIONS AND ACRONYMS

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<th>Description</th>
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<tr>
<td>BF</td>
<td>Breastfeeding</td>
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<tr>
<td>BFHI</td>
<td>Baby Friendly Hospital Initiative</td>
<td></td>
</tr>
<tr>
<td>EBF</td>
<td>Exclusive Breastfeeding</td>
<td></td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>MCH</td>
<td>Maternal and Child Health</td>
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<td>UNICEF</td>
<td>United Nations Children Funds</td>
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<td>WHA</td>
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## DEFINITIONS OF TERMS

**Complementary food:** Food given to complement the nutritional needs of a baby who is breastfed

**Breastfeeding:** This is when the child has received breast milk either direct from the breast or expressed.

**Exclusive breastfeeding:** Feeding the baby only on breast milk (including expressed breast milk), but no other liquids or solids with an exception of drops or syrups consisting of vitamins, mineral supplements or medicines, for the first six months of life

**Initiation of breastfeeding:** When the mother either puts the baby to the breast or the baby is given any of the mother’s breast milk within the first 24 hours of birth

**Lactation amenorrhea:** Absence of menstruation due to exclusive breastfeeding

**Mixed feeding:** Is feeding a baby less than six months old with both breast milk and other non-human milk or other liquids or foods

**Pacifiers:** Dummies given to babies to calm them down.

**Placement of baby:** A place where the baby is put to rest or sleep in relation to where the mother is sleeping while in hospital

**Postpartum:** Period beginning immediately after the birth of a child and extending for six weeks.

**Pre-lacteal Feed:** Any food or drink given to the infant before initiating breastfeeding after birth

**Rooming-in:** Mother and baby sharing the same room and bed
Supplementary Food:  Food given in place of breast milk
ABSTRACT

Exclusive breastfeeding (EBF) is the practice of feeding the infant for the first six months of life on breast milk only. This is the standard way of feeding the infants six months and below as per WHO/UNICEF recommendations. Globally, many studies have shown that there is increasing number of mothers who do not follow this practice for the full period of six months with, rates of as low as 13% in America, 20% in West and Central Africa and 32% in Kenya. Despite the serious consequences associated with low uptake of EBF such as increased morbidity and mortality of children, the compliance to EBF in central Kenya is not well documented. This study aimed at assessing the level of compliance to exclusive breastfeeding and the factors that influence it. The study was conducted in Mathira Sub-county in Nyeri County. A sample of 250 mothers were randomly selected from three Hospitals which serve a large population in the Sub-county. These were, one public hospital (Karatina) one mission hospital (Tumutumu) and two private hospitals, Jamii hospital and Karatina nursing home. Pre-tested questionnaires were used in collecting information on demography, practices of exclusive breastfeeding and factors influencing the same, from mothers with babies who had completed the first six months of breastfeeding. The Data was processed and analyzed using statistical package for social science (SPSS). The Chi-Square test was used to test for significant associations between independent and dependent variables. Results indicated that majority of the mothers (80%) interviewed were married and 74% had a previous experience with breastfeeding. Most (92%) were not employed or were in informal sector and don educational level, majority (92%) had either primary or secondary education. Majority (76%) initiated the first feeding within the first hour after birth and this had a significant (p=0.004) association with compliance to EBF. The result also showed that there was a significant association (p=0.005) between on demand breastfeeding and compliance to EBF. A majority of 82% observed the rooming-in and this had a significant (p=0.005) association with compliance to EBF. Overall, compliance to EBF was high at 65%. Factors such as education level of the mother, monthly income and previous breastfeeding experience were not significantly associated with compliance to EBF. Other factors that had significant association with compliance to EBF were the occupation (p=0.028) of the mother and marital status (p=0.0245). It was concluded that compliance to EBF for six months was high at 65%, within the respondents from all the health institutions under the study. The researcher recommends that more focus be directed on information that lead to increasing the level of the rooming-in, early initiation of breastfeeding as well as discouraging separate nurseries for well-babies to allow for early initiation of breastfeeding. Further, there is also a need to enhance the level of baby friendly initiative across all health facilities and for the government to develop a policy on breastfeeding shelters at all institutions.
CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The WHO defines breastfeeding as when the child has received breast milk either directly from the breast or expressed (WHO, 2010). Breastfeeding is recognized universally as being beneficial to both the mother and the baby. Breast milk is known to be the best source of nutrients and protective antibodies for the baby. For instance milk produced during the colostrum stage that occurs during late gestation to few days after delivery, is creamy, yellow colored and is much thicker than the milk that is produced in the other stages (UNICEF, 2013). Colostrum is richer in protein, vitamins, minerals, and the all-important antibodies compared to the milk that comes in later. The antibodies help to protect the baby from many illness-causing bacteria in the environment. Colostrum is also a mild laxative which helps the baby pass the meconium; the tar like stool of the first days and helps prevent jaundice. According to WHO (2010), EBF meets all the necessary nutrient and fluid needs of the infant until six months of age.

Breastfeeding is as old as man and it continues to be the norm both in low and high-income countries, but the period of exclusive breastfeeding after birth is often short. It is unequalled in providing an infant with ideal nourishment and protection from infections. The way in which babies are fed has important consequences for the short, medium and long term health of the babies and their mothers. BF is an integral part of the reproductive process with important implications on the health of the mother. Evidence has shown that on population basis, exclusive breastfeeding for the first six months is the optimal way of feeding infants (Fiona et al, 2012).
Thereafter, the infant should receive complementary food with continued breastfeeding for up to two years of age or beyond. Wall (2013), stated that to promote and sustain exclusive breastfeeding, WHO/UNICEF recommended initiation of breastfeeding within the first hour of life and should be continued from then for up to six months of life. He argued that from six months onward, children may be fed on quality complementary foods while continuing breastfeeding for two years or longer. Diallo et al (2009), noted that globally, there are new initiatives that encourages exclusive breastfeeding. These include the International code of marketing breast milk substitutes and baby friendly hospital initiative. WHO and UNICEF launched the baby friendly hospital initiative to strengthen the maternity practices to support breastfeeding. This initiative contributed to improving establishment of exclusive breastfeeding worldwide. While maternity services promote the initiation of exclusive breastfeeding, support throughout the health system is required to help mothers to sustain the practice (Horta & Victora, 2013).

Hospital practices were also cited as factors leading to the decline in breastfeeding. Such practices include mother and baby separation, rigid (timed) feeding regimes, administering pre-lacteal feeds such as glucose water and uses of dummies (Robert et al, 2013).

Globally, only 13% of mothers practiced EBF (Gupta, et al, 2012). Statistics indicate that approximately 3,000 to 4,000 infants die every day because the ability to breastfeed appropriately has been taken from their mothers, while thousands more die because of infection and malnutrition. Failure to practice EBF exposes the child to a significantly large number of acute and chronic infections leading to significant deaths worldwide (WHO 2010).

In Africa, 99% of mothers breastfeed their infants, although mixed feeding is widely
practiced with foods and fluids such as water, cereals, infant formula, teas, animal milk and herbal preparations from as early as the first week after birth (Mgongo et al., 2013).

According to Kenya Demographic and Health survey (KDHS) of 2014, exclusive breastfeeding is recommended because breast milk provides immunity to diseases. Early supplementation is discouraged because it exposes infants to pathogens and increases their risk of infection, especially diarrhea and acute respiratory infections (Ministry of Public Health and Sanitation, 2010).

In Kenya, only 32% of children below six months are exclusively breastfed with 60% of children being started on complementary foods at 4 to 5 months (Kenya Demographic and Health survey 2008-2009). Early initiation to breastfeeding is also very low, with only 58% of newborns being breastfed within one hour of birth. Many women in Kenya, especially in rural areas and among urban poor populations, do not exclusively breastfeed their children due to cultural beliefs and practices (Ochola et al., 2012). Breastfeeding practices seem to be worse in urban areas compared with rural areas according to studies in Kenya. For example, the median duration of Ek2BF is 0.6 months in urban areas compared with 1.0 months in rural areas (Kimani et al., 2014).

Some of the factors limiting optimal breastfeeding among urban poor Kenyans are poverty, livelihood and living arrangements, single and early motherhood, poor knowledge, myths and misconceptions among others. The most important of the factor was livelihood, where women have to resume work shortly after delivery and work for long hours, leaving them unable to breastfeed optimally (Kimani et al., 2014).

In Central Kenya, particularly in Nyeri County, Mathira Sub-County being a rural setting, very few studies have been carried to assess the levels and the factors limiting
compliance to EBF.

1.2 Problem Statement

WHO/UNICEF recommends that all babies aged 0-6 months should be exclusively breastfed. A lot of resources have been invested in implementing these guidelines, however the compliance on EBF remains relatively low at an estimated uptake level of 32% nationally (KDHS 2008/2009). According to Kenya Institute of Health and Paramedical Science (KIHPS) (2006), the national mean length of exclusive breastfeeding was 3.1 months, while in Nyeri it was 3.0 months, which was lower than the national mean length. Mothers continue practicing mixed feeding, which is detrimental to the general growth of the infants. The infant mortality rate in Nyeri County was 27 deaths per 1000 live births as compared to 39 deaths per 1000 live births nationally. In Central Kenya, level of compliance to EBF and the factors influencing it are not well documented. This study therefore aimed at assessing the level of compliance to EBF for the first six months and the factors influencing this in Mathira Sub-County Nyeri.

1.3 Justification

In the rural areas, most mothers seek MCH services in hospitals. In Mathira Sub-county for example, mothers generally seek the services in the four main hospitals that include one public, one faith based, two private hospitals. Therefore, mothers from all socio economic backgrounds are likely to be found seeking MCH services there. The implementation of UNICEF/WHO guidelines on EBF of babies in Kenya is recognized to be playing an important role in reducing childhood morbidity and mortality. To do this, there is cost implication of maintaining a well-trained health workforce, who in turn should educate mothers on importance of EBF. With the
managers of Ministry of Health advocating on the strict implementation of UNICEF/WHO guidelines on EBF, Nyeri County is not exceptional. All health facilities in the County, irrespective of their ownership are expected to implement these guidelines, with an aim of reducing the morbidity and mortality of babies. However, there are major challenges that hinder full implementation of EBF. In view of these challenges, a study to assess levels of compliance to EBF and factors influencing EBF practice in Nyeri County was found necessary. Mathira sub-county was selected because it is the most populated with the highest number of hospitals where most mothers seek maternal child health services. Further to that the investigator had previously worked there, participated in giving MCH services and counselling mother on EBF and therefore, was interested in having an overview of level of compliance to EBF.

1.4 Research Questions

i. What is the level of compliance to exclusive breastfeeding for infants less than 6 months by mothers seeking for Maternal Child and Health services in Mathira Sub-County Hospitals?

ii. What are the factors that influence compliance to exclusive breastfeeding for infants less than 6 months among mothers seeking for MCH services in Mathira Sub-County Hospitals?

1.5 Null Hypotheses

There is no significant relationship among socio-economic, health facility related factors and compliance to exclusive breastfeeding in Mathira Sub-County.

1.6 Objectives

1.6.1 General Objective

To assess compliance to exclusive breast feeding in children less than 6 months by
mothers seeking for MCH services in Mathira Sub-county Hospitals, Nyeri County, Kenya.

1.6.2 Specific Objectives

1. To determine level of compliance to exclusive breastfeeding for the first 6 months by mothers seeking for MCH services in Mathira Sub-County.

2. To determine the factors that influence compliance to exclusive breastfeeding practice among mothers seeking for MCH services in Mathira Sub-County.

1.7 Limitations

Since dietary recall from delivery was used, recall bias might have been introduced, as mothers may have not been able to accurately recall when they introduced other food items to the children. Failure to consent by mothers who were busy and did not want to be kept waiting may have left out many significant participants. Study was limited only to the mothers seeking MCH services in the hospitals in Mathira sub-county, Nyeri County.

1.8 Conceptual Framework

The model for this study was developed following the example of model of community nutrition environments. While the goal is to practice exclusive breastfeeding, the choice of mode of infant feeding rests on the mother. However, these choices are determined by knowledge of policy and guidelines, socio demographic characteristics and hospital practices that the mother is exposed to.

Figure 1.1 Conceptual framework
CHAPTER TWO: LITERATURE REVIEW

2.1 Status of Breastfeeding

The Innocenti declaration (1990) called for policies that would encourage the mothersto exclusively breastfeed their babies for the first 6 months of life and to, continue doing so for up to 2 years of age and beyond in addition to complementary feeding. However, a study by WHO (2010) on the status of breastfeeding found that only 35% children were exclusively breastfed between birth and their 5th month life. In spite of the well-recognized importance of EBF the practice is not widespread in developing countries. A study by Joshi Et Al in Bangladesh found that 36% of the mother were exclusively breast feeding while Olwafalaha et al, (2015), reported that in Nigeria, the prevalence of EBF varied from 67% in Jos, 52.9% Lagos to as low as 37.3% in Anambra, South East, the nation average was 17%. In Kenya according to KDHS thenational average of EBF was in 2014.

2.2 World Health Organization Breastfeeding Recommendations

WHO recommended that infants be exclusively breastfed for six months, after which supplementary foods can be introduced (WHO, 2010). They argued that this recommendation was supported by a systematic review commissioned by the WHO to evaluate the health outcomes of infants and mothers when exclusive breastfeeding is done for six months and when it is done for three to four months (Delgado et al, 2010). This led to the current recommendation for exclusive breastfeeding for the first six months followed by introduction of complementary food thereafter and continued breastfeeding for up to two years and beyond.

The WHO also recommends that mothers breastfeed on demand until two years of age or beyond. This means breastfeeding the infant as often as it wants, day and night. The use of bottles and pacifier teats is discouraged, because of the high hygiene standards
necessary for their safe use (WHO, 2010). In order to improve feeding practices, the WHO/UNICEF recommends that mothers and healthcare providers have access to objective, consistent and complete information regarding appropriate feeding practices without the influence of commercial advertisements. Also women must have access to healthcare providers’ support to help them initiate and continue breastfeeding and to deal with the difficulties encountered during the process. Healthcare providers must have enough knowledge to provide this support and guidance.

To achieve these standards, the WHO recommends that every health facility that provides maternity services fully practice the ten steps to successful breastfeeding. All the important messages about breastfeeding should be comprehensively taught to all healthcare providers offering maternity services. WHO in collaboration with UNICEF, created a forty-hour breastfeeding counseling training course to train healthcare providers to give skilled support to breastfeeding mothers and help them solve problems related to breastfeeding (WHO, 2010). The WHO recommendations are based on the finding on the nutritional aspect of breastmilk. According to studies by WHO(2012) breast milk contains necessary nutrients, antibodies and minerals important for growth and development which makes it perfect food for babies which is sustainable and safe. Breast milk contains many types of protein but the major types are whey and casein which all support growth and development (Gao et al, 2012). Apart from whey and casein, breast milk contains antibodies which help to fight against bacterial and viral infections (Castellote et al, 2011)

2.3 Exclusive breastfeeding practices

Despite high rates of initiation of breastfeeding, exclusive breastfeeding practices are not common in developing countries with only approximately a third of infants less than six months being exclusively breast fed. There are however variations in different
regions (UNICEF, 2013). East Asia so far has the highest rates of exclusive breastfeeding at 43%, with Eastern and Southern Africa at 41%. The region with the lowest reported exclusive breastfeeding rate is Western and Central Africa at 20% (UNICEF, 2013). Despite the low rates of exclusive breastfeeding in sub-Saharan Africa, the available data indicate that these rates improved between 1990 and 2004 – going from 15% to 32% (UNICEF, 2013). This rise is attributed to the BFHI practices and breastfeeding promotion and support programs that have been well established. A study by Abrahams & Labbok (2009), examined the impact of BFHI on exclusive breastfeeding trends. The data for this study were obtained from demographic and health surveys of 72 developing countries. Results of this study indicated annual significant increases in the rates of exclusive breastfeeding after the introduction of BFHI compared to before its introduction.

Despite this drawback, information on the median duration of exclusive breastfeeding in many African countries can be used to show a definite trend of the duration being shorter than the recommended six months. This highlights the need to improve both the rates of exclusive breastfeeding and the rate of those continuing this for six months.

2.4 Compliance to Exclusive Breastfeeding by the Mothers

Exclusive breastfeeding is extremely important in developing countries where limited access to clean water increases the risk of diarrheal diseases if alternate feeding is to be used (WHO, 2010). Other factors which render exclusive breastfeeding very important in developing countries include high rates of HIV, poverty and food insecurity as in lack of enough nutritious food for children and mothers (WHO, 2010). While breastfeeding rates are no longer declining at the global level, with many countries experiencing significant increases in the last decade, only 38% of the children less than six months of age in the developing world are exclusively breastfed. Mixed feeding, or
giving other liquids and or foods together with breast milk to infants under 6 months of age, is widespread in many countries and poses risks to an infant’s health. In the United Kingdom Millennium Cohort Survey on hospitalization for diarrhoeal and respiratory diseases, Quigley et al., (2006) reported that exclusive breastfeeding was associated with a 53% decrease in hospital admissions for diarrhea and a 27% decrease in respiratory infections.

In 1990, policy makers from more than 30 countries met at the Spedale Degli Innocenti in Florence (Italy) on breastfeeding and issued the Innocenti Declaration which affirmed the benefits of breastfeeding (UNICEF, 2013). A study done in Peri-urban South Africa revealed that 78% of mothers practiced mixed feeding. Complementary foods were fed to 32% of infants by their first month of life (Lindiweetal, 2009). In Africa, more than 95% of infants are currently breastfed, but feeding practices are often inadequate, feeding babies on water and other liquids in addition breastfeeding is a widespread practice. The rate of bottle feeding is high in some countries (exceeding 30% in Tunisia, Nigeria, Namibia and Sudan). Urbanization and mother’s education are the major factors that tend to shorten breastfeeding (Lindiweetal, 2009).

2.5 Health Benefits of Breastfeeding

2.5.1 Health Benefits of Breastfeeding to the Children

Breastfeeding infants are much less likely to die from diarrhea, acute respiration infections and other diseases. Breastfeeding supports infant’s immune systems and helps protect from chronic conditions later in life such as obesity and diabetes (Wall, 2013). Suboptimum breastfeeding still accounts for an estimated 1.4 million deaths in children below five years annually (Weng et.al, 2012). Many studies indicate that breastfed children score higher in intellectual and motor development tests than
children who were not breastfed. (Mastrup, 2014). According to studies by WHO (2012) breast milk contains necessary nutrients, antibodies and minerals important for growth and development which makes it perfect food for babies which is sustainable and safe (Castellote et al, 2011). Direct contact of the mother and the baby that occurs during breastfeeding is believed to cause mental and emotional activation and bonding, which contribute to growth advantages (Holm et al, 2010).

2.5.2 Maternal benefits of breastfeeding

Breastfeeding is reported to have short term and long term benefits for the mother. In the short term, early initiation of breastfeeding encourages the release of the oxytocin hormone, which is believed to aid in uterine contractions and to reduce postpartum bleeding (WHO, 2012). Exclusive breastfeeding also delays the return of fertility, therefore helping to reduce short birth intervals. Noted that this is important for the health of the mother and the survival of young children and it has been indicated that there is an increased mortality risk among children born after short birth interval. Breastfeeding women return to their pre pregnancy weight faster than formula feeding women and also form a strong bond with their babies.

The long term benefits of breastfeeding to the mother include reduced risk of breast cancer and ovarian cancer. Breastfeeding also lowers a mother’s risk of getting iron deficiency anaemia, as it delays the return of menstruation by up to 30 weeks after delivery (WHO, 2012).

On top of the individual benefits, breastfeeding can produce important economic benefits by lowering direct and indirect expenses. Among the direct costs that can be lowered by breastfeeding are hospital costs such as paying to see a physician and laboratory costs for stool examination in case of diarrhea. The costs of buying formula milk and other breast milk substitutes are reduced by exclusive
Indirectly, breastfeeding can reduce time and other costs incurred by parents when taking care of children (Kramer, 2010).

2.6 Factors affecting breastfeeding in Africa

Breastfeeding can be affected by various factors, including psychological and environmental factors, which all influence the decision to breastfeed. Mendoza et al. (2013), highlighted that women who are married, educated, older, wealthier and those with a positive opinion about breastfeeding are more likely to initiate breastfeeding early. Studies suggest that if social networks do not provide enough support, they have a negative effect on the initiation and continuation of breastfeeding. Al-sahabet et al. (2010) found out that maternal and paternal grandmothers of the child together with physicians were the ones who most influenced exclusive breastfeeding, but in contradiction, it is the same people who disrupted its continuity. Similarly, healthcare providers’ support and the general social atmosphere in which a woman lives both influence the initiation and maintenance of breastfeeding. Exclusive breastfeeding practices and the duration of breastfeeding are also influenced by similar factors as the initiation of breastfeeding, but also by breastfeeding education programmes, breastfeeding support, previous experience and other emotional elements (Mendoza et al., 2013).

Psychological and environmental factors that affect breastfeeding outcomes have been reported in various studies. It is said that 99% of mothers in Africa breastfeed their infants, although mixed feeding is widely practiced with foods and fluids like water, cereals, infant formula, teas, animal milk and herbal preparations from as early as the first week after birth. This is usually encouraged by improper health advice and beliefs that fluids help to relieve pain or herbal preparations give strength to the infant.
Almost all these habits are unhealthy, dangerous to the infant and increases the chances of infants acquiring infectious diseases such as diarrhea and respiratory infections (Mgongo et al., 2013).

A study carried out by Kakut et al., (2009), in Cameroon identified the following as ethnic barriers to exclusive breastfeeding; influences to practice mixed feeding from elders in the village and from family members because mixed feeding is a tradition and the conviction that breast milk is not a complete food for the infant as it does not make the infant gain sufficient weight. In Ghana, barriers to breastfeeding were identified as breast and nipple problems, lack of enough breast milk and influences from family and other community members (Otto et al., 2009). Various studies have suggested ways to effectively deal with education programs. The options include acceptable approaches that allow everyone to be involved and that encourage community support. All programs to support and promote breastfeeding must take into consideration cultural practices and the particular needs of the population concerned.

The responsibility of a nurse in antenatal and postnatal care setting is to assist and help to sustain interventions to overcome the needs of underprivileged populations. The rights, cultural beliefs, traditions and religious beliefs of each population must be respected when giving care (International Council for Nurses, 2006).

In a study to investigate infant feeding practices of HIV positive women, Adjeuyigbe et al., (2008) reported that women who had received counselling identified that the major reasons they preferred to exclusively breastfeed was fear of stigmatization and also their economic status. These women had not told their partners about their HIV infection and their economic status prohibited them from buying infant formula.
2.7 Health Care Providers and Breastfeeding

One of the most important factors that influences the initiation and continuation of breastfeeding is the provision (or lack thereof) of proper information and support to the mother during both the antenatal and postnatal periods. Various studies have indicated that mothers who get skilled support and advice on breastfeeding tend to have more positive opinions regarding breastfeeding and tend to breastfeed longer. Interventions aimed to increase the breastfeeding knowledge of healthcare providers have been shown to increase breastfeeding initiation rates (Daissyet al., 2012), and further skilled support from healthcare providers tends to increase the length of time mothers exclusively breastfeed (Brittonet al., 2010). On the other hand, when the support and advice given by healthcare providers is not adequate and appropriate, breastfeeding outcomes are negative (Montaltoet al., 2010). Healthcare providers who do not receive training in breastfeeding counseling are not confident in their ability to support and advise women, thus they are notable to give proper counseling (Brittonet al., 2010). Healthcare providers are believed to greatly influence mothers’ decisions to breastfeed and their desire to continue breastfeeding. Studies indicate that the support of healthcare providers can improve breastfeeding initiation and duration rates. Therefore healthcare providers are required to be knowledgeable in matters related to breastfeeding support and management. However, studies indicate that the majority of healthcare providers are less knowledgeable about breastfeeding than they should be and that they do not give mothers sufficient, correct information and support; sometimes they do not provide it at all (Brittonet al., 2010). Sake (2012), assessed the features of nurses and the factors that enhance their ability to deliver effective information, technical and emotional support to breastfeeding mothers. She found out that the supportive behavior of nurses was determined by their knowledge regarding
breastfeeding and the way they intended to give support. Nurses were found to be deficient in breastfeeding knowledge, thus supportive behavior was also lacking.

In a study to assess nurses’ knowledge and behavior in promoting breastfeeding Castellote et al. (2011), reported that, although nurses were knowledgeable regarding breastfeeding, about a quarter of them indicated that they were not comfortable to observe women breastfeeding in public. Although the composition of breast milk is the same irrespective of age, another knowledge gaps observed in this study was some nurses were not sure if the breast milk composition of adolescent mothers is the same as that of adult mothers. Service providers from different specialties had significant deficits in information on clinical management of breastfeeding and the benefits of breastfeeding. Personal experience of breastfeeding or that of a partner was found to strongly influence the confidence of healthcare providers when offering counseling on breastfeeding.

It is also reported that healthcare providers use their personal experience of breastfeeding to advice and support women, those who do not have such personal experience usually do not give advice (Castellote et al, 2011). Many healthcare providers identify personal experience as the most important source of their knowledge regarding breastfeeding. Nurses who have breastfed their own children have an emotional connection with mothers who breastfeed and thus they are closer to them than nurses who have never breastfed their own children. This emotional connection influences nurses’ positive attitude towards breastfeeding and in general counseling (Castellote et al 2011).

Studies in various countries have reported obstacles that discourage healthcare providers from providing support to breastfeeding mothers. These obstacles include a lack of adequate knowledge among healthcare providers, lack of personal
breastfeeding experience, inadequate skills and a lack of time to appropriately advice and counsel mothers (Castellote et al, 2011)
3.0 CHAPTER THREE: MATERIALS AND METHODS

3.1 Research Design

A cross sectional survey design involving interviews of mother attending selected health facilities for MCH services. The survey was largely used to obtain information on infant feeding, level of compliance to EBF, factors influences compliance to EBF and interventions that have impact on compliance to EBF. The design allowed data collection on a large population within a very short time and this is why it was the most appropriate design for this particular study. Mothers who had completed the first six months of breastfeeding and had children below one year were interviewed. The study used quantitative methods, in order to gain sufficient data. Quantitative approach provided precise, quantitative and numerical data that allowed for generalizations to be made. Both primary and secondary sources of data were used. Primary sources of data was interview of the mothers while secondary sources included journal articles, Government reports, theses and dissertations.

3.2 Study Variables

The independent variables were; education level, occupation of the mother, monthly income, marital status, number of siblings, initiation of breastfeeding and rooming in. The dependent variable was compliance to exclusive breastfeeding for up to 6 months.

3.3 Location of the Study

Nyeri County is located in the central region of Kenya and it is between Mt. Kenya (which is 30 miles from Nyeri town) on North East and the Aberdare ranges (which are 15 kilometers) on the opposite direction. It covers an area of 2475.4 kilometer squared. The county borders Laikipia County to the North, Kirinyaga County to the
East, Murang’a County to the South, Nyandarua County to the West and Meru County to the North East. The County has seven sub-counties namely; Mukurweini, Nyeri South, Kieni East, Kieni West, Mathira, Tetu and Nyeri Central. It is easily accessible by bitumen class road from Nairobi which is about 150 kilometers away. Agriculture is the main economic activity with coffee, tea and horticulture products grown for export.

Mathira Sub-County has the highest population with twelve health facilities which include; one public health hospital (Karatina Hospital), one faith based hospital (Tumutumu Hospital), one private hospital (Jamii Hospital), one nursing home (Karatina Nursing Home), three health centers and five dispensaries.

3.4 Study Population

This included all mothers seeking MCH services in the selected hospital, who had children who had completed the first six months of breastfeeding and were not more than one year old.

3.5 Inclusion Criteria

Mothers with children aged 6-12 months who consented to participate in the study.

3.6 Exclusion Criteria

Mothers with babies aged below 6 months
Mothers who did not consent
Mothers very sick or had very sick child

3.7 Sampling Design and Sample Size

3.7.1 Sampling Design

The target population composed of mothers with children who had completed the recommended EBF period of 6 months from Mathira sub-county, Nyeri County. Several sampling procedures were used to select the required respondents. Mathira
Sub-County was purposefully selected for the study from the seven Sub-Counties of Nyeri County.

Stratified sampling was used to identify the four hospitals based on their type, one in each category; the only public, the only faith based, the only nursing home and the only private hospital to allow for inclusion of respondents of all socio-economic, demographic and personal backgrounds. Simple random sampling technique was used to identify the respondents for the study. Sample size per hospital was proportionately computed from health facility records based on the average populations of mothers visiting the facility on a daily basis. This involved 60 for Karatina Hospital, 20 for Tumutumu Hospital, 10 for Jamii Hospital and 10 for Karatina Nursing Home. Three days to collect data from the selected facilities were randomly picked. All mothers who attended the MCH clinic on the particular days were purposively selected in order to get a representative sample from any particular facility visited.

### 3.7.2 Sample size determination

The sample size of mothers with babies aged six months to one year was determined using the formula applied by Fisher et al (1998) as follows:

\[ n = \frac{Z^2pqD}{d^2} \]

Where:

- **n** = the desired sample size (when the target population is greater than 10,000)
- **Z** = 1.96 (The standard normal deviation at 95% confidence Interval)
- **D** = Design effect in this case = 1
- **P** = Proportion in the target population estimated to have the characteristics being measured and in this case 0.2 (Proportion of women with infants who had completed the exclusive breastfeeding period of six months as in the National census of 2014).
q = 1 – p = 0.8

d = 0.05 (The level of statistical significance set).

Therefore

\[ n = \frac{1.96^2 \times 0.2 \times 0.8 \times 1}{0.05^2} \]

\[ = \frac{3.84 \times 0.2 \times 0.8 \times 1}{0.0025} \]

\[ = \frac{0.6144}{0.0025} = 246. \]

For this study the sample size was 250 mothers

**Table 3.1: Sample Size**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Average daily attendance</th>
<th>Computed study sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karatina hospital</td>
<td>60</td>
<td>150</td>
</tr>
<tr>
<td>Tumutumu hospital</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Jamii Hospital</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>250</strong></td>
</tr>
</tbody>
</table>

**3.8 Pre-testing of study tools**

Pretesting of research tool was carried out in Murang’a Hospital in June 2008, where 20 questionnaires were randomly administered. The results enabled the researcher to assess the clarity of the questionnaire items, so that those items found to be vague or inadequate were modified to improve the quality of the research instruments thus increasing its reliability.
3.8.1 Reliability

Reliability is defined as a measure of the degree to which a research instrument yields consistent results or data after repeated trial (Mugenda and Mugenda, 2003). The instruments were tested for reliability in Murang’a Hospital. The pre-test enabled the researcher to assess the clarity of the questionnaire items found to be vague or inadequate were modified to improve the quality of the research instruments thus increasing its reliability.

3.8.2 Validity

Validity is defined as the degree to which the sample of the test represents the content that the test is designed to measure. All measurements of validity are subjective opinions based on the judgment of the researcher. In this study the pre-test helped to improve the face validity of the instruments. Content validity was improved through expert judgment. For expert judgment, the researcher sought assistant from the research supervisors.

3.9 Data collection techniques

The selected respondents were interviewed face to face using pre-tested questionnaires. The researcher sought the assistance of one data collector per facility. The questionnaires were used for data collection because it offered considerable advantages in the administration. It also presented an even stimulus potential to a large number of people simultaneously and provided the investigation with an easy accumulation of data.
3.10 Ethical consideration

Approval of research proposal was done by the Kenyatta University graduate school and permission granted for data collection. Letter of authorization was given by the District Medical Officer of health, and it was addressed to the officers in charge of the health institutions under the study. At all levels, participants were briefed on the study objectives and their informed consent was sought. In addition, all the participants were informed of their right to withdraw their participation in the study at any stage and that no service would be denied to those who declined to be included in the study. Confidentiality was maintained on all data and information collected.

3.11 Data management and analyses

Questionnaires were examined by the researcher at the end of every day to ensure they were completed and consistently filled. The response questions were numerically coded and responses stored in a database template using statistical package for social sciences (SPSS) Version 17.0 computer software. Descriptive statistics such as frequency, means, and percentages were used to summarize the data. Chi square was computed to identify the relationship between the independent and dependent variables.
CHAPTER FOUR: RESULTS

4.1 Socio-demographic Characteristics of the Respondents

4.1.1 Age of the infants

There was no significant difference in the mean ages of infants across the study area. The mean age was 9.17 months with Karatina Nursing registering the oldest infants at 9.4 months while Jamii Hospital had the youngest infants whose mothers participated in this study (Table 4.1).

Table 4.1 Age of the infants

<table>
<thead>
<tr>
<th>Health facility</th>
<th>N</th>
<th>Mean age</th>
<th>Std.Std. Deviation</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamii Hospital</td>
<td>25</td>
<td>8.9480</td>
<td>1.61</td>
<td>0.32</td>
</tr>
<tr>
<td>Karatina Hospital</td>
<td>150</td>
<td>9.1387</td>
<td>1.79</td>
<td>0.14</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>25</td>
<td>9.3600</td>
<td>2.15</td>
<td>0.43</td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>50</td>
<td>9.2800</td>
<td>1.62</td>
<td>0.23</td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
<td>9.1700</td>
<td>1.77</td>
<td>0.11</td>
</tr>
</tbody>
</table>

4.1.2 Marital status of respondents

There was a significant association ($\chi^2=29.432$, $p=0.005$) between marital status and
the health facility attended. Majority (80%) of the respondents from the study area were married. Tumutumu Hospital had the highest number (86%) of married respondents while Jamii Hospital had the highest number (32%) of single respondents (Table 4.2).

### Table 4.2 Marital status of the respondents

<table>
<thead>
<tr>
<th>Health facility</th>
<th>Married</th>
<th>Single</th>
<th>(100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Jamii Hospital</td>
<td>17(68%)</td>
<td>8(32%)</td>
<td>25(100%)</td>
</tr>
<tr>
<td>Karatina Hospital</td>
<td>118(79%)</td>
<td>32(21%)</td>
<td>150(100%)</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>21(84%)</td>
<td>4(16%)</td>
<td>25(100%)</td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>43(86%)</td>
<td>7(14%)</td>
<td>50(100%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>199(80%)</td>
<td>51(20%)</td>
<td>250(100%)</td>
</tr>
</tbody>
</table>

#### 4.1.3 Number of other siblings

There was no significant association ($\chi^2=2.326, p=0.005$) between the number of siblings and the health facility that their mother took them for MCH services. Majority of the respondents (54%) from the study area had more than one child. Tumutumu Hospital recorded the highest percentage (54 %) of mothers with one child. (Table 4.3).
Table 4.3 Number of other siblings

<table>
<thead>
<tr>
<th>Health facility</th>
<th>One sibling</th>
<th>Two sibling and above</th>
<th>Total</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamii Hospital</td>
<td>8 (32%)</td>
<td>17 (68%)</td>
<td>25</td>
<td>100%</td>
</tr>
<tr>
<td>Karatina Hospital</td>
<td>70 (47%)</td>
<td>80 (53%)</td>
<td>150</td>
<td>100%</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>10 (40%)</td>
<td>15 (60%)</td>
<td>25</td>
<td>100%</td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>27 (54%)</td>
<td>23 (46%)</td>
<td>50</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>115 (46%)</strong></td>
<td><strong>135 (54%)</strong></td>
<td><strong>250</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

4.1.4 Occupation of the mothers

There existed no significant association ($\chi^2=2.5815, p=0.005$) between the occupation of the mothers and the health facilities they attended. Most of the respondents (92%) from the study area were in the informal sector or were unemployed, with only 8% of them being in the formal employment. Jamii Hospital had the highest percentage of respondents (96%) who were in the informal sector of employment (Table 4.4).
Table 4.4 Occupation of the mothers

<table>
<thead>
<tr>
<th>Health facility</th>
<th>Formal employment</th>
<th>Informal employment/unemployed</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Jamii Hospital</td>
<td>1 (4%)</td>
<td>24 (96%)</td>
<td>25 (100%)</td>
</tr>
<tr>
<td>Karatina Hospital</td>
<td>12 (8%)</td>
<td>138 (92%)</td>
<td>150 (100%)</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>2 (8%)</td>
<td>23 (92%)</td>
<td>25 (100%)</td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>4 (8%)</td>
<td>46 (92%)</td>
<td>50 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>19 (8%)</td>
<td>231 (92%)</td>
<td>250 (100%)</td>
</tr>
</tbody>
</table>

4.1.5 Education level of the respondents

There was no significant association ($\chi^2=7.810$, $p=0.005$) between the level of education and the facilities the respondents took their young ones. An equal majority of the respondents (46%) from the study area had attained either primary school or secondary school education level. Those who had attained tertiary education were 6% with only 2% of the respondents having had no formal education (Table 4.5)
**Table 4.5 Education levels of respondents**

<table>
<thead>
<tr>
<th>Health facility</th>
<th>No formal education</th>
<th>Primary education</th>
<th>Secondary education</th>
<th>Tertiary education</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamii Hospital</td>
<td>1(4%)</td>
<td>12(48%)</td>
<td>10(40%)</td>
<td>2(8%)</td>
<td>25(100%)</td>
</tr>
<tr>
<td>Karatina Hospital</td>
<td>0(0%)</td>
<td>68(45%)</td>
<td>71(47%)</td>
<td>11(7%)</td>
<td>150(100%)</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>1(4%)</td>
<td>12(48%)</td>
<td>11(44%)</td>
<td>1(4%)</td>
<td>25(100%)</td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>2(4%)</td>
<td>22(44%)</td>
<td>24(48%)</td>
<td>2(4%)</td>
<td>50(100%)</td>
</tr>
<tr>
<td>Total</td>
<td>4(2%)</td>
<td>114(46%)</td>
<td>116(46%)</td>
<td>16(6%)</td>
<td>250(100%)</td>
</tr>
</tbody>
</table>

**4.1.6 Respondents' levels of income**

There existed a significant association ($\chi^2=28.39, P =0.005$) between the respondents' level of income and the health facility that they attended. Majority of the respondents (48%) had an income of between Ksh. 3,001 and 5,000 per month. Jamii Hospital recorded the highest percentage (20%) of the respondent that had an income of less than Ksh. 3000 while Tumutumu Hospital had the highest respondents (6%) who earned above Ksh 15,000 (Table 4.6)
Table 4.6 Respondents' levels of income

<table>
<thead>
<tr>
<th>Health facility</th>
<th>&lt;Ksh 3000</th>
<th>Ksh 3001-5000</th>
<th>Ksh 5001-10000</th>
<th>Ksh 10001-15000</th>
<th>Ksh above 15000</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamii Hospital</td>
<td>5</td>
<td>13</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>25</td>
<td>0.005</td>
</tr>
<tr>
<td>Karatina Hospital</td>
<td>12</td>
<td>67</td>
<td>30</td>
<td>36</td>
<td>5</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>2</td>
<td>13</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>3</td>
<td>26</td>
<td>17</td>
<td>1</td>
<td>3</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>119</td>
<td>61</td>
<td>38</td>
<td>10</td>
<td>250</td>
<td></td>
</tr>
</tbody>
</table>

4.2 Compliance to Exclusive Breastfeeding among Mothers

The study sought to establish the uptake of exclusive breast feeding among mothers attending MCH in various health facilities. The respondents were asked a series of questions in line with WHO/UNICEF guidelines and recommendations and their responses recorded onto questionnaires.

4.2.1 Interval before first feed

This is the time taken between birth and the initiation of the first feed to the infant.

There was a significant difference between the timing of the first feeding and health facility ($\chi^2 = 13.487, p=0.004$). Majority of the respondents (76%) from the study area breastfed their infants within the first one hour while 24% breastfed their infants for
the first time after one hour. Karatina had the highest percentage of respondents (84%) who breastfed their infants for the first time within the first one hour while Jamii Hospital had the lowest (60%) percentage (Table 4.7).

**Table 4.7 Timing of first feeding in various health facilities**

<table>
<thead>
<tr>
<th>Health Facility</th>
<th>Within the First 1hr</th>
<th>After the first 1 hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamii Hospital</td>
<td>15 (60%)</td>
<td>10 (40%)</td>
</tr>
<tr>
<td>Karatina Hospital</td>
<td>126 (84%)</td>
<td>24 (16%)</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>16 (64%)</td>
<td>9 (36%)</td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>33 (66%)</td>
<td>17 (36%)</td>
</tr>
<tr>
<td>Total</td>
<td>190 (76%)</td>
<td>60 (24%)</td>
</tr>
</tbody>
</table>

**4.2.2 Mother and baby placement after birth**

There was a significant association between compliance to EBF and rooming-in in various health facilities ($\chi^2=45.55$, $p=0.005$). Majority (82%) of the respondents from the study area were with the infants immediately after birth in the same room while only 18% of the respondents were separated into different rooms. Most of the respondents (96%) of who attended Jamii Hospital indicated that they were with the child immediately upon birth whereas 4% in the same health facility were separated into different rooms. Most (78%) of those who attended Karatina Hospital shared the same room immediately upon birth and 22% were separated. Majority (84%) of the mothers in Karatina Nursing and 86% in Tumutumu Hospital shared the same room with the child immediately upon birth while 16% and 14% were separated into different rooms in the two facilities respectively (Table 4.8).
Table 4.8 Mother and baby placement after birth

<table>
<thead>
<tr>
<th>Health Facility</th>
<th>Same room with Mother N (%)</th>
<th>Mother/Child Different room N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamii Hospital</td>
<td>24 (96%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Karatina District Hospital</td>
<td>117 (78%)</td>
<td>33 (22%)</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>21 (84%)</td>
<td>4 (16%)</td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>43 (86%)</td>
<td>7 (14%)</td>
</tr>
<tr>
<td>Total</td>
<td>205 (82%)</td>
<td>45 (18%)</td>
</tr>
</tbody>
</table>

4.2.3 Reasons for not placing infants immediately after birth in the same room with mothers

Majority of the mothers (68.3%) indicated that they did so due to their medical condition, 20% due to lack of breast milk and 12% due to pre-mature births (Figure 4.2).
4.2.4 On demand breastfeeding and timed breast feeding

There was a significance association ($\chi^2=45.55$, $p=0.005$) between the on demand breastfeeding and compliance to EBF. Majority of the respondents from Karatina Hospital (97%) and Tumutumu Hospital (64%) carried out breastfeeding of their infants on demand. Most of the respondents who attended Jamii Hospital (56%) and Karatina Nursing (68%) breastfed their infants on timed basis (Figure 4.2).
4.2.5 Mode of baby feeding when mother was away

The respondents were asked what their infants were fed on in their absentia before they reached the age of six months. There was a significance association ($\chi^2 = 43.491$, $p=0.008$) between health facilities and mode of feeding when mother was away from the child. Most of the respondents (47%) used other feeds apart from breast milk when the mother was away. Analysis of data summarized in Table 4.9 indicates that 16%, 50%, 12% and 16% of all mothers attending Jamii, Karatina Hospital, Karatina Nursing and Tumutumu Hospital respectively gave their children expressed breast milk. Approximately 52%, 42.7%, 48% and 56% of the mothers indicated their children were fed on other feeds during their absence (Table 4.9).
Table 4.9 Mode of baby feeding when mother was away

<table>
<thead>
<tr>
<th>Health Facility</th>
<th>Expressed Breast</th>
<th>Other feeds</th>
<th>Expressed Milk &amp; Other Feed</th>
<th>Total N %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamii Hospital</td>
<td>4 (16%)</td>
<td>13 (52%)</td>
<td>8 (32%)</td>
<td>25(100%)</td>
</tr>
<tr>
<td>Karatina District Hospital</td>
<td>75(50%)</td>
<td>64(42.7%)</td>
<td>11 (7.3%)</td>
<td>150(100%)</td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>3 (12%)</td>
<td>12 (48%)</td>
<td>10 (40%)</td>
<td>25(100%)</td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>8 (16%)</td>
<td>28 (56%)</td>
<td>14 (28%)</td>
<td>50(100%)</td>
</tr>
<tr>
<td>Total</td>
<td>90(36%)</td>
<td>117(47%)</td>
<td>43(17%)</td>
<td>250(100%)</td>
</tr>
</tbody>
</table>

4.2.6 Mode of feeding the baby up to six months

The results showed that there was significant difference between the levels of compliance to EBF among mothers who attended various health facilities in the study area ($\chi^2=11.559$, p=0.002). Majority (65%) of the respondents in the health institution practiced exclusive breastfeeding for up to 6 months. Most of the respondents 66%, 56% and 74% from Karatina Hospital, Karatina Nursing and Tumutumu Hospital respectively practiced exclusive breastfeeding. Majority (64%) of the respondents from Jamii Hospital had practiced mixed feeding (Table 4.10).
Table 4.10 Mode of feeding the baby up to six months in various health facilities

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Exclusive breastfeeding</th>
<th>Mixed feeding</th>
<th>Totals</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamii Hospital</td>
<td>9(36%)</td>
<td>16(64%)</td>
<td>25(100%)</td>
<td>0.027</td>
</tr>
<tr>
<td>Karatina Hospital</td>
<td>99(66%)</td>
<td>51(34%)</td>
<td>150(100%)</td>
<td></td>
</tr>
<tr>
<td>Karatina Nursing</td>
<td>14(56%)</td>
<td>11(44%)</td>
<td>25(100%)</td>
<td></td>
</tr>
<tr>
<td>Tumutumu Hospital</td>
<td>37(74%)</td>
<td>13(26%)</td>
<td>50(100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>159(65%)</strong></td>
<td><strong>88(35%)</strong></td>
<td><strong>250(100%)</strong></td>
<td></td>
</tr>
</tbody>
</table>

4.3 Factors influencing Compliance to exclusive breast feeding Practice

4.3.1 Relationship between education level and exclusive breast feeding

The study showed that there is no significance association ($\chi^2=3.150, p=0.005$) between compliance levels of EBF and education level of the mother (Table 4.11). Majority of the respondents represented by 59%, 66% and 75% of the mothers with primary, secondary and tertiary education practiced exclusive breast feeding. The lowest percentage of non-compliance was recorded by mothers with tertiary level of education of 25% with the highest being for mothers with primary education that recorded 40% level of non-compliance. These results imply that increasing the level of education does not affect the compliance to exclusive breastfeeding.
Table 4.11 Relationship between the level of education of the mothers and compliance to exclusive breast feeding

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Primary education</td>
<td>70 (59%)</td>
<td>48 (41%)</td>
<td>118 (100%)</td>
</tr>
<tr>
<td>Secondary education</td>
<td>77 (66%)</td>
<td>39 (34%)</td>
<td>116 (100%)</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>12 (75%)</td>
<td>4 (25%)</td>
<td>16 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>159 (64%)</td>
<td>91 (36%)</td>
<td>250 (100%)</td>
</tr>
</tbody>
</table>

4.3.2 Relationship between monthly income and compliance to exclusive breast feeding

The study compared the mothers’ monthly income and compliance to exclusive breast feeding. There was no significant association between monthly income of mothers and compliance to exclusive breast feeding in the study area ($\chi^2=3.896$, $p=0.35$). Majority (64%) of the respondents under the study including those who earned Ksh.3001-5000 (60.5%), Ksh.5001-10000 (67.2%) and, Ksh.10001-15000 (86.8%) practiced exclusive breast feeding.
Table 4.12 Monthly income of mothers

<table>
<thead>
<tr>
<th>Monthly income</th>
<th>Exclusive breastfeeding</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
<td>Total (%)</td>
</tr>
<tr>
<td>&lt;Kshs 3000</td>
<td>9(401%)</td>
<td>13(59%)</td>
<td>22(100%)</td>
</tr>
<tr>
<td>Kshs 3001-5000</td>
<td>72(60%)</td>
<td>47(40%)</td>
<td>119(100%)</td>
</tr>
<tr>
<td>Kshs 5001-10000</td>
<td>41(67%)</td>
<td>20(33%)</td>
<td>61(100%)</td>
</tr>
<tr>
<td>Kshs 10001-15000</td>
<td>33(87%)</td>
<td>5(13%)</td>
<td>38(100%)</td>
</tr>
<tr>
<td>Kshs above 15000</td>
<td>4(40%)</td>
<td>6(60%)</td>
<td>10(100%)</td>
</tr>
<tr>
<td>Total</td>
<td>159(64%)</td>
<td>91(36%)</td>
<td>250(100%)</td>
</tr>
</tbody>
</table>

4.3.3 Relationship between marital status and compliance to exclusive breast feeding

The study compared the mothers’ marital status and compliance to exclusive breast feeding. There was a statistical significant difference between the marital status of mothers and their compliance to exclusive breast-feeding ($\chi^2=17, p=0.245$). Most of the respondents who were married (66%) practiced exclusive breast feeding whereas 32% practiced mixed and 2% of the babies were on formula feeds. Among the single mothers, 53% practiced EBF while 47% carried on mixed feeding.
Figure 4.4 Relationship between marital status and compliance to exclusive breastfeeding

4.3.4 Relationship between previous breastfeeding experience and compliance to EBF

In regard to the breastfeeding experience the study considered the number of different children the mother had breastfed and the compliance to exclusive breast feeding. The result showed that there was no significant association between the previous breastfeeding experience the compliance to exclusive breast feeding ($\chi^2=5.98$, $p=0.200$). Majority of the respondents with one previous child breastfeeding experience (70%), fifty six percent (56%) two and above (56%) and sixty one percent (61%) first time experience breastfed their children exclusively. This implies that the number of children that a mother had did not increase her compliance to exclusively breastfeed her child.
Table 4.13 Relationship between breastfeeding experience and compliance to EBF

<table>
<thead>
<tr>
<th>Previous experience</th>
<th>Exclusive Breastfeeding N (%)</th>
<th>Mixed Feeding N (%)</th>
<th>Formula Feeding N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>80(70%)</td>
<td>35(30%)</td>
<td>0(0%)</td>
<td>115(100%)</td>
</tr>
<tr>
<td>Two and above</td>
<td>39(56%)</td>
<td>29(41%)</td>
<td>2(3%)</td>
<td>70(100%)</td>
</tr>
<tr>
<td>None</td>
<td>40(61%)</td>
<td>24(37%)</td>
<td>1(2%)</td>
<td>65(100%)</td>
</tr>
<tr>
<td>Total</td>
<td>159(64%)</td>
<td>88(35%)</td>
<td>3(1%)</td>
<td>250(100%)</td>
</tr>
</tbody>
</table>

4.4.5 Occupation and compliance to EBF

There was a significance association between the occupation of the respondents and the compliance to exclusive breastfeeding ($\chi^2$=7.128, =0.028). Overall, 159(64%) of the mothers practiced EBF, with the rest 91(36%) practicing either mixed, or formula feeding. Majority of those that practiced EBF were either in the informal employment and those who were not employed. (Table 4.14).

Table 4.14 Relationship between the mothers’ occupation and compliance to EBF

<table>
<thead>
<tr>
<th>Employment</th>
<th>Exclusive Breastfeeding N (%)</th>
<th>Mixed Feeding N (%)</th>
<th>Formula Feeding N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal</td>
<td>7(37%)</td>
<td>12(63%)</td>
<td>0(0%)</td>
<td>19(100%)</td>
</tr>
<tr>
<td>Informal/unemployed</td>
<td>152(66%)</td>
<td>76(33%)</td>
<td>3(1%)</td>
<td>231(100%)</td>
</tr>
</tbody>
</table>
CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussions

5.1.1 Socio demographic characteristics

Results indicated that majority (80%) of the mothers interviewed were married and 74% had a previous experience with breastfeeding. Most (92%) were not employed or were in informal sector. Almost half (46%) had primary level education while another (46%) and (6%) had secondary and tertiary level. Majority 135(54%) had two or more children. The mean age of their children was 9.17 months.

5.1.2 Socio demographic characteristics and health facility attended

The study showed that there was a significant association between both the marital status($\chi^2=29.432, p=0.005$) and the income ($\chi^2=28.39, p=0.005$) and the health facility attended. There was no significant association between both the level of education ($\chi^2=7.81, p=0.05$) and occupation ($\chi^2=2.58, p=0.005$) and the health facility.

5.1.3 Compliance to exclusive breastfeeding

There was a significant association($\chi^2=13.487, p=0.005$) between the initiation of the first feed and compliance to EBF. Majority of the mothers (76%) fed their new born in the first sixty minutes after delivery. This however higher than the national average (52.3%) but lower than that of Uganda (19.9%). Three other African counties that recorded higher performance included Niger (80%), Eritrea (77.9%), and Malawi (72.1%) (Mukuria et al, 2006). The result showed that health problems played a big role for those who breastfeed after the recommended timing. This result agrees with WHO 2010 findings that maternal health problems contributed to 26% of non-compliance to initiation of breastfeeding within the first one hour.
A chi-square test was carried out to determine how rooming-in influenced the compliance to exclusive breast feeding. The result ($\chi^2=45.55$, $p=0.005$) showed that there was a significant association between the compliance to EBF and rooming-in, in the various health facilities. These results are in line with findings of Jones et al(2011), which stated that there is a better chance of success in compliance to EBF in roomed-in babies and also that the bond between the parent and the child is well established.

There was significant association between on-demand breastfeeding and compliance to EBF ($\chi^2=45.554$, $p=0.005$). This concurs with WHO (2012) recording that baby should be allowed to breast on-demand. Robert et al (2013) also stated that every baby is different hence breast feeding should be based on baby’s demand and not timed.

The study showed that the compliance to EBF by mothers in Mathira was high at 65%. This high level of compliance levels contrasts with the findings of the Kenya demographic and health survey (2008/2009) that reported the national exclusive breastfeeding rate is of 32%. It also differs with study by Jones et al (2011) that reported that in countries such as United Kingdom, only 8% of the mothers practiced exclusive breastfeeding. In Nigeria, WHO (2010) reported that only 39.6% of mothers were practicing exclusive breastfeeding while those in Middle-East and North African regions only 28% practiced EBF. On the other hand Imdad et al (2011) states that global monitoring indicates that only 39% of all infants worldwide are exclusively breastfed. The finding also nearly compare with that of other studies such as in Uganda, the percentage of mothers practicing exclusive breastfeeding was at about 50% (WHO, 2012). In Iran, Espinosa et al (2009) reported that 56.8% of mothers were practicing exclusive breastfeeding up to six months of life.

The type of the health facility practice was seen to have influenced the rooming-in, the initiation of the first feed, and on demand breastfeeding. This is not surprising as
study done elsewhere has shown similar trends. In a matched study between baby
friendly hospital initiative (BFHI) accredited and non-accredited facilities in Maine
USA Summers et al found that mothers attending BFHI accredited facilities reported
experiencing more (34.6%) of ten BFHI practice than those (%) attending non-
credited facilities (27.%). In non-accredited facilities mothers were more likely to
get a gift packs with formula.

5.1.4 Factors influencing EBF

The study showed that there is no statistical association($\chi^2=3.150$, $p=0.005$)between
compliance levels of EBF and education level of the mother. These findings concur
with Van Rosselet et al (2009) study that reported that educationally related differences
were not present in breastfeeding continuation between 2 and six months. Similarly in
United States,Jones et al (2011) reported that higher education in women in
developing countries was associated with shorter duration of exclusive breastfeeding.
The finding also corresponds to Colodro et al (2011) in his study that concluded in
Spain that maternal level of education is not associated with breastfeeding.

The study also determined that there was the relationship between the monthly
income of mothers and compliance to exclusive breastfeeding. Mathira. There was no
significant($\chi^2=3.896$, $p=0.35$) statistical difference between the monthly income of
mothers and level of compliance to exclusive breast feeding in Mathira.

The study also established that there was a statistical difference($\chi^2=17$, $p=0.5$)
between marital status and exclusive breast feeding. This finding compare well with
astudy by Alemayehuet al, (2009) which found that there was a statistical association
between marital status of mothers and compliance to EBF. They also noted that
unmarried women were two times more likely to exclusively breastfeed than those
married.
The study also found that increasing the number of children borne and breastfed by the mother was not significantly associated ($\chi^2=5.98$, $p=0.200$) with compliance to EBF. These results contrasts with the findings of a study by Gabriel et al (2010), that showed that exclusive breastfeeding at four months and six months increased with increasing number of children.

The result showed that there is statistically significant association ($\chi^2=7.128$, $p=0.028$) between compliance to exclusive breast feeding and occupation of the mothers.

Majority of mothers were either informally employed or unemployed and had better compliance to exclusive breastfeeding than those formally employed. This could have been an indicator that those in informal employment had more time to spend with their babies. Mothers in Mathira reported their main source of income to be casual employment (informal) which allowed them time to be with their babies. Of worth to note is that majority (63.2%) of those in formal employment did not comply with exclusive breastfeeding. This results agrees with others studies in developed countries such as America where the most significant obstacle to breast feeding was found to the need of mothers to return to work (Daniel and Joseph 2009). In United States, it is reported that working full time had a negative effect on breastfeeding, with 26.1% of mother breastfeeding their infants for up to six months after delivery, while mothers that were not employed were more than twice as likely to extend breastfeeding for up to six months. Further study by Amanda et al (2011) established that maternal employment has been shown to decrease exclusive breastfeeding practice.

5.2 Limitation of the study

The scope did not include a matched study to determine the practice of BFHI across the health facilities but was designed to determine the compliance to EBF as currently was in Mathira sub-County.
5.3 Conclusions

1. Compliance to EBF by mothers attending MCH in Health facilities in Mathira, Nyeri County was high at (65%) with majority of the respondents from all the health institutions under the study.

2. The occupation of the mothers was found to have a big influence, with mothers on informal and no employment (66%) being more compliant to EBF.

5.4 Recommendations

Based on the findings of this study, the following recommendations were made:

1. The compliance to exclusive breast feeding in Mathira Sub-county (Nyeri) was fairly high. This may be attributed to the practice of placing the mothers and babies together while in maternity (rooming-in), timely initiation of breastfeeding and on-demand feeding. This being the case, it is important for the Government through health sector to focus on improving health facility related factors like rooming-in of mothers and babies and discourage separate nurseries for well babies.

2. The government should also advocate for establishment of breastfeeding shelters at the working institutions.

5.5 Further Research

- Further study to establish why the Mathira sub-county average is almost two times that of the national average and which counties are performing poorly and why?

- A matched study on BFHI practice across health facilities to establish the levels of compliance to all initiatives.
REFERENCES


Fiona McAndrew, Jane Thompson, Lydia Fellows, Alice Large, Mark Speed, Mary J. Renfrew (2012). Infant Feeding Survey 2010, United Kingdom


Kenya Demographic Health Survey (KDHS, 2014). *Nutrition and Breastfeeding Promotion*. 

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World Health Organization: The State of Breastfeeding in 33 Countries. 2010,


APPENDICES

Appendix 1: Questionnaire

Questionnaire Serial No……………………

The purpose of this study is to assist the researcher determine compliance to exclusive breastfeeding. You will be asked a few questions to aid in the study. This may take up some of your time. Please feel free to accept or reject the request to give the information asked for or to withdraw your participation at any level.

Failure to accept to give the information will not affect the service given to you in any way. No service will be denied in case of decline.

If you accept we can now proceed.

Socio-Demographic Characteristics of the Respondents

1. Name of institution where the interview is conducted.
   Tumutumu Hospital ( )  Karatina hospital ( )
   Karatina nursing home ( )  Jamii nursing home ( )

2. Age of child  7-9 Months ( ) 10-12 Months ( )

3. Marital Status of the mother  Single ( )  Married ( )

4. Number of Siblings.  First Time Parent ( )  One ( )  Two and Above ( )

5. Occupation of Mother:  Formal Employment ( )  Informal Employment ( )

6. Monthly Income of the mother  Kshs 0-3000 ( )
   Kshs 3001-5000 ( )
   Kshs 5001-10000 ( )
   Kshs 10001-15000 ( )
   Above Kshs 15000 ( )
7. Educational Level of the mother: Primary and below ( )
   1. Secondary Education ( )
   2. College and above ( )

Uptake and compliance to exclusive breast feeding among mothers

8. Interval between birth and first feeding
   1. Within first 60 Mins ( )
   2. After first 60 Mins ( )

9. If first feeding was outside first 60 mins kindly explain reason why..................
    ........................................................................................................
    ........................................................................................................
    ........................................................................................................
    ........................................................................................................

10. What was the composition of first feed:
    a. Breast Milk ( )
    b. Other feeds ( )

Why did you give other feed? No breast milk ( )
   Mother experienced medical complications ( )

11. Placement of the baby immediately after birth:
    i. Same room with mother ( )
    ii. In separate rooms ( )

12. Reason for placing the baby and mother in separate rooms
    i. Medical Complications ( )
    ii. Premature delivery ( )

13. How does the mother carry out breast feeding: On demand ( )
    a. Timed ( )
14. The type of feeding when mother was away from the baby.

   1. Expressed breast Milk ( )

   b. Expressed breast milk and other feeds ( )

Others (Specify)........................................................................................................

15. Did the mother practice exclusive breast feeding up to 6 months?

   Yes ( ) No ( )

16. How did you feed the infant up to 6 months?

   Exclusive breast feeding ( )

   Mixed feeding ( )
Appendix 2: WHO and UNICEF recommendations for breastfeeding

- The first feed should be on delivery table or within first hour of birth.
- Exclusive breastfeeding for the first six months of life
- Rooming-in, which means baby and mother on same bed/room.
- On demand feeding which takes advantage of the baby’s alertness and desire to feed
- Baby to be allowed to suck as long as he/she needs after fixing (attaching) properly on the breast to allow for complete emptying of one breast before embarking on the other. This allows both fore and hind milk to be taken by the baby because the content is not the same.
- The introduction of nutritionally adequate and safe complementary foods at six months together with continued breastfeeding up to two years and beyond (WHO, 2010).
Appendix 3: Composition of Key Nutrients found in Breast Milk

<table>
<thead>
<tr>
<th>Component</th>
<th>Mean Value for Mature Breast Milk Per 100Mls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>280 (Kj)</td>
</tr>
<tr>
<td>Energy</td>
<td>67 (Kcal)</td>
</tr>
<tr>
<td>Protein</td>
<td>1.3 (g)</td>
</tr>
<tr>
<td>Fat</td>
<td>4.2 (g)</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>7.0 (g)</td>
</tr>
<tr>
<td>Sodium</td>
<td>15 (mg)</td>
</tr>
<tr>
<td>Calcium</td>
<td>35 (mg)</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>15 (mg)</td>
</tr>
<tr>
<td>Iron</td>
<td>76 (mcg)</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>60 (mcg)</td>
</tr>
<tr>
<td>Vitamin B</td>
<td>3.8 (mg)</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>0.01(mcg)</td>
</tr>
</tbody>
</table>

Kj=Kilo Joules, Kcal=Kilocalories, g=Grams, mcg=Microgram,

The composition of breast milk changes during the whole period of breastfeeding and even through a single feed (Indicated are average values).

Appendix 4: Map of Study Area Showing Location of Sampling Sites
Appendix 5: Approval of research proposal

KENYATTA UNIVERSITY
GRADUATE SCHOOL

INTERNAL MEMO

From: Dean, Graduate School
To: Murithi Mary Nyambura
     Dept. of Public Health

Ref: 187/OL/5441/03

Date: 13th November, 2007

Subject: APPROVAL OF RESEARCH PROPOSAL

This is to inform you that the Graduate School Board Meeting at its meeting of 29th October, 2007 approved your M.P.H. research proposal titled "Factors Influencing Exclusive Breastfeeding Practices by Mothers in Mathira Division, Nyeri District, Kenya."

Thank you.

M. C. MAKOKHA
FOR: DEAN, GRADUATE SCHOOL

C.C. Dean, School of Health Sciences
     Chairman, Department of Public Health

MCM/1wic
Appendix 6: Authorization letter

MINISTRY OF HEALTH

OFFICE OF THE MEDICAL OFFICER OF HEALTH
NYERI DISTRICT
P.O. BOX 27
NYERI

2nd March 2008

To
The Officer Incharge

RE: RESEARCH AUTHORIZATION FOR
Name: Muriithi Mary Nyambura
Reg. No: 157/01/5441/03

The above named student has been granted permission to carry out a research in Nyeri District, Mathira Division.

The title of her work is
“Compliance to exclusive breastfeeding among mothers attending maternal/child health clinic in facilities in Mathira Division, Nyeri District, Kenya”

Kindly accord her the necessary assistance.

Thank you

PATRICK MBUGUA
FOR: DISTRICT MEDICAL OFFICER OF HEALTH
NYERI