

ASSESSMENT OF MOTHERS' COMPLIANCE WITH NATIONAL INFANT  
AND YOUNG CHILD FEEDING RECOMENDATIONS AMONGST CHILDREN  
AGED 0-24 MONTHS IN NAKURU MUNICIPALITY, KENYA

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**DECLARATION**

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

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## **DEDICATION**

This work is dedicated to my loving and caring husband, David Kaberere. ‘You kept nudging me onwards on this road of study and always encouraged me in tough times. You believed, prayed and had faith that I could make it’.

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## DEFINITION OF OPERATIONAL TERMS

**Bottle feeding:** Feeding the infant and young child breast milk, milk, formula or semi-solid food from a bottle with nipple/teat

**Breast feeding:** Feeding the infant and young child on breast milk

**Complementary feeding:**

Is a process starting at six months when breast milk alone is no longer sufficient to feed infant and young child and hence need to initiate both other non-human milk and semi-solid and solid food in order to meet the nutritional requirements of infants while continuing with breast feeding as recommended by WHO and Kenya National Government.

**Continued breastfeeding:**

Is the status of children aged 6-24 months being fed on breast milk and solids, semi-solid and soft foods.

**Dietary diversity:** Is recommended by WHO and Kenya National Government that children receive food from four or more food groups namely: grains, roots and tubers; legumes and nuts; dairy products; flesh meat (animal source foods); eggs; Vitamin A rich fruits and vegetables; oil and other fruits and vegetables

**Early introduction of Breastfeeding:**

Is the putting of the infant on the breast within one hour of birth.

**Energy density food:** Is the food that provides substantial amounts of vitamin, minerals and calories.

**Exclusive breastfeeding:**

Is giving only breast milk to infant allowing oral rehydration salts (ORS), drops, syrups, (vitamins, minerals, medicines) and nothing else usually done to an infant from 0 to six months old.

**Feeding practice:** Is the performance of the mother pertaining to giving an infant and young child food such as breastfeeding, semi-solid and soft food.

**Food consistency:** Is the degree of thickness, firmness or solidity of nutrient dense food in pureed, mashed and semi-solid form given to an infant beginning at six months.

**Infant:** This is a child whose age ranges from 0-12 months.

**Information on IYCF:**

It is the messages that include timely initiation of breastfeeding, exclusive breastfeeding, dietary diversity and meal frequency.

**Meal frequency:**

Is the number of times that the child is fed complementary foods in 24 hours.

**Meals:**

Is an instance of eating specifically one that takes place at a specific time.

**Minimum meal frequency:**

Is the least number of times the infant is given solids, semi-solids or soft food in 24 hours which is 3 times for breastfed infants 6-8 months; 4 times for breastfed children 6-24 months; 5 times for non-breastfed children 6-24 months based on National guidelines of feeding a child 6 months old and above.

**National infant and young child feeding (IYCF) recommendations:**

This is the Kenyan strategy on how infants and young children should be fed in their first two years of life.

**Optimal breastfeeding:**

This means beginning breastfeeding within the first hour of birth and continuing to EBF for six months and introducing semi-solids, solids and soft foods that are culturally appropriate as from six months while breastfeeding is continued until two years and beyond.

**Prelacteal feeds:**

Semi-solids and liquids that are given to an infant before lactation is established usually between birth and first three days of life.

**Popular culture:**

Is the accumulated store of ideas, beliefs and practices held by a large number of people

**Seven Food groups:**

Food categorized into: grains, roots and tubers; legumes and nuts; dairy products; flesh food (Animal source food); eggs; vitamin A rich foods (yellow vegetables and fruits) and vegetables and other fruits and vegetables.

**Snacks:**

Convenient and easy to prepare foods given to child eaten between meals-usually self-fed for a young child.

**Support for infant young child feeding:**

Wide range of components such as; provision of information on IYCF, expression of empathy caring and concern by home visits, showing positive regard to mother by provision of opportunity to discuss IYCF issues.

**Teenage exposure to breast feeding:**

Is the instance of teenager being affected by a mother she observes breastfeeding a baby on a regular basis.



**Young child:** This is a child whose age is 12-24 months

**ABBREVIATIONS AND ACRONYMS**

<b>AED</b>	-	Academy for Education Development
<b>ALA</b>	-	Alpha-lindenic acid
<b>AMREF</b>	-	African Medical and Research Foundation
<b>ARI</b>	-	Acute Respiratory Infection
<b>BFHI</b>	-	Baby Friendly Hospital Initiative
<b>CHN</b>	-	Community Health Nurse
<b>CWC</b>	-	Child Welfare Clinic
<b>DHA</b>	-	Docosa hexaenoic acid
<b>DHIS</b>	-	District Health Information System
<b>DNA</b>	-	Deoxyribonucleic Acid
<b>EBF</b>	-	Exclusive breastfeeding
<b>EU</b>	-	European Union
<b>FHI</b>	-	Family Health International
<b>GIT</b>	-	Gastro-intestinal Tract
<b>GOK</b>	-	Government of Kenya
<b>HF</b>	-	Health Facility
<b>HIS</b>	-	Health Information System

<b>HIV</b>	-	Human Immune-Deficiency Virus
<b>ILO</b>	-	International Labor Organization
<b>ICF</b>	-	International Communication Forum
<b>IQ</b>	-	Intelligence Quotient
<b>IOM</b>	-	Institute of Medicine
<b>IYCF</b>	-	Infant Young Child Feeding
<b>KDHS</b>	-	Kenya Demographic Health Survey
<b>KMTC</b>	-	Kenya Medical Training College
<b>KNBS</b>	-	Kenya National Bureau of Statistics
<b>MCH</b>	-	Mother Child Health clinic
<b>MDG</b>	-	Millennium Development Goals
<b>MOH</b>	-	Ministry of Health
<b>MOPHS</b>	-	Ministry of Public Health and Sanitation
<b>NASCOP</b>	-	National AIDS and STI Control Programme
<b>NIC</b>	-	Nakuru Information Centre
<b>ORS</b>	-	Oral Rehydrating Salts
<b>PGH</b>	-	Provincial General Hospital
<b>PHC</b>	-	Primary Health Care

<b>RH/FP</b>	-	Reproductive Health /Family Planning
<b>SPSS</b>	-	Statistical Package for Social Sciences
<b>UNICEF</b>	-	United Nations Children Emergency Fund
<b>URC</b>	-	University Research
<b>USAID</b>	-	United State Agency for International Development
<b>WABA</b>	-	World Alliance Breastfeeding Action
<b>WHA</b>	-	World Health Assembly
<b>WHO</b>	-	World Health Organization

## ABSTRACT

Optimal infant and young child feeding (IYCF) is the World Health Organization (WHO) recommended way of feeding children. There is a lot that has been done on IYCF but there still remains a dearth of information in areas related to the application of IYCF recommendations in various regions. In the nations all around the globe, national IYCF recommendations and programs are in place. However, various studies reveal low incidences of exclusive breastfeeding (EBF); a major indicator of IYCF. It implies non-compliance to the national guidelines on IYCF amongst the mothers. This study was designed to assess the mothers' compliance with IYCF recommendations amongst mothers with infants aged 0-24 months in Nakuru Municipality. The study was carried out in five health facilities. The objectives were to establish the demographic and socio-economic characteristics of mothers, to establish the mothers' level of knowledge on IYCF recommendations, to establish the mothers' prior plan, sources of information, popular culture, prior teenage exposure to breastfeeding mother and support for IYCF, to establish the mothers' IYCF practices and to establish the mothers' level of compliance with IYCF recommendations. The study involved the administration of interview questionnaire adopted from the WHO questionnaire on the 24 hour recall food diversity. Nine research assistants were trained prior the exercise to collect data from 377 mothers with children aged 0-24 months. The findings indicated that 37.9% of the mothers were 25-29 years, 86% were married, 37% had attained secondary education and 40.6% were housewives. Over half (57%) of the children in the mother-child pair were aged 7-24 months while 62.1% were subsequent birth (second to seventh) with only 37.9% being firstborn. Mothers' knowledge on IYCF recommendation was good (66%) and indicated areas requiring strengthening as the insufficient breast milk management and the frequency of complementary meals during the transition period from breast milk to solids, semi-solid and soft food. Mothers' IYCF practice was predominantly early introduction of solids, semi-solid and soft food as early as 2 months. Almost half (49.6%) of mothers had prior plan for exclusive breastfeeding for six months, however only 14.2% carried through their plan. The main sources of IYCF information was the media (radio and television) by 39.3%, a large majority (95.5%) of the mothers had prior teenage breastfeeding exposure to witnessing a mother frequently breastfeed. The popular culture of IYCF was early (0-3 months) introduction of solids, semi-solids and soft foods (39%). The main sources of reassurance (support) on mothers' IYCF practice was by the community health nurse (46.4%). The mothers' level of compliance with IYCF recommendation was 55%. The study recommends that; IYCF information should be targeted to all mothers irrespective of neither demographic nor socioeconomic variables at HF by the CHN. Dissemination of information by health workers should emphasize on IYCF aspect of complementary feeding and continued breastfeeding up to two years and beyond when giving IYCF information to mothers. The policy makers should come up with strategies of building capacity to increase the community health nurse efforts of supporting IYCF. The policy makers need to come up with IYCF policies that would reach the mothers in the community with practical IYCF intervention. County Health System to ensure the CHEW monitor and evaluate of IYCF compliance at family level.



## CHAPTER ONE: INTRODUCTION

### 1.1 Background information

Infant and young child feeding (IYCF) in the first two years of life is a key determinant of growth and development in children (Lamberti *et al.*, 2011; Lahariya, 2008). Children below 2 years old grow rapidly and are vulnerable to illness (Senarath and Dibley, 2012; WABA, 2010). While under-nutrition usually spikes at the age of 3-18 months making the child's first two years of life are considered 'a critical window of opportunity' for the prevention of growth faltering and under-nutrition (Victora *et al.*, 2010). Prudence therefore calls for capturing of children at this period in life with appropriate interventions to ensure children reach their full growth potential and help prevent irreversible stunting and acute under nutrition (Dewel and Adu-Afarwuah, 2008). In order to engage effective measures to control and eliminate child malnutrition, there is need for mothers' compliance with optimal IYCF recommendations (Arabi *et al.*, 2012).

Indicators for monitoring IYCF that are utilized in this study on the basis of literature review on WHO IYCF indicators include; initiating breastfeeding (BF) within one hour of delivery, exclusive breastfeeding (EBF) for the first six months, introduction of solid, semi-solid and soft foods in 6-8 months of age, minimum dietary diversity, minimum meal frequency and continued breastfeeding for 2 years (Senarath and Dibley, 2012; GOK, 2007).

Globally about 8.8 million children under five years die each year mostly due to preventable causes such as under-nutrition, diarrhoea, pneumonia, measles, malaria and HIV/AIDS (UNICEF, 2009a; Black *et al.*, 2003). Globally, the disease burden can be attributed to under-nutrition whereas malnutrition has been responsible, directly or indirectly, for 60% of the 10.9 million deaths annually amongst children under five year (Lahariya, 2008). Over two-thirds of these deaths are associated with inappropriate feeding practices and occur during the first year of life (WHO, 2009a; WHO, 2003). Sub-optimal breastfeeding especially non-exclusive breastfeeding in the first six months results in 1.4 million deaths and 10% of disease burden in children younger than five years (WHO, 2009a). Worldwide the exclusive breast fed children rates are 34.8% (WHO, 2009a). Malnutrition in sub-Saharan Africa contributes to high rates of childhood morbidity and mortality (Olack *et al.*, 2011). Fortunately, the EBF rate in sub-Saharan Africa has increased from 22% to 30% (UNICEF, 2007). However, these rates are still low.

In the developing countries like Kenya, poor IYCF practices raise threat to child development causing growth faltering (WHO, 2007). More so, in the urban setting, where households are faced with the challenges of broken extended family support systems, and have to engage in rigorous activities to ensure household food security, the mothers must decide how to feed their young children within contexts that constrain them (KNBS and ICF macro, 2010). The resultant choices may be reflected in less than 3% of Kenyan infants being exclusively breast fed for the first six months of life (MOPHS, 2008). It may cause the Kenyan children to be at risk of food contamination due to exposure to ingestion of contaminated foods and drinks



when these are introduced too early. Contamination of dairy products was found by a study done in Dagoretti, Nairobi which revealed *Escherichia coli* in dairy products (Kang'ethe *et al.*, 2007). This was associated with milking hygiene, sources and treatment of water. Furthermore, lack of EBF arising from inappropriate optimal BF also causes risks of infection due to lack of immunity commonly found in breast milk (Lamberti *et al.*, 2011).

In Kenya, the IYCF recommendations states that mothers should initiate breastfeeding within one hour of birth, EBF for six months, continue breastfeeding for two years and beyond meanwhile introduce solids, semi-solids and soft food at six months. Meals frequency and food diversity be done as for appropriate age. Assessment of mothers' compliance to this recommendation has not been done in Nakuru as it was revealed in a study done by Kamau-Mbuthia *et al.*, (2008). However, a study done in Eldoret (Cherop *et al.*, 2009) showed that mothers do not EBF due to inadequate breastfeeding knowledge.

In Nakuru Municipality, within the first half of the year (2012), 16% of the children aged 0-11months old were recorded as underweight in the category of nutritional status with the highest proportion of children followed by faltering weight (2%) (DHIS Nakuru 2012).

## **1.2 Statement of the Problem**

Infant Young Child Feeding (IYCF) recommendations in Kenya are given to ensure child survival through interventions that are cost effective. Child malnutrition, morbidity and mortality are reduced when mothers comply with the national IYCF recommendations (Nduati, 2012). Compliance with national IYCF recommendations is in the mothers' domain as they make decisions as to how their children will be fed in terms of types of foods in a meal, frequency as well as timing of when to commence and stop breastfeeding. Mothers' non-compliance is manifested in outcomes of children health. No study has addressed the most current mothers' compliance with IYCF recommendations in Nakuru Municipality. Therefore, this study sought to fill the gap by assessing the current situation in mothers' compliance to national IYCF recommendations. There is need to be in touch with current IYCF practice status frequently so as to be aware of the current trends and make interventions in good time to ensure achievement of reduction of child mortality by two thirds by 2015 (World Bank, 2006).

## **1.3 Research Questions**

The study sought to answer the following research questions:

1. What are the demographic and socio-economic characteristics of mothers?
2. What is the mothers' level of knowledge on the national IYCF recommendations?

3. What are the mothers' prior plan, sources of IYCF information, popular culture, past teenage exposure to a breastfeeding mother and sources of support for IYCF?
4. What are the current mothers' IYCF practices?
5. What is the level of mothers' IYCF compliance with national recommendations?

#### **1.4 Broad objective**

To assess the mothers' compliance with National IYCF recommendations amongst children aged 0-24 months in Nakuru Municipality, Kenya.

#### **1.5 Specific Objectives**

- i. To establish the demographic and socio-economic characteristics of mothers with infants 0-24 months in Nakuru Municipality, Kenya.
- ii. To establish mothers' level of knowledge on National IYCF recommendations amongst mothers with infants 0-24 months in Nakuru Municipality, Kenya.
- iii. To establish mothers' prior plan, sources of information, popular culture, past teenage exposure to a breastfeeding mother and support for IYCF practices in Nakuru Municipality, Kenya.
- iv. To determine the mothers' IYCF practices amongst mothers with infants 0-24 months in Nakuru Municipality, Kenya.

- v. To establish the level of mothers' compliance with IYCF recommendations amongst mothers with infants 0-24 months in Nakuru Municipality, Kenya

### **1.6 Null Hypothesis**

There is no difference in mothers' compliance with IYCF recommendations and IYCF factors.

### **1.7 Justification**

Majority (35%) of children globally die before they celebrate their 5<sup>th</sup> birthday due to, amongst other causes under-nutrition (WHO, 2010). Under-nutrition culminates from poor IYCF practices. Initiation of breastfeeding within one hour and pre-lacteal feeds percentages are 56% and 47% respectively in Egypt, 52% and 36% in Ghana (DHS 2008-2009) while in Kenya, rates are 58% and 42% (KNBS-KDHS survey 2008-2009). EBF rates in Kenya are 32% (KNBS and ICF Macro, 2010). During the ante-natal period, 92% of the mothers visited a health worker at least once (KNBS and ICF macro, 2010). These health workers have a mandate to prepare the mothers during the antenatal period for IYCF especially breastfeeding. However, not all the mothers receive information on IYCF. According to KNBS and ICF macro (2010), rates of mothers in urban setting who receive information on breastfeeding are 65.8% while in the rural areas the rates are at 49%. Within the Rift Valley Province (RVP) about 52.2% mothers received IYCF information from health facilities (KNBS and ICF Macro, 2010). The IYCF practices depicted were; initiation of breastfeeding

within 1 hour of birth done by 58% of the mothers and gave something before breastfeeding (pre lacteal feeds) were 52%. EBF rates were at 24% for children less than 2 month old. All this prevalence rate of one of the key IYCF indicators is below the satisfactory rates requirement by WHO to move the MDG number 4 of decreasing infant and child mortality rate by two thirds by the year 2015 (World Bank, 2006).

Barriers that may cause the gap between the mothers' IYCF knowledge and the compliance with the recommended guidelines may be in the approaches of the IYCF information dissemination. The new knowledge generated by this study will help identify mothers' current IYCF practice; support accorded to mothers for IYCF and their IYCF compliance levels. Study in the area of IYCF has been done in Nakuru and this current study brings in the aspect of assessing the mothers' level of knowledge on National IYCF recommendation and mothers' current IYCF compliance with recommendations as also cited as a recommendation for further study by Kamau *et al.*, (2008).

### **1.8 Significance of the Study**

Awareness of the current mothers' IYCF practices as depicted in this study will influence public policy in supporting and promoting IYCF and contribute in supporting the government's plans to improve the prevalence rates of optimal IYCF and reduce morbidity and mortality rates.

This study would create an understanding of the current mothers' compliance with IYCF recommendations that aim at bringing change in the way healthcare providers do their jobs of dissemination of IYCF recommendations.

This study's findings will demonstrate the association of the various IYCF factors on mothers' compliance with IYCF recommendation thereby contributing to the work of government and non-government community strategy development.

### **1.9 Delimitation and Limitation**

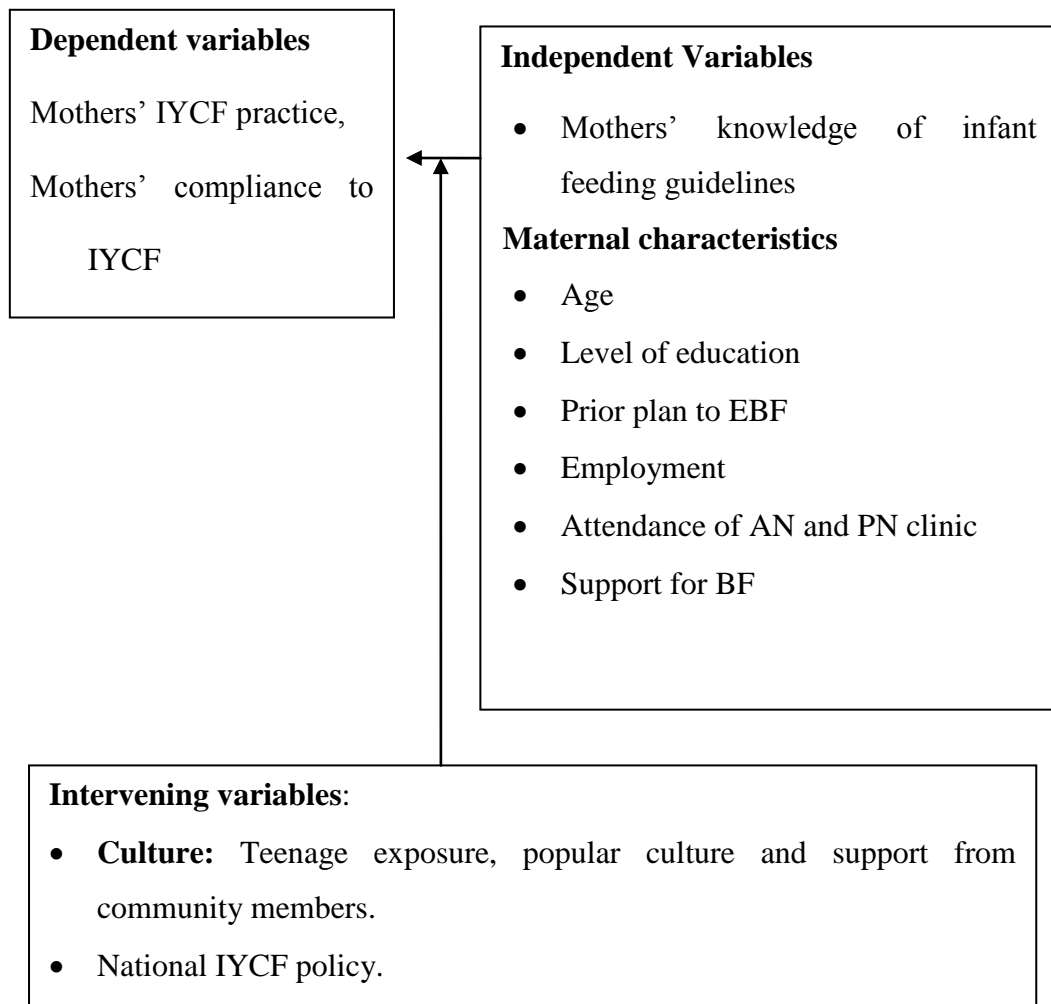
The limitations of this study were that only mother-child pairs attending the Child welfare clinic (CWC), mother child health and reproductive health (MCH/RH) clinics and sick children clinics were captured. Children who were not presented at the HF were omitted. These children would have been a special interest group. These limitations were dealt with by including both healthy and sick children of mothers who were attending the health facility as well as including children in the outreach services carried out by the HF.

### **1.10 Conceptual framework for infant and young child feeding**

Infant and young child feeding behaviors are influenced by the choices mothers make. Other factors playing a role in the behavior of IYCF are information and support given to the mothers before infants are born, at birth and afterwards. Family and mothers' norms also play a role on mothers' choices and practice of IYCF. Other

factors include demographic, economic and policy factors. The researcher conceptualized that these interrelated factors influence the mothers' choice of infants and young child feeding as first theoritized by Lutter (2000).

Hence, compliance with the recommended IYCF practices is obtained in attempting to establish factors influencing specific geographical areas and changing intervention measures to curb barriers identified as conceptualized by the researcher (Figure 1.1).



**Figure 1.1 Conceptual Frame work of determinant factors of IYCF (Mordified from Lutter, 2000)**

The mothers' level of education, level of knowledge of IYCF recommendations and the mother's characteristics such as age, level of education, prior plan to EBF, mothers' past teenage exposure to a mother breastfeeding regularly, popular culture and past IYCF experience which is captured as infants' birth order are conceptualized as factors influencing IYCF practice. The culture upheld by the mothers and the economic background of the mother may influence them to comply with the national IYCF recommendations or not. Employed mothers may not exclusively breast feed as per national IYCF recommendations due to returning to work before the EBF period is over. A national policy gives recommendation of how to feed infants and young children as per the Ministry of Public Health and Sanitation (MOPHS) directives. Mothers' awareness of National IYCF recommendations influences their IYCF practices. These factors were conceptualized as interacting and influencing the issue of IYCF in Nakuru Municipality.

The National IYCF strategy recommends that infants should be exclusively breast fed for the first six month of life. Optimal infant feeding means the infant should be initiated with breastfeeding within one hour of birth; continue to be breastfed exclusively for the first six months and receive adequate quantities of and safely prepared nutritious complementary foods while breastfeeding is continued for at least two years (WHO/UNICEF, 2007)



## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Background information on current IYCF strategies

Optimal IYCF is universally accepted as the essential element for the satisfactory growth and development of infants and young children for prevention of childhood illness (Lamberti *et al.*, 2011; WHO, 2009a; Sokol *et al.*, 2007). Globally strategies for IYCF are stipulated as global conventions such as World Health Assembly (WHA) Resolutions (1981), Convention of the rights of the child, the International Labour Laws (ILO) convention for maternity protection and the Innocenti Declaration of 1991 commit to do everything possible to promote, protect, and support optimal IYCF practices (WHO/UNICEF, 2007). Global efforts include the Innocenti Declaration (1991) ten steps to successful breastfeeding and baby friendly hospital initiative (BFHI) (Innocenti Declaration, 1991). WHO (2003) published a global strategy for IYCF which is a global instrument aimed at the protection, promotion and support of optimal IYCF. It assists in development of national strategies and action plans on IYCF for country's specific programs.

Kenya is a signatory to these conventions and has renewed its commitment to breastfeeding by adopting the 2006 WHO consensus Statements (WHO, 2006). The Kenyan National IYCF recommendations includes:- start breastfeeding within the first 60 minutes of birth, breast feed exclusively for the first six months of a child's life and introduce complementary foods at six months with continued breastfeeding into the second year and beyond (MOPHS, 2010; WHO, 2010). The national IYCF

strategy 2007-2010 derived from the global strategy of IYCF is crucial to help optimize key strategies for improving IYCF in Kenya (Komen, 2009).

## **2.2 IYCF recommendations**

The recommended practices include; exclusive breastfeeding for six months, continued breastfeeding for two years and beyond and appropriate, adequate and indigenous complementary feeding after six months (WHO, 2009b). Exclusive breastfeeding (EBF) is one of the key indicators of optimal IYCF. Other indicators are timely introduction of solids, semi-solids and soft foods after six months of age; continued breastfeeding which means that children aged 6-24 months are fed on breast-milk and also receive solids, semi solid or soft foods (WHO, 2010).

Universally, optimal IYCF key indicators are low and current IYCF practices remain far from recommended levels. Only 35% of infants worldwide are exclusively breastfed during the first four months of life and in developing countries. The EBF rates amongst children aged less than 6 months are at 39% (UNICEF, 2009a). In addition, introduction of solids, semi solids or soft foods often begins too early or too late and is inadequate and unsafe (KNBS and ICF Macro, 2010). Only 50% of children aged 0-24 months receive breast milk (WHO/ UNICEF, 2007, UNICEF, 2009b). Therefore, inappropriate IYCF remains one amongst others, a great threat to child survival (WHO/UNICEF, 2007).

### 2.3 Influence of Demographic Factors on IYCF

Demographic characteristics that influence the IYCF practices include: maternal age, marital status, mother's level of education and mother's attendance of ante-natal clinic. In a study done in Norway by Lande *et al.* (2003), maternal age was found to have significant positive trends of EBF at four months, breast feeding at 6 months and timely introduction of solids, semi solids and soft food. However, in another study done by Miharshahi *et al.*, (2010) in Bangladesh, older maternal age was a risk factor for bottle feeding.

Marital status is depicted in studies (Lindsay *et al.*, 2012, Senarath *et al.*, 2012 and Kimani *et al.*, 2011) as affecting IYCF practices and the direction of association is inconsistent within and between countries and regions. A study done in Britain showed that marital status had no significant relationship with cessation of breastfeeding (Agboado *et al.*, 2010) and yet another study done in USA showed that being married had significant association with multiple positive IYCF practices (Hendricks *et al.*, 2006).

Maternal level of education as shown in studies by Morgan *et al.*, 2010 and Memon *et al.*, 2010, done in Kenya and Pakistan respectively found out that mothers' cessation of breastfeeding was negatively influenced by lower educational levels. According to Serenath *et al.*, (2007) in a study done in Sri Lanka, mothers with primary education were found to be more likely to exclusively breastfeed than mothers with no education. Mothers with college level of education were associated

with the largest number of positive IYCF practices (Hendricks *et al.*, 2006). Lower maternal education was cited in a study by Serenath *et al.*, (2012) done in India as a factor causing mothers to practice non diversity of infant and young child foods in children meals.

According to Lindsay *et al.*, 2012, Senarath *et al.*, 2012 and Kimani *et al.*, 2011 maternal employment was depicted to cause non-compliance to EBF recommendations. In addition, a study done in Britain and Ireland by Hawkins *et al.*, 2007, showed that maternal employment was the reason why employed mothers who returned to work within EBF postpartum period failed to start breast feeding as recommended. Other studies by Al- Sahab *et al.*, 2010 and Rojjanasrirat and Sousa (2010) revealed that maternal employment had a negative impact on EBF and duration of breastfeeding. However, contrary to the above cited studies, a study by Serenath *et al.*, (2007) showed that continued breastfeeding at one year was significantly lower in non-working mothers than the working mothers.

Another maternal characteristic is the mothers' attendance of ante-natal clinics (Gewa *et al.*, 2011). According to KNBS and ICF macro (2010), majority (92%) of the mothers in Kenya attended antenatal clinics and a lower (43%) percentage of the mothers delivered at health facilities. The depicted scenario may cause the initiation of breastfeeding and IYCF patterns to be influenced by the mothers' uninformed decisions (Gage *et al.*, 2012, Datta *et al.*, 2012).

#### **2.4 Mothers' level of Knowledge of IYCF recommendation**

The Kenyan MOPHS in conjunction with Division of Nutrition and NASCOP (2007) have made among other efforts, brochures available with health messages on “how to feed a baby after six months” which enables the mother to be aware of the recommended IYCF after six months. The recommendation for complementary feeding of infant and young child includes; introduction of solids, semi-solids and soft foods after six months with appropriate, adequate and indigenous complementary foods while breastfeeding is continued for two years and beyond.

IYCF messages given to the mothers at various levels in their life culminate to their level of knowledge in IYCF recommendations. The IYCF messages are tailored in a manner to capture the key aspects of IYCF recommended practices. The IYCF messages include: information on how to prepare for breastfeeding of their infants, how to enable their infants latch on the breast and when to introduce solids, semi-solids and soft foods. IYCF information is disseminated to mothers attending CWC, MCH and reproductive health clinic (RH/FP) in the health facility through individualized one to one talk, group teaching and through posters and pamphlets (MOPHS/DON/NASCOP, 2007) . Content of the health messages includes: initiate solids, semi solids and soft foods at 6 months such as cereal porridge that should be thin initially then made thicker as the infant grows older. Thereafter, between 6-12 months, leguminous and vegetables foods should be added to the cereal porridge. At 9 months of age, the infant may be introduced gradually to foods from the family pot and thereafter between ages 12-24 months continue progressively omitting spices. Introducing foods from the family pot gives the infant a varied taste of foods, variety

of foods and also ensure nutritional needs are met (Liyanage, 2010). The infant should be given small frequent feeds; about 4-6 feeds in a day. Meanwhile breastfeeding is continued on demand (Liyanage, 2010; King and Burgess, 2000).

Mothers' IYCF knowledge gaps as identified in various studies for causing inappropriate IYCF practices include: infants' diet effects on the child's health in subsequent years and long term conditions (Gage *et al.*, 2011), practical aspect of IYCF (Schawtz *et al.*, 2011), practical aspect regarding breastfeeding challenges (Foss, 2010) and exclusive breastfeeding duration (Fjeld *et al.*, 2008, Bartick and Reyes, 2012). Furthermore, mothers' lack of knowledge on IYCF recommendations and proper nutrition education was revealed in studies done in Kenya and Nigeria (Arusei *et al.*, 2011; Onuoha *et al.*, 2011). Mothers' IYCF recommendations knowledge gaps impact on the IYCF practices as revealed in a study done in Eldoret, Kenya by Cherop *et al.*, 2009 which showed that mothers who had no knowledge about IYCF recommendations were nine-fold more likely to start mixed feeding by 10 weeks of age.

#### **2.4.1 Benefits of EBF for 6 months and continued breastfeeding for two years and beyond**

Initiation of EBF within one hour of delivery ensures that the child gets to consume colostrum which is the initial special breast milk produced within the first 2 days after delivery and is rich in antibodies, anti-infective proteins, white blood cells and growth factors (WHO, 2005). It also has purgative effects that help clear the infant's

gut of meconium and bilirubin thus preventing jaundice (Liyanage, 2010). Initiating exclusive breastfeeding (EBF) early in life is associated with greater appetite regulation later in childhood leading to reduction of early overweight (Disantis *et al.*, 2011). When EBF is initiated early and is continued for six months, it reduces risks of severe malnutrition, cough incidences, hypoxemia incidences and duration in children with pneumonia, diarrhoea, gastro-intestinal tract conditions, respiratory conditions, infections and anaemia (Cervantes-Rios *et al.*, 2012; Chisti *et al.*, 2011; Lahariya, 2008; Sawasdivorn and Taexiriyakul, 2011; Horta *et al.*, 2007; Quigley *et al.*, 2007). The breast fed children have less digestive troubles, colic pains and best working immune system (Cohen *et al.*, 2012).

Breast milk is the best source of alpha-linolenic acid (ALA) and docosahexaenoic acid (DHA) which are known to play a role in the development of the brain and the retina (Huffman *et al.*, 2011). Therefore, breastfeeding enhances good outcomes on the child's intelligence quotient (IQ), education and behavior of the child (Heikkila *et al.*, 2011; Quigley *et al.*, 2012). In addition, breast feeding for four months and longer has better outcomes on fine motor skills at age one and three years; higher adaptability at age two years and higher communication skills at ages one and three years (Oddy *et al.*, 2011). Furthermore, continued breastfeeding at 12-15 months of age is associated with reduction of higher risks of child underweight (Marriot *et al.*, 2012). Other benefits of breastfeeding include the breast milk's vitamin A important role in assisting a child to build up hepatic stores of vitamin A that later become critical for survival after introduction of solids, semi-solids and soft foods (Fujita *et al.*, 2011).

#### **2.4.2 Benefits of introduction of solids, semi-solid and soft foods at six months**

Timely introduction of solid, semi-solid and soft foods (complementary feeding) at 6 months of age is associated with reduction in risk of underweight, illness and mortality in children (Joshi *et al.*, 2012). According to a study done in 14 poor countries, complementary feeding at 6-8 months was associated significantly with lower risks of both stunting and under weight (Marriot *et al.*, 2012). Stunting in older children shows failure of growth and development during the first two years of life as revealed in a study done in Nairobi's informal urban settlements (Olack *et al.*, 2011). Hence, evidence of the need of nutrition intervention between 0-2 years of age. As a child grows there is need for increased energy intake as from six months (Liyanage, 2010; WHO, 2009b). However, due to poor breastfeeding and complementary feeding practices the child is exposed to greater risks of nutritional deficiency and growth retardation which occurs at three to fifteen months (Shrimpton *et al.*, 2001).

Cases of malnutrition are more frequently observed during the transitional period of 6-24 months than in the first 4-6 months and is largely because the families may not be aware of the special needs of the child or they may not know how to prepare complementary foods from available ingredients or they are too poor to ensure food security at family level (UNICEF/USAID, 2011). In addition to complementary feeding is the importance to continue breastfeeding for 24 months and beyond since it provides up to half of the child's nutritional needs during the second year of life (WHO, 2010). According to Ramakrishnan *et al.*, (2009), complementary feeding is



the most effective intervention that can significantly reduce stunting during the first two years of life.

The minimum age for the introduction of the solids, semi-solids and soft foods is at times dictated by the neuromuscular development of infants as pertaining to when they can ingest particular types of foods. There is evidence of a “critical window” for introducing “lumpy” solid foods: if these are delayed beyond ten months of age, it may increase the risk of feeding difficulties later (Northstone *et al.*, 2001). Semi-solid or pureed foods are needed at first, until the ability for “munching” (up and down mandibular movements) or chewing (use of teeth) appears.

There is also need to give the child minimum meal frequency which is defined as; two times for breastfed infants at six to eight months, three times for breastfed children aged nine to twelve months and five times for breastfed children aged thirteen to twenty four months which includes 1-2 snacks (Liyanage, 2010). Snacks are foods given in between meals which are usually self fed, convenient and easy to prepare (UNICEF/WHO/USAID/URC, 2007).

The complementary food should also meet the minimum dietary diversity defined as receiving food from four or more food groups namely: grains, roots and tubers; legumes and nuts; dairy products; flesh meat (animal source foods); eggs; vitamin A rich fruits and vegetables (yellow fruits and vegetable); oil and other fruits and vegetables (Senarath and Dibley, 2012). Such varied foods in a child’s meal ensure

that nutritional needs are met (Liyanage, 2010). However, foods low in nutrient value such as tea, sugary drinks and sodas should be avoided (Liyanage, 2010).

Evidence from study by Dewey and Brown, (2003) indicates that by 12 months, most infants are able to consume “family foods” of a solid consistency. Family food provide adequate nutrient density for protein, thiamine, riboflavin, vitamin B<sub>6</sub>, B<sub>12</sub> and C but not vitamin A, niacin, folate, calcium, iron and zinc (Vossenaar and Solomons, 2012). However, many of the children are still offered semi-solid foods presumably because they can ingest them more efficiently, and thus less time for feeding is required of the mother (Dewey and Brown, 2003).

### **2.4.3 IYCF sanitation recommendations**

Infants aged six months and older should be given water that has been treated or boiled. The food should be prepared in a clean area and needs to be covered. The use of open cup is also recommended. The use of bottles and teats should be avoided due to the difficulty in cleaning them and can lead to infection in the infant if not well cleaned (MOPHS/DON/NASCOP, 2007). Boiling water for drinking is a common strategy recommended for young children and is supported by a study Sodha *et al.*, 2011 showing that household that do not boil water for drinking are more likely to have contaminated stored water.

#### **2.4.4 Gaps in mothers' level of knowledge on various aspect of IYCF**

Mothers are reported to be more knowledgeable about recommendations related to breastfeeding but are less aware of solids, semi-solids and soft foods recommendations (Memon *et al.*, 2010). According to Wen *et al.*, (2012), mothers' awareness of the breastfeeding recommendation, indicator of 6 month exclusive breastfeeding duration, was an independent positive predictor of breastfeeding initiation and duration. Therefore, gaps in mothers' knowledge on EBF information would lead to non-compliance with recommendations. Other gaps in the area of mothers' knowledge on IYCF recommendation was depicted in a study done in Uganda which revealed mothers' lack of information on benefits of adding oil to complementary food to improve its palatability (Wamani *et al.*, 2005). In Kenya, mothers need to have information that locally available food is operationally feasible and it improves child's weight and reduces child malnutrition as revealed in a study by Tomedi *et al.*, (2012).

### **2.5 Mothers' prior plan for IYCF, Sources of information, popular culture, prior teenage exposure and support for IYCF**

#### **2.5.1 Mothers' prior plan of IYCF**

Prior plan made for intention to breastfeed as part of IYCF is a strong predictor of behavior (Di Girolamo *et al.*, 2005). Such IYCF intentions are influenced by significant others' opinion such as the spouse, family and friends (Hill *et al.*, 2008). In addition, maternal knowledge of infants' health benefits of breastfeeding also

affects the mothers' intention to breastfeed (Stuebe and Bonuck, 2011). However, having an intention to meet the IYCF recommendation was weakly positively associated with the initiation of breastfeeding (Wen *et al.*, 2012).

### **2.5.2 Mothers' source of IYCF information**

Mothers obtain information on IYCF from a variety of sources, the quality of which may vary, and is not necessarily evidence-based (Raat, 2010). A study by Halfon (2011) showed that primary health care providers have a role of disseminating IYCF information at the community level and can thus reduce early introduction of solids, semi-solids, and soft foods. Dissemination of IYCF information to mothers is best delivered through existing health systems as was recommended by Kabir *et al.*, (2012) in a study done in Bangladesh. According to Muluye *et al.*, (2012) in a study done in Ethiopia, IYCF education aligned to national policy should be strengthened in Primary Health Care (PHC) activities. In Kenya, the MOPHS has stipulated the need for the mothers to receive IYCF messages during their antenatal visits (DHIS Nakuru, 2012) where many PHC activities are done, such IYCF messages which are known to build confidence in the mother once they return home after delivery at a HF as revealed in a study done in England by Beake *et al.*, (2010). Despite the advantages of daily dissemination of information in support of IYCF, studies done in India and Kenya by Biswas *et al.*, (2010) and Lakati *et al.*, (2010) revealed that health education sessions are not carried out as per recommendation due to heavy work load of the Community Health Nurses (CHN) in whose docket it falls. However, according to DHIS (2012) Nakuru, there is evidence of IYCF message

dissemination during the ante-natal and post-natal period being in accordance to the expectation of the Baby Friendly Initiative in Nakuru.

Skilled trained health workers such as midwives were identified in various studies to be potentially cost effective in IYCF information dissemination (Renfrew *et al.*, 2009; Brown *et al.*, 2011; Heinig *et al.*, 2006; Senarath *et al.*, 2010). However, IYCF information dissemination has various challenges amongst the identified sources such as the health workers providing conflicting advice or guidance, being unavailable and lack of resources especially time to support the mothers on IYCF practical aspects (Brown *et al.*, 2011; McInnes and Chambers, 2008). According to Heinig *et al.*, (2006) grandmothers are sources of information to mothers. Other sources include: the mass media such as television and the radio are as depicted in a study done in Nepal by Joshi *et al.*,(2012). Unsatisfactory exposure to media is cited as factor that is associated with risks of premature cessation of EBF (Gewa *et al.*, 2011).

### **2.5.3 Popular culture**

Mothers base their infant feeding decisions on an array of factors which includes cultural beliefs (Pak, Aliya and Elinor, 2009). Jellife (1968) pointed out, "... all different cultures, whether in a tropical village or in a highly urbanized and technologically sophisticated community, contain some practices and customs which are beneficial to the health and nutrition of the group, and some which are harmful. No culture has a monopoly on wisdom or absurdity." Pre-lacteal feeding is a popular

culture as reflected in various studies done in India, Ethiopia and Tanzania (Dakshayani and Gangadhar, 2008; Alemayehu, Haidar and Habte, 2009; Shirima, Greiner, Kylberg and Gebre-Medhin, 2001). Additionally early introduction of complementary feeding is common in many cultures and frequently, such feedings are viewed as a means of socializing the infant into the family's diet culture (Pak *et al.*, 2009).

#### **2.5.4 Mothers' prior teenage exposure to breastfeeding mother**

According to Hoddinott, Kroll, Raja and Lee (2010) and Giles, Connor, McClenahan and Mallet (2010) researches, there was a positive association between breastfeeding exposure (witnessing others who are role models breastfeed and knowing someone who has breastfed) and positive breastfeeding attitudes. Targeting the prior exposure to an IYCF role model of a mother factor may be an important step in positively influencing infant feeding behavior and moving toward breastfeeding-friendly culture (Kavanagh, Lou, Nicklas, Habibi and Murphy, 2012). It is critical to influence the decision-making process among young adults, as this decision is an important predictor of actual infant-feeding behavior (Kavanagh *et al.*, 2012).

#### **2.5.5 Support for IYCF**

##### **2.5.5.1 IYCF support classes**

According to Saltan (2008) the modern society is no longer taking breastfeeding included in optimal IYCF as “instinctive, effortless or natural” or “the automatic

action” but it is viewed as skills that need to be acquired through learning (Zwelling, 1996). In the urban set up in Nairobi, young couples are availing themselves for classes where they are taught how to take care of their infants and young children (Corroll, 2004). One of the lessons in these classes is breastfeeding (Corroll, 2004; Bingham, 2010). There is need for effective communication of IYCF recommendations which is an essential element in supporting optimal IYCF (Simmons, 2003). Informational and other forms of support for breastfeeding need to be continuous so as to produce effective results as well as integrating other types of interventions during different phases of motherhood (Kaunonen, Hannula and Tarkka, 2012).

#### **2.5.5.2 IYCF support in health facilities**

Within the health facility the Baby Friendly Hospital Initiative (BFHI) was established to strengthen and to support optimal breastfeeding by implementing the ten steps to successful breastfeeding (Appendix 4), however not all health facilities (HF) adhere to recommendations as revealed in a Nairobi study by Lakati *et al.*, (2010). Implementation of IYCF recommendations and health education communication strategies to disseminate IYCF recommendations when undertaken, depict positive impact on mothers’ IYCF behaviour (Lingshi and Jingxu, 2011). Therefore, efforts are made nationally to ensure information on IYCF recommendations are disseminated to mothers in the health facility with the aim of higher EBF rates than those depicted in Kenyan studies (Kimani *et al.*, 2011; Kamau *et al.*, 2008).

A study based in Kisumu done by Morgan *et al.*, (2010) revealed that Community Health Nurse (CHN) support influences mothers' decision regarding breastfeeding cessation. CHN support during the birth of the infant also has influence on the initiation of breastfeeding (Heinig *et al.*, 2006). According to Craig and Dietsch (2010) in a study done in Australia, a mother requires practical skills on breastfeeding, reduction of anxiety, fostering a sense of self-confidence in their ability to breastfeed and ample time for CHN to assist the mothers initiate and continue breastfeeding.

Post-natal care is aimed at supporting the mother especially on initiation, establishing and managing breastfeeding problems. However, health facility post-natal care is chaotic in nature and is not conducive to mothers to learn breastfeeding (Athena *et al.*, 2009). Hardly does CHN carry out home visits post-natally to mothers. Such home visits are left to either the students nurses which is part of their nursing course requirement and the peer support groups (Kruskes *et al.*, 2007). The support for breastfeeding that mothers need includes assistance to latch baby on the breast and breastfeed, support on mothers' need for sleep and need to meet their goal of maternal identity (Athena *et al.*, 2009). However, CHN practice of assisting mothers has been shown in a study done in Nairobi by Lakati *et al.*, (2010) as not feasible with the current shortages of CHN in many HF.



### **2.5.5.3 Peers IYCF support**

Breastfeeding support is also done by peers. The role of peer support has been identified as the most important intervention during the post-natal period and if professional support is not available for mothers, then peer support could provide an alternative worth considering (Kaunonen *et al.*, 2012). Peer support significantly decreased the risk of discontinuing EBF in a study done in low and middle-income countries (Sudfel, Fawzi and Lahariya, 2012). Breastfeeding peer support is key in helping improve breastfeeding and exclusive breastfeeding rates (Thomsons *et al.*, (2012). The peer supporters provided feedback on mothers' and infants' progress, and through praise, reassurance and instilling calm, they helped women to focus their energy to achieve their breastfeeding goals as revealed in study by Thomsons *et al.*, (2012).

Other persons that are key in supporting mothers on IYCF are family members, friends, church members and occasionally strangers (Heinig *et al.*, 2006; Morgan *et al.*, 2010). Cultural norms also influence mothers' decision regarding breastfeeding cessation Morgan *et al.*, (2010). Cultural relationships within the extended family as is a practice amongst the Asian mothers cause conflict between the mother and mother in laws in regard to the best feeding method and cause the mother to end up using formula feed in order to sustain the daughter in law/mother in law relationship (Choudhry and Wallace, 2012).

## 2.6 Mothers' practice of IYCF

At the heart of all feeding choices, lies the interplay between mother and child, influenced by the environment at household, community and societal level (Raats, 2010). In Kenya, breastfeeding is universal. However, initiation of breastfeeding within one hour after delivery and EBF is not practised as recommended (KNBS 2008-2009; Wachira *et al.*, 2009; Gewa *et al.*, 2011, Arusei *et al.*, 2011, Kimani *et al.*, 2011). Pre-lacteal feeding such as feeding glucose water, infant milk formulae, cows' milk and water before lactation is established is a common practice as shown in various studies (Lakati *et al.*, 2010, Liqian *et al.*, 2007; Akuse and Obinya, 2002). However, mothers who fail to initiate breastfeeding within one hour after delivery were eight-fold likely to start solids, semi solids and soft foods by ten weeks as cited in a study done in Nairobi (Lakati *et al.*, 2010). Evidence from various studies (Naanyu, 2008; Vereijken *et al.*, 2011; Kimani *et al.*, 2011) show that the mothers are aware of the benefits of breastfeeding but are not exclusively breast fed as recommended leading to a gap on what is recommended on IYCF and what mothers actually do. In a study done in Nigeria by Agunbiade and Ogunleye, (2012), EBF was perceived as essential but very demanding thus leading to low rates.

Practices such as giving infant formula milk and cows' milk before six months of age are prevalent whereby cows' milk is a major food for infants and young children. According to Thorsdottir and Thorisdottir, (2011), cows' milk is associated with anaemia due to its low iron content, weight acceleration, development of overweight in childhood, milk protein allergy and high renal solute load. However, according to

Mølgaard *et al.*, (2011) consumption of cow's milk is recommended in many countries where the benefits of cows' milk on growth of children in low-income countries weighs more than the associated disadvantages. On the other hand, though formula milk composition is similar to human milk, there are differences in outcomes reflected on the status of the child (Hernell, 2011).

Mothers' practice on introduction of solids, semi-solids and soft foods in Kenya, is that of early commencement as from 2 months (Naanyu, 2008; Macharia *et al.*, 2004). Breast milk insufficiency is cited as the main reason for early commencement of complementary feeding as revealed in a study done in Nakuru by Webb *et al.*, (2012). A study by Crocetti *et al.*, (2004) revealed that some mothers had the practice and belief that cereals will help the infant sleep longer at night. It is known that introduction of complementary feeding brings challenges to the infants health especially when the recommended guidelines are not followed such as minimum dietary diversity.

One of the food groups required by the infant is animal source foods. Contrary to the recommendations, mothers hardly give children animal source foods and eggs as shown in a study done in five developing countries namely; Mexico, Peru, Haiti, Senegal, and Ethiopia (Pachón *et al.*, 2007). Diets that do not contain animal source foods (meat, poultry, fish or eggs, plus dairy products) cannot meet all nutrient needs of children aged 0-24 months leading to lack of amino acid required to build new tissues (organ and muscle) during this rapid growth period (Krebs *et al.*, 2011).

Therefore, it is necessary for children aged 12-24 months to consume meat daily as it has been associated with less stunting in low-income setting in a study done in Zambia (Krebs *et al.*, 2011) and is a rich source of many key nutrients such as Iron and Zinc (Allen and Dror, 2011). Animal source foods (ASF) or flesh foods in the diets of children in developing countries is associated with better growth and status of some micronutrients, cognitive performance, motor development and activity (Allen and Dror, 2011). In addition, meat and cow's milk are excellent sources of vitamin B<sub>12</sub>, a micronutrient commonly deficient in populations which consume low amounts of animal source food (Allen and Dror, 2011). A study done in two poor counties of China showed low levels of complementary foods meeting minimum dietary diversity in the age groups 6-11 months as compared to ages 12-24 months (Wang *et al.*, 2011).

## **2.7 Mothers' compliance with the national IYCF recommendations**

Generally the mothers' compliance with national IYCF recommendation is low. Gaps captured in studies on IYCF indicate that the prevalence rates of key IYCF are still way below those required to ensure that the Millennium Development Goal (MDG) number four is achieved by the year 2015 (World Bank, 2006). According to WHO (2009) and various studies (KNBS 2008-2009; Wachira *et al.*, 2009; Gewa *et al.*, 2011, Arusei *et al.*, 2011, Kimani *et al.*, 2011) the incidences of EBF are low in many countries, and is an indication of non-compliance with IYCF recommendations. For example, in Saudi Arabia, current IYCF are far from the recommendations (El Mouzan *et al.*, 2009) while in Uganda more than half of the mothers complied with IYCF recommendation (Babirye, Nuwaha and Grulich,

2009). In Kenya, only 32% of children are exclusively breast fed while only 39% of mothers comply with IYCF recommendations (KNBS and ICF Macro, 2010).

Cultural preferences of IYCF run counter the National IYCF recommendations (Giashuddin and Kabir, 2004) and the reasons cited for non-compliance include: lack of infant satisfaction on breast milk alone, infants need for complementary food, infant ready for solids, semi-solids and soft food and belief that complementary feeding causes infant to sleep longer (Crocetti *et al.*, 2004; Naanyu, 2008; Scott *et al.*, 2009). The benefits of compliance as is shown in a study by Torimiro *et al.*, (2004) where mothers compliance with the IYCF recommendations had outcomes of fewer episodes of the common signs of illnesses.

## **CHAPTER THREE: MATERIALS AND METHODS**

### **3.1 Study Design**

The study utilized the cross section descriptive design to assess mothers' compliance to five core IYCF indicators and six optional IYCF recommendations amongst children within their first two years of life.

#### **3.2.1 Dependent Variable**

Mothers' IYCF practices and compliance to national IYCF recommendations were the independent variables which were classified according to WHO definitions (WHO, 2010). The mothers were asked a 24 hour recall question; 'yesterday during the day or night what was given to (name of child) to drink or eat' (cross sectional approach) and 'what was (name of child) given to drink in the first three days of life' (retrospective approach) followed by a list of typical infant foods and beverages. Frequency of the meals per day was assessed but the quantity of food was not assessed. A descriptive analysis of age-specific prevalence rates was conducted based on the 24 hour dietary recall data where the age groups of 0-6 months, 7-8 months, 9-12 months and 13-24 months were used. Breast-feeding initiation rates, solids and semi-solid and soft food introduction rates were calculated using descriptive analysis of both cross sectional and retrospective data.

### **3.2.2 Independent variables**

The study of influence of the different IYCF risk factors (maternal level of education, level of knowledge on IYCF recommendations, support for IYCF, popular culture and teen age exposure to a breastfeeding mother) on the mothers' IYCF practices

### **3.3 Study Area**

The study was done in Nakuru Municipality in Nakuru County (Appendix 1). Nakuru is the fourth largest town in Kenya and has been identified as one of the fastest growing towns in Africa. The Nakuru Municipality is cosmopolitan with people of various socio-economic, races, different cultures and ideologies, religious and political aspirations. Nakuru's major strength is its being the headquarters of the Rift Valley Province and Nakuru County. It covers an area of 102 sq. Km and has a population of 307,990 (KNBS-KDHS, 2008-2009).

Nakuru Municipality is a dynamic urban area where a varied representative of people with various cultures and tribes reside. Since IYCF varies widely within and between populations for various reasons, Nakuru Municipality was chosen as an urban setup to identify different aspect of IYCF information that is only available in a cosmopolitan area. This would assist in deciding approaches to IYCF recommendation in response to urban settings.

The Nakuru Municipality hosts 39 health facilities. There are four hospitals and 3 health Centers, five dispensaries, two nursing homes and over 110 private health facilities (Municipality of Nakuru, 2010).

### **3.4 Study Population**

The study population for this study comprised all children within two years of life who attended clinics on a monthly basis. There was a total of 4356 children aged below two years in Nakuru Municipality. (DHIS, Nakuru).

#### **3.5.1 Inclusion criteria**

The mothers with children aged 0-24 months who reside in Nakuru Municipality attending 5 clinics in Nakuru Municipality and were willing to participate in the study were eligible respondents.

#### **3.5.2 Exclusion Criteria**

Mothers with children aged 0-24 months residing in Nakuru Municipality but had children too ill requiring immediate medical interventions or were unwilling to participate in the study were excluded.



### 3.6 Sampling Technique

The health facilities in Nakuru Municipality were stratified into management strata namely central government, local government, faith based and private health facilities. Purposive sampling was used to select 5 health facilities with the largest mean monthly attendance amongst the health services offered to the mother and child. The health facilities selected were PGH (Government), Mother Kevin (Faith Based), Gate House (Private), Langa Langa and Lanet (Local Government). Purposeful sampling was done to obtain dates to visit the health facilities. Every mother with a child aged between 0-24 months seeking health care services on the day the health facility was visited had an equal chance to be interviewed. Consecutive sampling was done to select the respondents in the health facility.

### 3.7 Sample Size Determination

Sample size was determined using the following formula as recommended by Fisher *et al.*, (1998).

$$n = \frac{z^2 p q}{\hat{d}^2}$$

Where:

$z$  – The standard normal deviation at the .05.

$p$  – Proportion in the target population estimated to have optimal infant feeding pattern.

$$q = 1 - p.$$

$\delta$  - The level of statistical significance set at 0.05

$$n = \frac{(1.96)^2 (0.37) (0.63)}{(0.05)^2}$$

$$(0.05)^2$$

$$n = 358.$$

For population less than 10,000 further calculations was carried out.

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

$$n_f = \frac{1}{1 + 358/4357}$$

$$n_f = \frac{1}{1 + 0.082}$$

$$n_f = \frac{1}{358/1.082}$$

$$n_f = 330 \text{ (minimum)}$$

The sample size number interviewed from each stratum was determined by calculating proportions (Appendix 6). The sample was distributed by dividing the mean monthly attendance in each health facility with the total mean of all health facilities and multiplying by 100 to get the percentage. Total mean for the five health facilities was 7818. The mean monthly attendance at the five health facilities was 1113.

The sample distributed to the five health facilities were as shown in Table 3.1.

**Table 3.1 Sample size in five health facilities**

<b>Health facility</b>	<b>Average attendance</b>	<b>Monthly</b>	<b>% total</b>	<b>Sample number</b>
Langa langa H.C	1113		14	47
Lanet H.C	708		9	30
PGH Nakuru	4032		52	170
Gate house	697		9	29
Mother Kevin	1268		16	54
<b>TOTAL</b>	<b>7818</b>		<b>100</b>	<b>330</b>

The minimum sample size determined was 330 and for each of the five health facility, 13% was added to increase the sample size proportionately leading to a total of 377 subjects.

### **3.8 Pretesting**

The research instruments (the structured and semi-structured questionnaire; Appendix 2), was administered to a pilot group of 33 mothers at Bondeni clinic to ensure validity and reliability.

### **3.9 Validity and reliability**

Training of the research assistance ensured that data collected was valid and reliable.

The data collection tool was reviewed by two supervisors.

### **3.10 Training of renumerators**

Data collection was done by nine qualified nurses who were selected on the basis of their familiarity with IYCF and were trained as research assistants for two days to ensure standardization of measurements and good probing techniques to obtain the 24 hour recall measures of the IYCF indicators (Whitney, Debruyne, Pinna and Rolfes, 2007). The research assistants were trained on the use of the CWC card to confirm child information of age and gender. The two days training content included an overview of the study, introduction to IYCF indicators, interviewing skills and practical assignment (Appendix 6).

### **3.11 Data collection procedures**

Administration of questionnaire was done to 377 mothers whereby interview of respondent by the researcher and research assistants on IYFC indicators was done. The researcher was a lead person and supervised the research assistants as well as provided guidance all through the data collection period.

The information gathered during the interview was data on infants' and mothers' characteristics, mother's level of knowledge on infant feeding guidelines', current practice of mothers' IYCF obtained from a 24 hour recall and support for optimal IYCF was collected. Maternal level of knowledge on IYCF were assessed using a knowledge scale developed consisting of 13 knowledge items which took approximately five minute to complete. Each correct response received a score of one allowing an overall range in scores of 0-17.

Current mothers' IYCF practices are the mothers' behavior relating to what is fed and how often. The core indicators assessed in this study relating to mothers' IYCF practice included; early initiation of breastfeeding, exclusive breastfeeding for children under six months, continued breastfeeding at 24 months, time introduction of solids, semi-solids or soft foods was done, minimum dietary diversity and minimum meal frequency. To assess dietary diversity, information was collected on different foods from different food groups that would have been given the last 24 hours. Other information gathered included the optimal indicators namely:-children ever breastfed, continued breastfeeding at 24 months, duration of breastfeeding and bottle feeding. Observation of CWC cards (road to health) was used to confirm the age of infant.

### **3.11 Data Analysis**

Data were coded, entered, and analyzed using SPSS version 20. Descriptive statistics were computed to determine proportion of timely initiation of breastfeeding and

timely introduction of solids, semi-solids and soft foods. Chi square analysis was computed to determine whether there was any relationship between variables.

### **3.11 Ethical considerations**

Permission was sought from Kenyatta University. Further permission was sought from the Ministry of Science and Technology, the Town Clerk, District Medical Officer of Health and from the Health Facilities authorities in Nakuru Municipality. The mothers were explained to about the study objectives and requested to participate, and once they consented verbally they were reassured of confidentiality of information given (Appendix 2).

## CHAPTER FOUR: RESULTS AND DISCUSSION

### 4.1 Mothers' demographic and socio-economic characteristics

The cumulative n = 301, 70% of the mothers interviewed were aged between 20-29 years; n=66, 18% were 30-34 years old; n=9, 2% were 35-39 years of age and an insignificant n=1, 0.3% was aged 40-44 years old. The mothers' age is shown in table 4.1. Majority (n =327, 86%) of the mothers were married; n=34, 9% were single; n=8 2% in each case were either divorced or separated while about n= 2, 1% were widowed (Table 4.1). The highest level of education attained by n = 140, 37% of the mother which was secondary school education; n=134, 36% had primary education; n=93, 25% were college/university graduates while n=10, 3% had no formal education (Table 4.1). Less than half (n=153, 41%) of the mothers were housewives; n=110, 29% were traders; n=74, 20% were in different professions while n=26, 7% and n=14, 4% were farmers and hawkers respectively (Table 4.1). The mothers' demographic characteristics suggest that the mothers with children aged 0-24 months in Nakuru Municipality were young, married, attained secondary school education and had no jobs. Being young, married, not pursuing education and not in any employment, may push the young mothers to embark on the job of raising children.

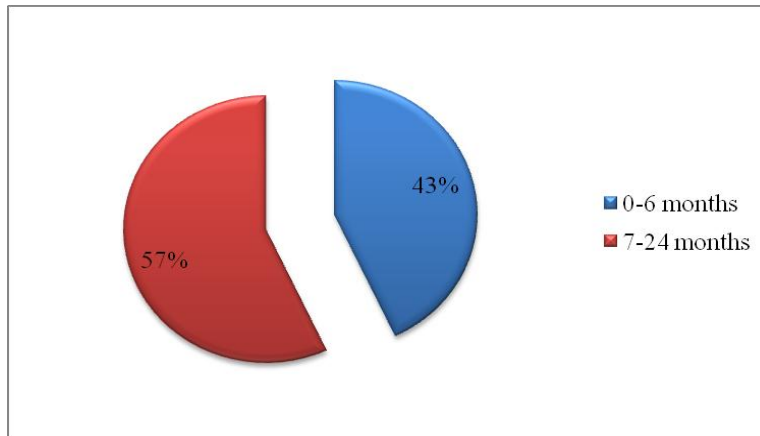
**Table 4.1 Mothers' demographic characteristics**

<b>Age</b>	<b>N</b>	<b>Percent</b>
Below 19	33	8.8
20-29	268	71.1
30-39	75	19.8
Above 40	1	.3
<b>Total</b>	<b>377</b>	<b>100</b>
<b>Marital status</b>		
Married	325	86.3
Divorced/Separated	16	4.2
Widow	2	.5
Single	34	9
<b>Total</b>	<b>377</b>	<b>100</b>
<b>Educational level</b>		
No formal education	10	2.7
Primary	134	35.5
Secondary	140	37.1
College/ University	93	24.7
<b>Total</b>	<b>377</b>	<b>100</b>
<b>Mothers' occupation</b>		
Hawker	14	3.7
Farmer	26	6.9
Trader	110	29.2
Professional	74	19.6
No job/ House wife	153	40.6
<b>Total</b>	<b>377</b>	<b>100</b>



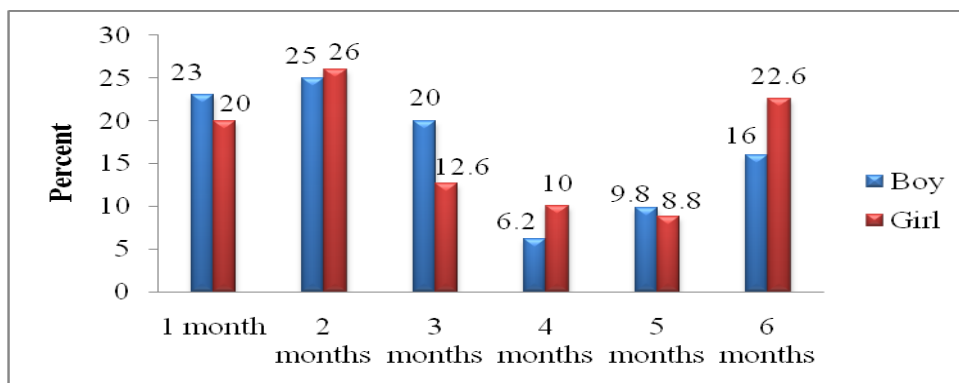
## 4.2 Child's Age and sex

The findings of this study showed that  $n = 162$ , 43% of infants were aged 0-6 months;  $n = 98$ , 26% were 7-12 months old;  $n = 72$ , 19% were children aged 13-18 months old while  $n = 45$ , 12% were aged 19-24 months. The distribution of the children by their ages and gender was as shown in figure 4.1.



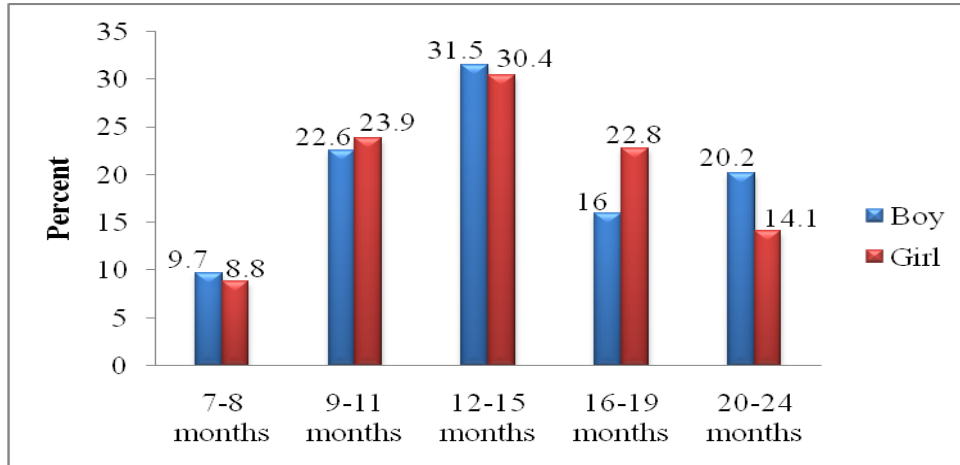
**Figure 4.1: Child's age proportion for 0-6 and 7-24 months.**

The proportion of children aged 0-6 month was  $n= 162$ , 43%, of these the proportions for 0-1 months were  $n=35$ , 22%, 2-3 months ( $n= 68$ , 26%), 4-5 months ( $n=28$ , 8%) 6- <7 months ( $n=31$ , 19%).



**Figure 4.2 Proportion of children aged 0-6 months**

Proportion of children aged 7-24 months (n = 216, 57%) was 7-8 months were n=20, 5.3%, 9-11 (n= 50, 13.3%), 12-15 months (n=67, 17.8%), 16-19 months (n=41, 10.8%) and 20-24 months (n=38, 10%) as shown in figure 4.3.



**Figure 4.3 Proportion of Children aged 7-24 months**

The child's birth order ranged from 1-7 and majority (n=275, 73%) of the children were subsequent born while only n=102, 27% were first born as shown in table 4.2.

**Table 4.2 Childs' birth order**

Child's Birth order	Frequency	Percent
First	102	27
Subsequent	275	73
<b>Total</b>	<b>377</b>	<b>100</b>

Demographic and social economic variable relationship with IYCF practice analyzed using Chi square showed: mothers' age [ $\chi^2$  (85, n = 371) = 97.42, p = .168], marital status [ $\chi^2$  (68, n = 371) = 84.211, p = .089], educational level [ $\chi^2$  (48, n = 371) = 40.56, p = .768] occupation [ $\chi^2$  (68, n = 375) = 70.69, p = .388] and [ $\chi^2$  (119, n = 375) = 177.32, p = .000] had no association with positive IYCF practice as the p-value was more than .05 hence null hypotheses that there was no relationship in the IYCF factors under assessment with positive IYCF practices was not rejected.

### **4.3 Mothers' knowledge of IYCF recommendations**

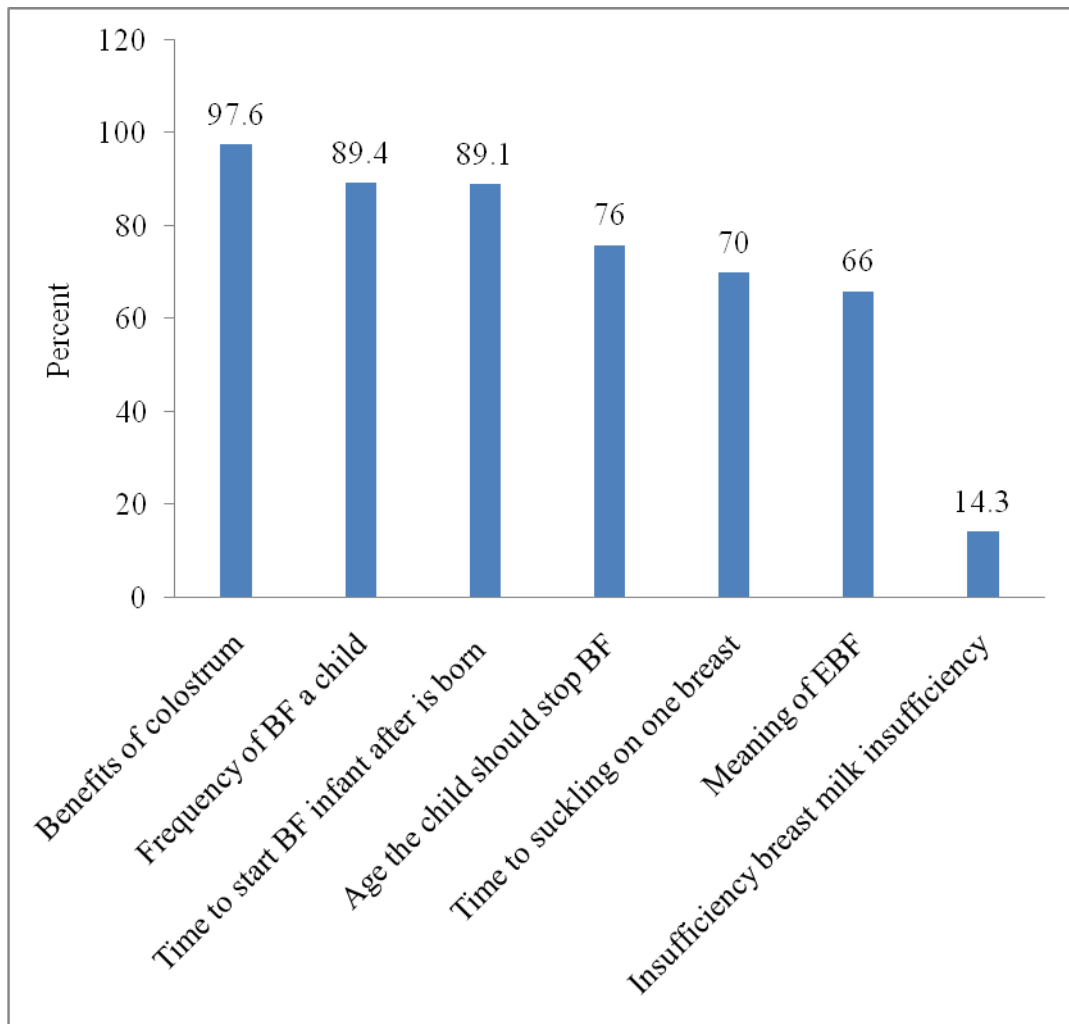
The IYCF Knowledge on recommendations results were divided in two sections; the knowledge on exclusive breastfeeding and second, continued breastfeeding and complementary feeding knowledge.

#### **4.3.1 Mothers' knowledge on optimal breastfeeding recommendations**

Parameter of breastfeeding that were assessed in knowledge were initiation of breastfeeding within one hour of birth, on demand breast feeding frequency and suckling the baby on one breast for as long as baby wants. Other parameters included: exclusive breastfeeding being defined as giving baby breast milk and nothing else, benefits of colostrum, breastfeeding cessation time of two years and beyond and management of breast milk insufficiency.

Majority (n= 336, 89.1%) of the mothers indicated that it was appropriate to put the baby on the breast for the first time within one hour after delivery while n=41, 11% indicated that it is appropriate within a period of 24 hours. Majority (n= 337, 89.4%) of the respondents indicated that an infant should be breastfeed on demand compared to n=23, 6% and n=19, 5% who indicated 5-7 and 8-10 times respectively. While responding to the question on how long a baby should be allowed to suckle the breast, n= 264, 70% indicated that the baby should be allowed to suckle for as long as he/she wanted to; n= 94, 25% indicated 10-15 minutes while n= 19, 5 % indicated varying other durations.

About two thirds (n=249, 66%) of the mothers had knowledge that exclusive breastfeeding means giving a baby nothing else except breast-milk while n=128, 34% lacked the knowledge. Majority (n=368, 97.6%) of the mothers were aware of the benefits of colostrums namely; nutritive, bonding, cost effective and protective. About three thirds (n=287, 76%) of the respondents indicated that the appropriate age to stop breastfeeding the baby was 21-24 months while n=64, 17% and n=26, 7% indicated 16-20 and 11-15 months respectively. Lastly but not least only n=54, 14.3% of the mothers knew that if a four month old baby was not getting enough breast milk then they should increase the breastfeeding frequency (Figure 4.4). The findings indicate that the mothers' knowledge on seven core areas of breastfeeding was good (72%).



**Figure 4.4 Mothers' level of knowledge on optimal breastfeeding**

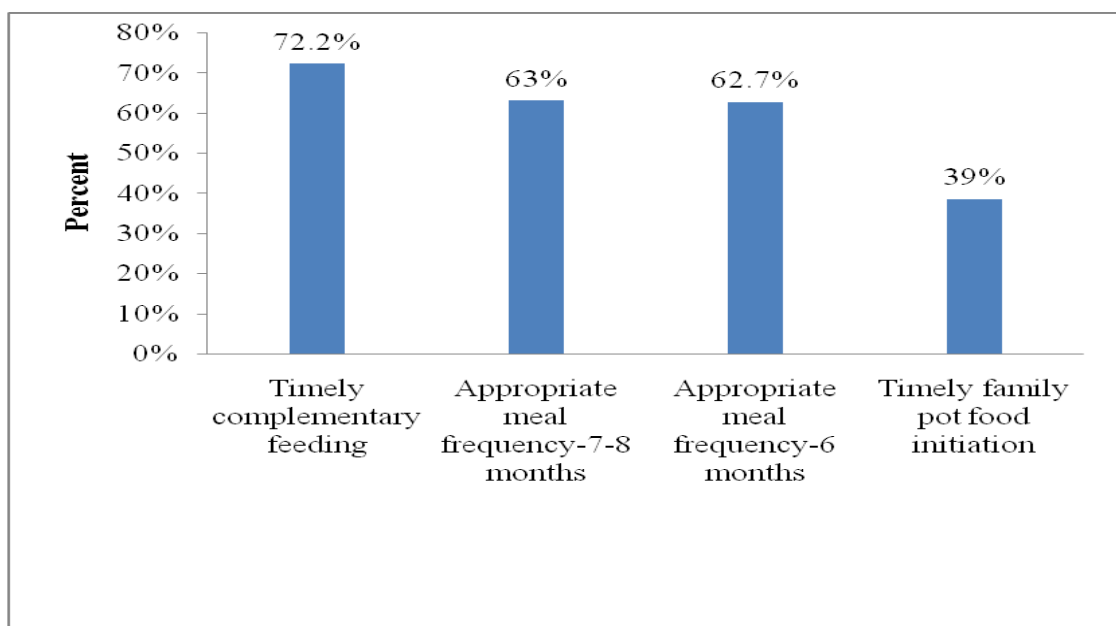
#### **4.3.2 Mothers' level of knowledge on complementary feeding recommendations**

The mothers' level of knowledge on the appropriate time to introduce solids, semi-solid and soft foods was established. Majority (n=275, 73%) of the mothers indicated that the appropriate time to introduce solids, semi-solid and soft foods was 7-8 months; n=79, 21% indicated 5-6 months; n=23, 6% - 3-4 months while those who indicated 1-2 months were an insignificant n=4, 1% (Figure 4.5). The results of mothers' level of knowledge of the frequency of giving an infant, who is

breastfeeding, soft porridge and mashed foods at 6 months, revealed that n=151, 40% and n=147, 39% was three and two times respectively compared to n=53, 14%, n=283 75% and n= 8, 2% who indicated once, four times and five times respectively (Figure 4.5). The findings suggest that though mothers have good knowledge on timely introduction of complementary food, the initial frequency of meals for a six month old was poor since only n=53, 16% of respondent gave the frequency of meals at six months as once as recommended. On how often a breast feeding infant should be given solid, semi-solids or soft foods in a day at 7-8 months, n=237, 63% of the mothers responded three times which is the recommended frequency, n=75, 20% - four times; n = 38,10% - twice; n=26, 7% - five times while less than n=4, 1% indicated once (Figure 4.5). The mothers' knowledge on frequency of meals improve from n= 53, 14% for a child at 6 months to n= 237, 63% for child at 7-8 months. However, the findings indicate that mother may introduce complementary food at six months at a frequency more than the recommended frequency compromising on the benefits of breast-milk.

Less than half n=162, 43% of the mothers indicated that the appropriate age at which the baby should receive food from the family pot was 12-14 months; n=139, 37% at 9-11 months which is recommended time; n = 53, 14% at 18-20 months and n=23, 6% at 15-17 months (Figure 4.5). Findings suggest that there was slight delay of introducing varied food taste and consistency from family pot.

The mothers' knowledge on feeding a baby after six months according to IYCF Knowledge indexes revealed that:- majority (n=274, 72.7%) had knowledge of the right age to start complementary food, n=238, 63% of frequency to feed child at 7-8 months, n= 236, 62.7% of age to start child on family pot and n= 145, 38.5% of frequency of feeding child at 6 months (Figure 4.5).



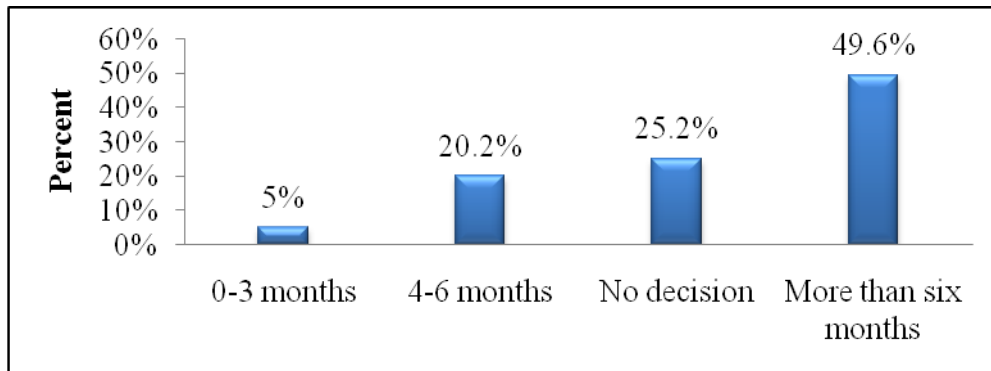
**Figure 4.5 Mothers' level of knowledge of complementary feeding**

The average score for seven knowledge items on breastfeeding was 72 % while average score for four knowledge items complementary feeding was 59%. This indicated that the total score for mothers' knowledge on IYCF recommendations was 66%.

#### 4.4 Mothers' prior plan of IYCF, exposure to breastfeeding mother during teenage, popular IYCF culture, sources of IYCF information and support for IYCF

##### 4.4.1 Mothers' prior plan of IYCF

Almost half n=187, 49.6% of the mothers had made decision to breastfeed for more than six months, n=95, 25.2% had not made a decision, four to six months (n=76, 20.2%), 0 to three months (n= 19, 5%) as shown in figure 4.6.

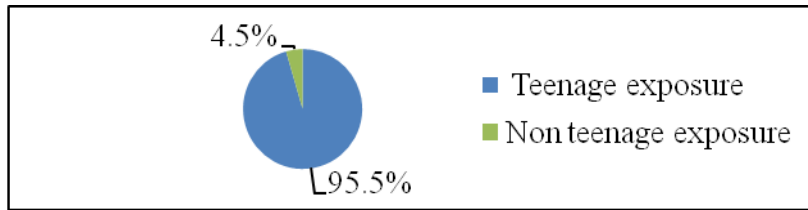


**Figure 4.6 Mothers' prior plan for exclusive breastfeeding practice**

##### 4.4.2 Prior teenage exposure to breastfeeding mother

Majority (n=360, 95.5%) of the mothers stated that they had been exposed to a role model of a breast feeding mother during their teenage either through own mother, a close relative or neighbor, while n=17, 4.5% of the mothers had not witnessed any one breastfeed (figure 4.7).





**Figure 4.7 Mothers' prior teenage exposure to role model of breastfeeding mother**

#### 4.4.3 Popular IYCF culture

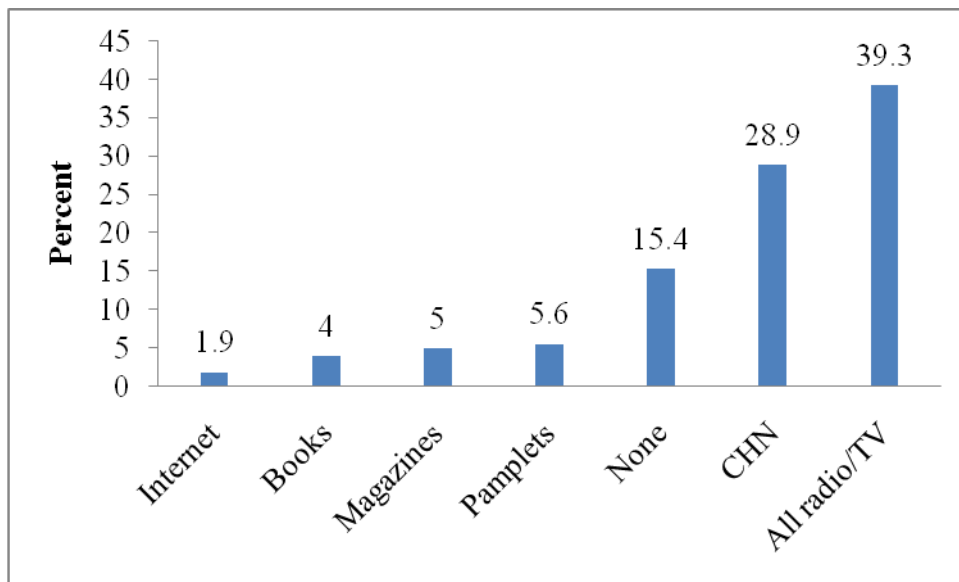
As regards the popular culturally accepted time to introduce solids, semi-solids and soft food, n=147, 39% of the mothers stated 0-3 months, n=119, 31.6% did not know and n=111, 29.4% stated 4-6 months as shown in table 4.3.

**Table 4.3 Popular culture for introducing solids, semi-solids or soft food**

Popular cultural time acceptable to introduce solids, semi solid or soft food	Frequency	Percent
0-3 Months	147	39
4-6 Months	111	29.4
Mothers do not know culturally acceptable time	119	31.6
<b>Total</b>	<b>377</b>	<b>100.0</b>

#### 4.4.4 Sources of IYCF information

Majority (n=318, 84.6%) of the mothers had received IYCF information while n= 59, 15.4% of the mothers had not. The mothers stated that the IYCF information was received from mass media (all Radio and television stations (n=148, 39.3%)), Community Health Nurse (CHN) (n= 108, 28.9%), magazines (n=19, 5%), books (n=15, 4%) and internet (n=7, 1.9%) while n= 58, 15.4% of the mother had never received IYCF information as shown in figure 4.8.



**Figure 4.8 Sources of IYCF practice information**

#### 4.4.5 Support for IYCF

This study assessed the support the mothers had received for their IYCF practices and the findings are depicted as; key person supporting through words of praise, providing reassurance and opportunity to discuss IYCF. About a third (n=117,

31.1%) of the mothers cited the child's father and community health nurse (CHN) (n=114, 30.2%) as key persons who supported BF through praising the mothers for their efforts. The mother-in-law accounting to n= 16, 4.2% had the least proportion of providing words of praise to the mothers in support of IYCF (Table 4.4).

Slightly less than half (n= 174, 46.4%) of the mothers cited the health worker as the person who provides reassurance on mothers' practice of breastfeeding. Own mother accounted for n=78, 20.7%, child's father (n = 63, 16.7%), mother in law (n= 16, 5.6%), friend (n=7, 1.9%) and n=33, 8.8% of the mothers had no one to reassure them on breast feeding (Table 4.4).

Slightly above half (n=215, 57%) of the mothers cited the health worker as the person who gave them opportunity to discuss IYCF practices, n= 70, 18.6% their own mother, n= 38, 10% their friend, n=15, 4% the mother-in-law and n= 12, 3.2% relatives as shown in Table 4.4. These findings indicated that the Community Health Nurse (CHN) and the child's father were key persons in offering the mothers IYCF support.

**Table 4.4 Support for IYCF**

<b>Support Person</b>	<b>Support of praise for IYCF efforts</b>	
	<b>Frequency</b>	<b>Percent</b>
Child's Father	117	31.1
CHN	114	30.1
Own mother	66	17.5
Mother in law	17	4.3
No one	63	17
<b>Total</b>	<b>377</b>	<b>100</b>

**Support of Providing reassurance on IYCF**

Child's Father	63	16.7
Own mother	78	20.7
Mother in law	21	5.6
Friend	7	1.9
No one	19	8.8
CHN	175	46.4
<b>Total</b>	<b>377</b>	<b>100</b>

**Support of giving opportunity to discuss on IYCF**

Own mother	70	18.6
Mother in law	12	3.3
Friend	38	10.1
Other relatives	12	3.2
CHN	215	57
No one	8	2.1
<b>Total</b>	<b>355</b>	<b>100</b>

There was no association between: mothers' prior plan for IYCF [ $\chi^2$  (51, n=375) =45.923, p=.675], popular breastfeeding culture [ $\chi^2$  (17, n=375) = 19.764, p = .286], support for IYCF by giving mother words of praise for breastfeeding [ $\chi^2$  (68, n = 375) =145.079, p = .000] and sources of IYCF information [ $\chi^2$  (102, n = 375) = 106.78, p = .353] with positive IYCF practices since the p-value was more than .05 hence null hypotheses was not rejected.

Exposure of the mothers' during her teenage phase to a role model mother breastfeeding [ $\chi^2$  (68, n=375) =101.347, p = .005] and response with concern to mothers' satisfaction [ $\chi^2$  (68, n = 375) =105.826, p = .002) showed positive IYCF practices where p-value was less than .05 suggesting that the null hypotheses was rejected (Table 4.5).

**Table 4.5 Determinant variables of IYCF association with mothers' IYCF**

<b>Determinant IYCF practice factors (Variables)</b>	<b>Chi square</b>	<b>Degree of Freedom</b>	<b>P value</b>	<b>N</b>
Mothers' prior plan of IYCF	$\chi^2 = 45.92$	51	.675	375
Mothers' prior teenage witness of BF mother	$\chi^2 = 101.3$	68	.005*	375
Popular culture of BF	$\chi^2 = 19.76$	17	.286	375
Source of IYCF information	$\chi^2 = 106.7$	102	.353	375
Support via giving word of praise for BF	$\chi^2 = 145.1$	68	.000	375
Support via responding satisfactorily to concern on BF	$\chi^2 = 105.8$	68	.002*	375
Note: -p-value was .005; where p-value of less than .005 was computed with *.				

#### **4.5 Mothers' infant and young child feeding practices**

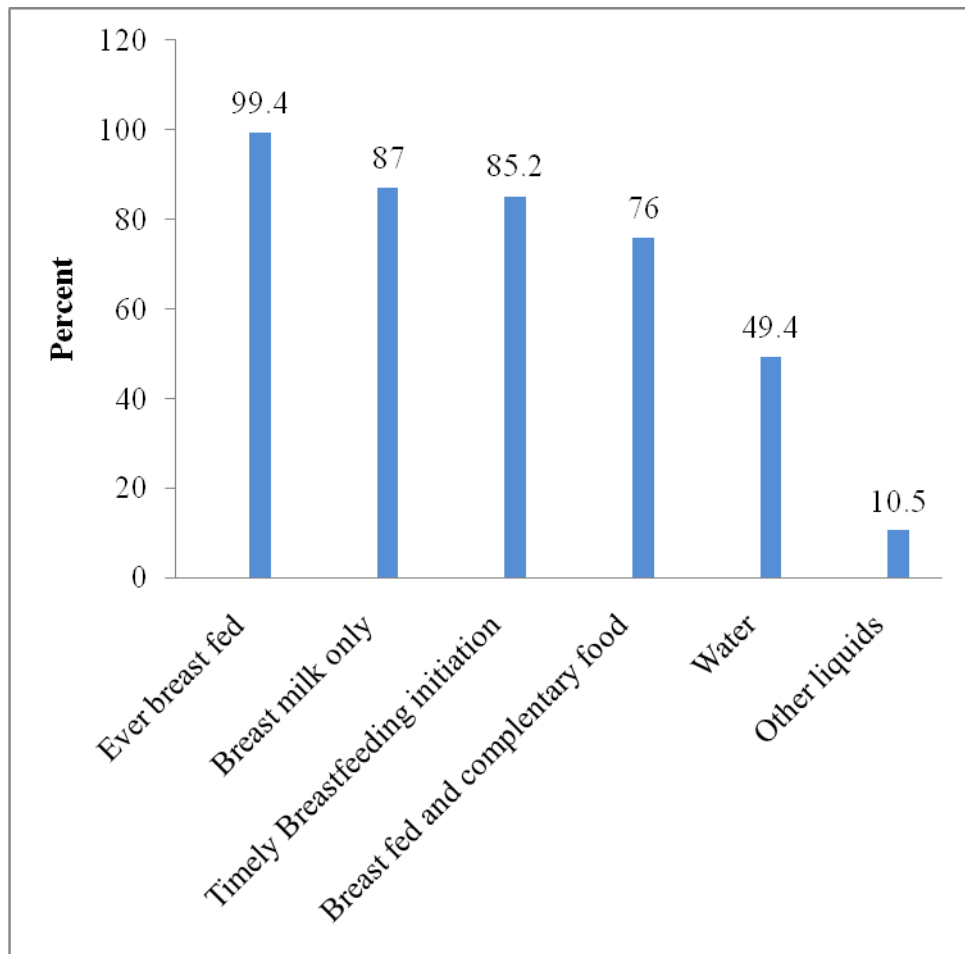
The study sought to establish the IYCF practices adopted by the mothers with reference to recommended National IYCF practices. The IYCF practices were established in two sub-groups of the sample namely 0-6 months and 7-24 months as guided by the national IYCF recommendations. Optimal IYCF practices are mainly

the mothers' breastfeeding practices for both age groups and complementary feeding practices for 7-24 month age sub group.

#### **4.5.1 Mothers' breastfeeding practices for age group of 0-6 months old**

Almost all (n=373, 99%) of the respondents had ever breastfed their young children compared to a paltry n= 4, 1% who did not breastfeed (figure 4.9). Initiation of breastfeeding after delivery was done by majority (n= 311, 85.2%) of the mothers within less than 60 minutes, n= 42, 11% less than 24 hours while less than n=4, 1% had taken less than 72 hours (figure 4.9). The practice of giving colostrums for the first three days was practiced by n=327, 87% of the mothers (figure 4.9). In the past 24-hour period prior to the study, n= 305, 80.9% of the mothers had breastfed their children while n=54, 14% had not breastfeed (figure 4.9).

Majority (n=287, 76%) of the mothers breastfed on demand and also gave complementary feeds which is not recommended (figure 4.9). Other than breast milk, n=40, 10.5% of the respondents gave liquids to infants such as formulae milk, thin porridge and glucose water. Plain water was given to infants by n=186, 49.4% of the respondents (Figure 4.9).



**Figure 4.9 Mothers' breastfeeding practices for age group 0-6 months**

The reasons cited for stopping breastfeeding were maternal work (n=28, 7.4 %) and insufficient breast milk represented by n=37, 9.8 % (Table 4.6).

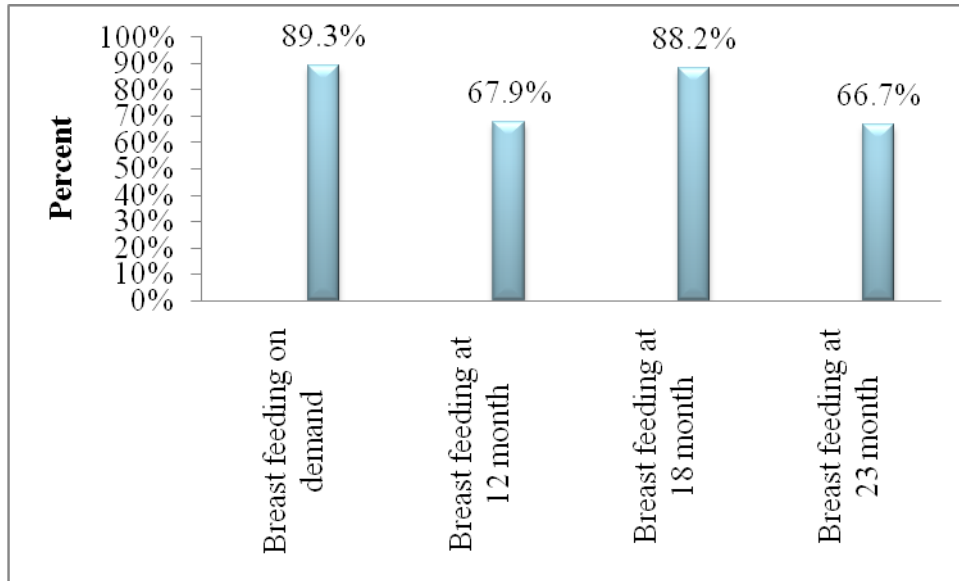


**Table 4.6 Reason for stopping breastfeeding**

<b>Reasons for stopping BF</b>	<b>Frequency</b>	<b>Percent</b>
No enough breast milk	37	9.8
Child cries a lot	4	1.1
Breast problems	3	.8
Advice from others	12	3.2
Work	28	7.4
still breast feeding	293	77.7
<b>Total</b>	<b>377</b>	<b>100</b>

#### **4.5.2 Mothers' practice of breastfeeding practices for 7-24 month age group**

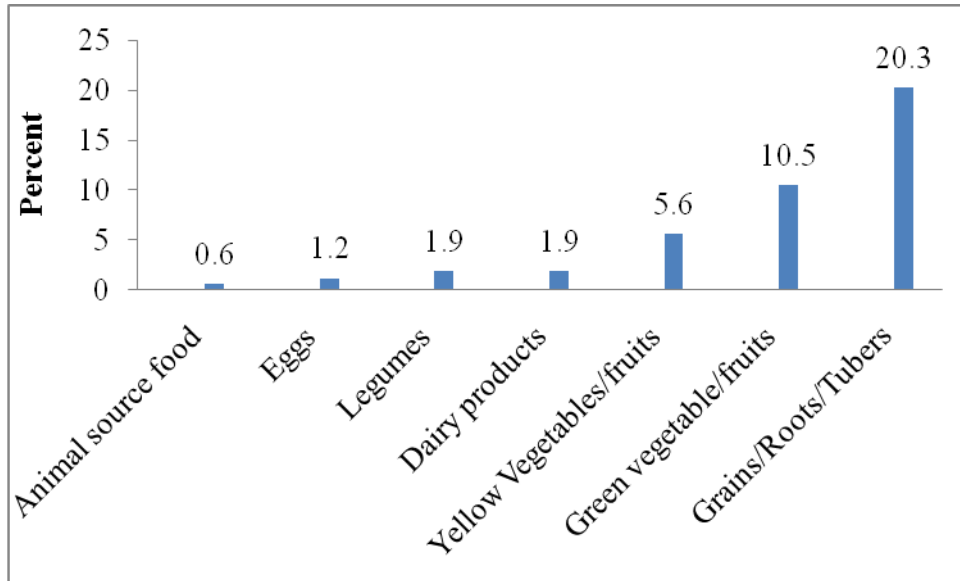
After initiation of semi-solids, solids and soft foods the mothers' breastfeeding practices were; breastfeeding on demand (n=337, 89.3%), still breastfeeding at 12 months of infants age (n=226, 67.9%), at 18 months of age (n=333, 88.2%) and at 24 months of age (n=226, 60%) as shown in figure 4.10.



**Figure 4.10 Mothers' practice of breast feeding for 7-24 month old children**

#### **4.5.3 Mothers' complementary feeding practices for children**

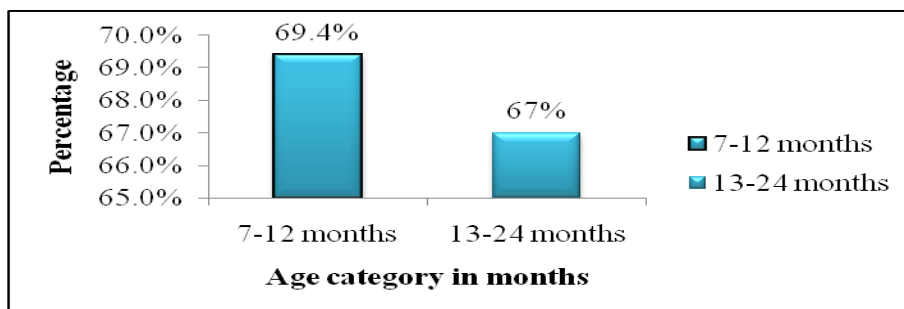
Mothers' practice of complementary feeding that was assessed in this study included: the practice of timely initiation of liquids, semi-solids and soft foods, dietary diversity, minimum meal frequency and use of bottle with teat to feed children semi-solids and liquids. A proportion of n=75, 19.8% of the mothers initiated liquids, semi-solids and soft foods as early as at the age of one month whereby such infants were fed on grains, roots/tubers (n=77, 20.3%), dairy products (n=21, 5.6%), foods rich in vitamin A such as fruits and vegetables and tubers that are yellow in color (n=21, 5.6%), legumes (n=7, 1.9%), vegetables and fruits (n=40, 10.5%), eggs (n=5, 1.2%), animal source foods (n=2, 0.6%), and oil (n=2, 0.6%) as shown in figure 4.11.



**Figure 4.11 Mothers' IYCF practice of early initiation of complementary food**

About three thirds (n=144, 67%) of the mothers with children aged 7-24 months had given solids, semi-solids and soft foods within the previous 24 hours prior the study as depicted by a proportion of n =150, 69.7% of mothers with 7-12 months old infants and n= 117, 67% of mothers with 13-24 months old young children respectively

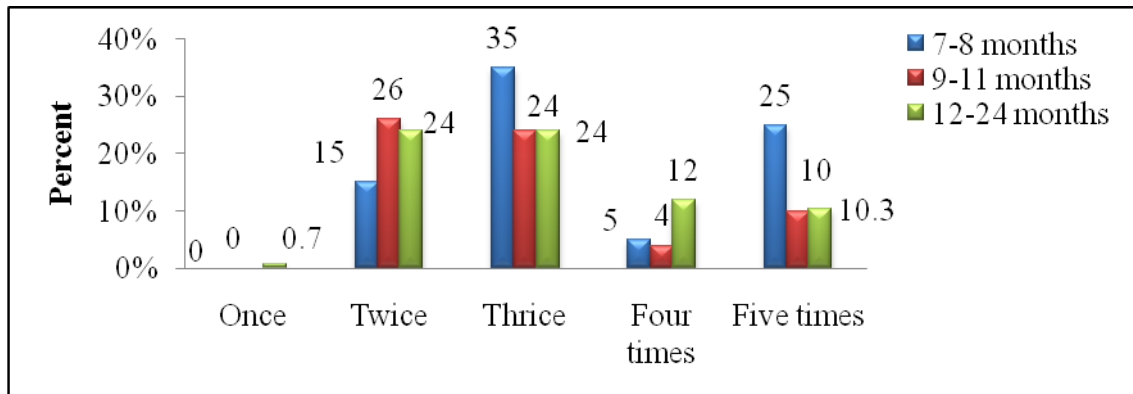
(figure 4.12).



**Figure 4.12 Mothers' IYCF practice of giving solid, semi-solids and soft food**

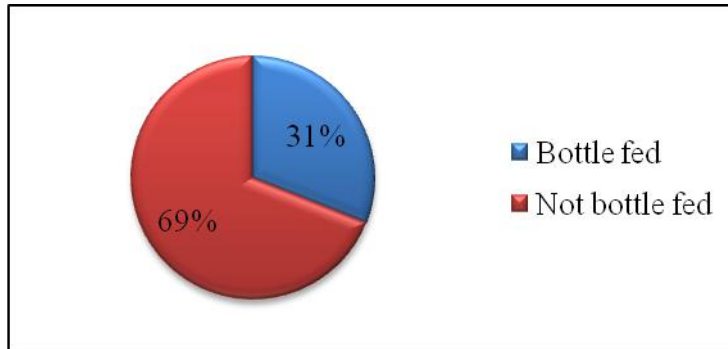
As for dietary diversity, the mothers' practice revealed that half (n=189, 50%) had given a mean of three types of foods from the recommended food groups to their children as per the 24 hour recall. The IYCF recommendations state satisfactory diversity is four to five types of food.

The meal frequency for the 7-8 month old infants, 9-11 months and 12-24 months age category was twice (n=20, 15%; n=50, 26% and n= 146, 24% respectively), three times (n=20, 35%; n= 50, 24% and n=146, 24%), four times (n=20, 5%; n=50, 4% and n=146, 12%) and five times (n=20, 25%; n=50, 10% and n= 146, 10.3%) respectively (figure 4.13).



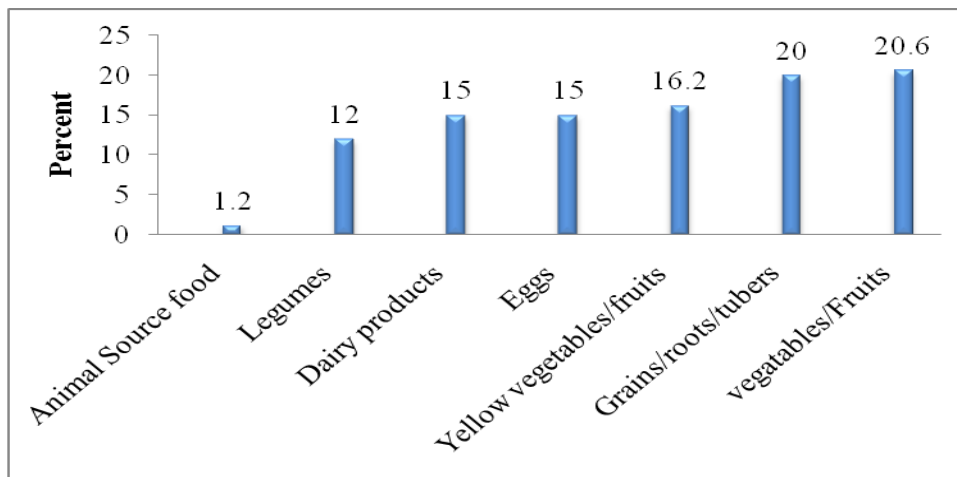
**Figure 4.13 Mothers' practice of IYCF meals frequency**

Bottle with teat utilization for IYCF of liquid and semi-solids was practiced by n=67, 31% of the mothers as shown in figure 4.14.



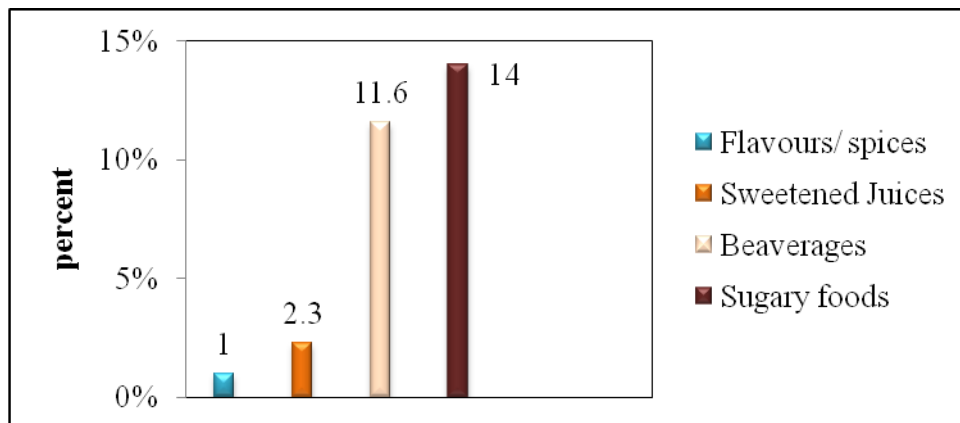
**Figure 4.14 Mothers' utilization of bottle with teat for IYCF**

A small proportion (n=44, 20.6%) of the respondents gave their infants and young children aged 7-24 months old vegetables and fruits, starch/roots and tubers (n=43, 20%), vitamin A rich food (Yellow colored fruits, vegetables and tuber) (n=35, 16.2%), eggs (n=32, 15%), dairy products (n=32, 15%), legumes (n=26, 12%) and animal source food (n=3, 1.2%) respectively as shown in figure 4.15.



**Figure 4.15 Food diversity given to children aged 7-24 months**

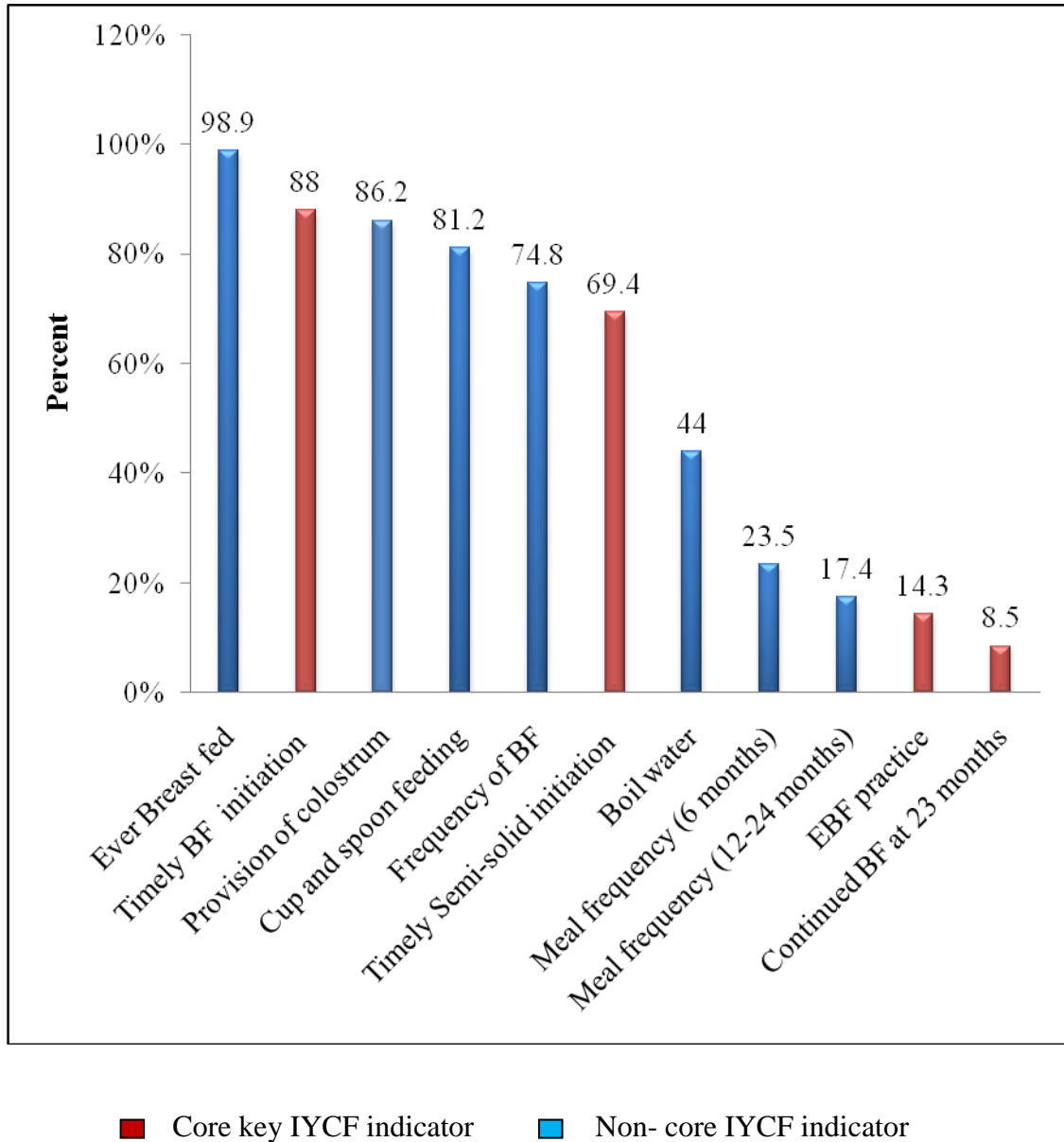
The IYCF practices of the mothers also included giving of other foods such as sugary foods like cakes, candies, sweets, chocolate and pastries (n=30, 14%), foods with spices and flavours (n=2, 1%), sweetened juices (n=5, 2.3%) and beverages such as tea and coffee (n=25, 11.6%) as shown in figure 4.16.



**Figure 4.16 Mothers' IYCF practice of giving non-recommended food groups**

#### **4.6 Mothers' IYCF practices compliance with national IYCF recommendations**

On the practice of complementary feeding, slightly above three thirds (n=149, 69.4%) of the mothers practiced timely initiation of complementary feeds, n=95, 44% ensured they boiled water for children to drink, n=10, 23% practiced proper meal frequency at 6 months of age, n=25, 17.4% at 12-23 months of age and only n=1, 8.5% practiced continued breastfeeding at 23 month of age (figure 4.17).



**Figure 4.17 Mothers' IYCF practice compliance with national IYCF recommendations**

## 4.7 Discussion

### 4.7.1 Demographic and socio-economic characteristics

The findings in this study showed that majority (n=301,79.9%) of the mothers were young mothers aged below 29 years who have special needs for guidance concerning IYCF recommendations due to their lack of experience on IYCF as was depicted in a study by Gudnadottir *et al.*, (2006). Furthermore, the high percentage (n=324, 86.2%) of married respondents is an indication that the children are raised in a family units. Family level intervention would be a good area to bring out the full potential of fathers' support and involvement in IYCF. Fathers' support of IYCF may be a key area to deal with compliance with the IYCF recommendations at the community level. Though the findings of this study did not suggest any association of marital status with IYCF [ $\chi^2$  (68, n = 371) = 84.211, p = .089] which concurs with study done by Britain (Agboado *et al.*, 2010).

A higher level of education enables mothers to comprehend IYCF recommendations since studies by Fjeld *et al.*, 2008; Morgan *et al.*,2010 and Memon *et al.*, 2010 showed that less educated mothers were more prone to conventional non-exclusive breast-feeding practice which is dissimilar to the findings in this study where the majority (n=274, 72.6%) of the mothers combined had attained primary and secondary levels of education and no association was found with positive IYCF practice [ $\chi^2$  (48, n=371) =40.56, p = .768].



Parental economic power influences IYCF practices; engagement of the parents in income-earning activities ascribes an economic ability to the parents to afford supplementation of the child dietary requirements at the various stages of growth. On the other hand, maternal employment had negative impact on EBF and duration of breastfeeding as was revealed in a study done in Canada and Brazil by Al-Sahab *et al.*, (2010). Mothers who had to report back to work within four months were less likely to start breastfeeding as depicted in a study done in Britain and Ireland by Hawkins *et al.*, (2007). Majority (n=153, 40.6%) of the mothers were housewives. The mothers who did not have to go to work and were housewives had time to practice the IYCF recommendations however, there was no association found of maternal employment with positive IYCF practices [ $\chi^2$  (68, n = 375) = 70.69, p >.05].

#### **4.7.2 Mothers' Level of Knowledge on IYCF Recommendations**

The mothers' level of knowledge of IYCF recommendations was good (n=271, 72%) in the assessed indexes of breastfeeding. Whereby the items on IYCF were scored and a mean score attained. The index of breast feeding recommendation reported as best known amongst the mothers in Nakuru Municipality was the benefits of colostrum to the infant (n=368, 97.6%) as compared to that of management of breast-milk insufficiency which had low score of n=54, 14.3%. It showed that the mothers had the knowledge that the 'breast is best for the baby' but when faced with a common breast milk insufficiency problem, they were not able to apply the best solution due to inadequate information. The gap in mothers' knowledge index of breastfeeding recommendation on practical aspects of handling breast milk

insufficiency was similar to findings depicted in a study by Foss (2010). Poor knowledge on how to handle breast milk insufficiency during the EBF period of 0-6 months may have lead to mothers' non-compliance to EBF recommendations. Mothers' exposure to information on the lactation let down which allows more milk to be produced in response to the frequency the child is put on the breast may have helped to build up on the knowledge deficit.

It was evident from findings of this study that the mothers' level of knowledge on the meaning of EBF was the lowest amongst the other breastfeeding practice indicators. Lack of clear understanding of what EBF means may have compromised the EBF recommendations practices and lead to non-compliance as revealed in this study. The findings of a study done in Eldoret, Kenya revealed that mothers who had no knowledge about IYCF recommendation were nine-fold more likely to start mixed feeding by 10 weeks of age (Arusei *et al.*, 2011).

The mothers had reasonable knowledge on the most appropriate time to initiate breastfeeding and by extension give the baby colostrum which was recommended due to its many benefits to the infant as depicted in various studies (Disantis *et al.*, 2011; Cohen *et al.*, 2012). This may have been attributed to the fact that majority n=271, 72% of the mothers had attended ante-natal clinic in BFHI accredited health facilities three or four times and had been guided on the initial step of the ten steps to successful breastfeeding practices undertaken in respect to introduction of the infant to breast milk.

Mothers' knowledge on IYCF of indicators on complementary feeding that was scored as the highest (n=274, 72.7%) was the appropriate time to start solids, semi-solids and soft foods as compared to scores (n=145, 38.5%) on the frequency of feeding solids, semi-solid and soft foods to infants at six months and at 7-8 months (n=238, 63%). This finding was in agreement with a study done in (Korogocho and Viwandani Slums) Nairobi, Kenya (Kimani *et al.*, 2011). The knowledge on complementary feeding indicator that was scored poorest (n=145, 38.5%) was the frequency of giving solids, semi-solids and soft foods at 6 months of age. This age period being the transition period from EBF to complementary foods, mothers need to be conversant with the recommended practice. The finding of this study would indicate that the content on the frequency of giving solids and semi-solids and soft foods at the stage of transition may not be clear or may be missing from the health education sessions given to the mothers. Strategies for such means of information dissemination would need to be identified to ensure the mothers are exposed during the entire two years period of a child's life which is a critical period for interventions to prevent growth faltering (Victora *et al.*, 2010; Dewel and Adu-Afarwuah, 2008).

#### **4.7.3 Sources of information on IYCF, Prior plan, support for IYCF, popular culture and prior teenage exposure to breastfeeding mother**

##### **4.7.3.1 Source of IYCF information**

From the findings in this study, the mothers had the opportunity to make choices of how to feed their infants from the position of having received information on IYCF

whereby n=147, 39% of mothers had received IYCF information from the all the radio and TV stations, n=109, 28.9% from community health nurses and others from pamphlets, magazines, books, and internet. This study showed that only n=109, 28.9% mothers in Nakuru Municipality visit antenatal and post natal clinics as recommended. However, the opportunities they had to receive information may not have been effective to change the mothers' IYCF practices to comply with the recommendations. They made choices which were contrary to even their prior plan decisions made before the baby was born. The mothers' preferred means of IYCF information dissemination was the health facility based interventions. This would mean improving the health facilities interventions in place to address the gap.

#### **4.7.3.2 Prior plan for IYCF**

Almost half (n=187, 49.6%) of the mothers had made a decision to exclusively breast feed for six months, however only n= 54, 14.4% had followed their decision. It shows a willingness to comply to the recommendations but lacks the push by family, relatives and community members to follow up with the recommendations. This study's finding was similar to those of a study by Wen *et al.*, 2012 who found out that having an intention to meet IYCF recommendations was weakly associated with initiation of breastfeeding only and not duration .

#### **4.7.3.3 Support for IYCF**

This study identified community health nurses (CHN), health workers and own mother as key persons in; provision of IYCF support of giving praise words on

mothers' efforts of BF, providing opportunity for discussion, reassurances, responding satisfactorily to mothers' concerns on IYCF and motivating the mothers on IYCF. However, with the present known situation of shortages of CHN in health facilities, they may not be in a position to provide the much needed support of hands-on in solving IYCF problems as was cited as a source of lack of compliance with IYCF recommendations.

The child's father was identified as key in provision of IYCF support of providing praise to the mother on IYCF efforts. They may offer praise to the mother but may not be competent to skillfully provide best IYCF practices when faced with difficult problems such as insufficient breast-milk which may lead to both mother and father being frustrated and hence non-compliant with the recommendations.

The person stated to be key in providing physical support for IYCF was own mother and neighbors. It was also revealed that about n=87, 23% of the mothers received no physical support on IYCF. This may be attributed to social network in an urban set up where the closely knit network of relatives is worn out due to economic related activity demands common in urban set ups. The demand of urban livelihood may cause the provision of IYCF support of visiting the mothers at home to be low as stated in this study whereby about n=87, 23% of the mothers reported that noone visited them.

#### **4.7.3.4 Popular IYCF culture**

Exposure of teenagers to popular culture of breastfeeding as depicted in mothers in a community who breastfeed their children as per recommendations may impact to them once they too become mothers to breastfeed as it was instilled in them as acceptable. This may explain the universal practice of ever breastfed status (n=373, 98.9%) but may not have an influence in compliance with whole package of IYCF recommendation. However, as n=269, 70% of the mothers stated that popular culturally accepted time to introduce complementary food was before the child was six months old, it may suggest that a mother may have a false accomplishment of being a good mother if they manage to breastfeed for 3 months. This popular culturally accepted duration falls way below the recommended complementary food commencement period of from six month. The Kenya Government Strategy of provision of health at level one through the Community Health Extension Workers (CHE) may impact on the IYCF support to ensure IYCF information is accorded at the community level.

#### **4.7.3.5 Mothers' past teenage exposure to a breast feeding mother**

The frequent exposure of a teenager to a mother who was a role model in IYCF practices may have positive outcomes in the mothers' future IYCF practices. The past teenage witnessing of a mother frequently breastfeeding had association with positive mothers' IYCF practices [ $\chi^2$  (68, n =375) =101.3, p < .05]. Mothers who had witnessed a mother breastfeed frequently had positive breastfeeding durations (p < .05). It culminate to the reasoning that when a teenager has exposure to a role model

of a mother complying to IYCF recommendations this would influence their future IYCF practice positively. This study's findings were similar with findings of other studies done by Hoddinott *et al.*, (2010) and Giles *et al.*, (2010).

#### **4.7.4 Mothers' IYCF Practice**

Timely introduction of breast milk within one hour of birth (n=340, 90.2%) and ever breastfed the child (n=371, 98.6%) was reported as a common practice amongst the mothers which is similar to other studies (Wachira *et al.*, 2009; Gewa *et al.*, 2011; Arusei *et al.*, 2011, Kimani *et al.*, 2011). This may be attributed to the fact that majority (n=335, 89%) of the mothers had given birth in health facilities. The health facility had the mandate to ensure the implementation of National IYCF recommendations (MOPHS IYCF recommendations) and the ten steps to successful breastfeeding (Appendix 4). To ensure compliance, the infant is put on the breast within the first hour after delivery which is ensured by the CHN in attendance of the delivery. The breast feeding practice prevalence rates revealed in this study was n=372, 98.9% showing that it was universal as also seen in other studies findings done in Kenya by Wachira *et al.*, (2009); Gewa *et al.*, (2011), Arusei *et al.*, (2011) and Kimani *et al.*, (2011). It showed that within Nakuru Municipality the culture of breastfeeding is what is expected of every mother.

However, there was low (n=54, 14.3%) prevalence of mothers exclusively breastfed their infants for the recommend six month period. It was notable from these findings that more than half of children below age 6 months were given solid/semi-solid

foods against the IYCF recommendations. Evidence from other studies by Naanyu (2008), Vereijen *et al.*, (2011) and Kimani *et al.*, (2012) reflected the same findings. The mothers' practice of IYCF was found to be predominantly that of early introduction of solids, semi-solid and soft foods which is as findings revealed by other studies done in Kenya and Uganda (Scott *et al.*, 2009, Naanyu , 2008; Liu *et al.*, 2003, Kimani *et al.*, 2011, Engebretsen *et al.*, 2007).

The major reason cited for cessation of breastfeeding was the return of the mother to work and also the insufficient breast milk syndrome as also revealed in other studies done in India, Indonesia and Kenya (Nakuru) respectively (Roy *et al.*, 2009, Yati and Dyah, 2012, Webb *et al.*, 2012). The practice of early introduction of solids, semi-solids and soft foods robs the children of many benefits of EBF and predispose the infant to infections (Chisti *et al.*, 2011). In addition, gaps are created for exposure of the infant to digestive troubles, poor outcomes on fine motor skills as was revealed in various studies (Chisti *et al.*, 2011; Cohen *et al.*, 2012; Quigley *et al.*, 2012).

Mothers cited "the infant cries a lot" as a sign of insufficient breast milk leading to early onset of complementary feeding which make the child to be quiet. A study by Crocetti *et al.*, 2004 revealed that some mothers have the practice and belief that cereals will help infant to sleep longer at night therefore do not comply with IYCF recommendations. Insufficient breast milk may also lead to mothers' practice of predominantly giving cows' milk as the main drink since it is readily available for



mothers in Nakuru Municipality. However, cows' milk is not recommended for children under one year old.

Adequate water intake for 7-12 months old is estimated to be 800 milliliters (IOM, 2005). It is constituted in breast milk, juices and plain water the child may take. This study showed that children are mainly given infant formulae more compared to plain water at the age below six months. There is a challenge of ensuring hygiene of the fluids given to children to drink as it may be contaminated with pathogens that may cause disease as a study done in Nairobi revealed (Kang'ethe *et al.*, 2007).

Sources of drinking water have an implication in the safety of IYCF. Findings in this study showed that almost half (n= 183, 49%) of the mothers obtained their water from taps. Where water is readily available the cleanliness in food preparation is probably ensured. However, tap water within the municipality of Nakuru is treated and assumed to be safe though its availability in terms of its flow from the tap is not always guaranteed. Therefore, due to other intervening factors such as handling of the water and at times how the water is stored may lead to contamination. There is need for children's drinking water to be boiled. Finding of this study revealed that n=166, 44% of the mothers boil the water they give to their children. This has a public health implication of ensuring children are protected from diarrhoeal infections.

Utilization of bottle-with-a-teat to feed the children any form of liquids and semi-solids is not recommended due to the difficulties of cleaning the bottle and teat, making this practice a risk in the safety of the IYCF. The screw cap and teat interiors of feeding bottles have been reported in a study by Redmond *et al.*, (2009) to be soiled with organic material that are potential for survival of bacteria in between infant feeds. The bottle feeding practices in this study revealed compliance to the recommendation with majority (n=306, 81.2%) of the mothers refraining from the practice.

Generally, from this study's findings, dietary diversity was below the recommended minimum of five types of food from each food group at every meal. It indicated that there was poor feeding of the children at the age where such diversity was required. The children are mainly fed on grains, vegetables, fats and oils. These foods are fairly cheap and many families may afford them. The solid, semi-solid and soft foods introduced were mainly from the group of grains, roots and tubers. These foods are rich in carbohydrates and give energy to the body. Evidence from a study done by Crocetti, Dudas and Krugman, (2004) showed that mothers gave starch due to their belief that the child would sleep more soundly. However, food diversity is important to ensure the child gets nutrients that are essential for growth and development. Animal source foods (flesh food) is a food group that is essential for the child during the first two years of life. This study showed that provision of animal source foods and eggs to children was low (n=90, 24%). In Zambia, a study revealed that giving animal source food to children was associated with better growth for the children

(Krebs *et al.*, 2011). Generally, the animal source foods are costly and may be the reason the mothers refrained from including it in the children's diet.

The vitamin A rich food (yellow vegetables and fruits) was given sparingly amongst ages 13 to 23 months. Possibly due to the introduction of baby to foods from the family pot at this age where the family foods lacked vitamin A rich foods. The deficit of intake of vitamin A foods has been supplemented by the national vitamin A supplementation that commences at 6 months of age. Food diversity practices were below average amongst the mothers with children aged 13-23 months which is similar to findings of studies by Seranath *et al.*, (2012) and Marriot *et al.*, (2012). Low food diversity practices predispose the children to risks of malnutrition (Senarath and Dibley, 2012). Non-nutritive foods given accounted for n=22, 10% whereby beverages were readily given to the children. This practice was not common amongst the mothers and hence they complied with acceptable practice.

The minimum meal frequency for the solids, semi-solids and soft foods practices amongst the mothers with children aged 0-6 months was contrary to the recommendation. Early complementary feeding was done with a wide range of minimum meal frequency. Minimum meal frequency practice at the recommended age to introduce the solids, semi-solid and soft foods was also characterized by a wide range frequency. Such wide range of meal frequency may be due to a varied source of information giving conflicting information from what the IYCF recommendations. This study's finding showed that there was a discrepancy in what

was recommended and what the mothers practiced which is similar to findings of a study done by Seranath *et al.*, (2012).

Continued breast feeding practice was above average with n=256, 67.9% of the mothers were still breastfeeding at the end of 11 months and a slightly lower proportion (n=226, 60%) at 23 months which is similar to the findings of others studies done in Turkey, Mexico, Uganda and Kenya (Yesildal *et al.*, (2008), Flores *et al.*, (2012) and Wamani *et al.*, (2005). The findings concurred with worldwide breastfeeding report by Bosco, (2012) which depicted the Kenyan proportion of continued breastfeeding at 23 months and beyond as 57%. Promotion of breastfeeding begins with education, continues with support from family, community and nation, and is prolonged when breastfeeding becomes a natural part of our culture (Bosco, 2012). The practice revealed in this study reflects the acceptance of breastfeeding of children for a longer period than six months.

#### **4.7.5 Mothers' level of compliance with IYCF recommendations**

The IYCF indicators utilized in this study to assess the mothers' IYCF practices were eleven whereby key indicators were four and seven were optional indicators. Amongst the key indicators the mothers IYCF practices were low in the continued breastfeeding up to 23 months which implies non-compliance. This was similar to findings of various studies done in Uganda and Kenya (Scott *et al.*, 2009, Naanyu , 2008; Liu *et al.*, 2003, Kimani *et al.*, 2011, Engebretsen *et al.*, 2007). Mothers may cease to breastfeed for the recommended two years and beyond because of their

belief of breast milk insufficiency as well as their lack of knowledge on when breastfeeding should cease. However, the main reason as showed in this study was the lack of knowledge to manage insufficient breast milk problems.

EBF practices were non-compliant with the recommendations. The mothers universally breastfed their infants but did not continue. The initiation of breastfeeding was done as per recommendations but once the mothers were left on their own in their home set up, then the practice of EBF was compromised. It reflects a need to reach the mothers with IYCF interventions that go beyond the health facilities. The introduction of the community health extensive worker (CHEW) at level one already actualized by the Ministry of Health, would be instrumental in reaching with IYCF support interventions though it was not within the scope of this study. Therefore, the mothers' compliance with IYCF was good for the initiation of breastfeeding done within the health facility but below average for IYCF indicators accomplished once the mothers left the health facilities.

Non-compliance with recommendations was depicted in the indicator of meal frequency for children aged 12-24 months. Possibly due to the introduction of the child to family pot foods in which case, most of the families take three or two meals in a day which is contrary to the recommendations. In addition, with the high cost of living offering a child the recommended frequency of meals for the age may not have been feasible. Further-more, diversity of food in a child's meal was non-compliant

with the recommendation whereby foods from the animal source group were hardly given to the children. This may cause retardation of children's growth.

The mothers' practice of timely initiation of breastfeeding, boiling drinking water and non-utilization of bottle with teat to feed the children was compliant with the national IYCF recommendations. While mothers' compliance with IYCF recommended practices was slightly above average (n=207, 55%).

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

### **5.1 Summary**

This study found that mothers' age, educational level, occupation, birth order, prior plan for IYCF and level of knowledge on IYCF recommendations had no association with positive IYCF practices. However, teenage exposure to a breastfeeding mother who was a role model and support for IYCF by community health nurses on responding satisfactorily to mothers' concern of breastfeeding had association with positive IYCF practices.

### **5.2 Conclusions**

Based on the findings of the study, the following conclusions were reached:

1. IYCF practice was neither influenced by mothers' demographic nor economic variables.
2. Generally, mothers' level of knowledge on national IYCF recommendation was good (n=249, 66%) though needed improvement on knowledge on management of breastfeeding problem and minimum frequency of feeding children aged 6-7 months
3. Mothers' prior plan of IYCF, exposure to breastfeeding during teenage, and support by community health nurse and child's father for IYCF had association with positive IYCF practices while popular breastfeeding culture and sources of IYCF information had no association with IYCF practices.

4. IYCF practices were mainly early introduction of solids, semi-solids and soft food and inadequate food diversity of children's meals.
5. The mothers' compliance level with National IYCF recommendations was n=207, 55%.

### **5.3 Recommendations**

1. IYCF information should be targeted to all mothers who are implementers of IYCF recommendations at family level irrespective of neither demographic nor socioeconomic variables at HF by the CHN.
2. Dissemination of information by the implementers' of the IYCF recommendations in the health system such as the newly established cadre community health extension workers (CHEWs), community health workers (CHW), CHN and other health workers (HW) should emphasize on IYCF aspect of complementary feeding and continued breastfeeding up to two years and beyond when giving IYCF information to mothers.
3. The policy makers should come up with strategies of building capacity to increase the community health nurse efforts of supporting IYCF.
4. The policy makers need to come up with IYCF policies that would reach the mothers in the community with practical IYCF intervention especially during initiation of complementary feeding.
5. County Health system to strengthen the CHEW at level 1 to ensure monitoring and evaluation of IYCF compliance.



#### **5.4 Suggestions for Further Research**

The following are some of the areas recommended for further research: -

1. To establish the level of fathers' awareness on National IYCF recommendations.
2. To establish perception of teenagers and youth on IYCF and their future intentions of IYCF practice.
3. To establish community based IYCF interventions.

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**APPENDICES**

**Appendix 1: Map of Nakuru Municipality**



**Appendix 2: IYCF STRUCTURED AND SEMI STRUCTURED****QUESTIONNAIRE****INTRODUCTION**

My name is Anne Kamau and a student at K.U. I am interested in understanding the various factors influencing Mothers' IYCF compliance to National IYCF recommendation in Nakuru Municipality. The information obtained from this study will be for the purpose of my academic study as well as to help provide better understanding of factors that influence IYCF in Nakuru to enable the mothers like you, be served better in health messages and support for IYCF.

**CONSENT**

If you consent to the study I reassure you of confidentiality in all the information you will give.

Do you consent to participate?

1. Yes

2. No

Thank

you.

**IDENTIFICATION INFORMATION**

Health Facility: 1. Langa Langa    2.Lanet H.C                    3.PGH Nakuru                    4.Mother Kevin                    5.Gate House

**1 DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS**

I would like to ask you some questions about yourself, your child and the child’s father.

1.1	1.2	1.3	1.4	1.6	1.7
What is range of your age?	What is your marital status?	What is your education level?	What is your Occupation?	Where do you live?	What fuel do you use for cooking?
1.15-19 2.20-24 3.25-29 4.30-34 5.35-39 6.40-44 7.45-49	1.Married 2.Divorced 3.Separate 4.Widow 5.Single	1.Primary 2.secondary 3.college/ University	1.Hawker 2.Farmer 3.Trader 4.proffession 5.Farmer	1.Langa Langa 2.Lanet 3.Afraha 4.Lanet 5.Kaptembwa 6.Others Specify_____	1.Chacoal 2.Kerosine 3.fierwood 4.Gas 5.Electricity
Enter code					



## 2. Mothers' Knowledge of IYCF recommendations

2.1.1	2.1.2.1	2.1.2.2	2.1.2.3	2.1.3.1	2.1.3.2	2.1.3.3	2.1.3.4
What are the Benefits of Breastfeeding?	Is the first Milk From the breast After delivery Good for the baby?	If yes,why?	If No,Why?	What is the Appropriate Time to put Baby on the Breast for the first time?	How often Should a Baby be Breast fed In a day?	How long Should a Baby suckle On one breast?	Does a baby On exclusive Breast milk Need water?
1. Nutritive 2. Bonding 3. Cost 4. Immunity 5. Others. _____	1.Yes 2.No If yes go to 2.1.2.2 If No, proceed to 2.1.2.3	1.Nutritive 2.Protective 3.Other Specify _____	1.Make baby ill. 2.Is bad. 3.Others. Specify____ _____	1.Within 1 hour 2.within 24 hours 3. within 2-3 days	1.On demand 2.5-7 times 3.8-10 times 4.11-13 times 5.14-17 times 6.17 and more	1. 10-15 minutes 2. As long as Baby wants. 3.Others. Specify_____	1.Yes 2.No
Enter code:							

## 2. Mothers' knowledge on IYCF recommendations

2.1.3.5	2.1.3.6	2.1.4.1	2.1.4.2	2.1.4.3	2.1.4.4
What is the appropriate age to stop breastfeeding a baby?	What would you do if a baby aged less than 4 months is not getting enough breast milk? Give:	What is the appropriate time to introduce solids, semi-Solid and Soft foods?	How frequently Should a baby Who is breast Fed be given Soft porridge and mashed Food at 6 months?	At 7-8 months, how often should a breast fed baby be given solid, Semi-solids or soft foods in a day?	At what age Should a baby Receive food From the family Pot?
1.11-15 mth 2.16-20 mth 3.21-24 mth	1.Formula milk 2.cows' milk 3.Porridge breast milk 4.stop breast feeding 5.Increase breast feeding frequency.	1.1-2 months 2.3-4 months 3.5-6 months 4.6-7 months 5.Other.Specify _____	1. once 2. twice 3. three times 4.four times 5.five times	1. Once 2.Twice 3.Three times 4.Four times 5.Five times	1.9-11 months 2.12-14 3.15-17 4.18-20
Enter code					

### 3. MOTHERS' INFANT AND YOUNG CHILD FEEDING PRACTICES

3.1.1	3.1.2	3.1.3	3.1.3.1	3.1.3.2
Did you ever breast feed (name)	How long did you take to start breastfeeding after delivery?	During the first three days was (name) given any fluid/liquid from the breast?	In the first three days after Delivery, was (name) given Anything to drink other than Breast milk?	What was given to (name) to drink?
1.Yes 2.No If yes ,go to 3.1.2	1. less than 60 minutes 2.less than 24 hours 3.less than 72hours	1.Yes 2.No If No,go to 3.1.3.1	1.Yes 2.No If yes, go to 3.1.3.1.2	1.Plain water 2.Sugar water (Glucose water) 3.Powdered milk 4.Fresh animal milk 5.Infant formulae 6.Drip water 7. Not given
Enter code				

**3. 24 Hour dietary recall.** Yesterday during the day or at night .....

3.2	3.2.1	3.2.2	3.2.3					
Was (name) breastfed ?	How many times was (name) breast fed ?	Did (name) drink Breast milk in any Other way?	What liquids was (name) given to drink ?					
			Liquid	1.Yes	2.No	Liquid	1.Yes	2.No
1. Yes. If yes, go to 3.2.1 2.No	1.On demand 2.5 -10 times 3.11-15 4.16-20	a.Cup 1.Yes 2.No b.Spoon 1.Yes 2.No c.Bottle with teat 1.Yes 2.No	a.Plain water c.Tinned milk . Powdered, Fresh milk g.Thin porridge			b.Infant Formulae d.Juice/juic e drinks e.Clear soup f.Yorghurt h. Others. Specify____		
Enter code		3.2.2.a 3.2.2.b 3.2.2.c	3.2.3a 3.2.3.b 3.2.3.c		3.2.3.d 3.2.3.e 3.2.3.f		3.2.3.g 3.2.3.h	







### 3 24 hour dietary recall continued

Yesterday during the day or at night .....

3.3	3.4	3.5	3.5.1	3.5.2
How many times did (name) eat solids, semi-Solid or soft foods other Than liquids?	Did (name) drink Anything from a Bottle with a teat?	What was the Source of (name)'s Drinking water?	Did you do Anything to (name)'s Drinking water Before giving to Him/her.	What did you do to (name)'s drinking Water.
1.Once 4. 4 times 2.Twice 5. 5 times 3.3 times	1.Yes 2.No	1.Well 2.Bore hole 3.Rain 4.Tap 5.Others. Specify_____	1.Yes 2.No If yes, go to 3.5.2	1.Boli 2.Filter 3.Add chlorine 4.Store 5.Others Specify_____
Enter code:				

#### 4 Support for IYCF

4.1.1	4.1.2	4.1.3	4.1.4	4.1.5	4.1.5.1
Who has often given You words of praise For your breastfeeding?	Who has ever Reassured you on Breast feeding issues?	Who has ever given You opportunity to Discuss IYCF issues?	Who has ever given You a visit to support You for IYCF ?	Have you ever had Concerns/questions On IYCF ?	Who responded To your concerns To your satisfaction?
1.Child's father 2.Own mother 3.Mother in law 4.Health worker (CHN) 5.No one 6.Others. Specify_____	1.Child's father 2.Own mother 3.Mother in law 4.Health worker 5.Friend 6.Others Specify_____	1.Friend 2.Own mother 3.Mother in law 4.Health worker 5.Others Specify_____	1.Women group 2.Own mother 3.Mother in law 4.Neighbours 5.Church 6.others Specify_____	1.Yes 2.No If yes ,go to 4.1.5.1	1. Neighbour 2.Mother in law 3.Own mother 4.Health worker 5.Others. Specify _____
Enter code:					

**4 Support for IYCF continued: Sources of information**

4.2	4.2.1	4.2.2	4.3	4.4	4.5.1	4.5.2
Have ever Received IYCF information?	What was the Source of Information?	Which information Did you find useful?	Which method of Giving support for IYCF do you think Is the best?	Who motivated You Most to breast feed?	Are you still Breast feeding?	What were your reasons for stopping breastfeeding?
1.Yes 2.No If yes,go to 4.2.1	1.Radio,Tv 2.Books 3.Internet 4.Magazines 5.CHN 6. Others Specify_____	1.Duration of BF 2.Frequency 3.management of Bf difficulties. 4.Others Specify_____	1.Groups 2.One to one 3.Health facility based 4.Community based 5.Proactive 6.Reactive 7.Over the phone 8.Internet	1.Own mother 2.Mother in law 3.Child's father 4.Friend 5.Health worker 6.Others. Specify _____	1.Yes 2.No If No, go to 4.5.2.1	1.No enough breast milk 2.child cry a lot 3.Breast problems 4.Advice from others; Specify_____
Enter code:						

**4 Support for IYCF continued : Prior plan and popular culture**

5.1	5.1.1	5.1.2	5.2	5.3	5.3.1	5.4
In your pregnancy how many Ante natal Visits did you make?	How Long Had you Decided to Breastfeed (name) prior Delivery?	How many post Natal visit did You visit in first Month after Delivery?	Did any health Worker visit Your home After delivery?	Had you witnessed Any mother breast Feed their child Frequently in your Teenage period?	Who is it you witnessed Frequently breastfeeding Their child?	In your culture, at what age should A child be started on solids, semi-solids,or soft food?
1.1 2.2 3.3 4.4 5.Others Specify_____	1.0-3 months 2.4-6 months 3.No decision 4.Others Specify _____	1.Once 2.Twice 3.Others Specify _____	1.Yes 2.No	1.Yes 2.No If yes, go to 5.3.1	1.Own mother 2.Relative 3.Neighbour 4.Others Specify_____	1. 0-3 month 2.4-6 months 3.Do not know.
Enter code:						

Thank you for your participation.

**Appendix 3 a: Letter of authorization**

**Appendix 3 b: Letter of authorization**

**Appendix 4: TEN STEPS TO SUCCESSFUL BREASTFEEDING**

Every facility providing maternity services and care for newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within half an hour of birth.
5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.
7. Practice rooming-in, i.e. allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.



**Appendix 5 Time table of the remunerators' training**

Time	Day 1	Day 2
8.30 am-10.30am	Introduction, norms,  Expectations and  objectives	Interview skills/ probing skills  on 24 hour recall for IYCF  practice items
10.30am-11 am	Tea break	Tea break
11.00am-12md	Questionnaire  Introduction, consent	Practice of 24 hour recall
12md- 1pm	Demographic characteristics	Discussion for clarification  of arising issues
1pm-2pm	Lunch	Lunch
2-3 pm	Interview skills/ Knowledge  items	Support for IYCF items
3-4 pm	Listening skills	Discussions/ closure

**Appendix 6 Calculations of proportions for five health facilities utilized**

- Langa langa - $1113/7818 * 100 = 14\% * 330 = 46.2$  (47)
- Lanet----- $708/7818 * 100 = 9\% * 330 = 30$
- PGH Nakuru- $4032/7818 * 100 = 52\% * 330 = 170$
- Gate House- $697/7818 * 100 = 9\% * 330 = 29$
- Mother Kevin- $1268/7818 * 100 = 16\% * 330 = 54$