

**MATERNAL BREASTFEEDING PRACTICES IN  
RELATION TO GROWTH AND NUTRITION STATUS OF  
CHILDREN AGED 0-24 MONTHS IN NAIROBI, KENYA**

**BY  
EMILY NJERI MUCHINA  
(A56/7406/04)**

**NAIROBI UNIVERSITY  
KABETE LIBRARY**

**A DISSERTATION SUBMITTED IN PARTIAL  
FULFILMENT OF THE MASTERS OF SCIENCE  
DEGREE IN APPLIED HUMAN NUTRITION,  
UNIVERSITY OF NAIROBI**

**AUGUST 2007**

University of NAIROBI Library



0442796 9

## DECLARATION

I hereby declare that this dissertation is my own original work and has not been presented for a degree in any other University.

Date 13<sup>th</sup> August 2007

Signed

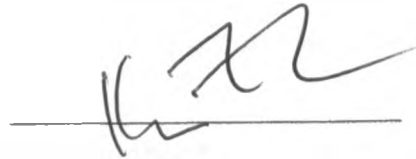


Muchina Emily Njeri, BSc. Nursing

This dissertation has been submitted for examination with our full approval as the university supervisors.

Date 23/08/07

Signed



Professor E.G. Karuri,

Dept. of Food Technology and Nutrition,  
University of Nairobi

Date 30/08/07

Signed



Professor W. Kogi-Makau,

Dept. of Food Technology and Nutrition,  
Applied Nutrition Programme,  
University of Nairobi

## DEDICATION

This work is dedicated to my husband Peter Muchina and our daughter Marlyn Wairimu for their love, patience, understanding and encouragement in my very busy times while working on this project. Thank you very much.

To my mother Helen Wakarindi, whose motherly advice and encouragement never departed from her lips throughout this study and who endeavoured to educate me in my formative years and for not giving up on me. God bless you.

Thanks to God for His grace and guidance throughout this study time and forever.

## ACKNOWLEDGEMENT

I would like to express my sincere appreciation to all those who assisted me in one-way or another during my study period. Special thanks to;

- The University of Nairobi for partly funding the study.
- My supervisors Professor E.G Karuri and Professor W. Kogi-Makau for their guidance and constructive comments throughout the study.
- The research assistants Priscilla Wanjiku Muriithi, Esther Wathira Gicheha, Alfred Ouma Odanga and Antony Karanja Chege, who spared no effort to ensure that the data collection process went on as planned with enthusiasm.
- The matrons of the Kangemi, Riruta, Mathare North and Langata health centres who facilitated my data collection and ensured safe storage of my study tools at their respective facilities.
- Any other person or institution that contributed towards the successful completion of this work.

## Table of contents

	<b>Content</b>	<b>Page</b>
	Declaration .....	i
	Dedication.....	ii
	Acknowledgement.....	iii
	Table of content.....	iv
	List of figures.....	vii
	List of tables.....	ix
	List of abbreviations.....	x
	Operational definitions.....	xi
	Abstract.....	xiv
	<b>Chapter one</b> .....	<b>1</b>
1.0	Introduction.....	1
1.1	Background. ....	1
1.2	Problem statement.....	3
1.3	Aim.....	4
1.4	Purpose.....	5
1.5	Justification.....	5
1.7	Objectives.....	6
1.8	Study questions.....	6
1.9	Benefits of study.....	7
	<b>Chapter two</b> .....	<b>8</b>
2.0	Literature review.....	8
2.1	Historical background of breastfeeding.....	8
2.2	Benefits of breastfeeding.. ....	8
2.3	Breastfeeding practices. ....	10
2.3.1	Appropriate breastfeeding practices. ....	10
2.3.2	Trends of breastfeeding practices.....	11
2.4	HIV/AIDS and breastfeeding.....	14
2.5	Malnutrition and other effects of inappropriate breastfeeding	

	practices .....	16
2.6	Breastfeeding information.....	19
2.7	Government policy and actions.....	21
2.8	Knowledge gap.....	23
	<b>Chapter three.....</b>	<b>24</b>
3.0	Methodology.....	24
3.1	Study setting.....	24
3.1.1	The population.....	24
3.1.2	Topography, climate and administration .....	24
3.1.3	Infrastructure and social services.....	25
3.1.4	Health services.....	26
3.2	Study design.....	27
3.3	Study population.....	27
3.4	Sampling.....	27
3.4.1	Sample size determination.....	27
3.4.2	Sampling Procedure.....	28
3.4.3	Sampling criteria.....	32
3.5	Study variables.....	32
3.6	Study tools.....	33
3.7	Pre-testing of data collection tool.....	33
3.8	Study implementation.....	33
3.8.1	Training of research assistants.....	34
3.8.2	Assessment of oedema.....	35
3.8.3	Obtaining the anthropometrical measurements.....	35
3.8.4	Questionnaire administration.....	36
3.8.5	Interpretation of the growth and monitoring chart.....	36
3.9	Ethical consideration.....	37
3.10	Data quality assurance.....	37
3.11	Data analysis and presentation.....	38
3.12	Study limitations.....	41

<b>Chapter four</b> .....	42
4.0 Results.....	42
4.1 Maternal socio-demographic characteristics.....	42
4.1 Maternal social demographic profile.....	42
4.1.2 Monthly household income.....	43
4.2 Characteristics of the children.....	44
4.3 Maternal attitude towards breastfeeding.....	45
4.3.1 Reasons why mothers would not express breast milk .....	46
4.4 Breastfeeding knowledge and practice.....	47
4.4.1 Initiation of breastfeeding after childbirth.....	48
4.4.2 Prolactal feeds.....	50
4.4.3 Colostrum.....	50
4.4.4 Frequency of breastfeeding a child.....	51
4.4.5 Items used in giving fluids to young children.....	52
4.4.6 Exclusive breastfeeding.....	54
4.4.7 Age of complementary feeds introduction.....	55
4.4.8 Total duration of breastfeeding.....	56
4.4.9 Summary of maternal breastfeeding practices.....	59
4.4.10 Relationship between maternal breastfeeding performance and maternal/child socio-demographic factors.....	60
4.5 Breastfeeding and HIV status.....	60
4.6 Sources of breastfeeding information.....	62
4.6.1 Timing of breastfeeding information by HCWs.....	63
4.6.2 Right to breastfeeding information.....	64
4.7 Growth of children.....	65
4.7.1 Periods of weight loss.....	66
4.7.2 Reasons for lack of weight gain.....	67
4.7.3 Growth performance of children.....	68
4.7.4 Age distribution of children by growth performance.....	69
4.7.5 The Relationship between the maternal/child factors with the child growth performance .....	69

4.7.6	Association between maternal breastfeeding practices and the growth of children.....	70
4.8	Nutrition status of children.....	71
4.8.1	Distribution of children by nutrition status.....	72
4.8.2	Association between maternal breastfeeding practices and the nutrition status of children.....	72
	<b>Chapter five.....</b>	<b>76</b>
5.0	Discussion.....	76
5.1	Social demographic profile.....	76
5.2	Maternal attitude towards breastfeeding.....	76
5.3	Maternal knowledge on the proper breastfeeding practices.....	77
5.4	The maternal breastfeeding practices.....	79
5.5	Mothers knowledge of breastfeeding in HIV positive status .....	82
5.6	The maternal sources of breastfeeding information.....	83
5.7	Growth and nutrition status of children.....	84
	<b>Chapter Six.....</b>	<b>87</b>
6.0	Conclusions and recommendations.....	87
6.1	Conclusion.....	87
6.2	Recommendations.....	88
	References.....	90
	<b>Appendices.....</b>	<b>94</b>
	Appendix I The survey questionnaire.....	94
	Appendix II A sample of the national policy on infant and young children feeding practices. ....	101
	Appendix III A sampling frame of the administrative units of the city council health facilities.....	103
	Appendix IV A national growth-monitoring chart.....	105



## List of figures

No.	Title	Pg
1	Trends of infants feeding practices in Kenya.....	13
2	Feed options for infants aged six-nine months in Kenya .....	13
3	Conceptual framework of the causes of malnutrition in society.....	18
4	Schematic drawing of the sampling procedure.....	31
5	Study variables.....	32
6	Maternal age. ....	43
7	Age categories of children in months.....	44
8	Maternal rating of breastfeeding.....	45
9	Mother's opinion on whether they would express breast milk.....	46
10	Reasons against breast milk expression .....	47
11	Benefits of breastfeeding.....	48
12	Time lag before initiation of breastfeeding.....	49
13	Benefits of colostrum.....	51
14	Demand versus scheduled breastfeeding.....	52
15	Items used in feeding liquid feeds to children.....	53
16	Duration of exclusive breastfeeding.....	54
17	Age at introduction of complementary feeds.....	55
18	Intended age for introduction of complementary feeds.....	56
19a	Knowledge of total duration of breastfeeding.....	57
19b	Intended age in months of total breastfeeding.....	58
20	Breastfeeding in HIV positive status.....	61
21	Time of awareness of maternal HIV status.....	62
22	Sources of breastfeeding information.....	63
23	Timing of giving breastfeeding information by HCWs.....	64
24	Reasons for unfulfillment of right to information.....	65
25	Child weight plotting in relation to the standard reference curves.....	66
26	The type of gradient of the growth curve.....	66
27	Periods of weight loss.....	67
28	Likely causes of weight loss.....	67
29	Age distribution of children by their growth performance.....	69
30	Distribution of children by age and nutrition status.....	72

## List of tables

1	Proportionate sampling .....	29
2	Training curriculum for research assistants. ....	34
3	Data analysis matrix.....	39
4	Maternal socio-demographic characteristics.....	42
5	Age, sex profiles and status of breastfeeding of the children.....	45
6	Reasons for not initiating breastfeeding within one hour.....	50
7	Maternal knowledge on proper breast feeding practices .....	58
8	Maternal breastfeeding practices.....	59
9	Distribution of mothers by their performance on breastfeeding practices....	60
10	Relationship between maternal/child socio-demographic factors and breastfeeding practices performance.....	60
11	Distribution of children by their growth performance.....	68
12	Relationship between maternal/child factors, and the child growth performance.....	69
13	Association between maternal breastfeeding practices and the growth of children.....	70
14	Association between overall maternal performance on breastfeeding practices and the growth trends of children.....	71
15	Distribution of study children by nutrition status.....	71
16	Association between maternal breastfeeding practices and acute malnutrition.....	72
17	Association between overall maternal performance on breastfeeding practices and acute malnutrition of children .....	73
18	Association between maternal breastfeeding practices and underweight among children.....	73
19	Association between overall maternal performance on breastfeeding practices and underweight among children .....	74
20	Association between maternal breastfeeding practices and stunting among children.....	74
21	A two by two table showing association between overall maternal breastfeeding practices and stunting among children.....	75

## LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
BCC	Behavior change communication
CBS	Central Bureau of Statistics
CI	Confident interval
cm	Centimetres
df	Degree of freedom
DNK	Don't know
EBM	Expressed breast milk
EBM	Expressed breast milk
FAO	Food and Agriculture Organization of the United Nations
Fig	Figure
HC	Health centres
HCWs	Health Care Workers
HFA	Height for age
HIV	Human Immunodeficiency Virus
Kg	Kilograms
MCH	Maternal and Child Health
MOH	Ministry of Health
MTCT	Mother to Child Transmission
NCHS	National Centre for Health Statistics
No.	Number
PPH	Post Partum Haemorrhage
WHO	World Health Organization
SD	Standard deviation
SPSS	Statistical Package for Social Sciences
TBAs	Traditional Birth attendants
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WFA	Weight for age
WFH	Weight for height

## OPERATIONAL DEFINITIONS

**Anthropometric nutritional assessment** involves physical measurements of weight, height, and body compartments of fat and lean tissue. Measures of growth are important in assessing continued development of infants, children, and adolescents. In infants the measures are compared to a standard child of the given age and sex.

**Attitude** refers to individual feelings, opinion or thoughts about something.

**Breastfeeding information** refers to the facts or knowledge on breastfeeding

**Complementary feeds** refer to the solid and liquid foods introduced to an infant in addition to breast milk in order to meet the infants evolving nutritional requirements.

**Dyad** refers to two individuals or units regarded as a pair. In this study the mother and her child were regarded as a pair.

**Exclusive breastfeeding** refers to feeding of infants with breast milk only; this could be from the mother or a wet nurse, expressed breast milk and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines. This includes both direct breastfeeding and indirect, through expressed breast milk (EBM).

**Height for age** is an indicator of nutritional status that gives information on the nutritional situation in the past and indicates whether a person suffers from chronic malnutrition. The height of a child is taken and compared with the height of a standard child of the same age.

**Growth** is the progressive increase in size with age in a child.

**Good growth** of a child is described as that whose scores are greater than six points on a growth performance scale (3 to 9 points). Indicating a likelihood that the child's weight plotting is within or above the two curves of the standard reference child, the growth slope is positive and has one or lacks period of weight loss.

**Odds ratio** compares the relative likelihood of an event occurring between two groups. An odds ratio of one (1) implies event is equally likely to occur in both groups. An odds ratio greater than one (1) implies the event is more likely in the first group. An odds ratio of less than one (1) implies that the event is less likely in the second group.

**Prelacteal feeds** refer to food item given to an infant within the first three days.

**Proper breastfeeding practices** are breastfeeding patterns that ensure optimal growth, development and health of infants. They include exclusive breastfeeding for the first six months of life; thereafter introduction of nutritionally adequate and safe complementary feeds while breastfeeding up to at least 2 years or beyond. (UNICEF/ WHO, 2003). They further include initiation of breastfeeding within one hour of childbirth, giving newborns colostrum thus avoiding giving prelacteal feeds. No use of feeding bottles with artificial teats and breastfeeding on demand.

**Poor growth** of a child is described as that whose growth performance scores are equal or less than six indicating weight plotting below the standard reference growth curves, with a negative or zero gradient of the slope and has at least two periods of weight loss.

**Total breastfeeding** is the total duration of breastfeeding inclusive of exclusive breastfeeding period and breastfeeding in addition to complementary feeding. For

the purposes of this study the ideal total breastfeeding duration is two years or beyond.

**Weight for age** is an indicator of nutritional status that is used to monitor growth of children and indicate chronic or acute malnutrition. The weight of a child is taken and compared to the weight of a standard child of the same age.

**Weight for height** is a nutritional indicator that gives information on the present nutritional status and indicates whether a child suffers from acute malnutrition. The weight of a child is taken and compared against the weight of a standard child of the same height.

## ABSTRACT

Bottle-feeding is common with more than half of the children given prelacteal feeds an hour after birth while median duration of breastfeeding (16.7 months) is also below the recommended duration. These inappropriate practices are likely to expose children to poor growth and malnutrition.

The aim of this study was to determine the maternal breastfeeding practices and relate them to the growth and nutritional status of children 0-24 months of age. A descriptive cross-sectional survey was carried out in randomly selected city council health centres. The study tools included a questionnaire, which focused on assessing maternal socio-demographic profiles, attitude towards breastfeeding, knowledge of the recommended breastfeeding practices, knowledge of breastfeeding in a HIV positive status, actual breastfeeding practices and sources of breastfeeding information. Growth monitoring charts were evaluated. Eventually anthropometric measurements of the children were taken using a salter scale for weights and a length board for height.

The study showed that over 70% of the mothers had adequate knowledge on the recommended breastfeeding practices but only 44% knew the recommended duration of exclusive breastfeeding. A majority (77%) knew that breastfeeding in a HIV positive mother should not be done due to the risk of mother-to-child transmission.

In total, 99% of the mothers had breastfed, 98% were still breastfeeding also 90% were breastfeeding on demand, 80% did not use bottles with nipples in giving fluids to their child and 79% gave no prelacteal feeds. The high scores notwithstanding, only 12.6% children (who were past age of six months) had been exclusively breastfed for the first six months of life and 34% of children aged less than six months were still exclusively breastfeeding. Majority (80%) of the mothers

obtained breastfeeding information from the health care workers. Information from health care workers was mainly (52%) obtained during antenatal visits.

Most children had experienced good growth trends (94%) with only 10.6 %, 6.2% and 2.1% being stunted, underweight and wasted respectively. Lack of adherence to most of the recommended breastfeeding practices was a risk factor to poor growth.

In conclusion, mothers have positive attitude, adequate knowledge and were compliant with most of the recommended proper breastfeeding practices. However, exclusive breastfeeding for the first six months was rarely practised. Most mothers lacked knowledge on other options HIV positive mothers have other than avoidance of breastfeeding. It was also realised that health care workers offer health education on breastfeeding mainly during antenatal clinics. Adherence to most of the recommended breastfeeding practices contributed to the good growth and nutrition status of the children.

From the study findings it is recommended that, health care workers plan breastfeeding information dissemination carefully in order to reach all targeted mothers thus reduce exclusion error; information to re-emphasise the benefits of breastfeeding, importance of giving colostrum and exclusive breastfeeding for the first six months and options that are in place, for an HIV positive mother who chooses to breastfeed.



## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Background

Breast milk is a natural resource that has a major impact on child health, growth and development. The breast milk has been infants' source of food since time immemorial. Breast milk contains all the nutrients that a baby needs and in the right quantity, for the first six months. The nutrients are quickly and easily digested (King, 1992).

Breastfeeding has significant benefits not only to the infant and its mother but also to the society at large. The benefits include optimal infant nutrition for the first six months of life, transferring of immunity to the infant against infections; promotion of mother to child bonding and minimal preparations since it's ejected at the body temperature thus does not require reheating. In addition it reduces maternal fertility hence promotes child spacing. Immediately after birth it decreases postpartum haemorrhage by facilitating uterus contraction. It has been shown to have future profound effects on the child since it promotes high intelligence and prevents later chronic diseases. It has great health and economic impact at the family and national levels.

It is recommended that infants should be exclusively breastfed for the first six months of life. Thereafter, nutritionally adequate and safe complementary foods should be introduced while breastfeeding continues for at least two years (WHO/UNICEF, 2003). Successful breastfeeding is achieved when the baby is breastfed within one hour after delivery, continued on demand and exclusively breastfed for up to six months. No other feeds or formula milk should be given till the baby is six months old. Mothers should avoid use of pacifiers and bottle-feeding with artificial teats since they affect dental development and are a source of infections that cause diarrhoea among the infants.. Rooming in, mother and

child staying together after birth (UNICEF/D'Urso, 1997), further enhance breastfeeding.

Decline in breastfeeding is associated with women involvement in work force as well as lack of knowledge on the benefits of the practice and management of lactation problems. Bottle-feeding is thus perceived as the modern way and breastfeeding as old fashioned and inconvenient (WHO/FAO, 1992). King, (1992) stated that women need advice about how often to feed their babies, about giving other fluids and solids, common problems associated with breastfeeding such as sore nipples, sore breasts, inadequate production of milk, production of too much milk and leaking breasts among others.

Health care workers (HCWs) are best placed in correcting misconceptions concerning the sufficiency of exclusive breastfeeding for the first six months of life, through antenatal and postnatal education about the physiology of lactation (Onayade et al, 2004). Mothers should therefore be informed of the value of breast milk over other types of milk and of the practices that hinder the establishment of successful breastfeeding. HCWs should offer scientific unbiased facts on breastfeeding support and encourage mothers to breastfeed. It has been identified that HCWs information is evaluated in the context of the mother's cultural norms. Therefore, the traditional family and community social networks are essential in promoting breastfeeding through exchange of information (WHO/UNICEF, 2003).

The government has developed policies on infant and young children feeding practices based on the UNICEF baby friendly initiative and supports the WHO codes for marketing breast milk substitutes with an aim of promoting, protecting and supporting breastfeeding.

## 1.2 Problem Statement

Breastfeeding or lack of it is a pivotal factor between life and death for the vast majority of children in developing countries.

Less than 35% of infants worldwide are exclusively breastfed during the first six months of life. This low adoption of appropriate breastfeeding practices has been found in developing countries especially in Africa. Kenya is no exception, in spite of breastfeeding being universal only 14% infants under six months are exclusively breastfed thus complementary feeds are introduced quite early in a child's life and by six months a quarter has not been given complementary feeds while 27% under six months are bottle fed (WHO/UNICEF, 2003). In Nairobi, more than one-quarter of children under six months are bottle fed, only 55.1% initiate breastfeeding within one hour after childbirth while 51.3% give prelacteal feeds. The median duration of exclusive breastfeeding and total breastfeeding are 0.5 and 16.7 months respectively much lower than the recommended duration (Central Bureau of Statistics CBS, 2004).

Studies have shown that inappropriate breastfeeding practices are associated with severe malnutrition and lack any advantage in terms of weight gain and are associated with growth faltering (Onayade et al, 2004). Malnutrition has significant health and economic consequences, which includes increased risk of death, illness and lower cognitive development among others. In Kenya 30.3% of children aged less than five years are stunted, 5.6% are wasted and 20% are underweight while in Nairobi 18.7% are stunted, 4.5% wasted and 6.3% underweight (CBS, 2004). About 33% of all deaths before the age of five years in Kenya are related to malnutrition (ORC Macro, 2004).

Early introduction of complementary feeds before the age of six months and bottle-feeding, exposes infants to infectious conditions such as diarrhoea, acute respiratory infections and allergic reactions before developing immunity. This is

due to use of unsafe water and unhygienic facilities especially in developing countries. In addition early complementary feeding causes the stomach of an infant to fill so that he/she takes less breast milk leading to a reduction in maternal milk supply.

Mothers especially in urban areas are exposed to varied sources of information on breastfeeding, which are not always right. The information is sometimes contradictory thus confusing especially to the first time mothers. The sources of information could be biased or inaccurate in terms of scientific evidence. Health care workers are best placed in sharing accurate scientific facts on appropriate breastfeeding practices. However, studies have shown them lacking adequate knowledge on breastfeeding (Mirie, 2001). Understaffing of most public health facilities has a detrimental effect on quality time spent and the frequency of nutrition education sessions. Inadequate maternal knowledge about feeding practices is often a greater determinant of malnutrition than lack of food.

Children continue to suffer from malnutrition and its related complications despite efforts by policy makers and health care service providers. There seems to be a gap between what should be happening and what is actually happening in relation to maternal breast feeding practices that needs to be addressed.

### **1.3 Aim**

The study aimed at generating information that will aid in improving child nutrition and promoting good growth of children. Policy makers, health services providers and community members especially the mothers would find this data useful for improvement of the maternal knowledge base on the value of practising the recommended breastfeeding practices. This will eventually contribute to the reduction of childhood mortalities and morbidities (one of the millennium development goals) in this country.

## **1.4 Purpose**

The study focused on establishing the maternal breastfeeding practices, knowledge of the recommended breastfeeding practices, mothers' attitudes towards breastfeeding and the sources of breastfeeding information. Ultimately, child nutritional status and growth trend as an outcome of the breastfeeding practices were determined.

## **1.5 Justification**

Proper breastfeeding practices contribute to optimal child health, growth and development. Consequently they have great health and economic impact at the family, community and national levels. The positive health and economic impact of breast feeding practices would benefit poor populations especially in the developing countries such as Kenya. Such populations are financially disadvantaged and suffer from unavailability of safe and hygienic water. With appropriate breast feeding practices these populations would save much needed money that they may have used on hygiene, safe water and alternative feeds.

The importance of having access to complete, accurate, unbiased and scientific facts about breastfeeding cannot be over emphasized. Since information confers knowledge through which values, social norms and thus inappropriate practices can be modified or changed. The source of information, accessibility to information, correct timing and accuracy of the information is of great importance to an infant feeding decision-making process of any mother. In this era of HIV/AIDS, any one planning to have a child should have accurate and unbiased information, early enough on the options there are regarding infant feeding in order to make favourable decisions based on their HIV status, socio-economic and environmental situations.

This study is timely since not much has been done to establish the status of the recommended breastfeeding practices and their influence on the child growth and

nutrition status in Nairobi. As a result of logistical issues the study was limited to Nairobi province.

## **1.7 Objectives**

### **Main objective**

To determine the association between maternal breastfeeding practices and the growth and nutritional status of children aged 0 – 24 months in Nairobi.

### **Specific objectives**

- 1) To determine maternal knowledge on the recommended breastfeeding practices and its influence on the practice.
- 2) To establish the association between recommended breastfeeding practices and the growth and nutrition status of 0-24 months children.
- 3) To determine the maternal sources of breastfeeding information.
- 4) To determine the maternal knowledge of breastfeeding in HIV positive status.

## **1.8 Study Questions**

- 1) Are mothers aware of the recommended breastfeeding practices?
- 2) Is there an association between maternal breastfeeding practices, the growth and the nutritional status of children aged 0-24 months?
- 3) Are the maternal breastfeeding practices influenced by knowledge of the recommended breastfeeding practices?
- 4) What is the maternal attitude towards breastfeeding?
- 5) What are the main sources of breastfeeding information to mothers?
- 6) Do the mothers have knowledge of breastfeeding in HIV positive status?

## **1.9 Benefits of study**

Data obtained from the study and the recommendations will be shared with the mothers, health care workers, community leaders, policy makers and other development organizations.

The data obtained from this study will contribute to the knowledge base on maternal knowledge on appropriate breastfeeding practices and patterns for breastfeeding infants and young children. The findings could be useful in designing and planning specific breastfeeding promotion for different categories of community groups (young, educated working and unemployed among others). In addition, it will sensitise health care workers on their role in sharing scientific information with an aim of promoting, protecting and supporting breastfeeding. The findings would also set a basis for the policy makers in designing strategies to improve the nutrition status of children in Nairobi.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Historical background of breastfeeding**

For centuries, breastfeeding has been the normal way of feeding the newborns (Amin, 1995). Towards the turn of the 20<sup>th</sup> century, scientists proceeded to develop an alternative to human milk by duplicating its composition. The outcome of this process was formula milk, which was viewed as an alternative to human milk (Family Health Administration, 2005). Breast milk substitutes were promoted to working women as a convenient and equivalent alternative to breast milk (Amin, 1995).

Studies, however, have shown that human milk is far different from a simple chemical mixture. It is a 'live' tissue with cells conferring immunity to infants and with many other substances in it that are of benefit to infants and young children (Family Health Administration, 2005). Nature has provided breast milk for nourishment of human infants hence it is the perfect food for babies. It is the nature's way of ensuring a sound, healthy start to life and meeting all the nutritional needs of the baby, safely and adequately (Martin, 1980).

#### **2.2 Benefits of Breastfeeding**

Colostrum, the yellow and thick milk secreted within the first few days after delivery, gives the baby first protection against most of the bacteria and viruses that he/she will encounter later in life. It contains growth factors that prepare the infants intestine to digest, absorb milk and to prevent the absorption of undigested proteins. Breast milk contains all nutrients that a baby needs for the first 4-6 months of life and it is quickly and easily digested. It contains the most suitable proteins, fats, vitamins, water, iron, correct amounts of calcium, salt, and enough lactose, phosphatase and lipase enzyme. It provides a much better chance for



optimal child health and development (King 1992).

Breast milk is not contaminated with bacteria and viruses that cause diarrhoea diseases and respiratory infections. It contains immune components-white blood cells, antibodies that directly transfer immunity and fight infections in the infants.

Mother infant body contact and body temperature of milk helps prevent hypothermia. Breastfeeding is also an important source of comfort to a sick child (King, 1992). Human milk has been found to be having positive long-term effects in the infant in terms of better neurological development and less risks of chronic diseases later in childhood (Family Health Administration, 2005).

In addition, it has positive effects to the mother for instance, it promotes child spacing through reduction in fertility rates thus acting as a family planning method (lactation amenorrhoea method). Immediately after birth breastfeeding reduces risk to postpartum haemorrhage by promoting contraction and involution of the uterus. It lowers the risk of ovarian and breast cancer especially with increased breastfeeding duration. Psychological benefits are acquired through emotional bond that develop between the breastfed infant and the mother (MOH, WHO and Well start, 1995). It offers a natural opportunity to communicate love at the very beginning of a child's life (UNICEF, 1999).

Breast milk substitutes are expensive and bottle-feeding requires purchase of special equipments. Poor families who cannot afford to purchase the required formula normally give their children over diluted mixtures or less nutritious substitutes that cannot support proper growth and development. The purchase of breast milk substitutes is especially damaging to the economy of developing countries since it siphons away its scarce foreign exchange from vital priorities (UNICEF, 1999).

## **2.3 Breastfeeding Practices**

### **2.3.1 Appropriate Breastfeeding Practices**

Exclusive breastfeeding is recommended for the first six months of life, for the achievement of optimal growth, development and health. Thereafter, in order to meet the infants' evolving nutritional requirements, the infants should receive nutritionally adequate and safe complementary foods while breastfeeding up to two years of age or beyond. This is with exclusion of human Immunodeficiency virus (HIV) positive mothers who do not wish to breastfeed. The introduction of complementary foods is necessary because milk is no longer sufficient to satisfy the developing infants' needs for energy, proteins, vitamins and micronutrients. (UNICEF / WHO, 2003). According to the American Academy of Pediatrics, (2005) breastfeeding should be continued "...for as long as mutually desired by mother and child". There is no upper limit to the duration of breastfeeding and no evidence of psychological or developmental harm from breastfeeding into the third year of life or longer.

To achieve success in breastfeeding, mothers should not give their babies extra fluids, such as water, glucose water or milk formula, especially in the early days of life (prelacteal feeds). Women are therefore encouraged to initiate breastfeeding within one hour after birth. This is with exception of HIV positive mothers who do not wish to breastfeed. Early initiation of breastfeeding increases chances of breastfeeding success besides, it generally lengthens the duration of breastfeeding and immediately after birth assists in uterus involution thus prevent postpartum haemorrhage (CBS, 2004).

Expressing breast milk to avoid breast engorgement during periods of separation from the baby should be done (UNICEF, 1997). The expressed breast milk should be given using an open cup and not by a feeding bottle with an artificial teat; this ensures that the infant will suckle effectively at the breast when his or her mother

returns (UNICEF, 1999). In addition, bottle feeding is also discouraged because improper sanitation and formula preparation with bottle feeding can introduce pathogens to the infant, putting the child at a greater risk of illness and malnutrition (ORC Macro, 2004).

On-demand breastfeeding (i.e. when the child requests) and allowing to feed until satiated, is encouraged in order for the infant to regulate their intake according to their needs hence be able to express their appetite. Only then can the natural process of appetite control operate, and the baby regulates its intake to suit its individual and changing needs (Royal college of Midwives, 1991).

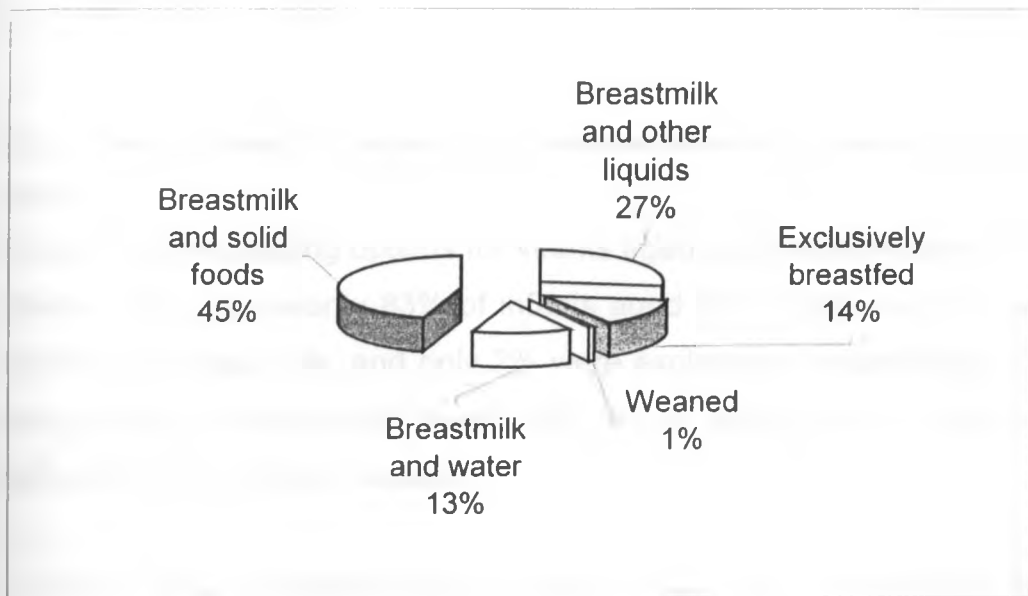
Recommendations for optimal feeding practices include increasing the frequency of breastfeeding during illnesses. A child recovers more quickly if he/she continues to breastfeed. If the child is able to breastfeed but only slowly and over a short duration, it should be frequently fed. If he/she is unable to breastfeed the mother can express and give the milk with a cup, spoon or tube (King, 1992).

### **2.3.2 Trends of Breastfeeding Practices**

Globally, less than 35% infants are exclusively breast fed during the first four months of life, complementary feeding begins too early or too late, and the foods are often inadequate and unsafe. In most Sub-Saharan Countries, relatively few mothers of infants under four months follow the recommended practice (WHO and UNICEF, 2003).

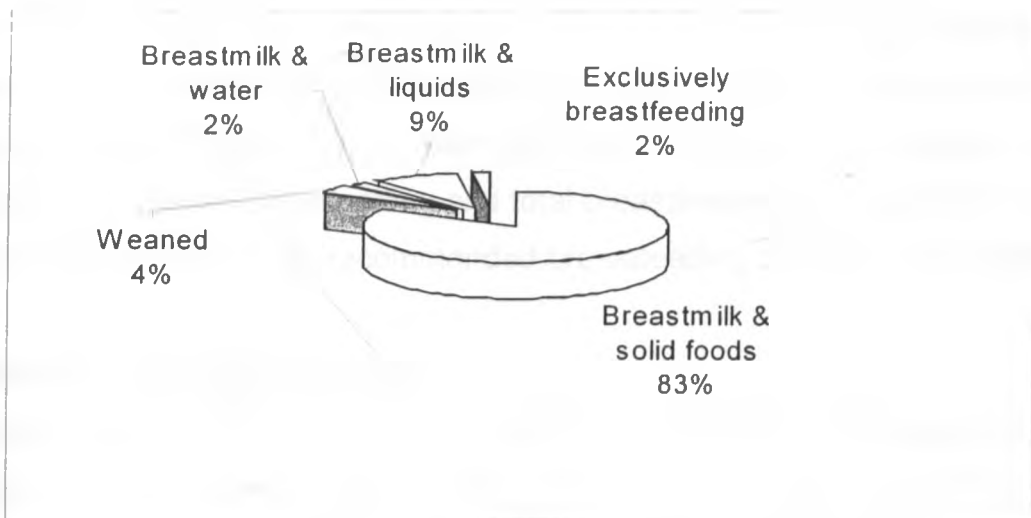
In rural Giza- Egypt, 68% mothers initiated early suckling of colostrum, however; only 51.2% of these infants were exclusively breastfed in the first week of life (Hakim et al, 1992). According to Onayade et al (2004) the causes for early introduction of complementary feeding include insufficient breast milk, thirst, convenience and inadequate infants' growth. Exclusive breastfeeding was not in practice in rural Lesotho highlands, in spite of the high prevalence of breastfeeding

of 100% and the intended long duration of breastfeeding for up to 24 months by 45% of the respondents. The main reasons given for not exclusively breastfeeding, were decline in milk production, child's hunger and that the child was old enough (Jooste et al 1997). Agnarsson et al (1999) in a study done in Tanzania, reported that 46% of mothers discarded colostrum, the median duration for exclusive breastfeeding was about 2 months and that of full breastfeeding was about 4 months.



**Fig 1. Trends of infants feeding practices in Kenya (source ORC Macro, 2004)**

The above pie chart demonstrates feeding practices for infants less than six months in Kenya. In Kenya only 14% of infants aged less than six months were exclusively breastfed as per the recommendations, solid foods had been introduced to the majority 45%, 27% had other liquids, 13% water while a 1% had been weaned.



**Fig 2. Feed options for infants aged six-nine months in Kenya** (source ORC Macro, 2004)

Figure.2 shows feeding options for infants aged six to nine months in Kenya (ORC Macro, 2004). A majority 83% of infants aged 6-9 months had received solids in addition to breast milk, and only 2% were exclusively breastfeeding. Another 2% were feeding on water and breast milk, 9% on other liquids in addition to breast milk while 4% had been weaned.

In Thika 81% of mothers with children less than 24 months old were still breastfeeding while the rest had stopped. About 72.7% had started complementary feeds while the child was less than four months of age and 3% when the child was more than six months (Kamau-Thuita et al, 2002). In Kathonzi division, Makueni District, 37.5% children in a project aimed at promoting appropriate childcare and feeding practices were introduced complementary feeds within the first three months while 63.8% of those excluded from the project introduced complementary feeds within the same period (Macharia et al, 2004). Onyango (2000) in a study with rural community of western Kenya, established that complementary feeding was initiated for 93% of the cohort before the age of 3 months.

Breastfeeding in Nairobi is universal (96.2%). However, 82.3% start breastfeeding within a day of birth and 55.1% within an hour of birth in accordance to the recommendations. Half of the children receive prelacteal feeds and the median duration of exclusive breastfeeding and total breastfeeding is 0.5 and 16.7 months respectively contrary to the recommended breastfeeding practices (CBS, 2004).

#### **2.4 HIV/AIDS And Breastfeeding**

Acquired Immunodeficiency Syndrome (AIDS) is caused by a retrovirus known as Human Immunodeficiency Virus (HIV), which attacks and impairs the body's natural defence system against disease and infection. There is no cure for AIDS however, some therapies can prevent, treat or even cure many of the opportunistic infections and relieve the symptoms associated with them. HIV is transmitted through three primary routes, namely, having unprotected sex with an infected person, transfusion of contaminated blood and its by products or use of un-sterilized instruments and from an infected mother to her child.

In the absence of prophylaxis, estimated rates of mother to child HIV transmission (MTCT) in developing countries ranges from 25-45%. PMTCT programmes that provide antiretroviral drugs (ARV) to pregnant women and newborns at birth can reduce the risk of transmission by half (UNICEF, 2004<sub>a</sub>). Approximately a third of infants born to HIV infected mothers; contract HIV through MTCT in absence of preventive interventions. Between 15%-20% of children born to HIV infected mothers get infected with HIV during pregnancy or delivery while about 15% of the children get infected through breastfeeding (UNICEF, 2005).

In Kenya only 28% of women and 30% of men knew that HIV can be transmitted through breastfeeding and that taking ARVs drugs can reduce the risk (CBS, 2004). In Nairobi more women (39.9%) knew HIV can be transmitted through breastfeeding and that taking ARV can reduce the risk (CBS, 2004).

For HIV positive women who choose to breastfeed, exclusive breastfeeding is recommended for the first six months of an infant's life, and should be discontinued once an alternative form of feeding becomes feasible. Mixed feeding (breastfeeding mixed with bottle feeding of water or formula, or providing other foods) is not recommended because studies suggest it carries a higher risk than exclusive breastfeeding. This may be because mixed feeding damages the lining of the baby's stomach and intestines and thus makes it easier for HIV in breast milk to infect the baby. Indirect evidence suggests that keeping the period of transition from exclusive breastfeeding to alternative feeding as short as possible may reduce the risk of transmission. Unfortunately, the best duration for this is not yet known and may vary according to the infant's age and/or the environment (Avert, 2006). The risk to HIV transmission through breastfeeding may be reduced through; shorter duration of breastfeeding, exclusively breastfeeding for first three to six months and avoiding mixed feeding (breastfeeding combined with other foods, juices and water), prevention and treatment of breast problems e.g. mastitis and early treatment of sores or thrush in the mouth of an infant.

However, the risk of HIV transmission has to be compared with the risk of morbidity and mortality due to lack of breastfeeding (UNICEF, 2005). In resource-constrained settings the decision not to breastfeed may result in social stigmatisation, economic hardship and early return of fertility. In such a setting all infants from birth to six months of age should be exclusively breastfed irrespective of the HIV status of the mother. However, breastfeeding should be discontinued as soon as it's feasible taking into account the local circumstances. If replacement feeding is acceptable, feasible, affordable, sustainable and safe avoidance of all breastfeeding by HIV infected mothers is recommended (USAID, 2001; UNICEF, 2005).

All infected mothers should receive counselling so that they make the best decision about their infant feeding option. However, the infant feeding choice

depends on the individual mother and her decision should be supported. HCWs should be skilled in HIV counselling and testing, prevention of MTCT, lactation management and promotion of good breastfeeding techniques and replacement feeding for HIV infected couples (UNICEF, 2005).

## **2.5 Malnutrition and Other Effects of Inappropriate Breastfeeding Practices**

Malnutrition is one of the most important health and welfare problems among infants and young children in Kenya (ORC Macro, 2004). Malnutrition has been responsible, directly or indirectly, for 60% of the 10.9 million deaths world wide, associated with inappropriate feeding practices that occur during the first year of life (WHO/UNICEF, 2003). Around 7 out of 10 deaths among children under the age of five in developing countries can be attributed to a few main causes among them acute respiratory infections, diarrhoea, measles or malaria. Malnutrition contributes to half of these deaths. Even when it does not threaten life itself, malnutrition in early childhood can cause stunting or disability and hinder brain development and children's capacity to learn, hampering their ability to accrue skills that are critical to their life chances (UNICEF, 2004<sub>a</sub>).

Malnutrition results from inadequate food intake and illness. Inadequate food intake is a consequence of insufficient food availability at household level and improper feeding practices. The latter include both the quality and quantity of food offered to young children as well as timing for their introduction (ORC Macro, 2004). In Kenya 30.3% of children aged less than five years are stunted, 5.6% are wasted and 20% are underweight. The case for Nairobi shows 18.7% are stunted, 4.5% wasted and 6.3% underweight (CBS, 2004).

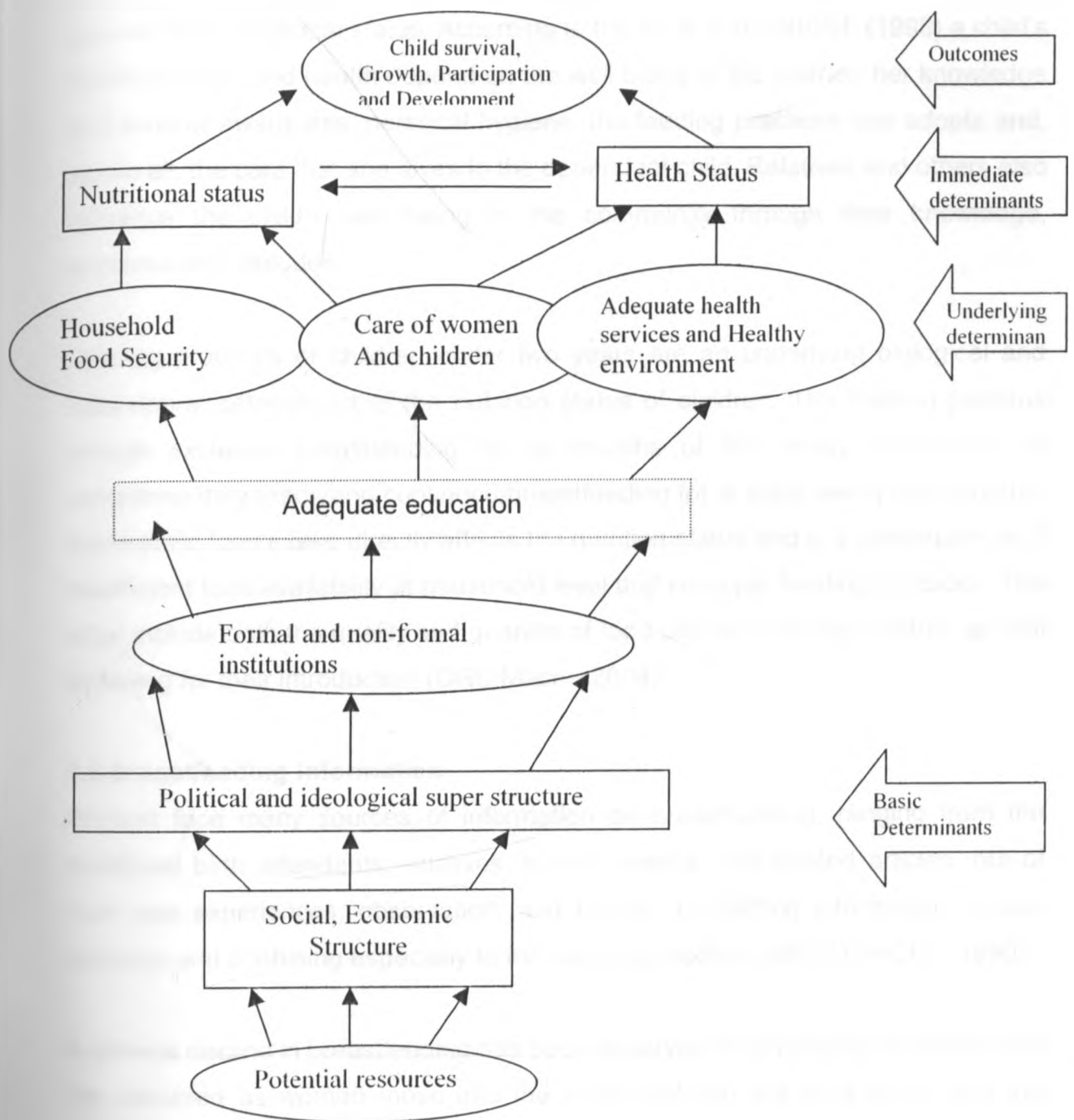
Globally, an estimated 1.3 million lives are lost each year due to inadequate exclusive breastfeeding and another 600 thousand from lack of continuation of breastfeeding with proper complementary feeding. In addition, improper infant and young child feeding cause one third of malnutrition (UNICEF, 2004<sub>b</sub>).



In a study in Kampala-Mulago Hospital, Owor et al (2000) reported a strong association between severe malnutrition and lack of breast-feeding, an odds ratio 3.222 (p-0.0009) that is those who lacked breastfeeding were three times likely to develop malnutrition compared to those who were breast fed. In a group of severely malnourished children, only 23% of those aged less than 2 years were still breastfeeding compared to 44% in the control group.

In developing countries, non-breastfed infants are 3-4 times more likely to die in the first 3 months of life. However, breastfed infants aged between 4-8 months are 60-90% less likely to die from infectious diseases (Tomkins, 2002). In Kenya 33% of all deaths that occur before the age of five are related to malnutrition.

According to MOH, WHO and well start et al, (1995), increased malnutrition results from poor feeding practices, short duration of exclusive breastfeeding, early introduction of complementary foods before the age of six months, which expose the child to disease carrying conditions before developing immunity. This is likely to result in infections, increased risk of diarrhoea and decreased child's time to breast feed hence reduced maternal milk supply. Early introduction of feeds before the age of six months and bottle-feeding leads to increase in morbidity due to the unsafe water and unhygienic facilities used in their preparation (CBS, 2004). Early introduction of these feeds is associated with triggering allergic reactions on the infant (UNICEF, 1999). Onayade et al (2004) reported that early introduction of complementary feeds did not have any advantage in terms of weight gain, and was frequently associated with illness episodes and growth faltering. According to the GOK and UNICEF (1998) repeated infections are known to have a major impact on the nutrition status of infants and children. In addition diarrhoea drastically increases the risk of wasting.



**Fig.3 Conceptual Framework of the Causes of Malnutrition in society**  
 (source UNICEF, 1998).

Malnutrition is a complex problem since it has multiple causative factors as shown in Fig.3. The framework reflects relationships among factors and their influences on children's nutritional status. According to the GOK and UNICEF (1998) a child's nutrition status and health depend on the well being of the mother, her knowledge and level of awareness, personal hygiene, the feeding practices she adopts and, above all, the care that she gives to the dependent child. Relatives and others also influence the child's well being in the community through their knowledge, practices and attitudes.

Feeding practices of children under two years are an underlying biological and behavioural determinant of the nutrition status of children. The feeding patterns include exclusive breastfeeding for six months of life, timely introduction of complementary feeds and continued breastfeeding for at least twenty-four months. Inadequate food intake directly affects the nutrition status and is a consequence of insufficient food availability at household level and improper feeding practices. The latter include both the quality and quantity of food offered to young children as well as timing for their introduction (ORC Macro, 2004).

## **2.6 Breastfeeding Information**

Women face many sources of information on breastfeeding, ranging from the traditional birth attendants, relatives, friends, media, and printed articles, out of their own experiences, observation, and HCWs. Conflicting information is thus common and confusing especially to the first time mothers (MOH/UNICEF, 1990).

A general decline in breastfeeding has been observed in developing countries, this has occurred as women move into the cities and join the work force, and the constant advertisements for commercial baby foods. Bottle-feeding is thus perceived as the modern way and breastfeeding as old fashioned and inconvenient (WHO/FAO, 1992). Urbanization has further caused erosion of traditional family and community support structures leading to lack of exchange of

information on optimal breastfeeding practices (Mukuria, 1999). Even though breastfeeding is a natural act, it is also a learned behaviour. Virtually all women can breastfeed provided they have accurate information, and support within their families and communities and from health care system. Inadequate knowledge about feeding practices is often a greater determinant of malnutrition than lack of food (WHO/UNICEF, 2003).

Health care workers (HCWs) have a major influence on the incidence and duration of breastfeeding (WHO/FAO, 1992). Mothers value the medical professional opinions when it comes to infant feeding choices. Therefore HCWs have a pivotal role in providing the much-needed support that mothers need to successfully breastfeed. HCWs are strategically placed to correcting any misconceptions concerning the sufficiency of exclusive breastfeeding for the first six months of life through antenatal and postnatal clinics, by offering scientific facts on appropriate feeding practices. Mothers should be supported and encouraged to exclusively breastfeed for the first six months and intensify effort to ensure that the mothers have better access to health services and information ((MOH/UNICEF, 1990; Onayade et al 2004).

However, the knowledge on exclusive breastfeeding and exposure to health services did not influence the rate of exclusive breastfeeding in a study done at Kangemi-Nairobi. Mothers process the information they receive from health institutions in the light of their cultural beliefs. These cultural beliefs influence infant feeding and are thought to be transmitted as information through interactions with the social network and mothers' previous experience (Mukuria, 1999).

Women need information, about how often to feed their babies, introduction of other drinks and foods, common problems resulting from breastfeeding such as sore nipples, sore breast, no enough milk, too much milk and leaking breast among others (King, 1992). Support and counselling for women and their

willingness to breastfeed are important factors for proper breastfeeding practices. HCWs should inform the pregnant and lactating women the benefits and management of breastfeeding problems; they should encourage and inform them about exclusive breastfeeding their infants for the first 6 months with no emphasis on complementary feeds.

The importance of having access to complete accurate and unbiased information cannot be over emphasized. Women have a right to full information on child feeding patterns and to decide how to feed their children (WHO/UNICEF, 2003).

## **2.7 Government Policy and Actions**

In 1991 the Kenyan government issued a national policy on infant and young children feeding practices that incorporates and combines the baby friendly initiative of the ten steps to successful breastfeeding. These spell out what every maternal and child health facility ought to do in promotion, protection and support of breastfeeding. It states that HCWs should be trained in skills necessary to implement the policy (MOH, 1991) **(See copy in the appendix II).**

The following are the ten steps to successful breastfeeding, according to the baby friendly initiative (UNICEF, 2006).

1. Have a written breastfeeding policy that is routinely communicated to all health staff.
2. Train all health staff in the skills necessary to implement the breastfeeding policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding soon after birth.
5. Show the mothers how to breastfeed and how to maintain lactation even if they are separated from their babies.

6. Give newborns no food or drink other than breast milk, unless medically indicated.
7. Practice rooming-in, allowing mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or dummies to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

In addition, Kenya is a signatory of WHO/ UNICEF code for marketing of breast milk substitutes, which aims at limiting the promotion of formula milk. The international code of marketing breast milk substitutes was established in 1981 by the general assembly of the world Health Organization (WHO). This code and a number of subsequent World Health Assembly resolutions, on the marketing of breast milk, such as infant formula, ensure that mothers are not discouraged from breastfeeding and that substitutes are used safely when needed. The International Code bans all promotion of bottle-feeding and sets out requirements for labelling and information on infant feeding. Any activity, which undermines breastfeeding, also violates the aim and spirit of the Code.

**Key points:**

- Baby food companies may not:
  - ♥ Promote their products in hospitals, shops or to the general public
  - ♥ Give free samples to mothers or free or subsidized supplies to hospitals or maternity wards
  - ♥ Give gifts to health workers or mothers
  - ♥ Promote their products to health workers: any information provided by companies must contain only scientific and factual matters
  - ♥ Promote foods or drinks for babies
  - ♥ Give misleading information

- There should be no contact between baby milk company sales personnel and mothers.
- Labels must be in a language understood by the mother and must include a clear health warning.
- Baby pictures may not be shown on baby milk labels.
- The labels must not include language, which idealizes the use of the product.

In 1992 the government in collaboration with the University of Nairobi and the Kenyatta National Hospital commenced the Lactation Management Education with an aim of training multidisciplinary team of health professionals in lactation management. The trained health professionals are expected to disseminate this information to their colleagues at the health facilities and more so to the mothers in order to inform and manage their breastfeeding problems (Mirie, 2001).

## **2.8 The Knowledge Gap**

Literature review yields information on trends on mother's breastfeeding practices most of which are inappropriate. However, little or no research has been done in Nairobi to associate the breastfeeding practices to the nutrition status and growth of children. The association needs be further explored using experimental studies. The accuracy of the actual messages given by various sources of information and especially the health care workers regarding breastfeeding has not been established.

In addition, little has also been done in evaluating the growth of children using the national growth and monitoring charts among others.

## CHAPTER THREE

### 3.0 METHODOLOGY

#### 3.1 Study Setting

The study was conducted in Nairobi, the capital city of Kenya. It is the smallest yet most densely populated province among the eight provinces in Kenya. Nairobi was established in 1899 as a small settlement during the construction of the Kenya – Uganda railway. The name Nairobi that means 'cool waters' was derived from the Maasai community.

##### 3.1.1 The Population

Nairobi has a population of 2 143 254 people according to the 1999 population census and a population density of 3,079 people per square kilometre. Being a cosmopolitan city, it has people from all the ethnic groups in Kenya and there are people from other races (GOK, 1997). The main religions are Christianity and Islam.

The city has a diverse population of different social economic classes. For instance it has the high-class people living in areas like Karen, Lavington and Muthaiga, middle class areas are Southland's, Westland's and Kahawa Sukari. Examples of low class areas are Kangemi, Kawangware and Dagoretti. Areas of very low social economic class include slums like Kibera, Mukuru wa Kwa Njenga, Korogocho and Mathare.

##### 3.1.2 Topography, Climate and Administration

Nairobi is 1930m above the sea level and covers an area of 696 square kilometres (GOK, 2001). This is approximately 0.1% of Kenya's total land area. The city is situated at the edge of Athi plains and borders Kajiado district to the south, Kiambu district to the west Thika district to the north and Machakos to the east. It is situated at latitude 1<sup>0</sup> south of the equator and longitude 36.6<sup>0</sup> east of the Greenwich meridian.



Its temperatures are altitude modified i.e. tropical. The months of July and August are distinctly cool. The mean annual rainfall is 1080mm. The long rains are from March to May and short rains from October to December. The mean annual temperature is 17<sup>0</sup> C and the daily maximum and minimum temperatures are 23<sup>0</sup>C and 12<sup>0</sup>C, respectively.

Nairobi has seven administrative divisions namely Parklands, Kasarani, Makadara, Pumwani, Nairobi National Park, Kibera and Dagoreti that are under the district officers; in each of the divisions there are several locations each headed by a chief. Being a capital city it is the seat for the government and the administrative headquarters.

### **3.1.3 Infrastructure and social services**

It has good road network, railways, and telecommunication services. However, their maintenance and efficiency is often deficient, hence have deteriorated over time. The city has two main airports namely the Jomo Kenyatta International and Wilson airports and an air base.

The municipal council supplies water to the city residents, though it is characterized by shortages necessitating services of water vendors within the estates.

The Kenya Power and Lighting Company supplies power to all its subscribers, however, in some parts of Nairobi frequent power cuts and low voltages are characteristic of the supply. The slum areas of Nairobi normally lack most of the above infrastructure and services.

Nairobi has a wide source of information which include the paid-for services, for example, the Internet, emailing services, print media; local, regional and international magazines, books and newspapers, among others. Conferences,

seminars, workshops that are held by various institutions form a source of information. The media disseminates information through radios, radio cassettes, televisions and videocassettes. Others include notice boards and posters placed at various places in the city, for example, in streets, churches, government offices, and health facilities, among others.

#### **3.1.4 Health facilities**

Nairobi has various health facilities regulated by the Medical, Pharmacy and Poisons Board. These range from hospitals, clinics, pharmacies, and laboratories among others. There are both public and private health facilities. The Government, through a parastatal, runs the Kenyatta National Hospital, which is the largest teaching and referral hospital in Kenya; Mbagathi District Hospital and Spinal Injury Hospital. The private hospitals include Nairobi, Aga Khan, M.P. Shah and Matter among others. There are other health facilities run by missionaries, private practitioners and non-governmental organizations.

In addition, the city council runs the Pumwani Maternity Hospital, health centres and dispensaries that are distributed all over the Nairobi area. They provide the following services: Maternity, Curative, Pharmacy, Maternal and Child Health (MCH) and Family Planning services. The MCH clinics constitute the following sections: growth and monitoring, immunizations, curative and antenatal clinic. The City Council health facilities are mainly utilized by the people of low social economic status.

The health facilities have a role in dissemination of information through displaying posters about health and nutritional issues in their premises, for example, prevention of HIV/AIDS or positioning a child during breastfeeding. They hold education sessions/seminars for their staffs and the public members where various health related topics are explored, and through their staffs, interpersonal counselling or education of their clients is carried out in their respective clinics. In

addition, the health facilities use various sources of information including brochures, magazines, and television in disseminating health related information to the public.

### 3.2 Study Design

This was a cross-sectional descriptive study, whose aim was to generate data on maternal breastfeeding practices and its relation to the growth and nutritional status of children 0-24 months in Nairobi.

### 3.3 Study Population

A dyad of mother and child 0-24 months of age attending the MCH clinics and the outpatient of the selected health facilities in Nairobi was the study population. The age category of infants and children was chosen on basis of recommendations of the minimum and maximum total breastfeeding periods of zero and 24 months, respectively.

### 3.4 Sampling

#### 3.4.1 Sample size determination

Using the Fisher's formula for sample size calculation the minimum number of mothers to be included in the study was determined (Fisher et al 1991).

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

Where  $n$ = the desired sample size

$Z$ = the standard normal deviation set at 1.96

$p$ = the proportion in the target population estimated to have a particular characteristic. The proportion of women in Nairobi who breastfeed up to the recommended 24 months is 57.3% (CBS, 2004).

$q$ =  $(1.0 - p)$ , the women in Nairobi who do not breastfeed up to the recommended 24 months is 42.7%.

d= the degree of accuracy desired, set at 5 % i.e. 0.05

$$n = \frac{(1.96)^2 \times 0.573 \times 0.427}{(0.05)^2} \quad n=376$$

The minimum number of mothers that were to be included in the study was 376 nevertheless, 418 mother and child dyads comprised the study sample. The reasons for targeting a bigger sample size was for the purpose of ensuring adequate sample size in case some of the questionnaires were discarded during the cleaning and analysis phase of the study.

### 3.4.2 Sampling Procedure

A multistage sampling method was used to arrive to the sampling units of the study.

- Purposive sampling was utilized in choosing Nairobi province for the study on basis of logistics.
- Again purposive sampling was used in deciding to base the study at the City Council health facilities, since they are well distributed in all the seven administrative divisions of Nairobi. They are accessible and affordable by the vast majority of people utilizing them thus serves a large number of populations in Nairobi as compared to other health facilities.
- The City Council has divided their health facilities into eight units for ease of administration based on the geographical location. However; the health centres in any unit provide a homogenous set of health services. For the purpose of this study four out the eight administrative units namely Central, Westland, Pumwani, Kibera, Kasarani, Embakasi, Makadara and Dagoreti were considered for the study. **(See the sampling frame of the eight units in the Appendix III)**
- Simple random sampling method was applied in the selection of four administrative units, where by each of the eight names of the City Council administrative units was written on a paper, folded and then the eight folded papers put in a container. After mixing the papers, a blindfolded person was asked to pick one paper. The name of the administrative unit written on the

picked paper was noted down and the paper placed back into the container. The process was repeated until four papers had been picked containing names of four administrative units namely Westlands, Kasarani, Kibera and Dagoreti.

- Based on wide population coverage and clients turn out, a health facility was selected (purposive sampling) from the four administrative units. The following were selected: Kangemi, Riruta, Langata and Mathare North health centers.
- From the four-selected health facilities probability proportionate method was used to determine the minimum number of mothers that were to be studied from each facility.

The average monthly attendance in the four health centers,  $N = 25,380$

The minimum required sample size,  $n = 376$

The proportionate constant,  $k = \frac{n}{N} = \frac{376}{25380}$

$$N \quad 25380$$

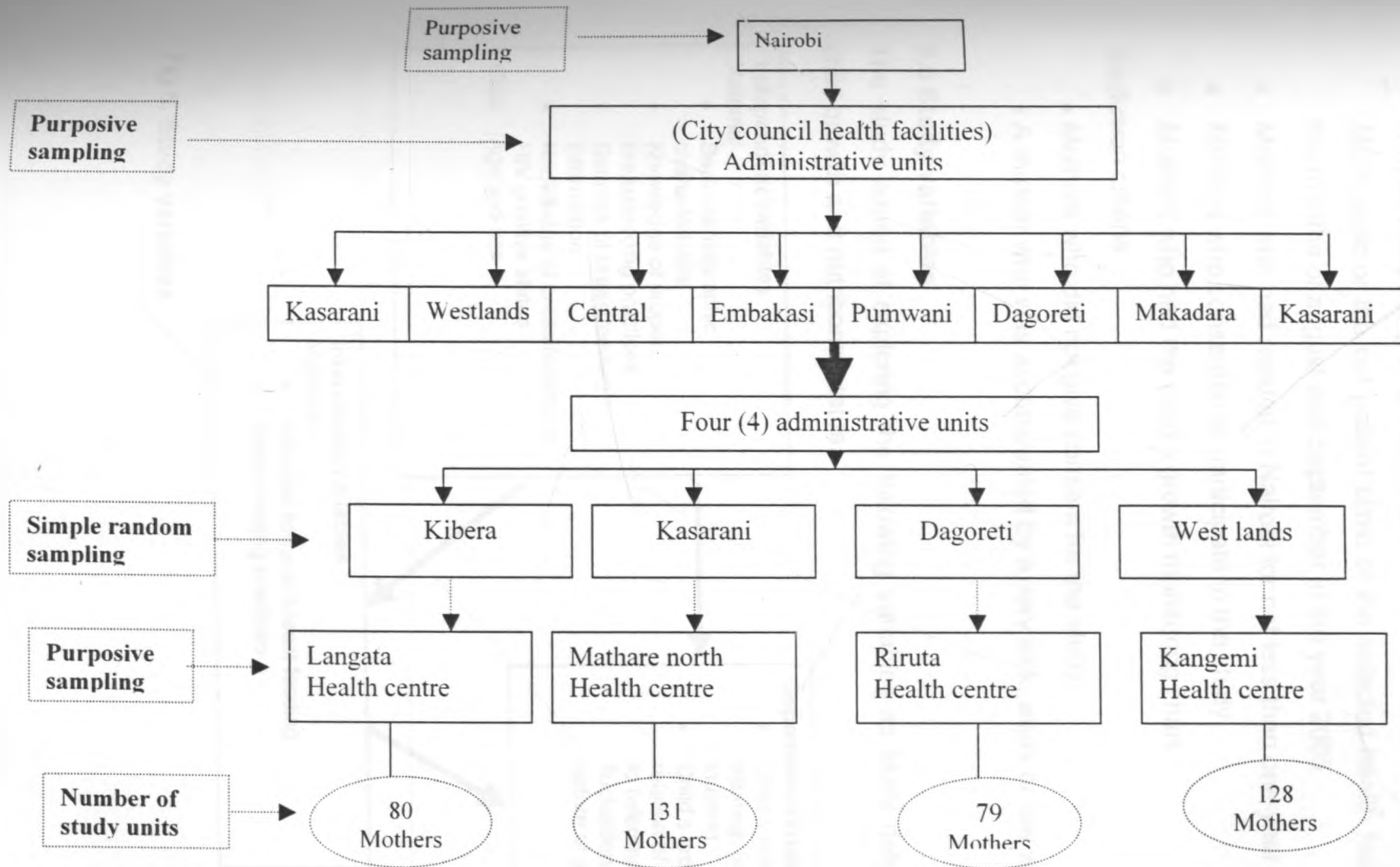
$$= 0.015$$

**Table1 Proportionate sampling**

Health facility	Monthly attendance	Minimum number of mothers that were to be studied	Number of mothers studied
Riruta	4820	$0.015 \times 4820 = 72$	<b>79</b>
Langata	4660	$0.015 \times 4660 = 69$	<b>80</b>
Mathare North	8330	$0.015 \times 8330 = 123$	<b>131</b>
Kangemi	7570	$0.015 \times 7570 = 112$	<b>128</b>

- As the mothers arrived, growth and monitoring/ immunization cards were obtained and the age of the child ascertained. Cards whose child/infant was within 0-24 months were given numbers in order of arrival such that the mother with a number 1(one) card would be the one who arrived the earliest. Then a research assistant would approach the mother with a number and on consent they would interview them. Thus, all qualified dyads that consented were interviewed until the desired sample size (more than the minimum required number) was obtained. The actual number of interviewed mothers exceeded the minimum number to be interviewed, this

was done in order to maximise on the sample size in an event of spoilt questionnaires since there was no way of following up the mothers after they left the clinics. There was no systematised way of allocating a mother to the study since it was established that mothers attended clinics with no appointments hence their arrival was random.



**Fig.4 Schematic Drawing of the Sampling Procedure**

NB; All the mothers visiting the health facility at the time of data collection and met the inclusion criteria were interviewed until the desired sample size was achieved.

### 3.4.3 Sampling criteria

#### Inclusion Criteria

- A dyad comprising of a mother and her 0 – 24 months old child attending MCH clinic or the out patient clinic of the selected health facilities during the months of August and September in the year 2005.
- Mothers who had resided in Nairobi for not less than one-year period.
- Mothers who consented to participate in the study.
- Mothers who had the child's growth monitoring chart.

#### Exclusion criteria

- Mothers who did not give consent for the study.
- A mother who was accompanied by a very sick, weak or low weight child.

### 3.5 Study variables

The study aimed at exploring the following variables as likely determinants of child growth and nutritional status.

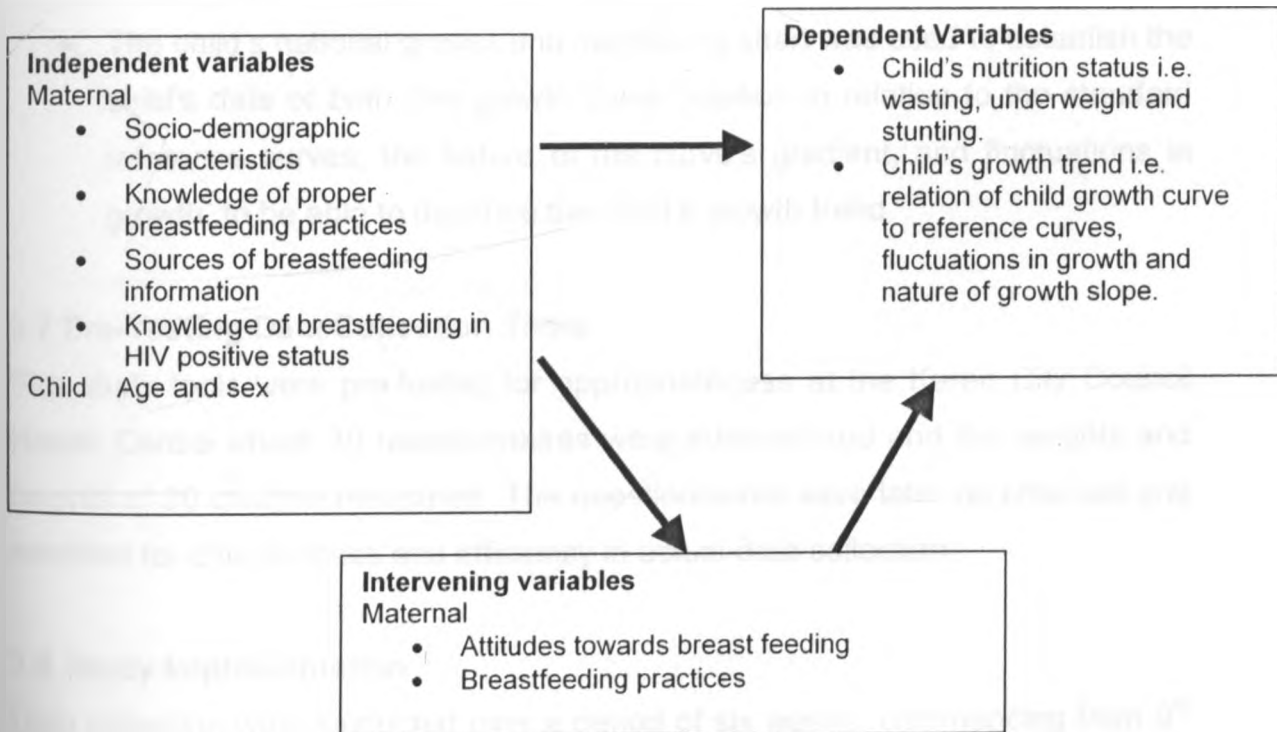


Fig 5. Study variables



### **3.6 Study Tools**

- A structured questionnaire was administered to the mothers (**see Appendix 1**). The questionnaire contained the following sections:- maternal socio-demographic and child characteristics, knowledge, attitudes and practices regarding breastfeeding, HIV status awareness, breastfeeding information sources, the anthropometrics and growth of the children.
- A Salter scale, in kilograms and weighing to accuracy of 0.1kilograms,was used to measure weights of 0-24 months old children in order to determine the nutritional status indices; weight for age and weight for height. The scale had a maximum weighing potential of 25 kilograms.
- A measuring length board graduated in centimetres, with a sliding foot piece was used to measure the length of the 0-24 months children for the purpose of determining the height for age and weight for height indices for nutritional status.
- The child's national growth and monitoring chart was used to establish the child's date of birth, the growth curve position in relation to the standard reference curves, the nature of the curve's gradient, and fluctuations in growth, to be able to describe the child's growth trend.

### **3.7 Pre-Testing Data Collection Tools**

The study tools were pre-tested for appropriateness at the Karen City Council Health Centre where 30 questionnaires were administered and the weights and heights of 30 children measured. The questionnaires were later on checked and modified for effectiveness and efficiency in actual data collection.

### **3.8 Study Implementation**

Data collection was conducted over a period of six weeks, commencing from 9<sup>th</sup> August to 20<sup>th</sup> of September in the year 2005.

### 3.8.1 Training of research assistants

Four undergraduate students on attachment at the selected health facilities were recruited and trained to assist in the questionnaire administration and taking the anthropometric measurements. This was carried out over duration of five days prior to pre-testing of study tools. The following was the training curriculum used.

**Table 2. Training curriculum for research assistants.**

Subject matter	Teaching method	Teaching aids	Day
<ul style="list-style-type: none"> <li>▪ Study title, objectives, aim and purpose.</li> <li>▪ Questionnaire contents; understanding the questions and the codes.</li> </ul>	<p>Lecture</p> <p>Discussion</p>	<p>Chalk board</p> <p>Chalk</p> <p>Notes</p> <p>Drafted questionnaire</p>	1 <sup>st</sup> day
<ul style="list-style-type: none"> <li>▪ Taking anthropometric measurements; Procedure of measuring weights using a salter scale, taking lengths using a length board, recording of findings.</li> <li>▪ Assessment of oedema</li> </ul>	<p>Demonstration</p> <p>Asking &amp; answering questions</p>	<p>Dummy child</p> <p>Notes</p> <p>Salter scale</p> <p>Measuring board</p>	2 <sup>nd</sup> day
<ul style="list-style-type: none"> <li>▪ Growth and monitoring chart; Purpose of the chart, interpretation of the graph/chart, recording findings.</li> </ul>	<p>Demonstration</p> <p>Lecture</p>	<p>Copies of growth &amp; monitoring chart</p>	3 <sup>rd</sup> day
<ul style="list-style-type: none"> <li>▪ Interviewing skills &amp;</li> <li>▪ Questionnaire administration i.e. asking of questions in English as written down, or standardized asking of questions after translation into Kiswahili, probing, clarification of answers, filling the responses.</li> </ul>	<p>Role play</p> <p>Asking &amp; answering questions</p> <p>Discussions</p>	<p>Chalk board</p> <p>Chalk</p> <p>Copies of the questionnaire</p>	4 <sup>th</sup> day
<ul style="list-style-type: none"> <li>▪ Ethics during field work; obtaining consent, maintaining confidentiality and creating and maintaining a rapport with respondents</li> <li>▪ Evaluation of the training</li> </ul>	<p>Discussion</p> <p>Role play</p> <p>Asking questions</p>	<p>Sheet with questions</p>	5 <sup>th</sup> day

### 3.8.2 Assessment of oedema

This was the first assessment for a child/infant; if one was found to be oedematous then no anthropometric measurements were taken since it meant that the child was severely malnourished.

The middle and index fingers were used to gently palpate the anterior region of the ankle for five seconds; pitting on removing the fingers confirmed presence of oedema. Sustained skin turgor i.e. no pitting on withdrawal of the fingers, confirmed absence of oedema.

### 3.8.3 Obtaining the anthropometrical measurements

- **Length**

A length board was placed on a firm flat surface; a child was then laid on the board in a supine position, head firmly against the fixed head board, with the eyes looking vertically. Applying firm pressure extended the knees. The feet flexed at right angle to the lower limbs. Then an upright sliding foot piece was moved to obtain firm contact with the heels and the length reading was taken to the nearest 0.1cm; a second reading was made to the nearest 0.1 cm and both readings were recorded on a table in the questionnaire. Two measurements were taken in order to reduce the intra-observer error. The average length was calculated soon after the interview by summing up the two readings then finding out the average reading.

i.e.  $\frac{1\text{st reading} + 2^{\text{nd}} \text{ reading}}{2}$

- **Weight**

Prior to fieldwork the salter scales were checked for accuracy using a standard 2kg sugar packet. The scale measuring up to a maximum of 25 kg was suspended on a steady pole to ensure the child's safety. A plastic pant was then placed on it and the pointer reading adjusted to zero. The child was undressed (leaving minimal clothing) and placed in the weighing pants. For

infants aged two months and below whose necks had not stabilised, were laid in a sisal basket, which had been placed on the salter hook and the pointer, adjusted to zero, in order to guard their safety. Holding the child safely, the child on the weighing scale was suspended. After the pointer stopped wobbling then the readings were taken. Duplicate readings were taken in order to reduce on the intra-observer error, consequently to the nearest 0.1kg and recorded on a table in the questionnaire. The average weights were calculated soon after the interview by summing up the two readings then finding out the average reading.

$$\text{i.e. } \frac{1\text{st reading} + 2^{\text{nd}} \text{ reading}}{2}$$

**NB:** The acceptable interval between the first and second readings was set at plus (+) or minus (-) 0.2 cm for length and 0.2 kg for weight.

### **3.8.4 Questionnaire administration**

An informed verbal consent was obtained prior to the interview of each study subject. A structured questionnaire was then administered to the subjects.

### **3.8.5 Interpretation of the growth and monitoring chart**

A growth-monitoring chart of each child was obtained from the mother and ascertained that it belonged to that particular child. The child's date of birth was noted down. All the plotted weight readings were calculated to ensure the number of plotted weights was as expected for that age and any missing plot was noted and recorded. (The first weight plotting is the birth weight and the consequent weight/s plotting are monthly weight for growth monitoring).

The child's growth curve (made up of all weight plotting) was observed for its position with regard to the standard reference curves at two standard deviations i.e. either within the two reference curves, above the upper reference curve or below the lower reference curve. The curve was further assessed for its slope/gradient i.e. either positive, negative or zero gradient. Finally the curve was

checked for any fluctuations (decreasing slopes at any time) and these were recorded as the number of decline in weight plotted.

### **3.9 Ethical Consideration**

The permission and authority to conduct the study was sought and granted from the Ministry of Education, Science and Technology. Authorization letters were forwarded to the district heads of the selected health facilities. Further the permit was obtained from the Nairobi City Council Medical Officer of Health. Administrators of the four health facilities were approached with the letter from the Medical Officer of Health and informed of the proposed study in their facility. A commitment was made that the findings of the study would be made available to the participating health facilities.

Each study respondent was informed of the title of the study, its objectives and the aim. Then the respondent's verbal consent was sought and once obtained the interview ensued. The study was not conducted with mothers who met the study inclusion criteria but did not consent to participate in the study. Confidentiality of collected information was ensured through numbering of questionnaires other than indicating the names of the respondents.

### **3.10 Data Quality Assurance**

Research assistants were trained on how to conduct the study, see the training curriculum (Table 2). Two supervisors were identified to edit where necessary and give constructive comments about this study prior to data collection and during the compilation of the report.

Every day the salter scales were standardized using a 2kg weight to ensure their accuracy in measurements. The plastic pan and the sisal basket were first placed on the hook of the scale and the pointer adjusted to zero reading before taking any child's weight. Two readings of weights and heights were obtained to improve on the accuracy of the readings. The hanging poles for the Salter scale

were checked daily to ensure that they were steady and the surface on which the length board was placed was flat and steady to ensure accuracy in measurements.

The completed questionnaires were crosschecked for any missing data. A close supportive supervision of the research assistants and a daily review of their experiences and problems was maintained. On data entry to the computer SPSS program, further screening for errors and outliers was carried out. Anthropometric data was validated using the Epi-Nut program.

### **3.11 Data analysis and presentation**

The data collected was entered in the computer Statistical Package for Social Sciences (SPSS), and screened in preparation for presentation and analysis. Data was also prepared for presentation using the spreadsheet (Excel package). Various forms of presentation were used i.e. frequencies, counts, proportions, percentages, charts, tables and graphs.

Anthropometrical data (age, weight and length measurements) was entered in the SPSS package then exported to the Epi-nut package where data was cleaned and Z-scores for the indicators of nutrition status obtained. Three standard nutritional indicators were used i.e. the weight for height (Wasting), weight for age (Underweight) and height for age (Stunting), these were expressed in standard deviations (Z-scores) from the mean of the international reference population according to the National Centre for Health Statistics (NCHS) (WHO, 1983). Deviations of the indicators below  $-2.01$  to  $-3$  standard deviation indicated that the children were moderately malnourished, deviations below  $-3$  indicated severely malnourished children while a deviation of  $-2$  to  $1.99$  reflected well-nourished children, beyond z-scores of  $2$  indicated overnutrition.

The following is the data analysis matrix showing the variables explored with their indicators and the statistical methods used in assessing the central tendency,

distribution, frequencies, percentages, relative risks and significance of some relations. Tests of significance were used for purposes of interpretation and hypothesis test i.e. the Chi-square to determine the associations between variables. Correlation analyses were used to measure strength of relationship between variables. The level of significance was set at 0.05. Odds ratio was calculated to estimate the relative risk in order to determine the strength of associations.

### Table3 Data analysis matrix

(The findings will be prepared for presentation in various forums for discussions, recommendations and further actions in future).

Variables	Indicators	Statistical methods
Maternal socio-demographic characteristics	<ul style="list-style-type: none"> <li>▪ Age</li> <li>▪ Duration of stay in Nairobi</li> <li>▪ No. of children</li> <li>▪ Monthly household income</li> <li>▪ Occupation</li> <li>▪ Marital status</li> <li>▪ Level of education</li> <li>▪ Division of residence</li> </ul>	Frequencies Percentages Mean Standard deviation Confidence interval Mode Median Range
Child characteristics	<ul style="list-style-type: none"> <li>▪ Age</li> <li>▪ Sex</li> <li>▪ Place of birth</li> </ul>	Frequencies Percentages Mean, Mode, range Confidence interval
Maternal attitudes towards breastfeeding	Opinion on the; <ul style="list-style-type: none"> <li>▪ Importance of breastfeeding</li> <li>▪ Expression of breast milk</li> </ul>	Frequencies Percentages
Sources of breastfeeding information	Main sources Awareness of the right to obtaining information from HCWs	Frequencies Percentages
Knowledge of breastfeeding in a HIV positive status	Awareness on whether to breastfeed	Frequencies Percentages

<p>Maternal knowledge on the recommended breastfeeding practices</p>	<p>Knowledge of;</p> <ul style="list-style-type: none"> <li>• Time of initiating breastfeeding</li> <li>• Giving of colostrum and benefits</li> <li>• Duration of EBF</li> <li>• Total duration of breastfeeding</li> <li>• Items used in feeding fluids to young children</li> <li>• Demand /scheduled breastfeeding</li> </ul>	<p>Frequencies Percentages Mean Standard deviation Confidence interval Mode Range</p>
<p>Nutrition status of children</p>	<ul style="list-style-type: none"> <li>▪ Wasting</li> <li>▪ Underweight</li> <li>▪ Stunting</li> <li>▪ Edema</li> </ul>	<p>Frequencies Percentages</p>
<p>Growth trends of children</p>	<ul style="list-style-type: none"> <li>▪ Position of the current weight against the reference curves <ul style="list-style-type: none"> <li>♥ Within (3 points)</li> <li>♥ Above (2 points)</li> <li>♥ Below (1 point)</li> </ul> </li> <li>▪ Gradient of the slope <ul style="list-style-type: none"> <li>♥ Positive (3 points)</li> <li>♥ Zero (2 points)</li> <li>♥ Negative (1 point)</li> </ul> </li> <li>▪ Periods of weight loss <ul style="list-style-type: none"> <li>♥ None (3 points)</li> <li>♥ One (2 points)</li> <li>♥ More than two (1 point)</li> </ul> </li> <li>▪ Growth performance, based on the scores of each attribute for the three indicators per child.</li> </ul>	<p>Frequencies Percentages Mean Standard deviation Mode Median</p>



<p>Maternal breastfeeding practices</p>	<ul style="list-style-type: none"> <li>• Time of initiating breastfeeding</li> <li>• Giving of prelacteal feeds to newborns</li> <li>• Exclusive breastfeeding for the first six months of life</li> <li>• Items used in giving fluids to children</li> <li>• Continuing breastfeeding until and/or beyond two years</li> <li>• On demand /scheduled breastfeeding</li> <li>• Overall breastfeeding practice performance in points.</li> </ul> <p>(One point for each correctly done practice per mother, then all summed up to give the overall performance for each mother).</p>	<p>Frequencies Percentages Mean Standard deviation Confidence interval Mode Range</p>
<p>Relations between the following variables; maternal/child socio-demographic factors, maternal knowledge and performance of the recommended breastfeeding practices and the growth and nutrition status of children.</p>	<p>Maternal performance on the recommended breastfeeding practices with;</p> <ul style="list-style-type: none"> <li>▪ Maternal/child socio-demographic factors</li> <li>▪ Growth performance of children</li> <li>▪ Nutrition status of children</li> <li>• Maternal knowledge of the recommended breastfeeding practices</li> </ul>	<p>Frequencies Percentages Odds ratio Chi-square Correlation</p>

### 3.12 Study Limitations

The study was carried out in a public health setting hence the findings do not portray the situation among the users of private health facilities. The study was only able to capture information from the mothers utilizing health facilities thus missing information about the same issue among none users of health facilities in Nairobi.

A few growth and monitoring cards had been erroneously entered by the health care workers thus information about the growth of the particular children was not obtained but this did not interfere with the rest of information.

## CHAPTER FOUR

### 4.0 RESULTS

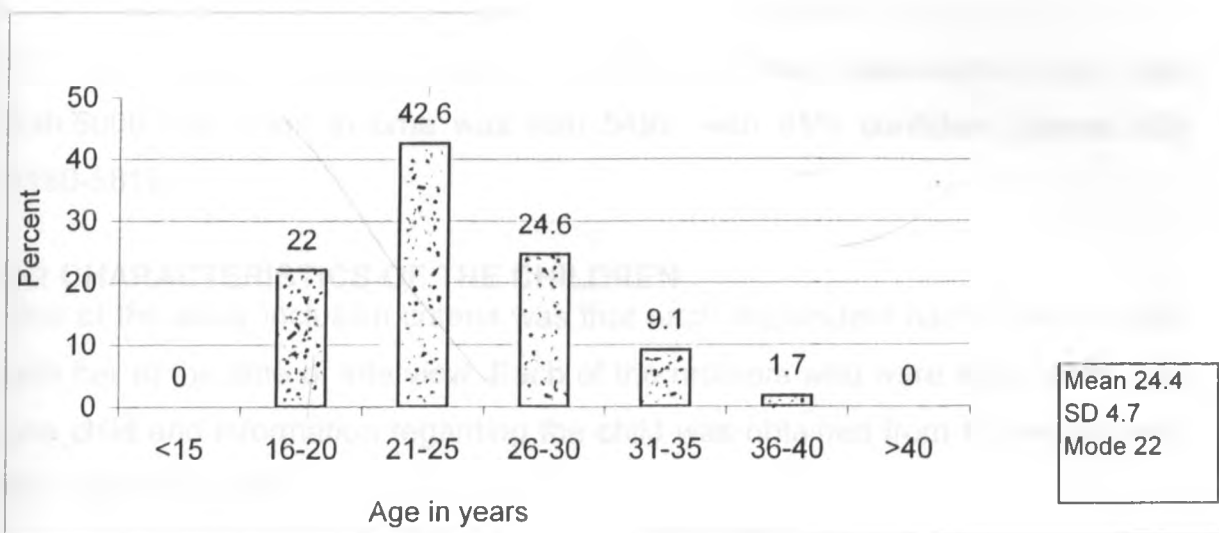
#### 4.1 MATERNAL SOCIAL DEMOGRAPHIC CHARACTERISTICS

A total of 418 mothers attending four selected city council health facilities were interviewed and their children (n=418) assessed for growth and nutritional status. A majority 91.1% of the mothers were married, 98.1% were Christians 93.7% had attained primary and secondary levels of education and 62.7% were housewives while 21.3% were self employed. Table 4 illustrates the profile further.

**Table 4. Maternal socio-demographic characteristics**

Socio-demographic characteristics	Frequency (N=418)	Percent (%)
<b>I Residence (Division) &amp; Health Facilities</b>		
Kasarani (Mathare HC)	131	31.3
Westlands (Kangemi HC)	128	30.6
Langata (Langata HC)	80	19.1
Dagoreti (Riruta HC)	79	18.9
<b>II Marital status</b>		
Married	381	91.1
Single	34	8.1
Others- divorced & widowed	3	0.7
<b>III Religion</b>		
Christian	410	98.1
Muslim	7	1.7
Others-atheists	1	0.2
<b>IV Level of education</b>		
Primary	243	58.1
Secondary	149	35.6
Tertiary	17	4.0
No formal education	9	2.2
<b>V Maternal Occupation</b>		
Housewives	262	62.6
Self employment	89	21.3
Unemployed	27	6.5
Formal employment	22	5.3
Casual employment	13	3.1
Students	5	1.2

A majority (67.2%) of the interviewed mothers were in the age group 21 – 30 years with modal class (42.6 %) being 21-25 years. The minimum age was 17 years while the maximum was 39 years (range 22 years). Fig.6 illustrates these findings.



**Fig.6 Maternal Age (n=418)**

Approximately 87% of the mothers had one to three children (38.3% had 1 child, 31.6% had 2 children, 17.2% had 3 children), 8.4% had 4 and 4.5% more than 5 children. The minimum and maximum number of children by the women were 1 and 10 respectively (range of 9 years).

The mean number of children was 2.05 with a standard deviation (SD) of 1.09. The mean was calculated with the exclusion of 6 outliers ( $\geq$  to six children).

A majority of the women 67.8 % had lived in Nairobi for at most 5 years, 19.8 % for 5 to 10years while 11.8 % had lived for more than ten years. The minimum and maximum duration of stay within Nairobi was 1 and 34 years, respectively. The median years lived in Nairobi were four while the mode was one year ( one year duration of stay was mentioned more than any other year).

#### **4.1.2 Monthly Household Income**

Out of the 418 households, 42.3% had a monthly income of between Ksh.2500 – 5000. A further 17.2% of the households had a monthly income of Ksh.5001 – 7500, 15.5% had Ksh. 7501 – 10000 while 14.1% had an income of less than Ksh.2500 and the remaining 10.8% had a monthly income of more than Ksh.10, 000. The minimum and maximum monthly income were Ksh.500 and Ksh.37, 000 respectively.

The median and mode monthly incomes of the households were both Ksh.5000. The mean income was Ksh 5499, with 95% confident interval (CI) 5180-5819.

#### 4.2 CHARACTERISTICS OF THE CHILDREN

One of the study inclusion criteria was that each respondent had to have a child with her at the time of interview. Each of the mothers who were interviewed had one child and information regarding the child was obtained from the mother and the child's records.

The males made up to 51.9% of all the children in the study, the rest 48.1% were females. About 68.2% of the children had been born in a hospital set-up while 31.8% were born at home. Over half of the children (63.2%) were less than 7 months of age, 89.3% were aged one year and less and only 9.8% were more than a year old (Fig 7).

The mean age was 5.8 months at 95% CI 5.4 –6.2 with exclusion of outliers ( $\geq 17.9$  months) while the modal class was 0-3 months of age. The minimum and maximum ages recorded were 1 day and 23.6 months respectively. Fig.7 illustrates these findings.

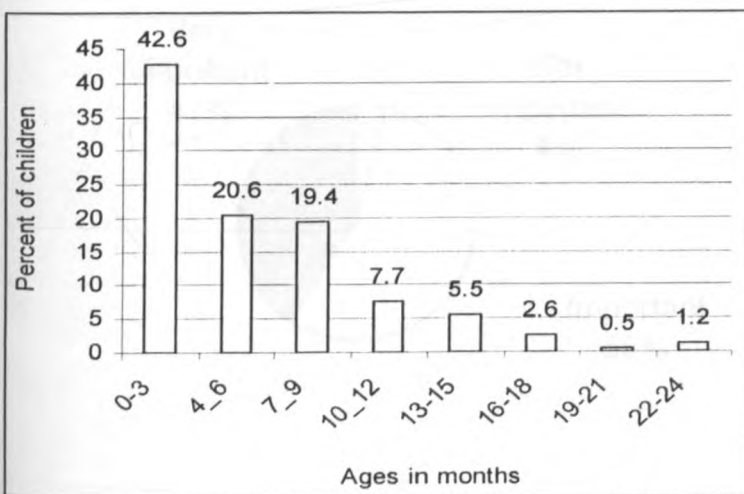


Fig.7 Age categories of children in months (n=418)

About half of the children were less than four months of age, two thirds in the same age group had been introduced to complementary feeds contrary to the recommendations and only 39% were EBF. Virtually all children were on breast milk regardless of the age group, discontinuation of breastfeeding increased gradually with age. The proportion of bottle fed children was highest among the 0-4 months old children and lowest among the 13-24 months old. There was no difference in mode of feeding between the male and female children

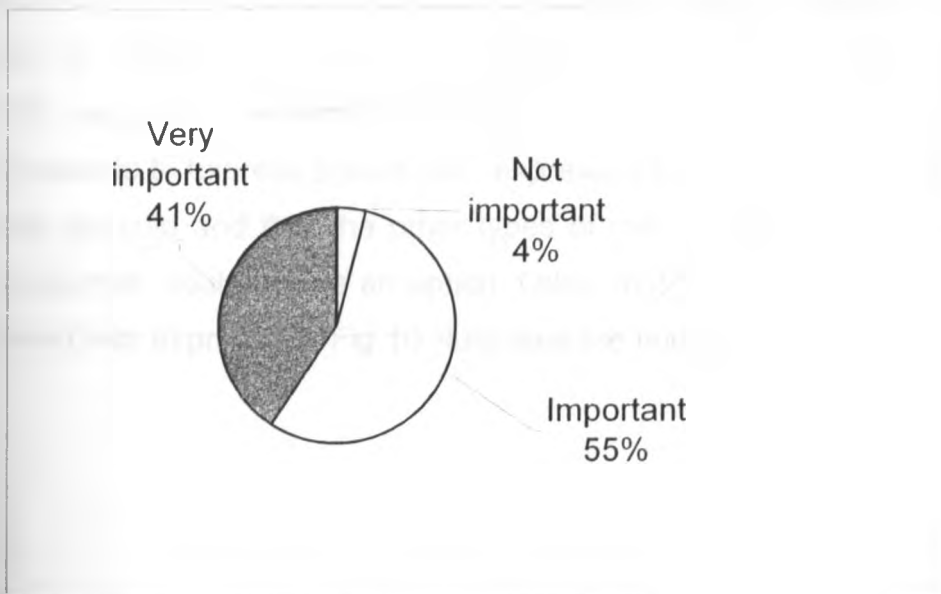
**Table 5. Age, sex profiles and feeding modes of the children in percentages**

Ages in months	Exclusively breastfeeding	Started on Complementary	Continuing breastfeeding	Not breastfeeding	Bottle fed with nipple	Number of children
0-4	38.6	61.4	99.5	0.5	31.1	205 (49%)
5-6	8.5	91.5	96.6	3.4	13	59 (14.1%)
7-12	2.9	97.1	97.3	2.7	17.7	113 (27%)
13-24	0	100	92.7	7.3	7.3	41 (9.8%)
Male	20	80	98.1	1.9	23.7	215 (51.9%)
Female	20.1	79.9	97.5	2.5	17.8	199 (48.1)

### 4.3 MATERNAL ATTITUDES TOWARDS BREASTFEEDING

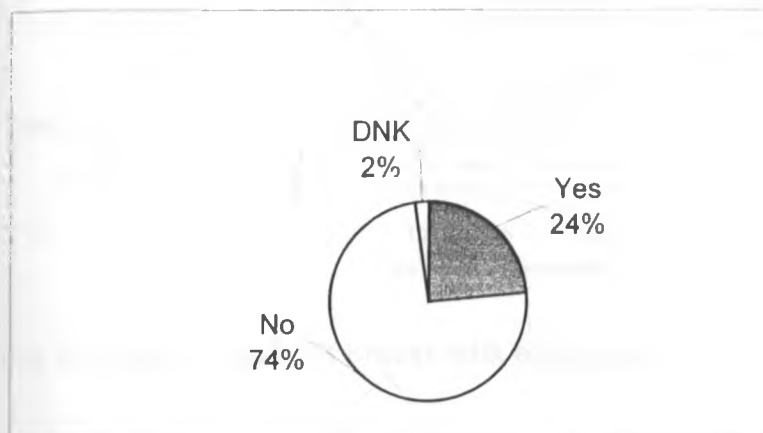
When asked how they would rate breastfeeding in a scale of importance, 55.3% rated it important, 40.9% very important while a 3.8% considered it not important.

Fig.8 further illustrates the foregoing.



**Fig.8 Maternal rating of breastfeeding**

When asked whether they would express breast milk and leave it for the child to be given if they had to be away from home for more than 4 hours, a majority of the mothers 74.2% reported that they would not, 23.7% would express breast milk while 2.1% were not sure whether they would express see Fig.9 below.



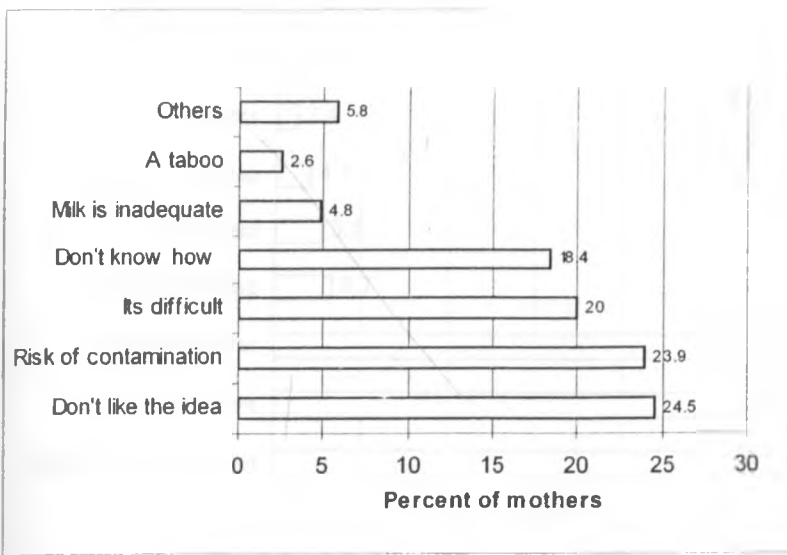
\*DNK stands for don't know

**Fig.9 Mothers opinions on whether they would express breast milk**

#### **4.3.1 Reasons Why Mothers Would Not Express Breast Milk**

Various reasons were given by the mothers (74% see Fig 9), who indicated that they would not express breast milk even when they had to be away for more than 4 hours from their child.

Most of the reasons given showed a negative attitude towards expressing breast milk for instance not liking the idea of expression but others indicated lack of skills necessary for breast milk expression. Included in the 'others' were; it is impossible to express breast milk, expressed breast milk would lose its nutrients, may get cold and that the other types of milk were available hence expressing breast milk would not be an option. Other mothers said they had never heard of breast milk expression. Fig.10 illustrates the findings.

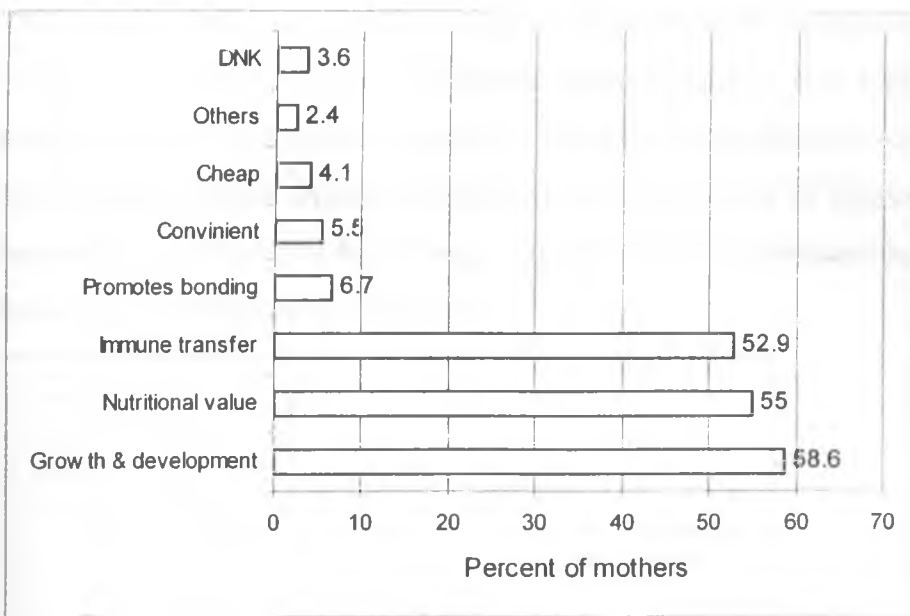


**Fig.10 Reasons against breast milk expression**

#### **4.4 BREASTFEEDING KNOWLEDGE AND PRACTICE**

Each mother was asked to mention all the breastfeeding benefits to a child that she was aware of. This question yielded multiple responses.

The majority (58.6%) of the mothers mentioned growth and development, 55% nutritional value, 52.9% immune transfer, promotion of bonding was mentioned by 6.7%. Other benefits that were mentioned included convenience in terms of having minimal preparations (5.5%), minimal costs compared to other feeds (4.1%), while 3.6% of the mothers did not know any benefit of breastfeeding. The other benefits mentioned by 2.4% of the mothers were prevention of breast engorgement and comforting the child in times of agitation. Fig.11 illustrates these findings.



**Fig.11 Benefits of breastfeeding (n=418)**

Among all the 418 mothers interviewed, only 1% (4) had never breastfed their child, all the rest 99% had breastfed.

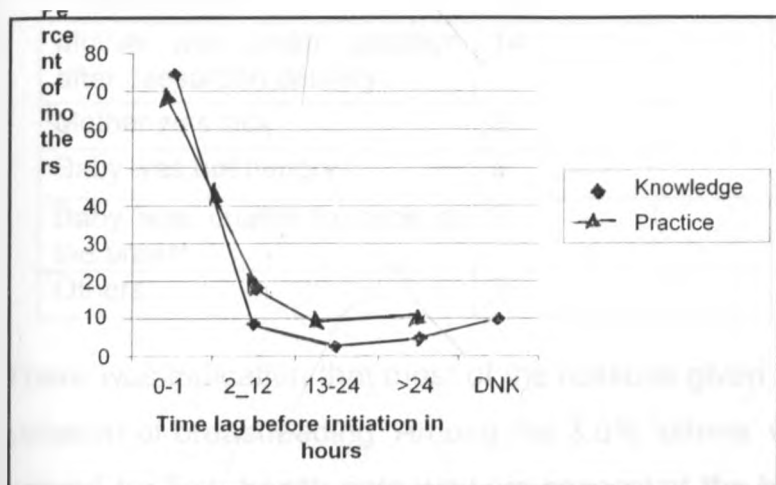
Among those who failed to breastfeed one said that she was sick, two were HIV positive and one had been advised not to breastfeed from the hospital. These mothers (4) were excluded from questions regarding breastfeeding practices such as initiation of breastfeeding, giving of prelacteal feeds, age of introduction of complementary feeds, continuing breastfeeding and demand/scheduled breastfeeding.

#### **4.4.1 Initiation of Breastfeeding after Child Birth**

A total of 418 mothers were asked when breastfeeding should be initiated. A majority 74.6% responded that a child should be breastfed within 0 – 1 hour after birth, 8.6% said after 2-12 hours and 6.8% said after 13 hours and beyond after child birth. The maximum duration after child birth at which breastfeeding should be initiated was 48 hours. But 10% of the mothers did not know after what duration is suitable for initiation of breastfeeding after childbirth.



When asked at what duration in hours, they actually initiated breastfeeding after child birth, 65.9% out of 414 mothers responded 0-1, 18% said 2-12 while 16.1% initiated after 13 hours and beyond. The maximum duration of actual initiation of breastfeeding after childbirth was thirty-six hours. Fig.12 illustrates the difference between the maternal knowledge and the actual practice regarding duration of initiating breastfeeding to a child.



**Fig. 12 Time lag before initiation of breastfeeding after childbirth**

There was a significant relationship between the responses in terms of the correct and incorrect knowledge and practice regarding duration of breastfeeding initiation after childbirth (chi-square 109 at 1 degrees of freedom  $p < 0.05$ ). An odds ratio of 22.8 i.e. mothers who knew that breastfeeding should be initiated within one hour were 23 times likely to do so compared to those who had incorrect knowledge about breastfeeding initiation after child birth.

Mothers who initiated breastfeeding after one hour of childbirth (141) were further asked why they did not do so within the recommended duration of one hour after childbirth. The reasons given were as follows;

**Table 6 Reasons why mothers did not initiate breastfeeding within one hour of childbirth**

Reasons given by mothers	Frequency (n=141)	Percent (%)
No breast milk produced	49	34.8
Mother was tired	16	11.3
Baby slept	15	10.6
Baby was sick	16	11.3
Mother was under sedation after caesarean delivery	14	9.9
Mother was sick	9	6.4
Baby was not hungry	9	6.4
Baby was unable to suck at the breast	8	5.7
Others	5	3.5

There was indication that most of the reasons given were not appropriate for late initiation of breastfeeding. Among the 3.5% 'others' were that the child had to be prayed for first, health care workers separated the baby from its mother for long and lack of knowledge on when to initiate breastfeeding.

#### **4.4.2 Prelacteal feeds**

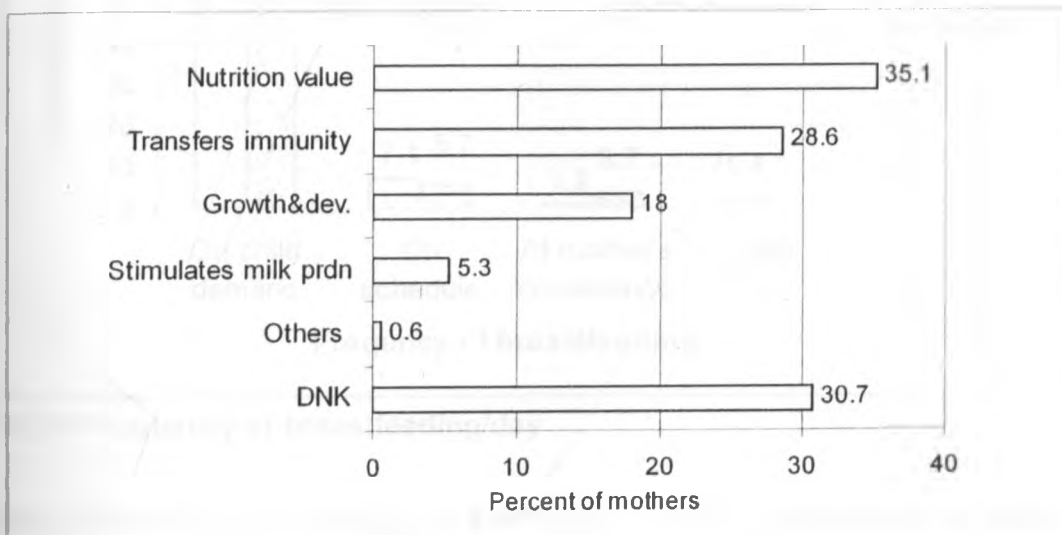
A majority of the mothers 79% (326) did not give any prelacteals feeds to their newborn; only 21 % (88) gave prelacteal feeds. Among the 88 mothers who gave prelacteal feeds the following type of feeds were given 44.6% sugary/ glucose water, 21.7% plain water, 18.1% formula milk, 9.6% sugary salty water, others 6% other types of milk and gripe water.

#### **4.4.3 Colostrum**

Among 418 mothers who were asked whether colostrum should be given to a child, a majority (76.8%) answered in affirmative, 14.8% said it should not be given while 8.4% did not know whether it should be given to a child.

Each of the mothers 76.8% (321) who answered in affirmative were asked to give various reasons why colostrum is good for a newborn. There were multiple responses given from each mother depending on her knowledge on the benefits of colostrum to a newborn.

Nutrition value was only mentioned by 35.1% of the mothers and transfer of immunity by 28.6% while 0.6% of the mothers said that giving colostrum keeps the baby warm and that it promotes initial maternal and child bonding. Further 30.7% mothers, who even though had indicated that a newborn should be given colostrum, did not know why it should be given to a child. Fig.13 further illustrates the findings.



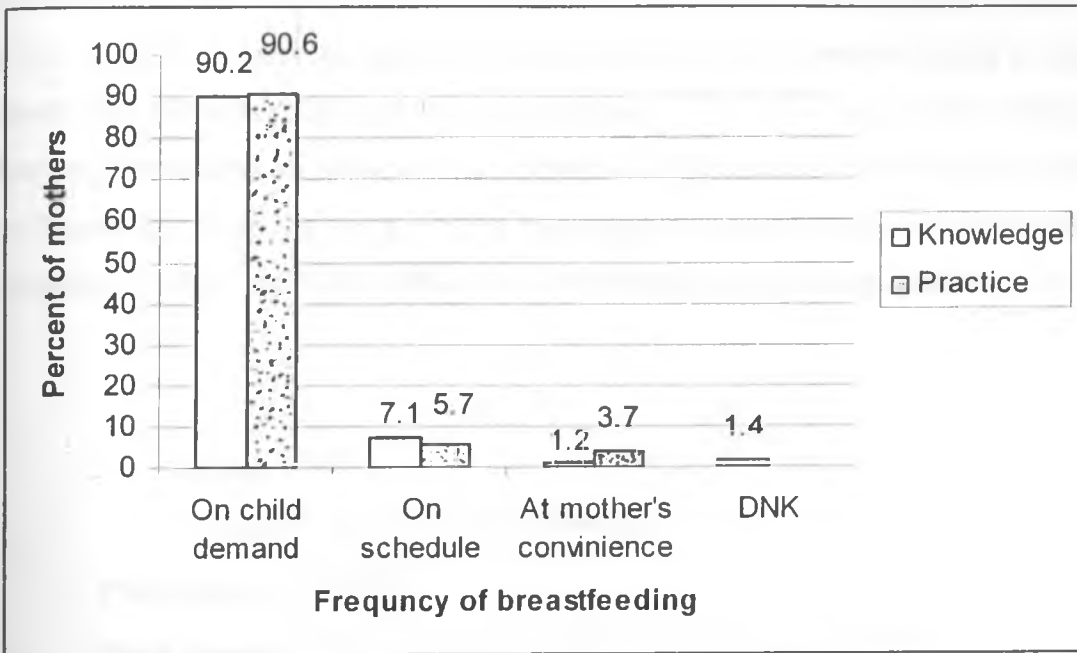
**Fig.13 Benefits of colostrum (n=321)**

Among 14.8% (62) mothers who said that colostrum should not be given to a child, had various reasons against giving colostrum. Some (39.3 %) said it was dirty, others 31.2% said it was bad for the child another 8.2% said it had no nutritional value, while 21.3% said it is either too thick, watery or smells bad.

#### **4.4.4 Frequency of Breastfeeding A Child**

The majority 89% (377) of the mothers knew that a child should be breastfed on demand, 7.1% (30) said it should be done on a time schedule, for example, after 2 - 6 hours while the rest 1.2% (5) said that it should be at mother's convenient time. But 1.4% (6) did not know how often a child should be breast-fed.

When asked how they actually breastfed their child. A majority (90.1%) said on child demand. 5.3% mothers followed a timing schedule, where by 4.0 % breastfed after 2–4 hours and 1.2% after 4-12 hours. A few 4.6% mothers breastfed the child at their convenient time. Fig.14 illustrates the knowledge and practices as regards frequency of breastfeeding.



**Fig.14 Frequency of breastfeeding/day**

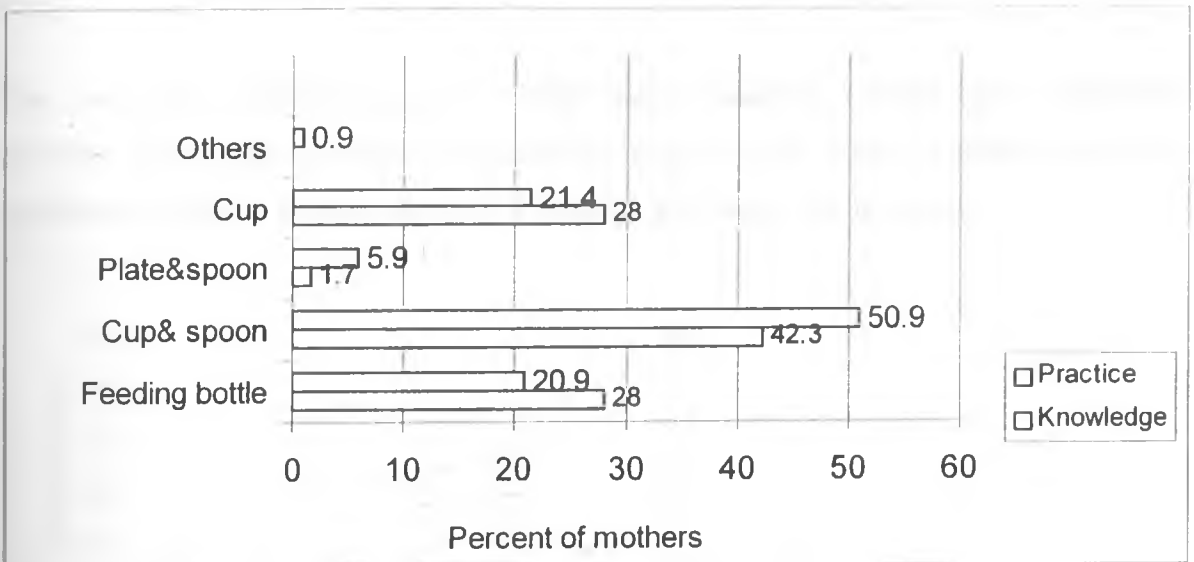
The Chi-square of 46.495 df 1  $p < 0.001$  ( $< 0.05$ ) indicate that there was a significant association between the responses given for knowledge and practice regarding the frequency of breastfeeding. Odds ratio of 10.2 i.e. mothers who knew that breastfeeding should be on child's demand were 10 times more likely to practice breastfeeding on demand compared to those who did not have the correct information.

#### **4.4.5 Items used in giving fluids to young children**

It is recommended that children be fed fluids with a cup, spoon or tube, as thus bottles with artificial teats should not be used since they interfere with effective suckling at the breast.

When all the respondents (418) were asked what should be used in feeding fluids to a child 42.3% said a cup and spoon, 28% said a cup and another (28.5%) said a feeding bottle with an artificial teat. Few of the mothers (1.7%) said a bowl/plate and a spoon.

Mothers who were not exclusively breastfeeding at the time of data collection (335 i.e 80.1 %) were asked what they actually used in feeding fluids to their child. Half of them (50.9%) said cup and spoon, 21.4% a cup while 20.9% said a feeding bottle with an artificial teat. Others 0.9% said they either used a syringe or fingers to scoop the feed. Fig.15 illustrates the knowledge and practices in relation to items that the mothers use for feeding their babies with liquid foods.



**Fig.15 Items used in feeding liquid feeds to children**

There was a significant association between the correct and incorrect responses given for knowledge and practice as regards items used to feed fluids Chi-square=135.7 df 1 sig.<0.001. An odds ratio of 30.2 i.e. mothers who did not mention feeding bottles with artificial teats as an item for use in feeding fluids to children were 30.3 times likely not to use them in practice as compared to those mothers who mentioned them .The practice is good in that less mothers (20.9%)

actually use feeding bottles as compared to mothers 28% who said that they should be used.

#### 4.4.6 Exclusive Breastfeeding

Exclusive breastfeeding (EBF) is recommended for the first six months of life, in achievement of optimal growth, development and health. Thereafter, in order to meet the infants' evolving nutritional requirements, they should receive complementary foods while breastfeeding up to two years of age or beyond (UNICEF and WHO, 2003).

When asked for how long a child should be exclusively breastfed, 44.7% said for 6 months, 68.2% said within 4 - 6 months, 26.3% said for duration less than four months, while 1.2% said for more than 7 months. The remaining 4.3% did not know for how long a child should be exclusively breastfed.

The minimum duration given for EBF was 1 week (1.43%) and maximum duration 12 months (0.24%). The mean duration of EBF was 4.6 months at 95 % confidence interval plus or minus 0.2. Fig.16 illustrates the findings.

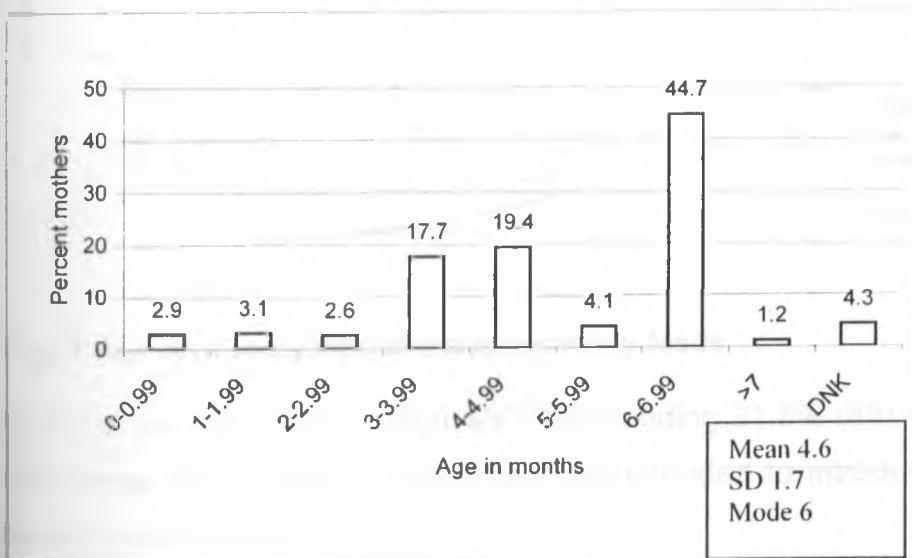
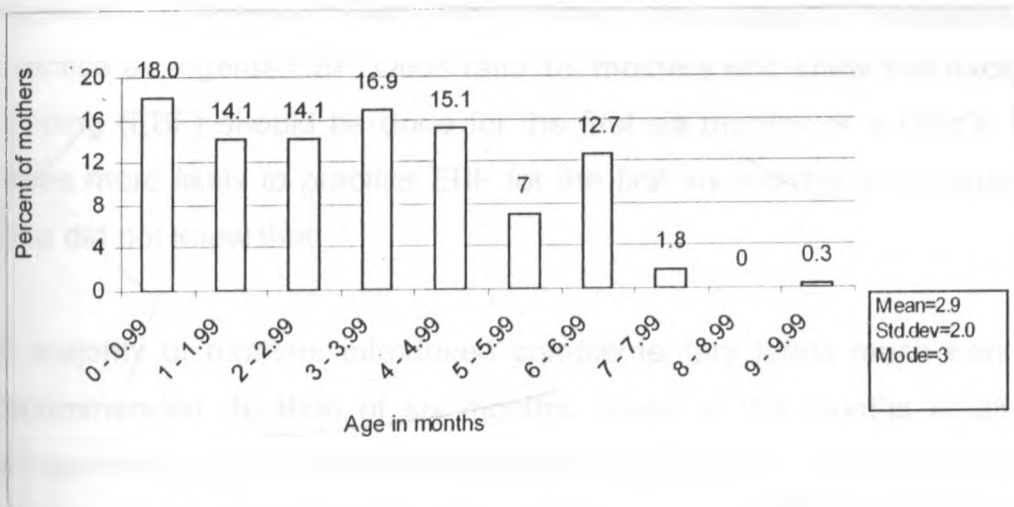


Fig.16 Duration of exclusive breastfeeding

#### 4.4.7 Age at introduction of complementary feeds

At the time of data collection 79.5% (331) of the interviewed mothers had introduced complementary feeds while 21.5% (83) were still EBF. When the 331 mothers who had introduced complementary feeds to their child were asked at what age they introduced, 12.7% said within the 6th month, 34.4% said between 4-6 months, 63.4% said when the child was less than four months while a few 2.1% introduced at 7months and above.

The minimum age of complementary feeds introduction was 0.03 months (at birth) among 0.9% of the mothers and the maximum age was 9 months among 0.3% of the mothers. Fig.17 illustrates these findings.

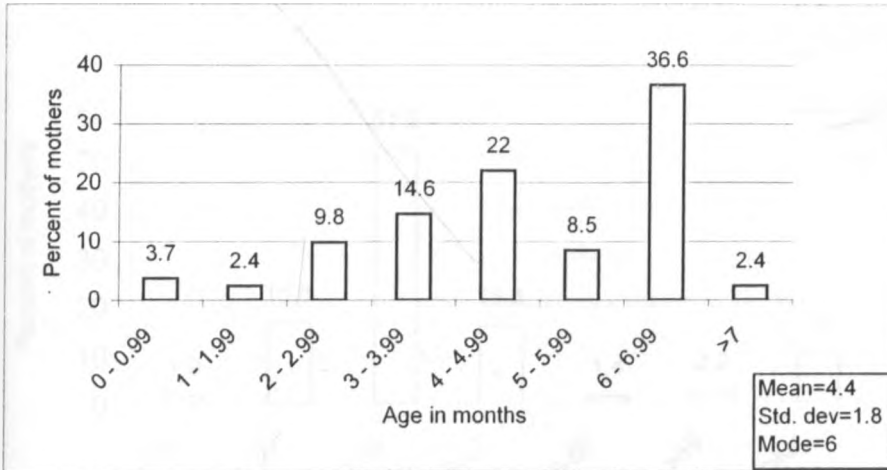


**Fig.17 Age at introduction of complementary feeds**

Mothers, who were still exclusively breastfeeding 21.5% (83), gave the following responses when asked at what age they intended to introduce complementary feeds to their babies;

At six months by 36.6 % (mode of 6 months); 67.1% between 4-6 months; 26.8% at an age less than 4 months. A few (2.4%) said at more than 7 months. The minimum and maximum ages at which complementary feeds were to be

introduced ranged from 2 weeks to 9 months respectively. Fig.18 illustrates these findings.



**Fig.18 Intended age for introduction of complementary feeds**

A chi-square of 39.434 df 1 significance <0.001 indicates that there was a significant difference between the correct and incorrect knowledge and actual practice as regards EBF. Odds ratio 15, mothers who knew that exclusive breast feeding (EBF) should be done for the first six months of a child's life were 15 times more likely to practice EBF for the first six months as compared to those who did not know that.

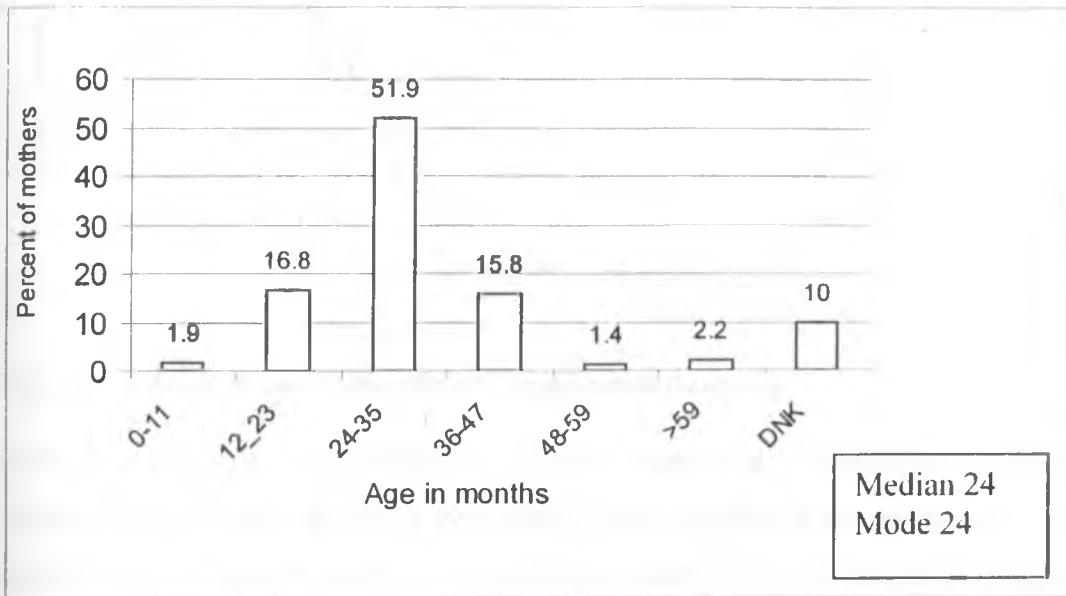
A majority of mothers introduced complementary feeds much earlier than the recommended duration of six months, mean of 2.9 months at 95% CI  $\pm 0.2$ . Those mothers who were still EBF at the time of data collection had the intention of introducing feeds at the mean age of 4.4 months at 95% CI  $\pm 0.4$ . Though slightly higher than in actual practice it was still lower than the recommended age.

#### **4.4.8 Total Duration of Breastfeeding**

It is recommended that breastfeeding should continue even after complementary feeds introduction for at least when the child is two years of age. When asked the total duration for which a child should be breastfed, 71.3% said 24 months and beyond while 18.7% reported duration less than 24 months. The rest (10%) did not know for how long a child is to be breastfed. The minimum and maximum



duration of total breastfeeding given was 6 and 60 months, respectively (range 54 months). Fig.19 illustrates the situation.



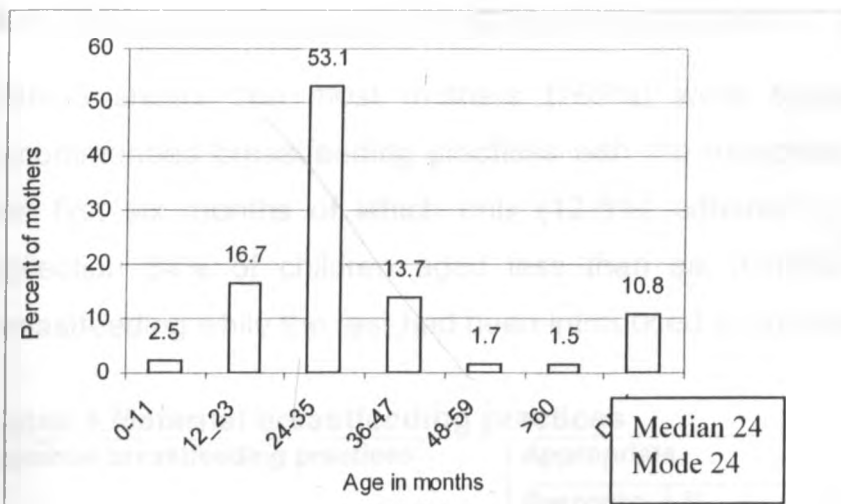
**Fig.19a. Knowledge of total duration for breastfeeding (n=418)**

Out of 414 mothers who had ever breastfed the index child, 97.8% were still breastfeeding at the time of the interview, on the other hand 2.2% of the mothers had stopped breastfeeding their child. The minimum and maximum duration in months at which breastfeeding was discontinued was 2 and 18 respectively (range= 16 months). The reasons given for stopping breast-feeding before the age of 24 months were; inadequacy of breast milk (4), baby refused to breastfeed (3) and that mother was sick (2).

Out of the 405 mothers who were continuing breastfeeding at the time of the study, 69.4% intended to stop breastfeeding their child at the age of 24 months and beyond, 19.2% would stop at an age less than 24 months while 11.6% did not know when they intended to stop breastfeeding.

The mean duration at which breastfeeding was to be stopped was 24.3 months with standard deviation of 6.7. The minimum and maximum age of a child at which the mothers intended to stop was 2 months (0.2%) and 72 months (0.5%).

Fig.19 further illustrates.



**Fig.19b. Intended age in months of total breastfeeding**

The following is a summary of the maternal knowledge regarding six recommended breastfeeding practices. The majority of the mothers (>70%) had correct knowledge regarding the practices apart from EBF for the first six months of which only 44.7% had correct knowledge. Some mothers had incorrect knowledge while a few others had no idea about the recommended breastfeeding practices. Table 7 further illustrates case for knowledge on proper breast feeding practices.

Recommended breastfeeding practices (N=418)	Knowledge status					
	Correct		Incorrect		No idea	
	Frequency	%	Frequency	%	Frequency	%
Initiation of breastfeeding within one hour	297	71.1	79	18.9	42	10
Giving of colostrum to a newborn	321	76.8	62	14.8	18	8.4
Breastfeeding on child demand	377	89	35	9.6	6	1.4
None use of feeding bottles with artificial teats for fluids	301	71.5	117	28.5	-	-
Exclusive breastfeeding for the first six months of an infant	187	44.7	213	51	18	4.3
Breastfeeding for at least 24 months and/or beyond	298	71.3	78	18.7	42	10

**Table7 Maternal knowledge on proper breastfeeding practices**

#### 4.4.9 Summary of maternal breastfeeding practices

Table 8 shows that most mothers (>65%) were compliant to most of the recommended breastfeeding practices with the exception of EBF their child for the first six months of which only (12.6%) adhered to. At the time of data collection 34% of children aged less than six months were still exclusively breastfeeding while the rest had been introduced to complementary feeds.

**Table 8 Maternal breastfeeding practices**

Maternal breastfeeding practices	Appropriate			Inappropriate		
	Response	%	No.	Response	%	No.
Ever breastfed the child (n=418)	Yes	99%	414	No	1%	4
Initiated breastfeeding within one hour of child birth (414)	Yes	61.1%	253	No	38.9%	161
Gave prelacteal feeds (414)	No	79%	326	Yes	21%	88
Breastfed on child demand (405)	Yes	90.9%	368	No	9.1%	37
Used feeding bottles with artificial teats in feeding fluids to the child (340)	No	79.1%	269	Yes	20.9%	71
Children that EBF for the first six months (331)	Yes	12.6%	42	No	87.4%	289
Children < than six months EBF (235)	Yes	34%	80	No	66%	155
Continuing breastfeeding (414)	Yes	97.8%	405	No	2.2%	9

The study aimed at exploring the following maternal breastfeeding practices;

- Time of initiating breastfeeding
- Giving of prelacteal feeds to newborns
- Exclusive breastfeeding for the first six months of life
- Items used in giving fluids to children
- Continuing breastfeeding until and/or beyond two years
- On-demand breastfeeding

To determine maternal performance on the practices, each of the above practices was awarded one point such that each mother was given points depending on the number of practices complied with. For instance, a mother with all the six points indicated that she had complied with all the above practices, on the other hand a mother with zero points showed that she did not adhere to any

of the practices and so on. Thus the best performing mother in terms of breastfeeding is the one who had six points while the worst performer had zero points. Table 9 illustrates the findings

Points attained	Frequency (N=418)	Percent
0	3	0.7
1	5	1.2
2	37	8.9
3	79	18.9
4	142	34
5	132	31.6
6	20	4.8

**Table 9. Distribution of mothers by their performance on breastfeeding practices**

The mean score of breastfeeding practices performance was 4.0 (SD) 1.1. The mothers were then categorized into two, those with appropriate and inappropriate practices i.e. 50-100% of the score (3-6points) and 0-49% (<3 points) of the scores respectively. Thus, 89% (372) mothers had appropriate practices while only 11% (46) had inappropriate breastfeeding practices.

#### 4.4.10 Relationship between maternal breastfeeding performance and maternal/child socio-demographic factors

**Table10 Relationship between maternal/child socio-demographic factors and maternal breastfeeding practices performance.**

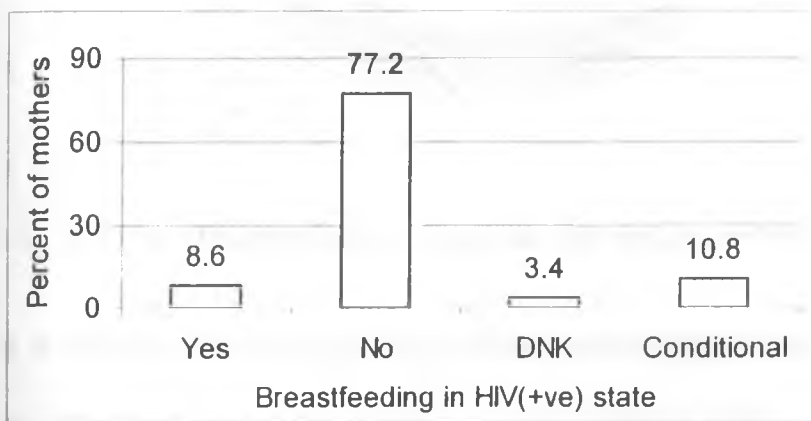
Socio-demographic characteristics	Correlation coefficient (r)	Significance (0.05 level)
Maternal age in years	0.099	<0.05
Number of children per mother	0.011	<0.05
Duration of residing in Nairobi in years	0.035	>0.05
Household monthly income	-0.031	>0.05
Age of children in months	-0.090	>0.05

There was a significant positive correlation between the maternal age, number of children a mother had and the mothers' performance scores of breastfeeding practices.

#### 4.5 BREASTFEEDING AND HIV STATUS

When 417 respondents (One respondent did not consent to answering this section) were asked whether a child should be breastfed by a HIV positive

mother, a majority 77.2% said that the child should not be breastfed while 8.6% said that the child should be breastfed regardless of the HIV status. However, 10.8% gave various conditions under which it should be done while a further 3.4% did not know what should be done. Fig 20 illustrates the findings.

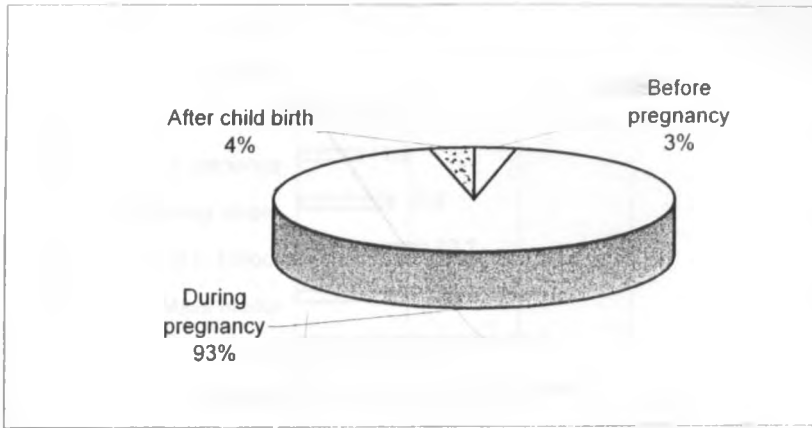


**Fig.20 Breastfeeding in HIV positive status (n=417)**

The 10.8% mothers, who said breastfeeding in HIV positive mother should be done under certain conditions, gave the following conditions to guide mother's decision on whether or not the child should be breastfed. The mother who is HIV positive should breastfeed exclusively for the first three to six months; the mother should decide whether or not to breastfeed her child; the mother should be on Anti Retroviral Therapy (ART) so as to breastfeed; mother should be advised by doctor on whether or not to breastfeed; it depends on mothers CD4 count and that if the child has mouth sores it should not be breast fed.

Among 77.2 % (324) of mothers, who said that a child should not be breastfed if its mother is HIV positive, gave the following reasons; 98.2% said that the child may get infected with the virus, 1.5% admitted not knowing the reason while 0.3% said that the mother's illness could get worse.

A majority of the mothers 91% were aware of their HIV status although 9% did not know their HIV status at the time of the interview. Among mothers who were aware of their HIV status, a majority 92.9% learnt of it during pregnancy. Fig 21 illustrates the findings.

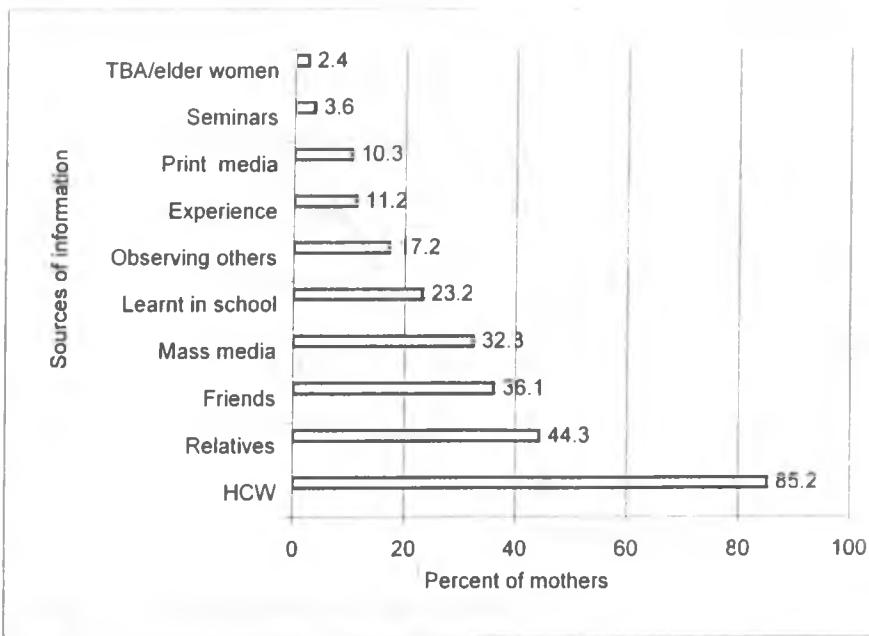


**Fig.21 Time of awareness of maternal HIV status (n=380)**

#### **4.6 SOURCES OF BREASTFEEDING INFORMATION**

A majority of the mothers (85.2%) had obtained information from the HCWs while 44.3% received from their relatives.

Among the relatives from where breastfeeding information was obtained, the mothers/mothers-in-law were the main source of information making up to 83.8%, sisters /sisters-in-law made up to 15.1% while husbands made up to only 1.1%. Mass media as a source of breastfeeding information consisted of the radio 91.1% and television 8.9%. Included in the print media were magazines 69.8%, health pamphlets 23.2% and posters 7%. The church (53.3%), women groups (26.7%) and finally the non-governmental institutions (20%) organized seminars, in which breastfeeding information was reported to have been disseminated from. Fig.22 further illustrates the findings.

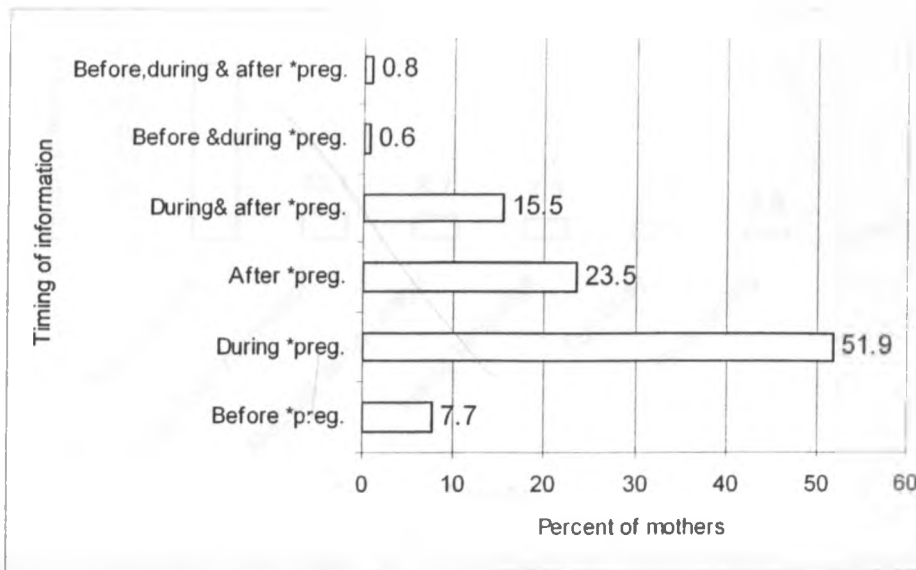


**Fig. 22 Sources of breastfeeding information (n=418)**

The respondents gave a similar pattern of responses when asked to mention their two main sources of breastfeeding information. Majority (79.7%) mentioned HCWs as main source of breastfeeding information, 35.9% relatives, 22.7% friends, 12.4% mass media, and 10.5% had learnt in school, 9.1% had observed others while experience and elder women were mentioned by 9.1% of the mothers. In an event of a breastfeeding problem, 88% mothers would consult HCWs for advice, 7% relatives and 3% elder women finally 2% would consult friends.

#### **4.6.1 Timing of Breastfeeding Information by HCWs**

About half of the mothers (51.9%), were informed about breastfeeding during pregnancy only, while about a quarter (23.5%) were informed only after child delivery. Fig.23 illustrates the rest of the findings.



\* preg. An abbreviation of pregnancy

**Fig.23 Timing of giving breastfeeding information by HCWs**

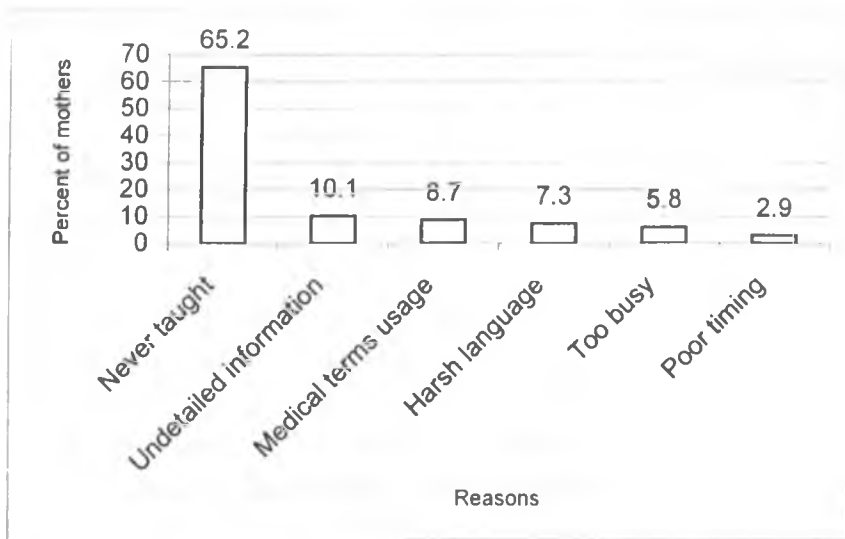
#### 4.6.2 Right to Breastfeeding Information

A majority of the mothers 95.7% (401) knew that they had a right to obtaining breastfeeding information from the health care workers. Nevertheless, a few 4.4 % ( 17) were not aware of the right.

Those who answered in affirmative 95.7% (401) were further asked whether the right to obtaining breastfeeding information from the health care workers was fulfilled. Most of them 79.1% (317) said it was fulfilled (among them 96.5% reported that the right was fulfilled through HCWs teaching and answering their questions about breastfeeding, in addition 3.5% said that the HCWs taught and demonstrated various aspects of breastfeeding).

A remaining 2.8% (11) said that they did not know whether or not the right to obtaining breastfeeding information from HCWs was fulfilled while 18.2% (73) said the right was not fulfilled. Among those who said that the right to breastfeeding information was not fulfilled, further gave the following reasons in support of the right not being fulfilled. A majority (65.2%) said that the HCWs had never taught them about breastfeeding, Fig.24 further illustrates.





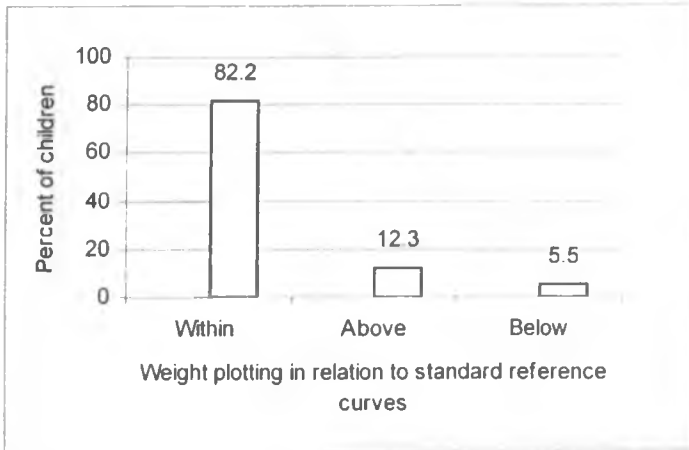
**Fig.24 Reasons for lack of fulfilment of the right to obtaining breastfeeding information from the HCWs**

#### **4.7 GROWTH OF CHILDREN**

There were two children whose growth charts had been recorded erroneously hence they were not entered for analysis. The growth trends of children were assessed using the national growth-monitoring charts (**see a copy on appendix 5**) based on the National Centre for Health Statistics (NCHS) reference standards. Evaluation of the child's growth was based on three indicators namely,

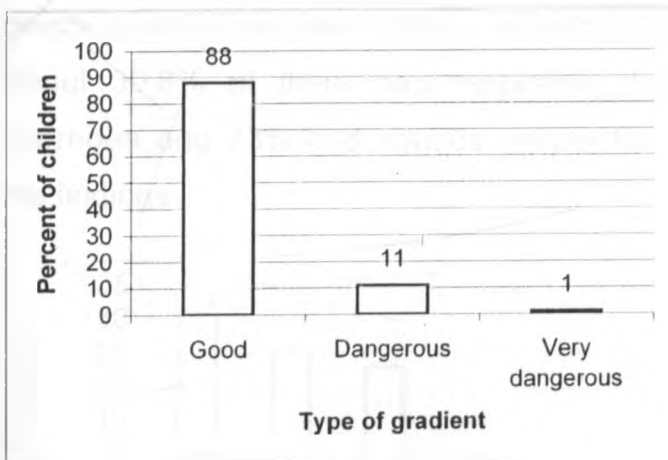
- Position of the current weight plotting against the two curves at two standard deviations of the NCHS reference standards. The child was in either above, below or within the two curves.
- The current gradient of the child's slope/curve, this was either positive denoting a good slope (increasing slope), negative denoting a very dangerous slope (decreasing slope) or zero gradient denoting a dangerous slope.
- Periods of weight loss. To ascertain whether the monthly weight plotted was a gain/loss and determine the number of periods of weight loss, which reflects growth fluctuations.

A majority (82.8%) of the children's growth curves lay within the reference curves at two standard deviations according to NCHS reference standards.



**Fig.25 Child weight plotting in relation to the standard reference curves**

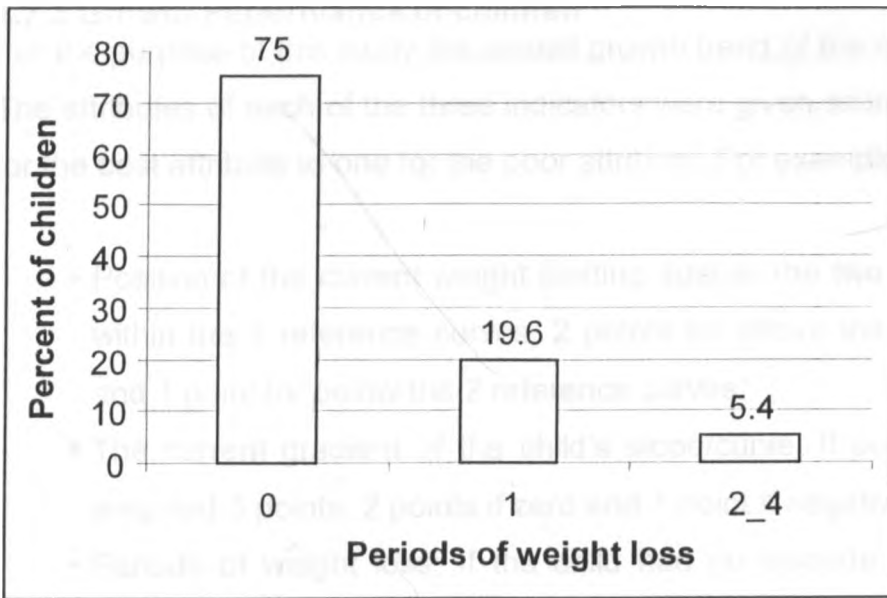
Children (24) who were visiting the health facility for the first time had only one weight plotted thus had no growth curve as yet. They were therefore excluded from the assessment of slope/gradient. Out of 392 children a majority (88%) had good or positive slopes/gradient. Fig.26 illustrates the findings.



**Fig.26 The type of gradient of the growth curve**

#### 4.7.1 Periods of weight loss

Only 392 children were included since they had more than one weight plotted on their chart, first time children who had only one weight plotted were excluded since information on the trend of weight loss/gain lacked. Majority (75%) had gained weight throughout their life. Fig.27 illustrates the findings.

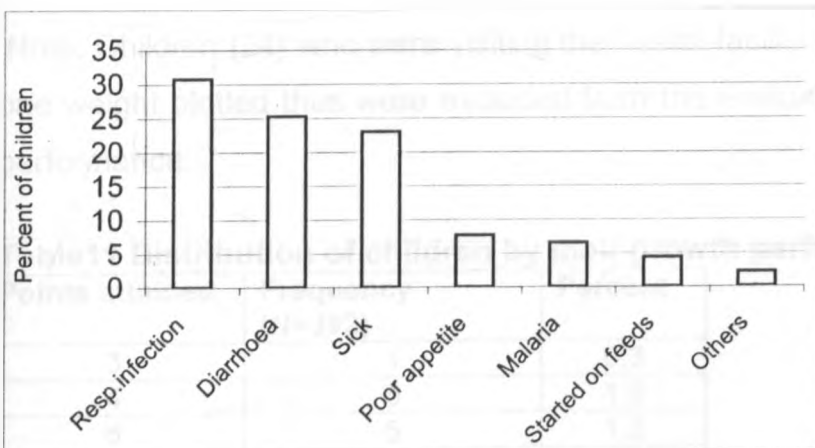


**Fig.27** Period of weight loss

#### 4.7.2 Reasons for lack of weight gain

Out of the 97 children who experienced weight loss at some time in their life, their mothers were asked what could have likely caused the loss of weight and the child's growth chart was counterchecked to confirm the mothers' explanation.

About 30.8% of them had respiratory infection, 25.3% had suffered from diarrhoea and 23% had various unspecified illnesses. Fig.28 further illustrates the findings.



**Fig.28** Likely causes of weight loss

### 4.7.3 Growth Performance of children

For the purpose of this study the overall growth trend of the children was graded. The attributes of each of the three indicators were given scores from three points for the best attribute to one for the poor attribute. For example,

- Position of the current weight plotting against the two curves; 3 points for within the 2 reference curves, 2 points for above the 2 reference curves and 1 point for below the 2 reference curves.
- The current gradient of the child's slope/curve; If positive the child was awarded 3 points, 2 points if zero and 1 point if negative.
- Periods of weight loss; If the child had no episode of weight loss was given 3 points, those with one period of weight loss 2 points and with two or more episodes of weight loss 1 point.

For each child the scores of attributes for the three indicators were summed up to obtain the overall growth performance scores. For instance, a child with nine points had the best growth performance while that with three points had the poorest growth performance. Children with more than 50% of the points were considered to have had good growth while the rest had unsatisfactory growth. A majority 94.2% showed good/satisfactory growth trends.

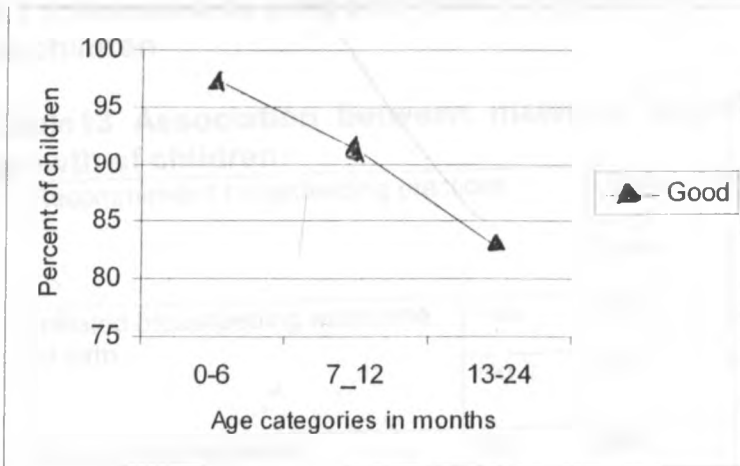
Note: Children (24) who were visiting the health facility for the first time had only one weight plotted thus were excluded from the evaluation of the overall growth performance.

**Table11 Distribution of children by their growth performance**

Points attained	Frequency (N=392)	Percent
3	1	0.3
4	6	1.5
5	5	1.3
6	16	4.1
7	36	9.2
8	84	21.4
9	244	62.3

The growth performances mean score was 8.3 SD1.0, median and mode of 9.

#### 4.7.4 Age distribution of children by growth performance



**Fig.29** Age distribution of children by their growth performance

A chi-square of 16.7 df 2  $p < 0.001$  indicate that there was a significant difference in growth among the different age groups. Zero to six months old children had experienced better growth compared to the other age groups in terms of weight gain and less fluctuations in growth in respect to the standard reference child.

#### 4.7.5 The relationship between the maternal/child factors with the child growth performance.

**Table12** Relationship between maternal/child factors with the child growth performance.

Characteristics/factors	Correlation coefficient	Significance
Maternal age in years	0.093	>0.05
Number of children per mother	0.074	>0.05
Duration of residing in Nairobi	0.035	<0.05
Household monthly income	-0.045	>0.05
Children's age in months	-0.281	<0.01
Maternal breastfeeding practices' performance	0.100	<0.05

A significant positive relation between maternal breastfeeding practices performance and the growth of children was found indicating that as mothers adhere to most of the recommended breastfeeding practices the better was their child's growth in terms of weight gain and lack of faltering. A significant negative

correlation between child's age and growth performance indicate that there was a decline in growth performance with age.

#### 4.7.6 Association between maternal breastfeeding practices and the growth of children

**Table13 Association between maternal breastfeeding practices and the growth of children**

Recommended breastfeeding practices		Growth trend		Chi-square	Odds Ratio
		Good	Poor		
Initiated breastfeeding within one of birth	Yes	225	14	0.001 P 0.979	1.0
	No	143	9		
Gave prelacteal feeds	No	288	17	0.239 P 0.625	1.3
	Yes	80	6		
Breastfed on demand	Yes	327	19	0.484 P 0.487	0.5
	No	35	1		
Used feeding items other than bottles with teats	Yes	242	19	3.049 P 0.081	0.2
	No	65	1		
EBF for six months/ EBF for child less than six months at time of study	Yes	106	5	0.532 P 0.466	1.5
	No	262	18		
Continuing breastfeeding	Yes	362	20	12.5 P <0.001	9.1
	No	6	3		

Individual recommended breastfeeding practices did not seem to associate with the growth of the children. However, in comparison to those who were not breastfeeding at the time of the study children of the mothers who were still breastfeeding were nine times more likely to have good growth trends. In addition, infants who were given breast milk exclusively for the first six months were one and half times likely to experience good growth trends compared to those who were introduced complementary feeds early in life.

**Table14 Association between the overall maternal performance on breastfeeding practices and the growth trends of children**

Maternal breastfeeding practices	Growth of children		Total
	Unsatisfactory	Good/Satisfactory	
Inappropriate	4	27	31
Appropriate	19	342	361
Total	23	369	392

Chi-square of 3.056, df1 P=0.96. An odds ratio of 2.7 at 95% CI 0.852-8.447 indicate that, in comparison to mothers who had complied to most of the recommended breastfeeding practices children whose mothers had inappropriate breastfeeding practices had a three times risk of having poor/unsatisfactory growth trends.

#### 4.8 NUTRITIONAL STATUS OF THE CHILDREN

No child was found to be oedematous on examination.

**Table15 Distribution of Study Children by Nutrition Status**

Nutrition Indicators	Male	Female	Combined	Normal
Global acute malnutrition (n=416)	7	2	9 (2.2%)	407(98%)
Severe wasting	-	1	1 (0.2%)	
Global underweight (n=417)	12	14	26 (6.2%)	391(93.8%)
Severe underweight	3	3	6 (1.4%)	
Global chronic malnutrition (n=417)	26	18	44 (10.6%)	373(89.4%)
Severe stunting	4	1	5 (1.2%)	

Out of 418 children 416 were analysed for wasting (2 flagged off because of abnormally recorded weights and heights). Out of those analysed 2.2% had global acute malnutrition i.e. below the normal weight for height of a standard reference child according to the NCHS reference standards. Out of 418 children, 417 were analysed for underweight (1 flagged off) and 6.2% were below the normal weight for age of a standard reference child according to the NCHS reference standards. Out of 418 children 417 were analysed for stunting (1 flagged off) and 10.6% were found to be below the height for age for a standard reference child according to the NCHS reference standards.

#### 4.8.1 Distribution of children by age and nutrition status

There was a significant difference in nutritional status among the different age groups. Stunting increased with age and was more prevalent among children more than 7 months to 12 months old. Underweight also increased with age and was more prevalent among children aged 13 to 24 months of age. The children in the age group of zero to six months were less malnourished as compared to rest of the age groups. Fig 30 further illustrates the status.

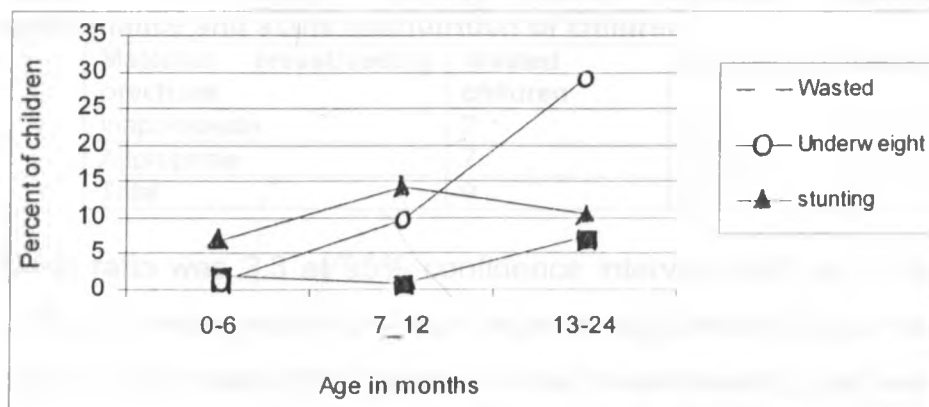


Fig.30 Distribution of study children by Nutrition status

#### 4.8.2 Association between maternal breastfeeding practices and the nutrition status of children

Table16 Association between maternal breastfeeding practices and acute malnutrition among children

Recommended breastfeeding practices		Normal	Wasting	Chi-square	Odds Ratio
Initiated breastfeeding within one hour of birth	Yes	245	6	0.128 p=0.505	0.8 CI (0.2-3.1)
	No	158	3		
Gave prelacteal feeds	No	317	7	0.004 P=0.606	1.1 CI (0.2-5.2)
	Yes	86	2		
Breastfed on demand	Yes	360	8	0.041 P=0.584	1.2 CI(0.2-10.2)
	No	35	1		
Used feeding items other than bottles with teats	Yes	262	5	0.323 P=0.57	1.6 CI (0.3-8.5)
	No	65	2		
EBF for six months/ EBF for child less than six months at time of study	Yes	118	4	0.9 P=0.343	0.5 CI (0.1-2.0)
	No	285	5		
Continuing breastfeeding	Yes	394	9	0.274 P=0.64	1.6 CI (0.3-8.2)
	No	9	0		



There was no significant association between each of the practices and acute malnutrition. In comparison to children who were not breastfeeding those breastfeeding were one and half times likely not to suffer from wasting. Further children who were not bottle-feeding were one and half times likely not to be wasted as compared to those who were bottle-feeding.

**Table17 Association between overall maternal breastfeeding practices performance and acute malnutrition of children**

Maternal breastfeeding practices	Wasted children	Nourished children	Total
Inappropriate	2	44	46
Appropriate	7	363	370
Total	9	407	416

Odds ratio was 2.3 at 95% confidence interval 0.463 to 11.404, i.e. the risk of children wasting was more than twice as high among those mothers who did not comply with most of the recommended breastfeeding practices as compared to those who complied with most of them. A Chi-square of 1.166 df1 P=0.261 indicates that there was no association between maternal breastfeeding practices and acute malnutrition.

**Table18 Association between maternal breastfeeding practices and underweight among children**

Recommended breastfeeding practices		Normal	Underweight	Chi-square	Odds Ratio
Initiated breastfeeding within one of birth	Yes	237	15	0.129 P=0.72	1.2 CI (0.5-2.6)
	No	150	11		
Gave prelacteal feeds	No	305	20	0.052 P=0.82	1.1 CI (0.4-2.9)
	Yes	82	6		
Breastfed on demand	Yes	345	22	0.021 P= 0.88	0.9 CI (0.2-4.0)
	No	35	2		
Used feeding items other than bottles with teats	Yes	247	22	1.29 P=0.256	0.5 CI (0.1-1.7)
	No	68	3		
EBF for six months/ EBF for child less than six months at time of study	Yes	118	4	2.83 P=0.09	2.5 CI (0.8-7.3)
	No	269	22		
Continuing breastfeeding	Yes	380	24	3.956 P=0.047	4.5 CI (0.9-23)
	No	7	2		

There was a significant association between continuing breastfeeding for a child less than 24 months and developing underweight, children who had discontinued breastfeeding had a 4.5 times risk of being underweight as compared to those breastfeeding. Those children who had not been breast fed exclusively for six months and the children less than six months not breast fed exclusively at time of data collection were 2.5 times more likely to be underweight than those who had breast fed exclusively.

**Table 19 The association between overall maternal performance on breast feeding and underweight among children**

Maternal breastfeeding practices	Underweight children	Nourished children	Total
Inappropriate	4	43	47
Appropriate	22	348	370
Total	26	391	417

Odds ratio of 1.5 at 95% confidence interval of 0.484 to 4.471 indicated that the children whose mothers did not comply with most of the recommended breastfeeding practices had a one and half times risk of being underweight as compared to children whose mothers adhered to most of the recommended practices. A chi-square of 1.058 df1 P=0.304 showed that there was no association between maternal breastfeeding practices and their children underweight state.

**Table 20 Association between maternal breastfeeding practices and stunting among children**

Recommended breastfeeding practices		Normal	Stunting	Chi-square	Odds Ratio
Initiated breastfeeding within one of birth	Yes	233	19	5.716 P=0.017	2.0 CI (1.1-4.1)
	No	137	24		
Gave prelacteal feeds	No	294	31	1.247 P=0.264	1.5 CI (0.7-3.1)
	Yes	76	12		
Breastfed on demand	Yes	329	38	0.806 P=0.369	0.7 CI (0.3-1.6)
	No	33	4		
Used feeding items other than bottles with teats	Yes	236	33	0.806 P=0.369	0.7 CI (0.3-1.6)
	No	65	6		
EBF for six months/ EBF for child less than six months at time of study	Yes	110	12	0.102 P=0.749	1.1 CI (0.6-2.3)
	No	260	31		
Continuing breastfeeding	Yes	362	42	0.005 P=0.945	1.2 CI (0.1-8.8)
	No	8	1		

A significant association between time of initiation of breastfeeding after childbirth and stunting was established. Children who were breastfed after one hour of birth were twice likely to be stunted as compared to those who breastfed within one hour of birth.

**Table 21. A two by two table showing association between overall maternal breastfeeding practices and stunting among children**

Maternal breastfeeding practices	Underweight children	Nourished children	Total
Inappropriate	7	40	47
Appropriate	37	333	370
Total	44	373	417

The odd ratio of 1.6 at 95% confidence interval of 0.659 to 3.766 indicated that children whose mothers did not comply with most of the recommended breastfeeding practices had a one and half times risk of being stunted as compared to children whose mothers adhered to most of the recommended practices. A chi-square of 0.469 df1 fisher's exact significance 0.517 indicates that there was no association between overall maternal breastfeeding practices and the stunting of their children.

## **CHAPTER FIVE**

### **5.0 DISCUSSION**

This study which aimed at determining the maternal breastfeeding practices in relation to the growth and the nutritional status of their children was conducted in four health centers in Nairobi province namely, Kangemi, Riruta, Langata and Mathare North. Generally, maternal positive attitude towards breastfeeding, adequacy in knowledge of appropriate breastfeeding practices and HCWs being the main source of breastfeeding information were viewed to have had influence on the mothers compliance to the recommended breastfeeding practices and hence the good growth and nutrition status of children.

#### **5.1 Social demographic profile**

The study established that a majority of the mothers were young with small families and had migrated to Nairobi in the last five years (probably to join their husbands or in search of jobs). A majority of them had attained primary level education while a few had gone through secondary education. Most of them were economically dependent on their husbands as they were not having any form of income generating activity and stayed at home as house wives.

#### **5.2 Maternal attitude towards breastfeeding**

The mothers who had advanced in age and had more children had better breastfeeding practices and their children showed good trends of growth as compared to the younger women who had less children probably because they had received breastfeeding information on the recommended practices over and over again and motherhood experience had seen them modify the inappropriate practices to achieve the appropriate practices. These findings were in line with findings by (Onayade et al, 2004) in Nigeria, where mothers who were aged more than 30 years were more likely to exclusively breastfeed for the first six months as compared to other age groups ( $P= 0.036$ ). Similarly, mothers nursing their first babies were more likely to start their infants early on complementary feeding as compared to those who had had other babies ( $P=0.019$ ). The higher

the household income the less the mothers were likely to comply with the recommended breastfeeding practices.

### **5.3 Maternal knowledge on the proper breastfeeding practices**

Most mothers considered breastfeeding important thus portraying a positive attitude towards breastfeeding. The positive attitude could have influenced most of them towards adhering to the recommended breastfeeding practices. Most however, had a negative attitude towards breast milk expression. This was so because slightly above half of them lacked the necessary breast milk expression skills and knowledge on how to manage the milk there after in order to avoid contamination and keep it warm.

Slightly above half of the mothers knew that breastfeeding would benefit children by improving their growth and development, boosting their immunity and providing them with nutrients. Only a very small proportion of mothers mentioned a few other benefits. This was an indication that mothers had inadequate knowledge of the numerous benefits of breastfeeding not only to the child but also to the mother and the community at large. Apparently, there were a few who did not know any benefit of breastfeeding.

Over three quarters of the mothers affirmed use of colostrum by newborns nevertheless, a third of them had no idea why it should be given. Only a third of them knew it had nutritional value and conferred initial immunity to newborns. A significant proportion of mothers asserted that colostrum should not be given to newborns since they considered it bad, dirty, awful smelling and above all lacking in nutritional value. A study by Agnarsson et al, (2001) in Tanzania documented findings in agreement with this study's in that 46% mothers in that study considered colostrum bad and therefore, discarded it. A few others did not know whether or not colostrum should be given to newborns, making them an easy target for negative influence if appropriate interventions were not addressed.

A majority of the mothers had adequate knowledge of the recommended breastfeeding practices, which included initiation of breastfeeding within one hour after child birth, giving of colostrum to newborns, avoidance of bottle feeding while giving fluids to infants, breastfeeding on demand and breastfeeding for at least 24 months. Only a small proportion knew that EBF should be done for the first six months. The fact that most mothers had adequate knowledge on proper breastfeeding practices could be attributed to having mainly sourced breastfeeding information from HCWs in their respective health centres. Apparently, there were some mothers who had no idea about the recommended breastfeeding practices in spite of having utilised health facilities; this reflected poor targeting of behaviour change communication dissemination at the facilities.

There was a significant relation between knowledge and actual practice of the recommended breastfeeding practices since having adequate knowledge of the recommended breastfeeding practices was highly attributed to adoption of the practices. This was evidenced by high probability of adherence to the recommended breastfeeding practices among the mothers who had the correct knowledge about practices as compared to those who had incorrect knowledge.

Other studies support this, for instance in a large scale community level behaviour change programs designed to improve breastfeeding practices in three countries, Quinn et al (2005) indicates that timely initiation of breastfeeding within one hour of birth increased from 56% to 74% in Bolivia, 32% to 40% in Ghana and 34% to 78% in Madagascar. There was also a marked increase in EBF of infants for the first six months of life from 54% to 65% in Bolivia, 68% to 79% in Ghana and 46% to 68% to Madagascar. In a study to assess the health benefits of selected breastfeeding recommendations Torimiro et al (2004) first canvassed information about the benefits of the practices to the mothers, there after compliance with the practices was high i.e. 74.4% reported exclusive breastfeeding, 87.5% did not give pre-lacteal feeds, 78.3% were not using feeding bottles while 92.9 gave colostrum.

#### 5.4 The maternal breastfeeding practices

The prevalence of breastfeeding was high (99%) and only a few mothers chose not to breastfeed or they were advised in the hospital not to breastfeed due to their HIV positive status. This high breastfeeding prevalence is comparable to previous studies in Nairobi (CBS, 2003 and Ngatia et al, 2005) where the prevalence of breastfeeding was 96.2% and 96% respectively. In Karnataka, India, the children who had ever breastfed were also high 97% (Banapurmath, 1996). This contrasts findings in a developed country, Kentucky-USA where only 49.2% of children were breastfed (Barton, 2001).

Most children were still breastfeeding at the time of the study and their mothers intended to continue breastfeeding them for at least twenty-four months of age. This was appropriate since it is recommended that children be breastfed for at least twenty-four months and stopped when mutually desired by the mother and child. Breastfeeding for a longer time allows the child to achieve most of the long-term benefits of breastfeeding such as better neurological development and reduced risk of developing chronic diseases later in life. The main reason given for early discontinuation of breastfeeding (before the age of twenty four months) was insufficiency of milk, this relates to findings by Marandi, (1993) in which a higher proportion of mothers (39%) reported to be the main reason for early discontinuation of breastfeeding.

Women are encouraged to initiate breastfeeding within one hour after birth; this is with exception of HIV positive mothers who do not wish to breastfeed. Early initiation of breastfeeding increases chances of breastfeeding success generally lengthens the duration of breastfeeding and immediately after birth assists in uterus involution thus prevent post partum haemorrhage (CBS, 2004). Two thirds of mothers initiated breastfeeding within one hour of childbirth. This proportion was slightly higher than 55.1% and 52.3% mothers who initiated breastfeeding within one hour in Nairobi and Nationally respectively (CBS, 2004). The slight difference could be attributed to the different study settings since CBS study was

carried out at the community set-up while this study was at a health facility setting. On the contrary, in Kanartaka-India only 3 infants (0.3%) were offered breastfeeding within 1 hour after delivery and most infants 90.9% begun breastfeeding 72 hours post-delivery (Banapurmath et al, 1996). Similarly, in Teheran-Iran the average period between delivery and initiation of breastfeeding was 42.5 hours (Marandi, 1993).

Most of the reasons for late initiation of breastfeeding such as inability of the child to suck, no breast milk being ejected, mother being tired, and baby not being hungry among others revealed lack of awareness of the rationale behind early initiation of breastfeeding. A quarter of the mother however, gave reasons that could have deterred early initiation of breastfeeding for instance mother being sick or under sedation and the baby being sick.

Over three quarters of the mothers did not give any form of prelacteal feeds to their index child. These findings differs with (CBS, 2003) in which a significantly higher proportion of children in Nairobi (51.3%) and (65%) nationally were given prelacteal feeds while in Kanartaka- India all infants received prelacteal feeds (Banapurmath et al, 1996). Prelacteal feeds interfere with early attachment of the child to the breast. Apparently, all the prelacteal feeds given were nutritionally inferior to breast milk and were mainly a source of water and energy while others like plain water had no nutrients at all. It was sad to note that these mothers preferred the feeds to breast milk that not only contains invaluable nutrients to the child in the right quantities but also has added benefits to the child and mother.

Virtually every mother practised on-demand breastfeeding. On-demand breastfeeding as opposed to scheduled feeding allows the child to regulate their intake according to their body needs, thus expressing their appetite fully (Royal college of midwives, 1991).



Bottle feeding is discouraged because improper sanitation and formula preparation with bottle feeding can introduce pathogens to the infant, putting the child at a greater risk of illness and malnutrition (USAID, 2004). A total of 79.1% mothers used safe modes of giving fluids to the child such as cups, spoon, bowls/plates, the palm and fingers. Similar findings by Torimiro, et al (2004), in Nigeria indicated that 78.3% of the mothers were not using feeding bottles. In a low-income peri-urban community, Shamin, (2006) it was established that out of 105 mothers 102 were using feeding bottles with teats for infants with or without breastfeeding. This was a very high prevalence of bottle-feeding compared to this study.

For optimal growth it is recommended that infants be exclusively breastfed for the first six months of life. Overall, only a tenth of the children had been exclusively breastfed for the first six months of life and only a quarter of infants less than six months were breastfeeding exclusively at the time of data collection. For the latter children, most of their mothers had a strong intention of exclusively breastfeeding for up to four to six months. However, in practice by the fourth month a majority (63.1%) of children had been commenced on complementary feeds. This indicates that mothers have good intentions of exclusively breastfeeding for about six months but, there are unavoidable issues that come to play forcing the mothers to introduce complementary feeds earlier than the intended age.

A majority of the mother did not therefore conform to the recommended duration of exclusive breastfeeding for the first six months of life. This raises questions as to whether the standard of six months, is unrealistic thus unattainable for this community whose malnutrition rates were also low.

These findings comparable to numerous other studies that have documented that early introduction of complementary feeds before the age of six months is a persistent negative practice regardless of the efforts put forward in improving the

trend. Nationally, in Kenya only 14% of infants less than six months of age were exclusively breastfed, 1% had been weaned while the remaining majority had been introduced on complementary feeds/fluids (ORC Macro, 2004). In a two-year prospective study in Nairobi's, low-income region, Kangemi (Mukuria, 1999) it was established that by one month 75% infants had received complementary fluids and feeds and by the fourth month 94% had been complemented. Besides, in a comparative study between a world vision project and non-project areas in Makueni district Macharia et al (2004) indicated that 37.5% and 68.3% of the in the project and non-project areas respectively introduced complementary feeds within the first three months. Similarly, a study by Mamabolo et al, (2003) in the Central region of South Africa, indicated that exclusive breastfeeding during the first three months was uncommon as mothers tended to introduce complementary feeds at an early age, with 56% of the infants receiving some form of supplement by the end of the first month.

#### **5.5. Mothers knowledge of breastfeeding in HIV positive status**

Over three quarters of the mothers knew that breastfeeding in a HIV positive state should not be done due to the risk of MTCT. These findings compares with that of the CBS, 2004 where 77.4% and 71.8% women in Nairobi and nationally, respectively knew that HIV could be transmitted through breastfeeding. Breast milk transmission of HIV is substantial and continues through the postnatal period (John et al, 2001).

Most of the mothers knew their HIV status and indicated that they had been tested during pregnancy. This seems to contradict the findings of CBS (2004), which indicated that 71.2% of the women in Nairobi had never been tested for HIV, further implying that most women wait until they are pregnant to know their status since it is a routine check in the antenatal clinics.

Only a few mothers knew other options that they could use as regards breastfeeding their children in a HIV positive status. Most mothers did not seem

to be aware of the various approaches that are possible regarding breast milk and transmission of HIV apart from complete avoidance of breast milk, others could include early weaning at three to six months after exclusively breastfeeding the child, withholding of colostrum, vitamin A supplementation of mother and infant and ART while breastfeeding (John et al, 2001).

### **5.6 Maternal sources of breastfeeding information**

The study established that HCWs were the main source of breastfeeding information to virtually all the mothers and were likely to be consulted first in case of occurrence of a breastfeeding problem. Mothers who had received breastfeeding information from HCWs during the pregnancy period only were 52%, this compares with findings by CBS, (2004) in that 53.6% mothers in Nairobi were given information on breastfeeding during antenatal visits and only 39% nationally.

The mothers were also likely to obtain breastfeeding information from their relatives (35.9%) mainly their mothers and from friends (22.7%). Similar findings were obtained by (Agnarsson, 2001) in that HCWs and elderly women influenced decision making by mothers concerning breastfeeding however, there was a contradiction in that in the said study a higher proportion (37%) obtained breastfeeding information from their relatives and TBAs while only 23% from HCWs. Mothers in a rural area in Cameroon, identified pressures from village elders and their families as some of the factors that influenced their decision to complement their children very early in order to adhere to the tradition (Kakute, et al (2005). Similarly, in a study to explore reasons for early weaning in Teheran, Iran Marandi, (1993) revealed that sources of knowledge about breastfeeding were relatives and friends (45%), radio and television (27%), print media (12%), and only 4% health workers.

A majority of the mothers knew they had a right to obtaining breastfeeding information from HCWs, and it was encouraging to note that HCWs carried out

teaching sessions on breastfeeding, may be this explains the high level of mother's knowledge about the recommended breastfeeding practices. Nevertheless, a few mothers had never received any breastfeeding information from HCWs reflecting poor targeting of the HCWs BCC sessions.

### **5.7 Growth and nutrition status of children**

A majority of the cards lacked information on the type of illness experienced by a child thus this information was derived from the mothers, who had to recall the cause of any episode of weight loss and if it was an illness the type suffered. Most mothers however, were not able to specify the type of illness that a child suffered from.

It was further established that most of the children in the study were below the age one year. Most of the charts observed had very good weight plotting but they lacked on other important aspects as required in the national chart for growth and monitoring such as complementation age, weaning, and illnesses among others.

Only a few children had experienced unsatisfactory trends of growth, characterised by growth faltering due to illnesses, low weights compared with the standard reference child for that age and periods of weight loss. Most children had minimal or no fluctuations in growth, adequate weights compared to the standard reference child for that age and had gradual weight gain. Weight loss was mainly as a result of diarrhoea and respiratory infections. The risk of experiencing poor growth trends was higher among children who had stopped breastfeeding and those who were introduced complementary feeds earlier in life (before the age of six months). In a study to examine the effect of variable breastfeeding duration on length and weight gain. It was found that breastfeeding was positively associated with growth in a manner that was inferred to be causal, the effect being stronger on linear growth than on weight gain (Onyango, 2000). Compliance with the recommended breastfeeding practice was significantly positively correlated with good trends of growth. In comparison to children whose

mothers had appropriate breastfeeding practices, children whose mothers had inappropriate breastfeeding practices had an added risk of experiencing poor growth trends. Thus, a good trend of growth by a majority of the children was likely a consequence of compliance to most of the recommended breastfeeding practises. Onayade et al (2004) indicated that improper breastfeeding practices lack any advantage in terms of weight gain and is associated with growth faltering in a study in Nigeria.

However, as the children became older their mothers tended to be less compliant with the recommended breastfeeding practices and thus negatively affecting their children's growth trend. In a study to assess feeding practices and growth of infants from birth to 12 months in Limpopo- South Africa, increased weight gain was seen during the first 3 months and then declined gradually until mean weight-for-age at 12 months was below 0 SD by NCHS (Mamabolo et al, 2004).

Acute malnutrition as measured by WFH was virtually absent among the study children probably because almost all children were still breastfeeding and on demand prior to and during the time of study. This is also in line with the low national level of wasting that stands at 5.6% nationally and in Nairobi 4.4% for under five years old children (ORC Macro, 2004). Wasting was highest in children aged 13-24 months, this was in line with findings by the CBS (2004) where wasting was highest in the 12-23 months age category.

Chronic malnutrition affected 10.6%, this was well below the national and provincial level of stunting of 30.3% and 18.7%, respectively. The level of underweight (6.2%) was also lower than the national level of 19.9% but at the same level with that of the province (6.3%). Stunting was more prevalent among children 13 to 24 months but underweight was more prevalent among 7-12 months old children. This compares with findings for a study done in Thika-Kenya where stunting was more prevalent among the 13 –24 months old children and the same pattern was observed for underweight (Kamau-Thuita et al, 2002). Similarly, in (CBS, 2004) Stunting was found to be highest (43%) in the 12-23

months old children and the same trend with underweight (27%). In Chandigarh-India, proportions of underweight (45.5%) and stunting (81.8%) were found maximum among children aged 13-24 months (Kumar et al, 2006).

The risk of being underweight was higher among children who had stopped breastfeeding and those who were introduced complementary feeds before the age of six months. According to Bloss et al (2004) children who were introduced to foods early had an increased risk of being underweight. In addition, initiation of breast-feeding after six hours of birth, deprivation from colostrum and improper complementary feeding were found significant ( $P < 0.05$ ) risk factors for underweight (Kumar et al, 2006). The children who failed to breastfeed within one hour of birth had a higher risk of being stunted. Wasting was not significantly associated with any of the breastfeeding practices however; the risk was higher among children who had stopped breastfeeding and in those who were using bottle with artificial teats. The findings are in line with those of Kumar et al, (2006) in that wasting was not significantly associated ( $P > 0.10$ ) with any infant feeding practice studied (Kumar et al, 2006). In a study to determine nutrition status of under fives Matee et al, (1997) established that breastfeeding was protective against stunting and wasting (odds ratio, 0.8).

There was an increased risk of a child becoming malnourished if the mother failed to conform to most of the recommended breastfeeding practices. The risk was, nevertheless, not very high since nutrition status is the result of complex interactions between food consumption and the overall status of health and care practices (ORC Macro, 2004). Similarly, in a study in Kampala- Mulago hospital, Owor et al, (2000) reported a strong association between severe malnutrition and lack of breastfeeding, an odds ratio 3.222 ( $p < 0.0009$ ). In a group of severely malnourished only 23% children aged less than 2 years were still breastfeeding compared to 44% in the control group. Compliance with the recommended breastfeeding practices allows the child to accrue almost all the benefits of breastfeeding not only in the short run but also in the long term.

## CHAPTER SIX

### 6.0 CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 Conclusions

Mothers have positive attitude towards breastfeeding and adequate knowledge about the following recommended breastfeeding practices; initiation of breastfeeding within one hour of child birth, giving of colostrum to newborns, avoidance of bottle feeding while giving fluids to infants, breastfeeding on demand and breastfeeding for at least 24 months. They are likely to have inappropriate knowledge of the duration of exclusive breastfeeding and the various approaches that are possible regarding breast milk and transmission of HIV apart from complete avoidance of breast milk. In addition, they could be deficient in knowledge regarding the importance of giving colostrum to newborns and various benefits of breastfeeding to the child, mother and the society at large.

Health care workers (HCWs) are the main source of breastfeeding information. Most breastfeeding information is obtained from HCWs during antenatal visits and much less after childbirth and during follow-up visits.

Almost all children in Nairobi are breastfed and only fail to be breastfed if their mothers' are HIV positive. Mothers are compliant with most of the recommended breastfeeding practices which include initiation of breastfeeding within one hour of child birth, avoiding giving prelacteal feeds to newborns, breastfeeding on demand, none use of feeding bottles with nipples in feeding fluids to infants and continuing of breastfeeding for at least twenty four months. Nevertheless, exclusive breastfeeding for the first six months of life is a rare practice as indicated by early introduction of complementary feeds.

Having adequate knowledge of the recommended breastfeeding practices is highly attributed to adoption of the practices. Maternal breastfeeding practices were positively associated with maternal age and parity.

It was realised that mothers do not take their children for growth monitoring after completion of immunizations and vitamin A supplementation.

Malnutrition rates were low and most children had good trends of growth. The good nutrition status and growth of children are attributed to high compliance of the mothers with most of the recommended breastfeeding practices. A majority of the children are thus breastfed in accordance to the recommended practices. Thus the hypothesis that appropriate breastfeeding practices contribute to good growth and nutrition status was accepted.

## **6.2 Recommendations**

- A behaviour change communication (BCC) program should be specifically designed that takes into account the requirements of different categories of women based on e.g. age, parity, financial capability, occupation among others in order to bridge the knowledge and practice gap regarding breastfeeding among the various categories of women. Other community and/or family members need to be involved during information dissemination since they also play a role in influencing mothers' decisions on breastfeeding.
- The HCWs involved in BCC should put effort to ensure that adequate content is covered, the timing is convenient to all targeted mothers in order to reduce the exclusion error, words used are simple and easy to understand and the language accords respect to the mothers. Breastfeeding information should be disseminated not only during the pregnancy period but also during follow-up visits to reinforce the breastfeeding teachings and support the mothers.



- In order to achieve success in breastfeeding the BCC programs on breastfeeding should emphasize on the following contents;
  - Benefits of breastfeeding
  - Importance of colostrum to a newborn
  - Rationale of the recommended breastfeeding practices
  - Breastfeeding and other feeding options in a HIV positive state
  - Expression of breast milk
- Studies be conducted out to evaluate the content of HCWs teachings on HIV and breastfeeding along with community surveys focusing on the children suffering from malnutrition disorders (wasting, underweight and stunting) in Nairobi, with an aim to further minimizing or eradicating the incidences.
- Effort should be made to encourage mothers to take their children for growth monitoring regularly even after completion of the immunizations and vitamin supplementations.

## REFERENCES

- Agnarsson, I., Mpello, A., Gunnlaugsson, G. Hofvander, Y. and Greiner, T., (1999). Infant feeding practices during the first six months of life, in a rural area in Tanzania. *East African Medical Journal*. Vol.78 (1) Pp9-13.
- Amin, S., (1995). Coalition of breastfeeding (WABA); Mothers and children bulletin on infant feeding and maternal nutrition. Vol. 14 (1), 2 ISSN0272-6917. Pp20-21.
- American Academy of Paediatrics, (2005). Breastfeeding and the use of human milk. Policy statement. <http://aappolicy.aapublications.org/htm> On 5<sup>th</sup>/June/2006
- Avert, (2006). Preventing mother to child transmission of HIV. <http://www.avert.org/motherchild/htm>. On 2<sup>nd</sup> /July/2006.
- Banapurmath, C.R., Nagaraj, M.C., and Banapurmath, S. and Kesaree, N., (1996). Breastfeeding practices in villages of central Karnataka. *Indian Pediatric Journal*. Vol.33 (6) Pp477-479
- Barton, S.J., (2001). Infant feeding practices of low-income rural mothers. *American Journal of Maternal Child Nursing*. Vol.26 (2) Pp93-97
- Bloss, E., Wainaina, F. and Bailey, R.C., (2004). Prevalence and predictors of underweight, stunting, and wasting among children aged 5 and under in western Kenya. *Journal of tropical paediatrics*. Vol. 50(5), Pp260-270.
- Central Bureau of Statistics, Ministry of Health, Kenya Demographic Health Survey, and ORC Macro, (2004). Kenya Demographic and Health Survey 2003. Calverton, Maryland. CBS, MoH and ORC Macro. Pp 153-155.
- Family Health Administration, (2005). Breastfeeding benefits. <http://www.fha.state.md.us/mch/breastfeeding/bf-benefits>, On 5<sup>th</sup>/May/2005.
- Fisher, A. A., Laing, J.E., Stoeckel, J.E. and Townsend, J.W., (1991). Handbook for family planning operations research designs. 2<sup>nd</sup> edn. The Population Council. New York 10017. Pp 22.
- GOK, (1997). National development plan (1997-2000), Nairobi: Government printers.
- GOK and UNICEF, (1998). Situation analysis of children and women in Kenya. Nairobi. Pp 126 and 129.

Hakim, I.A and El-Ashmawy, I.A (1992). Breastfeeding patterns in a rural village in Giza – Egypt. *American Journal of Public Health*. Vol.82 (5), Pp 731-732.

John, G.C, Richardson, B.A., Nduati, R.W., Mbovi-Ngacha, D. and Kreiss, J.K., (2001). Timing of breastfeeding HIV-1 transmission a meta-analysis. *East African Medical Journal*. Vol.78(2), Pp 75-79.

Jooste, P.L, Largenhoven, M.L, Kriek, J.A, Kunneke, E., Nyaphisi, M. and Sharp B. (1997). Nutritional status of rural children in Lesotho highlands. *East African Medical Journal*. Vol.74(11), Pp 680-688.

Kamau-Thuita, F., Omwega, A.M., Muita J.W.G. and UNICEF, (2002). Childcare practices and Nutrition status of children aged 0-2 years in Thika, Kenya. In the *East Africa Medical Journal*. Vol. 79(10), Pp 524-529.

King, F.S., (1992). Helping mothers to breast-feed. Pub. AMREF Nairobi Kenya. Pp 2-3,24-26.

Kumar, D., Goel N. K., Mittal P.C., Misra P., (2006). Influence of infant-feeding practices on nutritional status of under-five children. *Indian Journal of paediatrics*, Vol.73(5) Pp 417-421

Macharia,C.W., Kogi-Makau, W. and Murok, N.M., (2004). Dietary intake, feeding and care practices of children in Kathonzweni division, Makueni district, Kenya. In the *East African Medical Journal*, Vol. 81(8) Pp402-407

Marandi, A., Afzali, H. M. and Hossaini, A. F., (1993). The reasons for early weaning among mothers in Teheran. In the *World Health Organization Bulletin* Vol.71(5) Pp561-569

Martin, H.E.B., (1980). Message from the Ministry of Public Health. In the proceedings of workshop on breastfeeding and supplementary foods. Bangkok Medical Pub. Bangkok, Thailand. Pp1.

Mamabolo, R.L., Alberts, M., Mbenyane, G.X., Steyn, N.P., Nthangeni, N.G., Delemarre-Van De Waal, H.A. and Levitt N.S., (2004). Feeding practices and growth of infants from birth to 12 months in the central region of Limpopo province of South Africa. *Nutrition Journal*. Vol. 20(3) Pp 327-333.

Matee, M.I., Msengi, A.E., Simon, E., Iyamuya, E.F., Mwinula, J.H., Mbena, E.C., Samaranayake, L.P. and Scheutz, F. (1997). Nutritional status of under fives attending maternal and child health clinics in Dar es Salaam, Tanzania. *East African Medical Journal*. Vol. 74(6), Pp368-371

Mirie W., (2001). Impact of lactation management education on health professionals. *East African Medical Journal*. Vol. 78(3), Pp128-130.

MOH and UNICEF, (1990). Breastfeeding in Kenya maternity facilities. A study of changes in knowledge, attitude and practice 1982-1989; A report of a collaborative study by MOH and UNICEF. Pp 12-33.

MOH, (1991). National policy on infant feeding practices. Republic of Kenya. The division of Family Health. Pp 40.

MOH, WHO and Well Start, (1995). A report on promotion of breastfeeding in health facilities. A course for hospital administrators. Pp 11-12,14-19.

Mukuria, A.G., (1999). Exclusive breastfeeding and the role of social support and social networks in a low-income urban community in Nairobi Kenya. Pp96-97, 130.

Ngatia, E.M., Nganga, P.M., Muita, J.W.G. and Imungi J.K. (2005). Dietary Patterns and Nutrition Status of Pre-school children in Nairobi. In the *East African Medical Journal*. Vol.82 (10) Pp520-525

Onayade, A.A, Abiona, T.C, Abiyomi, I.O and Makanjuola, R.O.A., (2004). The first six months growth and illness of exclusively and non- exclusively breastfed infants in Nigeria. *East African Medical Journal*. Vol. 81(3), Pp 146 - 153.

Onyango, A.W., (2000). Breastfeeding and growth in rural Kenyan toddlers. *Advanced Exp. Medical Biology*. Vol.478 Pp 151-162

ORC Macro, (2004). Nutrition of young children and mothers in Kenya. *Africa Nutrition Chart Books*. Maryland, USA. Pp1,4, 41,43,45.

Owor, M., Tumwine, J.K and Kikafunda, J.K, (2000). Socio-economic risk factors for severe protein energy malnutrition among children in Mulago Hospital, Kampala. *East African Medical Journal*. Vol. 77(9), Pp 471-474.

Quinn, V.J., Guyon, A.B., Schubert, J.W., Stone-Jimenez, M., Hainsworth, M.D., and Martin, L.H, (2005). Improving breastfeeding practices on a broad scale at the community level: success stories from Africa and Latin America. In *Human Lactation Journal*. Vol.21 (3),Pp 345-354.

Royal College of Midwives, (1991). Successful breastfeeding. Churchill Livingstone, Mary Law publisher, London. Pp10.

- Shamim, S., Jamalvi, S.W., Naz, F.,(2006). Determinants of bottle use amongst economically disadvantaged mothers in Karachi. J Ayub Med Coll Abbottabad. Vol. 18(1) Pp48-51.
- Tomkins, A., (2002). Nutrition and immunity in child health. The International Newsletter on child health and disease prevention. Pp 9.
- Torimiro, S.E., Onayade, A.A., Olumese I., and Makanjuola, R.O., (2004). Health benefits of selected global breastfeeding recommendations among children 0-6 months in Nigeria. In Nutrition and Health Vol. 18(1) Pp 49-59.
- UNICEF, (2006).UNICEF UK baby friendly initiative. The baby friendly initiative in the maternity services <http://www.babyfriendly.org.uk/> . On 5<sup>th</sup>/June/2006
- UNICEF, (2005). Breastfeeding and HIV/AIDS. <http://www.unicef.org/programme/breastfeeding/hiv/htm> . On 2<sup>nd</sup>/June/2005
- UNICEF a, (2004). The State Of World's Children 2005. Childhood Under Threat. New York, USA. Pp 17,74.
- UNICEF b, (2004). Nutrition, what are the challenges? [http://www.A:/UNICEF-Nutrition-What are the challenges/htm](http://www.A:/UNICEF-Nutrition-What%20are%20the%20challenges/htm) . On 2<sup>nd</sup>/July/2006
- UNICEF, (1999). UNICEF Position on the duration of exclusive breastfeeding. UNICEF Nutrition section, New York Pp1.
- UNICEF/Ur D'Urso, (1997). Safe motherhood, a newsletter of world Aid activities. Issue 24 (2) Pp3.
- UNICEF, (1998). The state of world children 1998. Focus on Nutrition. Oxford University Press. New York. Pp 71
- USAID, (2001). HIV/AIDS: A Guide for Nutritional Care and Support. Food and Nutritional Technical Assistance Project, Academy for Educational Development. Washington DC. Pp 38-41
- WHO/UNICEF, (2003). Global strategy for infant and young child feeding. WHO-Geneva. Pp5-10.
- WHO/FAO, (1992). Kenya country position paper on nutrition. International Conference on Nutrition (ICN). Pp12-14.
- WHO, (1983). Measuring change in nutritional status. Geneva. Pp 63-101.

## Appendix 1: The survey questionnaire

### UNIVERSITY OF NAIROBI

COLLEGE OF AGRICULTURE AND VETINARY SERVICES  
DEPARTMENT OF FOOD TECHNOLOGY AND NUTRITION  
Applied Human Nutrition Programme

### A STUDY ON THE BREASTFEEDING PRACTICES IN RELATION TO GROWTH AND NUTRITIONAL STATUS OF CHILDREN 0-24 MONTHS IN NAIROBI

#### INTRODUCTION

Introduce your self by telling your name and that you are a student. Explain that the study is being carried out for the purpose of finding out the importance of breastfeeding children. The study is useful in that it will yield relevant information for planning actions aimed at sensitising the importance of breastfeeding a child. The study will be of benefit to the child, mother, health facility and policy makers. This cannot be done without establishing exactly what is going on among the mothers. The study will involve measuring the nutritional status of her child. The study is also useful to us because is part of our process for learning.

(The interview will take about 10 minutes. Do not give false promises).

Seek consent to proceed with the interview.

Date of interview \_\_\_\_\_ Questionnaire No. \_\_\_\_\_

Name of interviewer \_\_\_\_\_ Name of health facility \_\_\_\_\_

Division \_\_\_\_\_

## SECTION A

### SOCIO-DEMOGRAPHIC INFORMATION

[For each close ended question encircle only one code of the chosen answer, unless other wise stated. Fill in the answer in full in the space provided, for the open-ended questions]

1. What is your age? \_\_\_\_\_ Years
2. What is your marital status?  
1 Single      2 Married      3 divorced/separated      4 Widowed  
5 other [specify] \_\_\_\_\_
3. How many children do you have? \_\_\_\_\_
4. Where in Nairobi do you live? \_\_\_\_\_
5. How long have you lived in Nairobi? \_\_\_\_\_ Years.
6. To which religion do you belong?  
1.Christian      2.Muslim      3.Other [specify] \_\_\_\_\_
7. What level of education did you attain?  
1 None      2 Primary      3 Secondary      4 College      5 University
8. What is your occupation?
  1. Permanent formal employment
  2. Self-employment/ Business
  3. Casual employments
  4. Housewife
  5. Unemployed
  6. Students
  7. Other (specify) \_\_\_\_\_
9. What is your average household income per month? Ksh \_\_\_\_\_.

## SECTION B

### BREASTFEEDING KNOWLEDGE AND ATTITUDES

10. According to you how do you rate breastfeeding?  
1.Not important      2. Important      3.Very important
11. What are the benefits of breastfeeding a child?

[Encircle all the mentioned benefits. Do not probe, Listen and encircle when mentioned]

1. Nutritional value
2. Transfers immunity against diseases
3. It is cheap
4. It is convenient
5. Promotes mother to child bonding
6. Promotes growth and development
7. Others (specify) \_\_\_\_\_





23. For what reason did the child not breastfeed?  
1. Advised in the hospital      2. Mother was sick      3. Others  
(Specify) \_\_\_\_\_

**[Skip to Q30]**

24. How soon after delivery did you breastfeed your child?  
1. Immediately after birth      2. After \_\_\_\_\_ Hour/s  
3. After \_\_\_\_\_ Days      5. Don't know

**[If not within an hour, ask Q25. If within an hour skip to Q26]**

25. Why did the child not breastfeed within an hour of birth?  
1. Mother was under sedation after caesarean section      2. Baby was sick  
3. Mother was sick      4. Mother was tired      5. Others [specify]  
\_\_\_\_\_

26. Was the child fed on any other feed, just before commencing breast milk?  
1 Yes      2. No      3. Don't remember

**[If YES, ask Q27. If NO, skip to Q 28]**

27. What was your child fed on?  
1. Sugary/glucose water      2. Formula milk      3. Other milk  
4. Plain water  
5. Other (specify) \_\_\_\_\_

28. Are you giving other liquids (water, fruit juices, formula milk, other types of milk) or semi-solid foods (porridge, mashed foods, processed foods)?

**[Probe, read all the stated feeds]**

1. Yes      2. No

**[If YES ask Q 29. If NO skip to Q.31]**

29. At what age did you introduce any liquid/semi-solid foods in addition to breast milk?

1. \_\_\_\_\_ Months      2. Don't remember

30. What do you use to feed your child liquid feeds/ expressed breast milk?

1. Feeding bottle with a teat      2. Cup and spoon  
3. Bowl/plate and spoon      4. Cup  
5. Others (specify) \_\_\_\_\_

**[If NEVER BREASTFED, skip to Q 37. The rest of responses skip to Q 32]**

31. When do you intend to introduce other liquid or solid foods?  
\_\_\_\_\_ Months.

32. Are you currently breastfeeding this child?

1. Yes      2. No

**[If NO ask Q 33. If YES ask Q35]**

33. When did you stop breastfeeding the child? \_\_\_\_\_ Months.

34. Why did you find it right to stop breastfeeding the child at that age?
1. Baby refused
  2. Baby was cried a lot due to lack of satisfaction
  3. Child was big enough
  4. Had to resumed work /school
  5. Advised to, by \_\_\_\_\_
  6. Others (specify)

**[Skip to Q37]**

35. How many times do you breastfeed your child?
1. On demand
  2. At mother's convenience
  3. On schedule \_\_\_\_\_ hour
  4. Others (specify)
36. At what age do you intend to stop breastfeeding?
1. \_\_\_\_\_ Months
  2. Don't know
  3. Other (specify) \_\_\_\_\_

## SECTION D

### SOURCES OF BREASTFEEDING INFORMATION

[Use the along side codes for the Q.37, 38, 39. Fill in the responses for each

question on its column.]

	37. From which information sources did you/do you learn about breastfeeding	38. What are your <b>TWO</b> main sources of breastfeeding information?	39. In an event that you need advice on breastfeeding what source of information would you consult first?
1. Health care workers			
2. Mass media [specify]			
3. Relatives [specify]			
4. Friends			
5. Printed media [specify]			
6. Watching/observing others			
7. Experience			
8. Learnt from school			
9. Public banners			
10. Health pamphlet			
Other [specify]			

**[If mentions health care workers in Q38, ask Q40. If the rest of the sources, skip to Q41]**

40. When did the health care workers inform you about breastfeeding?

- 1. Before pregnancy
- 2. During pregnancy
- 3. After child delivery
- 4. Other

[specify] \_\_\_\_\_

41. Why that source in Q39? **[Encircle all the mentioned responses]**

- 1. Readily available
- 2. Accessible
- 3. Accuracy of the information
- 4. Experience
- 5. Other [specify] \_\_\_\_\_

42a. Do you think that it is your right to obtain information about breastfeeding from a health care worker?

- 1. Yes
- 2. No
- 3. Don't know

**[If yes ask Q42b. If No/don't know skip to Q43]**

b) Is this right fulfilled?

- 1. Yes
- 2. No
- 3. Don't know

c) If YES how is the right fulfilled? [Specify] \_\_\_\_\_

d) If NO how is the right not fulfilled? [Specify] \_\_\_\_\_

## SECTION E

**[Request her to allow you to ask her questions about HIV/AIDS that might refer to her or about her and are necessary for the conclusion of study. Re-assure her that the information will confidential and will not be used in reference to her. Obtain consent.]**

43. If a mother is HIV positive, should she breastfeed her child?

- 1. Yes
- 2. No
- 3. Don't know

**[If no, ask Q44. If yes, skip to Q45.]**

44. Why should she not breastfeed?

- 1. May infect her child
- 2. Mother will become sicker
- 3. Mother will become weak
- 4. Others (specify) \_\_\_\_\_

45. Do you know your HIV status?

- 1. Yes
- 2. No

**[If yes ask Q48. If NO. Skip to Q 49]**

46. When did you know your status?

- 1. Before pregnancy
- 2. During pregnancy
- 3. After child's delivery
- 4. Don't remember

## GROWTH AND MONITORING CURVE

47. Is your child weighed every time you visit the clinic?  
1. Yes                      2. No
48. Does the health worker always plot the measured weight in the card?  
1. Yes                      2. No
49. If no why [specify] \_\_\_\_\_

### [Observe the growth chart for the following questions]

50. Growth curve  
1. Within the road to health  
2. Above the road to health  
3. Below the road to health
51. The current slope of the growth curve  
1. Good                      2. Danger  
3. Very dangerous      4. N/A
52. The consistency  
1. Never sloping downward  
2. \_\_\_\_\_ Times sloping downwards  
4. Others [specify] \_\_\_\_\_
53. What was the reason for any downward / horizontal slope?  
\_\_\_\_\_
54. Where was the child born?  
1. Hospital                      2. Home

## ANTHROPOMETRY FOR CHILDREN 0-24 MONTHS

55. Date of birth. \_\_\_\_\_ [Obtain from the growth and monitoring chart]
56. Sex of the child              1. Male                      2. Female
57. Edema.  
1. Present      2. Absent  
**[If oedema is present do not take the height and weight]**

Indices	First Reading	Second Reading	Average
58. Weight			
59. Height			

[Thank the mother]

## Appendix II: A Sample of the National Policy on Infant and Young Children Feeding Practices

### Summary Statement

Every facility providing Maternal and Child Health (MCH) services should:

1. Adhere to the national infant feeding policy, which should be routinely communicated to all health staff and strategically displayed.
2. Train all health care staff in skills necessary to implement this policy.
3. Provide information to all pregnant and lactating mothers and their partners on the benefits and management of breastfeeding.
4. Assist mothers to initiate breastfeeding within the first minutes of birth.
5. Give newborn infants no food or drink other than breast milk unless medically indicated.
6. Show mothers how to breastfeed and to maintain lactation even if they should be separated from their infants.
7. Practise rooming-in, allow infants to remain together with the mother 24 hours a day.
8. Encourage breastfeeding on demand.
9. Encourage and actively promote exclusive breastfeeding for infants for six months.
10. Provide information and demonstrate to mothers how to introduce and prepare appropriate and nutritious complementary foods to the infants after six months.
11. Encourage mothers to breastfeed for at least 24 months.
12. Foster the establishment of breastfeeding support groups and other support groups and refer mother to them on discharge from hospital or clinic.
13. Not accept any free samples and supplies of breast milk substitute.
14. Not allow any publicity by manufacturers or agents of breast milk substitutes.
15. Not give any feeds using bottles and teats.

## HIV AND INFANT FEEDING PRACTICES GUIDELINES

- Provide information on benefits of breastfeeding, prevention and management of breastfeeding problems and appropriate complementary feeding
- Promote good maternal nutrition and self care
- Provide vitamin A supplement, iron, folic and zinc
- Counsel on child spacing
- Promote treatment of infections
- Information on reduction of HIV Infections
- Information on the risk of mother to child transmission of HIV
- Information on voluntary counselling and testing
- Information on reinforcing risks reduction to couple.

**Appendix III: A sampling frame of the administrative units (districts) of the city council health facilities**

No.	Administrative unit (District)	Facility Name
1	CENTRAL DISTRICT	Ngara H/C
		Ngaira H/C
		Chest Clinic
		Lagos
		Kariokor
		Huruma lions
		STC
		Innoculation
		Pangani
2	WEST LANDS DISTRICT	State House
		Highridge
		Karura
		Kangemi
		Westlands
		Lower Kabete
3	PUMWANI DISTRICT	Eastleigh
		Pumwani
		Muthurwa
		Shauri moyo
		Bahati
		PMH
		Eastleigh lions (Biafra)
		Jerusalem
4	KIBERA DISTRICT	Langata H/C
		Karen
		Jinah

5	KASARANI DISTRICT	Kahawa
		Mathare North
		Kariobangi
		Kasarani
		Babadogo
		Ruaraka
6	EMBAKASI DISTRICT	Kayole I
		Kayole II
		Dandora I
		Dandora II
		Umoja
		Embakasi
		Ruai
7	MAKADARA DISTRICT	Hono Clinic
		Ofafa Clinic
		Maringo Clinic
		Mbotela Clinic
		P & T Clinic
		Nairobi South B
		Makadara H/C
		Jeriko H/C
		Charles New
		Kaloleni H/C
		Sandford
		Lunga Lunga H/C
Makongeni		
8	DAGORETI DISTRICT	Waithaka
		Ngong Clinic
		Riruta
		Woodly



# Appendix IV: A national growth and monitoring chart for children aged 0-5 years

