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The demographic characteristics of mothers and their compliance levels with infant and young child feeding recommendations in Nakuru municipality, Kenya

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Abstract
Universally, optimal IYCF key indicators are low and current IYCF practices remain far from recommended levels. In Kenya, the National IYCF strategy recommends that infants should be exclusively breast fed for the first six month of life. The study was therefore conducted to explore the level of mothers' compliance with the IYCF recommendations among children aged 0-24 months in Nakuru Municipality, Kenya. Informed by the study, this paper examines the demographic and socio-economic characteristics and level of compliance with IYCF recommendations among women. Data for the study was collected using interview questionnaire adapted from the WHO questionnaire on the 24-hour recall food diversity. Nine research assistants were trained and used to collect data from 377 mothers with children aged 0-24 months. From the study findings, mothers' IYCF practice was predominantly early introduction of solids, semi-solid and soft food as early as 2 months. Based on the findings, the study recommended that policy makers need to come up with IYCF policies that would reach the mothers in the community with practical IYCF intervention. In addition, County Health System to ensure the CHEW monitor and evaluate of IYCF compliance at family level. The study established that 37.9% of the mothers were aged 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 first-born. The mothers' level of compliance with IYCF recommendation was rated at 55%. Consequently, it is recommended that IYCF information should be targeted at all mothers who are implementers of IYCF recommendations at family level irrespective of neither demographic nor socioeconomic variables at HF by the CHN.

Keywords: demographic, socio-economic, characteristics, mothers, levels, compliance, infant, young child feeding recommendations, Kenya

Introduction
Infant and young child feeding behaviours are influenced by the choices mothers make. Other factors playing a role in the behaviour 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. In Nakuru Municipality, within the first half of the year 2012, a survey found that 16% of the children aged 0-11months old were underweight in the category of nutritional status with the highest proportion of children followed by faultering weight (2%) (DHIS Nakuru, 2012) [7]. It was therefore important to understand the circumstances that make mothers unable to comply with infant and young child feeding (IYCF) recommendations. This paper explores the role of demographic and socio-economic characteristics of mothers with infants aged 0-24 months in their level of compliance.

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) [19], 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 Mihrshahi *et al.* (2010) [22] in Bangladesh, older maternal age was a risk factor for bottle feeding.

Marital status has been reported in studies (Lindsay *et al*., 2012; Senarath *et al.*, 2012; Kimani *et al*., 2011) [20, 29, 17] 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) [1] and yet another study done in USA showed that being married had significant association with multiple positive IYCF practices (Hendricks *et al*., 2006) [16].

Maternal level of education as shown in studies by Morgan *et al*. (2010) [23] and Memon *et al*. (2010) [21], done in Kenya and Pakistan, respectively, have found out that mothers' cessation of breastfeeding was negatively influenced by lower educational levels. According to Serenath *et al*. (2007) [28, 29], 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) [16]. Lower maternal education has also been cited in a study by Serenath *et al.* (2012) [29] 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) [20], Senarath *et al.* (2012) [29] and Kimani *et al.* (2011) [17], maternal employment has been depicted to cause non-compliance to EBF recommendations. In addition, a study done in Britain and Ireland by Hawkins *et al.* (2007) [15] has shown that maternal employment is the reason employed mothers who return to work within EBF postpartum period fail to start breast feeding as recommended. Other studies by Al-Sahab *et al.* (2010) [2] and Rojjanascrirat and Sousa (2010) [26] have revealed that maternal employment has a negative impact on EBF and duration of breastfeeding. However, contrary to the above cited studies, a study by Serenath *et al.* (2007) [28] shows that continued breastfeeding at one year is significantly lower in non-working mothers than among working mothers.

Another maternal characteristic is the mothers' attendance of ante-natal clinics (Gewa *et al.,* 2011) [12]. According to KNBS and ICF macro (2010) [18], majority (92%) of the mothers in Kenya attend antenatal clinics and a lower (43%) percentage of them deliver at health facilities. This 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) [11, 6].

Mothers' Compliance with the National IYCF Recommendations

Generally, the mothers' compliance with national IYCF recommendation is low. Findings from 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) [33]. According to WHO (2009) [32] and other various studies (KNBS 2008-2009; Wachira *et al.,* 2009; Gewa *et al.,* 2011; Arusei *et al.,* 2011; Kimani *et al.,* 2011) [18, 31, 12, 3, 17], the incidences of EBF are low in many countries, which is an indication of non-compliance with IYCF recommendations. For example, in Saudi Arabia, current IYCF practices are far from the recommendations (El Mouzan *et al.,* 2009) [8] while in Uganda more than half of the mothers comply with IYCF recommendation (Babirye, Nuwaha & Grulich, 2009) [4]. In Kenya, only 32% of children are exclusively breastfed while only 39% of mothers comply with IYCF recommendations (KNBS & ICF Macro, 2010) [18].

Cultural preferences of IYCF run counter the National IYCF recommendations (Giashuddin & Kabir, 2004) [13] 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) [5, 24, 27]. The benefits of compliance, as is shown in a study by Torimiro *et al.* (2004) [30] include, among other things, good health outcomes for the child and the mother, such as fewer episodes of the common signs of illnesses.

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) [25]. 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 had addressed the most current mothers' compliance with IYCF recommendations in Nakuru Municipality. Therefore, the 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) [33].

Materials and Methods

The study utilized the cross-section descriptive research design to assess mothers' compliance with the five core IYCF indicators and six optional IYCF recommendations amongst children within their first two years of life. It was conducted in Nakuru Municipality. The Municipality is a dynamic urban area with a varied representation of people from different cultures and tribes. Since IYCF varies widely within and between populations for various reasons, Nakuru Municipality was chosen as an urban set-up 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 centres, five dispensaries, two nursing homes and over 110 private health facilities (Municipality of Nakuru, 2010).

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

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). Purposive sampling was done to obtain dates to visit the health facilities. Every mother with a child aged from 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. 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. The sample distributed to the five health facilities were as shown in Table 1 below.

Table 1: Sample Size in Five Health Facilities

Health facility	Average Monthly attendance	% total	Sample number
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
Total	7818	100	330

Administration of questionnaire was done to 377 mothers whereby interview of respondent by the researcher and research assistants on IYFC indicators was done. The author was the principal investigator who supervised the research assistants as well as provided guidance all through the data collection period. The information gathered through interview included 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 IYCF practices are the mothers' behaviour relating to what is fed and how often. The core indicators assessed in the study relating to mothers' IYCF practices 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. All the collected data were coded, entered, and analysed 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.

Results

Mothers' Demographic and Socio-economic Characteristics

Of the mothers interviewed, 301(70%) of the mothers interviewed were aged 20-29 years, 66(18%) were 30-34 years old, 9(2%) were 35-39 years of age and an insignificant 1(0.3%) was aged 40-44 years. The findings on the mothers' age were as shown in Table 2. Majority, 327(86%), of the mothers were married, 34(9%) were single, 8(2%) in each case were either divorced or separated while 2(1%) were widowed (Table 2). The highest level of education attained by 140(37%) of the mother which was secondary school education, 134(36%) had primary education, 93(25%) were college/university graduates while 10(3%) had no formal education (Table 2). Less than half, 153(41%), of the mothers were housewives, 110(29%) were traders, 74(20%) were in different professions while 26(7%) and 14(4%) were farmers and hawkers, respectively (Table 2). 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 2: Mothers' Demographic Characteristics

Characteristics	Variables	Frequency	Percentage
Age	Below 19	33	8.8
	20-29	268	71.1
	30-39	75	19.8
	Above 40	1	.3

	Total	377	100
Marital Status	Married	325	86.3
	Divorced/Separated	16	4.2
	Widow	2	.5
	Single	34	9
	Total	377	100
Educational Level	No formal education	10	2.7
	Primary	134	35.5
	Secondary	140	37.1
	College/ University	93	24.7
	Total	377	100
Mothers' Occupation	Hawker	14	3.7
	Farmer	26	6.9
	Trader	110	29.2
	Professional	74	19.6
	No job/ House wife	153	40.6
	Total	377	100

Child's Age and Sex

The findings of the study showed that 162(43%) of the infants were aged 0-6 months, 98(26%) were 7-12 months old, 72(19%) were children aged 13-18 months while 45(12%) were aged 19-24 months. The distribution of the children by their ages and gender was as shown in Figure 1 below.

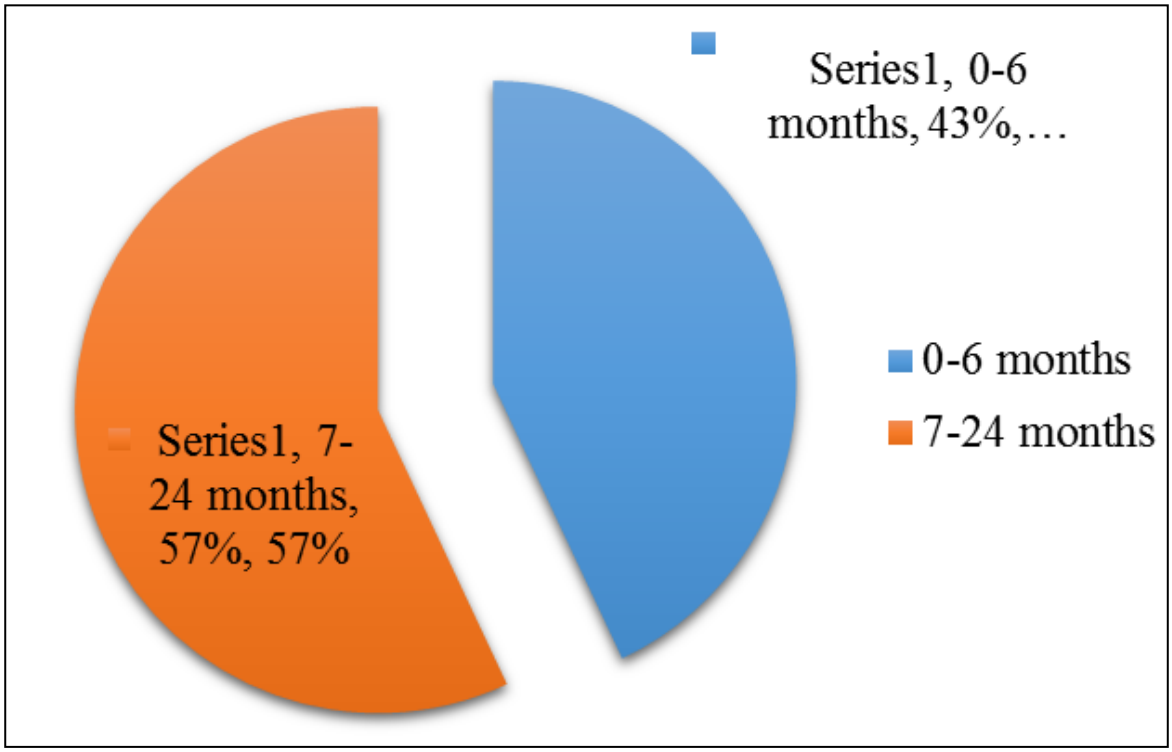

Fig 1: Child's age proportion for 0-6 and 7-24 months

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

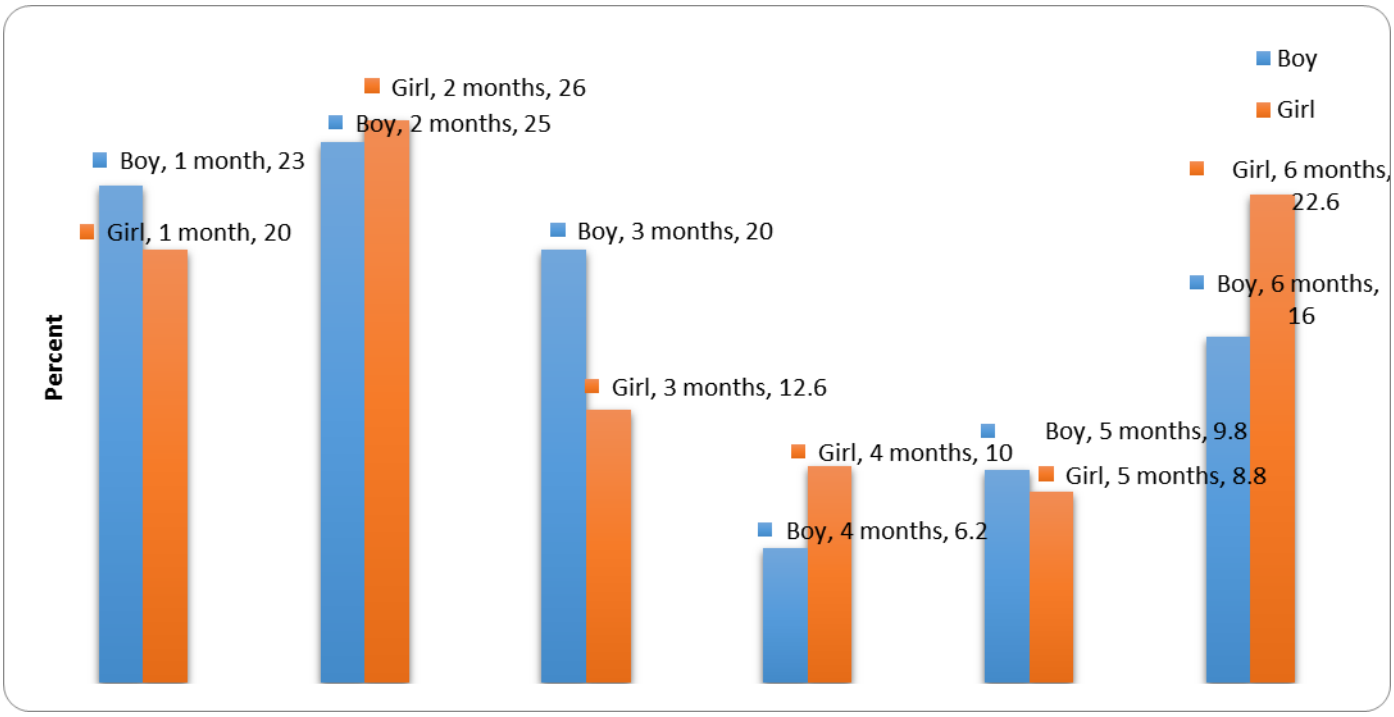

Fig 2: Proportion of children aged 0-6 months

The proportion of children aged 7-24 months was 216(57%), 7-8 months was 20(5.3%), 9-11 months were 50(13.3%), 12-15 months were 67(17.8%), 16-19 months were 41(10.8%) and 20-24 months were 38(10%) as shown in Figure 3.

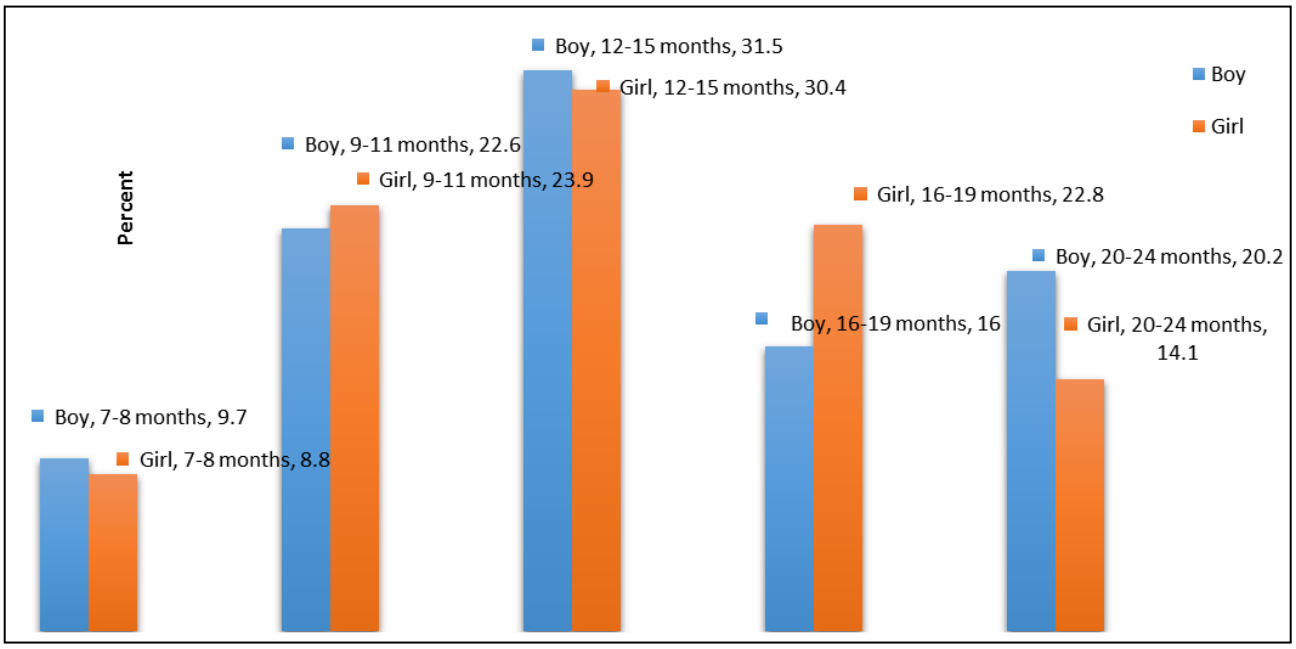

Fig 3: Proportion of Children aged 7-24 months

The child's birth order ranged from 1-7 and majority, 275(73%), of the children were subsequent born while only 102(27%) were first-born as shown in Table 3.

Table 3: Childs' Birth Order

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

Demographic and social economic variable relationship with IYCF practice analysed using Chi square showed: mothers' age (χ^2 [85, n = 371] = 97.42, p =.168), marital status (χ^2 [68, n = 371] =84.211, p=.089), educational level (χ^2 [48, n=371] =40.56, p =.768) occupation (χ^2 [68, n=375] = 70.69, p = .388) and (χ^2 [119, n = 375] = 177.32, p=.000) had no association with positive IYCF practice as the p-value was more than 0.05. Consequently, the null hypotheses that there was no

relationship in the IYCF factors under assessment with positive IYCF practices was not rejected.

Mothers' Compliance with National IYCF Recommendations

On the practice of complementary feeding, slightly above t Hree-thirds (149, 69.4%) of the mothers practiced timely initiation of complementary feeds, 95(44%) ensured they boiled water for children to drink, 10(23%) practiced proper meal frequency at 6 months of age, 25(17.4%) at 12-23 months of age and only 1(8.5%) practiced continued breastfeeding at 23 month of age (Figure 4).

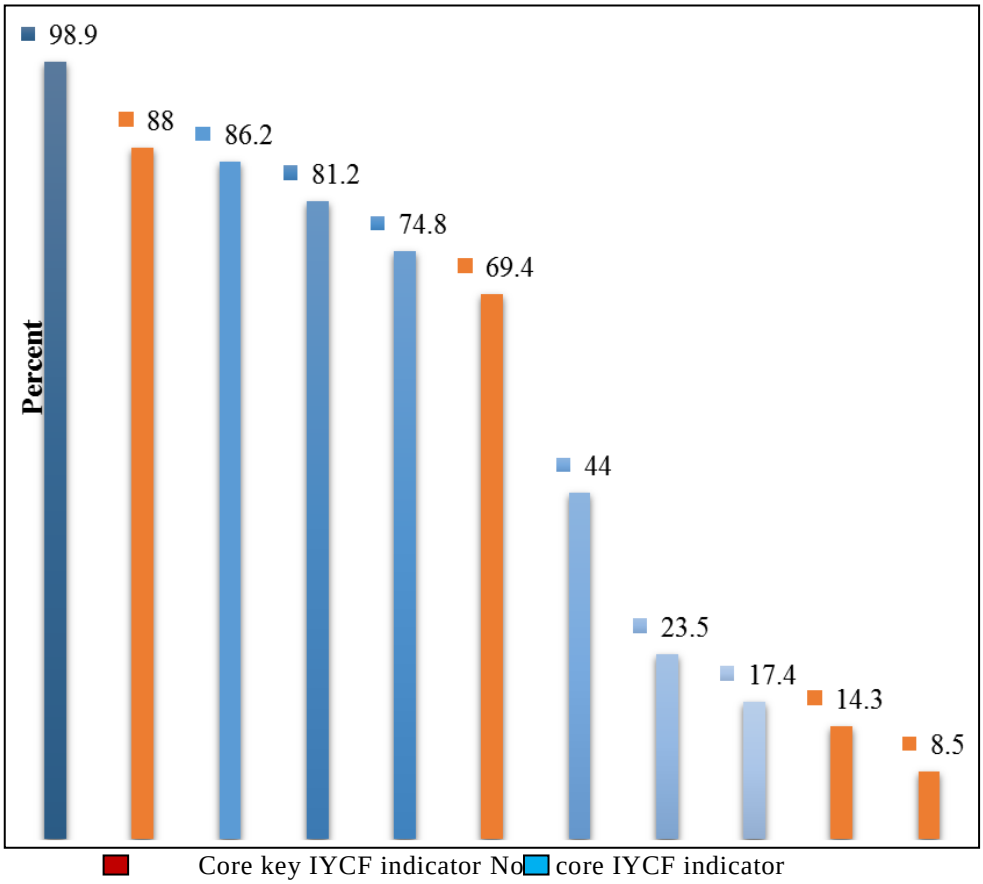

Fig 4: Mothers' compliance with national IYCF recommendations

Discussion

Demographic and Socio-economic Characteristics

The findings in this study showed that majority (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. This reiterated the findings of a study by Gudnadottir *et al.* (2006) [14]. Furthermore, the high percentage (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. The findings of the study did not suggest any association of marital status with IYCF which concurs with study done by Britain (Agboado *et al.*, 2010) [1].

A higher level of education enables mothers to comprehend IYCF recommendations since studies by Fjeld *et al.* (2008) [10], Morgan *et al.* (2010) [23] and Memon *et al.* (2010) [21] have shown that less educated mothers are more prone to conventional non-exclusive breast-feeding

Practice which contradicted the findings of the study in which majority, 274(72.6%), of the mothers combined had attained primary and secondary levels of education and no association was found with positive IYCF practice.

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) [2]. Mothers who had to report back to work within four months were less likely to start breastfeeding as reported in a study done in Britain and Ireland by Hawkins *et al.* (2007) [15]. A good number (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.

Mothers' Level of Compliance with IYCF Recommendations

The IYCF indicators utilized in the study to assess the mothers' IYCF practices were eleven, so that key indicators were four and seven were optional indicators. Among the key indicators the mothers' IYCF practices were low in the continued breastfeeding up to 23 months which implied 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) [27, 24, 17, 9]. 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. Furthermore, 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. Nevertheless, mothers' compliance with IYCF recommended practices was slightly above average (55%).

Conclusion and Recommendations

From the findings of the research, it is clear that infant and young child feeding (IYCF) practices are neither influenced by mothers' demographic nor economic variables. Generally, the mothers' compliance level with National IYCF recommendations is slightly above average. It is, therefore, recommended that IYCF information should be targeted at all mothers who are implementers of IYCF recommendations at family level irrespective of neither demographic nor socioeconomic variables at HF by the CHN. In addition, County Health system to strengthen the CHEW at level 1 to ensure monitoring and evaluation of IYCF compliance.

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