To Assess the Age of Giving Complementary Feeding to Infants before Six Months and Reasons Given and the Nutritional Status of Lactating Mothers of Mwanamukia Area- Nairobi

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Abstract

Exclusive breastfeeding with appropriate complementary feeding can save infants from many problems later in life. The study found that majority of respondents were married (63.9%), single (25.5%). 43.1% had primary school education while 35.3% had attained Secondary 'O' level. The maximum household number was 12 while the average was 6. Most of them had Meru (25.5%) and Luhya (17.3%) ethnicity. The average monthly income was Kenya shilings27, 154.12. Business (28.6%) and housewives (23.9%). Household heads 51.2% men and 34.6 women. Most had 36-40 years age. 9.4% exclusively breastfed for 4 months while 2.7% breastfed exclusively for 6 months. 50% breastfed until one year while 27.84% breastfed for 1 and 11/2 years. Majority of the mothers (51.8%) introduced complementary feeds by three months. Cow's milk was used (34.1 percent) followed by porridge at (22.4 percent). Lack of milk (29.8 percent) and lack of enough food were reasons for weaning early.

 Key words: Age, exclusive, breastfeeding, complementary feeding, lactating mothers.

1. INTRODUCTION

Exclusive breastfeeding for the first six months, continuing to breastfeed and giving appropriate complementary foods after six months up to the first two years of a child's life, saves one in five children. Exclusive breastfeeding with appropriate complementary feeding can save up to 19 percent of child deaths (Bhutta et al., 2008). Breastfeeding practices and introduction of supplemental foods are important determinants of children's nutritional status, particularly among children under age two. With improved nutritional status, the risk of child mortality is reduced and development is enhanced (KDHS 2015).

The aim of this study was to determine the social demographic and social economic characteristics of lactating mothers in Mwanamukia, Nairobi and was to determine the age of introduction of complementary feeding and identify the reasons given for the same.

This cross sectional study was conducted on 260 purposively selected lactating women living in Mwanamukia, Nairobi Kenya. A structured, validated and pre-tested questionnaire was used to obtain information on social, economic and demographic characteristics; age at which lactating mothers introduced complementary feeding to the infants and reasons given for not exclusively breastfeeding their infants and a 24-hour dietary recall was used to assess the nutritional status of lactating mothers. Data was entered into SPSS version 20 and analyzed using descriptive statistics and Pearson correlation coefficient was used to determine associations.

Complementary feeding refers to the consumption of both breast milk and other foods, usually during the period from 6 to 24 months of age, until the child ceases to nurse at the breast and is able to consume the same foods as the rest of the family (Brown, 2007).

Complementary feeding is the provision of foods or fluids to infants in addition to breast-milk. Complementary foods can be subdivided into transitional foods and family foods. Transitional foods are complementary foods specifically designed to meet the particular nutritional or physiological needs of the infant and family foods are complementary foods given to the young child and are broadly the same as those consumed by the rest of the family. It should be a process of introducing foods with an increasing variety of texture, flavor, aroma and appearance, while maintaining breastfeeding. Highly salted foods should not be given during the complementary feeding period, nor should salt be added to food during this period (Michaelsen et al., 2003).

Infants should receive breastmilk exclusively from birth to 6 months after which they are introduced to nutritious solids of increasing consistency while continuing to breastfeed until 24 months of age (PAHO/WHO, 2005). After six months of age, breastmilk alone is no longer adequate to meet an infant's nutritional requirements. From this age, complementary foods that are nutritionally adequate should therefore be provided in addition to breast milk. Breast milk continues to be an important source of vital nutrients, fluids and offers immunological protection (DON, 2013). Even with optimum breastfeeding children will become stunted if they do not receive an adequate quantity and quality of complementary foods after 6 months of age (Black et al., 2008).

As an infant grows and becomes more active, breast-milk alone is insufficient to meet it's full nutritional and psychological needs of the infant. Adapted family foods (transitional foods) are needed to fill the gap in energy and iron and other essential nutrients, between what is provided by exclusive breastfeeding and the total nutritional requirements of the infant. This gap increases with age, demanding an increasing contribution of energy and nutrients; especially iron, from foods other than breastmilk (Michaelsen et al., 2003).

Breast milk continues to be an important source of vital nutrients, fluids and it offers immunological protection. Giving complementary foods too early or too late are both detrimental to child health (DON, 2013). Poor nutrition and

less-than-optimum feeding practices during this critical period may increase the risk of growth faltering (wasting and stunting) and nutritional deficiencies, and may have longer-term adverse effects on health and mental development (Michaelsen et al., 2003).

The main purpose of introducing complementary foods is to provide needed nutrients that are no longer supplied adequately by breast milk or formula alone. The foods chosen must be those that the infant is developmentally capable of handling both physically and metabolically (Whitney and Rolfes, 2013). Complementary foods play an important part in the development of neuromuscular coordination. Infants do not have the physiological maturity to progress from exclusive breastfeeding directly to family foods. Transitional foods are necessary to bridge this gap, and are required until the infant is sufficiently mature to consume normal family foods. The introduction of transitional foods also exposes the infant to a variety of textures and consistencies, thus encouraging the development of vital motor abilities such as chewing (Michaelsen et al., 2003).

The exact timing of introduction of complementary food depends on the individual infant's needs and developmental readiness, varying from infant to infant because of differences in growth rates, activities, and environmental condition (Whitney and Rolfes, 2013). The age during which transitional foods are introduced is a particularly sensitive time in infant development. Timely introduction of appropriate complementary foods promotes good health, nutritional status and growth of infants and young children during a period of rapid growth, and should be a high priority for public health (Michaelsen et al., 2003).

Giving complementary foods too early or too late are both detrimental to child health and development (DON, 2013). Starting complementary feeding too soon is dangerous because; breast-milk can be displaced by complementary foods, leading to reduced production of breast-milk thereby increasing the risk of insufficient energy and nutrient intake by the infant. Infants are exposed to microbial pathogens present in foods and fluids which are potentially contaminated increasing the risk of diarrheal disease and consequently malnutrition. The risks of food allergies are increased because of intestinal immaturity and these increase the risk of malnutrition (Michaelsen et al., 2003).

If complementary foods are introduced too late it could result in inadequate provision of energy and nutrients from breast-milk alone may lead to growth faltering and malnutrition. Micronutrient deficiencies, especially of iron and zinc, may develop owing to the inability of breast-milk to meet requirements and the optimal development of motor skills such as chewing, and the infant's acceptance of new tastes and textures, may not be ensured (Michaelsen et al., 2003).

In addition to the infant's nutrient needs and physical readiness to handle different forms of foods, the need to detect and control allergic reactions should also be considered when introducing solid foods (Whitney and Rolfes, 2013). During the period of transition from exclusive breastfeeding to the cessation of breastfeeding, infants gradually become accustomed to eating family foods until they entirely replace breast-milk. Throughout the period of complementary feeding, breast-milk should continue to be the main type of milk consumed by the infant (Michaelsen et al., 2003).

Infant foods should be selected to provide variety, balance, and moderation. Homemade infant foods require that the cook minimizes nutrient losses during preparation to remain nutritious. Ingredients for homemade foods should be fresh, whole foods without added salt, sugar, or seasonings (Whitney and Rolfes, 2013). The advantage of home-prepared baby food is that a wider variety of foods may be introduced that are likely to be a part of the diet later (Brown et al., 2011). Frequent, complementary feeds (five small meals are recommended) of locally available foods adequate in nutrients and micronutrients and safely prepared could decrease stunting by 20% at 12 months (Bhutta et al., 2013).

From 9–12 months, infants are capable of consuming foods eaten by other family members (Brown et al., 2011). They no longer need to be modified to meet the special needs of the infant. From 12 months, cow's milk can be gradually introduced into the infant's diet as a drink. Complementary foods with a low energy density can limit energy intake, and the average energy density should not usually be less than 4.2 kJ (1 kcal)/g. This energy density depends on meal frequency and can be lower if meals are offered often (Michaelsen et al., 2003).

The first food generally recommended for infants at 6 months is baby cereal, such as iron-fortified cereal mixed with water or breast milk. Rice cereal is a common first food because it is easily digested. What are considered healthy first foods for infants vary in different cultures and ethnic groups. Regardless of what foods are offered first, the timing and spacing of new foods can be used to identify any negative reactions. Common recommendations are to add only one new food at a time and to offer it over 2 or 3 days (Brown et al., 2011).

To guard against food-borne illnesses, hands and equipment must be kept clean. To prevent choking, nuts, cherries, peanut butter, popcorn, raw carrots, raw celery, whole beans and whole grapes should not be given to infants or young children (Whitney and Rolfes, 2013).

2. Materials and Methods

A cross-sectional survey was conducted at Mwanamukia in Nairobi and the study targeted lactating mothers. It had a sample size of 260 lactating mothers. A structured and validated questionnaire was used to assess the socio-economic demographic of lactating mothers and age of introduction of complementary feeds and reasons given for early introduction before 6 months. The conventional 24-hour dietary recall method was used to record the amount of food consumed by lactating mothers for the last 24 hours. The principle researcher with the help of research assistants recorded the consumption of food items in chronological order from morning, mid- morning, lunch, mid-afternoon and diner time. Among the lactating mothers they had to meet the following criteria to be included for the 24-hour dietary recall interviews. Currently breastfeeding; free from any chronic illness and not on medication; not pregnant at the time; not fasting.; they also reported any food taken outside the home. A data base of nutritive values of foods were generated and analyzed using nutrisurvey.

2.1 Statistical analysis
2.1.1 Complementary feeding

Questions on complementally feeding were compiled to generate information on; time the child was breastfed before introducing complementary feeds, age of the child when the complementally feed was introduced, the first food/fluid given to the child, among others. Frequencies and percentages were obtained.

Responses on Socio-demographic and socioeconomic were coded and analyzed quantitatively, using statistical package SPSS

To facilitate data entry, questionnaires were coded. Data was then entered and cleaned using statistical packages for social sciences (SPSS version 20).The data was then analyzed. The variables for each objective were defined and coded for ease of data analysis. Frequencies mean, standard deviations, percentages were determined. Correlations were conducted to identify associations. Where the associations existed, chi-square was used to test their strength.

3. Results
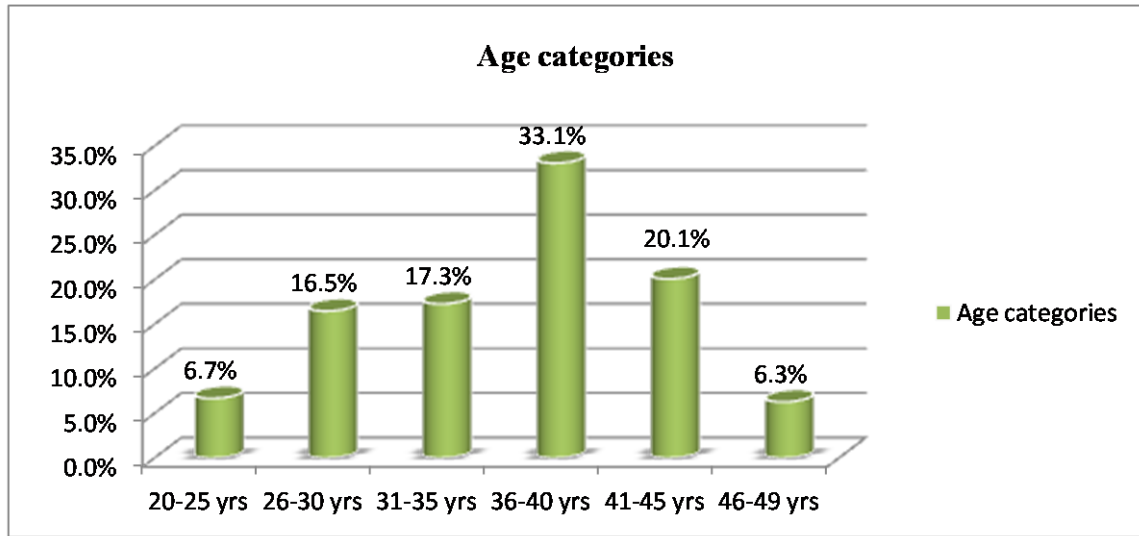
1. Age
The minimum age of the respondents was 20 while the maximum age was 49. The highest number of people fell in the 36-40 years age category.
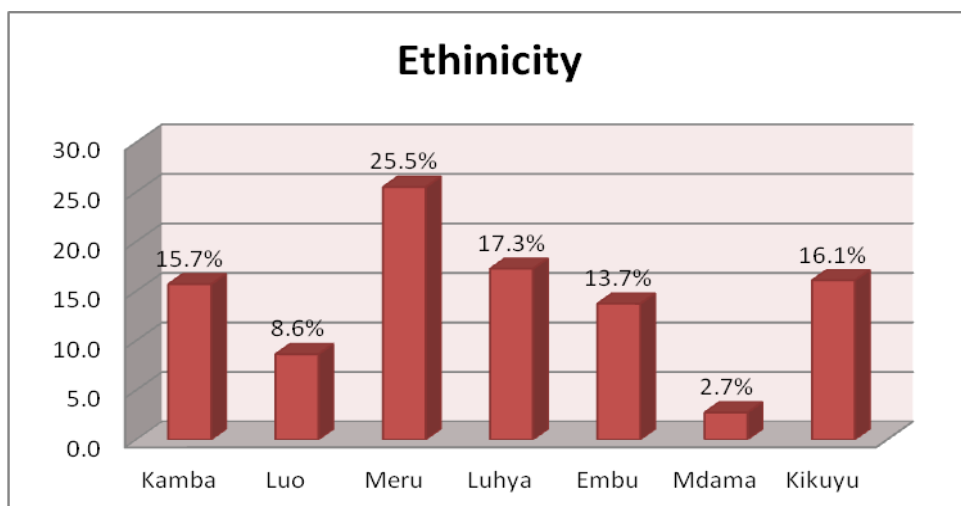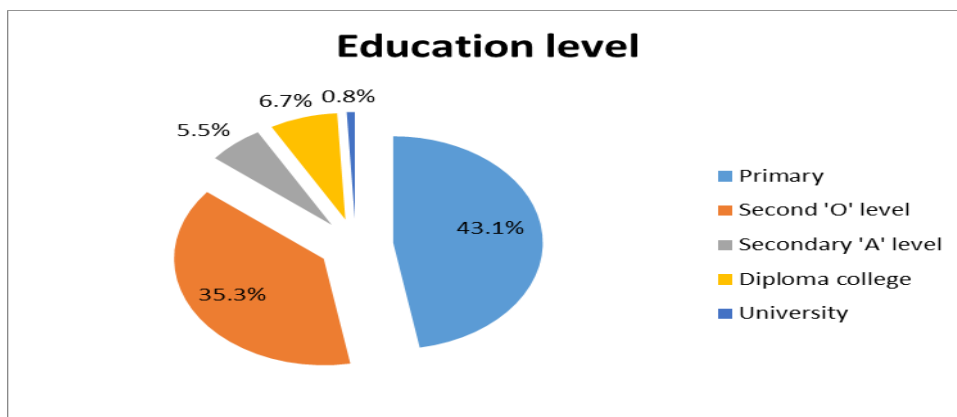

2. Ethnicity
The study had respondents from different ethnic backgrounds. Meru (25.5 percent), Luhya (17.3 percent) and Kikuyu (16.1 percent) formed the majority of the respondents.
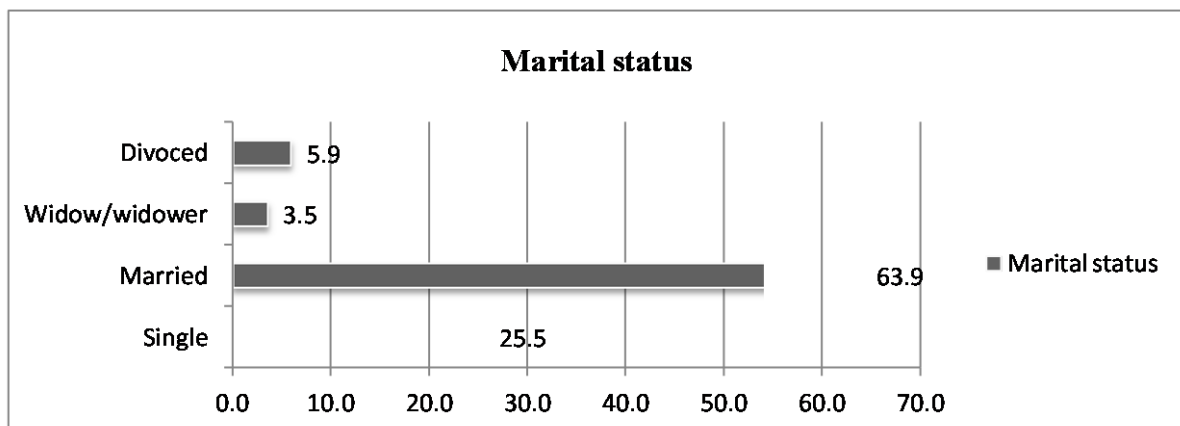
3. Marital status
Majority of the respondents were either married (63.9%), single (25.5%) or divorced (5.9%).

Education level

- Primary
- Second 'O' level
- Secondary 'A' level
- Diploma college
- University

4.   Education level
43.1% had achieved primary school education and 35.3 persons had attained Secondary 'O' level education.
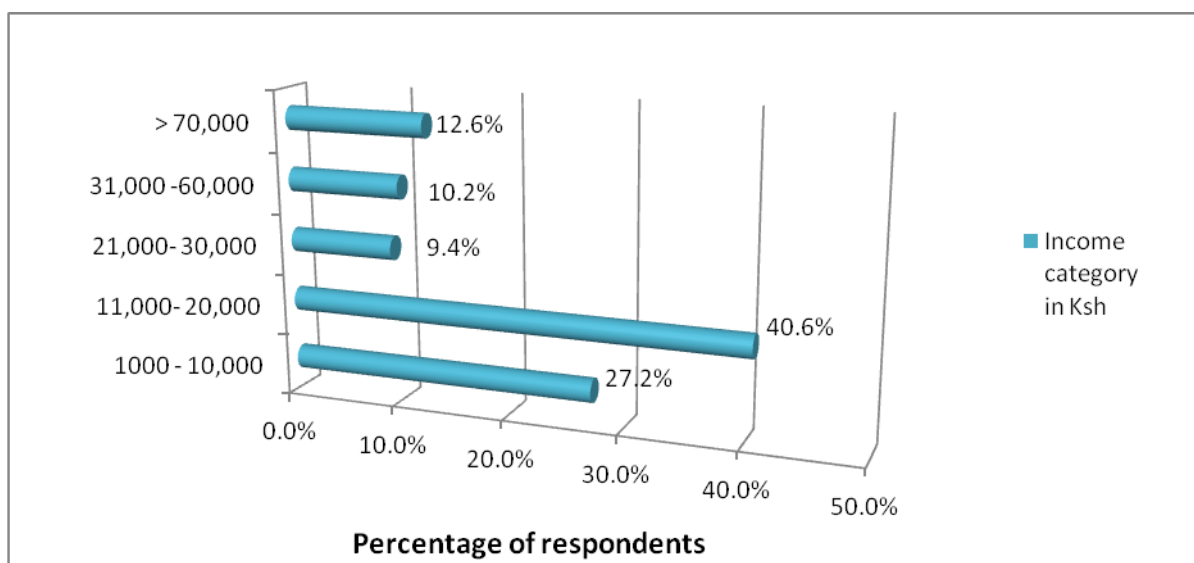
5.   The monthly income
The average monthly income was 27, 154.12 Kenyan shillings. The income category with the highest number was 11,000-20,000.
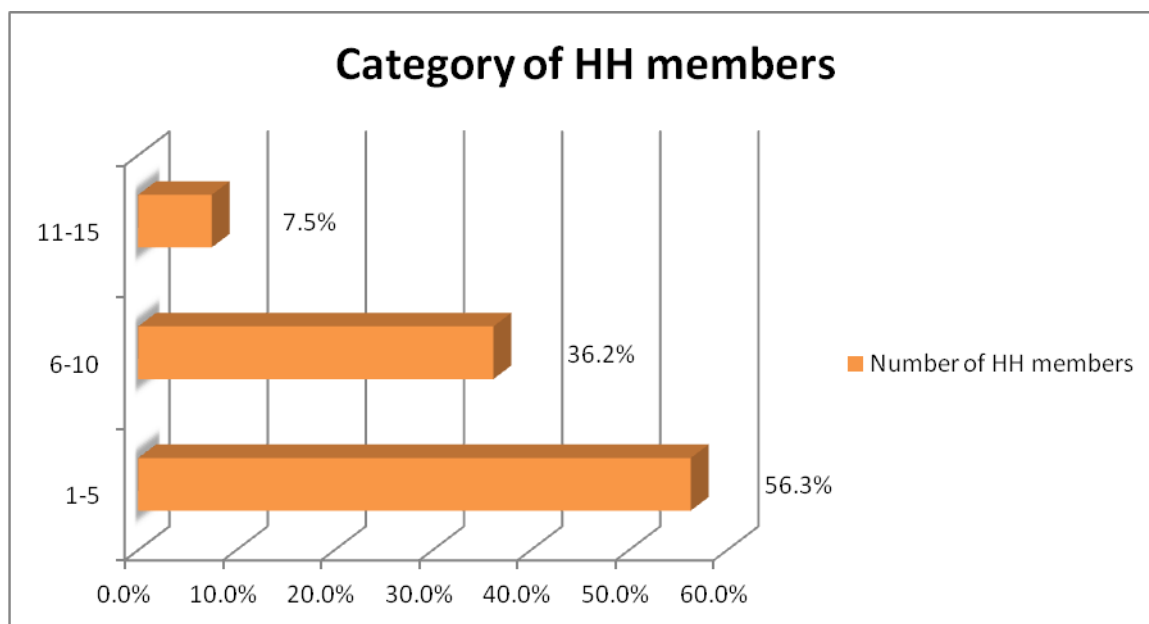
6.   Number of people living in the household
The maximum number of people living in households was 12. The average number of people was 6. Household members between 1-5 were the highest.
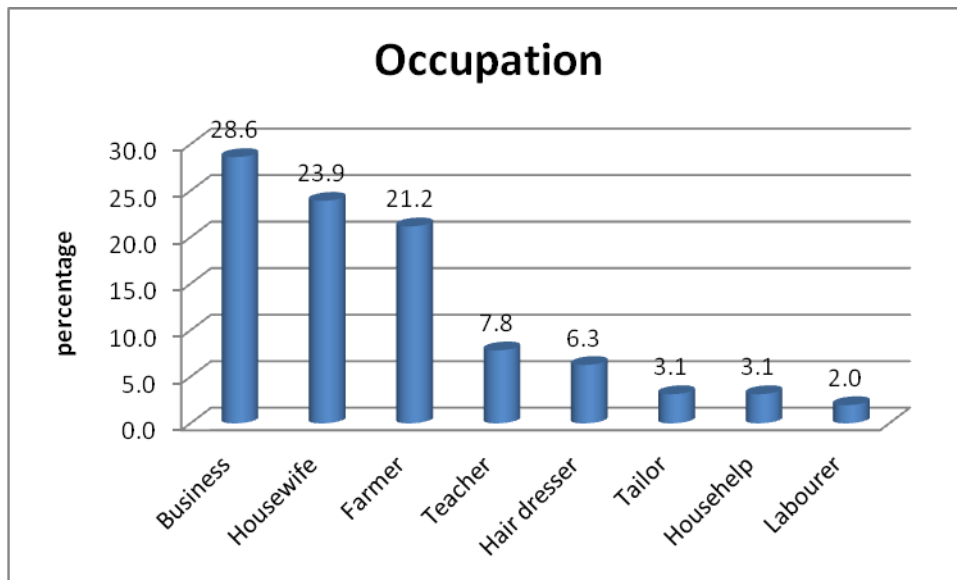
Occupation

7.   Occupation
There were many differing occupations among the respondents. Majority were business people (28.6%) and housewives (23.9%).

Number of living children
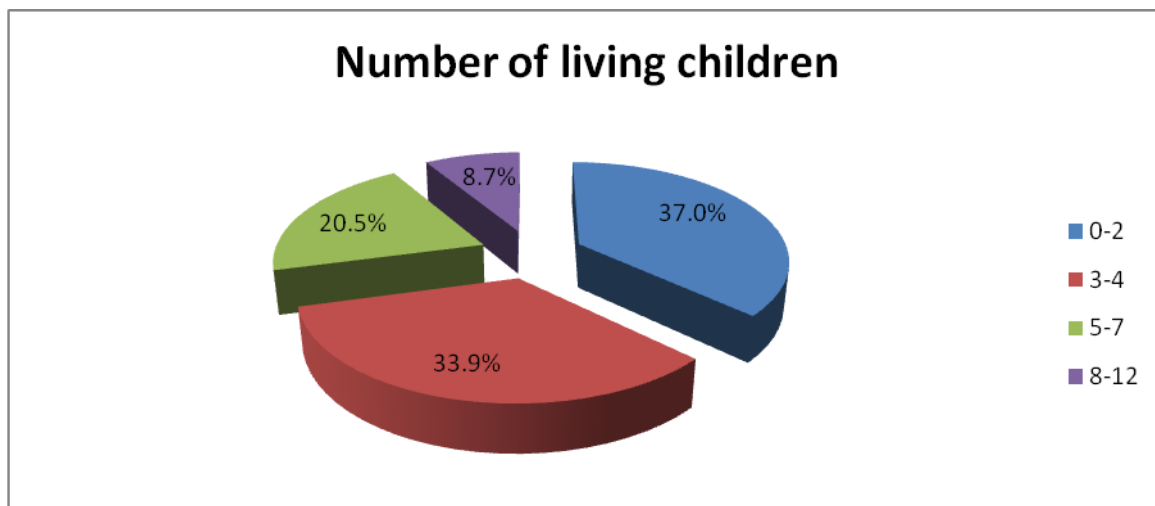
8.   The number of children in the HH
The maximum number of children in the household was 10. The average was 4 children. The category of 0-2 children per household had the highest percentage (37%)
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Number of children below 5 years
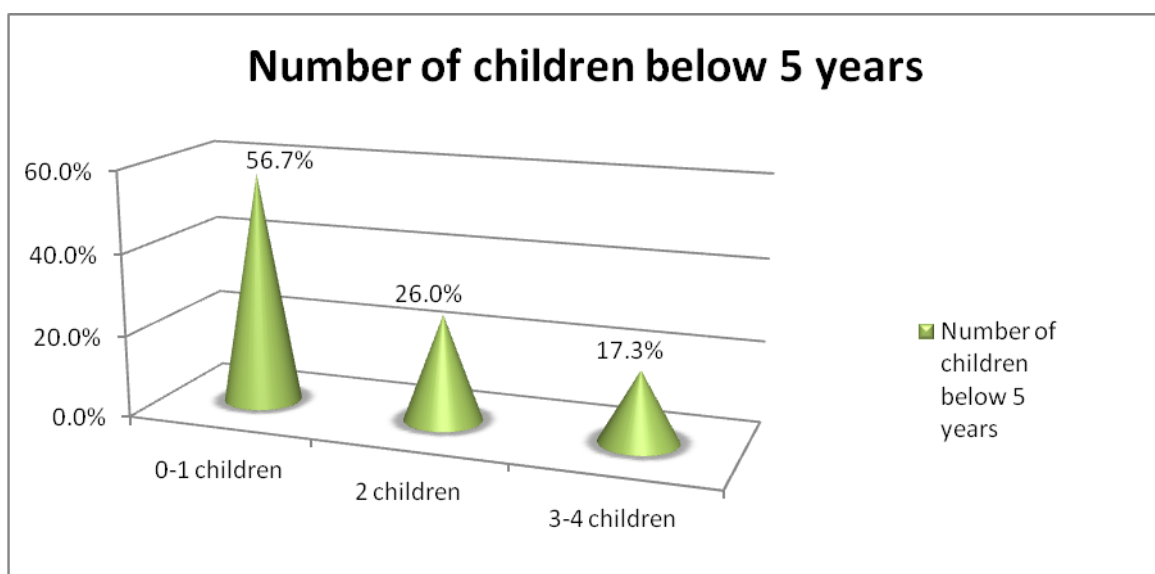
9.   Children below 5 years
The Maximum number of children under 5 years was 4. The average was 1.
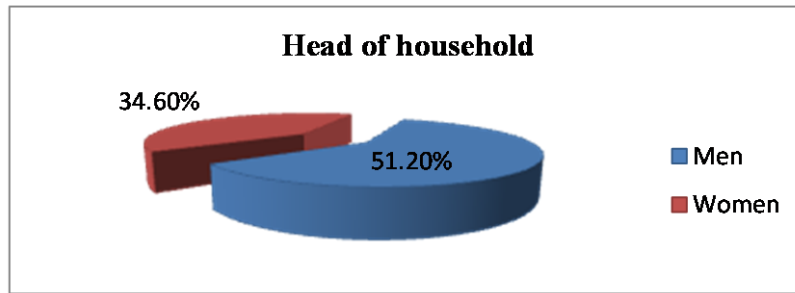
Head of household

10. The head of the household
51.2 percent of household heads were men while 34.6 percent were women.

Correlations
The study found associations among number of people living in household and occupation of mothers; number of people living in household and monthly income; number of people living in household and age of the mothers; occupation of mothers and age of the mothers. These were significant at 1%. The monthly income and age of the mothers were highly correlated at 5 percent. Complementary feeding started early for the young lactating mothers and later for young mothers.

Table1: correlation between age of complementary feeding and social-economic demorgraphic

|		Monthly income	Size of HH	Occupation	Number of children	Children below 5 years	Head of the Household	Age of complementary feeding
Age	Pearson Correlation	.151[*]	.498[**]	-.278[**]	.535[**]	.184[**]		-.135[*]
	Sig. (2-tailed)	.016	.000	.000	.000	.003		.031
	N	254	254	254	254	254		254
Ethnicity	Pearson Correlation				-.135[*]	-.166[**]		
	Sig. (2-tailed)				.032	.008		
	N				254	254		
Highest level of education	Pearson Correlation	.298[**]	-.154[*]	.208[**]	-.182[**]	-.188[**]		
	Sig. (2-tailed)	.000	.014	.001	.004	.003		
	N	254	254	254	254	254		
Monthly income	Pearson Correlation		-.196[**]		-.199[**]	-.325[**]		
	Sig. (2-tailed)		.002		.001	.000		
	N		254		254	254		
House Hold size	Pearson Correlation			-.383[**]	.878[**]	.734[**]	-.302[**]	-.321[**]
	Sig. (2-tailed)			.000	.000	.000	.000	.000
	N			254	254	254	254	254
Occupation	Pearson Correlation				-.322[**]	-.303[**]	.198[**]	.325[**]
	Sig. (2-tailed)				.000	.000	.002	.000
	N				254	254	254	254
Number of children?	Pearson Correlation					.680[**]	-.271[**]	-.261[**]
	Sig. (2-tailed)					.000	.000	.000
	N					254	254	254
Children below 5 years?	Pearson Correlation						-.358[**]	-.407[**]
	Sig. (2-tailed)						.000	.000
	N						254	254
Household Head	Pearson Correlation							.159[*]
	Sig. (2-tailed)							.011
	N							254

Table 2: correlation between duration of exclusive breastfeeding and socio-economic demographic

		Monthly income	Occupation	Number of children	Head of the Household	Duration of exclusive breastfeeding
Age	Pearson Correlation	.151*	-.278**	.535**		-.298**
	Sig. (2-tailed)	.016	.000	.000		.000
	N	254	254	254		254
Highest level of education	Pearson Correlation	.298**	.208**	-.182**		
	Sig. (2-tailed)	.000	.001	.004		
	N	254	254	254		
Monthly income	Pearson Correlation			-.199**		
	Sig. (2-tailed)			.001		
	N			254		
Occupation	Pearson Correlation			-.322**	.198**	.235**
	Sig. (2-tailed)			.000	.002	.000
	N			254	254	254
Number of children	Pearson Correlation				-.271**	-.365**
	Sig. (2-tailed)				.000	.000
	N				254	254

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 3: correlation between reasons for breastfeeding and socio-economic demographic characteristics
The respondents give reasons for early introduction as there was no enough breast milk and there was no enough food to eat after breast feeding. The correlation was significant at 0.05 level and 0.01 level.

		Monthly income	Occupation	Number of children	Head of the Household	Reason for breastfeeding
Age	Pearson Correlation	.151*	-.278**	.535**		.116
	Sig. (2-tailed)	.016	.000	.000		.064
	N	254	254	254		254
Marital status?	Pearson Correlation					-.146*
	Sig. (2-tailed)					.020
	N					254
Highest level of education	Pearson Correlation	.298**	.208**	-.182**		-.161*
	Sig. (2-tailed)	.000	.001	.004		.010
	N	254	254	254		254
Monthly income	Pearson Correlation			-.199**		-.257**

	Sig. (2-tailed)			.001	.000
	N			254	254
Occupation	Pearson Correlation			-.322**	.198**	-.076
	Sig. (2-tailed)			.000	.002	.230
	N			254	254	254
Number of children	Pearson Correlation				-.271**	.326**
	Sig. (2-tailed)				.000	.000
	N				254	254
Head of the Household	Pearson Correlation					-.113
	Sig. (2-tailed)					.073
	N					254

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

		Number of people in HH	Occupation	Monthly income	Age	Ethnicity	Marital status
Number of people in HH	Pearson Correlation		-.383**	-.196**	.498**	-.116	.022
	Sig. (2-tailed)		.000	.002	.000	.065	.728
	N		254	254	254	254	254
Occupation	Pearson Correlation			.085	-.278**	-.015	-.030
	Sig. (2-tailed)			.179	.000	.810	.630
	N			254	254	254	254
Monthly income	Pearson Correlation				.151*	.051	-.021
	Sig. (2-tailed)				.016	.418	.737
	N				254	254	254

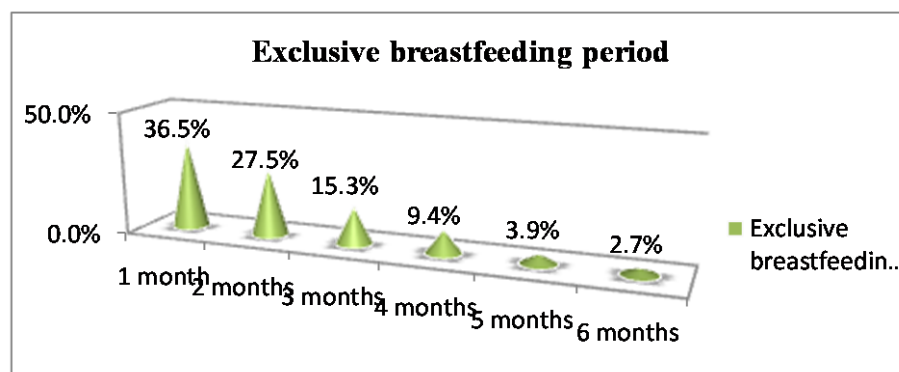**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4:Correlation between initiation of breastfeeding and socio-economic demographic characteristic. Correlation was significant.

		Monthly income	Occupation	Number of children	Head of the Household	Initiation of breastfeeding
Age	Pearson Correlation	.151*	-.278**	.535**		.136*
	Sig. (2-tailed)	.016	.000	.000		.031
	N	254	254	254		254
Highest level of education	Pearson Correlation	.298**	.208**	-.182**		
	Sig. (2-tailed)	.000	.001	.004		
	N	254	254	254		
Monthly income	Pearson Correlation			-.199**		-.169**
	Sig. (2-tailed)			.001		.007
	N			254		254
Occupation	Pearson Correlation			-.322**	.198**	
	Sig. (2-tailed)			.000	.002	
	N			254	254	
Number of children	Pearson Correlation				-.271**	.213**
	Sig. (2-tailed)				.000	.001
	N				254	254
Household head	Pearson Correlation					-.135*
	Sig. (2-tailed)					.031
	N					254

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Exclusive breastfeeding period

36.5% 1 month
27.5% 2 months
15.3% 3 months
9.4% 4 months
3.9% 5 months
2.7% 6 months

11. Time the child is breastfed after introducing complementary feeds

50 percent breastfed until one year while 27.84 percent breastfed for one year and a half. The percentages reduced with increase in age.

2.75
Two years   14.90
27.84
One year   50.20
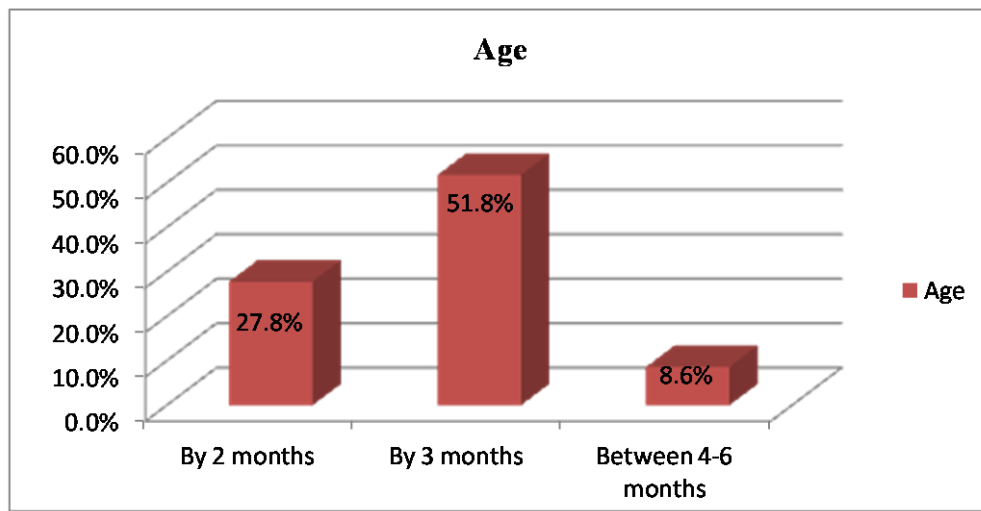
12. Age of the child when the complementally feed was introduced

Majority of the mothers (51.8%) had introduced complementary feeds by three months.

Type of food/fluid	Percentage
Cow's milk	34.1 %
Porridge	22.4 %
Plain water	11.0 %
Pawpaw	10.6 %
Infant formula	9.8 %
Solution of water, salt and sugar	2.7 %

13. The first food/fluid given to the child.

The study found that different types of food/fluids were used as complementary food. Cow's milk was widely used (34.1 percent) followed by porridge at 22.4 percent.
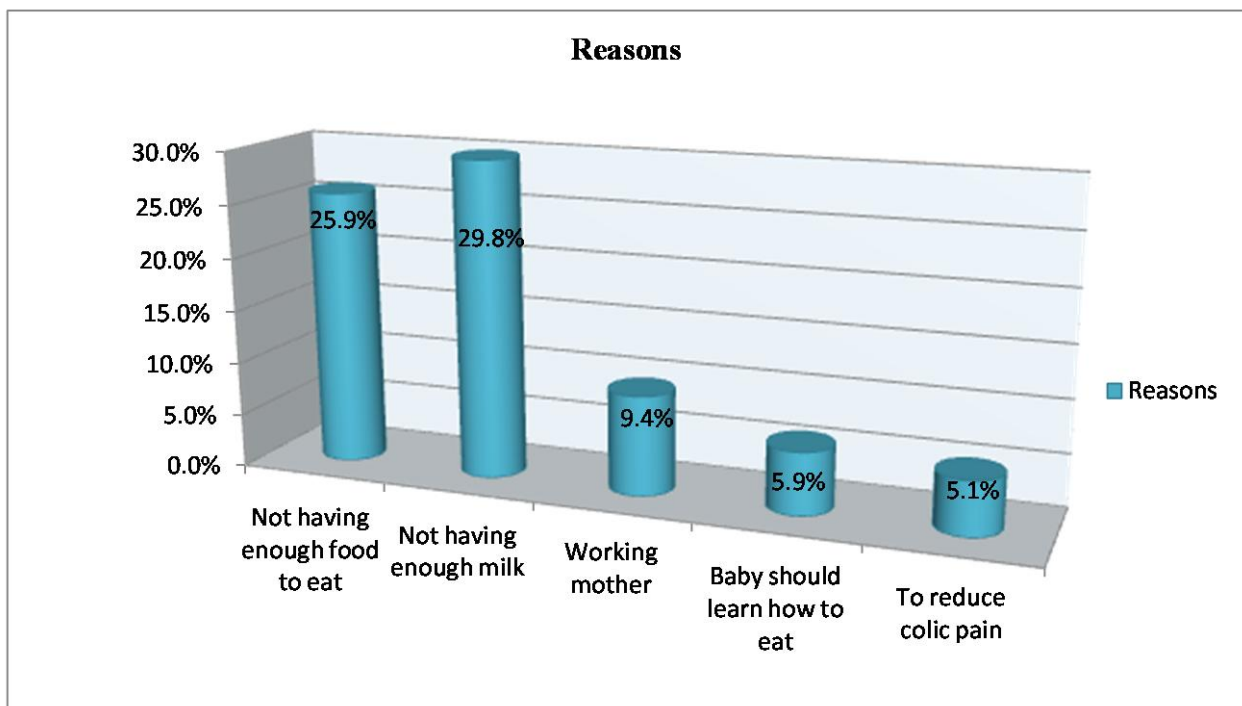
14.The reason for introducing complemetary feeding

Many reasons for initiating complemetary feeding were given. Not having enough milk (29.8 percent) was the leading reason. Not having enough food to eat after breastfeeding (25.9 percent) was the second. Other reasons given were working mother (9.4%), baby should learn how to eat (5.9%) and to reduce colic pain (5.1%).

Correlations

There were strong associations between age of the mother and the duration of exclusive breastfeeding which was significant at 1 percent. A strong relationship was also found between occupation of the mother and duration of exclusive breastfeeding. This association was significant at 1 percent (see table below)
Table 5:

		Duration of exclusive breastfeeding	Marital status	Level of Education	Occupation	Age
Duration of exclusive breastfeeding	Pearson Correlation	1		.084	.048	.235**	-.298**
	Sig. (2-tailed)			.183	.449	.000	.000
	N	254		254	254	254	254
Level of Education	Pearson Correlation	.048		-.018	1	.208**	-.102
	Sig. (2-tailed)	.449		.780		.001	.105
	N	254		254	254	254	254
Occupation	Pearson Correlation	.235**		-.030	.208**	1	-.278**
	Sig. (2-tailed)	.000		.630	.001		.000
	N	254		254	254	254	254
Age	Pearson Correlation	-.298**		.120	-.102	-.278**	1
	Sig. (2-tailed)	.000		.056	.105	.000	
	N	254		254	254	254	254

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6

The study found out that there was a strong association between the occupation of the mother and the age of the child when introducing complementary food. It is significant at 1 percent (99%CI). There was also a strong association correlation between the age of the mothers and age of the child when introducing complementary food. It is significant at 5 percent (95%CI) (see table below)

		Duration of breastfeeding	Marital status	Level of Education	Occupation	Age
Duration of breastfeeding	Pearson Correlation	1	.071	-.009	.180**	-.194**
	Sig. (2-tailed)		.261	.886	.004	.002
	N	254	254	254	254	254
Marital status	Pearson Correlation	.071	1	-.018	-.030	.120
	Sig. (2-tailed)	.261		.780	.630	.056
	N	254	254	254	254	254
Level of Education	Pearson Correlation	-.009	-.018	1	.208**	-.102
	Sig. (2-tailed)	.886	.780		.001	.105
	N	254	254	254	254	254
Occupation	Pearson Correlation	.180**	-.030	.208**	1	-.278**
	Sig. (2-tailed)	.004	.630	.001		.000
	N	254	254	254	254	254
Age	Pearson Correlation	-.194**	.120	-.102	-.278**	1
	Sig. (2-tailed)	.002	.056	.105	.000	
	N	254	254	254	254	254

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

There were significant associations (99%CI) between the number of people living in a household and the age at which the mother started giving the child complementary feed, the occupation of the mother and the age at which mother started giving the child complementary feed. The age of the mother and the age at which the mother initiated complementary feed were highly correlated at 5 percent (95%CI). See table below

Table 7: Correlation between age of initiating complementary food and some soci- economic characteristics.

		Number of people in HH	Occupation	Monthly income	Age	Ethnicity	Marital status
Age of initiating complementary food	Pearson Correlation	-.321**	.325**	.014	-.135*	.085	.053
	Sig. (2-tailed)	.000	.000	.827	.031	.178	.399
	N	254	254	254	254	254	254
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Table 8: Correlation between age of introduction of complementary food and the nutritional knowledge of respondents.

		The three food groups	Person preparing and cooking for the family	Knowledge on preparation of vegetables	Knowledge on cooking vegetables	Growing vegetables	Purpose for growing vegetables
Age of complementary feed initiation	Pearson Correlation	.032	-.107	-.140*	-.044	-.057	-.073
	Sig. (2-tailed)	.610	.089	.025	.487	.362	.244
	N	254	254	254	254	254	254
Knowledge of a balanced diet	Pearson Correlation	.922**	.020	-.145*	-.189**	-.043	-.022
	Sig. (2-tailed)	.000	.756	.021	.002	.494	.725
	N	254	254	254	254	254	254
The three food groups	Pearson Correlation		.023	-.216**	-.227**	-.045	-.024
	Sig. (2-tailed)		.719	.001	.000	.474	.708
	N		254	254	254	254	254
Who prepares and cook for the family	Pearson Correlation			.228**	.094	.049	.061
	Sig. (2-tailed)			.000	.135	.435	.336
	N			254	254	254	254
How are vegetables prepared?	Pearson Correlation				.543**	.049	.020
	Sig. (2-tailed)				.000	.438	.750
	N				254	254	254
How do you cook the vegetables?	Pearson Correlation					.134*	.132*
	Sig. (2-tailed)					.033	.035
	N					254	254
Do you grow vegetables?	Pearson Correlation						.815**
	Sig. (2-tailed)						.000
	N						254
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Table 9

The study found the following associations which were significant at 5%. Knowledge of vegetables preparation and the age of complementary feeding initiation; Knowledge of a balanced diet and age of complementary feeding initiation

		If yes, what are the three food groups	Who prepares and cook for the family	How are vegetables prepared?	How do you cook the vegetables?	Do you grow vegetables?	If yes, what are the purpose for which they are grown?
At what age did you start giving your child additionalfood or fluid in addition to the breast milk	Pearson Correlation	.032	-.107	-.140*	-.044	-.057	-.073
	Sig. (2-tailed)	.610	.089	.025	.487	.362	.244
	N	254	254	254	254	254	254
Do you know what a balanced diet is?	Pearson Correlation	.922**	.020	-.145*	-.189**	-.043	-.022
	Sig. (2-tailed)	.000	.756	.021	.002	.494	.725
	N	254	254	254	254	254	254
If yes, what are the three food groups	Pearson Correlation		.023	-.216**	-.227**	-.045	-.024
	Sig. (2-tailed)		.719	.001	.000	.474	.708
	N		254	254	254	254	254
Who prepares and cook for the family	Pearson Correlation			.228**	.094	.049	.061
	Sig. (2-tailed)			.000	.135	.435	.336
	N			254	254	254	254
How are vegetables prepared?	Pearson Correlation				.543**	.049	.020
	Sig. (2-tailed)				.000	.438	.750
	N				254	254	254
How do you cook the vegetables?	Pearson Correlation					.134*	.132*
	Sig. (2-tailed)					.033	.035
	N					254	254
Do you grow vegetables?	Pearson Correlation						.815**
	Sig. (2-tailed)						.000
	N						254

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 10:
   The study found that the food consumed most were dark green vegetable and eggs and food rich in iron were mostly consumed this means lactating mothers were getting enough iron with good bioavailability.

11. Food frequency

Food item	Frequency			
	Daily	**3-6 times a week**	**1-2 times a week**	**Once a month**
Sources of Vitamin A				
Eggs	22	17	5	1
Liver				
Dark green leafy vegetables	29	24	24	12
Deep orange fruits	18	7	12	5
Carrots	16	4	2	2
Sweet potatoes	20	6	11	3
Sources of Iron				
Goat, beef, pork, rabbit, lamb, chicken, fish	26	15	25	17
Eggs	22	17	5	1
Legumes	16	7	22	16
Sources of zinc are				
Protein-containing foods:				
Red meats				
whole grains	22	9	7	
Some fortified cereals				

BMI Classification
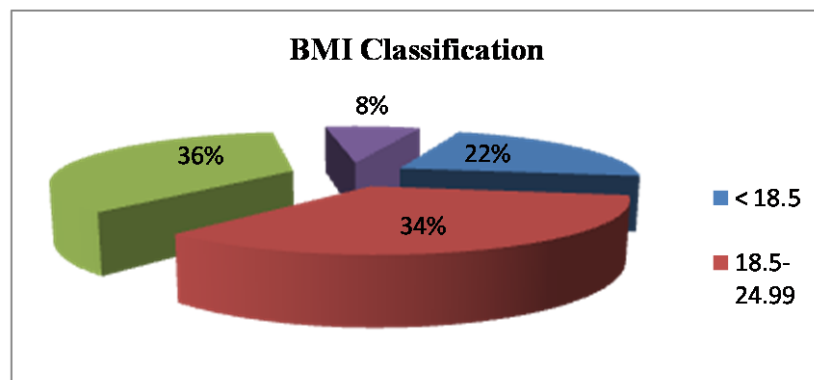
15.Nutrition status
The highest percentage (36%) of the respondents had a normal BMI. The least number of respondents were obese (8%)

4. Discussion
4.1 Age
        The minimum age of the respondents in the current study was 20 while the maximum age was 49. The mean age was 36 years. This is in agreement with a study in Ghana which found that 63% percent of the farmers were in the age bracket of 21-40 years (Ackerson and Awuah, 2010). In Namibia as well, majority of the respondents (66.3%) were young people falling in the age range of 21-40 (Dima, S.J et al., 2002).
        In Eldoret, the mean age of respondents was 28 years (Kadenyeka, M.V. et al., 2013). In Gweru city, Zimbabwe, the average age was 41 years (Jongwe, A. 2014). In their research, Salau and Attah (2012) discovered that the mean age of the respondents was 50 years. Most (35.56%) of the respondents were within the age of 41–50 years followed by those within the range of 51–60 years (24.44%). In their study, Yusuf et al., (2015) found that the majority of respondents (76.1%) were aged 41-60 years. This contradicts the findings of the current study. In Accra Ghana, 83% of the farming household is of 40 years and above while 17% were between 20-29yrs of age. None of the farmers was below 30 years (Danso et al., 2004). However, Stevenson et al., (1994), states that, farming is not restricted to certain age groups.

4.2 Marital status
        Majority of the respondents were either married (63.9%), single (25.5%) or divorced (5.9%). A study in Nigeria had findings similar to the current study. Majority (90%) of the respondents were married while 7.78% were single (Salau and Attah, 2012). A study in Namibia found that 58% of the respondents were single, 23.4% married, 13.5% cohabiting and 4% divorced and 6% separated (Dima, S.J et al., 2002). In Samre Woreda, Ethiopia, 92.3% of the respondents were married, 5.8% divorced and 2% widowed (Haileslassie et al., 2013). In Ibadan, Oyo state, Nigeria 90.9% of the farmers interviewed were married (Yusuf et al., 2015).

4.3 Education level

43.1% had achieved primary school education and 35.3 persons had attained Secondary 'O' level education. This was higher than the national averages in the primary education and lower in the secondary education. According to the KDHS 2014, 25% women and 23% men had completed primary education while 43% women and 49% men had attained post secondary education. In Nigeria, Salau and Attah (2012), also found that most (33.33%) of the respondents had primary education while 22.22% had secondary education. About 67% of the respondents in Kumasi Ghana had dropped out or completed basic education(Ackerson and Awuah, 2010).

In a study in Eldoret, the respondents level of education was 25% for Primary and Secondary 15% (Kadenyeka, M.V. et al., 2013). In a study in Nigeria, majority of the respondents(50.5%) had tertiary education followed by primary(25.4%) then secondary (24%) (Yusuf et al., 2015). In Accra Ghana a greater number of farmers interviewed had primary (33%) or secondary (37%) education while 6% had Tertiary education (Danso et al., 2004).

4.4 Household size

In this study, the maximum number of people living in households was 12 while the average number of people was 6. In Samre Woreda, Ethiopia, the mean family size was 6. The category of ≥5 persons was highest at 63.5% (Haileslassie et al., 2013). In Ghana, Ackerson and Awuah, (2010) found the highest family size to be 5-6 (28%). According to Stevenson et al., (1994), farm families are generally bigger than the average Dar es Salaam household (5-7 compared to 4-5 members). Larger households have a higher demand for family income and are thus using their resources to produce more of their own food (Stevenson et al. 1994).). In Ibadan, Oyo state, Nigeria, majority of the respondents (92.3%) had a household size of 4-8.

In Pretoria, South Africa the average household counted 4.4 members (Averbeke, W.V 2007). In a study in Eldoret, the Mean household size was also 4 (Kadenyeka, M.V. et al., 2013). In Gweru city, Zimbabwe, the average household size was 4.62 (Jongwe, A. 2014). In a study in Namibia, majority of respondents had household sizes ranging from 3 to 8 persons. In Windhoek 76% of the respondents had family sizes of 3-8 persons, 22% had less than 3 persons per household and only 2% had members greater than 8. In Oshakati the respective figures were 71% with 3-8 persons, 11% with less than 3 persons and 18% with more than 8 persons living in their families (Dima, S.J et al., 2002).

4.5 Occupation

Majority of the respondents in this study were business people (28.6%) and housewives (23.9%). These findings concur with those of Foeken and Mwangi (2000) who established that farming activities in the urban areas were mostly carried out on a part time basis by people in other livelihoods. Their participartion in urban agriculture was to supplement their family food or income. This study agrees with research conducted by the Planning Commission and the Ministry of Labour and Youth Development of Daresalaam (1995) which found that, about 30% of the urban population gains an income in the informal sector and about 6.5% of the informal urban workforce works in urban agriculture. Stevenson et al. (1996) found that, for 90% of interviewed periurban farmers, agriculture was their primary economic activity. Farming was the primary occupation of most (90%) farmers, although they all had other sources of supplementary income, such as trading, teaching, etc (Danso et al., 2004).

The results of Salau and Attah's study (2012), showed that majority (63.33%) of the respondents were civil servants, 22.22% with trading as their major occupation while 14.45% were full time farmers. In Zimbabwe, Mudzengerere's study (2014) showed that 55% of the respondents were unemployed whilst 24% worked in the informal sector. Only 13% were formally employed. In total, 87% of the interviewed people were unemployed and they were dependent on the informal sector for employment. In Pretoria, South Africa the contribution to mean total household income of employment was 67.1%, public welfare grants 16.0%, service provision 7.2%, trade 7.0%, transfers by kin 2.5% and agriculture 0.2% (Averbeke, W.V 2007).

4.6 Head of household

In this study male headed families constituted 51.20% and female headed families constituted 34.60. These results differ with results of a study carried out in Zimbabwe, where female headed families constitute 31% of the urban households and these families are vulnerable to poverty (The National Gender Policy, 2002). In Namibia, in Windhoek the male headed households were 78% and female headed households 22% while in Oshakati, the respective figures were 90 (63%) and 53 (37%) (Dima, S.J et al., 2002). In Accra Ghana, all the households interviewed (100%) are headed by men (Danso et al., 2004).

4.7 Gender

In this study, more women (49.7%) made decisions on what to plant in the farms than men (33.7%). More women (56.5%) provided labor in the farms than men (21%). In Kumasi Ghana, majority (98%) of the farmers practicing urban agriculture were males. Females were not so much involved in the vegetable farming (Ackerson and Awuah, 2010). In Gweru city, Zimbabwe, males were 66.4% and female 33.62% (Jongwe, A. 2014).

In their study, in Oyo state Nigeria, Yusuf et al., (2015) discovered that 85.5% of the farmers were male while 15.5% were female. In Nasarawa State Nigeria, Salau and Attah (2012), found that majority (55.56%) of the respondents were females while 44.44% were males. Hovorka *et al* (2009) describe that women were the greater part of urban farmers worldwide. They comprise 80% of urban farmers in Uganda and 56% in Kenya. The farming households interviewed in Accra Ghana were predominantly (73%) men (Danso et al., 2004)

4.8 Exclusive breastfeeding

The study showed that respondents exclusively breastfed their infants for a shorter time. 36.5 percent breastfed exclusively for one month. According to the KDHS (2015), In Kenya, 61 percent of children less than six months are exclusively breastfed. The proportion of breastfed children declines with age and breastfeeding is nearly universal in a child's first month of life. The national figure is higher than this study's findings. In Nigeria, 16% of infants within the

age range of 2 – 8 weeks (<2 months) were exclusively breastfed. Among the 71.6% of the infants studied that were within the age range of 9 – 16 weeks, 76% were exclusively breastfed. Out of the breastfed infants within the age range of 17 – 24 weeks, 8% were exclusively breastfed (Olaitan et al., 2015). A study in Malawi discovered that a total of 61 infants (13.3%) were exclusively breast-fed to 4 months, 29 (6.3%) to 5 months and 7 (1.5%) to 6 months (Kalanda et al., 2006), these results differ with the current study in that (36.4%) of infants were only exclusively breast fed for only one month

In Malaysia, the prevalence of exclusive breastfeeding among mothers with infants aged between one and six months was 43.1% (95% CI: 39.4, 46.8). The prevalence of exclusive breastfeeding when stratified by infant age from one to six months ranged between 32.4% and 63.3% with the highest among one month old infants and lowest among six month old infants (Tan, 2011). In Australia, in total, 93.8% of women left the hospital breastfeeding, with 75.6% of infants being exclusively breastfed. At 6 months of age, 45.8% of infants were receiving any breast milk and only 12.0% were being fully breastfed. Less than 1% of infants were exclusively breastfed at 6 months of age. The median duration of exclusive breastfeeding was 3 weeks (Scott et al., 2006). In Sweden, there has been a constantly high breastfeeding frequency from the beginning of the 1990's; 98% of all infants are breastfed at 1 week of age and 72% at 6 months of age (National Board of Health and Welfare, 2003).

In Italy, among mothers who exclusively breastfed the median duration of exclusive breastfeeding was 3.1 months. Within 48 hours of delivery, 91.1% of mothers started breastfeeding. 76.8% of the mothers exclusively breastfed at hospital discharge. At 4 months the rate of exclusive breastfeeding was 30.9%. At the age of 6 months, 46.8% of the infants, were still breastfed (Giovannini et al., 2004). In Alabama,   less than half (40.7%) of all of the mothers interviewed initiated breastfeeding, 31.3% breastfed for 1 week or more, and only 8.3% breastfed for 3 months or more. Breastfeeding duration (measured as mean survival time) in the total sample was 3.5 weeks. Of those mothers who initiated breastfeeding, one half stopped breastfeedingby 4 weeks postpartum and only one fifth continued for at least 3 months (Meyerink and Marquis, 2002).

The *Lancet* series states that; In Africa, Asia, and Latin America and the Caribbean only 47–57% of infants younger than 2 months are exclusively breastfed. For children 2–5 months of age this percentage falls to 25–31%. In children aged 6–11 months, 6% in Africa and 10% in Asia have stopped breastfeeding, as have 32% in Latin America and the Caribbean (Black et al., 2008).

Although around 63% of women in Scotland initiate breastfeeding (Hamlyn et al. 2002), the rate 6–7 days after birth is currently estimated at 42% (Tappin et al. 2001).

This study found that there was a strong association between age of the mother and the duration of exclusive breastfeeding. Older mothers introduced complementary feed later than young mothers. There was also a strong relationship between the occupation of the mother and the duration of exclusive breastfeeding. These were significant at 1 percent.

4.9 Breastfeeding duration

50 percent breastfed until one year while 27.84 percent breastfed for one year and a half. The percentages reduced with increase in age of child. These figures were lower than the national percentages indicated in the KDHS (2015), which states that more than half of children in Kenya are still breastfeeding at age 20-23 months (51 percent). At 9-11months, 93 percent are still breastfeeding, 83.6 percent at 12-17 months, and 59 percent at18-23 months. These results are in line with a study done In Malawi, where breastfeeding was continued for most babies until 9 months (74.6%). By a year of age, 11.9% of babies were still partially breast-fed (Kalanda et al., 2006). In Italy, the median duration of breastfeeding was 5.3 mo. and median duration of breastfeeding was 6.1 mo for those who exclusively breastfed. The median duration of breastfeeding in infants who were introduced early to solid foods was 3.1 months while in those who were not introduced early to solid foods was 5.8 months. At the age of 12 months 11.8% of the infants, were still breastfed (Giovannini et al., 2004).

A study conducted by Ahmed et al., (2014) in Islamabad, Pakistan, found that the longest duration of breastfeeding was 6 months (33.3%). In 2004, the Demographic and Health Survey of Bangladesh found that, 62% of infants aged 6–9 months received complementary foods while continuing to breastfed (BDHS 2004). Kabir et al., (2012) found that 71% of children in Bangladesh had received complementary foods by the age of 6–8 months. In Saudi Arabia, the proportion of mothers who ever initially breast fed their infants was 94.0%. Approximately 92.8% of mothers continued breast feeding up to 1 month, after which the proportion of lactating mothers declined to 40% by the 12th month postpartum. The median duration of breast feeding was 6 months (Shawky and Abalkhail, 2003).

The study found a strong association between occupation of the mother and duration of breastfeeding and a strong relationship between age of the mother and the duration of breastfeeding. These were significant at 1 percent.

4.10 Age of the child when the complementally feed was introduced

Majority of the mothers (51.8%) had introduced complementary feeds by three months. In their research, for example, Paul et al., (2011) discovered that the mothers who exclusively breastfed for until 6 months cited messages about exclusive breastfeeding delivered by clinic nurses as their reason. In Kenya, 15.4 % of mothers had introduced complementally food by the first month, 36.6% by the third month and 57.2% by the fifth month. In Nairobi, nearly all (98%) of children had been introduced to complementary foods (either liquids or solids) by the age of 6 months. Liquids were introduced much earlier than solids; the mean age of introduction of liquids was one month while that for solids was three and a half months (Kimani-Murage et al., 2011). In Ogun State, Nigeria, Hamudat and Ibisumbo (2014) found that 73% of the mothers introduced complementary foods before six months, 4% introduced complementary foods before 9 months while 2% introduced complementary foods after 12 months. In Malawi, at 2 months of age, 43% of infants had received complementary feeding and by 3 months 65% this study differ with the current study in that complementary feed was introduced by the third month by majority at 51.8%. The mean age for introduction of complementary food was 3.4 months and the mean age for introduction of solids was 4.5 months. The mean age for introduction of water supplements was 2.5 months (Kalanda et al., 2006).

In Italy, the median age at introduction of solid foods was 4.3 months. Solid foods were introduced before the age of 3 months in 5.6% of infants. At 4 and 6 months of age, 34.2% and 85.5% of infants, respectively, had solids introduced. All infants received solid foods by the age of 9 months. Early introduction of solid foods occurred in 4.4% of mothers having breastfed (Giovannini et al., 2004). In Saudi Arabia, the introduction of solid foods was as early as the 4th month of the infant's life. (Shawky and Abalkhail, 2003).

Przyrembel (2012), states that an introduction of complementary food before 15 weeks in breastfed infants may increase the risk of obesity in later life, particularly when breastfeeding is discontinued at the same time. The introduction of complementary food before the age of 12–15 weeks appears to increase the risk for infections of the gastrointestinal and the respiratory tract. The introduction of complementary food before 12 weeks of age appears to increase the risk for (atopic) eczema in later life and the risk for food allergy in high-risk populations. An introduction before the age of 17 weeks may be associated with adverse health consequences in later life and is not associated with any apparent health benefit.

This study found out that there is a strong association between occupation of the mother and age of the child at introduction of complementary food. It was significant at 1 percent. A strong association was also found between age of the mother and age of the child at introduction of complementary food. It is significant at 5 percent

4.11 The first food/fluid given to the child

The study found that different types of food/fluids were used as complementary food. Cow's milk was widely used (34.1 percent) followed by porridge at 22.4 percent and plain water (11 percent). In addition to breast milk, 15 percent of children less than 6 months are fed complementary foods, 10 percent consume plain water, 10 percent consume other milks, and 3 percent consume non-milk liquids (KDHS, 2015). A study in Nairobi by Kimani-Murage et al., (2011), discovered that the most common complementary foods given to children before the age of six months were: plain water (56%), with most children on it having been given within the first month (69%); porridge (54%), with most children on it having been introduced between the second and third months (64.7%); fresh or powdered milk (45%) with most children on it also having been introduced between second and third months of life (57%); and sweetened/flavoured water (41%), with most of children on it having been introduced within the first month of life (78%).

In an investigation in Pakistan, females supplemented breastmilk with other liquid items like rose water, cow/buffalo milk, sweetened water, honey and ghutti (Ahmed et al., 2014). In Nigeria, Most of the mothers used cereal (gruel) (58%) as complementary foods, 17% used solid foods as complementary food while 24% used beverages. Most of the babies (59%) were being given biscuit, 16% were given sweet and confectionaries while 27% were given soft drinks (Hamudat and Ibisumbo, 2014). In Italy, it was discovered that 27.8% infants received water with added sugar, 2.7% water and water-based drinks, and 1.1% water alone. The median age at the introduction of fruit juice was 4.9 months. Fruit (73.1%) and cereals (63.9%) were the first solid foods used for most infants. Vegetables, meat/poultry and milk products were introduced as first solids in 40.3%, 13.7% and 9.2% of infants, respectively. No infants had eggs or fish given as first solid foods. Cow's milk was introduced before 3 months in less than 2% of the infants. The median age of introduction of cow's milk was 9.3 months (Giovannini et al., 2004).

4.12 The reason for introducing complemetary feeding

Many reasons for initiation of complemetary feeding were given. Not having enough milk (29.8 percent) was the leading reason. Not having enough food to eat after breastfeeding (25.9 percent) was the second reason. Other reasons given were working mother (9.4%), baby should learn how to eat (5.9%) and to reduce colic pain (5.1%). These results conccur with the results of a study carried out in Nairobi by Kimani-Murage et al., (2011), ascertained that the main reason given for introducing complementary foods to children below six months was that the mother had no or little breast milk (approx 40%). These results also partly concurr with the results of a study carried out by Ahmed et al., (2014), which found out the reasons for giving complementary feeds early as, shortage of milk, not enough milk to satisfy the newborn needs, being working ladies and not able to attend their babies throughout the day and fitness issues were reported as reasons to cease breastfeeding. Paul et al., (2011) ascertained that mothers in Pemba introduced solid foods before 6 months because "the baby was crying."

Sika-Bright and Oduro (2013) discovered that the mothers in their study introduced complemetary feeding because they experienced low supply of breast milk and felt compelled to add other supplementary foods to get the babies satisfied. They also complained of lack of adequate support from family and friends since they themselves are young mothers. In the United states, for mothers who stopped breastfeeding within the first month and those who stopped between the first and second months after their child's birth, the 3 most frequently chosen reasons were "Baby had trouble sucking and latching on" (53.7% and 27.1%, respectively), "Breast milk alone didn't satisfy my baby" (49.7% and 55.6%), and "I didn't have enough milk" (51.7% and 52.2%). Among the mothers who discontinued breastfeeding when their infant was aged 3 months and above, perception of the infant's lack of satisfaction by breast milk alone (49.1%–49.5%) and concern about not having enough milk (43.8%–54.0%) continued to be important, and "My baby lost interest in nursing or began to wean himself or herself" became the third most frequent reason (33.1%–47.9%) (Li et al, 2008).

More than half of the respondents interviewed were literate, married and lived in households headed by men. A quarter of them were business people, single and had Meru ethnicity. The highest number of people fell in the 36-40 years age category

Two months was the longest period that most mothers exclusively breastfed their infants. Cow's milk was the favorite fluid introduced after weaning. The longest period of breastfeeding for most mothers was a year. The two major reasons given for weaning early were; not having enough milk and not having enough food to eat after breastfeeding.

Food frequency data from the study indicates that the respondents were consuming a lot of the Vitamin A, Iron and zinc rich foods at least daily or 3-6 times a day. The lowest consumption was 1 to 2 days a week.

The highest percentage (36%) of the respondents had a normal BMI. The least number of respondents were obese (8%). The fact that 8% of the respondents were obese could be due to the weight gained during pregnancy which they

may not have managed to shed off. It could also be due to the fact that some women tend to overeat while breastfeeding. Also, the BMI recommendation for normal adults was used in classifying the lactating women in this study, since there is no recommended standard for them. This could have positioned majority of the women in the overweight and obese categories (WHO, 2000).

5. Conclusion

Majority of the respondents were married and had achieved primary education. There was a maximum household members of 12 and an average of 6. Only a small percentage exclusively breastfed their infants for 6 months. Majority of lactating mothers introduced complementary feeding before 6 months. The food mostly given as the first complementary feed was the cow's milk followed by poridge. Reasons given by majority for introducing complementary feeding before 6 months were not having enough milk and not getting enough food to eat after breastfeeding. Majority of mothers had normal BMI and only a small percentage was under weight. Their consumption of micronutrients was adequate.

6. Reccomendations

Communications of the WHO guidelines on exclusive breast feeding and complementary feeding should be done effectively using various media channels to the mothers of infants

Female education should be made a priority by the government so that females are educated and empowered to practice adequate exclusive breastfeeding and safe complementary feeding.

Planting of vegetables should be encouraged in households with lactating mothers so that they get enough for own consumption and for sale to buy other food stuffs which will help them produce enough breast milk to exclusively breastfeed their babies for at least four to six months. Health professional's capacity should be strengthened so that they can regularly counsel clients on importance of exclusive breastfeeding and continuation of the same after introduction of complementary feeding for at least two years.

Nutrition education should be provided especially on the importance of exclusive breastfeeding for 6 months. The significance of continued breastfeeding for two years also needs to be passed on. Mothers also need to be informed on ways they can enhance their breast milk supply so that they do not wean early. Intervention on crop production in the lactating mother backyards using technologies such as multistory and organoponics can help improve on exclusive breastfeeding and improve nutritional status of mothers and communities.

7. Acknowledgement

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