

**INFLUENCE OF MATERNAL NUTRITION KNOWLEDGE
ON INFANT FEEDING PRACTICES AMONG THE
MAASAI COMMUNITY IN NAROK DISTRICT, KENYA**

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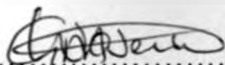
**DISSERTATION SUBMITTED IN PARTIAL FULFILMENT
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DECLARATION

I Grace M. Mugo, hereby declare that this is my original work and has not been presented for a degree in any other University.

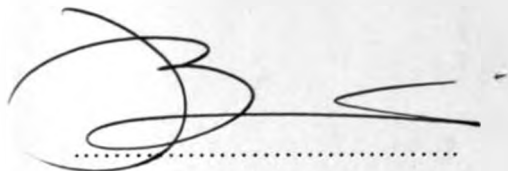


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DEDICATION

This work is dedicated to my husband R. M. Gichaga for his support and encouragement throughout the entire period, my dear daughters Priscilla, Lydia and Mary for their patience and understanding while I was away. My parents Mr. A. Waweru and Mrs. Lydia Waweru for they provided a firm foundation of my life.

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“GLORY AND HONOUR BE TO GOD FOR HIS WONDERFUL PROVISION”

TABLE OF CONTENTS

Declaration	ii
Dedication	iii
Acknowledgement	iv
Table of contents.....	v
List of tables.....	ix
List of figures.....	x
List of abbreviations	xi
Operational definition of terms	xii
Abstract	xiv
CHAPTER 1: INTRODUCTION.....	1
1.1 Background	1
1.2 Statement of the problem	4
1.3 Aim of the study.....	5
1.4 Purpose of the study.....	5
1.5 Justification of the study	6
1.6 Objectives	7
1.6.1 General objective	7
1.6.2 Specific objectives	8
1.7 Research hypothesis.....	8
CHAPTER 2: LITERATURE REVIEW	9
2.1 Overview of malnutrition.....	9
2.1.1 Global Malnutrition Situation in Children.....	9

2.1.2 The Double Burden of Malnutrition	10
2.1.3 Determinants of Malnutrition	10
2.1.4 Nutritional Status of Children under Five in Kenya	12
2.2 Infant feeding practice	13
2.2.1 Breastfeeding Practices.....	13
2.2.2 Complementary Feeding Practices	14
2.2.3 Challenges in Infant Feeding Practices.....	15
2.2.4 Hygiene and Sanitation.....	17
2.2.5 Feeding in Difficult Circumstances	18
2.3 Maternal nutrition knowledge.....	19
2.4 The role of health programs in improving nutrition	21
CHAPTER 3: STUDY SETTING AND RESEARCH METHODOLOGY	23
3.1 Study setting.....	23
3.2 Study design.....	24
3.3 Sample size determination	25
3.4 Sampling procedure	26
3.5 Study tools, instruments, and data collection.....	27
3.6 Preparation for the study	29
3.6.1 Consent and Permission.....	29
3.6.2 Recruitment and Training of Field Assistant.....	30
3.7 Data analysis	30
CHAPTER 4: RESULTS	31
4.1 Social-demographic characteristics	31

4.1.1 Household Characteristics	31
4.1.2 Hygiene and Sanitation	31
4.1.3 Mothers Profile	34
4.1.4 Infants Profile.....	35
4.2 Breast feeding practices	35
4.2.1 Exclusive Breast Feeding Practices	36
4.2.2 Breastfeeding Frequency	36
4.2.3 Breastfeeding Initiation.....	37
4.2.4. Prelacteal Feeding	37
4.2.5 Expression of Breast milk.....	38
4.2.6 Maternal Nutrition Knowledge on Breast Feeding Practices	39
4.2.7 Knowledge and Practice of Breastfeeding Practices	40
4.2.8 Traditional Verses Modern Knowledge on Breastfeeding Practices	41
4.3 Complementary feeding practices.....	43
4.3.1 Bottle Feeding.....	46
4.3.2 Maternal Nutrition Knowledge on Complementary Feeding Practices.....	46
4.2.7 Knowledge and Practice on Complementary Feeding.....	47
4.3.4 Traditional Verses Modern Practices on the Complementary Feeding	48
4.3.6 Reasons for Early Complementary Feeding	52
4.3.7 Prelacteal Foods as Complementary Foods	52
4.4 Infant morbidity	54
4.5 Nutritional status of infants.....	56
4.5.1 Underweight.....	56

4.5.2 Stunting	60
4.5.3 Wasting	61
CHAPTER 5: DISCUSSION	62
5.1 Social demographic profile	62
5.2 Hygiene and sanitation.....	63
5.3 Breastfeeding practices	64
5.4 Complementary feeding practices.....	65
5.5 Maternal nutrition knowledge on infant feeding practices	68
5.6 Factors influencing choice of infant feeding practices	73
5.7 Infant morbidity	76
5.8 Infant feeding practices and nutritional status	77
CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS.....	80
6.1 Conclusions.....	80
6.2.Recommendations.....	82
CHAPTER 7: REFERENCES.....	84
APPENDICES	88
APPENDIX 1: Key informant guidelines for Health Care Workers	88
APPENDIX 2: Key Informant Guidelines for Traditional Birth Attendants.....	89
APPENDIX 3: Questionnaire.....	89

LIST OF TABLES

Table 3.1 District fact sheet	24
Table 4.1 Distribution of the respondents by their main sources of water	32
Table 4.2 Distribution of respondents by method of water treatment	33
Table 4.3 Distribution of mothers by reasons for giving prelacteal feeds	38
Table 4.4 Major sources of nutrition knowledge on infant feeding practices	39
Table 4.5 Maternal knowledge and practice on key breastfeeding practices	40
Table 4.6 Sources of traditional knowledge on infant feeding practices	41
Table 4.7 Distribution of infants by foods given at sixth to eighth months.....	45
Table 4.8 Foods given to the infants at 6 th to 8 th month.....	46
Table 4.9 Major sources of nutrition knowledge on infant feeding practices	46
Table 4.10 Maternal Nutrition Knowledge and practice on initiation and frequency of Complementary feeding.....	48
Table 4.11 Major sources of traditional knowledge on infant feeding practices.....	49
Table 4.12 Comparison between Modern and Traditional complementary foods.....	51
Table 4.13 Distribution of child illness two weeks before the interview	54
Table 4.14 Association between key breastfeeding practices and illnesses	55
Table 4.15 Association between complementary feeding practices and illnesses.....	56
Table 4.16 Distribution of study infants by underweight	57
Table 4.17 Association between key breastfeeding practices and underweight.....	58
Table 4.18 Association between complementary feeding practices and underweight	59
Table 4.19. Association between complementary feeding practices and Stunting.....	60
Table 4.20 Association between complementary feeding practices and wasting.....	61

LIST OF FIGURES

Fig 3.1 Flow chart on sampling procedure	26
Fig 4.1 Distribution of study population by the type of housing	32
Fig. 4.2 Distribution of the respondents by fecal waste disposal.....	34
Fig 4.3 Distribution of mothers by age	34
Fig 4.4 Distribution of study mothers by level of Education.....	35
Fig.4.5 Distribution of mothers by their breastfeeding frequency.....	36
Fig 4.6 Distribution of respondents by the time of infant breastfeeding initiation.....	37
Fig 4.7 Distribution of study infants by type of prelacteal foods given	37
Fig 4.8 Distribution of respondents by reasons for not considering expressing breast Milk	39
Fig 4.9 Comparison of key breastfeeding feeding practices between modern and traditional practice.	42
Fig 4.10 Distribution of study infants by complementary foods given during the first month of life.....	44
Fig 4.11 Distribution of respondents by reasons for early initiation of complementary feeding.....	52
Fig 4.12 Distribution of respondents by reasons of giving traditional ghee.	53
Fig 4.13 Distribution of mothers by reason for giving herbs as complementary foods....	53
Fig 4.14 Distribution of study infants by level of malnutrition	57

LIST OF ABBREVIATIONS

ACC/SCN:	Administrative Committee on Coordination/ Standing Committee on Nutrition
ASAL:	Arid and Semi Arid Lands
BMI:	Body Mass Index
CBO:	Community Based Organization
CBS:	Central Bureau of Statistics
FBO:	Faith Based Organizations
GOK:	Government of Kenya
HIV/AIDS:	Human Immuno Deficiency Virus
MCH:	Maternal and Child Health
MOH:	Ministry of Health
NCHS:	National Center for Health Statistics
NHIC:	National Health Information Center
NGO:	Non Governmental Organization
SD:	Standard Deviation
TBAs:	Traditional Birth Attendants
UNICEF:	United Nations Children Fund
VAD:	Vitamin A deficiency
WHO:	World Health Organization

OPERATIONAL DEFINATION OF TERMS

- Bottle-feeding:** Feeding from a bottle, whatever the contents.
- Breastfeeding:** The child receives milk direct from the breast or after expression.
- Breast Milk substitute:** Any food being marketed or otherwise presented as partial or total replacement of breast milk.
- Cessation of breastfeeding:** Completely stopping breastfeeding
- Complementary feeding:** Any food whether manufactured or prepared at the domestic level, and used complement to breast milk or to infant formula.
- Cup-feeding:** Feeding from a cup, open or with a spout.
- Exclusive breastfeeding:** The infant receive only breast milk from his/her mother, wet nurse or expressed breast milk and no other liquid or solid with the exception of prescribed drops or syrups consisting of vitamins mineral supplements or medicines.
- Malnutrition:** Disorders that result from inadequate diet or from failure to adequately absorb or assimilate dietary elements.
- Mixed breast feeding:** Breastfeeding combined with other foods
- Predominant breast feeding:** The infant's predominant source of nourishment is breast milk. However the infant may also receive water or water based drinks (sweetened or flavoured water, tea infusion etc) fruit juice, Oral Rehydration salts (ORS); drops & syrup from vitamins, minerals and medicines and folk

fluids (in limited quantities). With the exception of fruits juices and sugar-water no food based fluid is allowed under this definitions

Prelacteal feeds: Any food, solid or liquid, other than breast milk given to an infant before the initiation of breast feeding.

Partial breast feeding: Giving the baby some breastfeeds, and some artificial feeds, either milk or cereal or other food

Replacement feeding: The process of feeding a child/infant who is not receiving any breast milk, with a diet that provides all those nutrients that the child/infant needs. During the first six months this should be with a suitable breast milk substitute, commercial formula or home prepared formula with micronutrients supplements.

Pastoralism; A way of life where people depend largely on livestock or livestock related activities using natural fodder and mobile forms of animal husbandry

ABSTRACT

Little is documented about the relationship between maternal nutrition knowledge and infant feeding practices in the Maasai community. A cross sectional survey which employed both descriptive and analytical methods of data collection and presentation was designed to assess the influence of maternal nutrition on the infant (0 – 12 months) feeding practices in the community. A previously pretested structured questionnaire was used to interview a sample of 165 mothers with infants aged 0-12months and attending Maternal and Child Health Clinic (MCH) at Ololunga sub-District Hospital. The study also interviewed three Health Care Workers at the MCH clinic and five Traditional Birth Attendants (TBAs). Data was collected on social demography of the households, sanitation and hygiene, maternal nutrition knowledge, infant feeding practices, and the anthropometry and morbidity of the index child.

Results showed that up to 86.7% of the infants studied had been delivered at home. Prolacteal feeding was practiced by 71.5% of mothers. Expression of breast milk was not common in the community and 99.4% of the mothers indicated unwillingness to express. The traditional infant feeding practices played a major role in influencing infant feeding practices. Up to 81.2% indicated having received traditional knowledge from their relatives.

The main source of modern nutrition knowledge was indicated as the relatives (40.7%), followed by the mass media (39.8%) and Traditional Birth Attendants. MCH clinic was indicated as a source of knowledge by only 5.9% of the mothers. About 71% of mothers

indicated having received instructions on the modern infant feeding practices but 53% demonstrated correct knowledge on the recommended period of exclusive breastfeeding while only 1.2% of the mothers practiced exclusive breastfeeding as recommended by the World Health Organizations. Traditionally, exclusive breastfeeding was not practiced. Only 41.2% of mothers demonstrated correct knowledge on the recommended breastfeeding frequency, but 78.2% were breastfeeding the infants on demand. About 76% of the mothers demonstrated correct knowledge on the recommended time to initiate breastfeeding and about 73% were practicing. With regard to time of initiation of breastfeeding and breastfeeding frequency, modern knowledge was similar to traditional knowledge.

Sixty-three percent of mothers demonstrated correct knowledge on the recommended age of introducing complementary foods, but 98.8% of the mothers had introduced complementary foods before the age of one month similar to what is advocated by the traditional knowledge. About 93% of the mothers demonstrated correct knowledge on the frequency of feeding the complementary foods and about 94% were practicing. Bottle-feeding of liquid foods was common (86%), while 13% of mothers used cups.

Cough/common cold and diarrhoea were the most prevalent diseases among the children at 75% and 22% respectively. Diarrhoea was more prevalent among infants 0 – 6 months than among the older infants (6 - 12 months). The nutritional status of the infants (0 - 6 months) was normal, with 96% having normal weight. High growth faltering was observed with the older infants.

Poor hygiene and sanitation was evident in the study area with only about 27% of the homesteads having pit latrine and 73% using bushes for human waste disposal. About 98% of the households lived in temporary houses with inadequate ventilation. Only about 20% had access to clean drinking water but about 57% treated their drinking water.

The results showed that when modern knowledge conflicted with the traditional knowledge, practice of modern knowledge was low. However, practice was high when modern knowledge acknowledged the traditional. This would imply that the mothers were still adhering to the traditional knowledge to make choices on infant feeding practices. The nutritional status of the infants (0 - 6 months) was normal and morbidity especially diarrhea disease not excessive. It does not seem therefore justified to recommend wholesale replacement of the traditional infant feeding practices with the modern practices.

A multifaceted approach which takes into consideration factors such as maternal nutrition, social economics status of households, traditional knowledge, maternal nutrition knowledge, beliefs and taboos is required in order to effectively improve infant feeding practices.

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Infant feeding practices play a pivotal role in determining optimal development of infants. Poor breast feeding and infant feeding practices have adverse consequences for the health and nutritional status of children, which in turn has adverse consequences on the mental and physical development. The three forms of malnutrition; mild, moderate and severe have varying degrees of effects on the development of the child. It has been reported that more than 80% of deaths associated with childhood malnutrition result from mild and moderate malnutrition (WHO/UNICEF, 1999).

World Health Organization (WHO) defines optimal behaviour as exclusive breastfeeding (EBF) for the first four to six months of infants' life, and thereafter appropriate complementary feeding with continued breastfeeding for two years and beyond (ACC/SCN, 2000). This recommendation is, however based on mothers with normal health and receiving adequate nutrition to produce sufficient milk for the baby. EBF as recommended is strongly presumed to increase child survival and reduce risk of morbidity, particularly from diarrhea. In Kenya, only about 13% of infants have been reported to be exclusively breastfed as recommended (CBS, 2003). This implies that 87% of the infants are given complementary foods before the WHO recommended time. Under normal circumstances of a mother affording adequate amounts for the baby, breast milk is sufficient for 4 - 6 months and any food/fluid other than medicine before this age does not increase nutrient intake but only displaces breast milk from the diet (Cohen et al., 1994).

WHO. However, this education does not seem to make the required impact, may be because it is often in conflict with the traditional knowledge on infant feeding practice acquired and entrenched in the mothers, and which to them is working.

However, a large number of children in Kenya are still unable to enjoy their right to food and nutrition mainly due to poverty and general shortage of food in the households. High levels of malnutrition, including micronutrient deficiencies are responsible for high national rates of illness and death (GOK/UNICEF, 1998). Traditional weaning diets included a relatively limited range of foods, usually based on rather coarse, bulky vegetable foods; consisting of the softer portions of the adult diets. Foods given are frequently carbohydrates which are sometimes made into pastes or gruels (Derrick et al., 1969). Bottle feeding is common in Kenya. According to CBS (2003), 27% of infants under six months are fed using a bottle with artificial teat. Bottle feeding practices may result in increased morbidity due to poor hygiene in cleaning the bottle, and unsafe water and food preparation facilities.

Appropriate infant feeding depends on accurate information and skilled support from family, community and the health care systems. In order to be effective, the information should be objective, complete and consistent, and take into account the prevailing social, cultural and environmental circumstances. It should also be free of commercial influence. Diversified approaches are required to ensure access to foods that adequately meet energy and nutrient needs of the growing infant. Inadequate knowledge on appropriate foods and feeding practices can be a greater cause of malnutrition than lack of food.

Health workers are in a position to design, implement and monitor nutrition programs. They therefore help alter family practices to improve care and feeding of women and children. By focusing on aspects such as hygiene and essential nutrition, the programs can reduce infant and child mortality, and improve their physical and mental development.

1.2 STATEMENT OF THE PROBLEM

Important causes of death among children under five years old include acute respiratory infection, diarrhea, measles, malaria, and anemia. Poor breast feeding and infant feeding practices have adverse consequences for the health and nutritional status of children, which in turn has consequences on the mental and physical development of the child. For optimal growth, it is recommended that infants should be breastfed for the first six months of life. Exclusive breastfeeding in the early life is correlated strongly with increased child survival and reduced risk of morbidity, particularly from diarrheal diseases.

Some communities practice prelacteal feeding with specific foods only because of the belief in the beneficial health effects associated with the practice as advocated by the traditional knowledge deeply entrenched in the cultures. The products given as prelacteal in most cases continue to be administered for a long while thereafter. Prelacteal foods could prevent the infant from suckling because the baby does not feel hungry. Therefore, the baby may not benefit from the colostrum which a normal baby needs at this time. Also, if the conditions for the preparation and feeding of the prelacteal foods are not adequately hygienic the baby may suffer from diarrhea and other diseases.

In Kenya, there has been many initiatives and campaigns to educate mothers and communities on the recommended infant feeding practices by the Ministry of Health (MOH) and United Nations Children's Funds (UNICEF). A lot of resources have been used on these campaigns but very little impact seems to have been created. For example, studies indicate that only 13 % of infants are exclusively breastfed for the first six months of life as recommended by WHO (CBS, 2003). This implies that 87% of the infants are given complementary foods earlier in life than the recommended time. The question is whether maternal nutrition knowledge plays a significant role in infant feeding practices.

A good understanding of knowledge on infant nutrition and feeding by mothers and its influence on current infant feeding practices among the pastoral community is needed in order to help in the formulation of strategies for improving nutrition education and communication interventions to help mothers improve infant feeding practices. This will translate into improved nutritional status and the health of the infants.

1.3 AIM OF THE STUDY

To contribute towards improvement of health and nutrition among infants in the Maasai community by providing information which helps to develop strategies that effectively improve dissemination of knowledge on infant feeding practices to the mothers.

1.4 PURPOSE OF THE STUDY

To establish an understanding of the relationship between maternal nutrition knowledge and practice on infant feeding in order to improve intervention strategies to enhance appropriate infant feeding practices.

1.5 JUSTIFICATION OF THE STUDY

The causes of malnutrition are both behavioral and resource related. Poor breastfeeding and complementary feeding, coupled with diarrhea and acute respiratory infection, are immediate direct causes. Household poverty and inadequate environmental sanitation and health care are the underlying causes (SCN, 2003).

Health Care Managers and Supervisors are encouraged to integrate promotion of infant and young child feeding, including HIV and infant issues into MCH services and community programmes. Trained counselors provide information on infant feeding practices including benefits of breastfeeding and the risks associated with early introduction of complementary feeding. Feeding practices play a pivotal role in determining optimal development of infants. Poor breast feeding and infant feeding practices have adverse consequences on the health and nutritional status of children, which in turn has consequences on the mental and physical development (WHO/UNICEF, 2003).

Health workers strive to provide accurate and complete information on recommended infant and young child feeding practices, hopefully taking into account the prevailing social, cultural and environmental circumstances. Mothers are supposedly keen to ensure that they have accurate information to make appropriate choices. Unfortunately, all these efforts have not yielded much change on the malnutrition levels countrywide. Still, 30% of children under five are stunted which reflects cumulative effects of chronic

malnutrition (CBS, 2003). Only 13% of the infants are exclusively breastfed against the WHO recommendation of exclusive breastfeeding for six month (CBS, 2003).

Training is intended to change behavior in the traditional infant feeding practices which would translate into discernible improvement on nutritional and health status among infants. Influencing change in established behavior is enormously complex, and no single communication tool will suffice. Different tools are required to address different audiences and to achieve different objectives at different points in time (WHO/UNICEF, 2003). It also requires a clear understanding of the established behaviour and the reasons for its deep entrenchment.

It is therefore important to study the influence of nutrition knowledge on the current feeding practices against the backdrop of the traditional infant feeding practices among mothers attending postnatal clinics, in a pastoral community which has low literacy level and a weak resource base. The study will provide information required to formulate strategies to effectively carry out nutrition education and change entrenched behaviour in infant feeding practices for the purpose of improving the health and nutrition among infants and young children.

1.6 OBJECTIVES

1.6.1 GENERAL OBJECTIVE

Determine the influence of maternal nutrition knowledge on the current infant (0-12months) feeding practices among Maasai community.

1.6.2 SPECIFIC OBJECTIVES

1. To determine the social, economic and demographic characteristics of the households.
2. To determine the current infant feeding practices among the Maasai community.
3. To determine maternal nutrition knowledge on infant feeding practices.
4. To assess infant nutritional status and morbidity experience.

1.7 RESEARCH HYPOTHESIS

Maternal nutrition knowledge positively influences infant feeding practices.

CHAPTER 2: LITERATURE REVIEW

2.1 OVERVIEW OF MALNUTRITION

Malnutrition refers to disorders resulting from consumption of suboptimal quantities of macro and micronutrients in the diet. The macronutrients consist of protein and energy, while the micronutrients include vitamins and minerals.

2.1.1 Global Malnutrition Situation in Children

Malnutrition is a widespread problem with devastating consequences. It weakens immune systems and worsens illnesses. It is a cause of about 50% deaths of children under five years of age. Even the malnourished children who survive have diminished cognitive capacity and lower productivity in adulthood. Malnutrition reduces quality of life and financially drains families, communities and countries. Even mildly malnourished child have an increased risk of dying. The World Health Organization (WHO) estimates that out of the 10.4 million deaths of children under five years of age that occurred in 1995, about half were associated with malnutrition (WHO/UNICEF, 1999).

Well over two-thirds of the deaths from malnutrition that occur during the first year of life are often associated with inappropriate feeding. Only about 35% of infants worldwide are exclusively breastfed in the first four months of life. Complementary feeding frequently begins too early or too late, and foods are often nutritionally inadequate and unsafe. Malnourished children who survive are more frequently sick and suffer the long-life consequences of impaired growth (WHO/UNICEF, 2003).

2.1.2 The Double Burden of Malnutrition

Malnutrition in all its forms refers to both underweight and overweight. Underweight is defined as low weight-for-age, a child may be underweight because she/he is wasted (low weight-for-height), or be stunted (low height-for-age). Stunting refers to a low height-for-age independent of their weight-for-age. In fact, some stunted children may have excess weight for their stature. Overweight refers to excess weight for length/ height measured as weight for height or BMI (Body Mass Index) for age. Underweight is the main nutritional concern in the underdeveloped countries.

Low quality diets lead to deficiencies of one or more micronutrients due to inadequacy in the diets. The prevention of nutrition related chronic cases is a life long process that starts with the achievement of optimal foetal and infant growth and continues throughout the life course, with the **promotion of healthy diets** and active living at each age (SCN, 2005, – 2006).

2.1.3 Determinants of Malnutrition

Determinants of malnutrition can be divided into immediate, underlying, and basic.

Disease and inadequate dietary intake are the immediate causes of malnutrition in most individuals. The main underlying causes include inadequate access to food and nutrients, inadequate care of mothers and children, inadequate health services, and unhealthy environments. The basic causes of malnutrition include political ideologies, economic factors and cultural factors (WHO/UNICEF, 1999).

Malnutrition manifests itself as stunting, underweight and wasting in individuals, and deficiencies of micronutrients; Vitamins such as vitamin A, B, D, E and Folic acid, and minerals such as iron, iodine, zinc and calcium. The immediate cause of death from malnutrition may be pneumonia or diarrhoea, which are preventable with adequate nourishment. Eating the same food daily or eating over cooked food often limit the body intake of all essential micronutrients it needs for normal growth and good health. This leads to micro-nutrient deficiencies which may have the following specific serious consequences.

Iron deficiency causes body to become weak and less productive due to lack of energy. It causes anaemia and weakens the immune system. Weakened body is more susceptible to infections. For pregnant women anaemia can reduce baby's physical growth and affect child birth seriously resulting to costly treatment or death (UNICEF, 2003). In Kenya, the prevalence of mild and moderate to severe anaemia among children were reported to be 19.2 and 54.2% respectively. Children below 30 months of age had highest prevalence at 76.5%. Within this group, half of the children were infants (MOH/UNICEF, 1999).

Vitamin A deficiency (VAD) causes night blindness and weakened immune system. Common illnesses such as cholera, typhoid, tuberculosis are likely to affect those with VAD (UNICEF, 2003). Among children, acute and moderate VAD prevalence was estimated to be 14.7% and 61.2% respectively in Kenya (MOH/UNICEF, 1999).

Iodine deficiency affects brain functions among all ages but for the unborn and infants it can cause mental retardation which affect the intelligence. The deficiency may also affect growth as well as hearing and speech. Iodine deficiency increases risks of still births and infant deaths (UNICEF, 2003).

Zinc deficiency leads to retarded growth in foetuses and infants. It may lead to costly childbirth. It causes slow wound healing in individuals (UNICEF, 2003).

Dietary diversification should be emphasized in infant feeding to ensure availability of micronutrients in diets. Proper food preparation is also essential to ensure retention of micronutrients in the meal

2.1.4 Nutritional Status of Children under Five in Kenya

The growth pattern of healthy and well fed children is reflected in the positive growth in height and weight. Inadequate food intake among other factors often lead to malnutrition resulting in serious consequences on the physical and mental growth and development of the children. Indicators used to assess adequate growth of infant/child includes height-for-age, weight-for-height, weight-for-age, and mid-upper-arm circumference (MOH, 2005).

Height-for-age is a measure of linear growth. A child below -2 standard deviation (SD) from the median of National Center for Health Statistics (NCHS) reference is considered stunted, reflecting cumulative effects of undernourishment or chronic malnutrition. A child below -3SD from reference median is considered severely stunted. Children whose

weight-for-height is below -2SD are considered to be wasted reflecting starvation or acute malnutrition, those below -3SD are considered severely wasted. Children whose weight-for-age is below -2SD are classified as underweight (ACC/SCN, 2000).

In Kenya 33% of children under five are stunted and 11-13% severely stunted. 6% of children are wasted and 1% severely wasted. A child could be underweight because he/she is stunted, wasted or both. 20% of children under five were underweight (CBS, 2003).

2.2 INFANT FEEDING PRACTICE

Infant feeding practice includes breastfeeding and complementary feeding.

2.2.1 Breastfeeding Practices

Mother's milk has just the right amounts of fat, sugar, water, and protein needed for baby's growth and development. Breast milk contains antibodies which help protect infants from bacterial and viral infections. Human milk straight from the breast is always sterile. Breastfeeding help mothers to bond with the baby. Physical contact is important to newborns and helps them feel more secure, warm and comforted. Nursing uses up extra calories, making it easier to lose the pounds gained from pregnancy. Breastfeeding helps the uterus to get back to its original size more quickly and lessens any bleeding the mother may have after birth. Breastfeeding also may lower risk of breast and ovarian cancers (UN, 2005).

Exclusive breastfeeding (EBF) is recommended for the first six months of infant life because it is strongly correlated with increased child survival and reduced risk of morbidity, particularly from diarrhoeal diseases. Overall in Kenya only 13% of infants under 6 months are exclusively breastfed (CBS, 2003).

Women delivering in health facilities and at home are encouraged to initiate breast feeding within the first 30 minutes after birth except for HIV positive mothers who have chosen not to breastfeed. Bottle feeding is discouraged. Early initiation of breastfeeding increases the chances of breast feeding success and generally lengthens the duration of breastfeeding. Mixed breast feeding for HIV positive mothers may increase the risk of HIV infection and is discouraged (CBS, 2003).

Colostrum is secreted for the first few days after delivery. Colostrum contains more antibodies and white blood cells that give the baby “immunization” to protect him/her against most bacteria and viruses. Colostrum is also rich in growth factors which stimulate a baby immature intestine to develop and is a laxative which helps the baby to pass meconium (the first, very dark stools). This helps prevent jaundice (King, 1992).

2.2.2 Complementary Feeding Practices

The period of complementary feeding should begin when breast milk alone no longer satisfies the nutritional requirements of the infants. The period of complementary feeding ends when the child no longer takes the breast milk but eats family foods. Timely, safe and adequate initiation of complementary feeding with continued breastfeeding is

recommended as high priority in global nutrition. Indeed the continued growth faltering of many children worldwide suggest that complementary practices remain inadequate in terms of timeliness, quality, and safety (WHO UNICEF, 2003).

Modern infant feeding practices recommends initiation of complementary feeding by about six months after birth. Complementary foods should as much as possible be energy and nutrient dense, easily obtained and prepared by the family, culturally acceptable, of appropriate consistency for the age and development stage of the infant, and clean and safe for consumption (Coutsoudis, 2004).

2.2.3 Challenges in Infant Feeding Practices

Many unsubstantiated beliefs and attitudes about breastfeeding prevent many mothers from exclusively breastfeeding for the first six months as recommended. The most common of these beliefs and attitudes include:

- 1) Mothers unfounded fear that the milk is insufficient and/or of poor quality.
- 2) Delay in initiating breastfeeding and discarding colostrums
- 3) Belief that infants become thirsty and need extra fluid
- 4) Lack of support from health services and
- 5) Also, marketing of breast milk substitutes have led to the belief that the products are superior to breast milk, thereby undermining breastfeeding practices. This problem has led to the development and use of the Code of marketing of breast milk substitutes (Coutsoudis, 2004).

Bottle feeding is common in Kenya, 27% of infants under six months are feed with a bottle with a nipple (CBS, 2003). Bottle feeding if not practiced hygienically may result in increased child morbidity due to unsafe water and preparation facilities. Sometimes bottle feeding is introduced or recommended by Health workers in cases of mothers who take time to generate sufficient milk for the baby, to give prelacteal foods. The prelacteal foods given to the infants vary but in most cases include glucose water and diluted cow`s milk. Finally, bottle feeding may make the baby suffer nipple confusion and may even lead to the refusal to suck from the breast altogether (Kings, 1992).

The period of complementary feeding is a particularly vulnerable time in the life of the infant due to; an inadequate energy and nutrient intake, the ingestion of contaminated complementary foods, reduced immunity to infections and children putting many items in their mouths during exploration of environment (Coutsoudis, 2004).

Inappropriate complementary feeding practices include; premature or late introduction of foods other than breast milk, inadequate amount of foods, nutritionally inadequate or unsafe foods, and early cessation of breast feeding. Foods which are supposed to complement breast milk often become substitutes (WHO, 1999).

Studies in Kenya show that 54% of children under six months receive solid or semi solid foods. The most commonly used complementary foods include; milk products other than breast milk – 36%, food from grain – 28%, and fruits and vegetables – 23%. Foods made from cereals are introduced to children at 2 – 3 months (32%); and at 6 – 7 months, 60%

of infants were already receiving these foods. Foods from roots tubers and legumes are introduced at around 4 – 5 months. By the age of 10 – 11 months, 31% are receiving root/tubers – based foods, and 25% receive legumes based foods. Consumption of protein – rich animal foods (meat, fish poultry, and eggs) generally begins at 4 – 5 months – 8% and increase to 27% by the first year of life (CBS, 2003).

Those who advice mothers and caregivers are not always aware of the following FADU principals which are key to feeding infants and young children successfully as outlined below:

- 1) Adequate Frequency of feeds,
- 2) Sufficient Amounts of foods at each feed,
- 3) Use of foods to increase nutrient Density in the diet, and
- 4) Ensuring that the food is Utilized after it is eaten, e.g., by reducing infections from contaminated foods (WHO/UNICEF, 1999).

2.2.4 Hygiene and Sanitation

Hygiene practices directly affect cleanliness of environment, and determine the number of infectious agents the infant/child ingests either through contaminated food or water, or by placing contaminated objects in their mouths. Mothers need to wash their hands with soap and water before handling cooked food and feeding the infant, after visiting the toilet, and after handling infant wastes. The child's hands should be kept as clean as possible. Infants must be kept clean through bathing.

Household waste should be disposed appropriately especially human and animal faeces and other contaminants. The way in which the caregiver/mother disposes these wastes can have a major effect on child's health. All members of the family should use sanitary facilities to lower the chances of worm infestation of the infant/child. Worm infestation increase with age and level of morbidity. Mothers should use clean/safe water for food preparation (UNICEF, 1997).

2.2.5 Feeding in Difficult Circumstances

The best hope for averting the disability and death that is so common among infant and young children in difficult circumstances is to ensure that they are adequately fed and cared for. However meeting the nutritional needs of infant who are born with low birth weight, and are already malnourished or whose families are socio-economically disadvantaged as well as during natural disasters like famine, civil unrest, in refuge settings and in presence of HIV/AIDS is complex and demanding. Particularly vulnerable are the nearly 70m severely malnourished children among whose case fatality rates are 30% to 50%, whereas with appropriate feeding and care these rates should be no higher than 3% to 5%. New approaches are required both to meet the needs of this especially vulnerable population groups and to cope with the growing scale variety and frequency of new emergencies that threatens their nutritional status. The unique challenges faced by families and children in these circumstances require special attention owing to the risks associated with artificial feeding and inadequate complementary feeding (WHO/UNICEF, 2003).

The low status of women, poor maternal nutrition, inadequate prenatal care and disproportionate burden of physical labour borne by mothers are some of the issues hindering improvement of nutritional status. About 50% of pregnant women suffer from iron deficiency anemia in Kenya. These women may give birth to premature or low birth weight infants who have inadequate iron stores, hence are at a greater risk of infection, weakened immunity, learning disability, impaired physical development and in severe cases death (UNICEF 2003). Infants born with low birth weights are at risk of being malnourished. Appropriate infant feeding practices are required to improve the condition. The Kenya Government is committed to ensuring that all citizens attain their right to nutrition. This is evident from the efforts being made by various Ministries and NGOs to improve nutritional security.

However, a large number of children in Kenya are still unable to enjoy their right to food and nutrition. Unacceptable levels of malnutrition, including micronutrient deficiencies are responsible for high rate of illness and death nationally (GOK/UNICEF, 1998).

2.3 MATERNAL NUTRITION KNOWLEDGE

Traditionally, weaning diets included a relatively limited range of foods, usually based on rather coarse, bulky vegetable foods; consisting of the softer portion of the adult diet which were very frequently largely carbohydrate food, which are sometimes made into pastes or gruels (Derrick et al., 1969).

Appropriate infant feeding depends on accurate information and skilled support from family, community and health care systems. Inadequate knowledge about appropriate foods and feeding practices is often a greater determinant of malnutrition than lack of food. Moreover, diversified approaches are required to ensure access to foods that will adequately meet energy and nutrient needs of the growing infants. For example, use of home and community based technologies to enhance nutrient density, bio-availability and the micronutrient content of local foods increases the nutritional value of diets.

In order to improve infant feeding practices mothers/caregivers should have access to objective, consistent and complete information about appropriate feeding practices that are free of commercial influence, and that take into account the prevailing social, cultural and environmental circumstances (WHO/UNICEF, 2003). Mothers need to know the recommended period of exclusive breastfeeding, complementary and continued breastfeeding, the timing of the introduction of complementary foods, the types of foods to give, how much and how often, and how to feed these foods safely. Mothers and caregivers also need to recognize the warning signs of growth faltering, so as to take the necessary action. With accurate information on infant nutrition and feeding mothers can make appropriate feeding choices. Knowledgeable health workers are well placed to provide this support during prenatal and postnatal visits.

Studies which have attempted to assess acquisition and use of nutrition knowledge after nutrition education, indicated mixed findings and opinions. One study showed that the proportion of breastfed infants (0 - 3months) was low at 26.02% despite the known

benefits of breastfeeding (Pascale et al., 2007). Another study showed that there was no significant difference in child feeding practices between mothers who had received training in nutrition and those who had not received training (Tumwet, 1996). Yet another study showed that only 30% of the mothers followed the advice given by health workers on child feeding practices. In the report 57% of the mothers followed advice by neighbours, friends and workmates to start complementary feeding at 3 months or earlier (Ashene, 2006). Therefore, implementation of nutrition education messages poses challenges. Most of the studies have not clearly identified the challenge facing mothers in implementing nutrition packages.

The problem of acceptance and practice of the modern infant feeding may be compounded by the fact that there exists well entrenched indigenous knowledge on infant care and feeding within the communities. This knowledge has been passed from generation to generation during the upbringing of children.

2.4 THE ROLE OF HEALTH PROGRAMS IN IMPROVING NUTRITION

Health workers are in a position to design and implement nutrition programs. They are also powerful monitors who can help change family practices and community beliefs about the care and feeding of women and children. By focusing on package of essential nutrition actions, health programs can reduce infant and child mortality, improve physical, mental growth and development, and improve productivity. These essential actions protect, promote, and support the following nutrition outcomes:

1. Exclusive breastfeeding for at least 4 months or if possible six months.

2. Adequate complementary feeding starting about six months with continued breastfeeding for two years.
3. Appropriate nutritional care of sick and malnourished children.
4. Adequate intake of vitamin A by women and the children.
5. Adequate intake of iron by women and the children.
6. Adequate intake of iodine by all members of the household.

Such nutrition intervention programs are incorporated into Maternal and Child Health (MCH) services both at the community and clinics levels. To achieve lasting impact, nutrition activities must be accompanied by other intervention to address the basic causes of malnutrition (WHO/UNICEF, 1999).

The activities must also put into consideration the social, cultural and economic environments of the community. Certainly it is futile to recommend exclusive breastfeeding of the infant for a long period without addressing the health and nutritional status of the mother because these are key to production of adequate milk for the baby. This is why any program in maternal nutrition education should be location specific to take care of all the salient features that might affect the adoption of the recommendations.

CHAPTER 3: STUDY SETTING AND RESEARCH METHODOLOGY

3.1 STUDY SETTING

The study was conducted in Narok District of the Rift Valley Province.

Narok District is one of 24 Arid and Semi-Arid Lands (ASAL) in Kenya, situated at the Southern tip of the Rift Valley Province. It covers an area of 15,717 square km. Narok District borders Tanzania to the South, Kajiando District to the East, Bomet and Nakuru Districts to the North and Transmara District to the West. Administratively the District is divided into eight Divisions namely; Central, Mau, Mara, Ololulunga, Olokruto, Mulot, Osupuko and Loita Divisions. The major rivers in the District are Ewaso Nyiro and its tributaries Siabei and Narok Rivers.

According to the 1999 Population and housing census the district had a population of 365,750 persons, of which 181,519 were female and 184,231 were males. The population density was 24 persons per square km. There were a total of 73,985 children under 5 years, of whom 37,684 were males and 36,344 were females. There were a total of 76,450 households.

The District consists of highlands and lowlands regions. The highlands which consist of Upper Mau, Olokruto and Mulot Divisions have high potential for wheat, barley, maize, beans and potatoes. The highlands have fertile soils and reliable annual rainfall ranging from 1200mm to 1800mm. The low lands cover Ololunga, Mara, Loita and Osupuko Divisions and have high potential for livestock rearing. The Maasai community inhabits

the lowlands and practice nomadic pastoralism and small-scale subsistence farming.

Majority of them are poor because they have a weak economic base.

Table 3.1: District fact sheet

Total area	15,087.8 sq. km
Arable land	4,500 sq. km
Non-arable land	10,588 sq. km
Water mass	None
Absolute poverty	
-Rural	64%
-Urban	66%
Doctor/Patient ratio	1:100,953
Average distance to the nearest health facility	30km
% household with access to health facility	50%

Source: GOK, (2002-2008)

The District has agro-pastoralism, pastoralism, leasing of land/pastoralism and trade as means of livelihood (Narok District report, March 2007).

3.2 STUDY DESIGN

The study was cross sectional survey and was designed to establish infant feeding practices and the influence of maternal nutrition knowledge on the practices. It was a case study of Ololunga Sub-District Hospital. The study employed both descriptive and analytical methods of collection and presentation of data. The study population consisted

of mothers with their infants (0-12 months) from Olulunga Division who attended the MCH clinic at the time of data collection.

3.3 SAMPLE SIZE DETERMINATION

In Narok District the prevalence of malnutrition among infants (0-12months) was 11% according to the hospital annual report of 2005.

Fisher's formula (Fisher et al., 1983) was used to obtain the sample size as follows:

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

Where n= the desired sample size

z= the standard normal deviate which is 1.96 for 95% confidence interval

p= proportion of infants who suffered from malnutrition

q= 1-p

d= degree of accuracy required

$$n = \frac{1.96^2 \times 0.11 \times 0.89}{0.05^2}$$

$$n = 150.4$$

$$n = 150.4$$

$$10\% \text{ Attrition} = \frac{10 \times 150.4}{100} = 15.04$$

$$100$$

$$n = 15 + 150 = 165$$

3.4 SAMPLING PROCEDURE

Multi stage sampling design was used to arrive at the 165 infants and their mothers. Ololunga hospital was purposively selected as it offers a big catchment area for the study population. Ololunga Division is predominantly occupied by the Maasai community. This study can be replicated in all the Maasai in the District since they all have the similar characteristics. Together, a total of 165 mothers and their infants were randomly selected from the M.C.H. clinic to form the sample by use of the method outlined in Figure 3.1.

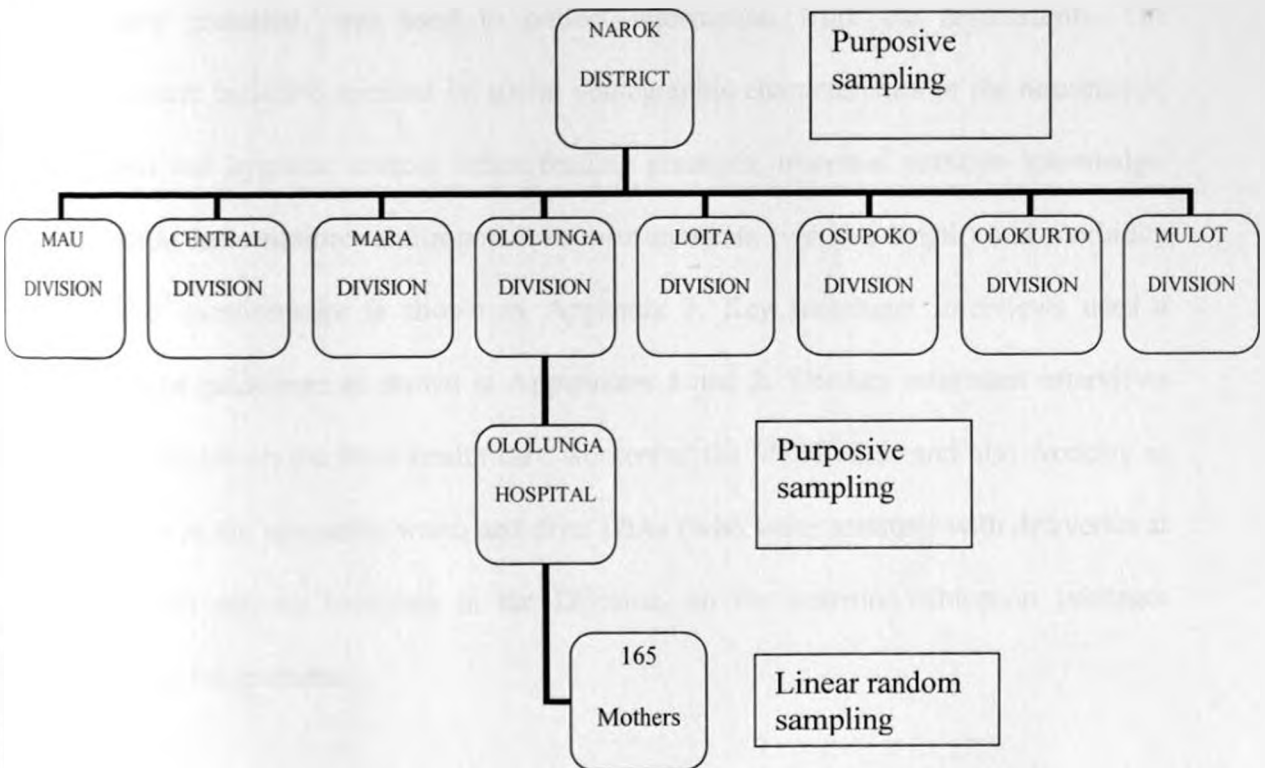


Fig 3.1: Flow chart on sampling procedure

The following inclusion criteria was used:

- 1) Infants were between 0-12 months of age.
- 2) Infants were Maasai by birth.
- 3) Mothers attended MCH regularly.

3.5 STUDY TOOLS, INSTRUMENTS, AND DATA COLLECTION

Data collection techniques included administration of questionnaire, key informant interviews, and anthropometric measurements. A semi-structured questionnaire, previously pretested, was used to collect information from the respondents. The questionnaire included sections on social demographic characteristics of the households, sanitation and hygiene, current infant feeding practices, maternal nutrition knowledge, index child information:- anthropometric measurements (weight, length) and morbidity data. The questionnaire is shown in Appendix 3. Key Informant Interviews used a checklist of guidelines as shown in Appendices 1 and 2. The key informant interviews were conducted on the three health care workers at the MCH clinic and also working as mid-wives at the maternity ward, and five TBAs (who were assisting with deliveries at home) from various locations in the Division, on the nutrition education packages provided to the mothers.

Anthropometric measurement instruments included pediatric scale and height board. The precision for weights was 0.1kg and 0.1cm for lengths. The weights and lengths of infants were measured as described by WHO (1983), and (UN, 1986). The weight of each infant was taken with minimum clothing and recorded to the nearest 0.1kg. For the

measurement of length a measuring board with an accuracy of 0.1 cm was used to take the lengths of the infants. The infant was made to lie down on the measuring board which was laid on a flat surface. The head was positioned firmly against the fixed head board, with the eyes looking vertically. The knees were extended by applying some pressure, and the feet were flexed at right angles to the lower legs. The upright sliding foot piece was moved to obtain firm contact with the heels and the length was read to the nearest 0.1 cm. For both weights and length measurements, two readings were taken and the average of the two readings computed. Anthropometric measurements were taken for all infants and their corresponding deviation scores (z-scores) calculated with reference to the National Centre for Health Statistics (NCHS) population. Using cut-off points, recommended by the WHO (WHO, 1995) the children were categorized into classes of nutritional status.

Stunting results from extended period of inadequate food intake, poor dietary quality, increased morbidity or a combination of these factors. It indicates deficit in length and takes some time to develop (Gibson, 2005). Young infant are unlikely to be stunted. Therefore, assessment of nutritional status of infants 0 - 6 months was based on weight-for-age (underweight) only, while that of older infants was based on weight-for-age (underweight), weight-for-height (wasting), and height-for-age (stunting).

The infant feeding practices dealt with were breastfeeding and complementary feeding practices. Breastfeeding included exclusive breastfeeding, breastfeeding initiation, frequency of breastfeeding, prelacteal feeding and expression of breast milk by mothers,

while the complementary feeding practices included the time of initiation of complementary foods, frequency of feeding, complementary foods given by the mothers and bottle feeding.

Knowledge of the mothers on the infant feeding practices was assessed based on the WHO recommendations on infant feeding. For the example, if the mother gave the recommended period for exclusive breastfeeding, she had the correct knowledge. Any other answer given was viewed as incorrect knowledge. Knowledge was assessed for the following practices; exclusive breastfeeding, time of initiating breastfeeding, frequency of breastfeeding, time of initiation of complementary feeding and frequency of complementary feeding.

3.6 PREPARATION FOR THE STUDY

3.6.1 Consent and Permission

Consent to carry out the research was obtained from the Government of Kenya (GOK) in form of a research permit. Further consent was obtained from the District Commissioners' Office and Medical Officer In-charge of the Olulunga hospital.

Finally, informed consent was obtained from each respondent before they were interviewed. No coercion was used to elicit information from the respondents who declined to be interviewed. Confidentiality of the information received was assured to the respondents.

3.6.2 Recruitment and Training of Field Assistant

One field assistant with good command of English, Kiswahili, and Kimaasai languages was recruited. The field Assistant was trained for two days using training curriculum developed by the principal investigator. The curriculum included: interview techniques, data collection procedures, use of survey instruments, and ethical and human rights issues. Hands-on training was done during the pretesting of the research tools. Ten mothers with their infants from Narok District hospital were used for pretesting of the study materials. The data obtained from the pretesting of the questionnaire was used to modify the questionnaire and were not included in the final research data.

3.7 DATA ANALYSIS

Each questionnaire was counter-checked for completeness and accuracy before leaving the data collection site. Statistical package for social sciences (SPSS) computer software was used to enter, clean and analyze the non anthropometric data. Microsoft Excel, a spreadsheet package was used for data presentation. EPI info was used to convert raw anthropometric data (weight and length) into anthropometric indices of Z scores for nutrition status classification.

Data was subjected to the following analysis:

- 1) Analysis of variance (ANOVA) to compare mean scores
- 2) Chi square to determine association between variables.
- 3) Odds ratio to estimate the relative risk.
- 4) Correlation to test the strength of the association.

CHAPTER 4: RESULTS

In this chapter, the results of the study are presented.

4.1 SOCIAL-DEMOGRAPHIC CHARACTERISTICS

4.1.1 Household Characteristics

The household size averaged 5.5 with a range of 2 - 13 persons. The modal household size was 5 persons. The household earning ranged between KES 1700 per month to KES 16,600 per month with an average of KES 5742 per month. Up to 94.5% lived below 1US dollar a day. Most of the households (92.1%) used firewood as cooking fuel.

4.1.2 Hygiene and Sanitation

Majority of the respondents (80.6%) lived in temporary type of houses with 17.5% living in the Manyattas (the traditional Maasai hut without widows and is smeared with mud and cow dung for roofing). Only 1.8% lived in permanent houses. Temporary type is just a little improved from the traditional Maasai manyatta structures. The temporary houses were found to be inadequately ventilated. Distribution of households by the type of housing is shown in Figure 4.1.

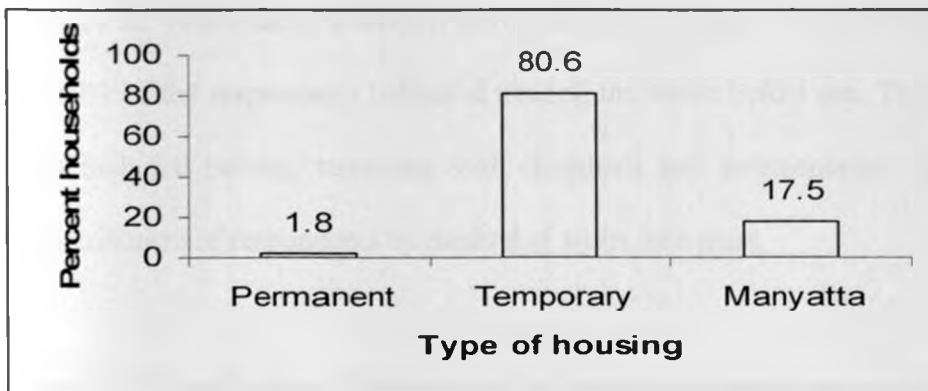


Fig 4.1: Distribution of study population by type of housing

Various sources of water were available and used. Majority of the respondents (72.1%) used water from rivers and streams and 17.6% used borehole water. About 21% of the households had access to clean water. The distribution of households by the source of drinking water is shown in Table 4.1 below.

Table 4.1: Distribution of the respondents by their main sources of water

Main source of water	Number	Percent
N=165		
River and streams	119	72.1
Borehole	29	17.6
Dams/water ponds	12	7.3
Harvest rain water	3	1.8
Tap	2	1.2

Up to 85.5% of the respondents indicated having adequate supply of water for domestic use. About 57% of the respondents indicated treating the water before use. The methods of treatment included boiling, treatment with chemicals and sedimentation. Table 4.2 shows the distribution of respondents by method of water treatment.

Table 4.2: Distribution of respondents by method of water treatment

Water treatment	Number	Percent
N=165		
Yes (Treating water)	94	57.2
1) Boiling	71	43.3
2) Use of chemicals	21	12.7
3) Sedimentation	2	1.2
No treatment	71	43.7

About refuse disposal, 37.6% used a compost pit, 35.2% dumped the refuse in the garden, while 27.3% indicated disposal by burning. About 27% of the respondents indicated having and using pit latrines. The rest used the bushes for fecal waste disposal. Figure 4.2 shows the distribution of the respondents by fecal waste disposal.

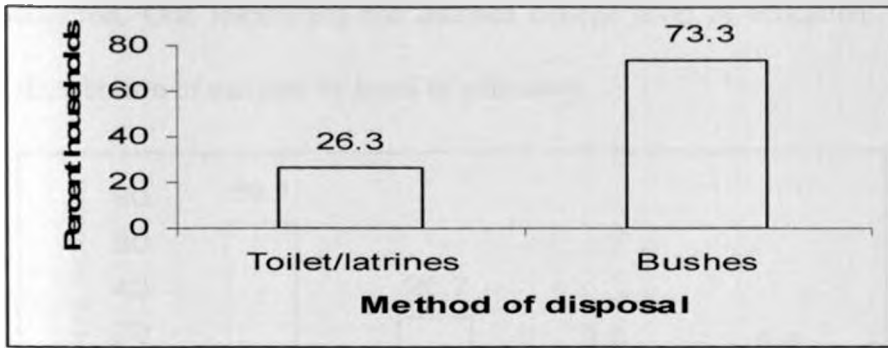


Fig.4.2: Distribution of the respondents by fecal waste disposal

4.1.3 Mothers Profile

The mean age of mothers was 24.8 years with range of 15 to 45 years. The modal age was 20 years. Over one-third of the respondents were young at age between 15 and 20 years. Figure 4.3 shows the age distribution of mothers.

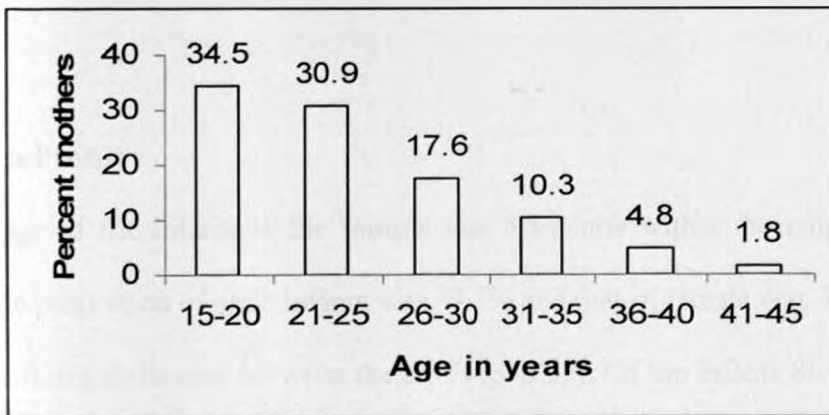


Fig 4.3: Distribution of mothers by age

Most of the respondents were married with 64.8% monogamously married and 33.3% polygamously married. Only 1.8% of the respondents were single. More than two-thirds of the respondents had not attained primary level of education. Only 3.6% had secondary

level of education. One respondent had attained college level of education. Figure 4.4 shows the distribution of mothers by level of education.

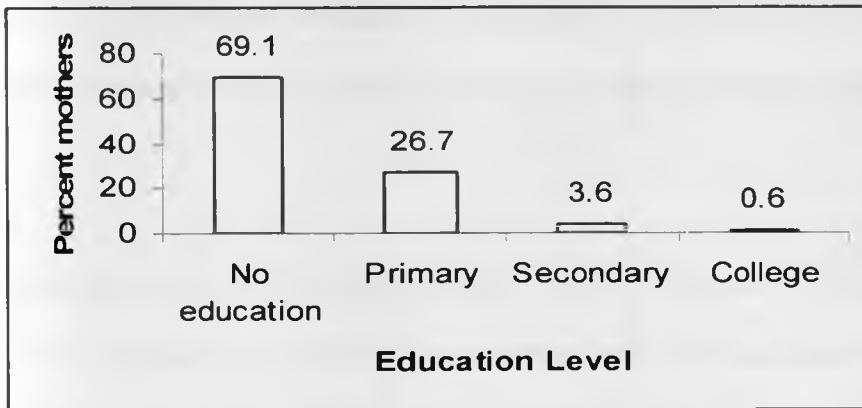


Fig 4.4: Distribution of mothers by level of Education

Majority of mothers (86.7%) were housewives, 2.4% were regularly employed, 1.8% were farmers, and 6.7% were operating small businesses. 1.8% were single and unemployed.

4.1.4 Infants Profile

The mean age of the infants in the sample was 5 months within the range of 0 – 12 months. The proportion of male infants was 52.7% and that of female was 47.3%. There was no significant difference between the sexes ($p > 0.05$). Of the infants 86.7% had been delivered at home while the rest had been delivered in the hospital.

4.2 BREAST FEEDING PRACTICES

This section deals with breastfeeding practices including exclusive breastfeeding, breastfeeding initiation, frequency, prelacteal feeding and expression of breast milk by mothers.

4.2.1 Exclusive Breast Feeding Practices

For the purpose of this study “Exclusive breastfeeding” means that the infant receive only breast milk from his/her mother, wet nurse or expressed breast milk and no other liquid or solid with the exception of drops or syrups consisting of vitamins mineral supplements or medicines.

All the respondents were still breastfeeding their infants at the time of interview. On exclusively breastfeeding of the infants for six months, only 1.2% indicated willingness to do so by the time of interview. The remaining majority at 98.8% had given additional liquids or semi-liquid foods to the infants before the age of one month. About breastfeeding in public, 72% of the respondents indicated willingness, while 28% would not be willing.

4.2.2 Breastfeeding Frequency

About 78% of the respondents were breastfeeding on demand. Figure 4.5 shows the distribution of the respondents by the frequency of breastfeeding practice.

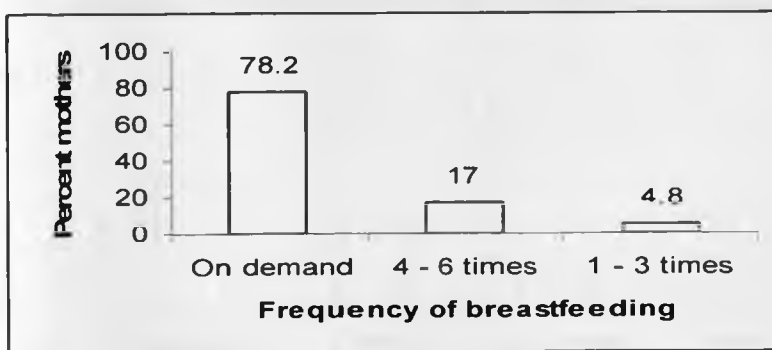


Fig.4.5: Distribution of mothers by breastfeeding frequency

4.2.3 Breastfeeding Initiation

The time of breastfeeding initiation varied but more than 72% of the respondents indicated having initiated breastfeeding immediately or within one hour after delivery. The distribution of respondents by time of breastfeeding initiation is shown in Figure 4.6.

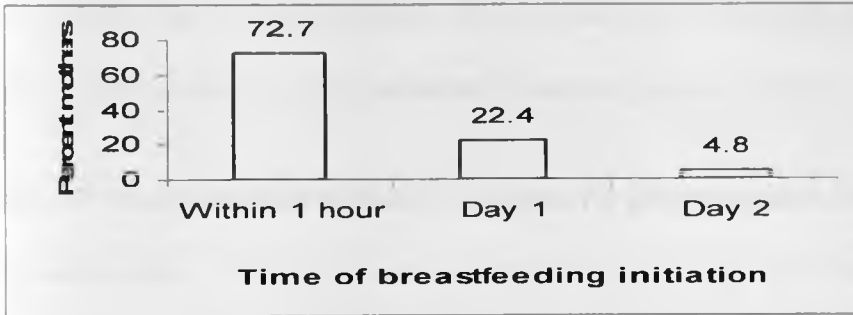


Fig 4.6: Distribution of respondents by time of infant breastfeeding initiation

4.2.4 Prelacteal Feeding

Up to 71.5% of the respondents indicated having given prelacteal foods. All the mothers continued to give the prelacteal foods to the infants together with breastfeeding and complementary foods. The main prelacteal foods given were traditional ghee, herbs, and aqueous glucose solutions. Figure 4.7 shows the distribution of infants by types of prelacteal foods.

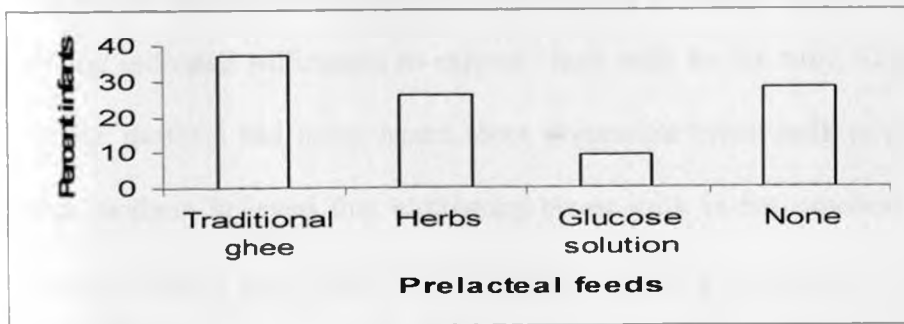


Fig 4.7: Distribution of study infants by prelacteal foods

Slightly more than 30% of the mothers indicated ease of first defecation and reduction of constipation as the main reason for giving prelacteal foods to the infants. Other reasons indicated were: that the baby could grow healthy, others did it as culture (16.8%) they found the practice going on. Others believed the foods could prevent the child from becoming ill (12.7%) and yet some mothers believed they had inadequate milk for the infant (10.2%). The reasons for giving prelacteal foods are given in Table 4.3

Table 4.3: Distribution of mothers by reasons for giving prelacteal feeds

Reasons given	Percent
Ease defecation/prevent constipation	30.5
Child to grow healthy	29.6
Culture	16.8
Prevent sickness	12.7
Baby crying/Inadequate breast milk	10.2

4.2.5 Expression of Breast milk

On expression of breast milk for the baby if they had to be away from the baby for several hours, almost all the mothers (99.4%) indicated not willing to express breast milk. Only one mother indicated willingness to express breast milk for the baby. Slightly more than 70% of the mothers had never heard about expression breast milk to give to the infants. Some mothers believed that expressing breast milk is not practical (12.7%). Other reasons were that it was a taboo (12.1%), that expressed milk could go bad (3.6%), and that the practice was unhygienic (0.6%). Figure 4.8 shows the results.

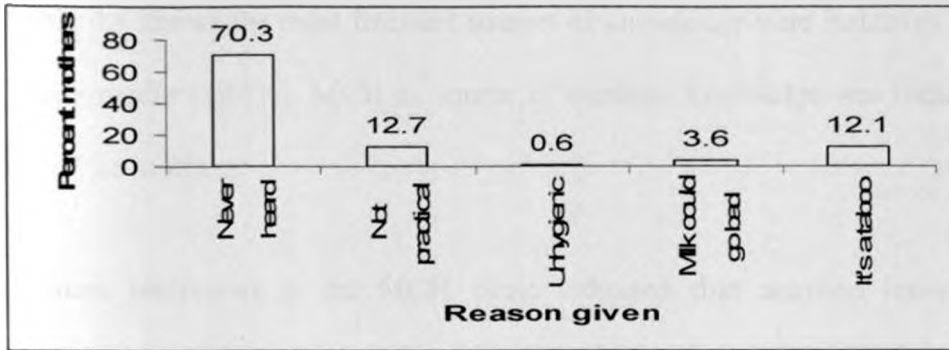


Fig 4.8: Distribution of respondents by reasons for not considering expression of breast milk

4.2.6 Maternal Nutrition Knowledge on Breast Feeding Practices

The study sought to know if mothers had received nutrition knowledge on appropriate infant feeding practices. Of the respondents about 71% indicated having received some form of nutrition education, while the rest had not. Of those who had received nutrition education on modern infant feeding practices, 55.4% received before and the rest after the infants were born. Sources of nutrition knowledge are shown in Table 4.4.

Table 4.4: Major sources of nutrition knowledge on infant feeding practices

Source of knowledge	Number	Percent
N=165		
Relatives	48.0	40.7
Mass media(radio)	47.0	39.8
Friends	8.0	6.8
School/workshops	8.0	6.8
MCH Clinic	7.0	5.9

As the Table 4.4 shows the most frequent sources of knowledge were Relatives (40.7%) and the mass media (39.8%). MCH as source of nutrition knowledge was indicated by only 5.9% of the mothers.

Key informant interviews at the MCH clinic indicated that nutrition lessons were irregular and that follow up of clients was rare. The key informant interviews also indicated that the TBAs often advised the clients on infant feeding practices.

4.2.7 Knowledge and Practice of Breastfeeding Practices

Mother's nutrition knowledge on breastfeeding practices according to WHO recommendations was classified as correct or incorrect depending on responses. About 54% mothers had correct knowledge on exclusive breastfeeding and about 76% on breastfeeding initiation. On the frequency of breastfeeding, about 41% of the mothers had the correct knowledge on the recommended practice. Maternal knowledge was as shown in Table 4.5. The Table also indicates those who had knowledge and practiced accordingly.

Table 4.5 Maternal knowledge and practice on key breastfeeding practices

Knowledge category N= 165	Exclusive breast-feeding Percent	Breastfeeding initiation Percent	Frequency of breastfeeding Percent
Correct Knowledge	53.9	76.4	41.2
Knowledge with correct practice	1.2	75.4	48.8

The mothers who had correct knowledge on exclusive breastfeeding and practiced correctly were only 1.2%. On breastfeeding initiation practice, those with correct knowledge were 76.4%, but those had knowledge and practiced appropriately were 75.4%. The Chi-square analysis indicated there was no significant ($p>0.05$) difference between correct knowledge and practice in the time of initiation of breastfeeding. On breastfeeding frequency correct knowledge was low at 41.2%, but those with correct knowledge and practiced appropriately were 48.8%. The Chi-square test indicated significant ($p<0.05$) difference between practice and knowledge on frequency of breast feeding.

4.2.8 Traditional Verses Modern Knowledge on Breastfeeding Practices

The study also endeavored to compare the current breastfeeding practice and the traditional breastfeeding practices to determine if there has been change due to gained knowledge. According to the study 90.3% of the respondents had some knowledge on traditional infant feeding practices, while 9.7% did not have the knowledge. The source of the traditional knowledge is shown Table 4.6.

Table 4.6: Sources of traditional knowledge on infant feeding practices

N=149	Number	Percent
Relatives	121	81.2
Observation	19	12.8
Friends	9	6.0

As Table 4.6 shows slightly more than 81% of mothers had received the indigenous knowledge from relatives. On traditional exclusive breastfeeding practice, all mothers indicated that infants were traditionally given additional foods to breast milk from the start. Exclusive breastfeeding was not practiced traditionally. It was also established that all infants received prelacteal foods traditionally. Asked about the time of traditionally initiating breastfeeding, 58.2% of the mothers indicated initiation of breastfeeding immediately after birth (within one hour). On the question of the frequency of breastfeeding, 55.2% of mother indicated that traditionally infants were breastfed on demand. Traditionally, breast milk was never expressed with the intention of giving it to the infant.

Comparison of breastfeeding practices based on the modern and the traditional knowledge is shown in Figure 4.9.

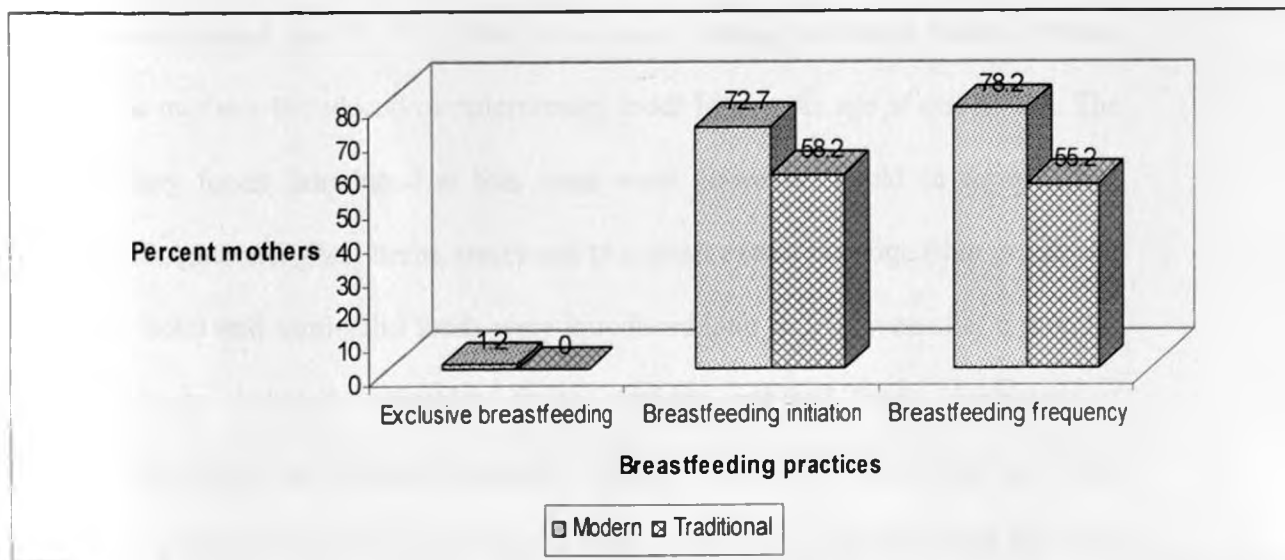


Fig 4.9: Comparison of Modern and Traditional Breastfeeding Feeding Practices

The Chi-square statistics at $p > 0.05$ indicated that there was no significant association between modern and traditional practice in the time of breastfeeding initiation. The modern practice on breastfeeding initiation showed a slight improvement over the traditional practice. The Chi-square statistic at $p = 0.000$ indicated a significant association between modern and traditional practice in regard to breastfeeding frequency. Modern practice on breastfeeding frequency showed an improvement over the traditional practice. Exclusive breastfeeding was non-existent traditionally, which seemed to be adhered to by the modern practice with only 1.2% practicing exclusive breastfeeding.

4.3 COMPLEMENTARY FEEDING PRACTICES

This section deals with complementary feeding practices including the time of initiation of complementary foods, frequency of feeding, complementary foods given by the mothers.

The study established that 98.8% of the infants were getting additional foods to breast milk. All the mothers introduced complementary foods before the age of one month. The complementary foods introduced at this stage were, however, liquid in form. These included milk, glucose, ghee, herbs, water and to a small extent porridge (thin gruel) and fruit juices. Solid and semi-solid foods were introduced later in life, even after 6 months. The solid foods included vegetables, fruits, porridge, mashed foods (consisting of bananas, root crops and mainly legumes). Mothers who gave the prelacteal foods continued to give the same foods as complementary foods. The prelacteal foods therefore had dual purpose in the community. The foods given during the first month of life are as shown in Figure 4.10.

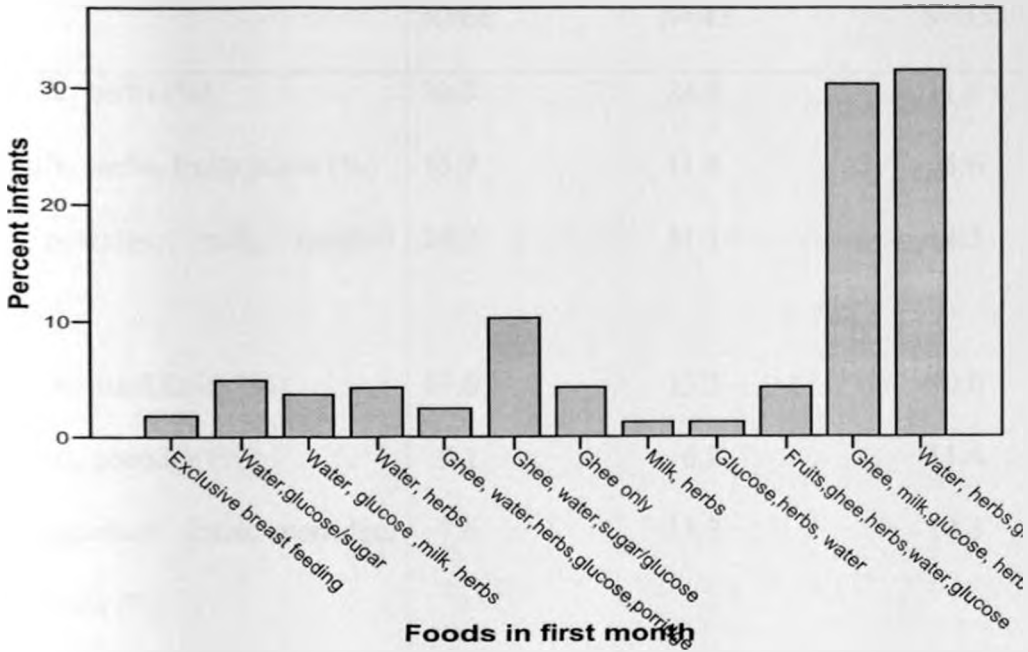


Fig 4.10: Distribution of study infants by complementary foods given during the first month of life

The study indicated late introduction of solid and semi-solid foods to the infants. By the sixth month 45.2% of the infants had not been introduced to semi-solid and solid foods, with 56.1% among them being given fruits/fruit juices. By the seventh month 35.5% had not been introduced to semi-solid and solid foods, with 62.2% getting fruits/fruit juices. Still by the eighth month 20% of the infants had not been introduced to semi-solid and solid foods, with 48.6% among them getting fruits. By the age of 12 months 11.1% of the infants had still not been introduced to semi-solid and solid foods. The distribution of infants by foods given at sixth to eighth month was as shown in Table 4.7.

Table 4.7: Distribution of infants by foods given at sixth to eighth months

Foods	6 th month N=66	7 th month N=45	8 th month N=35
Ghee, milk, herbs (%)	30.3	24.4	11.4
Ghee, milk, herbs, fruits juices (%)	15.2	11.1	8.6
Fruits, porridge, milk, mashed foods (%)	24.2	31.1	14.3
Milk and mashed foods (%)	13.6	13.3	40.0
Milk, fruits, porridge (%)	9.1	6.7	11.4
Milk, vegetables, fruits, porridge, mashed foods (%)	7.6	13.3	14.3

From Table 4.7 the infants who were given liquids foods, and those given solids and semi-solid foods were summed up as shown in Table 4.8.

Table 4.8 Foods given to the infants at 6th to 8th month

Foods	6 th month N = 66	7 th month N = 45	8 th month N = 35
Liquid foods only			
1) Milk (%)	100.0	100.0	65.7
2) Ghee and herbal extracts (%)	30.3	24.4	11.4
3) Fruit juices (%)	15.2	11.4	8.6
Solid and semi solid foods (%)	54.5	64.4	80.0
Vegetables (%)	7.6	13.3	14.3

4.3.1 Bottle Feeding

For complementary feeding with liquids, 85.5% of the mothers were using bottles with artificial teats, while 13.3% used cups to feed liquids to the infants as indicated in Table 4.8.

4.3.2 Maternal Nutrition Knowledge on Complementary Feeding Practices

The study endeavored to find out if mothers had received education on modern infant feeding practices. About 71% of mothers indicated having received some form of education. Of those who had received education on infant feeding practices 55.4% received the education before the infants were born, the rest received after the infants were born. The source of knowledge varied as shown in Table 4.9.

Table 4.9: Major sources of nutrition knowledge on infant feeding practices

Source of knowledge	Number	Percent
N=165		
Relatives	48.0	40.7
Mass media(radio)	47.0	39.8
Friends	8.0	6.8
School/workshops	8.0	6.8
MCH Clinic	7.0	5.9

Table 4.9 shows the predominant sources of knowledge were relatives (40.7%) and mass media (39.8%). MCH was indicated as a major source only by 5.9% of the respondents.

Results also indicated that the nutrition lessons at the MCH clinic were rare and irregular, and that follow up of clients was rare. The TBAs carried out most of the deliveries (86.7%), though having no training on modern nutrition usually advised the mothers on infant feeding practices.

4.2.7 Knowledge and Practice on Complementary Feeding

Up to 63% of the respondents indicated having correct knowledge on the right age (4-6months) of introducing complimentary feeding, but only 1.2 % indicated the practicing it. Majority of the respondents introduced complimentary feeding earlier than the recommended age.

The recommended frequency of complementary feeding is 3 times/day if the child is breastfeeding (WHO/UNICEF, 1999). On the frequency of complementary feeding, 93.3% of the mothers indicated having correct knowledge on the recommended frequency of feeding which was more than the 70.9% of the mothers who claimed to have nutrition knowledge. Those with correct knowledge and practiced appropriately were 94.1% (n= 144). Correct practice on the frequency of feeding was slightly higher than correct knowledge. Table 4.10 shows distribution of mothers according to knowledge and knowledge with correct practice on complementary feeding practices in regard to age of initiation of feeding and frequency of feeding.

Table 4.10: Maternal Nutrition Knowledge and practice on initiation and frequency of Complementary feeding

Knowledge category	Age of initiation of feeding	Frequency of feeding
N=165	Percent	Percent
Correct Knowledge	63.0	93.3
Knowledge with correct practice	1.2	94.1

The chi-square analysis indicated a significant ($p= 0.001$) relationship between correct knowledge and correct practice on the frequency of feeding. Only 41.2% of the respondents indicated knowledge of the dangers associated with introducing foods and fluids to the baby before the recommended age.

4.3.4 Traditional Verses Modern Practices on the Complementary Feeding

The study compared the current infant feeding practice and the traditional complementary feeding practices to determine if there has been change due to acquired modern knowledge. Results showed that up to 90% of the respondents had some knowledge on traditional infant feeding practices. The traditional infant feeding practices was acquired from relatives, friends and through observation. Over 80% indicated having acquired the traditional knowledge from relatives shown in table 4.11.

Table 4.11: Major sources of traditional knowledge on infant feeding practices

Source of knowledge	Number	Percent
N=165		
Relatives	121.0	81.2
Observation	19.0	12.8
Friends	9.0	6.0

The study compared the modern and traditional complementary feeding practices among the infants for at three months intervals up to 12 months. The study established that traditionally, exclusive breastfeeding was not practiced and all infants received additional foods from birth. The current practices indicated 98.8% were already receiving additional foods by the first month. The study also established that there were changes over time especially in the time of introduction of solid and semi-solid foods and also in the nutritional value of complementary foods given.

Based on traditional knowledge about 95.9% had not introduced solid and semi-solid foods by the age of 6 months and 72.7% by the age of 12 months. For the modern infant feeding practices, by the age of 6 month about 45.5% of the infants had not been introduced to solid and semi-solid foods and at age of 12months 11.1% of the infants had not been introduced to solid and semi-solid foods. The traditional practice of infant feeding introduced solid and semi-solid foods later than the current infant feeding practices.

On the nutritional value of foods, in the past the solid and semi-solid foods were mainly food staple made from cereals and root crops which were of low nutritional value to the infants. There has been improvement from the traditional practice as fruits and vegetables which were not given to the infants in the past have been introduced to the diet of the infants. By the age of 6 months 56.1% of the infants were receiving fruits in their diet, while 7.6% were receiving vegetables. Table 4.12 compares foods given to the infants at three months intervals up to 12 months based on both modern and traditional practices as reported by mothers.

Table 4.12: Comparison between modern and traditional complementary foods

Traditionally given foods (Percent)		Currently given foods (Percent)	
0-3months		0-3months	
Exclusive breast feeding	0.0	Exclusive breast feeding	1.2
Ghee, water, herbs	15.5	Milk, glucose, water, herbs, ghee	86.1
Ghee, milk, herbs	93.3	Ghee, herbs, water	9.1
		Milk, ghee, fruits, porridge	3.6
3-6months		3-6months	
Ghee, water, herbs	1.4	Ghee, milk, herbs	30.3
Milk, ghee, herbs	94.5	Ghee, milk, herbs, fruits	15.2
Mashed foods, ghee, milk	1.8	Fruits, porridge, milk, mashed foods	24.2
Ghee, herbs, porridge, water	1.2	Milk and mashed foods	13.6
		Milk, fruits, porridge	9.1
		Milk, vegetables, fruits, porridge, mashed foods	7.6
12months		12months	
Milk, herbs, ghee	72.7	Milk, ghee, herbs, fruits, water	11.1
Milk, herbs, mashed foods	12.7	Milk, ghee,, porridge, water	11.1
Milk, ghee, porridge	10.9	Ghee, porridge, mashed foods, ghee, herbs	11.1
		Milk, herbs, mashed foods, fruits, porridge	33.3
		Milk, fruits, vegetables, porridge, mashed foods	33.3

4.3.6. Reasons for Early Complementary Feeding

Various reasons were given for early introduction of complementary foods. The most common reason was that the mothers believed they produced inadequate breast milk for the baby. This was indicated by 40% of the respondents. Then 34% of the respondents believed giving the infant additional foods could accelerate their growth. About 11% of respondents did it if the baby cried because of hunger. Another 11% did it to copy others, and 3% indicated that it was in their culture. The distribution of mothers by the reasons for early complementary feeding is shown by Figure 4.11.

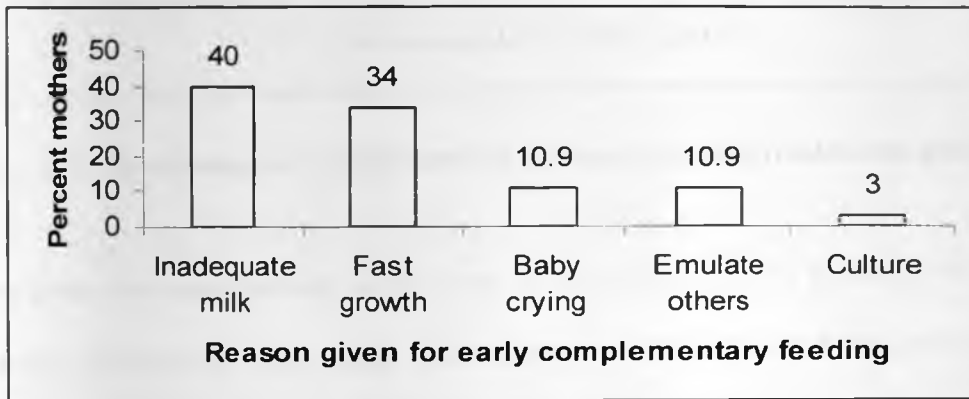


Fig 4.11: Distribution of mothers by reasons for early initiation of complementary feeding

4.3.7 Prelacteal Foods as Complementary Foods

All the mothers who gave prelacteal foods continued to give later in life as they believed the foods offered the same benefits as when they were introduced. The traditional ghee and the herbal extracts were the most frequently given. A small proportion (9.1%) of the mothers who gave the aqueous glucose solution believed it promoted fast growth hence weight gain by the infants. Most of the mothers (56.8%) who gave ghee believed that it

could reduce constipation among the infants, and slightly above 30% believed ghee promotes fast growth. A small proportion believed that ghee prevents disease and still a smaller proportion did it as culture. Fig 4.12 shows distribution of respondents by reasons of giving the traditional ghee.

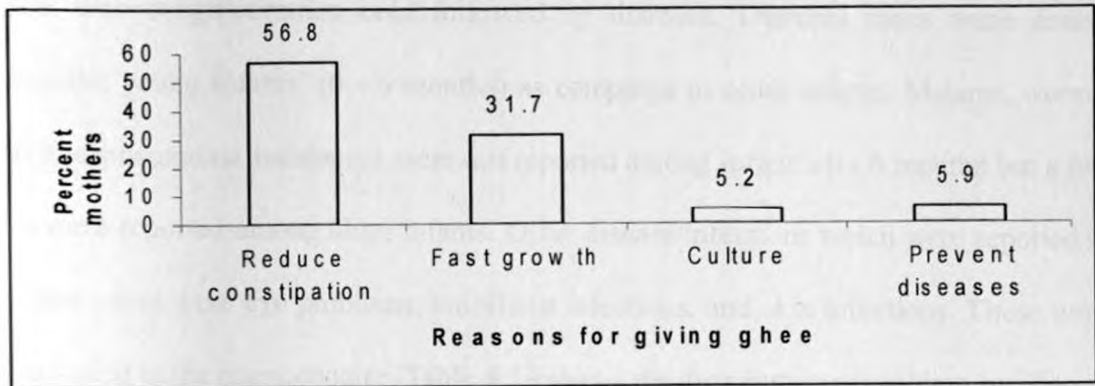


Fig 4.12: Distribution of respondents by reasons of giving traditional ghee.

For the herbs as complementary foods, most of the mothers (40%) believed that herbs promote fast growth thus weight gain, while about one-third, believed herbs prevents and can cure diseases. Still others (22.8%) were giving herbs to infants a culture. A few of the mothers thought the herbs could stop the baby from crying. The results are shown in Figure 4.13.

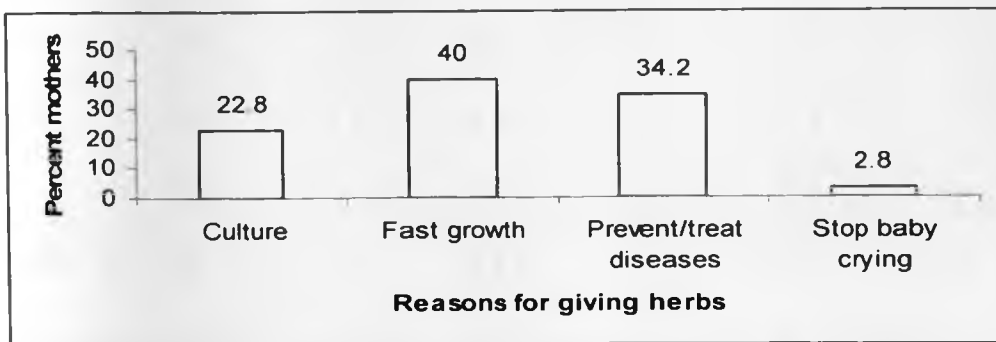


Fig 4.13: Distribution of mothers by reason for giving herbs as complementary foods.

4.4 INFANT MORBIDITY

Asked about child illness two weeks preceding the interview, it was indicated that among infant's 0 - 6 months old, 61.4% were reported to have been ill. Among infants 6 – 12 months, 84.1% were reported to have been ill. The most common illness among all infants was cough/common cold followed by diarrhea. Diarrhea cases were double among the young infants' (0 - 6 months) as compared to older infants. Malaria, worms, fever and pneumonia incidences were not reported among infant's 0 - 6 months but a few cases were reported among older infants. Other disease/infections which were reported in very few cases were eye problems, umbilicus infections, and skin infections. These were not included in the questionnaire. Table 4.13 shows the distribution of children by illness.

Table 4.13: Distribution of children by illness two weeks before the interview

Child illness	0 - 6 months N = 62 (61.4%)	6 – 12 months N = 53 (84.1%)	Total N = 115
Diarrhea	24.2	13.2	22
Cough/common cold	62.9	67.9	75
Malaria	0	5.7	3
Worms	0	1.9	1
Fever	0	1.9	1
Pneumonia	0	3.8	2
Others	12.9	5.7	11

The chi-square and odds ratio showed no significant association between the time of breastfeeding initiation and child illness. Chi-square analysis however indicated significant association between frequency of breastfeeding and child illness. Odds ratio indicated that infants fed on prelacteal foods were 1.2 times more likely to fall ill than those not receiving the foods, but chi-square test indicated no significant relationship between prelacteal feeding and illness. Odds ratio indicated that those infant not breastfeed as per recommendation were six times more at risk of becoming ill than those breastfed on demand. These results are shown by Table 4.14.

Table 4.14: Association between key breastfeeding practices and illnesses

Recommended practices		Child ill		Chi-square	Odds ratio
		Yes	No		
BF initiation within 1hr	Yes	87	32	1.848	0.6
	No	28	17	p= 0.397	
Prelacteal feeding	No	31	15	0.228	1.2
	Yes	84	34	p= 0.633	
Frequency of BF	Yes	82	46	14.822	6.2
	No	33	3	p= 0.011	

The odds ratio indicated that those not following recommended practice on frequency of feeding were 1.8 times more at risk of falling ill than those following the recommended practice. Same statistics indicated infants on bottle feeding were two times more at risk of falling ill than those not on bottle feeding. The chi square analysis ($p > 0.05$) indicated

that the complementary feeding practices were not significantly associated with child illness. The results are shown in Table 4.15.

Table 4.15: Association between complementary feeding practices and illnesses

Recommended practices		Child ill		Chi-square	Odds Ratio
		Yes	No		
Frequency of feeding	Yes	31	19	8.082	1.8
	No	84	29	p= 0.152	
Bottle feeding	Yes	13	9	0.186	2
	No	102	38	p=0.143	

4.5 NUTRITIONAL STATUS OF INFANTS

This section contains results of the infant's nutritional status in terms of underweight, stunting and wasting.

4.5.1 Underweight

Among infants 0 - 6 months nutritional status was assessed based on weight-for-age (underweight). For the older infants nutritional status was assessed based on weight-for-age (underweight), height-for-age (stunting), and weight-for-height (wasting). The results indicated that only 4% of infants (0 - 6 months) were underweight. Among the older infants (6 - 12 months), 12.5% were underweight with 1.6% among them being severely underweight. Table 4.16 shows the distribution of infants by nutritional status.

Table 4.16: Distribution of study infants by underweight

Nutritional status	0 – 6 months	6 – 12 months	Total
	N=99	N=66	N=165
	(%)	(%)	(%)
Severely malnourished	0	1.6	0.6
Moderately malnourished	4	10.9	6.7
Normal	96	87.5	92.7

Figure 4.14 shows the distribution of infants by level of malnutrition. The results indicate growth faltering at the first month, between 5th to 7th months, then again between 10th and 12th month. Severe malnutrition was indicated at the 11th month.

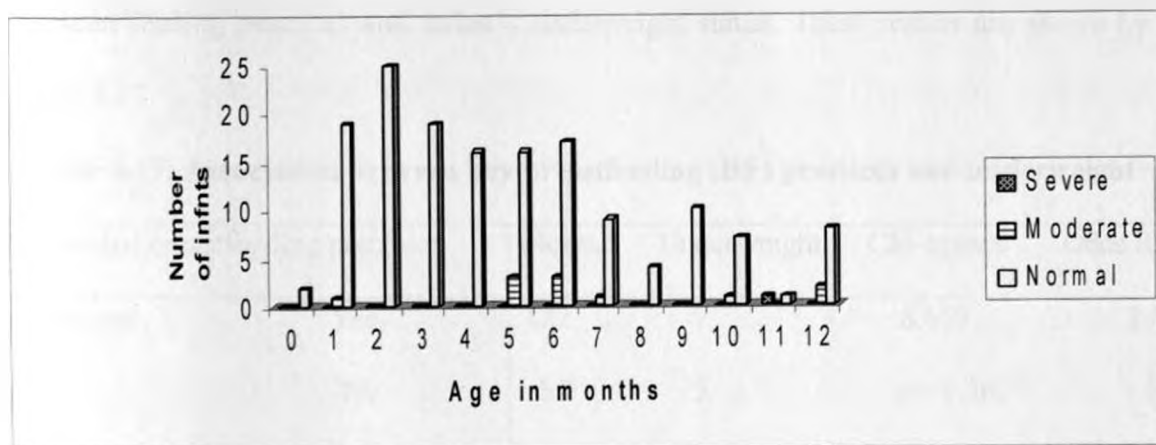


Fig 4.14: Distribution of study infants by level of malnutrition

Chi square test indicated significance ($p=0.000$) association between child's age and nutritional status (underweight). A bivariate correlation was done to assess the association between child's age and the underweight status of the infants. There was a weak correlation ($r = -0.210$) between age and nutritional status of the infants.

The odds ratio analysis indicated that those infants who were not breastfed as recommended were 2.8 times more at risk of being underweight than those infants whose mothers practiced breastfeeding on demand. On breastfeeding initiation within the recommended one hour after birth, the odds ratio analysis showed that there was less risk of being underweight for those who did not follow the recommendation. Odds ratio analysis indicate that those infants who were not exclusively breastfed for the recommended period were 24 times more at risk of being underweight than those who followed recommended practice. On prelacteal feeds the odds ratio analysis indicated that those infants given prelacteal feeds were two times more at risk of being underweight than those not given prelacteal feeds. The chi-square analysis of the above key breastfeeding practices indicated that there was no significant ($p > 0.05$) association between feeding practices and infant's underweight status. These results are shown by Table 4.17.

Table 4.17: Association between key breastfeeding (BF) practices and underweight

Recommended breastfeeding practice		Normal	Underweight	Chi-square	Odds Ratio
BF on demand	Yes	122	7	8.659	2.8
	No	31	5	$p= 0.565$	
BF Initiation within 1hr	Yes	109	11	7.760	0.23
	No	44	1	$p= 0.101$	
Exclusive BF	Yes	2	0	0.159	24
	No	151	12	$p= 0.924$	
Gave prelacteal feeds	No	44	2	0.960	2.0
	Yes	109	10	$p=0.619$	

Table 4.18 shows the association between age of complementary feeding initiation, frequency of feeding and bottle feeding and underweight status of infants.

Table 4.18: Association between complementary feeding practices and underweight

Recommended comp practice		Normal	Underweight	Chi-square	Odds ratio
Age of initiation	Yes	1	1	5.977	0.074
	No	149	11	p= 0.05	
Frequency of feeding	Yes	47	3	5.774	1.3
	No	105	9	p= 0.834	
Bottle feeding	No	21	1	0.361	10.2
	Yes	130	11	0.835	

The odds ratio statistic indicates that the risk of being underweight for those infants who did not follow the recommended age for introducing complementary foods is very low. The chi-square statistic indicates that there was a significant ($p=0.05$) association between the age of initiation of complementary feeding and underweight in infants. The odds ratio statistic implies that those infants whose mothers did not follow the recommended practice on the frequency of feeding were 1.3 times more at higher risk of being underweight than those who followed the recommended practice. The chi-square statistics at $p > 0.05$ indicated that there was no significant association between the frequency of feeding and the underweight state of infants. On bottle feeding practice the odds ratio statistics showed that those infants fed using the bottle were 10 times more at risk of being underweight than those not practicing bottle feeding. The chi-square

statistic, however, showed no association between bottle feeding and the underweight status of infants.

4.5.2 Stunting

Height-for-age is a measure of linear growth. A child below -2SD of the median value of NCHS reference is considered stunted, reflecting “cumulative effect of chronic malnutrition”. A child below -3SD of the median value of NCHS/WHO reference is considered severely stunted (ACC/SCN, 2000). Only the infants 6 – 12 months of age were tested for stunting and wasting. According to the results 1.5% were severely stunted, 20% were stunted, giving a total of 21.5% stunted. Table 4.19 shows association between complementary feeding practices and stunting.

Table 4.19: Association between complementary feeding practices and Stunting

Recommended comp practice		Normal	Stunted	Chi-square	Odds ratio
Frequency of feeding	Yes	18	2	17.843	3.2
	No	33	12	p= 0.022	
Bottle feeding	No	5	1	11.175	1.4
	Yes	46	13	p= 0.004	

Chi-square analysis showed significant ($p < 0.05$) association between frequency of feeding the infant and stunting. Odds ratio statistics showed that infants not feed according to the recommendation were 3 times more at risk of becoming stunted than fed

according to the recommendation. Chi-square analysis showed significant ($p < 0.05$) association between stunting and bottle feeding.

4.5.3 Wasting

A child whose weight-for-height is below -2SD of the median value of NCHS reference is considered to be wasted reflecting “acute malnutrition”, below -3SD of the median value of NCHS reference is considered severely wasted (ACC/SCN, 2000). Only infants 6-12 months were tested for wasting. According to the study, 1.5% of the infants were severely wasted, while 4.6% were wasted. Table 4.20 shows the association between age of complementary feeding initiation and bottle feeding and wasting in infants.

Table 4.20: Association between complementary feeding practices and wasting

Recommended comp practice		Normal	Wasted	Chi-square	Odds ratio
Frequency of feeding	Yes	18	3	4.083	0
	No	43	0	$p = 0.850$	
Bottle feeding	No	6	0	0.433	24
	Yes	55	4	$p = 0.805$	

Chi-square statistics showed no significant ($p > 0.05$) association between the complementary feeding practices and wasting. Odds ratio statistics showed that those infants fed using bottles were 24 more times at risk of wasting than those not using bottles.

CHAPTER 5: DISCUSSION

5.1 Social demographic profile

The study established that most of the households had low income levels and lived on less than the recommended poverty cut-off of 1US dollar a day. The study also established that most of the mothers were young, and generally housewives with more than average number of children. The household sizes were larger than the National mean household size of 4.4 (CBS, 2003).

The mothers were of low literacy levels, with 69.1% illiterate, 26.7% had primary level of education and only a small proportion had secondary level of education as compared with the CBS (2003) National findings for females; illiterate 22.9%, Primary education (complete or incomplete) 59.6%, secondary education 7.1%, above secondary 3.5%. The mothers depended on their husbands to raise the families.

The study also established that most of the deliveries (87%) were done at home with the help of the TBAs. The distances to the nearest health facility are long and this coupled with lack of adequate transport makes many deliveries to be performed at home. For example, in the study area, transport from the rural areas to the Health centre was available only once a week, on the market day. Therefore, the role of the TBAs cannot be ignored because it is crucial in this community. The government is discouraging the use of the TBAs due to risk of HIV/AIDs transmission, but in situations such as this one, where it is not possible for mothers to reach the hospital for safe delivery due to long distances to the hospital, the risk of losing the baby or baby and mother is higher. The

best option would be to train the TBAs on sound hygiene practices so as to continue helping mothers to deliver at home, until such a time that the infrastructure shall be improved.

5.2 Hygiene and sanitation

Clean portable water was found to be one of the major problems in the study area with about 80% of the community not having access to clean drinking water. Water can be a major source of contamination during preparation of food for the infant. Again, only about 26% of the households were using adequate sanitation facilities especially in relation to human faecal disposal. This was far much lower than the reported 48% of Kenyans who use adequate sanitation facilities (UNICEF, 2006). Faecal waste was disposed in the bushes. When rains fell, this was obviously washed down into rivers, streams, and ponds which were some of the main sources of water for use by many households. It was possible that the diarrhea cases found among the infants stemmed from the use of this water in the preparation of their food. The Ministry of Public Health needs to emphasize the need for pit latrines for households in this area to reduce the rates of contamination of water sources with faecal material.

About 98% of the study population lived in temporary houses with inadequate ventilation. This may have contributed to the high prevalence of communicable infections such as the upper respiratory infections which was noted among the infants.

5.3 Breastfeeding practices

The study established high (99.4%) prevalence of breastfeeding. This compares well with studies by CBS (2003) at 96.2%, and Muchina (2007) at 99%. The study also established that exclusive breastfeeding was very low (1.2%) in the community with almost all infants receiving additional foods before the age of one month. This is far below the National findings of 13% for infant who received exclusive breast feeding for at least six months of life (CBS, 2003). Exclusive breastfeeding did not exist traditionally.

A good proportion of mothers indicated initiating breastfeeding within the recommended one hour, this compares well with the traditional practice where about 58% of the mothers initiated breastfeeding within one hour. A study in Tanzania showed that only 20% of the mothers initiated breastfeeding within one hour (Agnarsson, 2001). Majority of the mothers practiced breastfeeding on demand, which was also a common practice traditionally. Prelacteal feeding, especially use of traditional ghee was initiated at birth even before breastfeeding initiation to facilitate easy bowel movement, herbal extracts were given as mothers believed they had some prophylactic properties. The proportion of mothers giving prelacteal foods to their infants was 71.5% and was higher than National level findings of 65% by CBS (2003). All the infants received prelacteal foods traditionally. It seemed that in spite of the majority of mothers having received knowledge on modern breastfeeding practices, they were still very strongly adhering to the traditional practices of giving prelacteal foods and complementary foods within one month after birth of the child. These results indicate that mothers mainly depended on the traditional knowledge to decide on the breastfeeding practices.

At the same time infants were introduced to bottle-feeding at an early age. This was mainly due to early introduction of complementary foods. Diarrhea and other infections were likely due to poor hygiene in bottle feeding. The baby could also suffer nipple confusion if the feeds are given using a bottle with artificial teats.

Expression of breast milk was not known in the community. More than two-thirds of the mothers had never heard about expression of breast milk for the infants. They knew that expression was done to relieve the heavy breasts if mother was away. Such expressed milk was thrown away because it was believed to have gone bad. This could imply that the nutrition education had not dealt with expressing breast milk as an option in case the mother had to be away from the baby for several hours. This could also cause early introduction of complementary foods.

5.4 Complementary feeding practices

The study findings were that early introduction of complementary foods (98.2%) was a common practice in the study area. This was much higher than figures for other parts of the Country and the national averages as reported from other studies by CBS (2003) at 52%. Ashene (2006) at 74%, and Mohamed (2007) at 48%.

Prelacteal feeding, especially use of traditional ghee continued to be administered as the child grew, because most of the mothers believed that the ghee could reduce constipation among the infants, and promote fast growth. Other prelacteal foods like the herbal extracts also continued to be given to the infants mainly because some mothers believed

the herbal extracts promotes fast growth thus weight gain, while others believed that herbs have some prophylactic properties as well. Some mothers gave the herbal extracts to infants as culture. Thus the prelacteal foods were given as complementary foods.

Complementary foods should as much as possible be energy and nutrient dense, easily obtained and prepared by the family, culturally acceptable, of appropriate consistency for the age and development stage of the infant, and clean and safe for consumption (Coutsoudis, 2004).

The complementary foods given during the first month of life were mainly liquids. Later in life, however, solid and semi-solid foods were introduced. Late introduction to semi-solid and solid foods may cause growth faltering and lead to malnutrition in older infants. There was a weak negative correlation between child's age and nutritional status.

On the frequency of complementary feeding, 70.9% of the respondents had indicated having received modern nutrition education, yet 93.3% of the mothers demonstrated correct knowledge on the recommended frequency of feeding. This indicated that the source of nutrition knowledge was not only from modern knowledge, but the traditional practice was similar in regard to this practice. This was confirmed by the high adherence to the practice by the mothers (94.1%). In this practice the nutrition knowledge had significant association with practice.

The most frequent reason indicated by mothers for early initiation of complementary feeding was that they had inadequate breast milk for the baby and hence the baby was not getting satisfied. This was associated with poor maternal nutrition. Malnutrition among women of reproductive age was reported to be highest (20.4%) between the ages 15 – 25 years (CBS, 2003). This group formed the majority of the study population. Poor maternal nutrition could be linked with poor socio-economic status of majority of the study population. Even late introduction to solid and semi - solid complementary foods could be due to the poor socio-economic status of the households.

Although the study indicated that breastfeeding prevalence was high among the infants, the nursing mothers require more educational support to improve their nutrition and overcome most mothers' belief and perception that they produce inadequate breast milk. Some mothers also practiced prolonged breastfeeding and late introduction to solid and semi-solid complementary foods, which was more based on the traditional practices. This however, could be caused by the poor social economic status of most households. These findings suggest that mothers could benefit from further education on the appropriate time to introduce solid and semi-solid foods. This would improve the feeding practices by mothers who believe that their infants nutritional and hunger needs are not being adequately met by breast milk alone, and also those who continue with breast milk and liquids, with late introduction of solid and semi-solid foods. But the nutrition education should not only address the mother's fears of inadequate milk supply, it should also deal with the problem of improving on lactation.

Bottle feeding was rampant in the study area with a high proportion (85.5%) using bottles with artificial teats. Bottle feeding is discouraged, and mothers are encouraged to give fluids with a cup, or a cup and a spoon. A baby who sucks from a bottle may have difficulty in suckling from the breast and may even refuse altogether. A few bottle feeds can cause breastfeeding failure. Also it is easier to maintain hygiene by mothers when cups are used than when bottles with artificial teats are used. Artificial foods are easily contaminated with bacteria. This can lead to infection of the baby or the milk becoming sour in the bottle. Bacteria grow in artificial foods very quickly, especially if the bottle is left in a warm place, conditions normally prevailing in a kitchen. Artificial foods do not contain anti-infective factors as the case with breast milk. Artificially fed babies are more often ill with diarrhea and other infections (King, 1992). The use of bottle feeding could have contributed to the high prevalence of diarrhea incidences especially among the young infants.

Rather than totally discourage bottle feeding, due to the high proportion of mothers practicing it, there is need to educate the mothers on sound hygiene practices on the use of bottle in order to reduce the prevalence of infections, especially diarrhea.

5.5 Maternal nutrition knowledge on infant feeding practices

It was interesting to note that the major sources of nutrition knowledge on infant feeding as reported by the mothers was from relatives (40.7%) and mass-media (39.8) in spite of the fact all the respondents were attending the post-natal clinic which was supposed to be the main educator. Only 5.9% of the mothers indicated having received nutrition

education from the clinic. The MCH clinic (post-natal) was scheduled only once a week, the number of clients attending was large and Health Workers therefore, spent all the time attending to the clients. The nutrition talks were reported to be rarely carried out during the MCH clinic. Clients follow-up were also rare. This explains why the major source of nutrition knowledge was not the MCH clinic. This study is not in agreement with similar studies in which majority of the mothers attending MCH clinic had their main source of nutrition knowledge as the Health Care Workers; Ashene (2006) at 82%, Muchina (2007) at 52%, and CBS (2003) at 39%. A similar study in Teheran (Marandi, 1993) compares well with this study in that the main sources of knowledge about breastfeeding were relatives and friends (45%), radio and television (27%), print media (12%); with only 4% receiving knowledge from Health Workers. Another study in Tanzania (Agnarsson, 2001) reported that 37% of the respondents received information from their relatives and TBAs, while only 23% received nutrition knowledge from the Health Workers.

Over 80% of mothers indicated having acquired the traditional knowledge from relatives. Indigenous knowledge is normally passed on to the younger generation by the older as part of their upbringing. The knowledge therefore becomes deep rooted in the community. Such knowledge is further enhanced by the TBAs during delivery.

Key informant interviews also indicated that the TBAs who carried out most of the deliveries had no nutrition trainings but advised the clients on infant feeding practices. This means that advice given to mothers during delivery by the TBAs was mainly based on the indigenous knowledge and practices since most of the TBAs were elderly women

from the said community. For example, traditionally all the infants received prelacteal foods which had real influence on the current infant feeding practices where more than two-thirds of the infants still received prelacteal foods. Exclusive breastfeeding was non-existent traditionally, which seemed to be adhered to by the modern practice with only 1.2% practicing exclusive breastfeeding. In any case, advice on modern nutrition at the health facility was rare due to heavy workload on the health care workers. This left the mothers with the only option of relying on the traditional teachings from relatives and the TBAs.

Over two-thirds of the mothers lacked appropriate knowledge and skills on breast milk expression. This compares with findings by Muchina (2007), where slightly above half of the mothers lacked breast milk expression skills and knowledge. This could imply that the nutrition education had not dealt with expressing breast milk as an option in case the mother had to be away from the baby for several hours. Traditional practice was adhered to, where mothers believed they could only express to relieve the breasts when they became heavy after having been away from the baby for long. Such expressed milk was thrown away because it was believed to have gone bad. This could have contributed to early introduction of complementary feeding especially for mothers who had to be away from the baby for long periods.

On average, the percentage of mothers who demonstrated having correct knowledge on breastfeeding practices was much lower than the 70.9% of the respondents who indicated having received nutrition knowledge on infant feeding practices. For example only about

53% demonstrated having correct knowledge on exclusive breastfeeding, and 41.2% demonstrated correct knowledge on the frequency of breastfeeding. This indicated that some of the information received was not appropriate which raised concern over the credibility of the major sources (relatives and mass media) of nutrition knowledge on infant feeding practices.

Correct knowledge on frequency of breastfeeding was low (41.2%), but 78% of the mothers had correct practice. There was a significant association between the modern and the traditional practices on breastfeeding frequency. This implies that the traditional practices on some of the breastfeeding practices did not deviate much from the modern recommendations.

Although about 63% of the respondents indicated having modern knowledge on the right age of introducing complimentary feeding, 98.8% of the respondents introduced complimentary feeding much earlier than recommended. According to the traditional knowledge, introduction of complementary feeding occurred within the first month after birth. It is therefore clear that traditional knowledge was deeply entrenched in mothers and modern knowledge did not offer adequate reasons for substituting it.

On the nutritional value of foods given to the infants, there seemed to have been improvement over the past in the complementary foods which were mainly starchy. These foods were bulky and had low levels of nutrients. Currently, fruits and vegetables which are richer in micronutrients (vitamins and minerals) have been introduced into the

diet of the infants. More than 50% of the infants were receiving fruits in their diet, and a small proportion was receiving vegetables. This improvement in the diets of infants is clearly an effect of modern nutrition knowledge.

The only source of animal protein in both the traditional and modern infant diet was milk. Other sources of animal protein such as meat and eggs were not given because they happen not to be common item of the household diet and also due to inadequate knowledge. Infants who were not receiving cow's milk were receiving plant sources of protein, which are of low biological value. It would be appropriate to educate mothers to include animal source foods as often as possible in infants diet, and for those mothers who have no access to animal protein, should be educated to use the quality plant proteins like the soya beans, fermented porridge and amaranthus seed that are easily available in their midst.

The results showed that media played major role in educating mothers on the modern practices of infant nutrition and feeding. However, considering the scarcity of media channels in the Maasai villages in the area, (mainly radio was available) and the lack of time by mothers to concentrate on listening, it was possible that the mothers only "heard about" but not "learnt" from the media. This could be the reason why traditional knowledge on infant feeding practices seems to have been applied in preference to modern knowledge.

There was a significant association between modern knowledge and practice in regard to breastfeeding frequency and frequency of complementary feeding practices. This means that in some of the infant feeding practices, nutrition knowledge positively influenced practice. However, there was no significant difference between correct knowledge and practice in breastfeeding initiation. There was also very little practice on exclusive breastfeeding among mothers including those who had correct knowledge. This was clear indication that the traditional knowledge was still being followed.

It was noted that the expected regular nutrition talks were not carried out during postnatal clinics. This means a lot needs to be done to improve on the effectiveness of these clinics in the study area and other marginal areas by solving the problem of staff shortages and the long distances to the health facilities.

5.6 Factors influencing choice of infant feeding practices

The study indicated more than 50% of the mothers were aware of the recommended period of exclusive breastfeeding but the practice was very low at 1.2%. This implies that there were other reasons influencing breastfeeding practice rather than the nutrition knowledge. Traditionally exclusive breastfeeding did not exist. On breastfeeding frequency correct modern knowledge was low at 41.2% but appropriate practice was high at 78.2%. This indicated that a number of mothers were not aware of the recommended modern practice, yet the practice was as per expected. The breastfeeding frequency by modern practice was similar with that by indigenous knowledge. It is possible that majority were only practicing the indigenous knowledge with regard to exclusive breastfeeding and breastfeeding frequency.

The role of the traditional knowledge on infant feeding practices in influencing current infant feeding practices cannot be ignored. For example, 81.2% of the mothers who indicated having received traditional knowledge from their relatives was more comparable to practice (78.2%) in breastfeeding frequency than the 41.2% indicating acquiring modern knowledge. The traditional knowledge is passed from the old to the young as part of the upbringing. The knowledge therefore gets deep entrenched in the minds of the young mothers. With the birth of each child, this knowledge is further enhanced by the TBAs who perform most of the deliveries.

Traditionally, expressing of breast milk for the baby was not practiced. Almost all (99.4%) of the mothers indicated unwillingness to express breast milk for the infant. Milk expression was looked at as a taboo. It would require enormous efforts to overcome it.

Most of the traditional infant feeding practices were found to be similar with current infant feeding practices. Examples of these include the exclusive breastfeeding and the frequency of breastfeeding. Prelacteal feeding was a traditional practice which was still deeply entrenched among the community, because of the belief that it offered health benefits to the infant. Most mothers believed that the infrequent passing of stools during the early weeks of infancy was due to constipation and would be avoided by giving prelacteal foods. Others believed that the foods could make the child grow faster and remain healthy. Some mothers believed that prelacteal herbal extracts promote faster growth and prevent or even cure diseases. Prelacteal foods may, however, deny the baby colostrums which naturally perform the same function like what mothers believe the prelacteal feeding does. Colostrum is secreted during the first few days after delivery. It

contains antibodies and white blood cells at levels higher than the normal milk. The antibodies and white blood cells from the colostrums help to give the baby "immunization" to protect him/her against most bacteria and viruses. Colostrum is also rich in growth factors which stimulate a baby immature intestine to develop and is a laxative which helps the baby to pass meconium (the first, very dark stools). This helps prevent jaundice (King, 1992).

By giving the baby prelacteal foods especially the ghee, the baby may not feel hungry and thus may not want to suckle the breast milk, the baby is therefore likely to be denied the goodness of the colostrums. This may make the baby vulnerable to diseases. The number of stools a baby passes is very variable, especially in the early weeks. A breastfed baby may not pass a stool for several days. This is not constipation, it is a sign that breast milk is a perfect food and is almost all absorbed with only very little waste. This lack of frequent passing of stools by the new born is usually confused by most mothers as constipation.

Poor social economic status of the households could lead to poor maternal nutrition. Adequate maternal nutrition is important in effecting adherence to the modern recommendation on exclusive breastfeeding. A malnourished mother is less likely to produce sufficient milk for the growing baby.

Therefore the choice of infant feeding practices involved interaction of many factors including indigenous knowledge, maternal nutrition, cultural beliefs and taboos.

education level of mothers, socio-economic aspects and maternal nutrition knowledge. Strategy to improve infant feeding practices and therefore growth and development of infants needs to be a multifaceted approach, which puts all these aspects into perspective.

5.7 Infant morbidity

The most common illness among all infants was respiratory infections. This was found to be high, among both the young and the older infants. This may be attributed to the type of housing. Majority of the families lived in temporary houses with inadequate ventilation.

There was slightly higher incidences of diarrhoeal cases among the infants (0 - 6 months) than the older infants (6 – 12 months), this could easily be attributed to early introduction of complementary feeding with the use of feeding bottles with artificial teats. Many families did not have access to clean domestic water and therefore it was possible that the complementary foods became contaminated with disease causing organisms during preparation.

The high incidence of diarrhea and respiratory infections encountered acts to counter the beliefs among mothers that some prelacteal foods, especially herbs and ghee, had curative and preventive properties. Giving of prelacteal foods and not breastfeeding on demand are likely to impact negatively on the infant's health status. For example, infants not breastfeed on demand were six times more at risk of illness than those breastfeed on demand, and those infants fed on prelacteal feeds were 1.2 times more likely to fall ill than those who did not receive the foods. Although infants fed on prelacteal foods were at

a slightly higher risk of falling ill than those not given the foods, the extent to which prelacteal feeding is responsible for growth faltering is only sparingly documented. Malaria, worms, fever and pneumonia incidences were not encountered among infants' 0 -6 months, but a few case were encountered among the older infants.

5.8 Infant feeding practices and nutritional status

The results of the study indicated that the infant's 0 - 6 months were better nourished than the older infants, despite the fact that they were introduced to complementary feeding long before the recommended age. Up to 96% of the infants had normal weight-for-age with only 4% being moderately malnourished. There was no case of severely malnourished infants under this category. This compares well with the expectation that only 2% of the children in a normal well population will to be malnourished (GOK and UNICEF, 1998). It is possible that breast milk and the complementary liquid foods given during the first 6 months afford adequate nourishment to the baby.

Mothers did not realize any handicaps on the growth of the infants and the possible side effects of early initiation of complementary feeding as advocated by the modern nutrition education. Therefore, the mothers did not perceive a strong reason to change from the traditional practices. Impact may be better created by improving on the traditional maternal nutrition knowledge to avert the possible negative side effects.

More growth faltering was experienced among the older infants with 12.5% being underweight, which was higher than the expected 2% malnutrition level of a normal well

population (GOK and UNICEF, 1998). There was a weak association between child's age and the nutritional status of infants. Late introduction to semi-solid and solid foods may have caused the observed growth faltering among the older infants. However, the findings showed a lower level of malnutrition compared with 20% underweight among children under five as reported from a National study (CBS, 2003).

Breastfeeding practices affect the nutritional status of infants. The study showed that infants whose mothers did not follow the recommended breastfeeding practices were at least two times more at risk of being underweight than those who followed recommended practices with the exception of the time for breastfeeding initiation. Although results indicated that infants not fed according to the recommended practices are more likely to be malnourished as compared to those who were fed according to recommendation, the malnutrition levels were low. This means that adherence to recommended period of exclusive breastfeeding is not a very strong determinant of the infant's nutritional status. This raises the big question as to whether it is indeed necessary to insist on the recommended six month for exclusive breastfeeding instead of determining the real factors that affect the infant health and nutrition.

According to the study among infants 6 – 12 months, 1.5% were severely malnourished, and 4.6% were wasted. For the severely wasted the value was slightly higher than the 1% for the under five years of age as reported by CBS (2003). High growth faltering was observed during the fifth and sixth months from birth when the infants are expected to be introduced to solid and semi-solid foods. This indicated problems with the introduction

the foods. The study indicated late introduction of solid and semi-solid foods for most of the infants than the recommended.

The study showed that infants fed using bottle with artificial teats were at very high risk of wasting as compared to those not practicing bottle feeding. The study also indicated that infants fed using bottle were at higher risk of falling ill than those not using bottle feeding. This was in agreement with reports by UNU (1981) that bottle-fed babies have a higher incidence of infection and have a higher risk of becoming malnourished.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

Results of the study shows minimal practice on exclusive breastfeeding. Almost all infants received additional foods before the age of one month. High adherence to practice was established in the aspects like the time of initiation of breastfeeding and breastfeeding on demand where the modern recommendations acknowledged the traditional practices. This was clear indication that traditional knowledge was still playing a major role in the choice of breast feeding practices.

Complementary foods were introduced very early after birth. Infact majority of the infants were given prelacteal foods in accordance with the traditional practice. Modern knowledge had therefore not succeeded in influencing or even replacing the traditional practices on the introduction of complementary foods. The main reason given for early introduction of complementary foods was that the baby was not getting enough milk, because the mother did not have enough to eat due to poor socio-economic status of households.

Education on the modern infant feeding practices at the MCH was very low because the staff often found themselves over-whelmed by the clients. Client follow-up was also low, mainly because of the long distances from the health facility to the homes. This left the mothers to the fate of relatives, friends and the TBAs who normally educated them on the traditional practices of infant feeding. Although media (mainly radio) was indicated as

one of the major sources of modern knowledge, it was not possible to ascertain its real contribution in influencing the choice of infant feeding practices by the mothers.

The study showed that in practices where the modern recommendations on infant feeding acknowledged the traditional knowledge, there was apparent influence of maternal nutrition knowledge on infant feeding practices. However in practices where modern recommendations conflicted with the traditional knowledge there was no apparent influence. This clearly indicated strong influence of the traditional knowledge on the infant feeding practices.

The most prevalent diseases among the infants were the respiratory infections and diarrhea. Inadequate ventilation could have contributed to high incidences of respiratory infections. Poor sanitary and hygiene conditions coupled by the fact that most of the households did not have access to clean water could have contributed to incidences of diarrhoeal cases among infants.

Although majority of the mothers did not follow the recommended modern practice especially on exclusive breastfeeding, the nutritional status of the infants (0 – 6 months) was generally normal. This raises the question as to whether the blanket recommendation of six month exclusive breastfeeding is indeed practical or needs further studies to allow for review.

6.2. RECOMMENDATIONS

The study findings suggest there is need for a paradigm shift in looking at infant feeding practices. Nutrition education does not seem to alter the entrenched cultural practices on infant feeding practices especially with regards to exclusive breastfeeding and the initiation of complementary foods because of underlying factors such as poor maternal nutrition and low socio-economics status of households. This coupled with the fact that the nutritional status of the infants was apparently normal may suggest a multifaceted approach which puts all factors into consideration is required in order to improve infant feeding practices and hence improved growth and development of the infants.

TBAs should be recognized as making an important contribution, especially in the marginal areas where health facilities are very far from the community and therefore the health workers cannot reach the community with nutrition education and other health services. Also mothers cannot be able to cover the long distances under labour without risking the lives of the baby and may be the mother or both. The TBAs should be well trained in order to practice hygiene and safety measures in deliveries and disseminate accurate and consistent nutrition information.

Nutrition education should be incorporated with other Community development programmes in the study area in order to reach the majority of the community who had a great influence on the mother's choice on infant feeding practices.

The government should ensure food security throughout the year especially in marginal areas by introducing drought resistant crop varieties and water harvesting technologies so that mothers may have adequate food in order to produce enough breast milk for the baby. This will enhance appropriate infant feeding practices. In times of severe food shortages pregnant and lactating mothers should be targeted with nutrition interventions. Women empowerment should also be incorporated into nutrition programmes. This could include income generating activities and also linking the mothers with micro-finance institutions. Family planning should be enhanced to help reduce the household sizes. It should also be included in the nutrition education messages.

Mobile clinics should be introduced in order to be able to reach the community in a more effective manner. The Ministry of Public Health should emphasize the need for pit latrines in the study area to improve sanitation in the households. Improvement of housing from the traditional temporary houses to improved houses with adequate ventilation should be encouraged.

A study which involves a control group which will be feed sufficiently to produce enough milk for the baby, after which they will be assesses on adherence to exclusive breastfeeding is recommended.

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APPENDICES

Date..... Designation.....

APPENDIX 1: Key informant guidelines for Health Care Workers

- What nutrition education messages are included in the MCH services?
.....
 - How frequent are the lessons per individual mother?
.....
 - Which communication skills do you use to pass messages?
.....
 - Which language is generally used?
.....
 - Do mothers understand the language used?
.....
 - Do mothers follow advice given at the MCH clinic?
.....
 - How much success on improved nutritional status of infants can you associate with the program?
 - Give reasons you can attribute to the success/failure of the program in achieving improved nutritional status among infants?
.....
- Success.....
.....
- Failure.....
.....
- What recommendations can you give to improve service delivery on nutrition messages?
 - What nutrition messages are given to mothers at the maternity ward?
.....
 - What percentage of mothers delivers at the hospital among the Maasai community?

THANK YOU.

APPENDIX 2: Key Informant Guidelines for Traditional Birth Attendants

Have you ever received any training as a TBA? 1=Yes 2=No

If yes, what did the training include?
.....

Do you have any knowledge on infant feeding practices?

1=Yes 2=No

If yes, how did you learn about infant feeding practices?
.....

What were the traditional infant feeding practices?

0-3months.....

3-6 months.....

6-12 months.....

What are the current infant feeding practices?

0-3months.....

3-6months.....

6-12months.....

How many mothers do you attend to per month?

Do you give the mothers advice on infant feeding practices?

1=Yes 2 = No

If yes, what messages do you include?
.....
.....

Do you think mothers follow your advice? 1=yes 2=No

Give reasons for any answer given above.....
.....

What are your recommendations to improve infant feeding practices among mothers?

Thank you.

APPENDIX 3: Questionnaire

APPENDIX 3

STUDY ON INFLUENCE OF MATERNAL NUTRITION KNOWLEDGE ON INFANT FEEDING PRACTICES AMONG THE MAASAI COMMUNITY IN NAROK DISTRICT (KENYA)

1. DEMOGRAPHIC INFORMATION

Division.....Location.....Sub-Location.....

Questionnaire No

Date of interview:(d/mth/yr) **Village name:**.....

Name of interviewer: **Name of respondent:**

Kindly let me know the names of the people who have been living with for the last three months.

No.	Name	Age (yrs)	Sex	Rel. to Hh head	Marital Status	Educ. level	Occupn	Religion
1								
2								
3								
4								
5								
6								
7								

Sex
1= male
2=female

4= daughter
5= other relative
6= friend
7= other (specify)

3=poly gamously married
4= divorced
5= widowed
6= children

Educational level
1= none
2= primary school
4= secondary school
5= college
6= university
7= children (>3yrs)
8=pre-school (3-6yrs)

Occupational status
1=regularly employed
2= farmer
3=business
4= casual labourer
5= unemployed
6= house-wife
6=herding
7= N/A (children)

8= student
Religion
1= Christian
2= Islam
3= Pagan
4=Traditional Believer
5=others(specify)

Rel. to hh head
1= hh head
2= spouse
3= son

Marital status
1= single
2=monogamously married

2. SOCIO-ECONOMIC STATUS [circle appropriate response]

- 1. What is the level of income for the family/year?
- 2. What is the main source of food for your family? 1=Purchase 2=Own farm produce
3= Purchase and own farm produce 4=Food aid 5= others
- 3. How much of the income do you spend on food/month?
- 4. What is your main fuel for cooking?
1=Paraffin 2= Gas 3=Charcoal 4=Firewood 5=Electricity 6=others (spec)
- 5. What is your main fuel/ energy for lighting?
1= Gas 2= Electricity 3= Paraffin 4= Candle 5= Solar 6=other.....
- 6. What type of housing do you live in?
1= Permanent 2= Temporary 3= Manyatta

3. SANITATION AND HYGIENE [circle appropriate response]

- 7. Where do you obtain your water?
1= River 2= Tap 3= Borehole 4= stream 5=Harvest rain water 6= Dam/pod 7=others
- 8. Do you treat drinking water? 1= Yes 2 =No
- 9. If yes, how do you treat it? 1 = Boil 2= Leave to decant 3 = use chemicals 4= others
- 10. How do you store your drinking water? 1 = covered container 2 =Not covered.
- 11. Is the water in adequate supply? 1= Yes 2= No
- 12. How do you dispose refuse from your compound? 1= Composite pit 2 =Burn
3 =Bury 4 = Throw in the shamba 5 = other (specify)
- 13. How do you dispose human waste in your family? 1= Toilet/latrine 2= Bush

INDEX CHILD INFORMATION

- 14a). Name of child -b) Sex 1=male 2= female
- c) Child delivered at 1=hospital 2= home d) Birth weight.....kg

e) Date of birth -d/m/y

--	--	--

4. INFANT FEEDING PRACTICES

Breast feeding Practices [circle appropriate response]

- 15. a) Is the child still breastfeeding? 1= Yes 2= No

- b) When did you initiate breast feeding? 1=within 30minutes after delivery
 2= 1hr after delivery 3= within first day 4= the following day after delivery
- c) How many times do you breastfeed? 1= on child's demand 2=1-2 times a day 3= 3 times a day 4= 4 times a day 5= 5 times a day 6= >6 times a day
- d) Is the child breastfeeding exclusively? 1= Yes 2= No
- e) If yes, how long will you breastfeed exclusively?months
- f) Do you breastfeed your child outside home/public places? 1= Yes 2=No
- g) If not, why don't you breastfeed? 1= shy 2= embarrassed 3= others (specify)

Complementary feeding practices

- 16) a) Are you giving the child anything else in addition to breast milk? 1= Yes 2=No
- b) At what age did you start giving other foods/fluids to the baby?months
- c) How many times do you feed your child/day 1 2 3 4 5 6 Others(specify)
17. a) Are there foods that infants are not traditionally allowed to eat? 1= Yes 2= No
- b) If Yes, which are these foods?
- c) Why are these foods prohibited in the community?
18. a). Please tell me the foods/fluids you give to your child.

Type of dish	Age(mont hs/days initiated	Ingredients	Frequency /day	Reasons for initiating the foods?
Water alone				
Water/glucose				
Cow's milk				
Tea				
Oil				
Fruits				
Fruit juice				
Porridges				
Vegetables				
Mashed foods				
Infant formula				
6. Other non-food substances				

19. What do you use for feeding liquids to the child?

1= Bottle-feeding 2= cup- feeding

5. MATERNAL NUTRITION KNOWLEDGE [circle appropriate response]

20. Have you ever received education on good child feeding practices? 1= Yes 2= No

21. If yes, where did you receive the education? 1= MCH clinic 2= Relatives 3=friends

4=School 5= Seminar/workshops 6= Radio/Mass media 7=others

22. Did you receive the education before or after the birth of the index child?

1= Before 2= after

23. Were you aware of the traditional child feeding practices before you received the modern education on child feeding practices? 1= Yes 2= No

24. If yes, who gave you traditional education? 1=Relative 2= friends 3=observation

25. Please answer the following questions in the table below

Question	Modern knowledge	Indigenous knowledge
When should breastfeeding be initiated after delivery?		
Up to what age (months) can the baby remain healthy on breast milk only?		
How often should a healthy baby breastfeed in a day?		
At what age should the baby be started other foods?		
If you had to be away from the child for several hours, would you express breast milk and leave to be given to the child by someone else?	1= Yes 2= No	1= Yes 2= No
If No. in the above question, why not?		
What complementary foods were given to the infants in olden days? 0-3 months 3-6 months 6-12 months		

What complementary foods are currently given to the infants? 0-3 months	
3-6 months	
6-12 months	
How did you receive the knowledge	

26a). Do you know the dangers of starting the child on foods and fluids before the recommended age? 1=Yes 2= No

b) If Yes, please tell me some of the dangers?.....

.....

c) How did you know about this dangers?.....

27.a) Has anyone discussed with you how to prepare complementary foods? 1=Yes 2= No

b) If Yes, who was it? 1= Nurse 2= Relative 3= friends 3= Seminar 4= others

c) Tell me three important things they discussed on preparation of complementary foods;

.....

28. How many times/day should a healthy baby be feed?.....

29. How can mothers be helped to follow the recommended infant feeding practices?

.....

6. MORBIDITY AND NUTRITIONAL STATUS

30. Has the child suffered from any illness in the last 14 days? 1= Yes 2= No

31. If yes, which ones? 1= Diarrhea 2 = cough / common cold 3 = malaria 4= worms 5 = fever 6 =pneumonia 7= other (specify)

32. ANTHROPOMETRY

MEASUREMENTS	1 st	2nd	Average
Height (cm)			
Weight (kg)			