DETERMINANTS OF THE NUTRITIONAL STATUS OF CHILDREN 6-23 MONTHS OF WOMEN WORKING IN THE CUT-FLOWER FARMS IN NAIVASHA, NAKURU COUNTY, KENYA.

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A Thesis Submitted to in Partial Fulfillment of the Requirements for the Degree of Master of Public Health (MPH) of the School of Public, Moi University

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DECLARATION

Declaration by the Candidate

This thesis is my original work and has not been produced or presented in any other institution of learning for award of a degree or for examination purposes. No part of this thesis may be replicated without prior written consent of the author and/or Moi University.

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DEDICATION

I hereby wish to dedicate this work to my family without whom I would not have reached this far. Your financial and emotional support has enabled me to find the strength and courage to prepare this thesis. Special gratitude goes to my husband Anthony, for his love, support and commitment; to my daughters Daniella, Ivanna and Cienna, my inspiration; and to my family: my parents, the late Geoffrey and Teresa Kinuthia, my brothers and sister for your contribution to my education and always believing in me.

ABSTRACT

Background

Infant and young child feeding practices are determinants of child survival and particularly during the period from birth to the age of 2 years. Mothers working in cut-flower farms in Naivasha work under difficult circumstances and are of low socio economic status.

Objectives

The objectives of this study were to assess the infant feeding practices of women working in the cut-flower farms in Naivasha Sub-county, Kenya; assess the nutritional status of their children 6-23 months and identify the factors associated with nutritional status of the children.

Methods

This study was a cross sectional study targeting 116 women with children aged 6-23 months, who had been employed for at least 6 months prior to the study as casual workers. The study employed purposive sampling to identify the study area. Respondents were identified through snowball sampling. Infant feeding practices were documented through interviews, 24-hour recall while anthropometric measurements determined nutritional status of the children. Descriptive statistics and bi-variate analysis (chi-square tests and odds ratio) was carried out to establish factors associated with nutritional status of the children.

Findings

The women sampled had worked an average duration of 49 months and had an average income of nine thousand and eighty (Kshs. 9,080) per month. The average working hours of the mothers was found to be 9.8 hours. While 98% of the mothers initiated breastfeeding at birth, exclusive breastfeeding rate was found to be low at 16% with mean duration of exclusive breastfeeding being 17 weeks. Continued breastfeeding rate was 82%. Majority of the mothers (62%) had crèches within the workplace but only 56% utilized them. Thirty nine percent (39%) left children in informal baby cares at the community. Establishment of a crèche facility alone was not found to be sufficient to ensure positive nutritional outcome for the children. Majority (84%) of the children sampled consumed foods from 4 and above food categories but the diversity of the food fed to the children was poorly constituted, with their diet comprising mainly of milk (fed to 94% of the children) and grain foods (fed to 95% of the children). Prevalence of diarrhea was 43% and other childhood illnesses 48%. Slightly less than half of the children were found to be malnourished with 43%, 41% and 49% of children being wasted, stunted and underweight respectively.

Conclusion

The factors associated with the nutritional status of children of women working in flower farms in Naivasha are food diversity, child care arrangements, availability of crèches, and incidence of childhood illnesses.

Recommendation

All farms should set up crèche, educated mothers on infant feeding practices and informed them of the availability and use of child care facilities within the workplace. The Ministry of health should register all informal baby care premises and organize trainings for all caregivers on operational guidelines, health and safety practices. They should also train mothers on prevention of childhood illnesses affecting this cadre of children including diarrheal diseases, upper respiratory tract infections and rickets.

TABLE OF CONTENTS

DECLARATION ..... **ii**
Declaration by the Candidate ii
Declaration by the Supervisors ii
DEDICATION ..... **iii**
ABSTRACT ..... **iv**
TABLE OF CONTENTS ..... **v**
LIST OF TABLES ..... **viii**
LIST OF TABLES ..... **ix**
LIST OF ABBREVIATIONS AND ACRONYMS ..... **x**
DEFINITION OF TERMS ..... **xi**
ACKNOWLEDGEMENT ..... **xiv**
CHAPTER 1 - INTRODUCTION ..... **i**
1.1. Background of the Study i
1.2. Problem Statement 4
1.3. Justification 4
1.4. Research Questions 5
1.5. Objectives 6
CHAPTER 2 – LITERATURE REVIEW **7**
2.1. Introduction 7
2.2. Exclusive Breastfeeding (0-6 months) 9
2.3. Complementary Feeding (6-23 months) 9
2.4. Infant Feeding Trends 11
2.5. Factors that Influence the Infant Feeding Practices 12
2.6. Conceptual Framework 16
2.7. Summary of Literature Review and Gap in Knowledge 19

CHAPTER 3 – RESEARCH METHODOLOGY 19

3.1. Study Area 19

3.2. Target Population 22

3.3. Study Design 22

3.4. Sample Size Determination 22

3.5. Pilot Test 26

3.6. Data Collection Methods and Procedures 26

3.7. Operational Framework 28

3.8. Data Analysis 29

3.9. Ethical Considerations 29

CHAPTER 4 - RESULTS 31

4.1. Introduction 31

4.2. Background Information of the Study 31

4.3. Mother's Work Environment 35

4.4. Child Care Arrangement 37

4.5. Child Health Information 38

4.6. Infant and Young Child Feeding Practices 41

4.7. Nutritional Status 44

CHAPTER 5 - DISCUSSIONS 56

5.1. Infant Feeding Practices of Mothers Working in the Cut-flower Farms in Naivasha Sub-County, Kenya. 56

5.2. Nutritional Status of the Children 6-23 months of Women Working in the Cut-flower Farms in Naivasha Sub-County, Kenya 57

5.3. Factors Associated with Nutritional Status of Children of Women Working in Flower Farms in Naivasha 58

CHAPTER 6 – CONCLUSIONS AND RECOMMENDATIONS 61

6.1. Conclusion 61

6.2. Recommendations 62

REFERENCES 64

APPENDICES 71

LIST OF TABLES

Table 1: Mother's education level 33

Table 2: Marital status of mother 34

Table 3: Child care arrangements while mother is at work 37

Table 4: Prevalence of diarrhea 39

Table 5: Prevalence of other childhood illnesses 40

Table 6: Action taken when child fell sick 41

Table 7: Number of times children 6-8 months were fed 44

Table 8: Bivariate analysis of wasting 47

Table 9: Bivariate analysis of stunting 49

Table 10: Bivariate analysis of underweight 51

Table 11: Bivariate analysis of faltered growth 54

LIST OF TABLES

Figure 1: Map of Hells Gate Location 22

Figure 2: Farm Type 32

Figure 3: Income level of the mother..... 35

Figure 4: Farm section mother works 35

Figure 5: Crèche availability at the workplace 36

Figure 6: Other child care options apart from crèche 38

Figure 7: Prevalence of wasting among children 6-23 months..... 46

Figure 8: Prevalence of stunting 49

Figure 9: Prevalence of underweight 50

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CDC	- Centre for Disease Control
ECD	- Early Childhood Development
HCDA	- Horticultural Crops Development Authority
HIV	- Human Immunodeficiency Virus
HR	- Human Resource
ILO	- International Labour Organization
IREC	- Institutional Research & Ethics Committee
IYCF	- Infant and Young Child Feeding
KEPI	- Kenya Expanded Programme on Immunization
MoH	- Ministry of Health
MOH	- Medical Officer of Health
MUAC	- Mid Upper Arm Circumference
PEM	- Protein Energy Malnutrition
ORT	- Oral Rehydration Therapy
SOWC	-Situation of Women and Children
SPSS	- Statistical Package for the Social Sciences
UNICEF	- United Nations Children's Fund
VCT	- Voluntary Counseling and Testing
WHA	- World Health Assembly
WHO	- World Health Organization
FADUA	- Frequency, Amount, Density, Use of food and Active feeding

DEFINITION OF TERMS

Anthropometric measurements – measurement of height, weight, arm, circumference, skin fold thickness or any other measurements made on the human body to determine their nutritional status (Gibson, 2005).

Complementary foods – any foodstuff, whether in solid or semi-solid form, given to an infant after the age of 6 months as part of transitional process during which an infant learns to eat food appropriate for his or her developmental stage while continuing to breastfeed (WHO, 2007).

Diarrhea - More than 3 loose stools passed in a 24-hour period. *Acceptably managed* means the child received increased fluids (preferably ORT or recommended home fluid) during the disease and while recovering (WHO, 2010).

Exclusive breastfeeding - Feeding only on breast milk and no other liquid or solid, not even water, with the exception of drops or syrup consisting of vitamins, mineral supplements or medicines. (WHO, 2007)

Exclusive breast milk feeding - when expressed milk is given using a cup or bottle but within the exclusive breastfeeding definition above (WHO, 2007).

Horticultural farms – Farms that grow fresh produce including flowers and vegetables on large scale and for export purposes (Council, 2013).

Infant – A person from birth to 12 months of age (WHO, UNICEF, 2003)

Low birth weight – Infants who have been born with birth weight less than 2.5 kilograms at any gestational age (Edmond, 2006).

Malnutrition – Impairment of health resulting from a deficiency, excess or imbalance of nutrients. It includes over nutrition, which is excess of one or more nutrients, usually of

energy and under nutrition, which refers to a deficiency of energy and or one or more essential nutrient.

Faltered growth – Also referred to as failure to thrive, is defined as decelerated or arrested physical growth (height and weight measurements fall below the third or fifth percentile, or a downward change in growth across two major growth percentiles) and is associated with abnormal growth and development. The reason for failure to thrive is inadequate nutrition (University, 2016). This is a dangerous trend with WHO guidelines recommending clinical intervention for any child with faltered growth.

Nutritional status – The nutrient status of a person as determined by anthropometric measures (height, weight, circumference etc), biochemical measurement of nutrients, or their by-product in blood and urine, a physical (clinical) examination and a dietary assessment and analysis (Gibson, 2005)

Under-nutrition - Outcome of insufficient food intake (hunger) and repeated infectious diseases. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin (wasted), and deficient in vitamins and minerals (micronutrient malnutrition) (WHO, 2011).

Stunting - Insufficient growth of babies for one's age; length/height for age below the -2 Z-score line. Severely stunted is below the -3 Z score line. Stunting indicates past growth failure and is associated with long term chronic insufficient protein and energy intake, frequent infections, sustained inappropriate feeding practices, and poverty (WHO, 2011).

Wasting: Weight for length/height or BMI for age below the -2 z-score line. Severely wasted is below the -3 Z-score line. Wasting indicates current or acute malnutrition resulting from failure to gain weight or actual weight loss. Causes include inadequate food

intake, incorrect feeding practices, diseases, and infection, or a combination of these factors (WHO, 2011)

Young child – A person from the age of 12 months up to the age of 5 years (60 months) (WHO, 2007).

Mother – For the purpose of this research, mother will refer to the biological mother of the child and not caregiver/guardian.

Baby care – This refers to a place or premises where mothers leave their children during the day to be cared for/looked after while they go to look for work. They range from informal arrangements made between mothers and a neighbor who 'watches' over the children to crèche and professional places where children are cared for by a trained caregiver e.g. ECD teacher (KHRC, 2012).

Fair trade –Fair trade certification provides an independent verification that the workers on these large-scale flower farms have decent wages and working conditions in line with the core International Labour Organization (ILO) Conventions. This includes the right to join a trade union, the right to negotiate collectively with the employer on terms and conditions of employment, freedom from discrimination, no child labour, and a safe and healthy working environment. As with conventional sales, the farms negotiate a price with the exporters who buy their flowers for the fair trade market. This price includes an additional payment called the fair trade premium, set at 10% of the negotiated price. This premium money is reserved specifically for investment in projects which benefit the workers and their wider communities. Decisions about how the premium is used are made by a Joint Body of elected workers and management representatives, in consultation with the workforce (Fair Trade Foundation, 2011).

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CHAPTER 1 - INTRODUCTION

1.1. Background of the Study

Infant and young child feeding is a key area to improving child survival and promoting healthy growth and development. The first two years of a child's life are particularly important, as optimal nutrition during this period lowers morbidity, reduces risk of chronic diseases and fosters better overall development. This period (0-23 months) is a time of rapid growth and represents a singular opportunity to provide a child with a strong nutritional and immunological foundation. Intellectual and physical growth is the most rapid, with doubling of brain size and quadrupling of body weight. If a child is malnourished during these early years, much of the damage is irreversible – the answer lies in prevention. Just as the damaging effects of malnutrition can pass from one generation to the next, so can the benefits of good nutrition (WHO, UNICEF, 2003).

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) have for many years emphasized the importance of maintaining the practice of breastfeeding, and of reviving the practice where it is in decline, as a way of improving the health and nutrition of infants and young children. Breast milk is an important source of energy and nutrients, with a half or more of a child's energy needs between 12 to 24 months being provided by the milk (WHO, 2013). It is also a critical source of energy and nutrients during illness and for malnourished children. Breastfeeding reduces the risk of obesity in adulthood, ovarian and breast cancer for mothers as well as enhancing lactational amenorrhea. Breastfed babies have at least six times greater chance of survival in the first months because breast milk has factors that protect the mucous membranes of gastrointestinal and respiratory tracts, and cells and immune factors that actively fight

infections, shielding babies from diarrheal diseases and upper respiratory infections (UNICEF, 2008).

The good news is that breastfeeding rates are no longer decreasing, but have increased, from 1990 when 34 per cent of infants were being exclusively breastfed (UNICEF, 2008) for the first six months, to 39 per cent today (International Food Policy Research Institute, 2016). While some gains were made globally in the duration of breastfeeding, poor infant feeding practices are still widespread (UNICEF, 2008) especially among mothers living and working under difficult socio-economic circumstances. The WHO comprehensive implementation plan on maternal, infant and young child nutrition of May 2010 includes among the six targets, increasing exclusive breastfeeding rate (EBF) for the first six months up to at least 60% by 2025.

A variety of factors influence the prevalence and duration of breastfeeding and adoption of recommended infant and young child feeding practices. According to UNICEF, a bottle-fed infant living in poverty is up to 14 times as likely to die of diarrhea and four times more likely to die of acute respiratory infections including pneumonia than an exclusively breastfed infant. Breastfeeding also protects against chronic conditions later in life such as obesity and diabetes.

While infant and young child feeding practices have been noted as having impact on child survival, mothers' child care practices have also been found to contribute to the children's overall well-being. Studies on women working under challenging work conditions globally have documented the effect of work related demands on mother's caregiving capacity. The World Bank discussion paper 'Raising the productivity of women farmers in sub-Saharan Africa' describes women as 'time poor' because of their dual roles in the household economy and the labour market. On

average, women are reported to work 12.9 hours (Saitoti Katrine A, 1994). The hours worked in the cut-flower sector are way above the national average with work days of 16 hours being common during peak hours. The cut flower industry Kenya provides direct employment to an estimated 90,000 people, approximately two thirds of whom are young women (Women Working Worldwide, 2008), while 2 million people indirectly depend on the flower industry for their livelihoods (Fair Trade Foundation). Naivasha sub-County houses a total of 38 cut-flower farms (KHRC, 2012) and among the employees, approximately 50 % are women of child bearing age. Of the women working in the farms, 55% are single mothers with an average of 3 children (KHRC, 2012). The report point out that the female workers were predominantly between the ages of 20-25 years; an age group considered to be the reproductive age bracket.

Some farms have through lobbying and advocacy and with the gazettement of the Employment Act 2007, put in place measures to improve working conditions for their workers especially the mothers. Among the benefits accorded to mothers is 3 months' maternity leave and 1 hour every day for breastfeeding until the child is 6 months. As much as this is a step in the right direction by the employers, the long working hours on resumption and exhaustion leaves the babies vulnerable to compromised feeding.

This study therefore undertook to establish the determinants of nutritional status of children 6-23 months; while establishing the feeding practices adopted by their mothers working in the cut-flower farms in Naivasha. It also recommends measures that can be put in place to ensure adherence to the recommended guidelines by WHO, UNICEF, Ministry of Health and the Constitution of Kenya.

1.2. Problem Statement

Over 55% of the women in the cut-flower sector are single (KHRC, 2012) and the Children's Act 2001 places the responsibility of caring for children born out of marriage on women (Government of Kenya, 2001). The KHRC report showed that children of women working in the cut-flower industry were reported to be the most vulnerable category to malnutrition, spread of contaminable diseases, child abuse and neglect as they lack proper child care facilities and services and are unable to care for the well-being of their children holistically. This could be attributed to high pressure working environment characterized by long and exhaustive working hours, fatigue, low income levels and inappropriate child care arrangements (KHRC, 2012).

The children are left in day care centers which are run in small crowded rooms with tens of children being left in tiny rooms that lack basic facilities like beds, playgrounds, toilets and have poor hygiene standards (KHRC, 2012). In the report by women working world wide, among the challenges faced by workers in horticultural farms in Kenya, Tanzania, Uganda and Zambia, is extreme low pay and forced and unpredictable overtime. This impacts directly on children especially those who are left unattended (Women Working Worldwide, 2008). This raises the question of what are the determinants of nutritional status of children of mothers working under the above prevailing circumstances and the extent to which they conform to the global guiding principles.

1.3. Justification

According to the Naivasha sub-County Hospital Medical Officer in-charge, the health information data indicates that children living in the communities around the cut-flower farms had elevated malnutrition and diarrhea level as compared to other populations in the sub-County. Globally, studies have shown that children of mothers working under difficult work conditions are susceptible to malnutrition, compromised feeding and care practices.

This study therefore documents the nutritional status of the children, recommends strategies, measures and interventions that will address incidence of mal-nutrition, among the children as well as health concerns arising from the alternative child care arrangements adopted by the mothers. It provided the Ministry of Public Health and Sanitation through the sub-County Ministry of Health office with evidence of gaps in infant feeding and recommended intervention that could ensure adoption of the recommended practices. It provided policy makers within and outside the cut-flower industry and related sectors with information that will inform policies and guidelines aimed at improving the nutritional and health status of the employee's children. In the long run, the children's survival through infancy and childhood years will be ensured.

1.4. Research Questions

1. What are the infant and young child feeding practices of the women working in the cut-flower farms in Naivasha?
2. What are the factors associated with the nutritional status of the children 6-23 months of women working in the cut-flower farms in Naivasha?

1.5. Objectives

Broad objective

To determine the factors associated with the nutritional status of children 6-23 months of the mothers working in the cut-flower farms in Naivasha , Nakuru County, Kenya.

Specific Objectives

1) To determine the infant feeding practices of mothers working in the cut-flower farms in Naivasha sub-County, Kenya.

2) To analyze the dietary patterns and food diversity of women working in the cut-flower farms in Naivasha sub-County, Kenya.

3) To assess the nutritional status of infants 6-23 months of women working in the cut-flower farms in Naivasha sub-County, Kenya.

4) To identify factors associated with nutritional status of the children 6-23 months of women working in the cut-flower farms Naivasha sub-County, Kenya.

CHAPTER 2 – LITERATURE REVIEW

2.1. Introduction

According to the Global Strategy of Infants and Young Child feeding (WHO, UNICEF, 2003), inappropriate feeding practices and their consequences are a major obstacle to sustainable socio-economic development and poverty reduction. Governments are going to be unsuccessful in their efforts to accelerate economic development in any significant long term sense until optimal growth and development of children, through appropriate feeding practices, is achieved.

The study of infant and young child feeding practices have continued to be carried out across the globe due to the vital role proper nourishment plays in the future life of all children. WHO, CDC, UNICEF as well as various institutions of higher learning, government bodies and research institutions are continually conducting studies to establish mother's feeding practices which include; exclusive breast-feeding, breastfeeding with supplementary/ artificial feeding and mixed-feeding. Although infant feeding practices are a major component of child caring practices, they constitute one of the most neglected determinants of young child malnutrition inspite of their important role in growth and development (D. Kumar, 2006). Feeding practices including lack of breastfeeding and early introduction of solid foods have been reported as heath risks (R. Uauy,

2005). In the study of factors that affect mother's choices and decisions related to breastfeeding practices and weaning habits (Al-Shoshan, 2007), further studies on factors affecting mother's determination and practice of breastfeeding were recommended.

The convention on the rights of the child (CRC) accords every child the right to good nutrition. Globally, in 2012, 162 million children under 5 were estimated to be stunted and almost 100 million had low weight-for-height, mostly because of poor feeding and repeated infections. Forty-four (44) million were overweight or obese (WHO, 2013). World Health Organization data reports that few children receive nutritionally adequate and safe complementary foods; in many countries, only a third of breastfed children 6-23 months of age meet the criteria of dietary and feeding frequency that was appropriate for their age.

Lack of breastfeeding – and especially lack of exclusive breastfeeding during the first half year of life are important risk factors for infant and childhood morbidity and mortality that are compounded by inappropriate complementary feeding. Adequate complementary feeding of children 6-23 months is particularly important for growth and development and prevention of under nutrition. Childhood under-nutrition remains the major health problem in resource poor settings. The Lancet 2013 Nutrition Series reports that sub-optimum breastfeeding still accounts for an estimated 800,000 deaths in children under 5 annually (13% of total child's death). The lifelong impacts included poor school performance, reduced productivity and impaired intellectual and social development (WHO, UNICEF, 2003). About 220,000 children's lives could be saved every year with promotion of optimal breastfeeding and appropriate complementary feeding as well as provision of supplements in food insecure populations (WHO, 2013).

2.2. Exclusive Breastfeeding (0-6 months)

Breast feeding is an unequalled way of providing ideal food for the healthy growth and development of infants; it is also an integral part of the reproductive process with important implications for the health of mothers. As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. WHO and UNICEF recommend early initiation of breastfeeding within one hour (WHO, 2007). This protects the new born from infection and hence reduce new born mortality (especially due to diarrhea). The infant should then be exclusively breastfed for the first six months of life without giving any additional food or drink, not even water. The infant should be breastfed on demand. Exclusive breastfeeding from birth is possible except for a few medical conditions, and unrestricted exclusive breastfeeding results in ample milk production. Early introduction of foods and other liquids reduces breast milk intake, decreases the full absorption of nutrients from breast milk, and increases the risk of diarrhea and acute respiratory infections for infants. It also limits the duration of the mother's postpartum amenorrhea and may result in shortened birth intervals (Mukuria, 2006). Formula feeding is one of the alternatives caregivers opt for. It is however an expensive, not nutritionally equivalent, and often dangerous alternative to breast milk, particularly in unhygienic environments (UNICEF, 2000).

2.3. Complementary Feeding (6-23 months)

As the infants grow, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond. The WHO complementary feeding guiding principles encourages

responsive feeding whereby the caregiver is patient, feeds the child slowly while encouraging them, maintains eye contact, talking to the child and ensuring that a child is not being forced to feed but encouraged to feed. Good hygiene practices and proper food handling are also important during responsive feeding (WHO, PAHO, 2003). Adequacy of the food (start with small amounts and increase gradually as the child grows older), food consistency and variety, food fortification as well as increasing fluid intake and breastfeeding during illness are also considered as important principles. According to UNICEF Senior Advisor, Infant and Young Child Feeding and Care, initiating breastfeeding is not the major problem – over 90 per cent of women worldwide start breastfeeding. The problem is the immediate societal and commercial pressure to stop (Labbok, 2017).

Continued breastfeeding is important for older infants and young children age 6-23 months, contributing significantly to overall nutrient intake. For older infants (age 6-11 months), breast milk fills most of the energy needs and remains an important source of Vitamin A and C, as well as essential fatty acids. Even for young children 12-23 months of age, breast milk can provide as much as 35-40 percent of their total energy needs (Mukuria, 2006). Breastfeeding alone is not adequate to meet a child's nutritional needs after the first six months of life.

In the transition to eating the family diet, children from the age of about 6 months are fed small quantities of solid and semi-solid foods throughout the day. During this period (ages 6-23 months), the prevalence of malnutrition increases substantially in many countries because of increased infections and poor feeding practices (Mukuria, Kothari, & Abderrahim, 2006).

Feeding guidelines have been developed for the introduction of complementary foods to children age 6-23 months (WHO, PAHO, 2003). Although the international recommendation is that infants should be breastfed for up to two years, there are a number of infants who will not have the benefits of breastfeeding from birth, or who will have stopped breastfeeding before two years. Feeding guidelines have been developed for children who are not breastfed because their mother is HIV positive and has decided not to breastfeed, or has for other reasons chosen not to breastfeed or to stop breastfeeding (WHO, 2005)

Based on WHO guiding principles for feeding breastfed (WHO, PAHO, 2003) and non-breastfed (WHO, 2005) children, the IYCF practices indicator is comprised of all of the following three components:

1. Continued breastfeeding or feeding with appropriate calcium-rich foods if not breastfed
2. Feeding (solid/semi-solid food) minimum number of times per day according to age and breastfeeding status
3. Feeding minimum number of food groups per day according to breastfeeding status (Mukuria, 2006).

2.4. Infant Feeding Trends

There has been strong, official encouragement of breast-feeding since 1974 when the US Department of Health published a report on present-day practice in infant feeding. Results from studies indicated a general decline in the incidence of breast-feeding, at least until the early 1970s. It appeared that at that time the majority of mothers made no attempt to breast-feed. In addition most mothers introduced solid food into the infant's diet before the age of three months. Infant

feeding practices thus did not conform with (sic) the official recommendation to breast-feed for the first four to six months, and to discourage the introduction of cereals or other solid foods to the diet of babies before the age of four months (Trends in Breastfeeding, 1979)

In the past few decades, infant feeding practice has changed rapidly with regards to the choice of early feeding methods. This has included the choice of the use of artificial milk or breast milk, the use of complementary foods and the frequency of feeding (Clavano, 1982) The success of early nutrition is no doubt dependent on the choice of early feeding methods; the correct use of nutrient supplementation, and the pattern of introduction of solid foods (Alakija, 1980). According to an article in Nutrition and Food Journal, Infant Feeding at a WHO/UNICEF meeting, poor feeding practices of this vulnerable age group were described as one of the world's major problems and a serious obstacle to social and economic development (WHO/UNICEF, 1980). This largely man-made problem continues to take a heavy toll in deaths and long term mental and physical disability. The meeting issued recommendations for urgent action. According to Lancet, Nutrition series of 2013, current data shows that the situation is yet to improve with 38% of the infants aged 0-6 months world wide being exclusively breastfed while in the developing world, 39% were exclusively breastfed. Only 42% of new born infants start breastfeeding within the first hour of birth. 60% of 6-8 months old children in the developing world continue breastfeeding while taking complementary foods. A further 58% of 20-23 months old are provided with continued breastfeeding (LANCET, 2013).

2.5. Factors that Influence the Infant Feeding Practices

According to an article by Murphy, Parker *et al* (1998), in feeding their babies, mothers are engaged in a number of different projects, some of them prevent their adherence to expert guidance on the nutritional benefits of feeding babies in particular ways. The article reports on the symbolic and practical purposes of which feeding babies in particular ways can serve for women, as they seek to combine infant feeding with their other responsibilities not only as mothers but more generally inside and outside the home. It concludes that women's infant feeding decisions represent their attempts to reconcile these symbolic and practical tasks and that educational and other interventions which ignore these competing agendas are likely to fail.

2.5.1. Work Conditions (Focus on the Cut-Flower Industry in Kenya)

The cut flower industry in Kenya in the recent past has benefitted from surge in new foreign investment with the World Bank estimating an increase from 200 million in 2002 to 300 million in 2004 (World Bank, 2005). Kenya is currently in fourth position globally in export of cut flowers with a market share of 6% (approximately worth US dollars 7.5 Billion) in 2010 (Center, 2010). The export of the flowers has also grown from 7.8 in 2006 to 9.44% in 2009. The sector is part of the agriculture sector, the mainstay in the Kenyan economy contributing 30% of the GDP and accounting for 80% of the employment (KFC, 2013). The sector presents an opportunity for growth of both the workers and the farms supplying the global market. This study recongnizes that while the sector continues to grow and its relevance to the economy increase, the importance of reflection by the key players on the 'price' that workers 'pay' to enable this growth must be documented and policies put in place to shield them from devastating impacts.

Working hours, physical and inflexible nature of the work remains the greatest challenges for mothers working in the horticultural industry in Kenya which employs approximately 5% percent of the total population in Kenya according to the Horticultural Crops Development Authority (HCDA). Women account for 50% of this workforce and are mostly aged 18-35 years of age which represent the reproductive years. Out of this age bracket, the KHRC reports that women aged between 20-25 years are the majority (KHRC, 2012). Naivasha sub-county houses the largest number of cut flower farms in Kenya, with 38 out of 60 registered farms (63%) being found in the sub-county. The Employment Act, 2007 declares and defines the fundamental rights of employees, provide basic conditions of employment. Among them are non-discrimination (article 5(3) a), Recommends 3 months maternity leave with full pay without loss of benefits (Article 29 (3). The 3 months maternity leave is in addition to annual leave and any sick leave, which are also provided by the law. In 2011, the guiding principles for business and human rights were endorsed by the United Nations Human Rights Commission. In line with the regulations mentioned above, some flower farms in Kenya, and especially the large flower farms, have put in place positive measures to ensure women are retained during the pre and post-natal period. These include three months fully paid maternity leave, breast feeding time on resumption of duty, light duties for mothers and exemption from 'overtime' work. However, according to the KHRC report, after maternity leave, these mothers are subjected to deplorable child care services and facilities that are of great public health concern (KHRC, 2012). The impact of these conditions, which the children continue to be subjected to, on their nutritional status has not yet been documented.

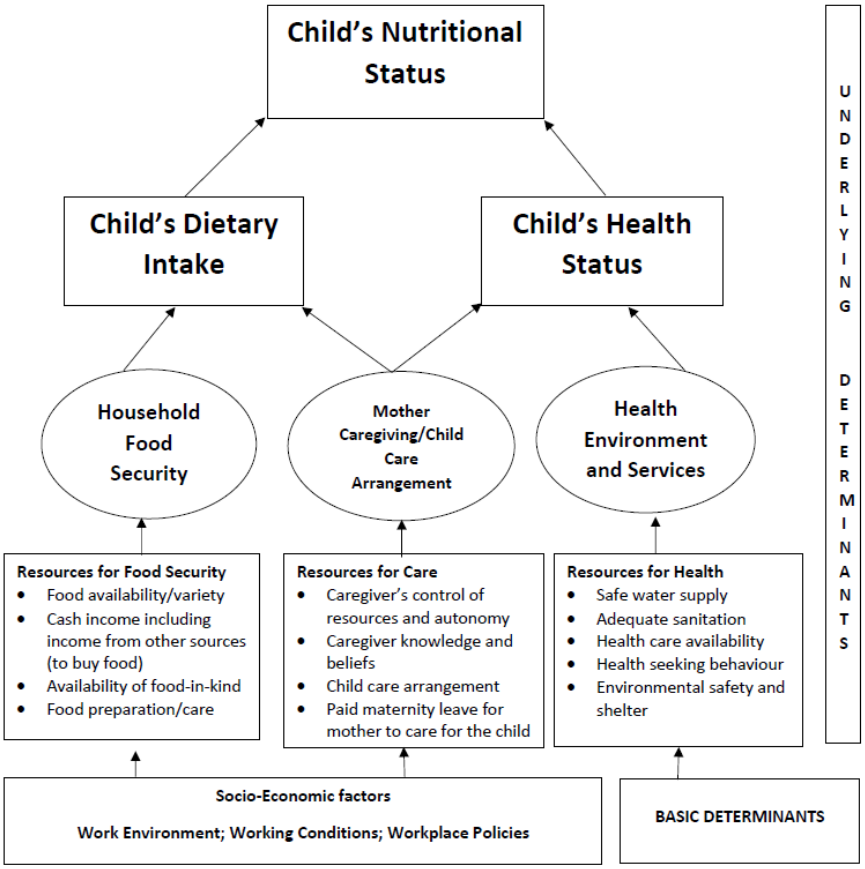
2.5.2. Child care arrangements

Young babies are vulnerable to food-borne disease and though mothers generally comply with recommended primary health care standards, sterilization techniques and food handling measures, question remains on whether the same is the case in the baby care centers and at home when the mother is away. As per a journal article (Worsfold, 1996), observations of infant feeding practices carried out in six day nurseries, the standards of food handling in the nurseries were high but there was a lack of knowledge about current food hygiene regulations. Parents generally complied with recommended techniques for sterilizing equipment and reconstituting infant feeds. Extensive use was made of convenient weaning foods but the foods were also prepared in the home. Recommended cooling and reheating techniques were not widely used. Some potentially unsafe practices were used to transport reconstituted milk feeds or weaning foods.

In Kenya, a study by KHRC(KHRC, 2012) indicates that child care services and facilities under which thousands of the children of women working in the cut flower industry of Kenya are growing are “repulsive and shocking”. Eighty nine percent of respondents in the KHRC study reported access to child care facilities being limited while 100% did not think the facilities available were adequate to meet worker’s needs. Seventy two percent of the workers reported that work has direct impact on the ability of the workers to care for their children especially due to the long hours of work and lack of transport facilities. Majority of the women have to leave their houses at 0600 hours to make it on time for work. The women with young children both single and married alike have no supportive social infrastructure to care for these children. This has led to proliferation of ‘day care’ centers in the suburbs where the workers live. These ‘day care’ centers are mainly 10 by 10 inches residential that are converted to be day care facilities during the day. Women are

required to leave food and clothes for changing. The report describes the centers to be “unhygienic and unsuitable for human habitation, let alone care centers for toddlers”. Most toddlers are brought into the premises with food which was found to go bad during the day since there were no facilities to preserve and warm it (KHRC, 2012). The report further documents that the day care facilities in Naivasha were found to have the worst conditions with reports of children dying from rickets by caregivers, workers and the health facilities. The study reports malnutrition, spread of communicable diseases, death due to preventable diseases and inability by some parents to provide food for the children as common. This study will therefore consider child care arrangements during the day when mothers are away from the child. It will look at the prevalence of malnutrition among the children, document the care practices and the level of compliance to the public health standards as stipulated in the Global Strategy on Infants and Young Child by WHO.

2.6. Conceptual Framework



Adopted from UNICEF conceptual framework of the determinants of child under nutrition adopted from Black et al., 'Maternal and Child Undernutrition' and accessed through (UNICEF , 2013)

Nutritional status is the result of many determinants, not solely related to food. It is essential to identify and understand the different reasons for under nutrition in a population to be able to design appropriate interventions (UNICEF, 2015). The UNICEF conceptual framework, which the nutrition community has been using for programming for the past 25 years, identifies three levels of determinants of nutritional status i.e. immediate, underlying and basic determinants. This study adopted the framework in designing the study, analysis of findings, discussions and

conclusion/recommendations. Data was collected for all the immediate, underlying and basic determinants. The basic determinants were modified as indicated in 2.6.1 below:

2.6.1 Modifications of the Conceptual Framework in the Study

The UNICEF conceptual framework was modified through narrowing down the basic determinants to those directly impacting on mothers working in the cut-flower farms. The envirnoment that the study took into consideration was the work environment and its policies which directly contribute to the resources available for food security, health and care of children. Social factors include the marital status of the mothers which determine the support available in availing the required resources. Economic determinants included the average income of the mothers.

2.6.2 Adoption of the Conceptual Framework in the Study

The study collected, analyzed and presented findings on the determinants of nutritional status of children of mothers working in cut-flower farms in Naivasha.

a) Immediate determinants included child health indicators of incidence and management of childhood illnesses (including diarrhea and rickets) and immunized status. Dietary intake was assessed through 24 hour recall of nutrient intake.
b) Underlying determinants included the household food security (available income for purchase of variety of food items and food preparation); care for children (paid maternity to care for the child and caregiving practices and kowledge as well as contol over resources established through position of woman in the household) and access to health.

c) Basic determinants included socio-economic factors (marital status, income and education level); work environment (workplace policies, working hours, availability of creche in the workplace and provision of health care for mothers and their children).

2.7. Summary of Literature Review and Gap in Knowledge

The area of infant and young child feeding has sufficient literature especially for breastfeeding and factors associated with breastfeeding. Research on effect of work conditions on breastfeeding and infant feeding practices is also available at global level. However, literature on the effect of work conditions in the cut-flower farms and particularly on the nutritional status of children of mothers' working in the farms, is not available globally nor in Africa.

CHAPTER 3 – RESEARCH METHODOLOGY

3.1. Study Area

This study was undertaken in Hells Gate location, Naivasha sub-County, Nakuru County of Rift-Valley region in Kenya. Specifically, Karagita informal settlement which had a population of

49,000 people in 2009 (Hassan, 2015); Kamere and DCK informal settlements were visited for data collection as well as Oserian, Florensis and Panda flowers crèches, representative of flower farms that provide care for children of their employees. Hells gate location houses majority of the 38 flower farms that deal with cut flowers farming in the sub-County. The extent of migration into Lake Naivasha area is shown by growth of the core urban population of Naivasha - which went from 6,900 people in 1969 to 181,966 people in 2009 (Kenya National Bureau of Statistics, 2009). Among these farms, there were various categories including:

a. **Large size flower farms:** These are farms with over 70 hectares of land under farming. They include Homegrown Kenya Ltd, Oserian Development Company, Finlays Horticulture Ltd and Sher Karuturi Ltd. They produce mainly floricultural products entirely for the overseas markets. They are almost all fair trade certified. The approximate number of staff per farm is 5,000-6,000. Oserian for example has 6,000 workers, 90% are permanent and around one third are female (Fair Trade Foundation).
b. **Medium size flower farms:** These are farms with 15 – 69 hectares of land under farming. They are characteristically owned by individual investors (both local and international) and produce floriculture products for both overseas and local markets. They have fewer staff and some of them are fair trade certified but majority are not. They include Panda Flowers, Bigot Flowers, Maridadi Flowers, Longonot Horticultural Ltd among others.
c. **Small size flower farms** are farms below 15 hectares. They are characteristically owned by individual local and some few international investors and produce floricultural products

for local and some international markets. The local ones are not fair trade but are members of the KFC.

Some of the horticultural farms have put in place workplace policies that ensure health care service provision as well as baby friendly services available to staff within their work places especially those that provide staff with housing. These include crèche services, 3 months maternity, and for only the farms with health facilities, access to Ante Natal Care (ANC), Maternal Child Health (MCH) clinics (including family planning). However, others are unable to provide any subsidized health care and baby friendly services. This leaves the staff and their children vulnerable to poor health condition directly or indirectly related to their working conditions which are characterized by low income (averagely Ksh. 9,024.15 for those that comply with minimum wage requirement) (Government of Kenya, 2013), long working hours with very tedious assignments (cultivation, standing all day for those grading) and exposure to chemicals used to spray and preserve the farm produce. These conditions compromise the mother's health as well as her ability to care for her child. She is unable to concentrate on the child's developmental needs as well as prepare well balanced food.

Majority of the women working in the farms are of reproductive age, have small children and are casual employees who live in slum dwelling/informal settlements and have very low income which they use to supplement their husband's salaries. They struggle to meet their basic needs including access to water, education for their children and health care. Many of them opt for overtime to make more money for the family or the nature of their work compels them to.

Figure 1: Map of Hells Gate Location

3.2. **Target Population**

This study targeted women employed by cut flower farms with children aged 6-23 months of age and who work as casual workers. All women included in the study had to be willing to avail their children for assessment of nutritional status.

3.3. Study Design

The study was a cross sectional study.

3.4. Sample Size Determination

The sample size was determined using the Fisher formula of 1998; $N=z^2pq/d^2$

Where

N=Desired sample size (for population>10,000

Z= The standard normal deviate usually set at 1.96 which corresponds to 95% confidence level.

P= Estimated nutritional status of the study population

Q= 1-p

D= The minimum error/degree of accuracy desired, which is usually set at 5% or 0.05

The prevalence of wasting children in Rift Valley(P) was 6.7% according to the KDHS, 2009, weight for height % below -2SD while the KIHBS 2005/06 gave the proportion of children 6-59 months who are wasted -2SD for Nakuru as 0.7%. The KDHS rate gives the following:

$N= 1.96^2 \times 0.067 (1-P)/d^2 = 1.96^2 x 0.067 x 0.9333/0.05^2 = 96$ ***sample size***

Non Response

Sample size was increased by 10% to cater for non-response. Hence, a sample of 106 children was used and an actual sample of 116 mothers reached. Out of these mothers, 109 of their children were included with 7 being left out because of unavailability of the mother to give consent during assessment.

3.4.1. **Sampling Technique**

The study employed purposive sampling to identify the study area and the farms with crèches. This was because there was need in identifying respondents from farms with crèches and without crèches. To identify mothers from farms without crèches, snowball sampling technique was used.

Purposive sampling of the study area

During the pilot, a key informant interview with the Medical Officer of Health (MOH) for Naivasha sub-county revealed need to concentrate the study efforts in areas that housed the flower farms and also contributed the highest cases of malnutrition of the target age group of children. The area (community) of study was therefore selected based on Ministry of Health malnutrition data accessed from Naivasha Sub-county MOH health information system (HIS). The malnutrition report on the percentage contribution of residence to severe malnutrition (-3 and -4 z scores for children 3-59 months) in the last quarter of 2014 (last 3 months to study) (MoH, 2015), Karagita contributed the majority of the cases at 15.6%. The area was hence selected and Oserian, DCK and Kamere areas (contributed 3.3% of malnutrition cases), also included in the study due to proximity to Karagita.

Stratified sampling to identify the farms to conduct the study

During the pilot study, it was noted that the flower farms were not all receptive to data collection from their workers and some completely denied the research team access to the farms especially those without crèches. The farms were purposefully grouped into those with crèches and without crèches for comparison. To identify which farms with crèches to visit, one farm of each size (Large, medium and small) was randomly selected from a list given by MoH based on their assessment and access sought from farm management with the help of the area Chief and the MoH.

All mother's found in the crèche were included in the study because the mothers who met the inclusion criteria were few. The farms with crèches were willing to accommodate the study with an aim of gaining insight into the success of their crèches.

Snowball sampling to determine the respondents from farms with no crèches.

Following the pilot report that documented challenges of access to farms that did not have crèches (majorly due to fear of victimization), the study opted to identify respondents to represent farms with no crèches, through snowball sampling method at the community. Through this method, mothers with a child aged 6-23 months that work in the farms on the sample frame (including large, medium and small farms) were identified, with the point of contact being the bus yard where mothers were dropped after work or the baby cares where children are left for care. Each mother identified would refer the study team to the next mother who met the criteria and left their children in the community.

3.4.2. Inclusion Criteria

The study included the mothers who;

i. Had a child aged 6-23 months.
ii. Had been employed as casual laborer in a cut flower farm; working either in the production line or the post-harvest line (Grading) of the farm or any other department that required casual laborers.
iii. Was not on maternity leave (had resumed work).

3.4.3. Exclusion Criteria

The study will exclude all mothers who are part of management.

3.5. Pilot Test

A pilot test was carried out as part of quality assurance. It was conducted in harvest flower farm in Murungaru, North Kinangop. It brought out the following lessons:

1. Not all farms gave access to the participants at the workplace ……were **willing** to participate in the study hence **change of sampling** procedure from random only to include snowball sampling of mothers at the community. As they were sampled, the farm size was documented and this information was used at analysis (stratified analysis).
2. Written **authorization** was required for access to the farms and access of MoH health information system (HIS) data.
3. Inclusion of clinical assessment of **rickets**.
4. **Timing** for identification of sample population was early in the morning and late afternoon.

3.6. Data Collection Methods and Procedures

3.6.1. Assessment of Infant Feeding Practices

An **Interview schedule** was used to collect the data from the mothers. Apart from collecting various socio economic and background characteristics, the schedule also collected data on exclusive breastfeeding and timely initiation of breastfeeding, complementary feeding and food diversification of diets fed on children.

Data on the dietary patterns and food diversification of women working in the flower farms was determined through collecting data on the types of foods given to the children using a **24 hour**

Recall template and number of times the children were fed. This ensured that the study established the number of food groups consumed and frequency of feeding of these food groups.

Additional qualitative data was collected on feeding practices of the persons entrusted with the responsibility to feed the children while the mothers were working including baby care proprietors and crèche nannies.

Key informant interviews were conducted to gather additional data from the farm's management, the Chief of Hells Gate Location, District Public Health Officer, District Nutritionist, the Medical Officer of Health and baby care managers/proprietors.

3.6.2. Assessment of nutritional status of children

This was established through anthropometric measurements which assessed wasting, stunting and underweight. The study determined weight parameters through us of a salter scale, length through use of a length board and MUAC using the MUAC tape. All parameters were taken thrice and an average calculated. The age was determined through review of the child's health card for date of birth and for those who did not have (n=6), through mother's recall of birth date. Their growth was then compared against the WHO standard. Review of the children's growth curve on the clinic cards identified cases of faltered growth. Wasting was determined through the child's weight against their length. Stunted growth was established through taking the children's height and calculating against their age and comparing against the WHO child growth standards. Negative weight gain was observed for all the children who had their clinical cards (94.8% had cards that were seen and reviewed by the interviewer), the growth curve was checked against the standard growth curve on the road to good health in their clinical cards. The current weight (average of the

3 weight records taken during the study) was recorded and plotted in their cards. It was compared against the last weight entered in the card and the standard weight and height for children of similar age. WHO guidelines recommends clinical intervention for any child with faltered growth and hence all children found to have faltered growth were referred to Naivasha sub-county hospital for immediate intervention.

3.6.3. Other factors influencing nutritional status of children

Data on other factors influencing the outcome of the study were collected using the **interview schedule**. They included mother's education level, income, marital status and work environment (working hours, section of duty, availability of crèche at workplace and maternity leave); child health information including immunization status, child hood diseases incidence and management as well as child care arrangements.

3.7. Operational Framework

The dependent variable of the study was nutritional status of children, which was established through calculation of wasting, stunting and underweight. Nutritional data was collected in numerical scale and included age in months; weight to the nearest 100 grams that was recorded thrice and an average computed and length in centimeters.

The independent variables of the study were breastfeeding (binary scale for practice and numerical scale for duration); education level (ordinal scale); income levels of the mothers (numerical scale); marital status (nominal scale); immunization status of the child (nominal scale); diarrhea and other childhood illnesses (binary scale for incidence and nominal for action taken); child care arrangements (nominal for type and numerical scale for cost of care); working hours (numerical

scale); work section (nominal scale); duration of maternity leave (numerical scale); availability and duration of breastfeeding breaks (nominal scale for availability and binary scale for duration) and complementary feeding practices (nominal for practice and numerical for duration of practice).

3.8. Data Analysis

Data was entered into SPSS statistical software (version 8.0). The first part of the analysis was descriptive analysis to describe socio-demographic characteristics and infant feeding practices of women working in the cut-flower farms Naivasha District, Kenya. Data was analyzed using SPSS statistical software (version 8.0). Analysis of anthropometric data was done using WHO Anthro software and the results merged with the rest of the data in SPSS for further analysis.

Chi square test was used to determine factors associated with nutritional status of the children. The significance level was set at 0.05 at 95% confidence interval.

3.9. Ethical Considerations

Ethical clearance was sought from Institutional Research and Ethics Committee (IREC) to conduct this study. Additional clearance was sought from the Director of Medical Services at the Ministry of Health (MoH) headquarters in Nairobi (following advice during the pilot study). This enabled use of health data from MoH health facilities for sampling and report writing and conduct of key informant interviews with MoH staff.

During data collection, consent was sought from participants through a written request for consent on the introduction page of the interview schedule. Identity of the staff interviewed was protected by not indicating their names on the questionnaire or any other part of the report. Identity of the flower farms was also protected during results, discussions and recommendations to avoid

victimization. Permission was obtained from the farm's management to conduct the study within their premises. Data obtained was maintained in confidence and was to be used only and specifically for purposes of this research and for intervention purposes by interested stakeholders. All mothers were given nutrition and health advise depending on the condition of their children. Sixteen (16) children who were found to have faltered growth (failure to thrive) were referred to Naivasha sub-county hospital for intervention and nutrition therapy. Unfortunately there was one fatality, from those referred, during intervention further bringing out the need for early diagnosis and intervention for these children. The 15 cases screened and found to have positive clinical signs of rickets were all referred for further diagnosis at Naivasha sub-county hospital orthopedic clinic where they received free laboratory tests and intervention.

CHAPTER 4 - RESULTS

4.1. Introduction

This chapter presents findings on infant and young child feeding practices of women working in cut-flower industry in Naivasha, the effect the practices have on the nutritional status of their children 6-23 months and factors associated with the nutritional status of the children. Further, the chapter explores the mother's background information, working environment, child care arrangements that have been put in place during working hours, their children's general health and nutritional status.

Data was collected from 116 mothers working in cut flower farms within Naivasha who had children 6-23 months of age. One hundred and nine (109) children were included in the study with 7 children being excluded due to unavailability of the mother to give consent at the time of the assessment). Fifty two per cent (51.7%) of the children included were male (n=60) while 48.3% were female (n=56).

4.2. Background Information of the Study

4.2.1. Farm Type

Among the mothers interviewed, the largest proportion worked for small size farms. In total, 15 farms were covered by the sample size out of 38 farms based in Naivasha (40% of the farms).

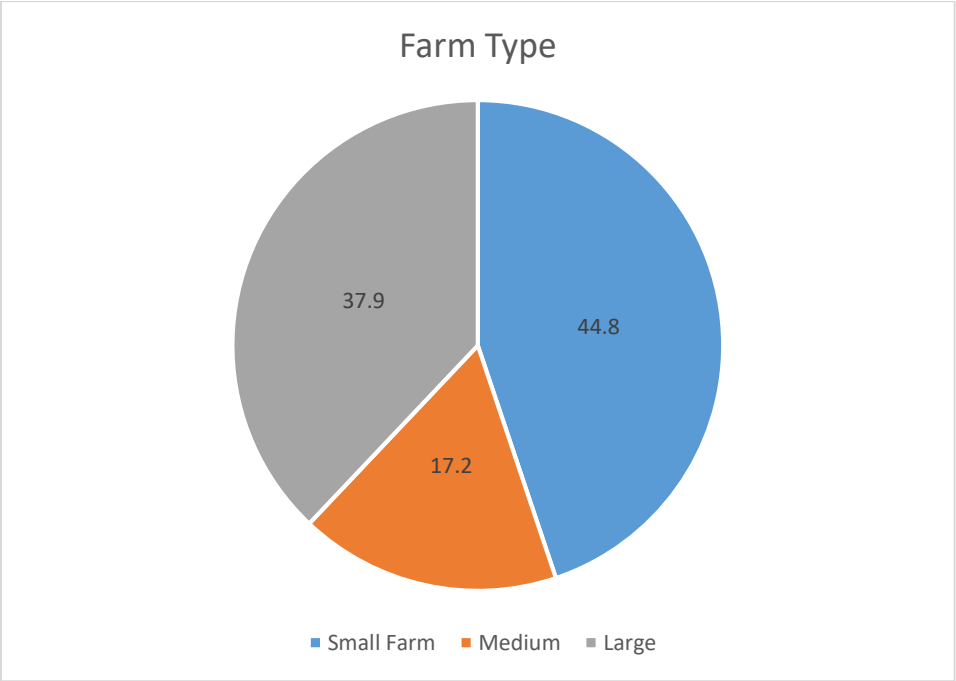


Figure 2: Farm Type

4.2.2. Duration of Mother's Employment

Duration of employment of the mother in the farm is the total number of months that the mother has been working in the cut flower farms in Naivasha. This could be at the farm they were working in at the time of the study or any other farm in the area. Duration of work provides insight into the duration that the mother is exposed to factors that affect their infant and young child feeding practices and hence influence the nutritional status of their children.

The average duration of employment in months was 48.7 months (SD=48.43). 21.4% of the respondents had worked for less than six months while the majority of the respondents were noted to have worked for between 22-31 months.

4.2.3. Mother's Education

All mothers were literate with the majority of them (61.2%) having secondary education.

Table 1: Mother's education level

Level of Education		
	Frequency	**Percent**
No Formal Schooling	1	.9
Upper Primary (4-8)	39	33.6
Secondary (F 1-4)	71	61.2
College (Certificate, Diploma)	4	3.5
University	1	.9
Total	**115**	**99.1**

4.2.4. Mother's Marital Status

Majority of the women interviewed were living together with their husbands but were not legally married. Only 20.7% were not married (either single, separated, divorced or widowed). This results were collaborated by 77.6% of the respondents who reported that they were not the household head and their relationship to the household head was 'wife'.

Table 2: Marital status of mother

Marital Status		
	Frequency	Percent
Married Monogamous	37	31.9
Married Polygamous	2	1.7
Together but not married	53	45.7
Single	19	16.4
Separated	2	1.7
Divorced	2	1.7
Widowed	1	.9
Total	**116**	**100.0**

4.2.5. Mother's Income

The average income per month paid to the workers is 9,080.82 (SD=3,745.27) with lowest earning Ksh. 4,000 and highest being Kshs.35,000. The majority (71.9%) earn below Kshs. 10,000 as shown in figure 3 below while only 5.4% earn above Kshs. 11,000.

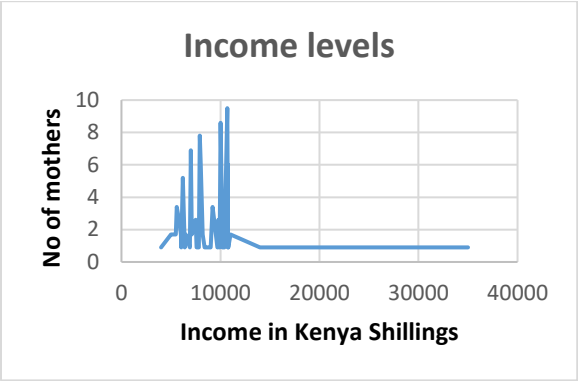


Figure 3: Income level of the mother

Ninety six per cent (95.7%) of the respondents reported their income as being from working in the flower farms only.

4.3. Mother's Work Environment

4.3.1. Farm Section

Majority of the respondents work in the production (farm) section of the flowers farms followed by the post-harvest section; which constitutes the key sections within flower farms.

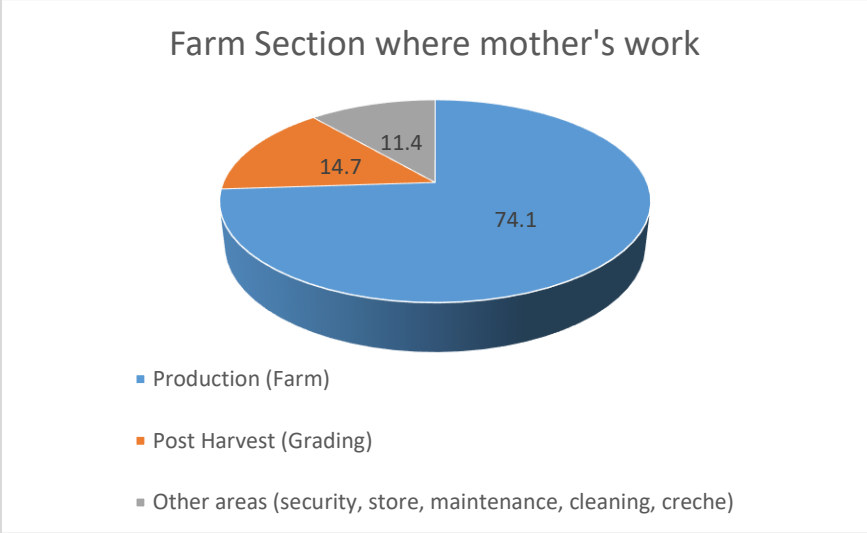


Figure 4: Farm section mother works

4.3.2. Working Hours

The average working hours were noted to be 9.8 hours with the minimum hours worked being 7.7 and the maximum 17 hours (1.3 SD). The majority (25%; N=29) worked for 9 hours followed by 18.1% (N=21) who worked for 10 hours and 12.1% (N=14) who worked for 9.5 hours.

4.3.3. Crèche Availability at Workplace

Majority of the respondents worked in farms with crèches. However, the study noted that while some of the mothers had access to a crèche at the workplace, they still chose to leave their children outside the crèche (56% leave in crèches within the workplace while 44% leave in other child care arrangements) as shown in figure s below.

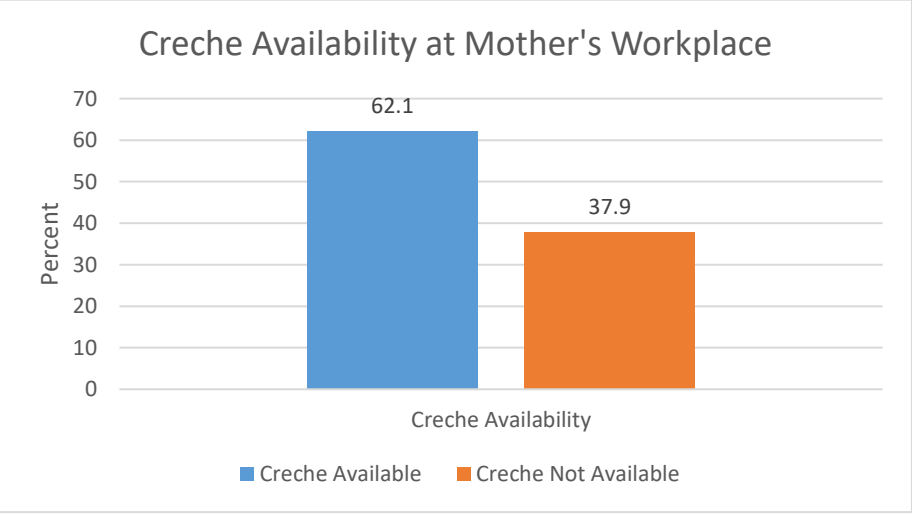


Figure 5: Crèche availability at the workplace

4.3.4. Maternity Leave for Mother

Seventy four per cent (74.8%) of the respondents reported having been given paid leave while the remaining reported having not been working when the child was born. Those that reported having been given paid maternity leave, 96.3% reported having been given 12 weeks (3 months) which is in line with the regulations. The mean duration of maternity leave was noted to be 11.9 weeks.

It was worth noting that 91.46% of those who were given maternity leave were also allowed extra time to breastfeed their children upon resuming work; with the average time given being 61.33 minutes (SD=7.77). This mainly extended to 6-8 months averagely and the time was mostly given as early exit from work (early evening). For those with crèches, the extra time applied both during lunch time and early exit. This was noted as a good practice across all farm types and in line with recommended workplace policies.

4.4. Child Care Arrangement

4.4.1. Child Care

The study included mothers who had access to crèches within the workplace and those who did not have crèches within their workplace. Of those who did not have crèches within their workplaces (who constituted 38% of the sample), baby care outside the workplace was the most common place where they left their children as shown in table 5 and figure 6 below.

Table 3: Child care arrangements while mother is at work

Child care arrangements when mother is at work	Frequency (n)	Percent (%)
Residential House Help	1	0.9
Non-residential House Help	3	2.7

Crèche within workplace	64	56.6
Baby Care outside workplace, Specify	44	38.9
Leaves with a neighbour	1	0.9
Total	113	100

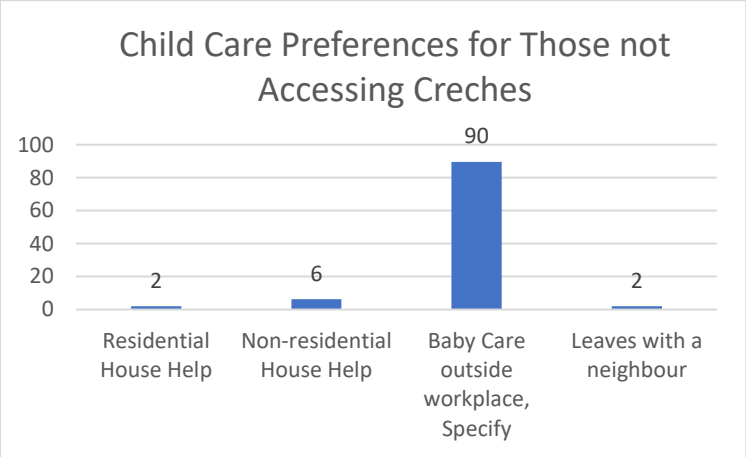


Figure 6: Other child care options apart from crèche

4.4.2. Cost of Child Care

The average cost of child care for women working in flower farms in Naivasha is 518.99 (SD=456.8) with the cheapest being free (mainly those provided for with crèches within the workplace) and the most expensive being Kshs. 2000. On excluding those who paid minimal contribution because they accessed crèche service within the workplace {Kshs. 0 (n=6); 50 (n=25) and 150 (n=15)}, the mean cost of child care for the rest of the mothers (n=59) who mainly sought child care outside workplace was Kshs. 830.

4.5. Child Health Information

4.5.1. Basic Information for Children 6-23 months

The assessment of nutritional status was carried out on a total of 109 children out of 116 children, with 7 children not being included due to lack of guardian consent during assessment. The children included 52% male and 48% females and were aged between 6 months and 23 months, four weeks.

4.5.2. Immunization

4.5.2.1 Immunization Status

Ninety-seven per cent (97.3%) of the children of women working in the flower farms in Naivasha were either fully immunized or partially immunized according to their age (the child had received all vaccines required for children their age). Eighty per cent (80%) had completed their immunization schedule while 17.3% were continuing with their schedule but were up to date.

4.5.2.1 Vitamin A Supplementation

Eighty-eight per cent) (88%) of the children had a clinic visits within 6 months prior to the study and received vitamin A supplementation given to the children.

4.5.3. Diarrhea

4.5.3.1 Prevalence of diarrhea

Table 6 below summarizes the prevalence of diarrhea among children of women working in the flower farms in Naivasha.

Table 4: Prevalence of diarrhea

Prevalence of diarrhoea in the previous 2 weeks to the study?	**Frequency**	**Percent**

Yes	50	43.1
No	66	56.9
Total	**116**	**100.0**

4.5.3.2 Management of Diarrhea

Of those that had diarrhea, 94% received proper management of diarrhea including fluid from ORS packet, zinc sulphate (reported as syrup given at the health facility), intravenous fluids and injections as well as homemade fluids (6%). This is consistent with good health seeking behavior with 87.2% of the mothers reporting taking their children to a health facility to seek treatment (reported health facilities included; government health facility, farm clinic and private clinic).

4.5.4. Common Childhood Illnesses

4.5.4.1 Common Childhood Illnesses by Type

Forty-eight per cent (48.3%) (N=56) of the children suffered from other childhood diseases in the 2 weeks prior to the study as summarized in table 7 below. Of those that suffered illness, URTIs (colds and flus, throat infections) were the most prevalent.

Table 5: Prevalence of other childhood illnesses

Diseases children suffered from 2 weeks prior to study	**Frequency (n=56)**	**Percent (%)**
Malaria	4	7.1
Pneumonia/ Fever	7	12.5
URTI (colds and flu, throat infections)	31	55.4
Ear Infection	3	5.4
Rashes	3	5.4
Colon Infection	1	1.8

Stomach Infection and Vomiting	3	5.4
Rickets	2	3.6
Other, Specify	2	3.6
Total	**56**	**100**

4.5.4.2 Mother's Health Seeking Behaviour

Majority of the mothers recorded positive health seeking behavior with 80.7% taking their children to a health facility (government or private hospital or farm clinic). Table 8 below summarizes action taken by mothers when the child was sick.

Table 6: Action taken when child fell sick

Action taken when child was sick	Frequency(n)	Percent
Taken to government hospital	19	36.5
Taken to farm clinic	21	40.4
Home Treatment	2	3.8
Nothing	7	13.5
Taken to Private Hospital	2	3.8
Bought drugs from a Chemist	1	1.9
Total	**52**	**100**

4.6. Infant and Young Child Feeding Practices

4.6.1. Breastfeeding

4.6.1.1Exclusive Breastfeeding

Early Initiation of Breastfeeding

Ninety-eight per cent (98.3%) of the respondents reported breast milk as the first thing the child was fed on after birth. Fifty-eight per cent (58.3%) reported that the child was put on the breast 30 minutes after birth while 12.2% reported 60 minutes.

Exclusive Breastfeeding

The exclusive breastfeeding rate for women working in cut flower farms in Naivasha is 15.7% with the mean duration of exclusive breastfeeding being 17 weeks and maximum duration being 36 weeks (1 respondent). This duration was noted to be in line with the 3 months maternity leave and 1 month leave allowed within most flower farms.

Thirty-two per cent (32.2%) of the respondents reported having breastfed their children on breast milk only for 12 weeks with 16.5% and 15.7% reporting 16 and 24 weeks respectively. Only 3 respondents reported having breastfed their children on breast milk only beyond 24 weeks (28, 32 and 26 weeks). Of all those that reported having breastfed their children on breast milk only, 43.5% reported that they also gave their children water hence indicative of partial exclusive breastfeeding.

4.6.1.2 Continued Breastfeeding

Mothers working in the flower farms were noted to be practicing continued breastfeeding, with 81.9% of the mothers reporting having breastfed their child the previous night. Only 6.9% had ceased breastfeeding or never breastfed at all. The reason given for cessation was return to work while the reasons given for never breast-feeding was because of the mother's HIV positive status.

4.6.2. Complementary Feeding

4.6.2.1Food diversification

There was high consumption of milk products (94%) as well as grain foods (94.8%) with the most common in each category being breast milk and rice respectively. Green bananas were a common diet with 31.9% of the children having consumed it in the previous 24 hours.

There was average consumption of green leafy vegetables and fruits and much lower consumption of foods rich in β-carotene and Vitamin A exposing children to risk of Vitamin A deficiency. However, high intake of oils, fats, butter or foods made with the oils and fats (86.2%) might improve the absorption of Vitamin A as well as E,D and K.

Apart from milk, there is generally low consumption of protein rich foods especially animal proteins. This leaves children vulnerable to Kwashiorkor, low immunity and wasting especially upon cessation of breastfeeding which together with milk is their main source of protein. This means that these children are a high risk group for wasting between 3-5 years of age. The results are summarized in Appendix 5.

The study further reviewed the children's food diversification by food groups consumed by each child. In child nutrition, it is recommended that children consume at least 4 of the 5 food groups to have sufficient nutritional intake. The categories include fats & oils, bread & cereals, milk products, meat-fish-poultry, vegetables & fruits. Majority of the children (84%) consumed foods in 4 and above categories while 16% consumed food that did not reach recommended 4 groups.

4.6.2.2 Food consistency

The study sought to establish from mothers with children 6-8 months the food consistency served to their children. Seventy one per cent (71.4%) of mothers with children aged 6-8 months reported

feeding the children on solid, semi-solid or soft food plus breast milk (recommended), while 23.8% were fed on liquid foods only. 4.8% reported having fed their children on solid, semi-solid or soft food without breast milk.

4.6.2.3 Meal Frequency

Children 6-8 months fed 4-5 times a day

Table 7: Number of times children 6-8 months were fed

Number of times a child 6-8 months is fed	**Percent %**
Five times	31.8
Four times	33.3
Three times	23.8
Two times	4.8

When asked how many times the mothers fed their children, 65% reported 4-5 times as indicated in table 7 above. The average feeding time for the children was found to be 2 times with the range being between 1 time to 4 times a day. This is very low for children given the recommended number of times is 5 (3 main meals and 2 snacks in between) (WHO, UNICEF, 2003).

4.7. Nutritional Status

Weights and heights of all children aged 6-23 months were measured using anthropometric equipment recommended by UNICEF (UNICEF, 2006) and age established from review of the child's clinical card. Findings in this section are based on the results of these measurements. WHO has developed the 'road to good health' chart (WHO growth standards) which shows the expected progression of weight and length gain by age for children. In this study, the weight of the children and length was plotted against their clinic cards to establish faltered growth; an important indicator for screening children at risk of developing complications as a result of malnutrition.

Bivariate analysis was carried out using chi square for the following variables against the dependent variables (nutritional status by wasting, underweight and stunting): sex of the child, marital status of the mother, level of education of the mother, place of delivery of the child, farm type and section/department where the mother works, availability of crèche in the workplace, place where the mother leaves their child while at work, maternity leave option at workplace, extra breastfeeding time given to the mother upon resumption to work, continued breastfeeding, food categories consumed by the child, diarrhea prevalence in the previous 2 weeks to the study, other disease incidence in the 2 weeks prior to the study, rickets prevalence among the children. Of the above variables, no test could be carried out for education level and farm section that the mothers' work in due to chi square violation during statistical testing. The values in the cells were too small to carry out the tests.

4.7.1. Wasting

Children whose weight-for-height is less than two standard deviations below the median of the reference population are classified as moderately or severely wasted, while those who fall less than

three standard deviations below the median are severely wasted. Wasting is usually the result of a recent nutritional deficiency. The indicator may exhibit significant seasonal shifts associated with changes in the availability of food or disease prevalence.

4.7.1.1 Prevalence of wasting

The prevalence of wasting among children of women working in flower farms in Naivasha is 43%. Of those wasted figure 7 below shows percent who are mildly, moderately and severely wasted.

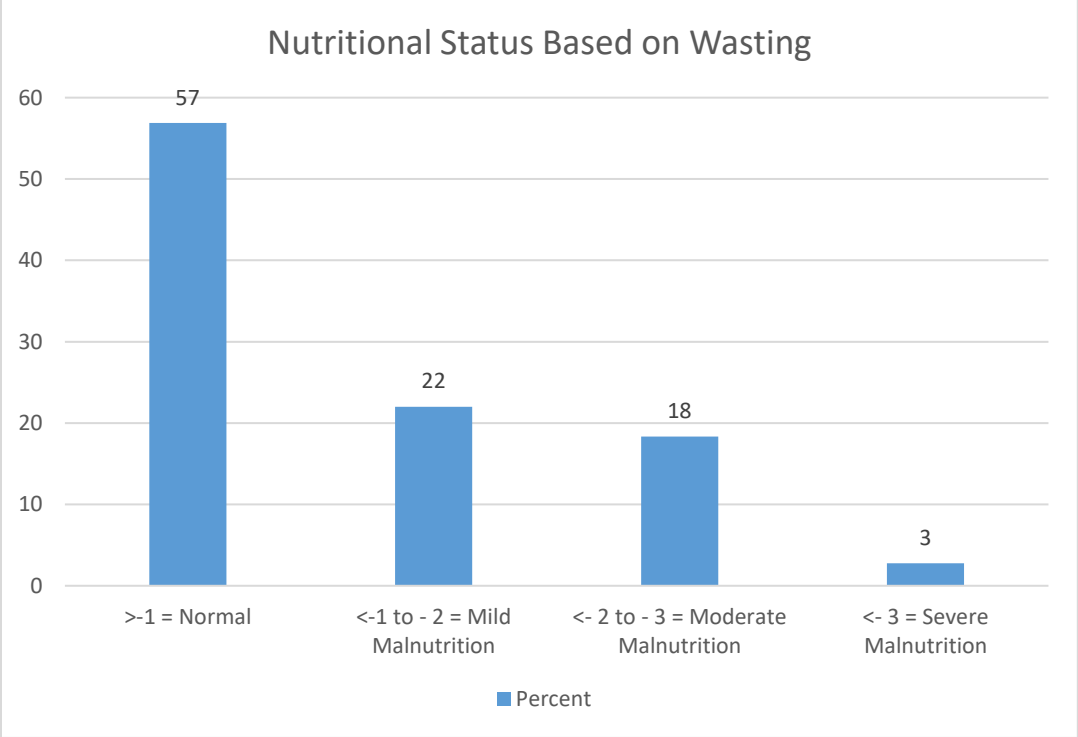


Figure 7: Prevalence of wasting among children 6-23 months

4.7.1.2 Bivariate analysis of nutritional status according to wasting

The factors that were found to have an associated with wasting for women working in the flower farms in Naivasha are food diversification, whether or not a child had suffered from other diseases

in the 2 weeks prior to the study, presence of rickets and whether or not a mother was given maternity leave. The results are summarized in table 9 below.

Table 8: Bivariate analysis of wasting

Independent Variables		**Wasting**		**Statistical Test (Chi-square)**	**Statistical Test (Odds Ratio)**
		Normal >-1 Z scores	**Malnourished <-1 to – -3 Z scores**		
		Freq (n)	**Freq (n)**		
Food Diversification by categories consumed	< 4 categories	5	12	**χ^2= 6.196; df=1, P= 0.013 (P<0.05)**	**OR=3.9 (1.26-12.04) 95% CI**
	4> categories	57	35		
Has child had other diseases in the last 2 weeks?	Yes	24	30	**χ^2= 4.432; df=1,**	**OR=…… () 95% CI**
	No	38	17		

				P= 0.009 (P<0.05)	
Rickets	Yes	2	13	**χ^2= 13.449; df=1, P= 0.000 (P<0.05)**	**OR=11.47 (2.44-53.88) 95% CI**
	No	60	34		
Maternity leave given	Yes	48	29	**χ^2= 4.432; df=1, P= 0.035 (P<0.05)**	**OR=0.39 (0.16-0.95) 95% CI**
	No	11	17		

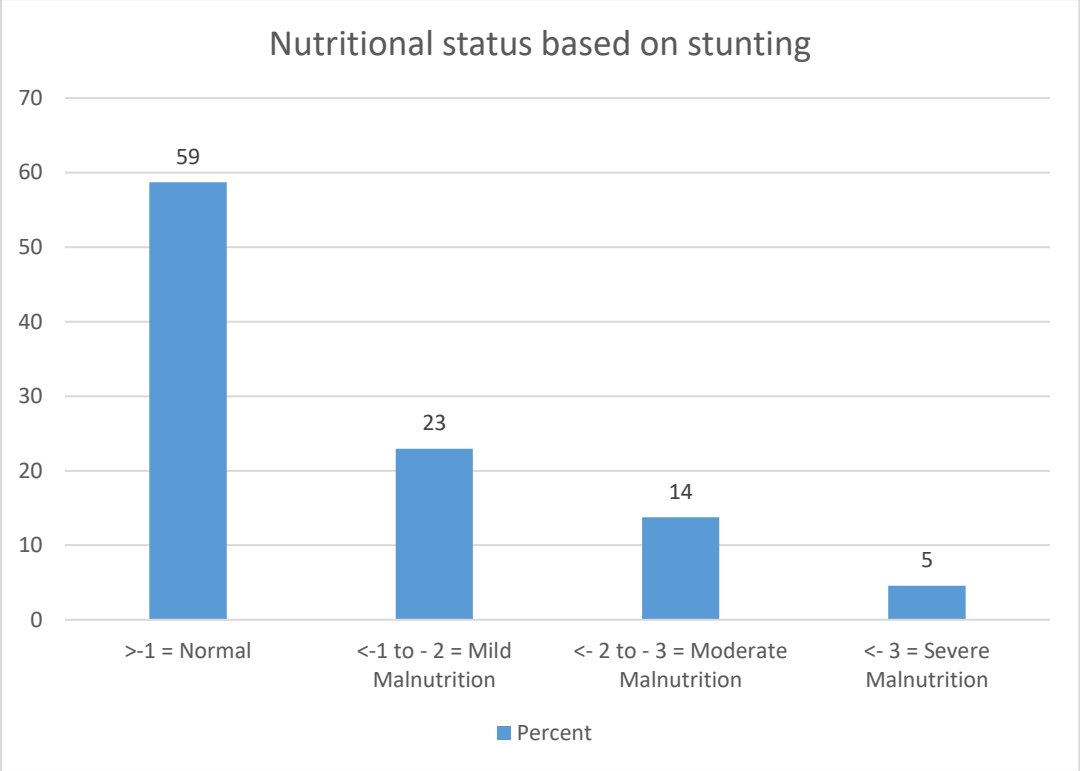
4.7.2. Stunting

Height-for-age is a measure of linear growth. Stunting is a reflection of chronic malnutrition as a result of failure to receive adequate nutrition over a long period and recurrent or chronic illness. Children whose height-for-age is less than two standard deviations below the median of the reference population are considered short for their age and are classified as moderately or severely stunted. Those whose height-for-age is less than three standard deviations below the median are classified as severely stunted.

4.7.2.1 Prevalence of stunting

Fourty one per-cent 41% of the children of women working in flower farms in Naivasha are stunted. Of those found to be stunted, those who are mildly, moderately and severely wasted are shown in figure 8 below.

Figure 8: Prevalence of stunting



4.7.2.2 Bivariate analysis of nutritional status according to stunting

Farm type (large, medium or small farm) was the only factor that had an association with long term malnutrition (stunting) out of all variables tested as summarized in appendix 4. Table 10 below shows the association between being in a small, medium and large farm with stunting levels.

Table 9: Bivariate analysis of stunting

Independent Variables		**Stunting**		**Statistical Test (Chi-square)**
		Normal >-1 Z scores	**Malnourished <-1 to – -3 Z scores**	
		Freq (n)	**Freq (n)**	
Farm Type	Small	30	21	**χ^2 = 6.576; df = 2, P = 0.037 (P<0.05)**
	Medium	15	3	
	Large	19	21	

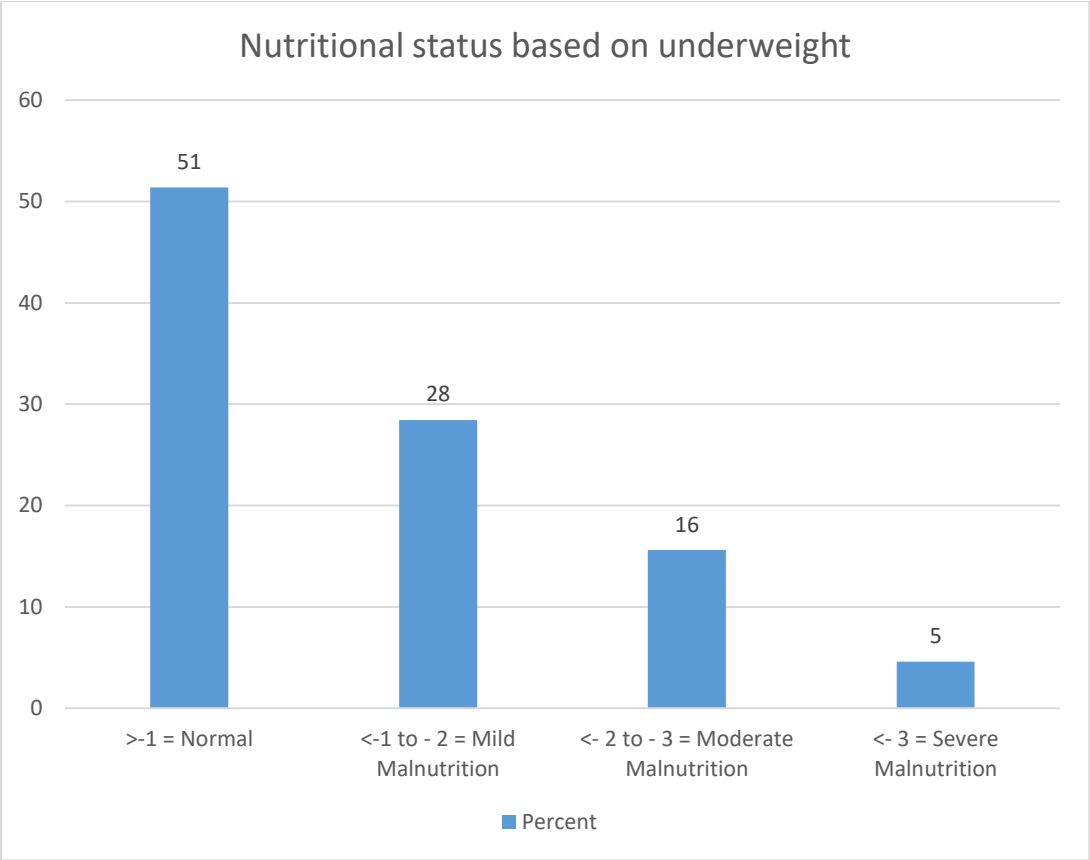
4.7.3. Underweight

Weight-for-age is a measure of both acute and chronic malnutrition. Children whose weight-for-age is less than two standard deviations below the median of the reference population are considered moderately or severely underweight while those whose weight-for-age is less than three standard deviations below the median are classified as severely underweight.

4.7.3.1 Prevalence of underweight

The prevalence of underweight among children of women working in flower farms in Naivasha is 49%. Of those found to be underweight, those who are mildly, moderately and severely wasted are shown in figure 9 below.

Figure 9: Prevalence of underweight



4.7.3.2 Bivariate analysis of nutritional status according to underweight

The factors found to have an association with underweight status of children of women working in flower farms in Naivasha were food diversification, whether or not a child had suffered from other diseases in the 2 weeks prior to the study and presence of rickets. Table 11 below summarizes the association.

Table 10: Bivariate analysis of underweight

Independent Variables	**Under Weight**	**Statistical Test**	**Statistical Test**

				(Chi-square)	**(Odds Ratio)**
		Normal >-1 Z scores	**Malnourished <-1 to – -3 Z scores**		
		Freq (n)	**Freq (n)**		
Food Diversification by categories consumed	< 4 categories	4	13	**χ^2 = 6.252; df =1, P = 0.012 (P<0.05)**	**OR=4.23 (1.28-13.94) 95% CI**
	4> categories	52	40		
Has child had other diseases in the last 2 weeks?	Yes	18	36	**χ^2= 13.946; df =1, P = 0.000 (P<0.05)**	**OR= 4.47 (1.99-9.99) 95% CI**
	No	38	17		
Rickets	Yes	1	14	**χ^2= 13.918; df =1, P = 0.000 (P<0.05)**	**OR=19.74 (2.49-156.44) 95% CI**
	No	55	39		

4.7.4. Faltered Growth also referred to as ‘Failure to Thrive’

Faltered growth was measured through plotting the current weight of the child against the previous weight of the child for all children who had their health card and were frequently weighed in their clinic visits. A downward change in growth across two major growth percentiles was considered faltered growth.

4.7.4.1 Prevalence of faltered Weight Gain

16.7% (N=16) had negative weight gain that fell downwards across two major growth percentiles while 83.3% had positive weight gain.

4.7.4.2 Bivariate analysis of nutritional status according to negative weight gain

The factors that were noted as having an association with negative weight gain were: where the child was left while mother was at work, crèche availability at the work place presence or absence of rickets and diarrhea episode in the 2 weeks prior to the study. Table 12 below captures the analysis.

Table 11: Bivariate analysis of faltered growth

Independent Variables		**Faltered growth**		**Statistical Test (Chi-square)**	**Statistical Test (Odds Ratio)**
		Normal >-1 Z scores	**Malnourished <-1 to – -3 Z scores**		
		Freq (n)	**Freq (n)**		
While at work, with whom is the child left with?	Crèche within workplace	5	59	**χ^2= 8.513; df=1, P=0.004 (P<0.05)**	**OR=4.8(1.57-14.66) 95% CI**
	Baby Care outside workplace, Specify	13	32		
Crèche Available at workplace	Yes	7	64	**χ^2= 6.542; df=1, P= 0.0011 (P<0.05)**	**OR=3.72(1.30-10.63) 95% CI**
	No	11	27		
Rickets	Yes	8	7	**χ^2= 17.104; df=1,**	**OR=0.1 (0.03-0.34) 95% CI**
	No	10	84		

				P=0.000 (P<0.05)	
Has child had diarrhea in the last 2 weeks?	Yes	15	32	**χ^2= 8.513; df=1, P= 0.004 (P<0.05)**	**OR=0.18 (0.06-0.54) 95% CI**
	No	5	59		

4.7.5. Rickets

All children in the study were observed for clinical signs of rickets using the clinical features management and prevention guidelines provided by Ministry of Health, Naivasha Sub-County (MoH, Rickets clinical features, management and prevention guidelines, 2015). 14.6% had positive indicators of rickets with majority having delayed or regressed milestones, generalized muscular hypotonia, Frontal bossing and delayed closure of the anterior fontanelle.

CHAPTER 5 - DISCUSSIONS

5.1. Infant Feeding Practices of Mothers Working in the Cut-flower Farms in Naivasha Sub-County, Kenya.

The feeding practices of women working in the flower farms ranges from positive practice during maternity leave (EBF) to poor feeding practice upon resumption to work especially in the adherence to EBF, frequency of feeding children 6-8 months and diversity of foods given to the children. A study in Ethiopia (Setegn T, 2012) found that being an employed mother made it less likely for a mother to practice proper infant feeding practices including EBF.

Majority (98%) of mothers working in the flower farms initiated breastfeeding at birth but practice of EBF was not sustained for majority with exclusive breastfeeding rate being low at 16%. This finding was consistent with studies carried out in a Taiwanese semi-conductor manufacturing company (Chen YC, 2006) showing only 11% of mothers having carried out EBF as compared 70% who had initiated and maintained breastfeeding during maternity leave. In Sao Paulo, a study on determinants of breastfeeding patterns among working women (Rea MF, 1999) found the EBF rate median duration to be 10 days; predominant breastfeeding to be 70 days and any breastfeeding to be 150 days. In this study, the mean duration of EBF was found to be 17 weeks (equivalent of 4 months) which is consistent with the duration of maternity leave which was found to be 12 weeks plus 4 weeks annual leave. This falls way below the recommended 24 weeks.

Continued breastfeeding rate was high with majority of the mothers reporting having breastfed their children the previous night. This finding was found to have a positive contribution to food diversification with a high consumption of breast milk being noted.

Foods fed to the children were noted to lack recommended diversity hence predisposing the children to risk of infections due to poor intake of fruits and vegetables. This was found to be consistent with the fact that almost half had suffered from a childhood illness (majority suffering from diarrhea and upper respiratory tract infection). The mothers rarely fed their children on proteins rich foods apart from milk. With the high incidence of childhood diseases already noted in the study, there is need for increase in consumption of animal based proteins including eggs to build antibodies which form the body's defense against infections and re-build body tissues worn out by diseases.

5.2. Nutritional Status of the Children 6-23 months of Women Working in the Cut-flower Farms in Naivasha Sub-County, Kenya

In a well-nourished population, there is a reference distribution of height and weight for children. Under-nourishment in a population can be gauged by comparing children to a reference population. The reference population used in this report is the WHO/CDC/NCHS reference, which is recommended for use by UNICEF and the World Health Organization. Three indicators of nutritional status (Wasting, Stunting and Underweight) can be expressed in standard deviation units (z-scores) from the median of the reference population.

Among women working in the flower farms in Naivasha, underweight was the most prevalent form of malnutrition, followed by wasting and then stunting. However, all forms of malnutrition

were noted to be at the same range i.e. 41% to 49% which is consistent with KDHS finding for children below 6 months but not 6-23 months were stunting was noted to be more prevalent (KNBS, 2009).

The three forms of malnutrition are affected by inadequate dietary intake and recurrent and chronic illness. In this study, recurrent childhood illness was noted as being prevalent among this age group (affecting almost half of the children) and could be responsible for the malnutrition. With most children currently noted as being on continued breastfeeding, the nutritional status could get worse upon cessation of breast feeding at the age of 2 years due to poor dietary practices.

5.3. Factors Associated with Nutritional Status of Children of Women Working in Flower Farms in Naivasha

A child's nutritional status is influenced by various factors associated with the child's health status, mother's lifestyle and family stability, demands of the workplace, knowledge and understanding of optimal feeding practices and household economic status. The feeding practices adopted by the mothers have direct influence of the child's nutritional status while other factors influence the nutritional outcome of the child. The study documented the infant and young child feeding practices of the mothers working in the flower farms in Naivasha, the influence of the practice on the nutritional status of their children and factors which are associated with the nutritional status of the children.

1. **Workplace environment, policies and baby friendly facilities**

The study findings showed effort by various flower farms to put in place workplace policies that are friendly to mothers with children under 2 years. These included mandatory three months paid

maternity leave and an hour breastfeeding extra time for nursing mothers. A few have gone ahead to put in place crèches for children within the workplace.

Maternity leave as a benefit for the mothers, crèche availability at the workplace, child care arrangements and farm type a mother worked in were found to have significant association with nutritional status of the children. This is consistent with findings from other studies globally. In a study on the benefits of a dedicated breastfeeding facility and support program for exclusive breastfeeding among workers in Indonesia (Basrowi RW, 2015), the presence of a dedicated breastfeeding facility increased EBF practice almost threefold and knowledge on breastfeeding support increased EBF rate by almost 6 times. In a study on breastfeeding policies and support programmes at the workplace, it was noted that some of the strategies that improved breastfeeding outcome of mothers were keeping the baby near the mother at work, having on-site or nearby care centers, offering flexible work schedules and allowing mothers time to breastfeed the child (ME, 2012).

However, this study also noted that having a crèche at the workplace was not equivalent to its use with results showing that not all women who had a crèche at their workplace left the children there. A similar study in Indonesia showed that of the 22% that had breastfeeding support programme, only 8% utilized it. In another study on employee perception of breastfeeding friendly support in a female labor-intensive electronics manufacturer in Taiwan (SY, 2014), presence of breastfeeding breaks, educating mothers on importance of breastfeeding and greater awareness on the existence and importance of the facilities were noted to be associated with positive use of the workplace services for mothers. In Pakistan, a study on evidence based workplace interventions among

working women (Hirani & Karmaliani , 2013), education for working mothers on managing infant feeding, enhancing awareness on breastfeeding facilities at workplace, providing flexible working hours and putting physical facilities that are private and comfortable were noted as the best strategies for promoting breastfeeding practice.

2. **Food diversification**

Categories of food groups a child was fed on was found to have a significant association with wasting and underweight in children of mothers working in flower farms in Naivasha. This finding is consistent with nutritional guidelines and the KDHS 2009 where inadequate dietary intake affects both wasting and underweight in children.

3. **Childhood illness incidence**

The study found a significant association between presence of diarrhea, rickets and other childhood diseases especially upper respiratory tract diseases and wasting, underweight and faltered growth. This is consistent with findings of KDHS in 2009 where the two forms of malnutrition were noted as being sensitive to recurrent and chronic illness.

5.4 Factors with no associated with nutritional status of the children

Income, duration of employment, marital status, mother's age and education level did not have any notable significance to nutritional status of children of women working in the farms.

CHAPTER 6 – CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusion

The study findings concludes that there is an association between nutritional status of children of women working in flower farms in Naivasha and the following factors:

1. Adopted feeding practices notably from this study, food diversification especially the categories of food groups the mother makes and leaves behind for the children. A mother employed in the flower farms adopts positive feeding practices beneficial to their child (EBF) up until resuming work after maternity leave and annual leave break, where they drop the practices and adopt practices dependent on their work conditions and policies.
2. Child care arrangements while the mother is at work which significantly influences nutritional outcome of the children. However, having a crèche available at the workplace alone is not sufficient to ensure well-nourished children. Educating the mothers on importance of various infant feeding practices especially exclusive breastfeeding and food diversification as well as knowledge of availability of child care facilities and proper use of the facilities in the workplace is of great importance to the nutritional outcome of the children.

3. Child friendly workplace policies such as maternity leave for the mothers, flexible working hours and breastfeeding breaks significantly improve the nutritional outcome of children.
4. Child health status such as incidence of childhood diseases (majorly diarrhea incidence, rickets and upper respiratory tract infections) has influence on the nutritional status of the children of women working in flower farms in Naivasha. This is despite notably positive health and care seeking behavior during illness. The recurrence of diseases such as diarrhea further compromises the recovery of body mass leading to faltered growth and wasting.

6.2. Recommendations

1. The governments through the Ministry of Health, labour and other stakeholders should make it mandatory for employers to offer a breastfeeding and child care support program and a dedicated breastfeeding facility at the workplace. These simple measures will significantly improve the nutritional status of children 6-23 months of mothers working in the flower farms as recommended. Incentives such as government recognition of model flower farms with baby friendly workplace policies will encourage farms to adhere to the recommendations.
2. The farms that set up crèches should make an effort to equip the facilities with recommended equipment such as breast pumps, sterilizing units, refrigerators and storage labels for the safety of expressed milk especially with the risk of HIV infection through mixed up milk.
3. The Ministry of Health should organize for nutrition outreach programmes targeting mothers working in the flower farms to educate them on proper infant and young child

feeding practices especially food diversification and age appropriate nutrient needs of children. The flower farms should partner with the MoH in ensuring mothers are equipped with knowledge on importance of the crèches in the workplace, lactation management and how to utilize facilities such as pumping units etc.

4. Rickets was noted to be a major concern affecting the children's development and associated with their nutritional status. The study carried out screening but would recommend further studies on the extent of its impact on the children's physical development beyond 2 years. There is also need for further studies on its causal factors in Naivasha town. The MoH should also prioritize training of caregivers (formal and informal caregivers especially in the informal baby care centers) on ways of preventing rickets especially through exposure to sunlight.
5. The study brought out child care arrangement as a factor associated with the nutritional status of the children. On review of child care options preferred by the mothers, community baby care services (set up within the informal settlements where the mothers live) were most preferred yet were ran in unlicensed premises with no supervision or proper guidelines of their operations. Study results brought out association between diarrhea and children nutritional status and from observation and MoH records, the child care centers could be contributing significantly to the incidence of the condition. The study therefore recommends development of standard operational guidelines for the running and management of all baby care centers in Naivash The public health department should make effort to register and monitor all the baby cares and hold out reach trainings for their

caregivers on water, sanitation and hygiene practices, nutrition and child care essential practices including first aid.

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APPENDICES

Appendix 1 – IREC Approval

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471//2/3

MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET

Reference: IREC/2014/76
Approval Number: 0001192

9th June, 2014

Ms. Violet Nyambura Kinuthia,
Moi University,
School of Public Health,
P.O. Box 4606-30100,
ELDORET-KENYA.

Dear Ms. Kinuthia,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:-

"Influence of Infant Feeding Practices on the Nutritional Status of Children 6-23 Months of Women Working in the Cut- Flower Farms in Naivasha, Kenya".

Your proposal has been granted a Formal Approval Number: ***FAN: IREC 1192*** on 9th June, 2014. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 8th May, 2015. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

PROF. E. WERE
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc	Director	-	MTRH	Dean	-	SOP	Dean	-	SOM
	Principal	-	CHS	Dean	-	SON	Dean	-	SOD

Serial No: _____

Appendix 2 – Interview Schedule

Informed consent & cover page

Hello. My name is _____. I am a Master of Public Health student from Moi University. I am currently conducting a research on Influence of Infant feeding practices on the Nutritional Status of Children 6-23 months of Women Working in the Cut-flower Farms in Naivasha, Kenya. The study aims at collecting information that will help mothers understand the effect that the feeding and care practices they adopt have on their children and hence ensure improved health and nutrition status. In order to get the information, I would like to ask you some questions related you and your child's feeding and care practices.

Participation in the survey is voluntary, and you can choose not to take part. There will be no risk in the participation and also no material benefit from your participation. However, you may gain some knowledge on nutrition and health of your infants as well and understand better various implications of certain care practices. It will also help your employer better understand how to support you and your child during this critical time of development.

All the information you give will be confidential. The information will be used to prepare general reports, make recommendations and highlight lessons learned and will not include any specific names. There will be no way to identify that you are the one who gave this information.
If you have any questions about the survey, you can ask me.

At this time do you have any questions about the survey?

Signature of interviewer: _____

Respondent agreed to be interviewed:

01=Yes
02=No

SECTION 1: FARM IDENTIFICATION AND WORKING DETAILS

101. Farm No. ☐

102. Date of Interview: _____/_____/_____

103. Name of the Farm _____

104. Which section of the horticultural farms do you work in?
01=Production (Farm)
02=Post harvest (Grading)
77= Others, Specify.....

105. In your section, how many hours per day do you work? _____ hours
(Record from when she leaves home to when she returns) From___am to___pm time

SECTION 2: HOUSEHOLD CHARACTERISTICS

201. Can you please tell me the names of all members of your household who usually live and sleep in your house and eat from the same bowl including yourself. Please include children, relatives, and orphans but don't count temporary visitors. First names are sufficient. This information is confidential and will not be shared with anyone but will be used for the sole purpose of this research.

	Members role i.e. father, mother, first born, second, third born etc	Gender	Age ***NB:*** *For children under 5 years, indicate the date of birth*
a)			
b)			

c)			
d)			
e)			
f)			
g)			
h)			
i)			

202. Marital Status 01=Married monogamous 02=Married polygamous 03=Together but not married 04=Single 05=Separated 06=Divorced 07=Widowed 99=Refused	203. Are you the household head? 01=Yes 02=No 99=Refused
204. If No in 203, what is your relationship with the household head? 01=Wife 02=Daughter 03=Daughter-in-law 04=Sister 05=Self 77=Other, Specify _____ 88= Don't know 99=Refused	205. What is your level of education? 01=No formal schooling 02=Lower primary (1-3) 03=Upper primary (4-8) 04=Secondary (F 1-4) 05=College (Certificate, Diploma) 06=Vocational school (Tailoring, Dressmaking) 07=University 77=Others, Specify _____ 88= Don't know 99=Refused
206. How long have you been employed by this farm? (Duration in months)_____	207. a) What is your average income per month (in Kshs) _____
207. b) Is this income from employment as casual labourer in the farm only? 01=Yes 02=No 99=Refused	207. c) If No in 207.b), what else do you do for income generation? 01=Casual work (specify)_____ 02= Hawking 03= Crop farming 04= Livestock keeping 05= Mixed farming 06= Small Business 77=Others, Specify_____ 88= Don't know 99=Refused
If No in 207.b),What is your average income from working in the flower farm only (in Kshs) _____	

300. CHILD WELFARE INFORMATION

Child Health Questions	**Youngest Child (name)**
301. Where was your children <23 months child born?	01= Government health facility 02=At home 03=At the farm (health facility) 04=Private hospital or clinic 77=Other place, specify_____
302. What type of delivery did you have for your children <23 months?	01=Normal 02=Caesarean Operation

303. a) Were you given maternity leave for your children under 23 months? If yes, proceed with 302b). If No, move to 400.	01=Yes 02=No 03=Not applicable i.e. not working when child was born 99=Refused
303. b) if yes in 302 a), Was the maternity leave paid?	01=Yes 02=No 99=Refused
303. c) if yes in 302 a), What was the duration of the maternity leave (in weeks)	_____
304. if yes in 302 a), Upon resuming work, did you have any hours given by your company to go and breastfeed the baby?	01=Yes 02=No 88=Don't know 99=Refused
305. If yes in 304, How much time is given?	Record in minutes _____

400. INFANT FEEDING INCLUDING EXCLUSIVE, PREDOMINANT BREASTFEEDING

For this section, first explain to the mother/primary caregiver the meaning of exclusive breastfeeding i.e.
Exclusive breastfeeding *is defined as when a child is fed on no other food or drink, not even water, except breast milk (including milk expressed from the mother) for the first 6 months of life, but allows the infant to receive ORS, drops and syrups (vitamins, minerals and medicines). Explain further that sometimes the mother can express milk and leave behind the milk to be spoon or bottle fed to the child. As long as no other artificial milk is given to the baby, then this is still considered for purpose of this study as breast feeding.*

Breastfeeding questions	**Youngest Child (name)**
401. What was first given to the baby after birth?	01=Breast milk 02=Water 03=Formula 04=Glucose 77=Others, specify_____ 88=Don't know/can't remember
402. When you delivered your child, after how long (in minutes) did you put the baby on the breast?	_____minutes 88=Don't know/Can't remember
403. For how long (in weeks) did (name) feed on breast milk only? ***See definition above***	_____weeks 88=Don't know/Can't remember
404. In those (state weeks indicated above), did (name) ever receive water? Or any other feed/drink rather than breast milk?	01=Yes 02=No 88=Don't know/cant remember 99=Refused
405. Was (name) breastfed yesterday during the day or night?	01= Yes 02= No 03=Breast feeding stopped 88=Don't know/can't remember

24-Hour Recall

406. Next, I would like to ask you about some liquids or foods that (name) may have had yesterday during the day or night starting from this time (quote time as per your watch). Describe everything that they ate whether at home or outside the home that you know of.
a) Think about when ***(Name)*** first woke up yesterday. Did ***(Name)*** eat anything at that time? *If yes*: Please tell me everything ***(NAME)*** ate at that time. *Probe:* Anything else? *Until respondent says nothing else.*
b) If respondent mentions mixed dishes, probe: What foods were in that (mixed dish)? Probe: Anything else? Until respondent says nothing else.

Use Attachment 1 – list of foods, categories and codes to complete the a-q for all the children

Youngest child		
Time	**Food Type**	**Comment/clarification**
.....	.....	.....
.....	.....	.....

Complementary foods: From the above and from further asking the mother/primary caregiver, ask the following question:

407. For children below 8 months: What kind of food is (name) fed on? 01=Solid, semi solid or soft foods + breast milk 02= Solid, semi solid or soft foods without breast milk 03=Breast milk only 04=Liquid foods only 05=Liquid foods and breastmilk 77=Others, specify _____ 88=Don't know 99=Refused	**408.** For children 6-8 months: How many times do you feed (name)? 01=5 times 02=4 times 03=3 times 04=2 times 05=1 time 06=No meal fed 88=Don't know 99=Refused

500. IMMUNIZATION

This section is to be filled by the mother or primary caregiver for each child aged 6-23 months in the household. Use the coding as indicated for each question and circle the correct answers.

Immunization Questions	**Youngest child as reported by mother**	**Youngest child as confirmed by the card**	
501. Do you have a health card for (name)? **Ask to see card** If ans is No, go to 504	01=Yes, produced by mother 02=No 03=Lost 88=Don't know 99=Refused	01=Yes, seen by interviewer 02=Not seen 99=Refused	
502. If yes in 501 above, record for the following (*for BCG, check for the BCG scar on the child's left arm*):		01=BCG 02=DPT 1 03=DPT 2 04=DPT 3 05=OPV 0 06=OPV 1 07=OPV 2	08=OPV 3 09=PCV 1 10=PCV 2 11=PCV 3 12=Rotarix 13=Measles
503. If all the above in 502 above are circled, the child is fully immunized		01=Fully Immunized 02=Partially Immunized according to age 03=Incomplete immunization	
504(a) Has (name) ever been given an injection on the arm that left a scar?	01=Yes=BCG 02=No 88=Don't know 99=Refused		
504(b) Has (name) ever been given an injection for vaccination on the thighs? If yes, How many times?	If Yes, circle by times 01=DPT1 02=DPT2 03=DPT3 88=Don't know		

	99=Refused	
504(c) Has (name) ever been given drops as vaccines to prevent disease? If yes, how many times?	If yes, circle by times 01=OPV0 02=OPV1 03=OPV2 04=OPV3 88=Don't know 99=Refused	
504(d) Has (name) ever been given an injection as vaccination in the arm at the age of 9 months or older?	01=Measles 02=No 88=Don't know 99=Refused	
504(e) If all the above in 504 (a-d) are circled positively for immunization, the child is fully immunized	01=Fully Immunized 02=Partially Immunized according to age 03=Incomplete immunization	
505. For those fully immunized (503=01), was the last vaccine given by 1st birthday?	01=Yes 02=No 88=Don't know 99=Refused	01=Yes, noted from card 02=No 88=Don't know 99=Refused
506. Did (name) take a Vitamin A drop like this (show sample) during the last 6 months?	01=Yes 02=No 88=Don't know 99=Refused	01=Yes, recorded in card 02=No 88=Don't know 99=Refused

600. DIARRHOEA AND OTHER CHILDHOOD ILLNESSES MANAGEMENT

This section is to be filled by the mother or primary caregiver for each child aged 6-23 months in the household. Use the coding as indicated for each question and circle the correct answers.

Diarrhoea information	**Youngest Child**
601. Has (name) had diarrhoea in the last 2 weeks	01=Yes 02=No 88=Don't know 99=Refused
602. If yes in **601**, What was given to the child to control the diarrhoea?	01=Nothing 02=Fluid from ORS packet 03=Home-made Fluid 04=Syrup (Show Zinc sulphate) 05=Injection 06=Intravenous Fluid 07=Home-made remedies(herbs) 77=Others, specify 88=Don't know 99=Refused
603. (If yes in **601** and For only breastfeeding children) When having diarrhoea, did you breastfeed your child less, about the same or more than usual?	01=Less 02=About the same 03=More 04=Did not breast feed 88=Don't know 99=Refused
604. If yes in **601** When (name) had diarrhoea, what amounts of drink were offered?	01=Less 02=About the same 03=More 04=No drinks

	88=Don't know 99=Refused
605. If yes in **601** When (name) had diarrhoea[1], what amounts of food was offered?	01=Less 02=About the same 03=More 04=Nothing 88=Don't know 99=Refused
606. Did you seek advice or treatment for the diarrhoea?	01=Yes 02=No 88=Don't know 99=Refused
607. During the time (name) was recovering, what amount of food did you give?	01=Less 02=About the same 03=More 04=Nothing 88=Don't know 99=Refused
608. Has (name) suffered from any other disease in the last 2 weeks?	01=Yes 02=No 88=Don't know 99=Refused
609. If yes in 608 above, which one?	01=Malaria 02=Pneumonia/fever 03=URTI (colds and flu, throat infections) 77=Others, specify…… 88=Don't know 99=Refused
610. If yes in 608 above, what action did you take?	01=Take to government hospital 02=Take to farm clinic 03=Home treatment 04=Nothing 77=Others, specify…… 88=Don't know 99=Refused

700. CHILD CARE ARRANGEMENT

Child Care Arrangement	**Youngest Child**
701. While at work, with whom do you leave your child (name) with?	01=Residential house help 02=Non Residential House help 03=Crèche within workplace 04=Baby care outside workplace _____ 77=Others, specify _____ 88=Don't know 99=Refused
702. If ans in **701** is **04** (Baby care outside workplace), how much do you pay per month for your child's care	Kshs……..

[1] Diarrhoea means more than 3 loose stools passed in a 24 hour period. *Acceptably managed* means the child received increased fluids (preferably ORT or recommended home fluid) during the disease and while recovering.

703. If ans in **701** is **04** (Baby care outside workplace), what services are provided by the baby care?	List all services mentioned ……. ……. …….

800. ANTHROPOMETRIC MEASUREMENT

For this section, carry out anthropometric measurements of all the youngest children aged 6-23 months. Record weight in Kilograms to the nearest one decimal place and Length (recumbent) in centimetres to the nearest one decimal place. Record MUAC (mid-point of the upper arm) to the nearest mm

801. Can I weight and measure (name)? 01=Yes/Agreed 02=No/Refused 03=Child not present

Nutritional Assessment Summary Table	
802. Child's Code	
803. Date of birth	_____/_____/_____
804. Sex	01=Male 02=Female
805.a) Weight 1(kg)	……
805.b) Weight 2	……
805.c) Weight 3	……
806.a) Length 1	……
806.b) Length 2	……
806.c) Length 3	……
807.a) MUAC 1	……
807.b) MUAC 2	……
807.c)MUAC 3	……
808. Check both the child's feet for oedema. Is oedema visible?	01=Yes 02=No
809. Check for any clinical signs of rickets	01=Yes 02=No
810. Check for negative weight gain (against the growth chart in the clinical card)	Negative growth noted: 01=Yes 02=No

NB. If yes in 808-810 or MUAC red reading, child to be referred to the hospital immediately.