

**CORRELATES OF COMPLEMENTARY FEEDING PRACTICE AMONG  
CAREGIVERS OF INFANTS AND YOUNG CHILDREN AGED 6-24 MONTHS AT  
MBAGATHI DISTRICT HOSPITAL, NAIROBI.**

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**JULY 2014**

## **DECLARATION**

I, Lina Otaigo Mwita declare that this research thesis is my original work and has never been presented for an academic award in any University or Institution of Higher Learning.

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## **LIST OF ABBREVIATIONS**

CF:	Complementary Feeding
CFP:	Complementary Feeding Practice
ERC:	Ethics and Research Committee
IBFAN:	International Baby Food Action Network
IYCF:	Infant and Young Child Feeding
IYCFP:	Infant and Young Child Feeding Practice
KNH:	Kenyatta National Hospital
LMIC:	Low and Middle Income Country
MCH:	Maternal and Child Health
MDH:	Mbagathi District Hospital
SPSS:	Statistical Package for Social Sciences
UNICEF:	United Nations Children's Fund
WHO:	World Health Organisation

## OPERATIONAL DEFINITIONS

**Alternate Caregiver:** Individual in whose care an infant or young child is left while the primary caregiver is away.

**Caregiver:** The mother of an infant or young child or the primary individual providing care to the infant or young child.

**Complementary Feeding:** The process starting other foods when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk. The target age range for complementary feeding is generally taken to be 6 to 24 months of age (WHO, 2003)

**Complementary Feeds:** any nutrient-containing foods or liquids other than breast milk given to infants and young children during the period of complementary feeding (WHO, 2003).

**Core Indicators:** The essential standardised measures for assessing Infant and Young Child Feeding practice. These have been adopted to suit the study and have been used as guidelines in measuring complementary feeding practice.

**Correlate:** These are factors that affect or influence complementary feeding practices and also those factors that are dependent on or are determined by complementary feeding practices.

**Health outcomes:** indices that describe the short term health consequences of complementary feeding among infants and young children. This study focuses on weight for age, a description of the growth trajectory using the percentile curve progression with reference to the patient held Maternal and child health record and frequency of nutrition associated conditions such as diarrhoea, respiratory tract infections and atopic dermatitis

**Indicators:** Standardised measures for assessing infant and young child feeding practice adopted from the WHO IYCF indicators and modified to suit the study scale and setting.

**Minimum acceptable diet:** A summary core indicator describing the proportion of children 6–24 months of age who receive both minimum meal frequency and minimum dietary diversity during the previous day.

**Minimum dietary diversity:** A core indicator describing the proportion of children 6–24 months of age who receive foods from 4 or more food groups with the food groups consisting; grains, roots and tubers; legumes and nuts; dairy products (milk, yogurt, fermented milk); flesh foods (meat, fish, poultry and liver/organ meats); eggs; vitamin-A rich fruits and vegetables; other fruits and vegetables during the previous day.

**Minimum meal frequency:** This indicator describes the proportion of breastfed and non-breastfed children 6–24 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more during the previous day. Minimum is defined as 2 times for breastfed infants 6–8 months, 3 times for breastfed children 9–24 months, 4 times for non-breastfed children 6–24 months.

**Nutrition associated conditions:** morbidity among infants and young children that is a consequence of complementary feeding practice. This includes diarrhoea, atopic dermatitis, upper respiratory tract infections and pneumonia

**Introduction to solid and semisolid foods:** This indicator describes the proportion of infants and young children 6-24 months that were introduced to complementary foods at 6 months.

## ABSTRACT

**Background:** Complementary feeding practice is a critical determinant of nutrition and health outcomes in infancy and early childhood and has lifelong repercussions. In Kenya, compliance to recommended complementary feeding practice has been shown to be low despite adoption of high impact policies and guidelines. Context specific correlates of complementary feeding practice must be highlighted as the first step towards addressing this gap

**Objective:** To identify the correlates of complementary feeding practices among caregivers of infants and young children aged 6-24 Months at Mbagathi District Hospital.

**Methodology:** A descriptive cross sectional study was conducted in the Paediatric outpatient and Maternal and child health (MCH) clinics of Mbagathi district hospital among caregivers of infants and young children. Simple random sampling was utilised to select 155 caregiver-infant dyads, allocated proportionately to the two clinics. Interviews were conducted using a standardised questionnaire that assessed for maternal socio demographics, infant and young child characteristics, alternate caregiver and health care worker influence and infant and young child feeding practices. A response rate of 100% was attained.

**Results:** Only 44%, 70.7% and 66.9% of the participants attained minimum dietary diversity, minimum meal frequency and timely introduction to complementary feeds respectively. Correlates of dietary diversity included: maternal education level  $P= 0.018$ , occupation  $P= 0.012$ , being in or having ever been in a marital union, and healthcare worker support in infant and young child feeding  $P= 0.017$ . Dietary diversity improved with the household wealth index, maternal employment, level of education and health education on nutritional composition. Health care workers were the main source of information on complementary feeding while alternate caregivers were key care providers. Previous maternal experience and

presence of an immediately older sibling was shown to influence complementary feeding practice. Diarrhoea was the most prevalent nutrition related morbidity affecting 58.2% of the infants with an average frequency of 2 episodes per child.

**Conclusion and recommendations:** The study shows low compliance to WHO recommended complementary feeding practice. Interventions should focus on improving maternal socio economic status and education level and enhancing capacity in health care facilities to provide consistent, context appropriate health education early in the reproductive life of mothers. In addition, social marketing and behaviour change models are important in addressing this situation. Further research should focus on the role of primary social support systems of caregivers in complementary feeding practice.

# **CHAPTER ONE: INTRODUCTION**

## **1.0 BACKGROUND INFORMATION**

Nutrition in infancy and early childhood is a critical determinant of health and productivity of the individual throughout life. Noteworthy is the dietary transition period from 6 months to 2 years which coincides with a physiologically significant period of growth and development of the child and greatly influences physical, mental, intellectual and social development; repercussions of which are lifelong (WHO, 2003; Victora et al, 2008). During this period, appropriate, safe, nutritionally adequate and frequent feeding is essential.

Complementary feeding denotes the transition of an infant from exclusive breastfeeding to a family diet characterized by timely introduction of solid and semisolid foods with increasing amount, frequency and variety as the child gets older, while maintaining frequent breastfeeding. Complementary feeding practice is a significant determinant of the nutritional status of infants. It is during this period of transitioning from exclusive breastfeeding to family foods that the incidence of malnutrition rises sharply resulting in deficits that are hard to compensate for in later childhood and in life (Victora et al; 2008 ).

The World Health Organization (WHO) and The United Nations Children's Fund (UNICEF) recommend introduction of solid food to infants at the age of 6 months. This timing is determined by physiological factors (Wellstart, 2001) including maturation and capacity of the immune system, the gastrointestinal tract and oral development in relation to coping with the transition from a purely liquid diet to semi-solid and solid foods. Additionally, by this age, the caloric demand for optimal growth and development exceeds that provided by breast milk alone (WHO, 2003).

During the complementary feeding period, breastfeeding remains a vital source of nutrients for the infant and young child. It provides approximately half of an infant's energy needs up

to the age of one year, and up to one third during the second year of life (WHO, 2003). The quality of nutrients supplied by breast milk is superior compared to those supplied by complementary foods and also contains protective factors (KDHS, 2008/09; WHO, 2003). It is therefore recommended that breastfeeding on demand continues with adequate complementary feeding up to 2 years or beyond.

The prevalence of malnutrition increases substantially during the complementary feeding period in many countries (Senarath et al., 2012, Arabi et al, 2012) because of increased infections, digestion related difficulties and poor feeding practices. Exposure of the infant to pathogens commonly found in food also predisposes the infant to age related gastrointestinal disease (Naylor and Morrow, 2001). Malnutrition contributes to 53% of child mortality (WHO, 2010). Worldwide in 2012, it was estimated that 162 million children under five were stunted and almost 100 million had low weight-for-height, mainly due to poor feeding and repeated infections; 44 million were overweight or obese (WHO, 2013). It is estimated that 2 out of 5 children are stunted in low-income countries. In Kenya, the nutritional status of children less than five years of age showed no significant change between 1998 and 2008(KDHS, 2008/09). Nationally, over 2 million children (35%) are stunted (KDHS, 2008/09).

During the first two years of life, poor breastfeeding and complementary feeding practices, coupled with high rates of infectious diseases, are the principal proximate causes of malnutrition (WHO, 2001). It is therefore important to ensure that caregivers are provided with appropriate and adequate and contextually appropriate support and guidance regarding optimal feeding of infants and young children.

## **1.1 PROBLEM STATEMENT**

Compliance to the recommended Infant and young child feeding practice has been shown to be very low. Globally, only a third of breastfed infants 6–23 months of age meet the criteria



of dietary diversity and feeding frequency that are appropriate for their age (WHO, 2013). Infant and young child feeding practices in 33 countries located in Africa, Asia, Latin America, and the Caribbean showed high rates of noncompliance with infant and young child feeding (IYCF) recommendations (International Baby Food Action Network, 2010). In Kenya, despite the adoption of a set of high impact IYCF policies and guidelines, only 39% of all children age 6-23 months are fed in accordance with the recommendations. In Nairobi province, only 51% of children aged 6-23 months are fed according to IYCF recommendations (KDHS, 2008/09). Under nutrition in the 6-24 month age group in developing countries is a direct consequence of caregiver complementary feeding practices (Kikafunda et al, 2003) in turn resulting in significant childhood morbidity and mortality since the surviving children have increased susceptibility to and have compromised physical growth, impaired cognitive development and reduced lifetime earnings (World Bank, 2006; Victora et al, 2008; Haas et al, 2006). Evidence shows that decline in length-for-age mainly occurs during the complementary feeding period, between 6 and 24 months of age (Dewey & Huffman, 2009; Victora et al, 2010). Indeed, poor complementary feeding has been identified as a risk factor associated directly with stunting (Bhutta et al, 2013).

Poor feeding practices are a serious obstacle to attaining and maintaining health of this age group (WHO, 2003). About 220 000 child lives could be saved every year with promotion of optimal breastfeeding and appropriate complementary feeding (WHO, 2013). Interventions promoting optimal complementary feeding could prevent up to 6% of deaths in countries with high mortality rates (Jones and Steketee et al., 2003; Lozano and Naghavi et al., 2013). The complementary feeding period represents a significant window of opportunity when nutrition has the greatest effect on child health, growth and development (World Bank, 2006; Victora et al, 2010).

There exists a significant gap in explaining why in spite of the adoption of high impact IYCF policies and guidelines in Kenya, there is still low compliance to the recommended practice.

The gravity of nutritional outcomes during this period also underpins the urgency for contextualised evidence-based interventions to prevent malnutrition in these children by targeting and improving complementary feeding practice. The description of the correlates of complementary feeding practice hence will be an important step in facilitating the formulation of interventions to address situation.

## **1.2 RESEARCH QUESTIONS**

What are the complementary feeding practices among the caregivers of infants and young children aged 6 -24 months attending Mbagathi District Hospital?

What are the correlates of complementary feeding practices among caregivers of infants aged 6 months and above attending Mbagathi District Hospital?

## **1.3 OBJECTIVES**

### **1.3.1 MAIN OBJECTIVES**

To identify the correlates of complementary feeding practices among caregivers of infants and young children aged 6-24Months at Mbagathi District Hospital.

### **1.3.2 SPECIFIC OBJECTIVES.**

1. To identify the complementary feeding practices of caregivers of infants and young children aged 6-24 months.
2. To determine the rate of compliance to recommended complementary feeding practices among infants and young children aged 6-24 months
3. To identify the factors that influence complementary feeding practice among infants and young children aged 6-24 months.
4. To describe the health outcomes of infants and young children aged 6-24 Months in relation to complementary feeding practice.

## **1.4 STUDY HYPOTHESIS**

Caregiver and infant/child characteristics do not influence complementary feeding practice.

## **1.5 STUDY VARIABLES**

### **1.5.1 Independent Variables**

- Caregiver socioeconomic and demographic characteristics, pregnancy history,
- Child characteristics: age, birth order, sex, birth weight
- Support: Alternative caregiver role, Health care worker role

### **1.5.2 Intervening Variables**

- Caregiver Knowledge
- Previous complementary feeding practice of caregivers

### **1.5.3 Dependent Variables**

- Complementary feeding practices

### **1.5.4 Outcome Variables**

- Infant /child health outcomes
- Indicators of recommended complementary feeding practice

## **1.6 JUSTIFICATION**

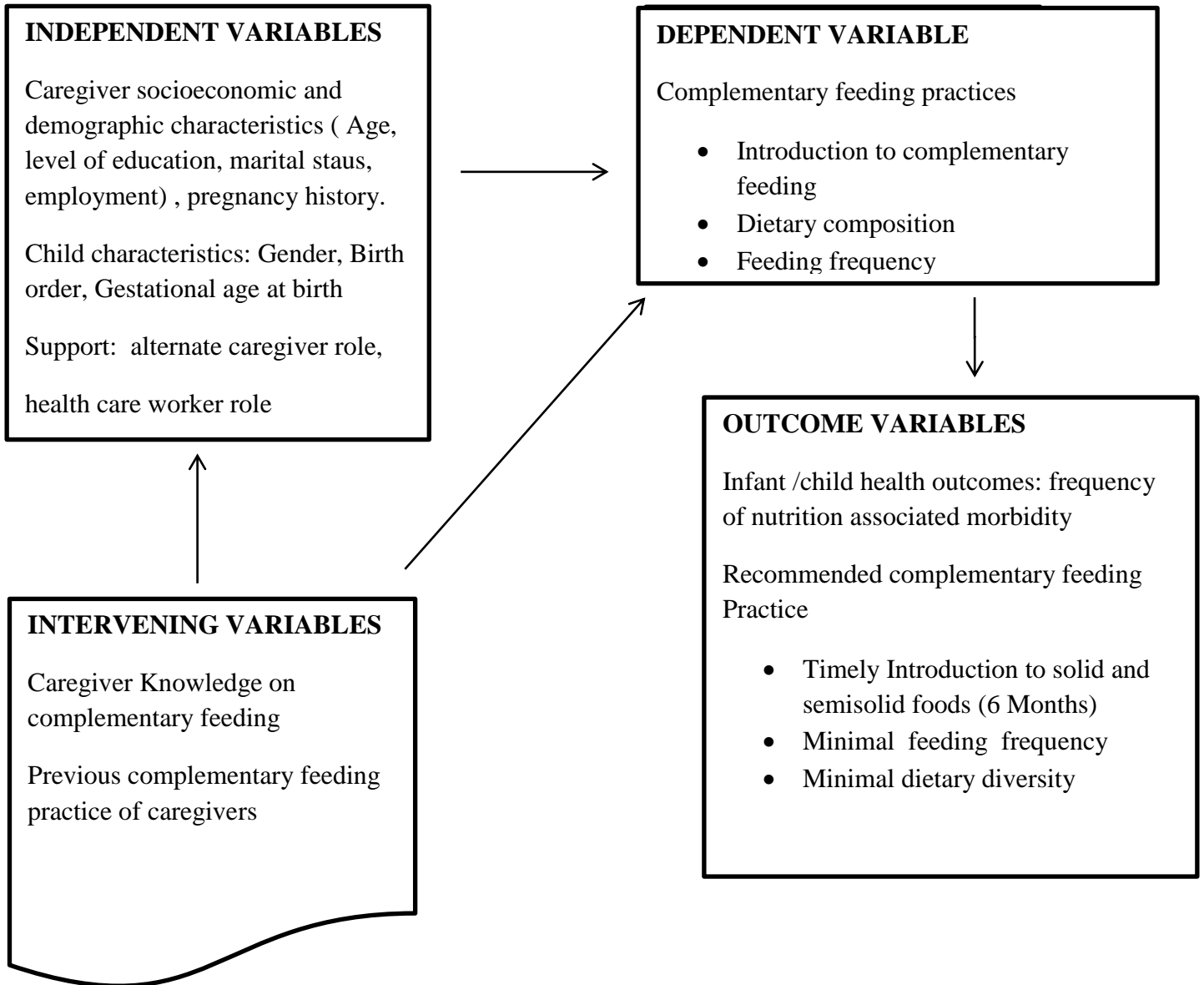
The complementary feeding period and associated practices play a significant role in health and development outcomes of infants and young children (Agostoni et al., 2008; IBFAN, 2010). This period presents an opportunity within which appropriate interventions can result in tangible gains (Victora et al, 2010) as infant and young child feeding is a critical component of child survival and promotion of healthy growth and development.

Taking into consideration the multifaceted and dynamic nature of infant and child feeding within the first two years and the scale of the study, four of the recently updated WHO IYCF core indicators were used as a guideline in describing complementary feeding practice. This was to facilitate the achievement of the study's aim of gathering and synthesising information on the correlates of complementary feeding practice among infants and young children aged 6-24 months. The study intended to identify specific factors influencing complementary feeding practices thus highlight the factors promoting ideal and those leading to suboptimal infant feeding practices.

Knowledge of feeding practices, their correlates and utilisation of the modified WHO IYCF indicators will facilitate better monitoring of trends in the feeding practices and the design of locally appropriate interventions to increase the recommended feeding practices and thereby contribute to reducing malnutrition in the significant infant and young child population served by The Mbagathi District Hospital. Overall the study will inform and guide development of appropriate evidence based interventions from the level of the facility to the level of policy making to ensure optimal outcomes for this critical age group.

## 1.7 CONCEPTUAL FRAMEWORK

Figure 1: Conceptual Framework



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 INTRODUCTION**

Complementary feeding refers to gradual dietary transition characterized by introduction of solid and semisolid foods to an infant's diet when breast milk alone becomes insufficient in meeting the nutritional needs of the infant. The recommended age range for complementary feeding is generally taken to be 6 to 24 months even though breastfeeding may continue beyond two years (WHO, 2003). Complementary foods are meant to 'supplement' ongoing breastfeeding and thus facilitate the transition from milk feeding to family foods (Przyrembel, 2012). The World Health Organization (WHO) has described the complementary feeding period as the period during which other foods or liquids are provided along with breast milk.

The recommended complementary feeding practices and guidelines are determined by physiological maturity and nutritional needs of the infant. By 6 months, the digestive system is functionally mature to efficiently digest and absorb starch, protein and fat in the non-milk diet (Michaelsen et al. 2003). In addition, oral anatomy is functionally adapted and well developed, neuromuscular coordination enables the necessary motor skills to cope safely with complementary feeding and renal function is mature enough to handle the osmolality of other foods (Agostoni et al. 2008; Michaelsen et al., 2003; WHO and UNICEF, 1998). The functional gastric capacity which is a significant determinant of the amount of food an infant or young child can ingest, remains similar to that of term infants ranging between 38-76mL, whilst in toddlers the capacity is approximately 20mL/kg body weight (Michaelsen et al. 2003).

### **2.1 RECOMMENDED PRACTICE**

Guidelines on complementary feeding outlined in the Kenya National Policy on Infant and Young Child Feeding as adopted from the WHO recommendations are comprehensive. They include the following: Commencing complementary feeding at six months with small amounts of food increased gradually as the child gets older. Food variety and consistency

should also be gradually increased. Another recommendation is frequent, on-demand breastfeeding until two years of age or beyond and the use of responsive feeding which directs that infants are fed directly and older children assisted with eating. It is also recommended that infants and young children be slowly and patiently fed thus encourage eating without use of force. The practice of good hygiene and proper food handling is also emphasized while age guided increase in meal frequency with 2-3 meals per day for infants 6-8 months of age and 3-4 meals per day for infants and young children 9-23 months of age with 1-2 additional snacks as required. The use of fortified complementary foods or vitamin-mineral supplements as needed and increasing feeding frequency and fluid intake including more breastfeeding, and offering soft, favorite foods in times of illness is also emphasized. According to the Kenya National Policy on Infant and Young child feeding, complementary foods should meet the basic criteria of frequency, adequacy, dense (enough), and utilization and active feeding (FADUA). These are objectively assessed using the complementary feeding indicators.

## **2.2 INFANT AND YOUNG CHILD FEEDING INDICATORS**

Evaluation of feeding practices in children aged 6 months and older involves assessing various dimensions of feeding simultaneously against the recommended practice. These dimensions include continued breastfeeding, appropriate timing of introduction of complementary foods, and optimum quantity and quality of the foods consumed.

The WHO published a document which presented indicators for assessing infant and young child feeding practices (WHO, 2008). The updated set of indicators includes eight core and seven optional indicators. The core indicators of complementary feeding practice used as guidelines in this study are: Introduction of solid, semi-solid or soft foods, Minimum dietary diversity, Minimum meal frequency and Minimum acceptable diet.

### **2.2.1 Introduction to solid and semisolid foods**

Introduction to solid and semisolid foods evaluates the appropriateness of timing of complementary foods. Complementary foods are to be introduced at six months after a period of exclusive breastfeeding (Kramer and Kakuma, 2013; WHO, 2003). This is because after six months of age, breast milk becomes insufficient in meeting the nutritional demands of infants and young children (WHO/UNICEF, 1998). In addition, infants are developmentally ready for other foods (Naylor and Morrow, 2001). Studies done in Malawi, Kenya and Uganda have shown that complementary foods are introduced earlier than the recommended time (Nankumbi et al. 2012; Kimani-Murage et al. 2011; Kamudoni et al. 2007) with the median age of introduction of complementary feeding being 3 months.

### **2.2.2 Dietary diversity**

Dietary diversity as an indicator is a proxy for adequate micronutrient-density of foods and liquids other than breast milk (WHO, 2010). Consumption of foods from different groups increases the likelihood that diverse nutrients will be provided in daily intake, which will help in meeting the nutritional requirements and minimize deficiencies. The food groups that should constitute complementary foods include: grains, roots and tubers, legumes and nuts, dairy products (milk, yogurt, and cheese), flesh foods (meat, fish, poultry and liver/organ meats), eggs, vitamin-A rich fruits and vegetables and other fruits and vegetables (WHO, 2008). These foods should be modified to a texture appropriate for the infant's developmental readiness (Agostoni et al. 2008; Michaelsen et al. 2003).

### **2.2.3. Feeding Frequency**

Feeding frequency is a proxy for adequate energy intake from non-breast milk sources. For the average healthy breastfed infant, meals of complementary foods should be provided 2-3 times per day at 6-8 months of age and 3-4 times per day at 9-11 and 12-24 months of age, with additional nutritious snacks offered 1-2 times per day, as desired. This recommendation is based on standardized estimates of the caloric density of local foods, the nutritional



demands of infants per kilogram body weight and the gastric capacity of infants and young children (Dewey and Brown, 2002). Feeding frequency higher than the recommended times will result in displacement of breast milk (WHO, 2001).

#### **2.2.4 Minimum acceptable diet**

Minimum acceptable diet among breastfed and non-breastfed children is a composite of dietary diversity and meal frequency (WHO, 2008; WHO, 2010). It is an indicator showing the proportion of infants receiving both minimum dietary frequency and minimum dietary diversity.

### **2.3 CONSEQUENCES OF COMPLEMENTARY FEEDING PRACTICE**

The period from birth to two years of age is a critical period for the promotion of optimal growth, health and behavioral development. It is a period of opportunity that has lifelong consequences (Victora et al, 2008). Physiologically the brain and body undergo significant growth which exerts intense nutritional demands per kilogram body weight than during any other period of life. Nutritional outcomes of infants are influenced by feeding practices, adequacy and quality of food. Any factors affecting the supply of nutrients such as timing of introduction of feeds, sufficiency of nutrient intake, care practices and infectious disease impact on child wellness resulting in malnutrition and growth faltering with long term consequences on overall health and neurological development.

#### **2.3.1. Effects of time of introduction to complementary feeding**

The short- and long-term health implications of both early and delayed introduction of complementary feeds are well documented. Early introduction has been associated with increased risk of allergy (Kajosaari, 1991; Armentia et al, 2001), eczema (Ferguson et al, 1990; Forsyth et al, 1993) and enteritis (Popkin et al, 1990). Introduction of complementary feeds at less than 12 weeks has been shown to increase the incidence of respiratory illness in infants aged 14–26 weeks and persistent cough at 27–39 weeks (Forsyth et al, 1993).

Evidence also suggests that early introduction to solid foods may result in increased percentage body fat in childhood (Wilson et al; 1998). Conversely, weaning infants beyond the recommended time may deleteriously affect the feeding behavior (Northstone et al, 2001), and may lead to nutritional deficiencies (Hendricks and Badruddin, 1992) and failure to thrive (Wright and Birks, 2000).

### **2.3.2. Malnutrition**

Longitudinal studies have consistently shown that the complementary feeding period is the peak age for growth faltering, deficiencies of certain micronutrients, and common childhood illnesses such as diarrhea. The incidence of malnutrition increases significantly from 6 months of age in most countries (Senarath et al. 2012). It was previously estimated that 35% of under five deaths in the world were due to the presence of under nutrition (Black et al. 2008) with over two-thirds of these deaths associated with inappropriate feeding practices during the first year of life. Rising incidences of obesity and over nutrition in children are an emerging matter of serious concern in Low and Middle Income Countries (LMIC). It has been estimated that in 2010 there were 43 million children (more than 80% of these in LMIC) who were overweight or obese. The global prevalence of these conditions increased from 4.2% in 1990 to 6.7% in 2010 and is expected to reach 9.1% by 2020 (Victora et al, 2008). Because poor feeding practices are a major threat to social and economic development, they are among the most serious obstacles to attaining and maintaining health that face this age group. After a child reaches 2 years of age, it is very difficult to reverse stunting that has occurred earlier (Martorell et al., 1994).

### **2.3.3 Health and developmental consequences**

The immediate consequences of poor nutrition during this period include increased morbidity and mortality which is correlated to inadequate immune response (Arimond and Ruel, 2004) and delayed or poor mental and motor development (Victora et al, 2008). Long term effects impact on adult stature, intellectual performance, economic productivity, immune response,

and reproductive outcomes. Individuals who are stunted at 2 years of age are likely to grow up to be stunted adults (Adair et al. 2013). There may be some opportunity for catch-up growth during childhood, because of improved nutrition or a delay in skeletal maturation and the growth spurt at puberty which lengthens the overall period for growth in height (Coly et al. 2006). Undernourished children in this age group, who later gain weight rapidly after two years, are at high risk of nutrition-related chronic disease as adults (Victora et al. 2010). Early feeding practices also influence feeding behavior later on in life. Experimental findings causally link restrictive early child-feeding practices to overeating in children (Birch et al, 2003)

## **2.4 FACTORS INFLUENCING COMPLEMENTARY FEEDING PRACTICE**

### **2.4.1 Maternal Factors**

Maternal age, level of education and employment have been shown to influence complementary feeding practice. Younger maternal age (Joshi et al. 2012), lower maternal education (Joshi et al. 2012; Kabir et al. 2012; Patel et al. 2012; Senarath et al. 2012), unemployment (Joshi et al. 2012; Senarath et al. 2012) and inadequate maternal exposure to mass media such as newspapers, radio or television (Joshi et al. 2012; Patel et al. 2012), are risk factors associated with inappropriate complementary feeding practice in developing countries. Lower maternal education and lower household wealth index were found to be the most consistent determinants of inappropriate CF practices in Bangladesh, India, Nepal, Pakistan and Sri Lanka (Senarath et al. 2012). In Tanzania lower level of paternal/maternal education, limited access to mass media, lack of post-natal check-ups, and poor economic status are the risk factors for inappropriate complementary feeding practice (Victor et al, 2012). Maternal socialization has also been demonstrated as a significant determinant of CFP with mothers being likely to feed their infants in the same manner in which they themselves or their siblings were fed (Hawthorne, 1994; Meyerink & Marquis, 2002). Predictors of early introduction of complementary foods include the desirability of the pregnancy of the index

child and the place of delivery (Kimani-Murage et al, 2011). Ante natal attendance and mother's perception of child's size are other factors that influence feeding practices (Kimani-Murage et al, 2011). Having never been in union/married was associated with higher risk of early introduction of complementary foods.

### **2.4.2 Infant Factors**

Infant characteristics that have been associated with complementary feeding practice are multiple. Birth order, birth weight and fussiness of the infant has been demonstrated to have a profound impact on infant feeding practices (Kimani-Murage et al, 2011). The sex of the child has also been shown to influence CFP with boys being likely to be introduced to complementary feeds earlier. Anecdotal evidence indicates that boys are introduced to complementary foods early because breast milk alone does not meet their feeding demands. A study among low income black women in the United States demonstrated that infant fussiness both precedes and affects maternal feeding decisions with earlier initiation of complementary feeding among infants perceived to be fussy by their mothers (Wasser et al, 2011).

### **2.4.3 Support**

#### **2.4.3.1 Social support**

Infant feeding being a social behavior, is best practiced in a supportive environment. Lack of social support, therefore, has emerged as a key constraining factor on infant feeding choices especially in a setting where the mother has to work. A link between social support and breastfeeding initiation and duration has been supported in multiple studies. Having friends who successfully breastfeed and seeing family and friends breastfeed increases the likelihood of a mother breastfeeding (Meyerink & Marquis, 2002). Indeed the same may be postulated on complementary feeding practices.

Employment of primary caregivers has been shown to influence complementary feeding. Globally, women's participation in the labour market remained steady in the two decades from 1990 to 2010, hovering around 52 per cent (UN, 2010). In spite of the changes that have occurred in women's participation in the labour market, women continue to bear most of the responsibilities for the home: caring for children and other dependent household members, preparing meals and doing other housework. Employed women spend an inordinate amount of time on the double burden of paid work and family responsibilities (UN, 2010). This brings to light the need for alternative caregivers. A study in Guatemala showed that urban mothers were significantly less likely to report all day child care as their work hours increased and required alternative care arrangements (Engle and Breux, 1998). As the child moves from breastfeeding and infancy to early childhood, time spent on direct child care by the primary caregiver declines precipitously while the role of the alternate caregivers becomes significant. Primary caregivers may continue to provide supervisory care but the care of infants and young children becomes a preserve of alternate caregivers (Engle and Breux, 1998). Siblings and adult females are important sources of alternative care in most societies especially when their charges are beyond one year of age (Weisner and Gallimore, 1977). Men also provide some care and tend to assist with holding and carrying rather than other aspects of child care (Engle and Breux, 1998). Some studies suggest that care by a pre-teen caregiver is associated with lower nutritional status in a child under two, with controls for mother's education and socio-economic status (Blumberg, 1995)

Although men should become more involved with child care as women increase their time in the labour force, men still contribute far less than an equal share of time to household chores and child care (UN, 2012). Fathers may provide a particularly important source of emotional support and information to the caregiver. There is some evidence that when fathers contribute a higher proportion of their income to family food budgets, children are better nourished

(Blumberg, 1995). Fathers' opinions on child caregiving can significantly affect decisions on infant feeding, particularly breast-feeding (Littmann et al, 1994).

#### **2.4.3.2 Health care worker role**

The role of health care workers in complementary feeding practice has been shown to be significant. Nutrition counselling of caregivers and close monitoring of complementary fed infants and young children by knowledgeable health care workers has been shown to improve IYCFP thus reducing the risk of under nutrition among children of counselled caregivers (Sunguya et al, 2013; Pelto et al, 2004). This counselling clears cultural and tradition-based misconceptions and improves caregivers' knowledge on general nutrition (Shi and Zang, 2011) which positively impacts on IYCFP and child health. The opportunities for routine nutrition counselling can be identified in existing health care frameworks. Antenatal and postnatal visits to health care facilities, birth in a health facility or by a skilled birth attendant present potential opportunities for nutrition counselling by trained health workers (Bhandari et al, 2004).

## **CHAPTER THREE: METHODOLOGY**

### **3.0 STUDY DESIGN**

A cross sectional design was utilised to establish the correlates of complementary feeding practice among caregivers of infants and young children aged 6-24 months attending the child welfare clinic at Mbagathi District Hospital

### **3.1 STUDY AREA**

The study was conducted at The Mbagathi District Hospital's Anderson Hall Maternal and Child Health Clinic (MCH) and Paediatric Outpatient Departments.

Mbagathi District Hospital is a public facility owned by the Ministry Of Health. The Hospital is situated in Nairobi County, 2 kilometres from the Central Business District just off Mbagathi way. Neighbouring the facility is The Kenyatta National Hospital, Kenyatta Market, The Armed Forces Memorial Hospital, Kenya Medical Research Institute, Kibera Slum and various Estates including Ngummo, Golfcourse, Highrise to mention just a few. It serves a population of more than 3,000,000 people. It is an autonomous District Hospital for Nairobi, with a bed capacity of 200. The pediatric population is served by a Paediatric medical ward, an Outpatient clinic and Maternal and Child Health (MCH) Clinic. The pediatric outpatient department offers care for minor illnesses on outpatient basis and also emergency care for very ill children who are subsequently admitted, while the MCH offers immunisation and growth monitoring services. The hospital was selected as the study site because it serves a significant segment of the lower income population in Nairobi County and results and conclusions from the study can hence be postulated to the rapidly expanding low income urban population in Kenya.

## **3.2 STUDY POPULATION**

The study population comprised of all caregivers of infants and young children aged 6-24 months attending Mbagathi District Hospital pediatric outpatient clinic and MCH for immunisation and growth monitoring or treatment of minor ailments.

## **3.3 INCLUSION AND EXCLUSION CRITERIA**

### **3.3.1 Inclusion criteria**

Care givers of an infant or child aged 6-24 months presenting to the paediatric departments for treatment of minor ailments or to welfare clinic for immunisation and/or growth monitoring

Caregivers must have with them the Patient Held Maternal and Child health record (Road to Health Card)

Infant or child aged 6-24 months of age on complementary feeding

Caregiver consents to participate in the study

### **3.3.2 Exclusion criteria**

Caregiver of Infant or child below 6 or above 24 months of age

Caregivers of very sick infants and young children, those with known anomalies or those requiring emergency care

Caregiver declines to participate in the study

## **3.4 SAMPLE SIZE DETERMINATION**

Sample size was determined using the following formula (Mugenda and Mugenda, 1999)

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

**n** is the desired sample size



**Z** is the standard normal deviation at a confidence level set at 95% which is 1.96

**p** is the proportion in the target population estimated to have the characteristic of interest. In Nairobi 51 % of all children age 6-23 months are fed in accordance with all IYCF practices (KDHS, 2008/09).

Therefore using the above population proportion, for this study  $p = 0.51$

**q** is the proportion in the target population without the characteristic of interest

$$q = 1 - p \text{ hence } q = 1 - 0.51$$

$$q = 0.49$$

**d** is the degree precision set at  $\pm 5\%$  or 0.05

Hence substituting the formula:

$$\begin{aligned} n &= \frac{(1.96^2) (0.51 \times 0.49)}{(0.05)^2} \\ &= 3.8416 \times 0.2499 / 0.0025 \\ n &= 384 \end{aligned}$$

Adjusting the above sample size for a finite population (of less than 10,000)

$$N_f = \frac{n}{1 + n/N}$$

$$1 + n/N$$

**nf** is the desired sample size

**N** is the estimated population size

Estimation of Population size was done in accordance to the monthly attendance of infants aged 6-24 Months seen in each paediatric department at MDH. The paediatric outpatient clinic reviews approximately 160 while the MCH reviews 100 children aged 6-24 Months.

Therefore  $N = 260$

Sample Size calculated is:  $\frac{384}{1 + \frac{384}{260}} = 155$  Therefore **Sample Size 155**

$$1 + \frac{384}{260}$$

$$260$$

### 3.5 SAMPLING PROCEDURE

A random sampling method was utilised to select study participants. The researcher and research assistants had a box of cards 155 of which will have yes and 105 No markers. Every caregiver of an infant or young child 6-24 months meeting the eligibility criteria, consenting to participate in the study and picking a yes card was interviewed. Each department was allocated a sample size proportionate to the population.

The number of infants and young children allocated was determined as follows

<b>Department</b>	<b>Total Number of children aged 6-24 Months</b>	<b>Sample size determination</b>	<b>Sample size</b>
1. Paediatric outpatient clinic	160	$160/260 \times 155$	95
2. MCH	100	$100/260 \times 155$	60
Total	260		155

Table 1 : Allocation of sample to clinics

### 3.6 STUDY INSTRUMENT

A semi structured questionnaire consisting of closed and open ended questions was used to elicit responses from the study participants. The questionnaire (Appendix VI) was developed after a comprehensive review of relevant literature. The questionnaire comprised: The socio demographic characteristics of caregivers, Infant characteristics including prenatal history, birth order and overall child health, Caregiver Knowledge and previous complementary feeding practice, Support from immediate social network, complementary feeding practices and intake of complementary foods using 24-hour recall adapted from the WHO Infant and Young Child Feeding Indicator questionnaire(WHO,2010).The questionnaire captured data on each of the objectives of the study and was coded to facilitate data entry and analysis.

### **3.6.1 Pre-test of the tool.**

The Questionnaire was pretested at the Kenyatta National Hospital MCH clinic to assess for reliability, clarity and simplicity of the tool. Twenty mothers were interviewed by the researcher and data analysed. The results were used to guide the making of appropriate adjustments to the tool.

## **3.7 RECRUITMENT AND TRAINING OF RESEARCH ASSISTANTS**

Three research assistants were recruited and trained on the pertinent aspects of the study by the researcher. The assistants were Bachelor of Science in Nursing (BScN) interns who attended a 2 day training covering the following:

- Description and orientation to the study
- Aim and objectives of the study
- Ethical issues pertaining to the study
- Data collection procedures and protocols to ensure accurate, complete and reliable data
- A preview of the study tool to ensure consistency in asking questions and elicited responses

## **3.8 STUDY PROCEEDURES.**

### **3.8.1 Participant Selection**

Participants were recruited from the Maternal Child Health Clinic (MCH) and Paediatric Outpatient Units. During each data collection session, the investigator liaised with a the unit in charge and the staff in the unit to ensure that a member of the data collection team was stationed in the reception and triage points to identify caregivers of infants and young children 6-24 months. Upon completion of services in the unit, and while on queue each of the identified caregivers was approached, necessary introductions done and reviewed against the inclusion criteria. Eligible participants were sampled and consent procedures commenced

at designated points within the units. This ensured non disruption of services. In the Paediatric Outpatient clinic, participants only included caregivers of infants and young children presenting to the unit with minor ailments such as upper respiratory tract infections and being treated as outpatients.

### **3.8.2 Consent procedures.**

Consent was sought from identified caregivers after completion the services required or during the waiting periods on the queue. To ensure privacy and also minimise disruption of services, the researcher liaised with each unit in charge to facilitate allocation of designated points in the unit where consenting procedures and interviews were conducted. Consenting procedures required the presence of two members of the data collecting team with one acting as a witness. The process entailed utilisation of the information and consent form to comprehensively explain to potential participants pertinent aspects of the study including the background, nature and objectives of the study, the implications of participation in terms of benefits, utility, compensation and risks of participation and participant rights in a language understood by the participant. Finally the potential participants were allowed to ask questions to clarify aspects they deem necessary. Upon consenting to participate, they were taken through the statement of consent declaration and allowed to sign as appropriate with the investigator and witness countersigning. The participants were then guided to the designated interview points.

### **3.8.3 Participant interviews**

Interviews were conducted using researcher administered questionnaires at the designated points in each unit. This was done following consent procedures.

#### **3.8.3.1 Description of health outcomes**

Information on infant/ child health outcomes was obtained by referring to the patient held maternal and child health record (road to health cards) and current clinic record where

applicable. Health outcomes of interest will included: Infant/Child's current weight, weight for age for each entry on the booklet and a description of the growth trajectory using growth percentiles. Data on the frequency of nutrition associated conditions was captured in section I of the questionnaire (Appendix. III)

### **3.9 DATA COLLECTION**

Data was collected using the questionnaire and was administered to caregivers by the researcher and two trained research assistants over a period of four weeks. The infant/ child's road to health booklet was used to ascertain the infant age, immunisation status and the infant/ child's age for weight entries on the booklet including the current weight.

### **3.10 DATA CLEANING AND ENTRY**

At the end of each day during the data collection period, questionnaires were checked for completeness, validity and clarity. In addition, the researcher and the research assistants had alternate day meetings to discuss data collection experience, challenges and progress. Relevant recommendations and adjustments were made as appropriate. The data was then entered into a Microsoft Excel spread sheet where data cleaning was done. Missing values, extreme values and inconsistencies were identified and corrected. After cleaning, the data was then exported to software for analysis using statistical package for social sciences (SPSS) version 18 computer package by the researcher. Each questionnaire was entered against its unique identifier number. Incomplete and wrongly answered tools were omitted during the data entry process.

### **3.11 DATA ANALYSIS AND PRESENTATION**

Data analysis was done using the Statistical Package for Social Sciences (SPSS) Version 18.0. Descriptive statistics were utilised to summarise data on respondent characteristics and presented in narrative and pictorial format using graphs, charts and tables as applicable. For categorical variables such as gender, level of education, marital status, religion and income

generating activity, frequencies and percentages will be computed and presented in frequency tables, pie charts and bar graphs. For numerical variables such as age, number of children, income, episodes of complementary feeding associated conditions such as diarrhoea and the birth order of the child, means and standard deviation were calculated for normally distributed data. Median and interquartile range were calculated and presented in a frequency tables for skewed data.

To test for the association between two variables such as maternal or infant characteristics and infant and young child feeding practices, Chi-square was used to determine significance of association. To determine association between outcomes such as timely introduction to solid and semi-solid foods and a variable such as child's gestational age at birth, logistic regression model was utilised get Odds Ratios. Associations between the variables were calculated at 95% confidence interval at P-value 0.05.

### **3.12 ETHICAL CONSIDERATIONS**

Authority, clearance and approval to conduct the study were sought by presenting the study protocol to The University of Nairobi- Kenyatta National Hospital Ethics and Research Committee and Mbagathi District Hospital.

Participants were required to give a signed, voluntary informed consent prior to participation and were briefed on their rights and the expected benefits of the study. In addition there was no coercion or inducement to participate.

Anonymity of participants was ensured by serialising the questionnaires. No form of identification was required of participants nor any markers to identify participants noted on questionnaires. All completed questionnaires were handled only by the trained research assistants and researcher. They were stored under lock and key.

Participants were informed of the potential benefits of the study and assured that the findings would be available at various points.

### **3.13 STUDY LIMITATIONS**

The cross sectional study design employed will only be useful in indicating how or to what extent variables are associated with each other. Causal inference cannot be established from the study. Further studies will be required to investigate the observed associations.

Data collected was based on interviews and rely on the memory of caregivers. There is possibility of recall bias and socially desirable response. Recall bias on complementary feeding practice was minimised by use of a 24 hour food recall.

Simple random sampling was utilised to enhance the representativeness of the sample to counter the study's limited generalizability by virtue of the fact that it is a hospital based study.

### **3.14 DISSEMINATION PLAN**

The results of this study will be presented as a thesis in partial fulfilment of the requirements for award of the Master of Science in Nursing (Paediatric Nursing) Degree of The University of Nairobi. In addition, the results will be presented to the Mbagathi District Hospital and discussed with the relevant authorities within the institution with an objective of informing decisions and activities that impact on IYCFP. A manuscript will be presented for publishing in a reputable journal and abstracts presented in various relevant conferences, symposia and seminars.

## CHAPTER FOUR: RESULTS

### 4.0 INTRODUCTION

The study was conducted among a sample of 155 caregiver and infant and young child dyads attending the Pediatric outpatient and Child welfare clinics at the Mbagathi District Hospital in the month of May 2014. Of the informants 96.1% (n=149) were the mothers of the infants and young children. Other informants included fathers, grandparents, or other caregivers with each category accounting for 1.3% (n=2) of the sample size.

Mothers were the primary caregivers in 87.1% (n=135) of the population while the house-help, grandparents and other persons represented 6.5% (n=10), 1.3% (n=2) and 3.9% (n=6) of the primary caregivers respectively. Fathers were the head of the household in 78.1% (n=121), while mothers and grandparents were heads in 20.0% (n=31) and 1.3% (n=2) of the households respectively.

### 4.1 DEMOGRAPHIC PROFILE OF INFORMANTS

#### 4.1.1 Age, parity and Marital Status

The mean age of the mothers interviewed was 27+/-5 years. On average each mother had 2 children. Table 2 represents the marital status of the mothers. The majority 79.4% (n=123) were married whereas 14.2% (n=22) were single.

Maternal characteristic		Frequency (n)	Percent (p)
Maternal marital status	Single	22	14.2%
	Cohabiting	4	2.6%
	Married	123	79.4%
	Separated/Divorced	6	3.9%

Table 2: Maternal marital status



	Mean	Median	Standard Deviation
Age of Mother ( In completed years)	27	26	5
Number of Living Children ( Parity)	2	2	1

Table 3: Maternal age and parity

#### 4.1.2 Religion, Occupation, and Level of Education

The majority of informants were Christians distributed between Catholics (29.0%) and Protestants (64.5%). The rest belonged to the Muslim faith (3.9%) or other religious persuasion (2.6%). Nearly half of the mothers 47.7%, (n= 74) described their occupation as being housewives whereas 26.5% (n=41) were in self-employed. Only 14.2% (n=22) of the mothers were in salaried employment (Table 4). The occupation distribution closely mirrors the educational level of informants which shows that the percentage of mothers who had at least completed secondary school totaling 50.9%.

		Frequency (n)	Percent (%)
Religion	Catholic	45	29.0%
	Protestant	100	64.5%
	Muslim	6	3.9%
	Other	4	2.6%
Maternal Occupation	Housewife	74	47.7%
	Casual laborer	12	7.7%
	Self employed	41	26.5%
	Salaried employment	22	14.2%
	Other	6	3.9%
Maternal level of education	None	4	2.6%
	Lower primary	1	0.6%
	Upper primary	37	23.9%
	Secondary incomplete	32	20.6%
	Secondary complete	47	30.3%
	College/University	33	21.3%
	Other	1	0.6%

Table 4: Maternal age, occupation and level of education

### 4.1.3 Distribution by Residence and Income

Informants were drawn from areas within the vicinity of the health facility and the outskirts of Nairobi city as shown in Table 5. Most of the residential areas listed are low income areas. On average each household had 4 residents. The composition of informants by residence and household income is as shown in table 5.

		Frequency (n)	Percent (%)
Residence ( Specify Estate )	Eastlands	54	34.8%
	Kibera	29	18.7%
	Industrial area	6	3.9%
	Southlands	10	6.5%
	Dagoretti	15	9.7%
	Rongai	15	9.7%
	Thika road	26	16.8%
Average household monthly income in Kenya Shillings	Upto 5000	40	25.8%
	5000-10000	45	29.0%
	11000-20000	45	29.0%
	21000-30000	12	7.7%
	Over 30000	7	4.5%
	Other	6	3.9%

Table 5: Distribution by residence and household income.

The distribution of informants by monthly income shows that more than half of the participants had an average household income of ten thousand shillings or less placing them in the low income bracket. The distribution by income is shown in Figure 2.

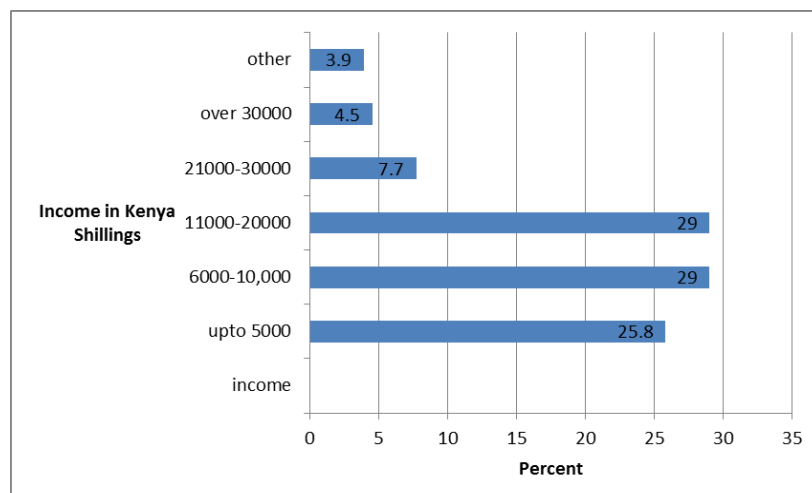


Figure 2: Average monthly household income

## 4.2 INFANT CHARACTERISTICS

The index child sample comprised 59.4% male and 40.6% female with a mean age of 12 months. Of the infants and young children, 43.9% (n= 68) were first borns, 34.2% (n=53) second borns and the other birth orders represented 20.2% (n=33). The average birth weight of index children was 3.2 kilograms +/- 0.6 kilograms while their average current weight was 9.0 kilograms +/- 1.8 kilograms. Index child pregnancies were reported to be planned in 71.6% (n=111) of the cases and 28.4% (n=44) unplanned with 93.5% (n=144) of the mothers attending at least 3 or more antenatal sessions. Infants and young children delivered in a health facility comprised 96.8% of the population and 76.1% (n=118) were born at term. Children immunized as per schedule were 99.4 % ( n=154). In this study the infant characteristics outlined were not statistically significant correlates of complementary feeding practice.

		n	%
Gender of Child	Male	92	59.4%
	Female	63	40.6%
Birth Order of Child	1	68	43.9%
	2	53	34.2%
	3	23	14.8%
	4	9	5.8%
	5	1	0.6%
	6	1	0.6%
Desirability of pregnancy of index child	Planned	111	71.6%
	Unplanned	44	28.4%
Number of Ante Natal Sessions Attended During Pregnancy	None	2	1.3%
	1-2	7	4.5%
	3-4	67	43.2%
	>4	78	50.3%
	Other	1	0.6%
Place Of Delivery	Home	4	2.6%
	Health facility	150	96.8%
	Other	1	0.6%
Maturity of the infant at Birth	Preterm	19	12.3%
	Term	118	76.1%
	Postdates	18	11.6%

Table 6: Index child characteristics

	Mean	Median	Minimum	Maximum	Standard deviation
Birth Weight of Index child in Kilograms	3.2	3.2	.8	4.9	.6
Current Weight of index child in Kilograms	9.0	8.8	5.3	14.9	1.8

Table 7 : Weight of index children

In terms of morbidities associated with complementary feeding diarrhea was found to be the most prevalent nutrition related morbidity affecting 58.2% (n=89) infants with an average of 2 episodes per affected child. It is followed by pneumonia which affected 32.5% (n=50) of the infants and young children and last by atopic dermatitis which affected 5.3% (n=8) each having an average of one episode per child.

		Frequency ( n )	Percent (%)
Occurrence of diarrhea	Yes	89	58.2%
	No	64	41.8%
Occurrence of atopic dermatitis	Yes	8	5.3%
	No	143	94.7%
Has the infant /child pneumonia	Yes	50	32.5%
	No	104	67.5%

Table 8: Morbidities associated with complementary feeding

	Mean	Median	Minimum	Maximum	Standard deviation
Diarrhea episodes	2	2	1	5	1
Dermatitis episodes	1	1	1	1	0
Pneumonia episodes	1	1	1	3	1

Table 9 : Episodes of morbidities associated with complementary feeding

### 4.3 CAREGIVER KNOWLEDGE AND PREVIOUS PRACTICE

#### 4.3.1 Prior Knowledge and source of information

Among the caregivers, 66.2%, (n=102) of the caregivers had prior knowledge on complementary feeding before the birth of the index child. Of these, 55.2% (n=58) listed healthcare providers as the source of this information, 28.6% (n=30) listed previous

experience while relatives, friends and neighbors combined accounted for 13.3% (n=14) of the source. After birth of the child the primary source of information on complementary feeding still remained the Health care providers 54.5% ( n=84), followed by Friends and neighbors 16.9% (n=26) ,previous experience 14.3% ( n=22) , Relatives 12.3% (n=19). This indicates that after the birth of infants and young children, despite the fact that health care workers are a major source of information on complementary feeding, caregivers also rely on non-healthcare worker sources of information.

		n	%
Had information on complementary feeding before the birth of index child	Yes	102	66.2%
	No	52	33.8%
Source prior information	Health care providers	58	55.2%
	Previous experience	30	28.6%
	Relatives	8	7.6%
	Friends and neighbors	6	5.7%
	Media	0	0.0%
	Other	3	2.9%
Primary source of information on complementary feeding after birth of child	Health care providers	84	54.5%
	Previous experience	22	14.3%
	Relatives	19	12.3%
	Friends and neighbors	26	16.9%
	Media	1	0.6%
	Other	2	1.3%

Table 10: Caregiver knowledge on complementary feeding

### 4.3.2 Complementary Feeding Practice Knowledge

#### 4.3.2.1 Knowledge on Breastfeeding practice after introduction of complementary feeds

The mean age at which caregivers reported that complementary feeds be introduced was 6 months with the least age of introduction being listed being 1 month and the greatest age 7 months. Among the caregivers, 64.1% (n=98) stated that infants should be breastfed on demand after introduction of complementary feeds, which is the recommended frequency while 6.5% (n= 10) and 24.8% (n= 38) reported that they should be breastfed one to two times and three to four times respectively. Some 4.6% (n=7) of informants reported that the

infants and young children should be fed on other frequency regimes. The mean age stated as the minimum period required for breastfeeding an infant and young child was 24 months. These findings indicate that caregivers are knowledgeable on recommended breastfeeding practice after introduction of complementary feeds.

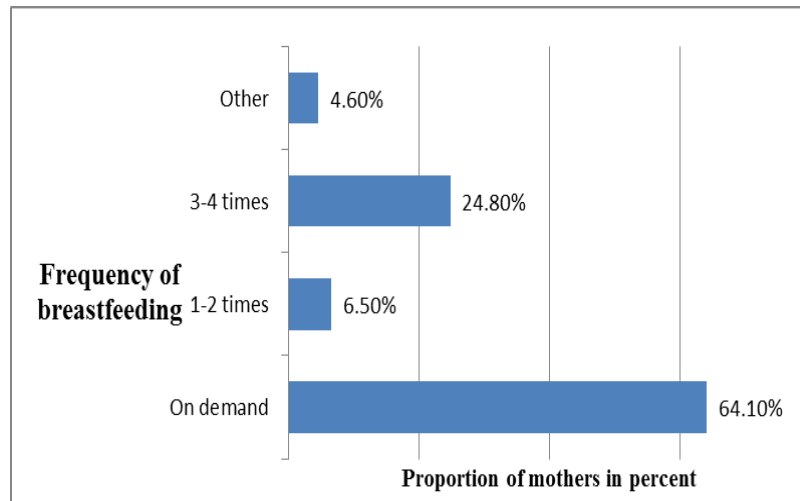


Figure 3: Knowledge on frequency of breastfeeding after introduction of complementary feeds

#### 4.3.2.2. Knowledge on dietary composition and food consistency

Only 38.3% (n= 59) of the informants were knowledgeable on the ideal dietary composition of complementary feeds while 61.7% (n=95) were not. Majority of informants also stated that the consistency of food at six months should be semi-solid (90.9%) with only 5.8% reporting liquid consistency and 3.2% reporting that the consistency should be solid. Low levels of knowledge on dietary diversity mirrors the sub optimal levels of compliance to the recommended dietary diversity seen among complementary fed infants and young children in this study

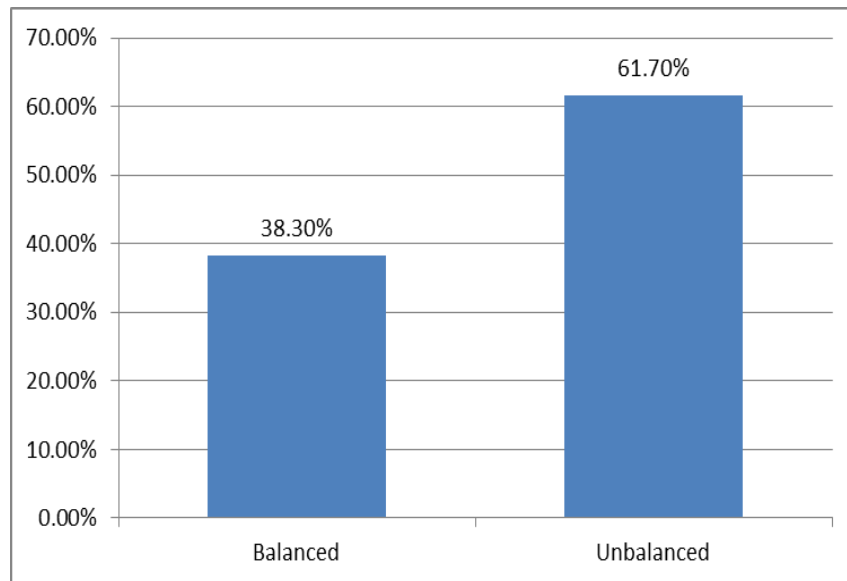


Figure 4: Caregiver knowledge on dietary composition

#### 4.3.1.4 Influence of older sibling.

The mean age of introduction of complementary feeds to the immediately older sibling of the index child was 5.1 months with a standard deviation of 1.6 months. The lowest age stated was 0.5 months and the highest 7.0 months. The main reason stated by caregivers for introducing complementary feeds at the given time is that they were advised by health care personnel 44.7% (n=38). Of the children, 77.0% (n=67) progressed within the recommended paths after introduction of complementary feeds while 19.5% (n=17) deteriorated. This outcome was reported by caregivers 53.5% (n=46) to have had an influence on the complementary feeding practice in the index child. The influence of the older sibling brings out the role of previous experience in determining the infant and young child feeding practices. This study however has not demonstrated the influence of the older sibling to be statistically significant.

## 4.4 SOCIAL SUPPORT

### 4.4.1 Partner Involvement and complementary feeding consultant

Caregivers that stated that their partners participated in feeding their children were 75.2% (n=115) while 13.7% (n=21) reported that they did not participate. Of those who did not

participate in the feeding of the infant, cultural reasons accounted for 19.0%, lack of knowledge 14.3% while other reasons relating to unavailability and conflicting work schedules made up 66.7% ( n=14). Caregivers who consulted healthcare workers on complementary feeding when need arose were 41.6% (n=64), 24 %( n=37) and 18.2(n=28) consulted experienced neighbors and relatives respectively, previous experience and other people such as traditional birth attendants 15.6% (n=24) of the consultants. This finding highlights the role of non-healthcare support for caregivers of infants and young children in complementary feeding.

#### 4.4.2 Role of Alternate Caregivers

Half of the mothers (53.6%) relied on other persons to care for their infants. The frequency with which such infants were left in the care of alternative persons is shown in Table 11.

	Average time child left	Frequency (n)	Percentage (%)
Frequency of leaving child with alternate caregiver	30-21 days per month	40	47.6%
	20-11 days per month	8	9.5%
	10-6 days per month	2	2.4%
	<6 days per month	34	40.5%

Table 11: Frequency of leaving child with alternate caregiver

Relatives accounted for 38.6% (n=32) of the alternate caregivers, House helps 22.9% (n=19), partners/fathers 13.3% (n=11) older children 2.4% (n=2) and other which was predominantly daycare, represented 10.8% (n=9) of alternate caregivers. With this significant proportion of caregivers relying on alternate caregivers for the care of infant and young child feeding for a significant proportion of time, their role in infant and young child feeding practice and adherence to recommended practice is pivotal.

The reasons given for leaving child in the care of other persons were work-related (61.4%), ill-health (6.0%) or unspecified (32.5%) meaning that for majority of these mothers, the



alternate caregiver is a necessity. The primary caregivers rated the quality of care from alternative caregivers as good (61.4%), poor 32.5% (n=27) and fair 6% (n=5).

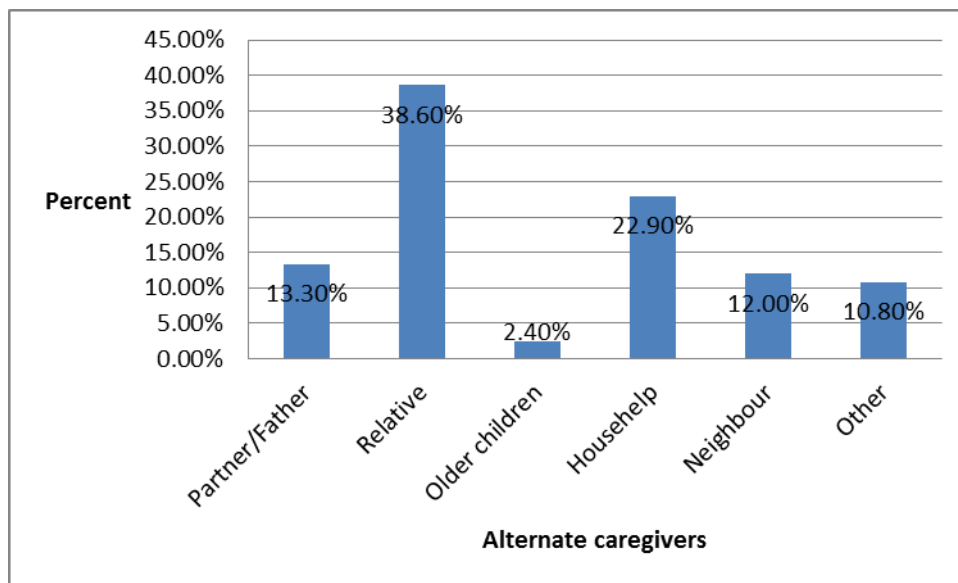


Figure 5: Alternate caregivers

#### 4.5 ROLE OF HEALTH CARE WORKERS

Health care workers acted at the primary source of information and advice on complementary feeding to caregivers. The mothers that learnt about complementary feeding at the antenatal clinics comprised 41.6% (n=64), 18.2% (n=28) obtained the information immediately after delivery, 13% (n=20) within the first three months of MCH visit, 20.1% (n=31) were informed about complementary feeding at the sixth month visit to the clinic and another 7.1% (n=11) got the information from health care workers at other forums.

The caregivers that reported to have been given information by a health care worker on timely introduction to complementary feeds at 6 months were 97.7% (n=126). This is mirrored in the maternal level of knowledge where mean age stated for introducing complementary feeds was 6 months. Those reporting to have been educated on ideal dietary composition were 77.5% (n=110), while those that had information on the ideal feeding frequency at 6 months were 64.3% (n=74). Only 75.7% (n=106) caregivers felt that the health care worker was knowledgeable and only 78.0% (n=110) put their advice into practice.

Despite the fact that caregivers relied on information from healthcare workers, inconsistency in delivering information in terms of frequency of health education, completeness of information on recommended complementary feeding practice and lack of confidence in the knowledge of the health care workers may be the reason the caregivers seek other sources of information.

		Frequency (n)	Percent (%)
First time a health care worker discussed complementary feeding	Antenatal clinic	64	41.6%
	Immediate post delivery	28	18.2%
	In the first 3 months of MCH visits	20	13.0%
	6 month visit	31	20.1%
	Other	11	7.1%
Information/ lessons on complementary feeding in routine immunization clinics	Yes	101	66.4%
	No	50	32.9%
	N/A	1	0.7%
Advice on time of introduction of complementary feeds	2	1	0.8%
	6	126	97.7%
	7	1	0.8%
	9	1	0.8%
Given information on the ideal content composition of complementary feeds	Yes	110	77.5%
	No	32	22.5%
Advice on frequency of feeding of a child on complementary feeds	1	4	3.5%
	2	17	14.8%
	3	74	64.3%
	4	14	12.2%
	5	6	5.2%
Felt health worker was knowledgeable	Yes	106	75.7%
	No	34	24.3%
Put advice to practice	Yes	110	78.0%
	No	31	22.0%

Table 12: Health care worker role in educating caregivers

## 4.6 COMPLEMENTARY FEEDING PRACTICE

### 4.6.1 Breastfeeding Practice

In line with recommended practice, the proportion of infants and young children on complementary feeding that were breastfeeding were 87.6% (n=134).

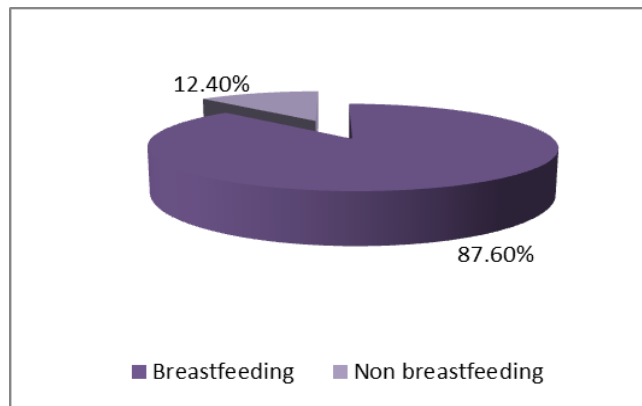


Figure 6: Breastfeeding Infants and young children

The frequency and regimes of breastfeeding are shown in the table 11. Breastfeeding on demand which is the ideal regime was reported by 72.6% (n=98) of breastfeeding mothers.

On average the infants and young children breastfed 6 times the previous day.

		Frequency ( n )	Percent (%)
Breastfeeding Regime	On demand	98	72.6%
	Scheduled time	11	8.1%
	When convenient	26	19.3%
	Other	0	0.0%
Number of times child consumes breast milk in a day	1-2 times a day	8	5.9%
	2-5 times a day	41	30.4%
	6-8 times a day	27	20.0%
	>8 times a day	59	43.7%

Table 13: Breastfeeding practice

#### 4.6.2 Introduction of complementary foods

Infants and young children who had been introduced to complementary feeds comprised 96.4% (n=150) of the population. The average age of introduction to complementary feeds was 6 months. The highest age at which a child was introduced was 9 months and the lowest 3 months. The mean age stated by mothers to be the ideal age of introduction to complementary feeds was 6 months. The major reason accounting for the introduction of complementary feeding was that the mother did not have adequate breast milk 21.9% (n=33).

		n	%
Age ( in months)of introduction	3	4	2.6%

of index child to complementary feeds	4	13	8.6%
	5	8	5.3%
	6	101	66.9%
	7	22	14.6%
	8	2	1.3%
	9	1	0.7%

Table 14: Age of introduction to complementary feeds

### 4.6.3 Dietary Diversity

Dietary diversity was measured by the variety of food groups consumed by the Infants and young children the previous day. On average infants on complementary feeding received foods from 3 food groups which is below the recommended Minimum dietary diversity. Only 45.81 % of infants and young children attained the recommended Minimum dietary diversity while 54.2% did not.

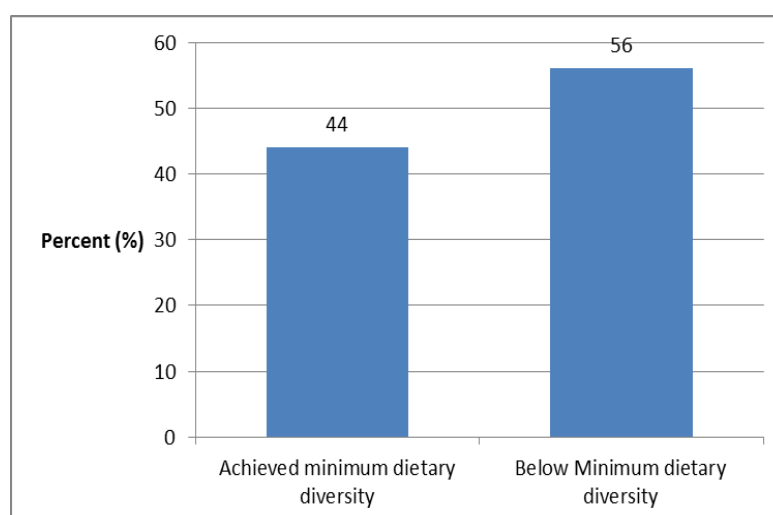


Figure 7 : Infants achieving minimum dietary diversity

Minimum dietary diversity was correlated to Maternal occupation and level of education  $P = 0.012$  and  $P = 0.018$  respectively at a 0.05 level of significance. Working mothers including casual laborers, self employed mothers and those in salaried employment were more likely to provide a diverse diet compared to housewives. Partner participation also influenced dietary diversity with a  $P = 0.048$  it is apparent that those whose partners participated in caregiving were less likely to provide a diverse diet. Information to caregivers on ideal composition of complementary feeds by health care workers was significantly associated with the dietary

diversity  $P = 0.017$ . The caregivers who had been given information on ideal dietary composition were more likely to provide the minimum dietary diversity.

		Recommended Dietary diversity		Below recommended Dietary diversity		P Value
		n	%	n	%	
Maternal Occupation	Housewife	25	34.7%	47	65.3%	0.012
	Casual laborer	8	66.7%	4	33.3%	
	Self employed	19	46.3%	22	53.7%	
	Salaried employment	8	42.1%	11	57.9%	
	Other	6	100.0%	0	0.0%	
Maternal level of education	None	4	100.0%	0	0.0%	0.018
	Lower primary	0	0.0%	1	100.0%	
	Upper primary	10	28.6%	25	71.4%	
	Secondary incomplete	15	46.9%	17	53.1%	
	Secondary complete	17	37.0%	29	63.0%	
	College/University	19	61.3%	12	38.7%	
	Other	1	100.0%	0	0.0%	
Partner participation	Yes	45	39.5%	69	60.5%	0.048
	No	9	50.0%	9	50.0%	
	N/A	12	70.6%	5	29.4%	
Health care worker education on dietary diversity	Yes	54	50.0%	54	50.0%	0.017
	No	8	25.8%	23	74.2%	

Table 15 : Correlates of dietary diversity

### 4.6.3 Meal Frequency

The frequency with which infant received solid, semi-solid, or soft food is summarized in table 16.

		n	%
Frequency of feeding	1	3	2.0%
	2	41	27.3%
	3	71	47.3%
	4	30	20.0%
	5	5	3.3%

Table 16: Feeding frequency

After disaggregating the age groups as in Table 17 below, the proportion of infants and young children 6-8 months who received at least 2-3 meals the previous day represented 26.7% of the population and those 9-24 months (9-11 months and 12-24 months) who received at least 3-4 meals the previous day were 52.6%. Therefore the proportion of infants and young children who attained the Minimum Meal Frequency was 79.3%.

		Infant age group			
		6-8 months		9-24 months	
		n	%	n	%
Frequency of feeding	1	0	0.0%	3	2.0%
	2	13	8.7%	28	18.7%
	3	21	14.0%	50	33.3%
	4	6	4.0%	24	16.0%
	5	0	0.0%	5	3.3%

Table 17: Meal frequency in disaggregated age groups

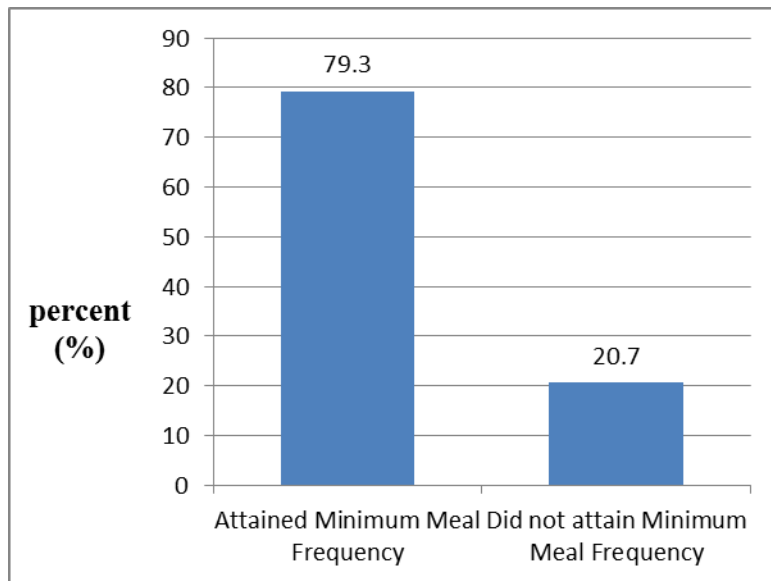


Figure 8: Infants and young children attaining Minimum Meal Frequency

## **CHAPTER FIVE: DISCUSSION, RECOMMENDATIONS AND CONCLUSION**

### **5.0 INTRODUCTION**

The focus of this study was to establish the correlates of complementary feeding practice among caregivers of infants and young children aged 6-24 months at Mbagathi District hospital. The findings of the study show low levels of compliance to recommended complementary feeding practice. The correlates of complementary feeding practice that were identified included the Maternal occupation and level of education, Knowledge of recommended complementary feeding practice, healthcare worker support and the support of the partners. These findings are consistent with findings of other similar studies done in Tanzania, Kenya, Ethiopia, India and Bangladesh (Kabir et al, 2012, Kimani-Murage et al, 2011, Patel et al 2012).The study also highlights the role of healthcare providers in enhancing recommended complementary feeding practices. It is also important to note that friends and relatives comprised an important source of information on complementary feeding practices.

### **5.1 COMPLEMENTARY FEEDING PRACTICES AND COMPLIANCE TO RECOMMENDED PRACTICE**

The study findings show that slightly over half of the participants introduced complementary feeds at the appropriate age of 6 months. This is a significantly low level of compliance to the recommended timing. This statistics however, differ from the findings of the Kenya Demographic Health Survey statistics (KDHS, 2008/09) which show that only 32% of infants and young children are introduced to complementary feeds at 6 months while a majority are introduced earlier. This difference in findings could be accounted for by the urban setting of the study, a hospital based sample and the likelihood of respondents giving a socially desirable response. Time of introduction was strongly correlated to residence with those from the outskirts of the city being more likely to introduce complementary feeds earlier. The economic status as measured by average monthly income was also a significant correlate of complementary feeding practice with the higher income earners displaying a propensity to



introduce feeds earlier compared to other groups. Maternal knowledge on ideal time of introduction to complementary feeds and advice by health care workers on ideal timing of introduction to complementary feeds were found to influence timely introduction to complementary feeds. This is consistent with the findings of other studies that have found maternal knowledge, directly influenced by health care expert advice to be a strong determinant of compliance to recommended complementary feeding practice (Patel et al, 2010, Senararth et al, 2012).

Slightly below half of infants and young children in the study were found to be attaining the recommended dietary diversity. Dietary diversity was strongly correlated to maternal occupation with those being in salaried employment being more likely to adhere to the recommended guidelines. This could be attributed to the fact that economic capability determines the ability to provide a diverse diet as shown in studies that have demonstrated that household income and wealth are determinants of dietary diversity (Arimond and Ruel, 2006). Similar studies have also demonstrated that unemployment is a barrier to recommended complementary feeding practice (Joshi et al, 2012, Senararth et al, 2012)

In line with the Kenya Demographic Health Survey 2008 statistics, it was found that about 70% of infants and young children were fed on a recommended frequency regime. Findings from this study did not reveal any significant correlates to minimum dietary frequency.

## **5.2 CORRELATES OF COMPLEMENTARY FEEDING PRACTICE.**

Study findings demonstrated that the maternal characteristics that impacted significantly on complementary feeding practice were maternal occupation, residence and marital status. The relationship to complementary feeding practice was varied. Employed mothers were more likely to introduce their infants and young children to complementary feeds earlier than the unemployed and conversely they were more likely to provide a diverse diet compared to the unemployed mothers. This could be explained by the fact that the mothers leave their infants

at a younger age to return to work and the fact that a consistent income increases the wealth index and purchasing power of the family. Other similar studies have also demonstrated this trend. A study on determinants of dietary diversity in complementary feeding by Arimond and Ruel, 2006 has shown this. In terms of residence, it was found that mothers residing closer to the facility were more likely to adhere to recommended feeding guidelines while those from the outskirts of the city less likely. Single mothers were more likely to introduce their children to feeds earlier than their married, cohabiting or ever married counterparts. This is consistent with the findings of a similar study conducted in a slum settlement in Nairobi where it was found that having never been married in a union increases the risk of early introduction to complementary feeds (Kimani- Murage, 2011) A study on complementary feeding in Tanzania also highlighted the role of the same factors in influencing complementary feeding (Victor et al, 2012).

Infant and young child characteristics such as maturity at birth, birth weight, desirability of index pregnancy and gender of the child were not found to be correlates of complementary feeding practice. This is a contrary to a study conducted in Nairobi in informal settlements that showed all these factors to be determinants of complementary feeding practice ( Kimani- Murage 2011) . This difference in findings could be attributed to a smaller sample size, a hospital based sample which differs greatly from the sample of the above study and the focus and quantitative methodology applied in the study.

Partner support was shown to negatively influence the time of introduction of feeds with resulting in earlier introduction this is a contrast to other studies that have shown partner support to be a factor enhancing compliance to complementary feeding practice.

Health care worker support in terms of nutrition education was shown to be a significant correlate of timely introduction to complementary feeds and provision of a diverse diet. It is likely that the nutrition knowledge among caregivers improved when they were frequently

counseled by health workers and possibly improved caregivers' knowledge in food preparation, and healthy feeding behaviors. As a result, caregivers were more likely to improve their children's feeding frequency and dietary diversity (Palwala et al,2009). However this study demonstrated that there was a lack of consistency in information delivered to caregivers by health care workers in terms of the timing of health education, frequency and content. It is to be noted that despite having been educated on complementary feeding practices, some of the caregivers did not feel that the health care workers were knowledgeable enough and quite a good proportion did not put their advice to practice. These could explain the why friends, neighbors and relatives comprise an important source of complementary feeding advice, and provide a possible explanation to the poor levels of compliance to recommended complementary feeding practice. Prior knowledge and experience have also been shown to be significant correlates of complementary feeding practice (Sunguya et al, 2013, Pelto et al, 2004, Kimani- Murage, 2011).

### **5.3 HEALTH OUTCOMES RELATED TO COMPLEMENTARY FEEDING PRACTICE.**

Diarrhea was found to be the most prevalent and frequent nutrition associated morbidity affecting a significant proportion of the population. It was followed by pneumonia and atopic dermatitis. Early introduction may be associated with increased risk of allergy (Kajosaari, 1991; Armentia et al, 2001), eczema (Ferguson et al, 1990; Forsyth et al, 1993) and enteritis (Popkin et al, 1990). However from the findings of the study, the relationship between early introduction of complementary feeds and morbidities associated with complementary feeding was not statistically significant.

## **5.4 CONCLUSIONS AND RECOMMENDATIONS**

### **5.4.1 CONCLUSIONS**

Compliance to recommended complementary feeding practice remains low among caregivers of infants and young children at Mbagathi District Hospital. Maternal Age, level of education, and occupation were found to be significant correlates of complementary feeding practice with the higher level of education being shown to enhance compliance to recommended complementary feeding practice. Alternate caregivers are an important group of caregivers in infant and young child feeding hence must be targeted for interventions to ensure optimal health outcomes among infants and young children. Health care providers are the most important source of information on complementary feeding to mothers. However, the information they to mothers on recommended complementary feeding practice was reported to be inconsistent in terms of frequency and content. Previous maternal experience and presence of an immediately older sibling influences complementary feeding practice. The study also highlights the role of friends, relatives and neighbors as sources of information on complementary feeding perhaps resulting in contradictory messages to caregivers hence low compliance to recommended complementary feeding practice. Majority of informants of had insufficient knowledge on dietary composition of infants' diet a finding that correlates to the indicator minimum dietary diversity. Regarding health outcomes associated with complementary feeding practices, diarrhea emerged as a great challenge. The high incidence and frequency of diarrhea in this group indicate the urgent need for intervention targeted towards addressing it.

### **5.4.2 RECOMMENDATIONS.**

To enhance adherence to recommended IYCFP, household socioeconomic status and maternal levels of education are key areas that should be addressed by the government at policy level.

Individual health facilities must take initiative to develop systems and structures that support nutrition education on infant and young child feeding to caregivers at every contact opportunity and at the earliest point in the reproductive life of these mothers. Teachings must be tailored to the socio demographic setting, consistent in content, frequency and timing of delivery. In addition, investments should be made towards improving the capacity of health care workers in performing this role. Home-based counseling of mothers and alternate caregivers on infant and young child feeding by community based health workers and support of private service providers by the ministry of health to offer services according to established government guidelines is key. Social marketing and use of social and behavior change communication strategies targeting primary social support systems of caregivers should be utilised to enhance knowledge and application of appropriate complementary feeding practices in households caring for infants and young children.

#### **5.4.3 SUGGESTIONS FOR FURTHER RESEARCH**

Study findings demonstrate a high incidence of diarrhea among infants on complementary feeding in terms of the proportion of children affected and frequency (2 episodes per affected child). Nutrition related morbidity in this study was investigated as a secondary outcome and since the study was not designed or powered to detect differences in morbidity or causes, it is suggested that further research be undertaken to investigate the exact nature of the relationship between complementary feeding and diarrhea episodes. The study should go beyond establishing a correlation and attempt to identify the exact actions and habits which might be causing this occurrence.

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## TIME SCHEDULE AND WORK PLAN

Activity \ Month	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Proposal development and supervisor clearance								
Forwarding to KNH-ERC								
Questionnaire pretesting								
Data collection								
Data processing and Analysis								
Report Writing								
Draft report presentation and corrections								
Final report presentation and Submission								
Thesis Defence								

## APPENDICES

### APPENDIX I: BUDGET

	Item	Units	Unit cost	Total cost
Stationery	A4 Notebooks	3	150	450
	Reporter's Notebook	3	80	240
	Pens	10	25	250
	Pencils	6	10	60
	Erasers	3	30	90
	Folders	8	60	480
	Clip Boards	3	200	360
	Sharpeners	3	30	60
<b>Sub total</b>				<b>1,990</b>
Services	<b>Photocopy</b>			
	Proposals			
	3 Drafts @ 50 pages	150	2	300
	4 Final copies @ 60 pages	240	2	480
	Thesis reports			
	3 Drafts @80	240	2	960
	1 Draft @80 pages for Ext. Examiner	80	2	160
	<b>Printing</b>			
	Proposals			
	3 Drafts @ 50 pages	150	5	750
	1 Final copy @ 60 pages	60	5	300
	Thesis reports			
	3 Drafts @80 pages	240	5	1,000
	1 Draft @80 pages for Ext. Examiner	80	5	400
	5 Final Copies @ 80 Pages	400	5	2,000
	<b>Binding</b>			
	Proposals			
	5 copies	5	40	200
	Thesis Reports			
	5 Copies	5	500	2,500
<b>Data Processing and Analysis</b>			20,000	
<b>Communication</b>				
Airtime				
Researcher		5000	5,000	
3 Assistants	3	1000	3,000	
<b>Sub Total</b>				<b>37,050</b>
Transport	Data Collection Period			
	30 Days			
	Researcher	30	200	6,000
	3 Assistants	30	200	18,000
	Questionnaire Pretesting			
3 Days				
Researcher	3	100	300	
2 Assistants	3	100	600	
<b>Sub Total</b>				<b>24,900</b>
Personell	Research Assistants	3	10,000	30,000
<b>Sub Total</b>				<b>20,000</b>
	Dissemination budget		15,000	<b>15,000</b>
<b>Total</b>				<b>108,940</b>
Contingency	10% of Total			10,894
<b>Grand Total</b>				<b>119,838</b>



## **APPENDIX II: INFORMATION AND CONSENT FORM**

**Study Title :** Correlates of complementary feeding practices among caregivers of infants and young children aged 6-24 months at Mbagathi District Hospital, Nairobi.

**Investigator:** Mwita Lina Otaigo.  
School of Nursing Sciences,  
University of Nairobi  
Po Box 19676, Nairobi.

### **Introduction:**

Good day,

My Name is Lina Mwita, a Master of Science in Nursing student at the School of Nursing Sciences, University of Nairobi. I am conducting a study titled: **Correlates of complementary feeding practices among caregivers of infants and young children aged 6-24 months at Mbagathi District Hospital, Nairobi.** This study is being conducted at The Mbagathi District Hospital, Nairobi, Kenya.

The purpose of this consent is to give you information pertaining to study that will enable you make an informed decision regarding participation. You are free to ask questions to clarify any of the aspects we will discuss in this information and consent form.

**Background and objective:** The purpose of this study is to establish those factors that influence the complementary feeding practices of caregivers of infants and young children aged 6- 24 months and also the outcomes of these practices. This is because complementary feeding practice plays a significant role in ensuring optimal health of infants and young children. Therefore understanding these factors will provide information that will be useful in enhancing the practice of recommended complementary feeding practices.

**Participation:** Participation in the study will entail answering questions which will be filled by the interviewer in the questionnaire. The interviewer will also request to refer to your child's health booklet. Neither you nor your child will be subjected to any invasive procedure.

**Benefits :**The results of the study will be useful in facilitating the understanding of factors that impact and those that are influenced by complementary feeding practice. The findings will be availed to the hospital, other relevant decision makers and stakeholders to aid in putting in place measures that will guide and encourage mothers and caregivers in feeding Infants and young children appropriately to ensure good health.

**Risks:** There are no risks to participating in the study. However, due to the time taken in responding to questions and during health education, you may take a longer time than usual in the clinic.

**Confidentiality:** I assure you that confidentiality will be maintained and the information you provide will only be used for the intended purpose of the study. In addition, your name or that of your infant will not be required thus ensuring your anonymity.

**Voluntary participation:** Participation in this study is voluntary. Refusal to take part will not attract any penalty. You retain the right to withdraw from the study without any consequences.

**Compensation:** There is no compensation for participating in the study.

If you Consent to Participate in the study please sign below:

I hereby consent to participate in this study. I have been informed of the nature of the study being undertaken and that there are no risks or invasive procedures involved. I also understand that my participation in the study is voluntary and the decision to participate or not to participate will not affect my treatment in any way whatsoever. I may also choose to discontinue my involvement in the study at any stage without any explanation or consequences. I have also been reassured that my personal details and the information I will relay will be kept confidential. I confirm that all my concerns about my participation in the study have been adequately addressed by the investigator.

Participant's Signature (or thumbprint).....Date.....

I confirm that I have clearly explained to the participant the nature of the study and the contents of this consent form in detail and the participant has decided to participate voluntarily without any coercion or undue pressure.

Investigator's Signature..... Date .....

Witness's signature .....Date.....

For any Clarification, please contact

Lina Otaigo Mwita

Researcher

Mobile Number: 0720594647

Email; otaigolm@yahoo.com

or

The Chairman,

University of Nairobi- Kenyatta National Hospital Ethics and Research Committee

Tel: 020-2726300 Ext 44355

## APPENDIX II: QUESTIONNAIRE

### QUESTIONNAIRE ON CORRELATES OF COMPLEMENTARY FEEDING PRACTICE AMONG CAREGIVERS OF INFANTS AGED OVER 6 -24 MONTHS ATTENDING MBAGATHI DISTRICT HOSPITAL CHILD WELFARE CLINIC

Serial Number \_\_\_\_\_ Questionnaire Status \_\_\_\_\_ (1=complete; 2= partially complete)

Interviewer ID \_\_\_\_\_ Date of Interview \_\_\_\_/\_\_\_\_/\_\_\_\_ Caregiver/Child dyad Number \_\_\_\_\_

*Instructions: Where applicable; Circle the appropriate response or fill responses in the provided spaces, specific instructions are in italicized bold lettering.*

#### SECTION 1: SOCIO DEMOGRAPHIC INFORMATION

No.	Question	Code	
101.	Informant	1 2 3 4 9	Mother Father Grandparent Sibling Other ( Specify ) _____
102.	Infant's Primary Caregiver	1 2 3 4 5 9	Mother Father Grandparent Sibling Househelp Other ( Specify ) _____
103	Head of household	1 2 3 4 5 9	Mother Father Grandparent Sibling Househelp Other ( Specify ) _____
104.	Age of Mother ( <i>In completed years</i> )		
105.	Maternal marital status	1 2 3 4 5 9	Single ( Never Married) Cohabiting Married Separated/ Divorced Widowed Other ( Specify ) _____
106.	Number of Living Children ( Parity)		
107.	Religion	1 2 3 9	Catholic Protestant Moslem Other ( Specify ) _____

108.	Maternal Occupation	1 2 3 4 9	Housewife Casual Labourer Self Employed ( business) Salaried Employment Other ( Specify)_____
109	Maternal level of education	1 2 3 4 5 6 9	None Lower Primary ( 1-3) Upper Primary ( 4-8) Secondary ( Not completed) Secondary ( Completed) College/ University Other ( Specify)_____
110.	Residence ( <i>Specify Estate</i> )		
111.	How many people in total reside in the residence?		
112.	What is the average household monthly income ?(in Kenya Shillings)	1 2 3 4 5 9	upto 5,000 5,000-10,000 11,000-20,000 20,000-30,000 Over 30,000 Other ( Specify)_____

#### SECTION II: INFORMATION ON INDEX CHILD

No.	Question	Code	
201.	Age in Months ( <i>Confirm from immunization card</i> )		
202.	Gender of Child	1 2	Male Female
203.	Birth Order of Child		
204.	Age of immediate older sibling		
205	Desirability of pregnancy of index child	1 2	Planned Unplanned
206	Number of Ante Natal Sessions Attended During Pregnancy	1 2 3 4 9	None One to Two Three to Four More Than four Other ( Specify)_____
207	Place Of Delivery	1 2 9	Home Health Facility(Specify)_____ Other(Specify)_____
208.	What was the maturity of the infant at Birth?	1 2 3	Preterm Term Postdates
209	Birth Weight of Infant at Birth in Kilograms ( <i>Confirm from immunization card</i> )		
210	Current Weight of child in Kilograms ( <i>Confirm from immunization card/ health record</i> )		
211.	For each weight for age entry in the road to health curve, list the age weight and the growth percentile for each. ( <i>refer to road to health growth curve in card</i> ) <b>Age in months    Weight for Age Percentile</b>		

212a.	Is the child immunized as per Schedule ( <i>Confirm from Card</i> )	1 2	Yes ( <i>Skip to 213</i> ) No ( <i>Proceed to 212b.</i> )
212b.	If No, Why?	1 2 3 9	Mother too busy Facility too far Mother does not think it is important Other ( Specify)_____
213	Has the infant /child had any episode of the following conditions or illnesses since introduction of complementary feeds? ( <i>probe and highlight code and number of episodes against each condition in list</i> ) <b>Code</b> Diarrhoea _____ Atopic Dermatitis _____ Pneumonia _____	1 2	Yes No  Episodes _____ Episodes _____ Episodes _____

### SECTION III: CAREGIVER KNOWLEDGE AND PREVIOUS PRACTICE

No.	Question	Code	
301a.	Did you have any information on complementary feeding before the birth of this child?	1 2	Yes No ( <i>skip to 302</i> )
301b.	What was the source this information?	1 2 3 4 9	Health Care Providers Previous experience Relatives Friends and Neighbours Media ( Radio, Tv, Newspapers Other ( Specify)_____
302	After the birth of your child, what was your primary source of information on complementary feeding?	1 2 3 4 5 9	Health Care Providers Previous experience Relatives Friends and Neighbours Media ( Radio, Tv, Newspapers Other ( Specify)_____
303	What is the recommended time for introduction of foods and drinks other than breast milk be introduced to infants?		
304	Upto what age should the infant continue breastfeeding after introduction of other foods?		
305	How frequently should they breastfeed after they start on other feeds?	1 2 3 9	On Demand 1-2 times 3-4 times Other Specify

306	What should an infant's diet consist of? ( <i>list all foods mentioned</i> )		
307	What consistency of food should be given at six months of age? ( <i>do not probe –circle more than one as stated by respondent</i> )	1 2 3	Liquid ( eg water, milk) Semi solid ( egyptourgurt, porridge, pureed feeds) Solid ( eg. Ugali, mashed potatoes)
	<b>Previous practice (<i>fill section where applicable</i>)</b>		
304	At what age did you introduce the immediately older sibling of the index child to other foods?		
305	Why did you introduce foods at this age?		
306a.	After introduction of other foods to this child how did the growth curve progress?	1 2 3 4	Within recommended path Exceeded recommended path Deteriorated No effect
306b.	Did this outcome influence your feeding practice with your current infant?	1 2	Yes No

#### SECTION IV A: SUPPORT - ALTERNATE CAREGIVERS

No.	Question	Code	
401	Does your partner participate in the daily routine care of the child including feeding?	1 2 3	Yes No Not Applicable ( <i>skip to 402</i> )
401b.	If no, why not?	1 2 3 9	Cultural reasons Too tired to help Lacks knowledge Other( Specify)
<b>402</b>	Whom do you regularly consult on feeding your child when you need to?	1 2 3 4 9	Partner/ Father Relative Experienced friend/ Neighbors Health Workers Other ( Specify)_____
<b>403</b>	Do you leave your child in the care of another person?	1 2	Yes No( <i>Skip to Section V</i> )
<b>404</b>	How often do you leave them in the care of others?		
<b>405</b>	In whose care do you leave your child while away?	1 2 3 4 5 9	Partner/ Father Relative Older Children House help Neighbour Other ( specify)_____
<b>406</b>	What are the reasons for leaving the child in the care of others?	1 2 9	Work Ill Health ( Sickness) Other( Specify)_____

407	How would you rate the quality of care they get in such circumstances?	1	Good
		2	Fair
		3	Poor

**SECTION IV-B SUPPORT: HEALTH CARE WORKERS**

408	When was the first time a health care worker discussed with you information regarding complementary feeding?	1 2 3 4 9	Ante Natal Clinic Immediate Post delivery period In the first 3 months of MCH visits 6 <sup>th</sup> month visit Other _____ (specify)
408	After delivery of your baby, what advice did the staff give you about the duration of exclusive breastfeeding?		
409	Whenever you visit the clinic for routine immunization and growth monitoring are you given any information/ lessons on complementary feeding?	1 2	Yes No
410	What advice were you given regarding the appropriate time to introduce other foods to your child?		
411a	Have the staffs ever given you information on the ideal content composition of complementary feeds?	1 2	Yes No
b	What have they told to feed your child on?		
412	What advice have the health care workers given you regarding the frequency of feeding of a child on complementary feeds?		
413a.	Do you feel the health care workers adequately prepared you to complementary feed your child?		
b.	Do you feel that the health care worker was knowledgeable enough?	1 2	Yes No
414 a.	Did you put their advice to practice?	1 2	Yes No
b.	If No, Why		
414	What additional help do you feel you needed?		

**SECTION V: INFANT AND CHILD FEEDING PRACTICES**

<b>Breastfeeding Practice</b>			
No.	Question	Code	
501	Is the child currently breastfeeding	1 2	Yes ( <i>Skip to 502</i> ) No ( <i>Answer 501a,b and skip to 505</i> )
501a.	When did the child stop breastfeeding?	1 2	Child Never Breastfed Other( <i>Specify</i> )_____
501b.	Why did the child stop breastfeeding?	1 2	Child Refused to breastfeed



		3 4 5 9	Mother unable due to Medical reasons Mother had to return to work Child refused other foods Mother pregnant Other( Specify)_____
502	When do you breastfeed the child?	1 2 3 4	On Demand Scheduled time When convenient Other( Specify)_____
503a.	Yesterday, during the day or at night, did the child consume breastmilk or did anyone give them breastmilk using a spoon, cup or bottle?	1 2 9	Yes No Other(Specify)_____
503b	How many times did the child breastfeed yesterday?		—
504.	On Average, how many times does your child consume breast milk per day? ( <i>Including breastfeeding or consumption of expressed breast milk</i> )	1 2 3 4	1-2 Times a day 2-5 Times a day 6-8 Times a day More than 8 times a day
	<b>Introduction of Complimentary foods</b>		
505	Have you introduced the child to other foods?  Why not?	1 2	Yes ( <b>skip to 506</b> ) No ( <b>answer505b and end.</b> )
506	At What age did you introduce the child to other foods?		
507	Why did you introduce the child to other foods at this age?	1 2 3 4 5 9	Did not have adequate breast milk Advised by Health worker Had to return to work Child was old enough Advised by experienced mothers Other ( Specify)_____
508	From what you know what is the ideal age of introduction of other foods?		
	<b>Complementary feeding diet and food diversity</b>		

509	<p>Yesterday, during the day or at night, did your child receive any of the following even if it was combined with other foods? (<i>Indicate with the appropriate code response against each statement.</i>)</p> <p><i>(Ask about every liquid)</i></p> <ul style="list-style-type: none"> <li>a. Vitamin syrup or other medicines as drops _____</li> <li>b. ORS _____</li> <li>c. Plain Water _____</li> <li>d. <b>Infant Formula ( eg, Nan)</b> _____</li> <li>e. <b>Milk- packet, powder or fresh animal milk</b> _____</li> <li>f. Juice _____</li> <li>g. Clear soups _____</li> <li>h. <b>Sour Milk ( Mala) or Yourghrt</b> _____</li> <li>i. Thin porridge _____</li> </ul>	<p>1 2 3</p> <p>If Yes If Yes  If Yes</p>	<p>Yes No Don't Know</p> <p>____ Times ____ Times  ____ Times</p>
-----	---	---	---

510	<p>Please tell me everything that the child ate yesterday during the day or night (whether at home or outside the home) from the time they woke up to the time they slept.  <i>(For mixed dishes like a sauce or stew, probe: What ingredients in the dish)</i></p> <p><i>List all food mentioned in the space provided below then at the end of interview, code as appropriate each food group that had at least one food mentioned</i></p> <p><i>Every line must have a code.</i></p> <p>aa. <b>Grain based foods:</b> Bread, rice, ugali, millet or other grain based porridge? _____</p> <p>bb. <b>Root based foods:</b> White potatoes, white yams, cassava, or any other foods made from roots? _____</p> <p>cc. <b>Legume based foods:</b> beans, peas, lentils or nuts _____</p> <p>dd. <b>Orange vegetables:</b> Pumpkin, carrots, butternut, beet root or sweet potatoes that are yellow or orange inside? _____</p> <p>ee. <b>Green leafy vegetables</b> _____</p> <p>ff. <b>Vitamin A rich Fruits:</b> Ripe mangoes, ripe papayas, oranges _____</p> <p>gg. <b>Any other fruits or vegetables?</b> _____</p> <p>hh. <b>Iron rich meats:</b> Liver, kidney, heart or other organ meats? _____</p> <p>ii. <b>Other Meats:</b> meat such as beef, pork, lamb, goat, chicken or duck? _____</p> <p>jj. <b>Fish:</b> Fresh or dried fish ,Omena, shellfish, or seafood? _____</p> <p>kk. <b>Insects:</b> Termites or other edible insects? _____</p> <p>ll. <b>Eggs</b> _____</p> <p>mm. <b>Milk Products:</b> Fermented milk ( mala), yogurt, or other milk products? _____</p> <p>nn. <b>Fats and oils:</b> blue band , butter, Kimbo, Cooking oil _____</p> <p>oo. <b>Sugary foods and Snacks:</b> chocolates, sweets, mandazi, cakes or biscuits? _____</p> <p>pp. <b>Flavourings:</b> such as royco, garlic, ginger, chilies, spices, herbs _____</p>	1 2	Yes No
	<i>Write Other foods that the child ate not in the above List in this box</i>		
	<b>Feeding frequency</b>		
511.	How many times did the child eat solid, semi-solid or soft foods other than liquids yesterday during the day or at night? <i>(Small snacks and small feeds such as one or two bites of mother's or sibling's food should not be counted.)</i>		

### **APPENDIX III: LETTER TO ETHICS AND RESEARCH COMMITTEE**

Lina Mwita,  
School of Nursing Sciences,  
University of Nairobi,  
P.O Box 30197,  
Nairobi.  
Admission No: H56/79347/2012  
30<sup>th</sup> January 2014

The Chairman,  
Kenyatta National Hospital Ethics and Research Committee  
P.O Box 20723-00202  
Nairobi.

Dear Sir/Madam,

#### **RE: PERMISSION TO CONDUCT RESEARCH AT MBAGATHI DISTRICT HOSPITAL**

I hereby request for approval to conduct a research study titled **Correlates of complementary feeding practice among caregivers of infants aged 6-24 months at Mbagathi District Hospital, Nairobi** at Mbagathi District Hospital.

I am a second year postgraduate student at the University of Nairobi, School of Nursing Sciences pursuing a Master of Science in Nursing ( Paediatric Nursing) and undertaking this study as a requirement for the course.

Attached is the Research proposal for the study.

Looking forward to your favourable response.

Yours Faithfully,

Lina Mwita.

Email Adress: [Otaigolm@gmail.com](mailto:Otaigolm@gmail.com)

Mobile no. 0720594647

**APPENDIX V: LETTER TO THE MEDICAL SUPERINTENDENT  
MBAGATHI DISTRICT HOSPITAL.**

Lina Mwita,  
School of Nursing Sciences,  
University of Nairobi,  
P.O Box 30197,  
Nairobi.

The Medical Superintendent,  
Mbagathi District Hospital,  
Nairobi.

Dear Sir,

**REF: PERMISSION TO CONDUCT RESEARCH AT MBAGATHI DISTRICT  
HOSPITAL**

I hereby request for approval to conduct a research study titled **Correlates of complementary feeding practice among caregivers of infants aged 6-24 months at Mbagathi District Hospital, Nairobi** in your institution.

I am a second year postgraduate student at the University of Nairobi, School of Nursing Sciences pursuing a Master of Science in Nursing ( Paediatric Nursing) and undertaking this study as a requirement for the course.

Looking forward to your favourable response.

Yours Faithfully,

Lina Mwita.

Email Adress: [Otaigolm@gmail.com](mailto:Otaigolm@gmail.com)

## APPENDIX VI: ETHICS AND RESEARCH COMMITTEE APPROVAL



UNIVERSITY OF NAIROBI  
COLLEGE OF HEALTH SCIENCES  
P O BOX 19676 Code 00202  
Telegrams: varsity  
(254-020) 2726300 Ext 44355

KNH/UON-ERC  
Email: [uonknh\\_erc@uonbi.ac.ke](mailto:uonknh_erc@uonbi.ac.ke)  
Website: [www.uonbi.ac.ke](http://www.uonbi.ac.ke)



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

Ref: KNH-ERC/A/110      Link: [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN)

16<sup>th</sup> April 2014

Mwita Lina Otaigo  
School of Nursing Sciences  
College of Health Sciences  
University of Nairobi



Dear Lina

RESEARCH PROPOSAL: CORRELATES OF COMPLEMENTARY FEEDING PRACTICE AMONG CAREGIVERS OF INFANTS AND YOUNG CHILDREN AGED 6-24 MONTHS AT MBAGATHI DISTRICT HOSPITAL (P51/01/2014)

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above proposal. The approval periods are 16<sup>th</sup> April 2014 to 15<sup>th</sup> April 2015.

This approval is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
- c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
- e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- f) Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
- g) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN).

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Yours sincerely



**PROF. M. L. CHINDIA**  
**SECRETARY, KNH/UON-ERC**

- c.c. The Chairperson, KNH/UoN-ERC  
The Deputy Director CS, KNH  
The Principal, College of Health Sciences, UoN  
The Director, School of Dental Sciences, UoN  
The Assistant Director, Health Information, KNH  
Supervisors : Mr. Samuel Kimani, Mrs. Margaret Muiva

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# APPENDIX VII: LETTER OF APPROVAL - MBAGATHI DISTRICT HOSPITAL

## MINISTRY OF HEALTH

Tel: 2724712, 2725791, 0721 311 808  
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mdhnairobi@yahoo.co.uk  
Our Ref: MS/VOL.1/2013/14



Mbagathi District Hospital  
P.O. Box 20725- 00202  
Nairobi

2<sup>nd</sup> May 2014

**Lina Otaigo Mwita**  
University of Nairobi

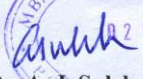
Dear Madam,

**RE: RESEARCH AUTHORIZATION**

This is in reference to your application for authority to carry out a research on "*Correlates of complementary feeding practice among caregivers of infants aged 6-24 months at Mbagathi District Hospital, Nairobi*"

I am pleased to inform you that your request to undertake the research in the hospital has been granted.

On completion of the research you are expected to submit one hard copy and one soft copy of the research report / thesis to this office.

  
**Dr. A. J. Suleh**  
**Medical Superintendent**  
**Mbagathi District Hospital**

NURSING OFFICER IN CHARGE  
**MBAGATHI DISTRICT HOSPITAL**  
P. O. Box 20725, NAIROBI.  
TEL: 2728530

51414  
Seen. C.M.C. Coordinator  
to handle.