

**CARE GIVERS' FORMAL AND NUTRITION LITERACY AND ITS INFLUENCE ON
NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN IN MUNYU, THIKA EAST
DISTRICT, KENYA //**

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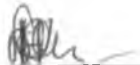
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**DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT
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Declaration

This Dissertation is my original work and to the best of my knowledge has not been presented for a degree or any award in any other university.


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Dedication

I wish to dedicate this work to my dad Pius Kiarie, my late mother Priscilla Gachiku for their dedication in my formative years and instilling in me a sense of hard work; to my husband George Odipo and our children Karen Odipo, Lorna Odipo and Barack Odipo for their understanding and patience during my Master's programme.

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Acronyms and Abbreviations

ACC/SCN: Administrative Committee on Co-ordination/ Subcommittee on Nutrition

ANP: Applied Nutrition Programme University Of Nairobi

A.R.I: Acute Respiratory Infections

HIV/AIDS: Human Immuno Deficiency Virus / Acquired Immune Deficiency Syndrome.

K.D.H.S: Kenya Demographic Health Survey

GAM: Global Acute Malnutrition

GCM: Global Chronic Malnutrition

GoK: Government of Kenya

GUM: Global Underweight Malnutrition

HFA: Height For Age (HAZ)

HH: Household

HHH: Household Head.

M.C.H: Maternal and Child Health

MUAC: Middle Upper Arm Circumference

NCHS: National Centre for Health Statistics of the United States of America

N.G.O : Non Governmental Organization

ORS: Oral Rehydration Salt

P.E.M : Protein Energy Malnutrition

RDA: Recommended Daily Allowance

SPSS: Statistical Package For Social Sciences

T.V: Television

UNESCO: United Nations Educational, Scientific and Cultural Organization.

UNICEF: United Nations Children Fund

WFA: Weight For Age(WAZ)

WFH: Weight For Height(WHZ)

WFP: World Food Programme

WHO: World Health Organization

Operational Definitions

Absolute poverty: refers to subsistence below minimum socially acceptable living conditions and is based on a deficit in meeting nutritional requirement and other basic needs

Anthropometry- The study and technique of taking body measurements, especially for use on a comparison or classification basis. It refers to the measurement of the human individual for the purposes of understanding human physical variation.

Care Giver: Refers to any person providing care to the child whether at the household level or even in a health institution. This includes both mothers and the people they leave under care of their children.

Child: Every human being below 18 years

Childcare activities: All activities such as feeding, washing clothes, bathing, changing clothes, breastfeeding and teaching.

Childcare Practices: For this study refers to the practices of caregivers in the household which translate to food and nutritional security and health care resources into a child's growth and development.

Chronic Poverty: refers to persistence in poverty and captures the fact that some of the poor are poor for short periods while others are poor for long periods)

Complementary food: Foods given to a child in addition to breast milk usually introduced between 4-6 months of age.

Customary education: This is form of knowledge acquired from one generation to the next mainly on customary issues like child upbringing, socialization, mainly from parent to child.

Diarrhoea: Refers to the passage of three or more loose or watery stools in 24 hour period.

EPI-Info- A series of micro computer packages used to assess nutritional status such as height for age, weight for height and weight for age.

ENA: Emergency Nutrition Assessment. Refers to a series of micro computer packages used to assess nutritional status such as height for age, weight for height and weight for age. Used for emergency situations.

Feeding practices: Are related to the factors such as exclusive breastfeeding, complementary feeding, frequency, quantity, and quality of foods.

Food security: Access by all people at all times to adequate and quality food for active healthy life.

Formal education: The structured form of learning which is mainly acquired by attending basic, high school and tertiary education

Household: Refers to one person who lives alone, or a group of persons, related or unrelated who share food or make common provisions for food and other essentials for living.

Illiteracy: Inability to read and write caused by lack of formal education. It is seen as a social problem to be solved through education. It is possible to be illiterate but have customary education and wisdom.

Literacy: The ability to use language to read, write, listen and speak .Literacy is the ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. (UNESCO, 2009)

Malnourished Child: In this study, a malnourished child is a child whose weight-for-age index is below -2 Z- scores of the World Health Organization 2006 reference.

Malnutrition: This is a condition of impaired development or function caused by either a long term deficiency or an excess in energy and /or nutrient intake, the latter representing a state of over-nutrition.

Nexus: Refers to association of or indicates relationship

Nutrition Literacy: Is a function of formal nutrition education and knowledge gained from other sources i.e health facility, mass media , person to person. (www.google.co.ke 18/5/09)

Nutrition Security: Refers to access to adequate and quality supplies of food that meets the nutrient requirement of individuals now and in the future.

Nutrition Status: This refers to whether or not the child is underweight, stunted or wasted

Pre-School Child: Child below 5 years of age. Not yet in school.

Stunting: Refers to deficit in linear growth achieved pre- and post natal. This indicates long term cumulative effect of inadequate nutrition.(HAZ)

Underweight: Refers to having low weight for age mainly due to chronic under nutrition or acute malnutrition. (WAZ)

Wasting: Refers to having low weight for height according to WHO standard with a <-2 SD mainly due to acute malnutrition.(WHZ)

Well nourished child: For the purpose of this study, a well nourished child is defined as a child whose weight-for –age index is above -2 Z score of the NCHS reference.

Z score or standard deviation: The deviation of anthropometric value(s) for an individual child from the median value of the reference population. World Health Organization (WHO) divided by the standard deviation of the reference population.

Abstract

The objective and purpose of the study was to determine the influence of caregivers' formal and nutritional literacy on the nutritional status of children aged 6-36 months in Munyu location of Thika East District. The sample consisted of 126 households out of 1551 households in a population of 6435 persons who were randomly sampled. In each house one pre-school child was sampled.

Data were collected using a pre-tested semi-structured questionnaire, key informant interviews questionnaire and anthropometric measurements from which nutritional indices were derived. Data entry, cleaning management and analysis was done using Statistical Package for Social Sciences software (Version 17.0). The data were subjected to descriptive statistics, chi-square, odds ratio and student t test.

Nutrition literacy is very crucial to enable a care-giver be aware of what food to give to the child and also the frequency of the meals for proper growth and development. Unlike formal literacy, nutrition literacy is not always imparted in formal settings. The mass media and postnatal clinics are some of the avenues through which nutrition education is disseminated. Currently, not everyone attends the postnatal clinics in government hospitals where this is offered. In some cases the mother is too busy with paid employment and entrusts the care of her child to hired house help or relative who may not be well equipped with nutrition literacy. This may lead to the child being malnourished.

Nutrition data was inadequate especially in the area studied. This study aim/objective was to avail this data which would contribute in understanding the shortcomings and how well they would be empowered especially in nutrition education so as to help improve nutritional status of pre-school children and help lower cases of malnutrition.

Information on child nutritional status, nutritional knowledge of the mother and information on socio-economic status of households was collected in a cross-sectional study of 126 households with children aged 6-36 months in a population of 6435 persons in Munyu location of Thika district Central Kenya. The area was selected by purposive sampling while the households in the 3 clusters of Munyu, Magana and Komo villages were randomly sampled by skipping one household then moving to the next.

The results showed that majority of the mothers got nutrition literacy knowledge from the Maternal and Child Health (MCH) clinics (84.5%) followed by relatives (6.0%), then school and mass media at 3.6% and friends at 2.4 %. Most of the mothers had access to health services which was disseminated by the nurses as there was no nutritionist at the Munyu health centre. The good nutritional status of children was positively related to caregivers having both formal and nutrition literacy. The chi-square results, $p=0.000$ show a highly significant relationship between having both formal and nutrition literacy and good nutritional status of the children. However in some cases since most of the mothers were housewives and farmers, economically they were not well off and this could have led to their children having poor nutrition status despite being formally educated

It is important to back up the school system with nutrition education to make the mothers better equipped in taking care of their children and family at large. This is because even the young mothers who left schools recently did not have command of nutrition literacy though they had formal education.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

The vision 2030 for the education sector in Kenya is “to have globally competitive quality education, training and research for sustainable development”. Kenya encourages community education to discourage retrogressive cultural practices that are associated with low education indicators. The country’s vision for health is “to provide equitable and affordable health care at the highest affordable standards to her citizens,” (GoK, 2007). Access to good health care and provision of education gives rise to a healthy and enlightened community. This is expected to ensure that the next generation is not malnourished.

The first Millennium Development Goal is to “eradicate extreme poverty and hunger by 2015”. The nutrition indicator for Kenya is “to halve the prevalence of underweight in children less than five years old from 35.5% in 1990 to 16.25% in 2015”. An analysis of data on the anthropometric status of young Kenyan children collected between 1993 and 2006 during six national surveys shows very little change. In 1993 the national prevalence of stunting, underweight and wasting were estimated to be 32.7%, 22.3% and 5.9%. Thirteen years later they were at 34.7%, 20.9% and 6.1% respectively. Malnutrition, including macronutrient and micronutrient deficiencies, is more common where there is food insecurity, in arid and semi-arid regions and is associated with poor healthcare and nutritional practices within the general population. Poor nutrition is an underlying cause of 50% of deaths in children,(Child Survival and Development Strategy, GoK 2008-2015)

The term caregivers refer to the people entrusted with the day to day upbringing of the children. This include both the mothers and the alternate caregivers. Nutrition literacy refers to knowledge regarding nutrition matters about nutrients the functions they play in the body, proportions required for proper body functioning among others. It is mainly acquired from formal education in schools or in a health care set-up. Nutrition literacy is very crucial in enabling a care-giver be aware of what food to give to the child and also the frequency of the meals for proper growth and development. Nutrition literacy is also a person's ability to recognize and use their resources for food to provide their family with a healthful diet and help them develop healthful food habits. (Internet [www.google.co.ke/nutrition literacy](http://www.google.co.ke/nutrition%20literacy) 18/5/09)

Formal literacy, which refers to knowledge of mothers from formal education play major roles in determining how resources are utilized to achieve better nutrition status for their children. Behaviours such as mother's access to and control of resources, beliefs, physical and mental health and confidence have a significant role in rendering quality care for her child. With the current scenario in Kenya and also elsewhere in the world, where the care giver is not necessarily the mother (due to women taking paid work outside the home), the possibility of the child becoming malnourished is there not because of lack of access to food but due to lack of knowledge on the right childcare practices. Inadequate knowledge on appropriate foods and feeding practices can be a greater cause of malnutrition than lack of food. (UNICEF, 1990)

Childcare practices refer to the practices of caregivers in the household which translate to food and nutritional security and health care resources into a child's

growth and development. The activities include; feeding, washing clothes, bathing, changing clothes, breastfeeding and teaching.

Good care of a child starts at conception and continues to three years of age after which the child joins pre-school. From this age the care received both at home and school play a role in nutrition status of the child. Nutritional care refers to the practices of the caregivers in the household which translates to food and nutrition security and health care resources into a child's growth and development. (UNICEF, 1997; GOK 1998) .The practices include care for pregnant and lactating women, breastfeeding, complementary feeding, psychosocial care, food preparation and food hygiene, hygiene practices and health seeking practices. (Tumwet , 1996), (UNICEF, 1997) These include taking a child to health services for immunization and an ill child for treatment. An ill child should be encouraged to eat during the illness episode rather than withholding food.

A child's health depends on the well being of the mother, her knowledge and level of awareness, personal hygiene and feeding practices particularly the care she gives to her child. The most important group to consider in matters of malnutrition is children younger than two years of age because preventing under-nutrition in this age group will benefit them, as well as society as a whole, for the rest of their life. Stunting or chronic malnutrition due to poor foetal growth and poor growth during the first two years of life results in reduced mental development, leading to poorer school performance, and reduced adult income earning potential. It also leads to short adult stature and in women to low birth weight of their babies. Poor growth is the result of inadequate nutrition i.e. insufficient intake of appropriate foods, frequent infections

and sub-optimal caring practices. The first two years of life are most critical in this regard because nutrients needs are high due to rapid growth and frequent illnesses, and children's bodies need to adjust to the transition from frequent breastfeeding to fewer, largely plant-based, meals per day. Furthermore, it is difficult to catch up on poor growth and reduced mental development accumulated during early life unless circumstances (diet and environment) change drastically,(Sight and Life magazine, 2008)

Timely, safe and adequate complementary feeding with continued breastfeeding up to two years of age are a major priority of child nutrition. Indeed the continued growth faltering of many children worldwide suggests that complementary practices remain inadequate in terms of timeliness, quality and safety.

The major question is when is it timely to introduce complementary feeding among the majority of poor mothers in the developing countries who often do not get adequate nourishment to produce sufficient milk for the baby. Complementary foods should as much as possible be energy and nutrient dense, easily obtained, commonly prepared and consumed by the family, culturally acceptable, of appropriate consistency for the age and development stage of child and clean and safe for the child. (Mugo, 2008)

Appropriate child feeding depends on accurate information and skilled support from family, community, and health care system. In order to be effective, the information should be objective, complete and consistent, and take into account the prevailing social, cultural and environmental circumstances. Diversified approaches are required

to ensure access to foods that adequately meet energy and nutrient needs of the growing child.

1.2 Statement of the Problem

The pre-school child is the most vulnerable to malnutrition as most of the growth and development processes take place at this stage of the lifecycle. This stage requires greater priority for the maintenance of the nutritional health of the child in these vital years, (Tsehai ,2004).

Malnutrition continues to be a major public health problem of considerable concern in the developing countries (Sangvi, 1997). In Kenya for example, it is estimated that 50% of all child deaths are related to malnutrition. Studies have shown that, poor economic status, socio-cultural factors, infection, poor food and nutrition security and the environment in addition to inadequate childcare practices play a significant role in the nutritional status of any given community (Abate 1998). However, human and economic resources to enable the caregivers provide care effectively, are limited in all the organizational levels namely; family, community, national and regional levels (UNICEF, 1997)

Nutrition literacy which is acquired in formal learning as well as in post-natal clinics at the health facilities, affect the type of care a child receives.

In cases where the care giver is the parent or the grandparent, some may not have formal and nutrition literacy therefore, exposing the child to malnutrition.

In some cases children from high and middle income families become malnourished not because of lack of finances but due to lack of nutrition literacy of the care giver.

Unlike formal literacy, nutrition literacy is not always imparted in formal settings. The mass media and postnatal clinics are some of the avenues through which nutrition education is disseminated. Currently not everyone attends the postnatal clinics in government hospitals where mainly this is offered. The Government clinics are also few. In some cases the mother is too busy with paid employment and entrusts the care of her child on hired house help who may not be well versed with child care practices. This may lead to the child being malnourished.

1.3 Justification of the Study

To be able to come up with interventions to integrate nutrition literacy as an important requirement in care givers for pre-school children mothers included, there is need to determine and accumulate data on the current care practices and nutritional status of the children as well as the level of education of care givers. Nutrition data was inadequate especially for the area studied. The study set out to avail the data which would supplement in understanding the care givers shortcomings and how well they can be empowered especially in nutrition education so as to help improve nutritional status of pre-school children and help lower cases of malnutrition. The area was purposively chosen as it is semi-arid and sometimes experiences drought leading to provision of relief food.

1.4 Aim

To contribute to nutritional and formal literacy acquisition advocacy for care givers so as to improve the nutritional status of pre-school children under their care.

1.5 Purpose

The purpose of the study was to provide data that could be utilized in the empowerment of care givers with nutrition literacy so as to improve the nutritional care of children.

The outputs of the study were also expected to inform health and nutrition policy makers, planners, and implementers drawn from the public, private and NGO sectors regarding importance of nutritional and formal literacy in child up bringing. This will result in the designing, testing and adoption of interventions that would promote the nutritional status and overall wellbeing of the pre-school age children.

1.6 Objectives

1.6.1 Main Objective

The overall objective of the study was to determine the nexus between the level of formal and nutrition education of the care givers to the type of childcare practices and nutrition status of children 6-36 months old.

1.6.2 Specific Objectives

1. To determine the demographic and socio-economic characteristics of households in the study.
2. To determine the childcare practices by the caregiver and the level of water, sanitation and hygiene in households.
3. To determine the extent of morbidity among the pre-school age children
4. To determine the nutritional status of children 6-36 months using anthropometry , dietary diversity and nutrition literacy based questions in the questionnaire.

5. To determine the level of nutritional and formal literacy among care givers and relate to nutritional status of the children.

1.7 Study Hypothesis And Research Questions

1.7.1 Study Hypothesis

The type of care and the nutritional status of the pre-school child are positively related to the level of formal education and nutrition literacy of the caregivers.

1.7.2 Research Questions

These included:

1. Is there a difference in the nutritional status of children (6-36 months) between the mothers/caregivers with formal literacy and those without **formal literacy**?
2. Is there a difference in nutritional status of children (6-36 months) between the mothers/ caregivers with nutrition literacy and those with low levels of **nutrition literacy**?
3. Is there a difference in the child care practices, morbidity levels, and dietary diversity among children of care givers with formal literacy and those without **formal literacy**?
4. Is there a difference in the child care practices, morbidity levels and dietary diversity among children of care givers with nutrition literacy and those with **low levels of nutritional literacy**?

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Malnutrition overview and determinants

Malnutrition is a pathological condition resulting from absolute or partial deficiency or excess of one or more essential nutrients. Deficiency rather than excess has been observed in developing countries,(Jelliffe,1968). Child malnutrition has been reported to be the most widely spread disorder known in tropical and sub-tropical areas,(McLaren, 1983). The term “pre-school child” refers to all children up to their fifth birthday, (Jelliffe, 1968).

Malnutrition in early childhood is a major public health problem throughout the developing world, and is a great problem in many parts of Africa. Malnutrition takes many forms; generalized malnutrition or what has frequently been referred to as protein-energy malnutrition, manifests itself in stunting (low height for age) underweight (low weight for age) and wasting (low weight for height). Children who are classified as malnourished using these indicators typically have measurements that are less than -2SD from the median value of an international reference population. There are also specific nutritional deficiencies of vitamin A , iron, iodine, and others. In many children, specific nutritional deficiencies co-exist with protein – energy malnutrition, and therefore also contribute to growth faltering, and subsequent stunting and underweight, (Omwega, 1998).

Three forms of malnutrition are recognized:

- a) Dietary deficiency,
- b) Dietary excess

c) Dietary imbalance.

a) Dietary deficiency

Various dietary inadequacies may lead to malnutrition. There may be definite lack of one or more nutrients for example lack of vitamin C causes scurvy.

b) Dietary Excess

Excessive intake of certain nutrients can lead to forms of malnutrition. In the industrialized world the most widespread example is obesity.

c) Dietary imbalance:

Malnutrition may result from an incorrect balance between various nutrients in the diet. The most common example is a severe form of protein-calorie malnutrition of early childhood leading to Kwashiorkor where the diet is unbalanced with a low intake of protein but a relatively high intake of carbohydrate calories. (Jelliffe, 1968)

Other causative factors of malnutrition are:

- a) *Dietary inadequacy and dietary deficiency:* In the tropics, malnutrition is often due to dietary inadequacy, whether lack of nutrients or imbalance of nutrients. An inadequate diet may be due to a variety of causes: (1) poverty may put various foods beyond the budget of the family especially expensive animal protein. Some may produce the foodstuff rich in animal protein but end up selling it out to get money instead of consuming it. (2) Poor production due to unsuitable climate or soil, or defective food distribution or marketing. (3) Lack of knowledge of the best foods for different age groups especially for young children with high protein requirements due to rapid growth. Without exposure to modern knowledge, it is impossible for an intelligent but illiterate and uneducated individual to have any awareness of modern nutritional concepts.

- b) *Cultural blocks*: This may be termed as misinformation which may form part of the traditional local culture pattern for example children may suffer from kwashiorkor yet there are a range of locally available protein foods yet the child is not fed on them due to cultural beliefs..
- c) *Infections*: It has been shown that many infections occur more easily, persist longer, and have a much higher mortality rate in malnourished children; while infectious diseases also play an important role in the initiation of malnutrition itself. Many infections are characterized by poor appetite, and sometimes by vomiting and sometimes by vomiting and diarrhoea. Apart from this , it has been shown that during even minor infections the body's need for protein and other nutrients increases. Infections with various parasites also may have nutritional relevance like roundworms and malaria whereby they increase the body requirements hence denying the person what is available for use by the body.
- d) *Social cultural factors*. Various socio-cultural factors can play a part in causation of malnutrition e.g. the method of stopping breastfeeding is often relevant and particularly how and when it is carried out. Other cultural factors include length of breastfeeding, food preparation and meal pattern, and mother and child interdependence i.e. the birth spacing and the nutritional status of the mother.(Jelliffe, 1968).
- e) *Westernization of the society*: With the current society set-up the care giver is not always the mother. This is because the modern woman is also involved in paid employment as opposed to earlier days when mothers basically stayed home to take care of the family. As a result in most households especially in the peri-urban and urban set-ups in Kenya, domestic workers are engaged to take care of the young ones. In other cases close relatives are involved in

taking care of children. The level of education and competence of the potential care giver is not set as a criteria for hiring of the domestic workers and in some cases mothers are forced to hire the one available in order for mothers to secure their jobs. In other cases there is frequent turnover of care givers which affect the normal development of a child. This means that even if the mother is learned formally and has nutrition literacy, this is not transferred to the hired caregiver

In sub-Saharan Africa, the UN agencies estimate that about 40% of children under 5 are stunted, about 30% are underweight and about 7% are wasted. Many children are likely to be malnourished and growing poorly but have not yet reached then -2SD cut-off to be officially classified as malnourished. The problem of malnutrition in young children, therefore, is likely to be even more common than these numbers suggest. The major reason for this growth faltering is that the foods and liquids consumed are quite often inadequate in energy density, and protein and micronutrient concentration or quality. Also, they are often prepared, stored, and fed to children in ways that increase risks of illness. What follows at this age has been called the weaning's dilemma: the infant requires food in addition to breast milk to continue growing well, but that food increases risk of infection and illness, which in turn affect appetite, eating patterns, and subsequent growth.

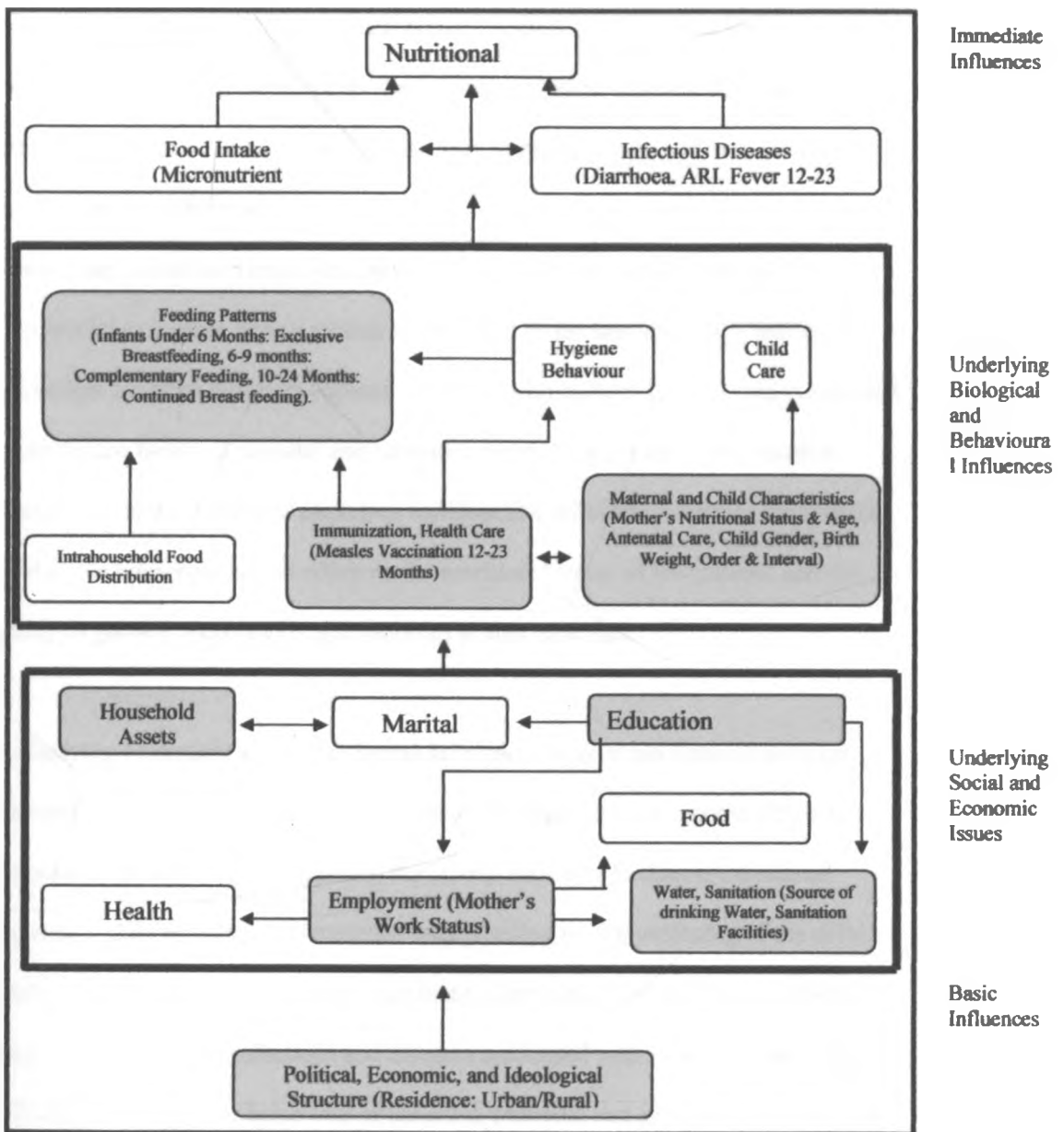


Figure 1: Causes of child under nutrition (UNICEF,1998)

The conceptual framework clearly shows how various actors affect the nutritional status of children. The way a country is governed has an effect on the nutritional status of the children as well as the general population. Where there is lawlessness,

the nutritional status of children is also poor. There is a difference in those who live in urban areas and those who live in rural areas. For those who live in urban slum areas, conditions are poor for the residents due to poor sanitation and lack of proper living amenities in general. In some rural areas, clean drinking water is not available as some depends on the rivers near by.

Underlying social and economic issues, the employment status of the mother is very crucial as income from a mother always goes to feeding her family before she can budget for other things as opposed to fathers who mainly deal with big investment issues for the family. The water and sanitation level of the family which involve source of drinking water and sanitation facilities like toilet and generally the hygiene level of the household has an effect on the nutritional status of the children and the family in general. Access to health facilities is also important.

Underlying biological and behavioural influences there is intra household food distribution which affects the feeding patterns of infants under 6 months who are supposed to be exclusively breastfed, then complementary feeding is introduced between 7 to 24 months with continued breastfeeding for the wellbeing of the child. Immunization, health care(measles vaccination between 12-24 months ensures the baby is protected from infections and diseases associated with lack of immunization. This affects the hygiene behaviour of the child. Maternal and child characteristics like mother's nutritional status and age, antenatal care, child gender, birth weight and order and birth intervals affects the type of child care the child receives

After the underlying influences, we have the **immediate influences or manifestations** coming due to basic and underlying influences. The type of food intake including the micronutrient intake and the frequency of infectious diseases like

diarrhoea, ARI, fever all affect the nutritional status of the baby. This may lead to good nutritional status of the baby or death of the said baby due to malnutrition.

2.2 Dangers Of Malnutrition

Malnutrition and under nutrition are both direct and indirect causes of death during infancy and early childhood. In the 1970s about 6% of all deaths among infants and young children (up to the age of 4 years) in Latin America were attributable directly to malnutrition while 57% were associated with various types of malnourishment,(Eckholm,1976). Severe Protein Energy Malnutrition (PEM), if untreated is fatal but even in children treated in hospitals the mortality rate may be as high as 40 %, (WHO ,1972). More than a quarter of all world's deaths occur among children of under five, and under nutrition has been reported as an underlying cause, (Eckholm,1976).

Children with mild and moderate PEM grow at a slower rate than normal,(WHO,1972). Under nutrition also causes higher vulnerability to infection. Clinical observations suggest that malnourished individuals may respond to infection differently from well nourished individuals,(WHO,1972). An organism that may be relatively harmless to the well nourished child may give rise to severe or even fatal infection in the malnourished child. Malnutrition mainly interferes with the cell mediated immunity which is an important defence against measles, tuberculosis and chickenpox, (Scrimshaw,1968). Under nutrition also results in decreased work output, (Kielman,1976) and reduced life expectancy, (WHO,1972).

2.3 Nutrition Literacy In Relation To Child Care

Nutrition education may be defined as education of the public aiming at a general improvement of the nutritional status, mainly through the promotion of appropriate food habits, elimination of unsatisfactory dietary practices, introduction of better food hygiene and more efficient use of food resources, (Jelliffe,1983).The purpose of nutrition education is to achieve an improvement in the knowledge, attitudes, motivation ,skills and behaviour of individuals who are in the nutrition education process (Jelliffe,1983). To achieve nutrition literacy, a person needs to have a variety of experience with food, not just eating it. It is important that children start learning about food and developing positive eating behaviours when they are young. Healthful food habits should be developed for a life time. Including children in talking about foods, making decisions about what is to be eaten and how to prepare it helps them learn important life skills. The home environment is the first place that children learn about food. Food is basic to every family member's existence and there is no stronger influence on a child's eating habits than the parents own food practices, (www.google.co.ke 18/5/09).

Children whose parents have low nutrition literacy are more likely to have low nutrition literacy skills too. Parents who teach their children about food and related skills tend to change their own nutrition skills .Good nutrition and eating habits at an early age can have a lifelong effect on health, (Wikipedia 18/5/09)

Malnutrition is one of the most important health and welfare problems among young children in Cameroon and Malawi. It is a result of both inadequate food intake and illness. Inadequate food intake is a consequence of insufficient food availability at the

household level, improper feeding practices, or both. Improper feeding practices include both the quality and the quantity of foods offered to young children as well as the timing of their introduction. Poor sanitation puts young children at increased risk of illness, in particular diarrhoea disease, which adversely affects their nutritional status. Both inadequate food intake and poor environmental sanitation reflect underlying social and economic conditions.(Macro, 2006)

Malnutrition has significant health and economic consequences, the most serious of which is an increased risk of death. Other outcomes include an increased risk of illness and a lower level of cognitive development, which results in lower educational attainment. In adulthood, the accumulated effects of long-term malnutrition can be a reduction in workers productivity and increased absenteeism in the work place; these may reduce a person's lifetime earning potential and ability to contribute to the national economy. Furthermore, malnutrition can result in adverse pregnancy outcomes, (Macro,2006)

A few studies have been done on relationship between maternal nutritional knowledge and child nutritional status .Waihenya, 1994 conducted a study in Kibera, Nairobi Kenya. The aim of the study was to find out whether mothers' nutritional knowledge had a relationship with the nutritional status of children aged 6-24 months in a low income population. Almost all the mothers in the study area were exposed to nutrition information. The main source of the information was Maternal and Child Health/Family Planning clinics (MCH/FP). Despite this, many mothers still indicated that they required more nutrition information. Some poor nutrition knowledge components were negatively related with child nutrition status. These included

dangers of introducing food to a child too early (before 4 months) and frequency of feeding a sick child. Mothers knowledge on some aspects of nutrition helps to promote good child nutritional status, (Waihenya , 1994)

2.3.1 Child Care Practices

The meaning of care differs with disciplines. For medical personnel, care may refer to curative and preventive care for illnesses and infections. For social welfare professionals, it may mean custodial care for children without families. Care for nutrition refers to the practices of the caregivers in the household which translate to food and nutrition security and health care resources into a child's growth and development. Specific care giving includes; breastfeeding, providing emotional security, and reducing the child's stress, providing shelter, clothing, feeding, bathing, supervision of child's toilet, preventing and attending to illnesses, nurturing and showing affection, interaction and stimulation, playing and socializing, protecting from exposure to pathogens, and providing a relatively safe environment for exploration. A second set of behaviours include:- use of resources outside the family, including curative and preventive health clinics, prenatal care, traditional healers, or members of an extended family network, (Tschai, 2004)

2.3.2 Factors Affecting Childcare Practices

- **Care givers time**

Women's time commitments are recognized as sort of merry-go-round, what they start with in the morning is repeated day-in and day-out, washing of babies, cooking has to be done daily(zero sum game); no new activities can be incorporated into their lives unless other activities are replaced or performed more efficiently in less time. Women who are the main care givers are typically

engaged in other time intensive domestic activities in the running of the homes.

Women commonly work longer hours than men and do their fair share of work in agricultural activities as well as household chores. How much time women have to devote to childcare and how much other work they have to do influences child outcome. Whether a mother is formally employed adversely or positively affects her child's nutrition depending on the adequacy of alternate care givers. The level of family and community support may be the deciding factor in this issue, (Wario, 2006)

- **Education**

Educated women tend to provide better home health care and hygiene and are more likely to seek help when a child is ill. On the other hand educated women in both developed and developing countries tend to terminate breastfeeding earlier. The family's home health practices both preventive health care (include immunization, antenatal care for the mother) and seeking health care in the event of morbidity is associated with child's health and nutritional status. Better educated women are more likely to use available health care and community service facilities than women with no education,(Wario,2006)

- **Health and nutritional status of the care giver.**

Although a direct link between caregiver's nutritional status and type of care has not been studied extensively, patterns indicate that women care for their children less during periods of food shortages, as they spend more time looking for food also their energy levels are low,(Abate,1998).

- **Social support received by the care giver**

Provision of competent alternate child care is an important type of social support. Institutional care is seldom available in developing countries. The role of fathers as decision makers and as alternate care givers has seldom received attention in developing countries. This is a potential that has been overlooked.

- **Autonomy, control of resources and intra household allocation**

Autonomy and control of resources refer to the caregivers' ability to play a role in decisions made within the household and the community. Working for income does not automatically mean women control their incomes. In some societies, it is assumed to be the property of the husband. Women generally enjoy greater autonomy in female headed households (Engel, 1993). Mothers in some societies do not have the authority to make decisions regarding the care and feeding of their young ones. These decisions may be made by the child's father or mother-in-law or older female in the husband's family. This means that it may not be the level of household wealth that determines a mother's resources for child health, but rather the mother's access to these resource, (Engle et al ,1993)

- **Nutritional Status of children under consideration**

Child malnutrition continues to represent a major problem in India, accounting for more than 40% of the world's malnourished children and adversely affecting child mortality rates, disease prevalence, and economic growth. It has been asserted that national food security does not necessarily ensure household or individual food security, and that 20% to 30% of the population of countries where per capita supply of food is at or above 100% of dietary energy needs may persistently subsist on inadequate diets and be unable to meet their requirements for normal physiological functioning with particularly adverse implications for the nutrition of young children.

Food security has been defined as access to food adequate in quantity, quality and safety to ensure healthy and active lives for all household members. In addition, although insufficient food availability may be the direct cause of low food intake in food-insecure households, the nature of the diet, particularly its quality may actually be the cause of low food intake, (food and nutritional bulletin, 2007).

2.4 Review Of Previous Methodologies

The studies on care practices were cross-sectional in nature and involved getting recall information from the mothers (retrospective) as well as dietary diversity in the last 24 hours. Equipment such as height boards, salter scales and MUAC tapes were used.

There are several studies which have earlier looked at the connection between care practices and nutritional status of pre-school children for example Mugo (2008), (Wario 2006), and (Tumwet, 1996). Waihenya (1994) studied maternal nutritional knowledge and nutritional status of children. Various nutritional assessment methods are used to determine the nutrition and health status of an individual. Nutrition assessment is the interpretation of information obtained from anthropometric, dietary, biochemical and clinical studies to determine the nutrition and health status, as influenced by food intake and nutrient utilisation of an individual or population, (Gibson, 1990). The process of nutrition assessment thus enables health scientists to identify the occurrence, nature, and extent of impaired nutritional status of an individual, (Omweaga, 2000).

2.5 Gap In Knowledge:

Malnutrition is known to be a distinct public health concern and little has been done to determine prevalence of risk factors among pre-school children. A gap in

knowledge is the effect of nutrition literacy and formal literacy on nutritional status of pre-school aged children aged 6 months to 3 years. There is very little information reported on the effect of having both formal and nutritional literacy by the caregivers taking care of the children.

CHAPTER THREE

3.0 STUDY SETTING AND METHODOLOGY

3.1 Study Site

The study was carried out in Munyu Location of Thika Municipality Division in Thika District. Thika district is in Central province of Kenya(see map of Kenya and map of Thika district on the pages 24 and 2 . The three sub-locations in Munyu location were sampled by cluster method while the specific households sampled were selected randomly.

Thika District(see map 1) is one of the seven districts in Central Province. The district covers an area of 1,960.2 sq Km². It borders Nairobi City to the south, Kiambu District to the west, Maragua District to the north and Machakos District to the east. The district lies between latitudes 3°53' and 1° 45' south of Equator and longitudes 36° 35' and 37° 25' east see map one.

The district(see map 1 pg 24) is divided into 6 divisions namely Ruiru, Gatundu South, ThikaMunicipality, Kakuzi, Gatanga, and Kamwangi (Gatundu North), 20 locations and 89 sub-locations. The largest Division is Ruiru followed by Kakuzi and Kamwangi see map 2. The smallest division is Gatundu South with an area of 192.1km².. Munyu has two sublocations namely Munyu and Githima The district has four constituencies; Juja Constituency that embraces Ruiru and Thika Municipality Divisions, Gatanga Constituency that comprises Gatanga and Kakuzi Divisions, Gatundu North covering Kamwangi Division and Gatundu South covering

Gatundu Division. Munyu location is in Juja constituency . The area is mainly inhabited by kikuyus. Other ethnic groups are also present mainly immigrants who work in the schools, hospitals and other public areas.

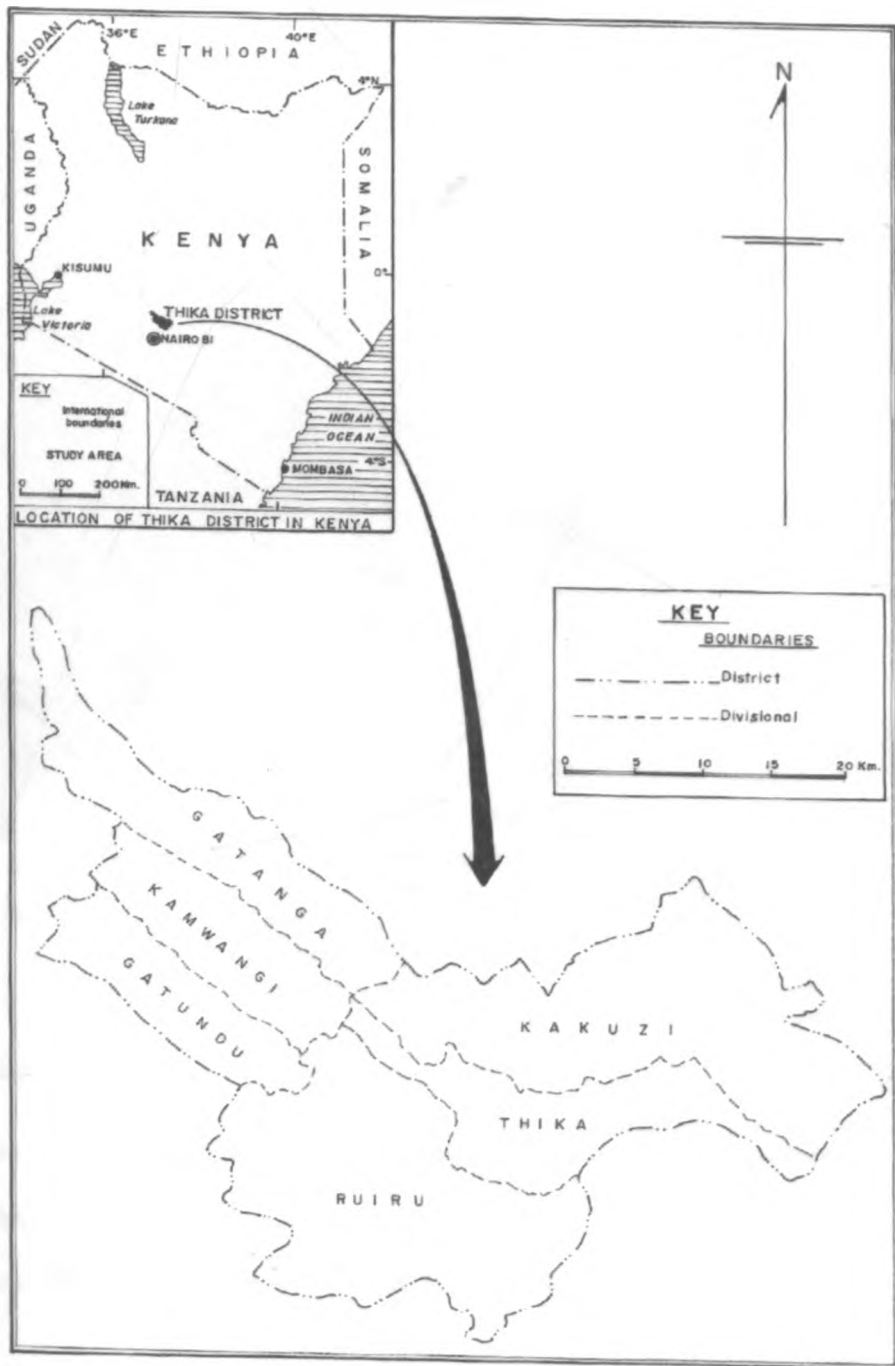


Figure 2. Map 1 of Kenya showing Thika District and the study area.

Source: Thika District Strategic plan: Ministry of Planning(2005-2010)

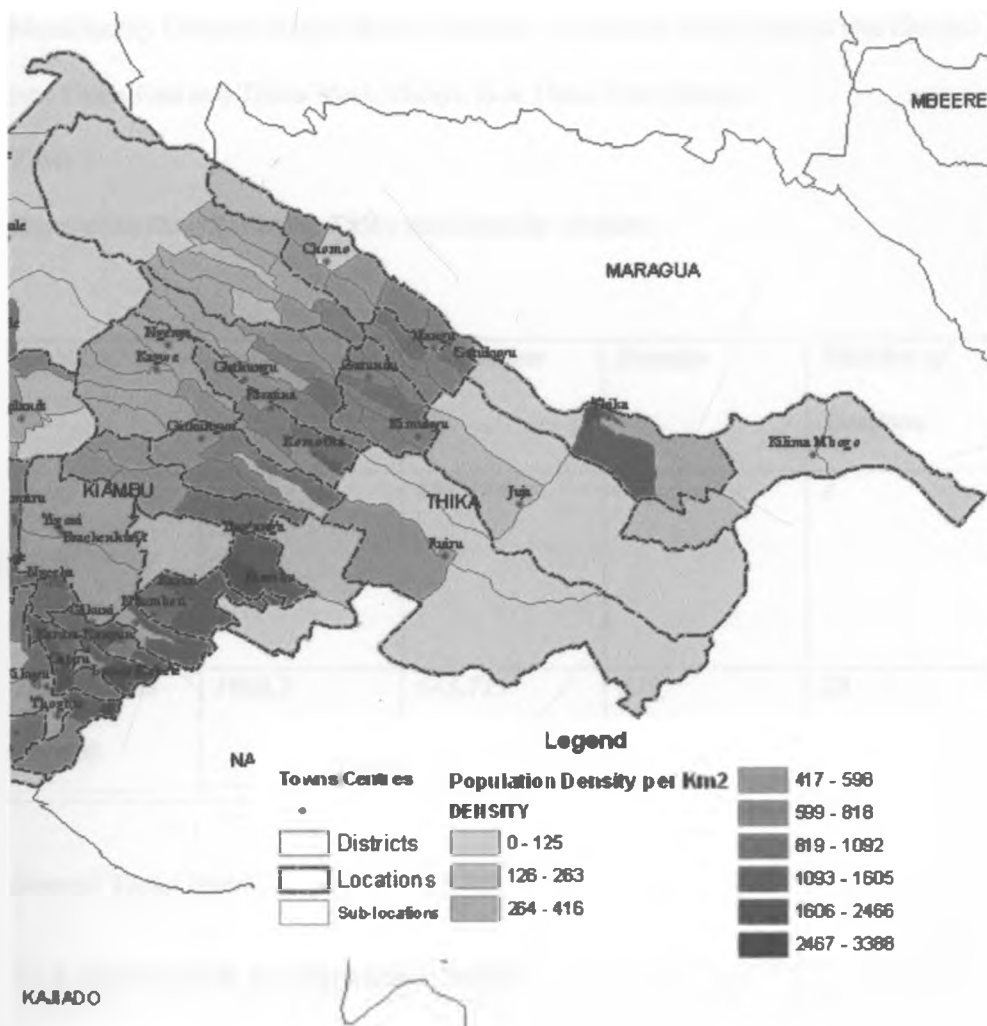


Figure 3: Map 2:Thika District local administrative boundaries and population density.

Source: Thika District Strategic plan: Ministry of Planning(2005-2010)

The population density pattern in the district is shown in Map 2 and table 1 on page 26..

The table below shows the population density per square kilometre in the Thika Municipality Division where Munyu Location was before Thika District was divided into Thika East and Thika West. Munyu is in Thika East District.

Table 1
Population Density for the Thika municipality division.

Division	Area sq km	Population	Density	Number of locations
Thika municipality division	220.2	107,174	487	2
Total (Thika district)	1960.2	645,713	329	20

Source: Thika District Strategic Plan: Ministry of Planning (2005-2010)

3.1.1 Demographic And Population Profile

The district is quite densely populated but with diverse distribution varying from one division to the other. Gatundu, Thika Municipality and Gatanga Divisions are the most densely populated with Gatundu having the highest. The lower parts of Ruiru and Kakuzi Divisions have the least population. High population density in most parts of the district has put pressure on land leading to fragmentation into

smaller uneconomical units, (GoK, 2005-2010). In addition to Thika being a rich agricultural district, it is one of the leading industrial districts of the country.

However, there are isolated pockets of poverty in the district mainly found in urban slums in Thika Municipality, Ruiru Town and Juja.

The district's population stood at 575,968 in 1989 for the then Gatundu and Thika Divisions. Growing at the rate of 2.56%, the population increased to 670,265 persons in 2000 with Gatundu and Thika Divisions having been hived off to form part of the new Thika District. The district population was projected to reach 674,868 in 2010.

The population structure of the district indicates a fairly balanced sex ratio. The overall male/female ratio for the district is 1:1. There are variations in sex ratios of the population in various age cohorts. For example in the age bracket 0-9 and 25-54, males are more than females whereas age brackets 10-24 and 55-69 females are more than males. No substantive reason can be given for the variation, but a plausible explanation is that more males are moving into the district in search of employment at the ages of 25 to 54 since the district has many industries.

3.1.2 Welfare Indicators

3.1.2.1 Education

Thika District has 342 primary schools. The primary school enrolment rate is 83% for both boys and girls. School drop out was reported to be 5.7%. The Primary school going population (6-13 years) makes up to 20.3% of the district total population and was estimated to be 131,235 in 1999. This cohort increased to 150,730 in year 2004. It was expected to rise to 168,391 by the year 2008.

The enrolment rate is high (83%) and so the district will need to invest in the provision of additional educational facilities.

The district has 98 secondary schools and an enrolment rate of 70% for both boys and girls. Not all the students who complete primary school join high school. This secondary school going age group comprises 9.3% of the total population and was estimated to be 60,198 in 1999. It was projected to rise to 77,242 by year 2008. The secondary school drop out rate was estimated to be 5.2%. Many children drop out of primary and secondary school mainly due to inability to afford cost of education and the limited number of schools.

3.1.2.2. Labour Force

The labour force in Thika District is increasing rapidly. According to the 1999 Population and Housing Census the total population of this age group (21-60yrs) represented 56.3% (267,376) of the total population and comprised 187,529 males and 184,647 females. This number was projected to increase to 477,549 comprising of 240,623 males and 236,926 females by year 2008. The high increase in labour force has led to increase in unemployment and this could lead to escalation of crimes as a result of non-absorption of this active population in services of gainful employment.

3.1.2.3 Poverty Analysis

In Thika District, all forms of poverty including chronic (refers to persistence in poverty and captures the fact that some of the poor are poor for short periods while others are poor for long periods) and absolute poverty (refers to subsistence below minimum socially acceptable living conditions and is based on a deficit in meeting nutritional requirement and other basic needs) are experienced and indeed chronic

poverty incidence is on the increase due to factors such as unemployment, collapse of agricultural sector, collapse of industries, poor infrastructure and the rise in HIV/AIDs.

The prevalence of chronic poverty in the district currently stands at 48.4. Chronic poverty situation in Thika District is manifested in various forms such as inaccessibility to education and inadequate education facilities.

3.1.2.4 Health

In the year 2001, Thika had over 105 health facilities spread across the district. The doctor/population ratio is about 1:21,940 implying over-utilization of doctors. The average distance to a health facility is less 5 Km from the households. The most prevalent diseases are Malaria, HIV/AIDS and Broncho-pneumonia while the top six childhood diseases are anaemia, marasmus, eye infection, pneumonia, malaria, kwashiorkor among others.

HIV/AIDS in Thika is a major health problem with the prevalence averaging 34%. With regard to bed occupancy, about 60% of the hospital beds are occupied by patients with HIV/AIDS related diseases. The age group 20-49 years is the most affected, majority of whom are females. This has resulted in high increase in number of HIV/AIDs orphans in the district and loss of families' incomes which is directed towards addressing the pandemic in the household. The main causes of the spread of HIV/AIDs in the district include unsafe sexual behaviour, drug abuse especially drinking of illicit brews, high levels of peer pressure family breakdowns.

The socio-economic impact of HIV/AIDS in the district include high drop out rates in high school, female and children headed families, loss of manpower and high mortality and morbidity rates, orphans and street children etc. (Thika district strategic plan ,2005-2010)

3.1.2.5: Nutritional Status

In Thika and specifically in Munyu the nutritional status of the children under consideration is poor. This is because Munyu is a semi-arid place and sometimes experience drought and this leads to poor nutritional status of the families and also the children. Various crops are grown in Munyu including maize, beans, potatoes, vegetables like Amaranth (terere), kales (sukuma wiki), cabbages, drought resistant crops like cassava and sweet potatoes. Various livestock are also reared examples are cows goats, goats sheep, rabbits, hence providing various types of food which improve the nutritional status of the population and the children under consideration.

3.2 METHODOLOGY

3.2.1 STUDY DESIGN

The research was carried out using both cross-sectional survey and descriptive methodologies.. Cross-sectional survey form a class of research methods that involve observation of some sub-set of a population of items all at the same time, in which groups can be compared at different ages with respect of independent variables, (en.wikipedia.org/wiki/cross-sectional_survey 29/6/2010). Descriptive research is a process of collecting data in order to test hypothesis or to answer questions concerning the current status of the subjects in the study, (Mugenda,1999) It was carried out from August to September 2009. The study subjects included pre-school

aged children in Munyu Location, in Munyu Division. Care givers were expected to provide retrospective information regarding the socio-demographic information, socio-economic, care practices, nutrition information, vaccination and Vitamin A uptake by the children. The enumerators took anthropometric measurements on children which included weight, height and MUAC.

3.2.1.1 Study Population

The sample population consisted of caregivers and children between 6months to 36 months(3years) in all the households randomly chosen in the three sub locations of Munyu Location which are: Munyu, Komo and Githima sub-locations.

3.2.1.2 Sampling Frame

This included pre-school aged children aged 6-36 months and the mothers or caregivers entrusted to take care of them. One hundred and twenty six (126) households were sampled and per home information was collected for one child.

3.2.2 Sampling

3.2.2.1 Sample Size Determination

The fisher et al formula,(Mugenda,1999) was used to determine the sample size.

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

n= desired sample size, z= standard normal deviate set at 1.96 which correspond to 95% confidence interval,

p= Proportion in total target population expected to be malnourished (estimated prevalence of chronic malnutrition in Munyu, Thika 8 %(source chief's office, Munyu and Clinical officer Munyu Sub location)

q= 1-p (proportion of well nourished children in study community)

d= The level of statistical significance test.(Approximate test difference in child care and nutritional status between the groups of household which is significant at alpha level of 0.05)

$$n = \frac{(1.96)^2(0.08)(0.92)}{(0.05)^2} = 113.096$$

10% for attrition

114+12=126 households

3.2.2.2 Sampling Procedure

The survey was carried out in Munyu Location of Thika Municipality Division in Thika District. Thika district is in central province in Kenya. Munyu was purposively chosen. Purposive sampling technique allows a researcher to use cases that have the required information with respect to the objectives of his or her study,(Mugenda, 1999). The three sub-locations in Munyu location were sampled by cluster method, Cluster sampling is used when it is not possible to obtain a sampling frame because the population is either very large or scattered over a large geographical area. It involves selection of an intact group,(Mugenda, 1999). while the specific households were sampled using simple random sampling same with the pre-school children between 6 months to 36 months of age. Where there were two children or more, the names were written down on different papers folded and randomly picked. Simple random sampling involves giving a number to every subject or member of the accessible population, placing the numbers in a container and then picking any number at random,(Mugenda ,1999) The sampled households were visited by sampling one household, skipping the next and then moving to the third one. This process was repeated to ensure random sampling. Random sampling of the children within the households if more than one were done by writing the names of

the children on pieces of paper, fold then ask a neutral person from the household to pick one paper.

The sampling frame included children aged 6-36 months from the six villages of Munyu location. The mothers or the care givers entrusted to take care of the children were interviewed from the one hundred and twenty six households randomly chosen from the six villages. Each sub-location had two villages.

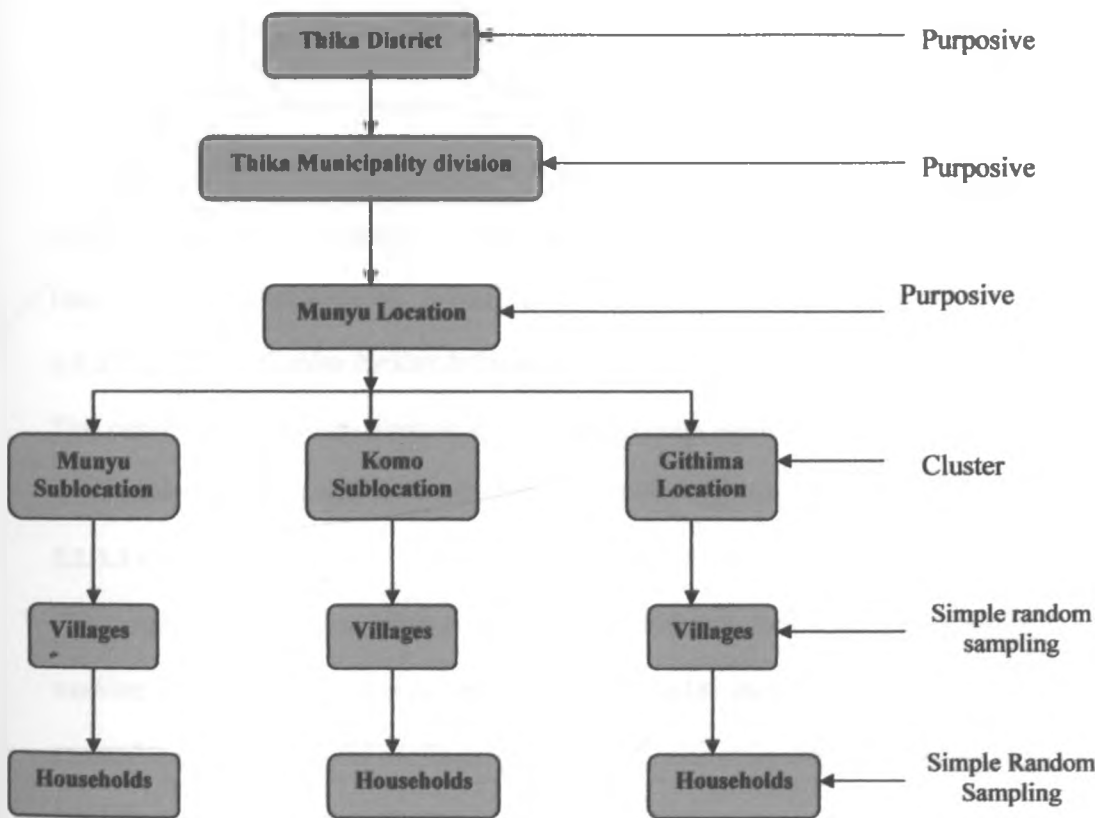


Figure 4: Schematic diagram of the sampling procedure

3.2.3 Research instruments or tools

The main study was carried out with the use of a structured pre-tested questionnaire, to determine the socio-economic characteristics of the households under study, asses

the care practices of the care givers on the children among the study groups. The questionnaire also included determination of nutritional status using anthropometric and dietary assessments. The literacy level was determined by including in the questionnaire six levels from zero education, primary incomplete, primary complete, secondary incomplete, secondary complete and post secondary level. Key informant guides were also administered to the health workers.

The following were the research instrument tools:

3.2.3.1 Questionnaire: Semi- Structured and Pre-tested.

A semi-structured questionnaire is one with questions with answers, where a person responds in their own way then tick the appropriate answer on questionnaire. The questionnaire consisted of questions which were targeted to answer the objectives of the study like social demography and social economic status, care practices, nutrition literacy, anthropometry among others.(Refer appendix.2).

3.2.3.2 Question Guides forKey Informant:

This consisted of questions directed at the health workers about the types of nutritional messages taught at the MCH centres. (Refer appendix 1).

3.2.3.3 Checklist

This consisted of all the materials required for the fieldwork. Before the start of each working day, the checklist was perused and items ticked as they were identified. This ensured the enumerators did not forget their tools of work at the storage place.

3.2.4 Techniques of data collection

3.2.4.1 Anthropometric measurement:

Height boards were used for taking both length and height of children, salter scales were used to take weight for the children while MUAC tapes were used to take the MUAC measurements. The salter scales were calibrated by weighing a kilo of sugar

to ensure they were accurate. Other tools used were plastic hanging pant and sisal rope.

Children of 6 months to 36 months were taken weight, height and MUAC measurements by the enumerators.

Weight: The salter scale was hung on a supporting place by use of a sisal rope. The plastic pant was first put on the lower end hook of the scale and the scale adjusted to zero. The pant was then removed and put on a child with light clothing. The child was then hooked on to the scale and allowed to hang unsupported for the reading to be taken. The weight was read to the nearest 0.1 kg with scale at eye level. Two readings were taken and an average was calculated..

Height: children under two years (length was taken) were put on the height boards on a horizontal position with the legs tightly on the board and the face facing upwards.. Two measurements were taken and average taken. For children above two years their height was taken while standing. The knees had to be tightly held next to the board and the face to face straight ahead. Two measurements were taken for accuracy.

MUAC which stands for mid-upper arm circumference was taken on the non active hand of the child. For right handed children, the left hand was used while for left handed children the right handed hand was used. The child elbow was bent to make a right angle. The tape was placed at zero which is indicated by the two arrows, on the tip of the shoulder and the tape was pulled straight down to the tip of the elbow. The number at the tip of the elbow was read to the nearest centimetre then divided by two. The midpoint of the arm was marked with a pen. The arm was then straightened,

the tape was placed around the marked area and the reading taken twice to get an average. .

3.2.4.2 Morbidity determination:

A set of questions were posed the respondents regarding the most common diseases affecting the index child, for the last fourteen days. These diseases were, diarrhoea, ARI which was cough related ailments , rapid breathing and fevers, febrile illness i.e suspected malaria , suspected measles and where the treatment was sought. The respondents were also asked whether the child slept under a mosquito net.

3.2.4.3 Formal and Nutritional Literacy level assessment

Questions were posed to the caregivers regarding the level of formal education attained. There were also nutrition literacy questions posed to the respondents to find out how informed the care givers were about how to feed the child. This included; where they received the nutrition literacy education, whether they knew about the three food group, proteins, carbohydrates and vitamins, also if they could classify a set of foods into the three food groups. Dietary diversity of the twelve food groups was also administered to the respondents to find out their eating patterns.

3.2.4.4 Care practices assessment

The respondents were asked a set of questions to determine the type of care they gave to their children. These included whether they practiced exclusive breast feeding, when they started complementary feeding(i.e age of initiating complementary feeding) and what foods they gave to the children. The number of times per day they

fed the children was also determined. The method of food preparation to determine the hygiene levels of the caregivers was also checked.

3.2.4.5 Socio-economic determination

Questions were asked to determine the socio-economic status of the household. This included; where they sourced their water, type of fuel used for cooking, whether they owned a radio or television among others.

3.2.5 Ethical and human rights consideration

Research clearance was sought from the Dean's office University of Nairobi Faculty of Agriculture in conjunction with the Ministry of Higher Education. (Refer to appendix 3). Informed consent was sought from the local authorities before the research was undertaken. Verbal consent was also sought from the respondents before administering the questionnaire; after clearly explaining the objectives of the study. The information obtained from the respondents was handled with confidentiality. A summary of the findings of the study was availed to the local authority in form of a written report which was copied to the chief and the clinical officer of Muniyu Health Centre.

3.2.6 Recruitment and training of field assistants

3.2.6.1 Recruitment

This was done from the study area. Adverts of the vacancies were posted in local churches notice boards and also at the shopping centres. The locals who were former leavers with Kenya Certificate of Secondary Education Certificate (K.C.S.E) were considered for hiring. Those who had participated in data collection before and were fluent in English, Kiswahili and Kikuyu had an added advantage. Six

enumerators were hired out of ten applicants, four males and two females. It was proposed that the questions were to be posed to the respondents in the language they were most comfortable with. The majority of Munyu residents are Kikuyus with a few members of other ethnic groups . The language of choice in the area is Kikuyu and Kiswahili.

3.2.6.2 Training of field assistants

The recruited field assistants were trained on how to take weight, height and MUAC measurements on the children. Please see training curriculum on Appendix 5. The whole team with guidance from principal investigator went through the questionnaire to understand its contents and agreed on uniform interpretation of the questions. Translations to vernacular and Kiswahili were also agreed upon. They were also taught on ethical behaviour and courtesy as they visit various household. This included dress code, they had to dress smartly and in a decent way. They were not to take or make calls during the interviews. They were not to smoke during the field work. Fraud or faking data was not allowed. The enumerators were to observe the right sitting positions and they were not supposed to tune women/ men that they met during the household visits.

3.2.7 Data collection process

The selected households were visited by sampling one household, skipping the next and then moving to the third one. Random sampling of the children within the households if more than one were done by writing the names of the children on pieces of paper, fold then ask a neutral person from the household to pick one paper. Consent was sought before administering the questionnaire on the respondent. The answers were recorded as provided on the questionnaires. During the training the

enumerators had been trained on how to introduce themselves and seek consent from respondents before starting the interview.(Appendix 5: Training curriculum).

3.2.8 Data quality control/assurance

Data collection tools that are relevant and easy to understand were designed.

Questions in the questionnaire were phrased in simple and clear language. where the respondents could not understand English, Vernacular languages were used. Field assistants were trained on how to administer the questionnaires and proper way of filling them. Supportive supervision was done on field assistants, as they collected data. Anthropometric measuring equipment were calibrated to ensure accuracy. For weighing scale a kilo of sugar was used to ensure that the scales were properly working. In the field, storage of data and questionnaires was in secure folders.

Questionnaires filled each day were checked daily for corrections and meetings were held with the field assistants to review and discuss any arising issues. Assistance was provided by the University supervisor in the areas where there were weaknesses during the interviews. This helped to improve in data collection for subsequent days.

3.2.8.1 Pre-testing of the questionnaires and other data collection tools

This was done to make sure that the questions and tables were well understood by respondents and filled correctly by the field assistants. It was carried out in Mbagathi village which was not part of the Munyu Location. The actual data collection started after the questionnaire was modified based on feedback that was obtained from the pre-test. The corrections and reconstruction of the pre-tested questionnaire was done with the help of professional and technical assistance of two research supervisors.

3.2.9 Data Management and Analysis

3.2.9.1 Data Management

Data entry templates were developed before data collection. This made it easy for daily entries of data collected in the field. Upon completion of data collection, data were entered, cleaned and analysed using SPSS, Ms Excel and ENA for SMART softwares. The variable for each objective were defined and coded for ease of analyzing the data.

3.2.9.2 Data cleaning

Upon completion of data collection, the data were keyed into the computer. Data cleaning, recording and or post data collection coding was carried out. This ensured that the data was consistent.

3.2.10 Data analysis

Descriptive statistics using SPSS version 17 and Microsoft Excel, the main statistical methods used for analysis were, cross tabulations, chi-square, t-test, odd's ratio, frequencies and charts both pie charts and bar graphs.

The primary outcome, nutritional status, was calculated as Weight-for –Height Z scores (WHZs), Weight-for –Age (WAZs) and Height-for –Age Z scores (HAZs) smaller than negative two standard deviations (SDs) below the mean with reference to WHO (2006), growth reference values using ENA for SMART software. WHZ <-2 SD is a well established indicator for wasting or thinness usually due to recent and severe weight loss, often associated with acute starvation or severe disease. WAZ less than -2 SD indicate that the target child is underweight. HAZ less than -2 SD indicate chronic stunting, often due to repeated exposure to adverse conditions.

Statistical and graphical distributions of the main exposures, outcomes and confounding variables will be used for descriptive analysis. The unadjusted associations of the main exposure and outcome of confounding variables were

determined by Chi-square analysis and expressed as odds ratio at 95% confidence intervals. Multiple tests of statistical significance of factors were done to determine rejecting or retention of null hypothesis.

3.3: Resource Requirement

The following resources were used in conducting the research

i) Personnel

Six (6) field assistants

One(1) Statistical consultant

Three(3) University Supervisors

ii) Equipment

Three (3) salter scales, three(3) height boards, three(3) sisal ropes, three (3) plastic pants and six (6) MUAC tapes.

iii) Stationery

iv) Running and maintenance cost

v) Travel and per diem allowances.

vi) Data processing and analysis cost

vii) Writing up of the draft and final dissertation cost.

3.4 Challenges

The budget was a challenge since the research was not externally funded. However, the work was completed on schedule. The Gantt Chart was also adhered to. During fieldwork, there were challenges of covering long distances on foot as the homes were far apart.

CHAPTER FOUR

4.0 RESULTS

4.1. Household characteristics/ Social Demographic information

Table 2 below shows the demographic classification of the households sampled. A total of 126 households out of a total of 1550 households were sampled. It indicates the age groups, gender and sex ratio between male and female. The age classifications are done as indicated in K.D.H.S. 2003.

Table 2: Demographic Information of the sampled households

Age group	Sex		Total	Sex ratio	Percent
	Male	Female			
<5	69	68	137	1:1	32.3
5-9	17	17	34	1:1	8.0
10-14	12	5	17	2.4:1	4.0
15-19	5	10	15	1:2	3.5
20-24	15	29	44	1:2	10.3
25-29	17	46	63	1:2	14.8
30-34	27	14	41	2:1	9.6
35-39	14	23	37	0.6:1	8.7
40-44	21	5	26	4:1	6.1
45-49	3	2	5	1.5:1	1.1
50-54	4	0	4	4:0	0.9
>55	1	0	1	1:0	0.2
Total	205	219	424	1:1	100

The average size of the sampled households was five people, generally comprising two parents and three children. Some were headed by males(69.9%) but there were also others who were headed by single mothers (22.9%).

Under marital status of the mothers, 69.9% were in monogamous marriages, 22.9% were single mothers, 4.8% were widows, 1.2% were divorced while 1.2% were in polygamous marriages.

N=126

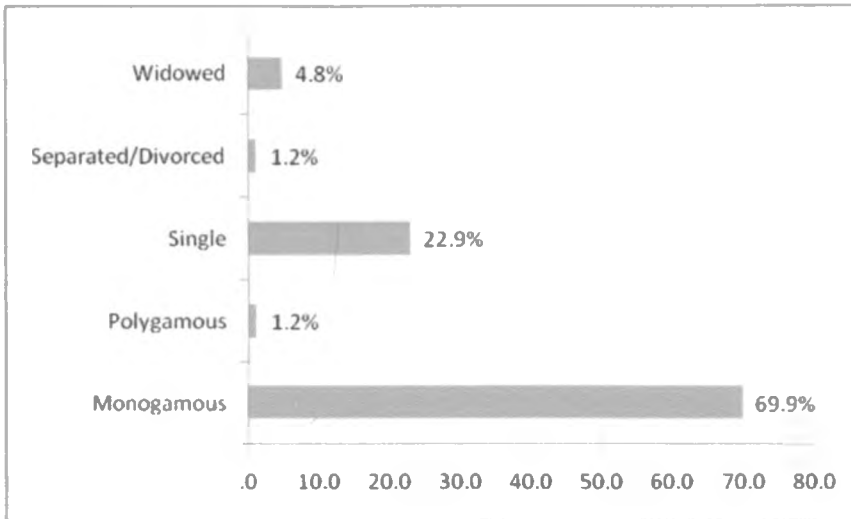


Figure 5: Mother's marital status

The fathers had secondary education (48%) in most of the sampled households but a few had only primary education(22%). A total of 30% of the sampled households, fathers had tertiary education. Under mothers' education, 62.5% had completed primary school, 6.3% had not completed primary school , 25% had completed secondary, 2.5% had not completed secondary school while 3.8% had tertiary education.

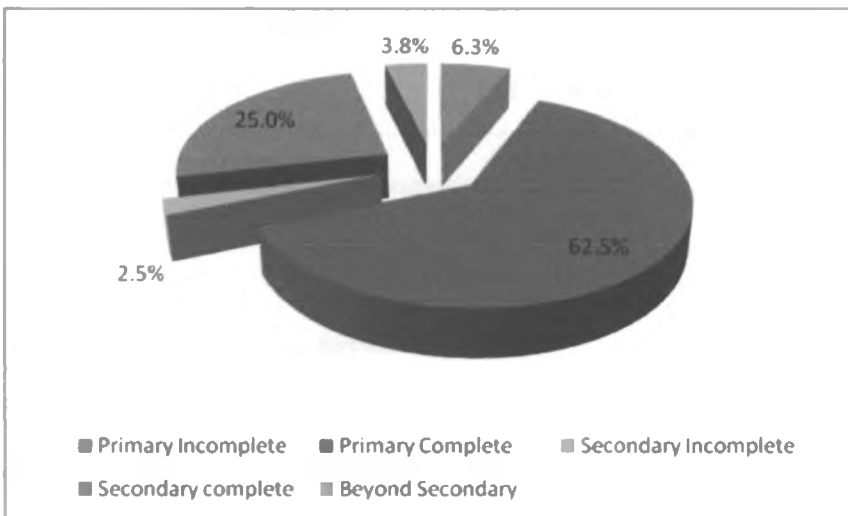


Figure 6: Mother's Education

On occupation, most of the Munyu residents earned their income from farming (44.6%), business (21.8%), formal employment (19.8%) and casual labour at (13.9%). Most of the marriages were monogamous. There were also young girls who had delivered babies in their parent's homes and mainly depended on them for their upkeep. Some engaged in casual employment like washing people's clothes or farm work.

On caregivers' occupation, 54.5% were housewives cum farmers, 16.9% were self employed, 11.7% were farmers, 7.8% were formally employed, 5.2% engaged in business while 3.9 % were baby sitters.

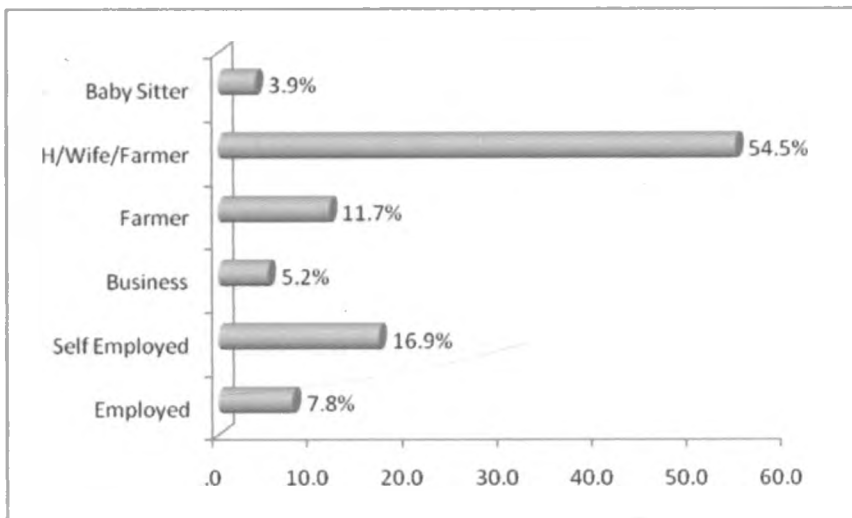


Figure 7: Mothers/ care givers occupation.

4.2 Socio-economic characteristics

From the data collected, majority of Munyu residents earn their livelihood from farming (44.6%), followed by businesses (21.8%) , formal employment (19.8%) and casual labour (13.9%).

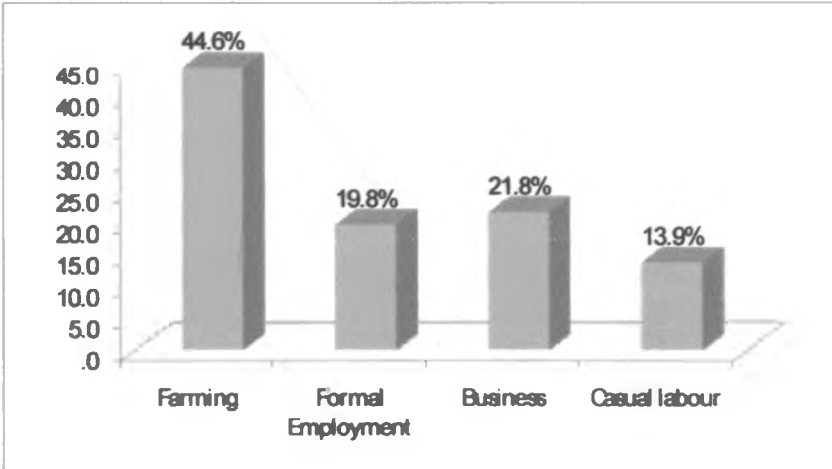


Figure 8: Source of income for residents of Munyu.

In Munyu there is a water project where the water is pumped from Ndarugu river, treated and then pumped to common taps (44.7%) where it is sold at Kshs 2/- per 20 litre jerrican to the residents. Some people have gone further and connected the water into their own homes hence the 25.2% residents use water from their own taps. There are also homesteads where boreholes were sunk for their everyday use (14.6%). Ndarugu river is also a source of water for 11.7% of the residents who may not afford to buy the treated water. In a few of the homes water is harvested from the rain (1.9%).

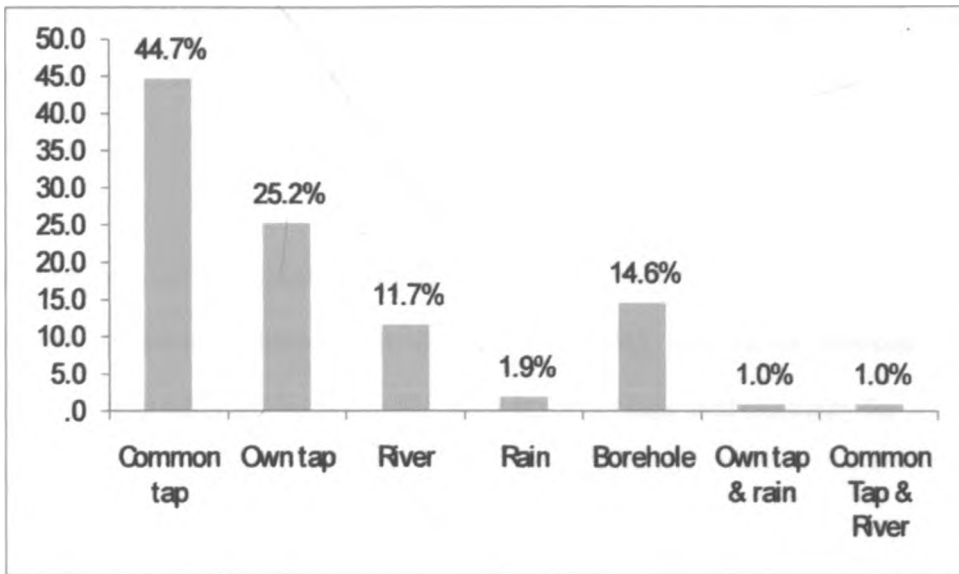


Figure 9: Source of water for households

Munyu being a settlement scheme, most of the residents own their homes. Some have rental houses which they have rented to those who are working in Munyu but do not originally come from there.

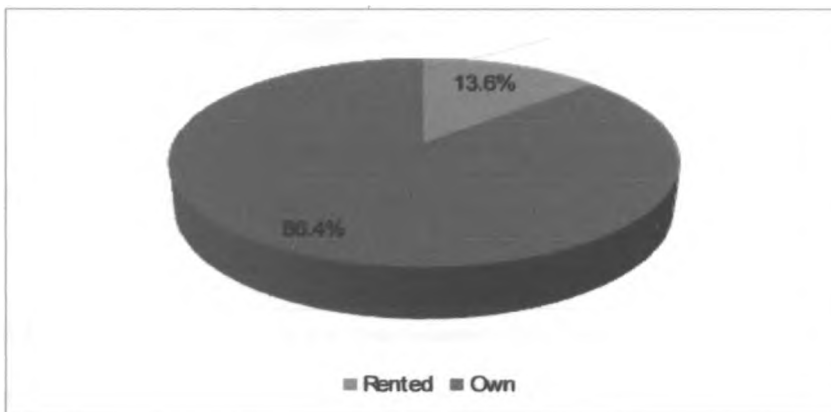


Figure 10: Type of house ownership

The majority of the households (94.2%) had radios and were thus exposed to the mass media. Only 5.8 percent did not have radios. For televisions(T.Vs), 46.1% had

TVs while 53.9 % did not have. However this was still a good number as it was almost a half. This helped pass the nutrition education offered via mass media to the residents.

The majority of the residents used charcoal and firewood (35.9%) as a fuel for cooking, followed by firewood (34%), charcoal (10.7%), paraffin and firewood (7.8%), gas at 6.8% and lastly paraffin alone at 4.9%. None used electricity for cooking.

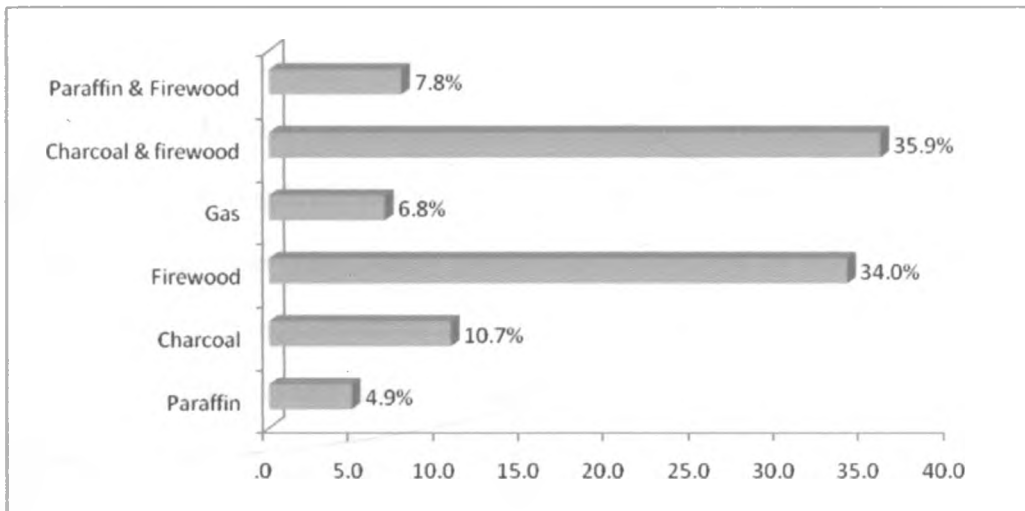


Figure 11: *Type of Fuel used for Cooking:*

After checking the various socio-economic variables of means of livelihood, source of water, type of house, availability of radio and TV, and type of fuel used for cooking, the table below classifies the residents according to their level of economic status. 23% are in high economic status, 71% are of middle economic status while 6% are of low economic status.

Table 3: Social Economic Status

Social economic status	Frequency	Percent
High economic status	29	23.0
Middle economic status	90	71.0
Low economic status	8	6.0
Total	N=126	100.0

4.3: Child Care Practices

The main child care practices considered were: breastfeeding, complementary feeding, frequency of feeding children over two years of age, health seeking behaviour when the child was sick and the type of food given to the baby during complementary feeding. In the absence of the mother the following persons took care of the child under observation. Mainly grandmothers took care of the children followed by elder siblings. As shown in Table 4.

Table 4: Alternate child care giver in the absence of the mother

Person Responsible for Child in Absence of The Mother	Percent N=126
Father	4.9
Sibling	17.3
Grandmother	60.5
Domestic Worker	9.9
Friends	4.9
Others	2.5
Total	100.0

The mothers sampled understood the need to breastfeed their babies exclusively for the first six months and after weaning started at 6 months, they continued breast feeding up to two years. However, a few, though they understood the need to breastfeed, were not able to do so up to two years due to formal work engagements. At the time of the study, majority of the mothers(57.8%) were still breastfeeding while 42.2% were not breastfeeding

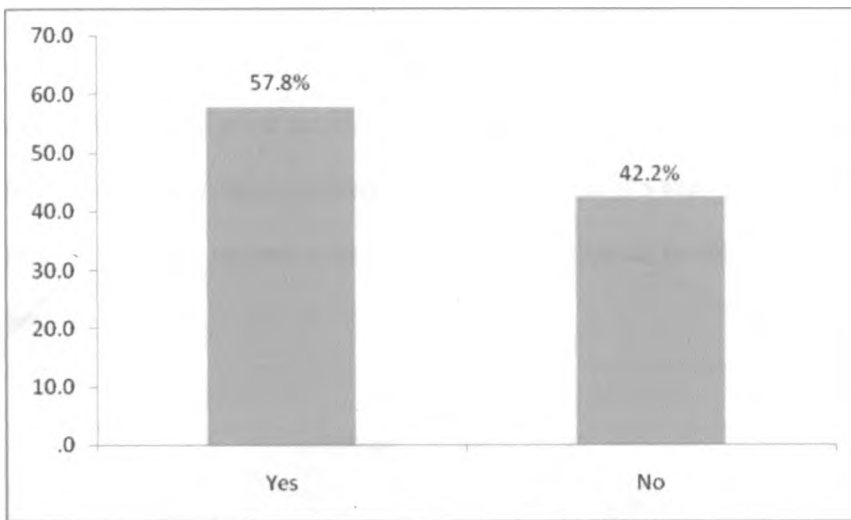


Figure 12: Children Breastfeeding Status

The sampled caregivers (mothers) understood the need to initiate breastfeeding immediately after birth, 89.1% initiated 30 minutes after delivery, 8.7% initiated breastfeeding one hour after delivery. Only 2.2% initiated later than one hour after delivery.

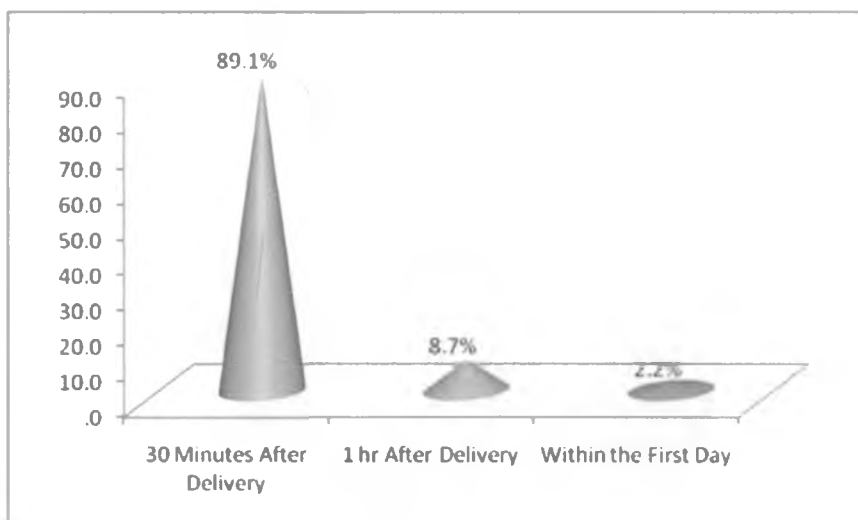


Figure 13: Period when the Mother initiated Breastfeeding

Majority of the mothers practised breastfeeding. Out of a total of 126 mothers, 66.7% of them practiced exclusive breastfeeding for the first six months while 33.3% did not.

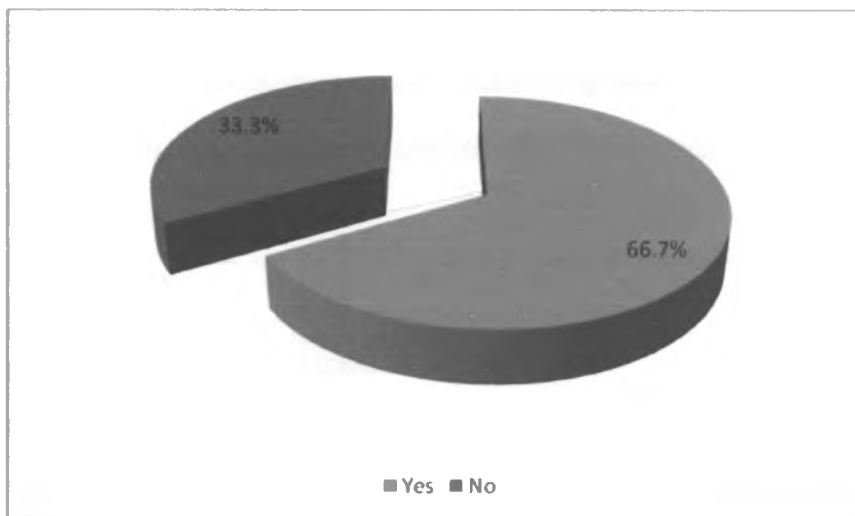


Figure 14: Whether Mother practised exclusive breastfeeding

A total of 73.4% of the care givers sampled fed their children 5 or more times per day while 26.6% fed them 1-4 times per day. This shows that majority of the care givers

understood the need to frequently feed their children due to high level of activities that the children are involved in.

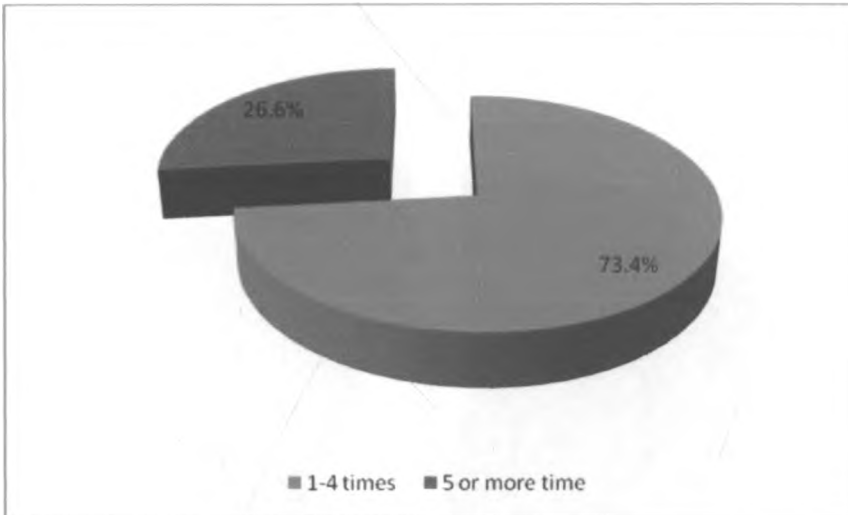


Figure 15: Number of feeds per day for children aged between 24-36 months
1-4 times: 73.4%, 5times or more: 26.6%

The age at which the mothers stopped breastfeeding varied with 37.8% stopping at 12-18 months while 20% stopped breastfeeding when the baby was less than 6 months.

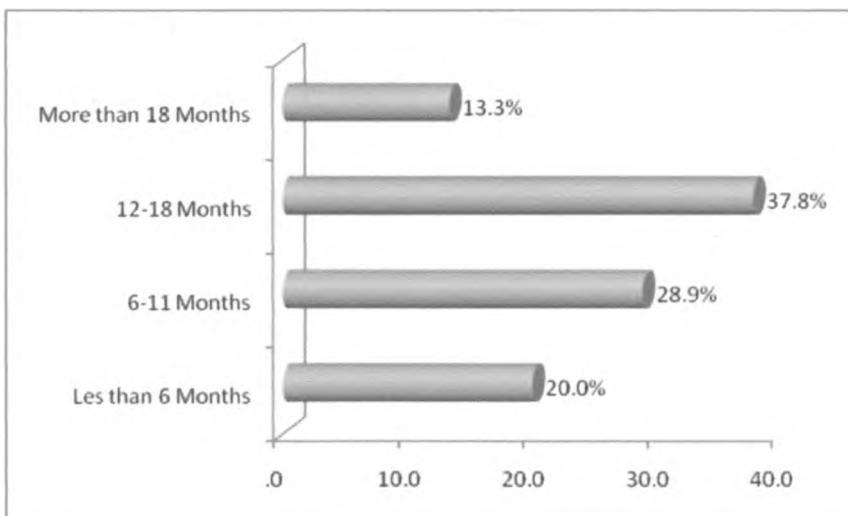


Figure 16: Age at which the child stopped breastfeeding

The age at which the baby was fed on other food beside breast milk varied with 40% starting at 4-5 months (red) while another 40% (light blue) started at six months. A few (blue 12%) started at 0-3 months while also a small portion (purple 8%) fed at 7 months and above.

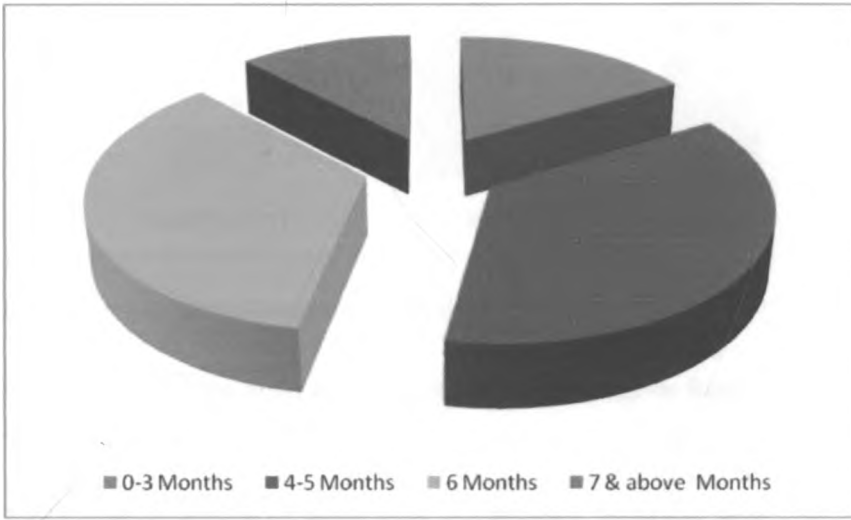


Figure 17: Age at which child was given food/water other than breast milk

For the frequency of breastfeeding, 64.5% breastfed on demand, 25.8% 3-6 times per day while 9.7% breastfed 2 or less times per day. The last group were mainly for the older children more than 24 months.

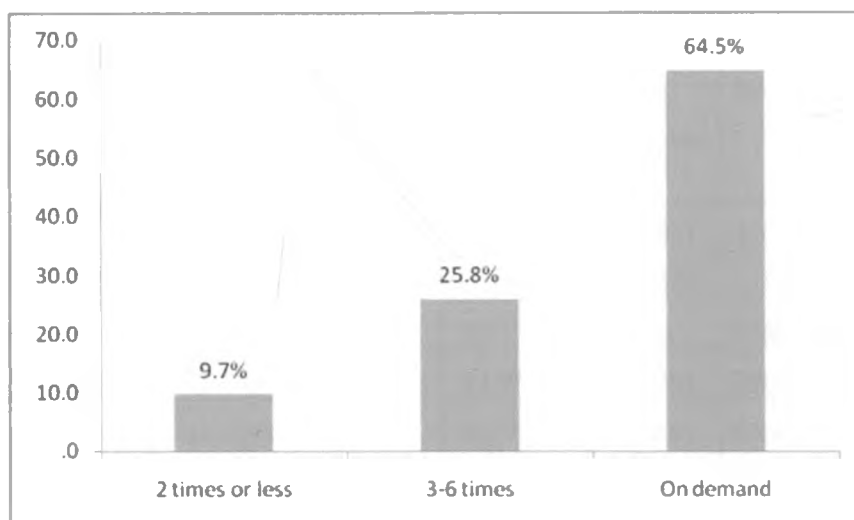


Figure 18: Number of breastfeeds per day

Care practices: How many times a week does the caregiver feed the child the following foods

Maize product in form of maize meal was the most frequently used food to feed the children followed by fruits. The children were mostly fed these foods 2-3 times per day.

Table 5: Number of times per week different foods were fed to the baby

Food	Number of times per week different foods are fed to the baby						Total
	1-4 times	5-7 times	8-10 times	More than ten times	Not eaten	Rarely eaten	
Maize	64(50.5%)	33(25.7%)	8(5.9%)	4(3.0%)	8(6.9%)	9(7.9%)	126(100.0%)
Beans	54(42.9%)	41(32.7%)	8(6.1%)	4(3.1%)	9(7.1%)	10(8.2%)	126(100%)
Eggs	45(35.7%)	9(7.1)	3(2.0%)	3(2.0%)	32(25.5%)	34(27.6%)	126(100%)
Meat	57(44.9%)	5(4.1%)	5(4.1%)	3(2.0%)	37(29.6%)	19(15.3%)	126(100%)
Vegetables	55(43.3%)	28(22.7%)	20(15.5%)	10(8.2%)	9(7.2%)	4(3.1%)	126(100%)
Irish potatoes	49(38.8%)	12(9.2%)	8(6.1%)	10(8.2%)	17(13.3%)	30(24.5%)	126(100%)
Green grams	35(35.7%)	4(4.1%)	5(5.1%)	4(3.1%)	26(26.5%)	25(25.5%)	126(100%)

Food	1-4 times	5-7 times	8-10 times	More than ten times	Not eaten	Rarely eaten	Total
Peas	48(37.8%)	5(4.1%)	4(3.1%)	1(1.0%)	41(32.7%)	27(21.4%)	126(100%)
Fruits	59(46.9%)	37(29.6%)	12(9.2%)	12(9.2%)	4(3.1%)	2(2.0%)	126(100%)
Cassava	4(3.1%)	4(3.1%)	3(2.1%)	0(0%)	83(66.0%)	33(25.8%)	126(100%)
Weetabix	37(29.9%)	23(18.6%)	1(1.0%)	2(2.1%)	39(30.9%)	22(17.5%)	126(100%)
Sweet potatoes	22(17.5%)	10(8.2%)	1(1.0%)	1(1.0%)	51(41.2%)	39(30.9%)	126(100%)

Table 6: Number of times per day various foods are fed to the baby.

Number of feeds besides breast milk	Percent
1-4 times	80.2
5 or more times	19.8
Total	100.0

There were no foods in the community which were considered as taboo for the children. Most of the mothers fed their children more than four (4) times per day. Some bottle fed their children but majority used cup for feeding the young ones. On methods of stopping breastfeeding, the mothers indicated that the baby would reduce gradually the times of breastfeeding then finally stop while some said they put the baby in a different room for a few days then they forget about breastfeeding. A few cases warranted the mother to apply aloe-vera on the breast to stop the baby from breastfeeding.

Table 7: Exclusive breast feeding, age of stopping breastfeeding and introduction of complementary feeding.

Time	N	Mean	Std Deviation
Number of months exculsive breasfeeding was practiced	50	7.28	4.695
Best age to stop breastfeeding in months	92	21.79	4.844
Age other foods fluids were introduced to the baby (months)	98	5.45	2.463

4.4: Nutrition literacy level among the caregivers

From the sampled respondents, 81.5% indicated that they had received nutrition education while 18.5 % had not as shown in figure 19 . The nutrition education was from various sources; maternal and child clinics (MCH), relatives, friends, formal schools and others from the mass media. This is shown in figure 20. Nutrition literacy was classified by checking on those who had ever received any form of nutrition literacy versus those who had not. The care givers were also asked whether they knew about the three food groups of proteins, carbohydrates and vitamins. Those who knew and were able to classify the mentioned foods correctly into the three food groups were classified as having nutrition literacy while those who did not know the food

groups and were not able to classify them were classified as having low levels of nutrition literacy. The caregivers were also asked about dietary diversity for the households which included twelve (12) food groups and how many they had consumed in the past 24 hours. Households which had consumed more than four food groups were considered as food secure and nutritionally literate. This way the caregivers were classified into two categories, high nutrition literacy and low nutrition literacy.

Nutritional Education Level:

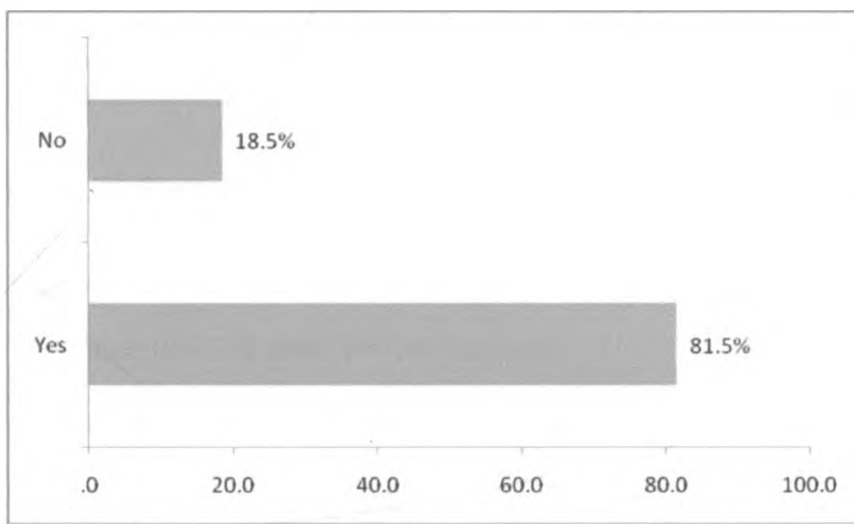


Figure 19: Whether respondent has ever received education on good child feeding practices

The figure (20) below indicates the various sources the caregivers obtained their nutrition knowledge.

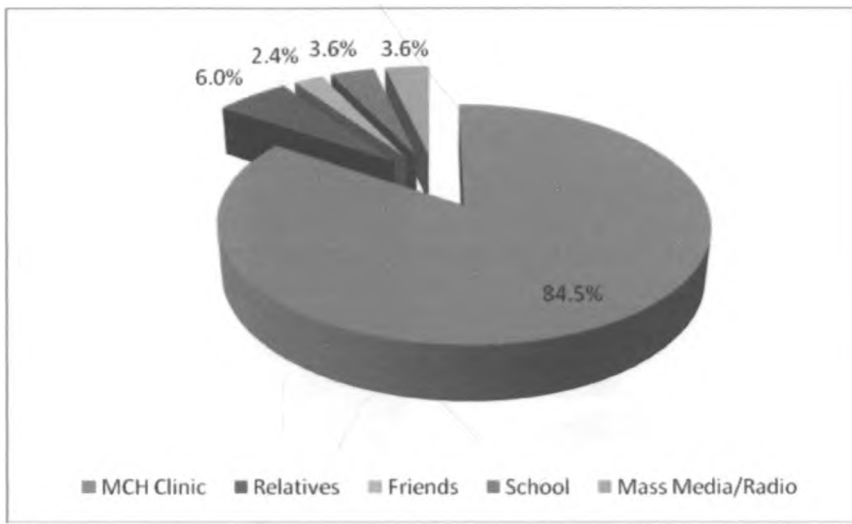
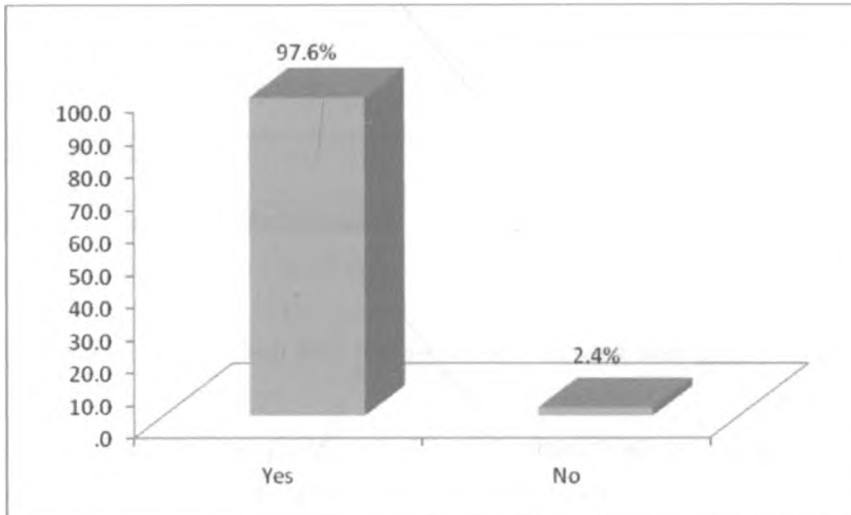


Figure 20: *Source of nutritional knowledge*

Table 8: Knowledge on making weaning foods, mixing ORS and making suitable food for a sick child (N=126 caregivers)

Activity	Yes	No
Weaning food	51.0%	49.0%
Mixing O.R.S.	68.8%	31.2%
Making suitable food for a sick child	60.7%	39.3%

On usefulness of nutrition education, 97.6% indicated that it was useful while 2.4% indicated that it was not useful.



1. Figure 21: Whether nutrition literacy is useful to the respondent

On the information about the three food groups; 85.1% indicated that they knew about protein, carbohydrates and vitamins while 14.9% had not heard about them.

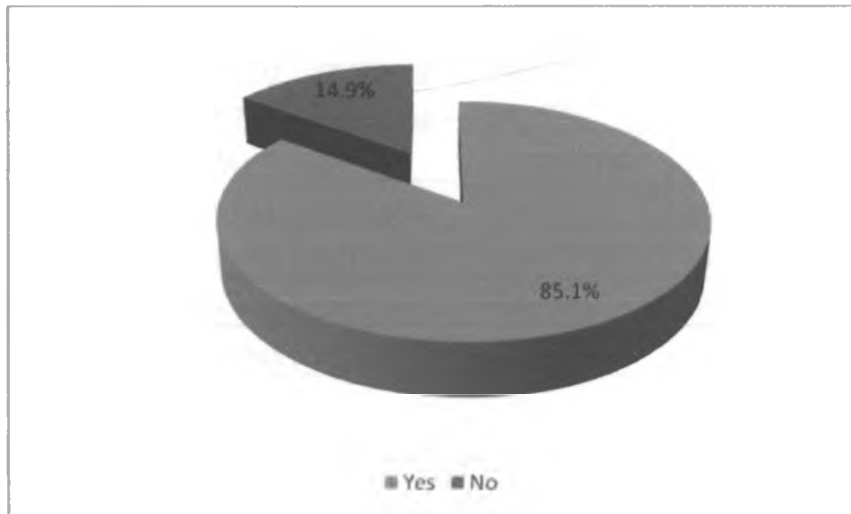


Figure 22: whether they knew about the three food groups

Table 9 : Naming the three types of food:

Which are the 3 food groups	Percent
Did not answer	18.3%
Protein, vitamins, carbohydrates	81.7%

Nutrition literacy: which food groups do the following belong to:

The respondents were given a set of foods to classify into protein, carbohydrate and vitamins and the results are as shown below table 10.

Table 10: Classification of food into the three main food groups

Classification of foods into the three food groups					
Food	Proteins	Carbohydrates	Vitamins	Do not know	Total
Maizemeal	24(18.8%)	96(76.6%)	6(4.7%)	30(23.5%)	126(100%)-
Potatoes	23(18.2%)	99(78.8%)	4(3.0%)	27(21.2%)	126(100%)
Sukuma	8(6.1%)	6(4.5%)	112(89.4%)	14(10.6%)	126(100%)
Beans	101(80%)	15(12.3%)	8(6.2%)	23(18.5%)	126(100%)
Milk	90(71.4%)	22(17.5%)	14(11.1%)	36(28.6%)	126(100%)
Millet	99(78.5%)	17(13.8%)	8(6.2%)	107(84.7)	126(100%)
Fish	86(68.2%)	36(28.8%)	4(3.0%)	40(31.8%)	126(100%)

A number of respondents were able to classify the foods correctly into proteins, carbohydrates and vitamins. Only millet which gave majority of the respondents a problem.

Linear Regression : Dependent Variable WHZWHO versus:

- Whether respondents had ever heard of the 3 food groups
- Importance of receiving education on good child feeding practices
- Usefulness of nutritional literacy

Table 11: Regression Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.157 ^a	.025	-.005	1.599597

a. Predictors: (Constant), Whether respondents Had Ever heard of Three Food Groups, Receiving of Education on good Child Feeding Practices, Usefulness of Nutritional Literacy

Table 12: Linear Regression

Mode	Variables entered	Variables removed	Method
1.	Whether respondents had ever heard of 3 food groups		
	Receiving of education on good child feeding practices		
	Usefulness of nutritional literacy		

Dependent variable: WHZ WHO.

Table 13: ANOVA Results

Model	Sum of squares	d.f.	Mean Square	F	Significance
Regression	6.373	3	2.125	0.830	0.480
Residual	250.754	98	2.229		
Total	257.128	101			

- a) Predictors (Constant) whether respondent had ever heard of 3 food groups, receiving of education on good child feeding practices, usefulness of nutritional literacy
- b) Dependent variable WHZWHO

Table 14: Coefficients

Model	Unstandardized coefficients		Standardized Coefficients Beta	T	Significance
	B	Std Error			
Constant	.654	.543	-	1.204	.231
Receiving education on child feeding practices	-1.15	.418	-.028	-.275	.784
Usefulness of nutritional literacy	-.311	.226	-.143	-1.380	-.171
Whether respondents had ever heard of 3 food groups	.043	.133	-.034	-.322	.748

- a) Dependent variable WHZWHO

From the regression data on the three named variables; a) receiving of education on good child feeding practices, b) Usefulness of nutrition literacy and c) whether respondents had ever heard of the three food groups, the dependent variable was weight for height (WHZ,WHO), On the beta results the first and the third (a and c) had a positive effect on good nutritional status of the children under study. The second (b) had no significance.

On the causes of diarrhoea, 58.0% said it is caused by dirt, 25.0% percent said it is caused by teething, 14% did not answer while 3.0% had no idea.

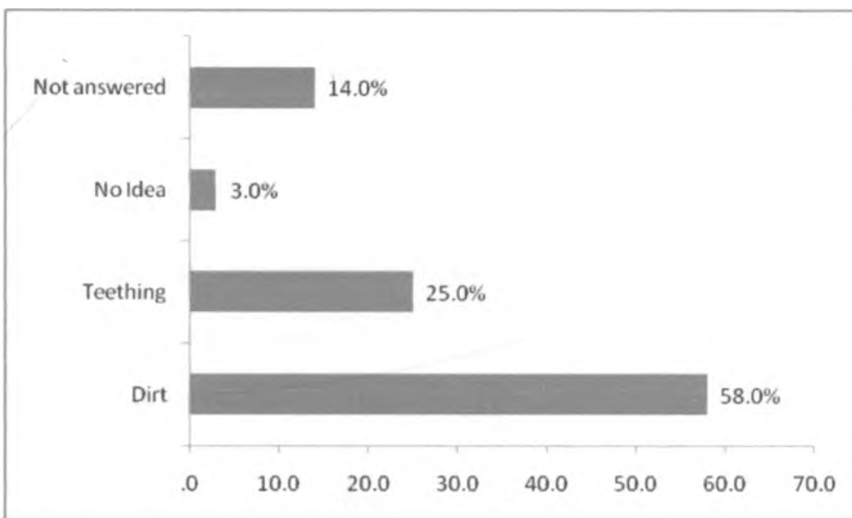


Figure 23: causes of diarrhoea

The ways of treating diarrhoea is as indicated in the figure 24 below;

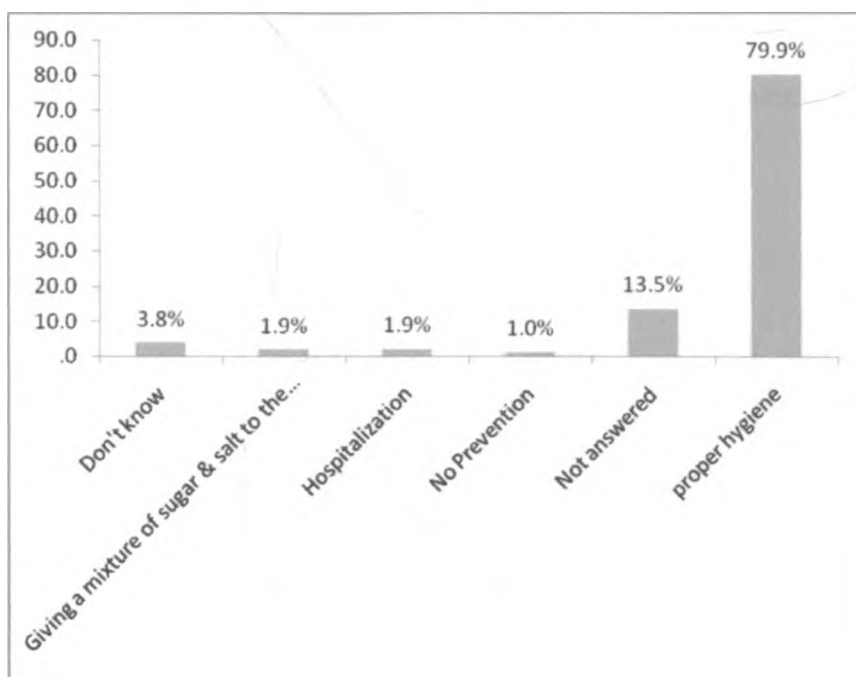


Figure 24: ways of treating diarrhoea

Table 15: Categorized nutrition level: descriptive statistics

Categorized Nutrition Level	Percent
High Nutritional Level	47.4
Low Nutritional Level	52.6
Total	100.0

4.5: Sanitation and Health Facilities:

Among the sampled respondents (126 households), 99% had access to toilet/ latrine facility. The whole population had access to health services and the means of transport to the health facility was mainly walking (95.2%) while 4.8% used motor bikes, matatu or bicycles.

Majority of the respondents indicated that the distance from the health facility was near (62.4%) while the others(37.6%) indicated that it was far,(more than 5km away from households)

Table 16: Availability of mosquito net in the household

Do you have a mosquito net?	Percent N=126
Yes	93.2
No	6.8
Total	100.0

4.6 Vaccination and Vitamin A intake among the community:

Whether the child has been provided with Vitamin A in the last six months:

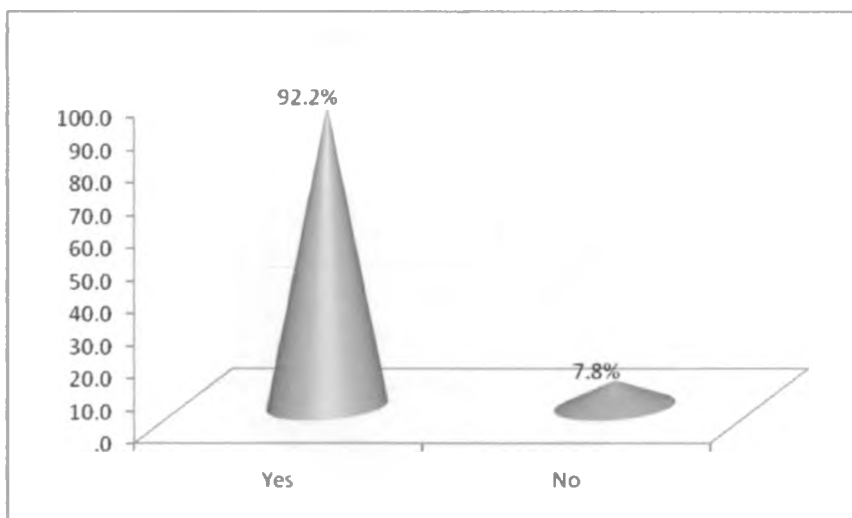


Figure 25: Vitamin A provision to the children

The intake of vitamin A among the community is high at 92.2%. After the normal immunization schedule, the children are given Vitamin A when they present themselves with disease complications.

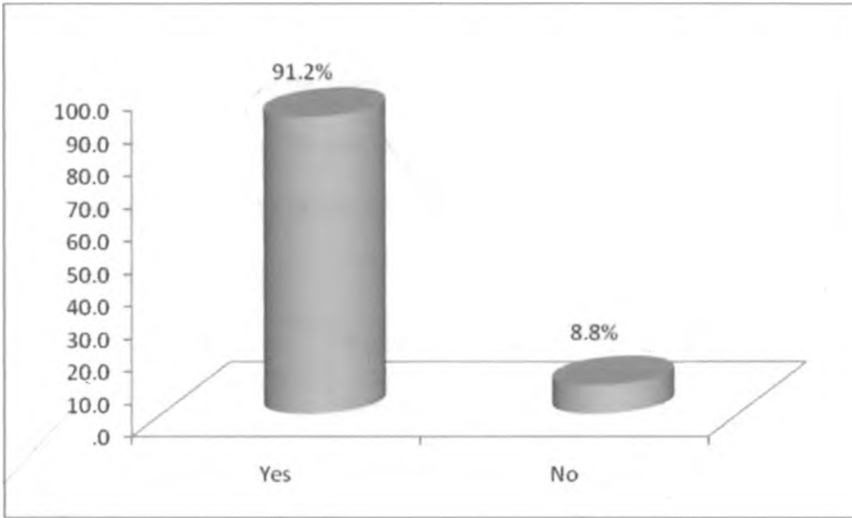


Figure 26: *Whether the child has received full immunization*

The vaccination level is at 91.2% also quite high. The community health workers should aim for 100% immunization.

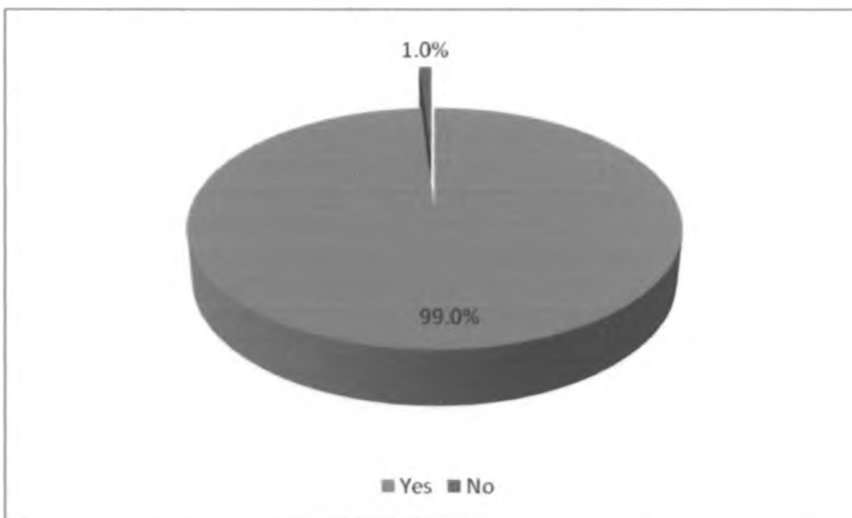


Figure 27: *Whether the child has received polio vaccine orally?*

Yes: 99.0% No: 1.0%

Only 1% had not received polio vaccine due to various reasons. Some mothers delivered at home and had not had contact with a healthcare provider to give polio vaccine.

4.7 Level of morbidity in the children in the two weeks prior to interview (n=126)

Table 17 :Morbidity for the last two weeks among children 6-36 months

Total children = 126. 48 children were reported to have been sick in the past two weeks prior to the survey.

Disease	Number of children infected	% Infection
Diarrhoea	10	10.1
ARI eg cough	18	38.4
Malaria	20	40.6
Measles	0	0
Total	48	38

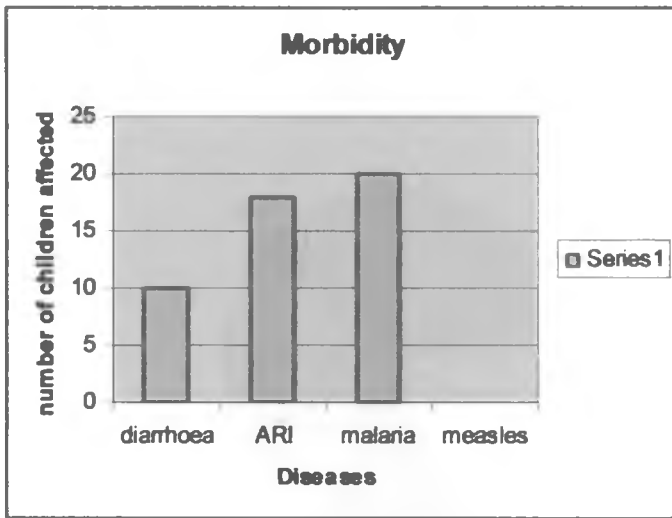


Figure 28: Morbidity in the past 2 weeks.

The table (14) below shows how many children slept under a treated mosquito net and those who did not. It also indicates where those children who were sick were taken for treatment. This is under morbidity objective.

Table 18: Usage of mosquito net and where medical help was sought.

Characteristic:	N (%)
Slept under mosquito net	
Yes	120(94)
No	6(6.0)
Where medical assistance was sought	
No assistance sought	20 (15.6)
Private clinic/pharmacy	7 (5.8)
Public health	99 (78.8)
	Total 126(100.0)

4.8 Dietary diversity in the past 24 hours

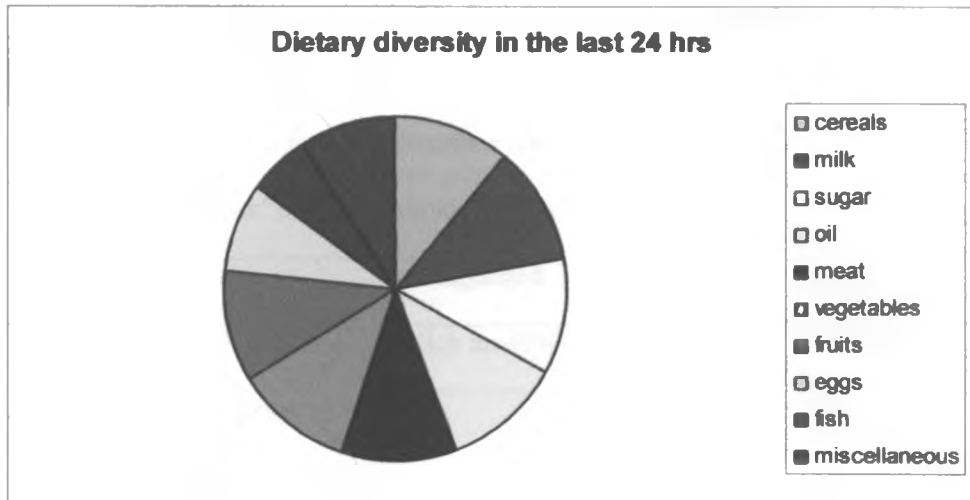


Figure 29: Dietary diversity in the past 24 hours

In the households sampled, most of the food groups were consumed. The main source of the food eaten by the households was purchase. At the time of the survey, there was a drought hence even crops like maize, beans, fruits, vegetables and roots and tubers which are normally available from own production were not available. Milk and milk products were also available only from purchases. The households consumed three meals per day.

4.9: Formal Literacy Of The Care givers Versus Nutritional Status Of The Children:

After carrying out chi square test on formal literacy versus nutrition status, p value was 0.285 which is greater than alpha which is 0.05.

This showed that there was no significant relationship between the two.

Having formal education did not translate to better nutrition status of the children.

The reasons could be that the mothers have the knowledge but they lack finances to buy the types of foods required to feed the child. It is also possible that the people they left in charge of their children may not be having formal education hence are not able to follow instructions about feeding their children.

Table 19: Mothers' education versus categorized nutrition level.

		Categorized	Nutrition	Level
		High level(%)	Low level (%)	Total%
Mother's education	Primary incomplete % t	0	7.1	7.1
	Primary complete %	21.4	42.9	64.3
	Secondary complete %	7.1	7.1	14.3
	Beyond secondary %	14.3	0	14.3
Total	% total	42.9	57.1	100.0

4.10: Nutritional Literacy Versus Nutritional Status Of The Children

Null hypothesis (Ho): There is no relationship between the Nutrition status of the children and the Nutrition Literacy of the mothers/care givers.

P value is 0.000 hence lower than alpha which is 0.05 . This means that there is a strong relationship between nutrition status and nutrition literacy. That means rejecting the null hypothesis and accepting that there is a significant relationship between the nutrition status of children and the mothers having nutrition literacy. This

shows that care givers who have nutrition literacy be it from MCH, mass media, formal settings or from relatives, tend to give better care to children under their care nutrition wise. Once the mothers or alternative care givers were well educated formally and they have nutrition education, this had a positive effect in the upbringing of the child.

Table 20: Categorized nutrition status

			Nutrition		Education
			Low	High	Total
Nutrition Level	High Nutritional Level	% of Total	47.4%	0%	47.4%
	Low nutritional Level	% of Total	10.5%	42.1%	52.6%
Total		% of Total	57.9%	42.1%	100.0%

Chi-square tests for categorized nutrition level; nutrition status versus nutrition education

P= 0.000

4.11:Anthropometric results

Global Acute Malnutrition (GAM for wasting) is defined as <-2 z scores weight-for-height and/or oedema, severe acute malnutrition is defined as <-3z scores weight-for-height and/or oedema.

Global Underweight Malnutrition (GUM for underweight) is defined as <-2 z scores weight for age and /or oedema, severe underweight malnutrition is defined as <-3 z scores weight for age and /or oedema.

Global Chronic Malnutrition (GCM for stunting) is defined as <-2 z scores height for age and /or oedema, severe chronic malnutrition is defined as <-3 z scores height for age and / or oedema.

Result Tables for WHO standards 2006

A total of 126 children were sampled, 62 boys and 64 girls. Boys had a higher rate of malnutrition with 7 of them being malnourished as compared to 4 girls. 6 boys suffered from moderate malnutrition while 5 boys suffered from severe malnutrition. 2 girls suffered from moderate malnutrition while 2 girls suffered from severe malnutrition.

Table 21: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 126	Boys n = 62	Girls n = 64
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(11) 8.7 % (4.5 - 16.3 95% C.I.)	(7) 11.3 % (3.6 - 30.4 95% C.I.)	(4) 6.3 % (5.4 - 7.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=3 z-score, no oedema)	(6) 4.8 % (0.8 - 22.7 95% C.I.)	(4) 6.5 % (0.9 - 34.3 95% C.I.)	(2) 3.1 % (0.7 - 13.3 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(5) 4.0 % (1.5 - 10.4 95% C.I.)	(3) 4.8 % (1.4 - 15.0 95% C.I.)	(2) 3.1 % (0.9 - 10.5 95% C.I.)

The prevalence of oedema is 0.8 %

Out of 126 children; 4 suffered from severe wasting (3.2%) while 6 suffered from moderate wasting (4.8%). A total of 115 children were normal (>-2 z score) which was 91.3% while 1 child suffered from oedema (0.8%) as shown in table 23.

Table 22: Prevalence of acute malnutrition by age based on weight-for-height z-scores and/or oedema

Age (mths)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z- score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	61	3	4.9	4	6.6	53	86.9	1	1.6
18-29	46	1	2.2	1	2.2	44	95.7	0	0.0
30-36	19	0	0.0	1	5.3	18	94.7	0	0.0
Total	126	4	3.2	6	4.8	115	91.3	1	0.8

Four children were classified as Marasmic (3.2%) with oedema absent while 1 was classified as having Kwashiorkor(0.8%) 121 children were not having neither oedema or severe malnutrition as shown in table 23.

Table 23: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 1 (0.8 %)
Oedema absent	Marasmic No. 4 (3.2 %)	Not severely malnourished No. 121 (96.0 %)

According to table 19, 10 children had moderate malnutrition (underweight) which is <-2 z score and > -3 z score, 6 boys and 4 girls. A total of 3 children were severely underweight < -3 z score with 2 boys and 1 girl. In total 13 children out of 125 children were underweight (8 boys and 5 girls)

Table 24: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 125	Boys n = 61	Girls n = 64
Prevalence of underweight (<-2 z-score)	(13) 10.4 % (9.3 - 11.6 95% C.I.)	(8) 13.1 % (8.7 - 19.3 95% C.I.)	(5) 7.8 % (3.2 - 18.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=3 z-score)	(10) 8.0 % (4.6 - 13.5 95% C.I.)	(6) 9.8 % (3.7 - 23.8 95% C.I.)	(4) 6.3 % (5.4 - 7.2 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(3) 2.4 % (0.2 - 19.7 95% C.I.)	(2) 3.3 % (0.5 - 19.6 95% C.I.)	(1) 1.6 % (0.0 - 42.8 95% C.I.)

As shown in table 23, 3 children were severely underweight which was 2.4%, 10 were moderately underweight which was 8.0%. A hundred and twelve children were normal forming 89.6 of the children. One child had oedema in 6-17 months bracket(0.8%).

Table 25: Prevalence of underweight by age based on weight-for-height z-scores and oedema

Age (months)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	60	2	3.3	5	8.3	53	88.3	1	1.7
18-29	46	1	2.2	2	4.3	43	93.5	0	0.0
30-36	19	0	0.0	3	15.8	16	84.2	0	0.0
Total	125	3	2.4	10	8.0	112	89.6	1	0.8

A total of 25 children were moderately stunted out of 126 children (12 boys and 13 girls < -2 z score and > -3 z score). Sixteen children were severely stunted out of 126 children; 10 boys and 6 girls (<-3 z score). A total of 41 children were stunted, 22 boys and 19 girls (<-2 z score). This is stunting based on height for age z scores by sex.

This is shown in table 24.

Table 26: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 126	Boys n = 62	Girls n = 64
Prevalence of stunting (<-2 z-score)	(41) 32.5 % (12.6 - 61.7 95% C.I.)	(22) 35.5 % (13.1 - 66.8 95% C.I.)	(19) 29.7 % (12.7 - 55.0 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(25) 19.8 % (10.5 - 34.4 95% C.I.)	(12) 19.4 % (6.4 - 45.8 95% C.I.)	(13) 20.3 % (14.7 - 27.4 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(16) 12.7 % (3.6 - 36.3 95% C.I.)	(10) 16.1 % (8.3 - 29.1 95% C.I.)	(6) 9.4 % (1.0 - 50.7 95% C.I.)

On stunting based on height for age z scores, 25 children were moderately stunted (>-3 and < -2 Z score), 16 children were severely malnourished (<-3 z score) and this represented 12.7%. A total of 41 children were stunted (<-2 z scores) which represented 32.5% of the total children sampled. This is shown in table 25.

Table 27: Prevalence of stunting by age based on height-for-age z-scores

Age (mths)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (>= -2 z score)	
		No.	%	No.	%	No.	%
6-17	61	5	8.2	8	13.1	48	78.7
18-29	46	7	15.2	12	26.1	27	58.7
30-36	19	4	21.1	5	26.3	10	52.6
Total	126	16	12.7	25	19.8	85	67.5

- The level of Global Acute Malnutrition (GAM) was 8.7% compared to 5.9% National figure. (GoK, 2008-2009 Child Survival and Development Strategy)
- The level of Global Underweight Malnutrition (GUM) was 9.5 % compared to 22.3% National figure (GoK, 2008-2009 Child survival and Development strategy)
- The level of Global Chronic Malnutrition (GCM) was 26.2% compared to 32.7% National figure, (GoK, 2008-2009 Child Survival and Development Strategy)

Table 28

Odds ratio ,T test and Chi square results on care givers receiving nutrition education and those ones not receiving.

Condition	Odd's ratio value	T test value (p value)	Means(T test)	Pearson Chi square test p value
GAM (WHZWHO) Wasting	1.244	0.601	0.081 and 0.091	0.166
GUM (WAZWHO) Underweight	0.868	0.034	0.945 and 0.941	0.833
GCM (HAZWHO) Stunting	0.421	0.120	0.747 and 0.738	0.099

Children whose care givers received education on good child feeding practices **wasting**, the odds ratio was 1.244, Chi square $p= 0.166$ while t test, p value = 0.601. This shows that receiving good child feeding practices was not protecting the child against wasting as Odds ratio was greater(>) than one(1) at 1.244, Chi square p value was greater than 0.05 at 0.166 and for T test, p was greater than 0.05 at 0.601.

Children whose care givers received education on good child feeding practices **or underweight**, the odds ratio was 0.868, Chi square $p= 0.833$ while t test p value = 0.034. This shows that receiving good child feeding practices was protecting the child against underweight as odds ratio value is less than one (1) at 0.868, however Chi square value is not significant as it was greater than 0.05 at 0.833. With t test the value was less than 0.05 at 0.034 hence nutrition education was significant in helping the children not to be underweight

Children whose care givers received education on good child feeding practices **under stunting**, the odds ratio was 0.421, Chi square $p=0.099$ while T test $p= 0.120$. This shows that receiving good child feeding practices was protecting against stunting as odds ratio was less than (<) one (1) at 0.421. For Chi square it was not significant as the value was greater than 0.05. The same case applied to T test, p was = 0.120 hence greater than 0.05 and so not significant according to T test and Chi square test.

4.12: Key informant guidelines for Health Care Workers

The following is the information gathered using the Key Informant Guidelines for Health Workers. The nutrition education messages included in the MCH services are balanced diet, breastfeeding importance and weaning. These are given once a week. The main means of communication skills used to pass the messages are: posters, booklets, demonstrations by nutritionists.

The languages used are Kiswahili and Kikuyu and the mothers understand these languages. Whether the mothers understand the advice, the nurses may not know as currently there is no nutritionist at the centre. There is success on improved nutritional status of infants associated with the program. The reasons attributed to the success/failure of the programme are, in terms of success, there is need for the centre to have a nutritionist who would trace the malnourished children in the community. Lack of food and money due to drought causes the children to be malnourished hence a failure of the program.

To improve service delivery on nutrition the Ministry of Health need to post a Nutritionist at the centre to hold demonstration to the mothers and also provide food supplements. In the maternity wards, mothers were given the following nutrition messages: exclusive breastfeeding up to six months of age of the baby, post-natal diet of the mother. The percentage of mothers who deliver at the hospital are 20 per month. The recommended are 50 per month hence some are still delivering at home.

4.13: Determine level of formal education and nutrition education and relate to nutrition status of the children.

A combination of both formal literacy and nutrition literacy (refer to tables, 15, 16 and 24) yielded to good nutrition status of the child. For mothers who had formal education up to form four level and they attended the nutritional classes at the MCH clinics, their children had better nutritional status as compared to those who had not completed primary education and rarely attended the nutrition education classes at MCH clinics. Formally educated mothers benefited more from information from the mass media since they understood both Kiswahili and English which are the main languages used to pass the information by the radios and TVs.

CHAPTER FIVE

5.0 DISCUSSION

From the findings and literature it was obvious that there was a relationship between having formal education and having better nutrition status of the children. It was also important for the mothers/caregivers to have nutrition education for better upbringing of the children. Most of the care givers got their nutrition education from the maternal and child clinics not necessarily from formal schools. Another good source of nutrition education was from mothers of the care givers who were the grandmothers. They had a wealth of customary education regarding nutrition which they passed on to their daughters.

However, in some cases the care givers had both formal and nutrition literacy but the nutrition status of their children was poor. This may be due to the fact that the mothers do not have money to put into practice what they know bearing in mind that the majority were housewives (54.5%). Fathers' employment status in this study failed to show a significant relationship with child nutrition status, (Waihenya, 1994) argues that a mother's earned income may often be used for an infant's food than a father's income.

5.1 Household characteristics/ Social demographic Information

Most of the families had one child under 3 years then two elder sibling plus the parent(s). The mothers who were the major caregivers were mostly farmers as well as housewives so in case they needed to leave the children; they were left under the care of children grandmothers. The grandmothers were well versed with child up bringing and were able to be good respondents regarding personal questions like breastfeeding

since they knew the parent of the children well. Older siblings were also responsible for taking care of young ones. In instances where the older siblings took care of the children, the enumerators had to make a second visit at a time when the mothers were present. Same case applied with the domestic workers. Only 9.9 % of the mothers left their children under the care of domestic workers probably due to formal employment. Fathers and friends were left with the children by only 4.9% of the sampled mothers, refer to table 4 under care practices results. The children who were brought up by their mothers or their grandmothers had better nutrition status compared to the ones brought up by domestic workers, fathers or elder siblings. This could be explained by the fact that the mothers and grandmothers had a soft spot for their children and grandchildren and would not do anything to jeopardize their welfare. From the study, families with a regular source of income whether mothers or fathers, the children had better nutritional status. This might be attributed to the positive association between the monthly income and the amount spent on food. This may imply that the higher the income, the higher the amount allocated for food. Therefore, access to higher incomes most likely enables one to save money for buying food hence better nutritional status.

5.2: Socio-economic characteristics of the households

The majority were middle income earners with a few extremes on both high income and low income.

The families were then grouped into high, medium and low economic status as shown in result table 3 (Social Economic Status). The families in the high economic bracket had purchasing power to buy what the families needed. Mostly those who were well endowed economically had formal education hence were able to provide nutritious

foods to their families. There were also cases of families with low purchasing power but they produced their own foods and hence were also able to provide nutritious foods to their families. The study established that the nutrition education offered in Government hospitals was very good. The problem is that not everyone who took their children to government hospital, some went to private hospitals which did not have these classes. After the children finished their immunization at nine months, very few parents took their children for growth monitoring and hence they missed on the nutrition education offered at the clinics.

5.3 Child care practices

The answers were varied especially on the types of food given to the children, the number of times the children were fed and methods of stopping breastfeeding which included physical separation of the mother and child, applying of aloe-vera or pepper on the breast. In cases where the mothers left their babies under the care of domestic workers, (9.9%) of the mothers who were formally employed, some were not able to answer some questions since they related directly to the mothers. Most were working under the command of their employers and hence their work was to obey and follow instructions without much thought. The mothers fed their children for over four times per day hence understood on the need for the child to replace energy from the body since 6-36 months is a rapid growth period. Most mothers used cup feeding to feed liquids to their children. A few bottle fed their children while others used cup and spoon for feeding. The type of care given unto a child especially at the age of 6-36 months is very crucial as this is the time complementary feeding starts and the child is progressively integrated to feed with the rest of the family members. After three years most children join baby class and from here school feeding plays a part in the growth

and development of a child. It is therefore very crucial to lay a good foundation of feeding practices.

5.4 The level of water, sanitation and hygiene in the households

This was also found to be good. There is a water project in Munyu –Thika hence the households do not suffer from water shortage. Some households used borehole water while others used rain water when it is available. On sanitation, 99% of the households had latrines/toilets. This is a high number and we can conclude that sanitation and hygiene standards are quite high. The level of sanitation was related to good nutrition of the pre-school children since this helped in proper food preparation using clean utensils. With good clean water this helped reduce cases of diarrhoea and other water borne diseases like typhoid.

5.5 To determine the level of morbidity among the pre-school age children.

A total of 48 out of 126 children were reported to be sick in the two weeks preceding the study. Malaria was the most common illness two weeks prior to the study, followed by cough, then diarrhoea, measles was at zero. Other non specified diseases like wounds or falls were at 1%. Once a child falls sick, the level of feeding goes down due to lack of appetite. Other diseases like diarrhoea make the child to be dehydrated thereby worsening the nutritional status of the child. This is a confounding factor in the nutritional status of the child.

5.6 Determine nutritional status of children 6-36 using anthropometry,

Most of the children were normal (that is above -2SD). Out of 126 sampled, only eleven(11) were wasted A few were moderately wasted while others were severely wasted. Once this is linked to the main objective of the study which was to find out

the relationship between caregivers' formal and nutritional literacy and the nutritional status of children 6-36 months, the mothers had exposure about nutritional literacy mostly from MCH clinics (84.5%), relatives (6.0%), school (3.6%), mass media (3.6%) and friends (2.4%). All the respondents had access to health services (100%). The mothers and caregivers were aware of the immunizations and vitamin A which the children needed.

5.7 Dietary diversity in the households,

At the time of the study there had been a drought and hence most of the food was purchased. A few of the crops like green vegetables were from the farms. There were varieties of the food in the households. Most of the households acquired their food from purchasing (56.4%) followed by own production and purchase (28.2%), own production alone was at 11.5% while gifts from friends/ relatives was at 3.8%.

Cereals, milk and milk products, vegetables and pulses were the most frequently consumed food in the households (figure 28 on dietary diversity). In developing countries most of the diet is starch based while protein sources is mainly from pulses. In the area under study, the people also consumed meat products which is a better source of essential amino acids, (Martin 2010)

5.8 To determine the level of nutritional and formal literacy among care givers and relate to nutritional status of the children.

For nutrition literacy versus nutrition status using Chi-square test of independence, $p = 0.000$ which was less than $\alpha = 0.05$ at 95% confidence interval. This shows a strong

association between having nutrition education and better nutrition status of the children. The care givers could have acquired nutrition education either from MCH clinics, relatives, mass media or formal education.

5.9 Formal literacy versus nutrition status,

By use of Chi- square test of independence, p value = 0.285 which was greater than α which is = to 0.05 at 95% confidence interval .The null hypothesis stated that there is no relationship between formal education of mothers and nutrition status of the children. Since $p > \alpha$, the null hypothesis is not rejected. There was no strong relationship between mothers having formal literacy and their children having good nutritional status. The level of formal literacy for majority of the mothers was primary school level at 62.5%, followed by secondary level at 25%. Only 2.5% had tertiary education. This could have been the reason for the weak association. With formal education it is expected that the mothers would give better care to their children. This is because they understand about the importance of a balanced diet and varying of various types of food to maximize on the nutrients .The mother's income is very important in determining the kind of diet the household receives.

After carrying out t test to compare children among nutritional literate mothers and non- nutritional literate mothers, for wasting, stunting and under weight, the results showed that the means were equal as t value was greater than 0.05 in all the cases. For wasting, (WHZ,WHO) t value was 0.081 and 0.091 hence no difference in the means. For stunting, (WAZ,WHO) the t value was also greater than 0.05. The means were 0.747 and 0.738 hence no significance difference. For under weight, (HAZWHO)

t value was 0.949 and 0.941 hence no difference in the two means. This could be interpreted to mean that the care givers did not apply what they learnt probably due to other confounding factors like lack of money, being in formal employment and having to leave the child under domestic workers among others.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The aim of the study was to find out whether caregivers' formal and nutritional literacy has an influence on nutritional status of pre-school aged children in a rural setting of Munyu Thika district. Majority of the mothers had exposure to nutritional education from the MCH clinics.

As a conclusion formal and nutrition literacy play a positive role in improving the nutritional status of the pre-school aged children. Educated caregivers have knowledge on what food to give to their young ones and also how to balance their diets.

Having both nutrition education and formal literacy helped to improve the nutritional status of the pre-school children as long as the mothers were economically endowed so that they could either purchase or grow the required foods.

6.2 Recommendations

More needs to be done to entrench nutrition education in the school system. This way the mothers once they acquire formal education, they will also have nutrition education. The mass media also need to sensitize people more on nutrition issues as malnutrition contributes to 50% of all deaths in children under five years, (GoK 2008-2015 Child Development Strategy)

Nutrition education should emphasize nutrition knowledge components that have a significant relationship with child nutritional status, these are, frequent feeding of sick

children, increasing calorie density of children's food, dangers of introducing food to a child too early and emphasis on recognition of signs of deficiency diseases. To reduce high rates of stunting in children, mothers should feed their child more frequently that is five to six times a day.

There is need for further studies in other parts of the country for comparative purposes.

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Appendix 1: Key informant Guide

Key informant guidelines for Health Care Workers

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

- What recommendations can you give to improve service delivery on nutrition messages?.....
.....
- What nutrition messages are given to mothers at the maternity ward?
.....
- What percentage of mothers delivers at the hospital among the Munyu community.....
.....

THANK YOU FOR YOUR TIME

Appendix 2: Questionnaire

UNIVERSITY OF NAIROBI, DEPARTMENT OF FOOD SCIENCE, NUTRITION AND TECHNOLOGY. APPLIED HUMAN NUTRITION PROGRAMME

A STUDY ON CARE GIVERS NUTRITION AND FORMAL LITERACYS AND NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN AGED 6-36 MONTHS IN MUNYU LOCATION, THIKA EAST DISTRICT KENYA.

INTRODUCTION AND CONSENT SEEKING.

Hello? My name isI am carrying out research on behalf of **Hannah M. Kiarie who is a student at the University of Nairobi pursuing Msc in Applied Human Nutrition.**

Your household has been randomly selected from among many others. The information you give us will be treated confidentially and your names will not reflect in the main report. It is voluntary to take part in the survey, but we urge you to participate whole heartedly. Should you have any questions we will gladly answer you.

Respondent agreed to be interviewed

Yes.....

No.....

Signature of interviewee.....

Date.....

Household Number _____ Date _____

Name of respondent _____

Name of interviewer _____

1. District _____

2. Location _____

3. Sub- location _____

4. Village _____

5. Household Characteristics/ Social Demographic information

S/N	Name	Age	Sex	Marital Status	RHHH	Education Level (in years)	Occupation	Contri to HH

Codes

Sex

1. Male
2. Female

Marital status

1. Married
2. Divorced
3. Separated
4. Widowed

5. Single
6. N/A(for pre-school children)

Relationship to Household Head (RHHH)

1. Household head
2. Spouse

3. Son
4. Daughter
5. Grandchild
6. Parent
7. Uncle
8. Aunt
9. Inlaws
10. Worker(Househelp/S hamba boy)

Occupation

1. Farmer
2. Housewife
3. Unemployed
4. Student/Pupil
5. Small-scale trader
6. Businessperson
7. Casual labourers
8. Employed
9. N/A (for pre-schoolers and retired persons)

Contribution to H/hold

1. Nothing
2. Money
3. Labour
4. Childcare
5. Less than 15 yrs
(N/A)
6. Savings
7. Pension

Education

- 0= None
1= Primary incomplete
2= Primary complete
3=Secondary incomplete
4= Secondary complete
5= Tertiary (Beyond secondary)
6=Preschool child
7= Attending school

SOCIAL ECONOMIC STATUS

Q6. Source of water for the household _____

- Code: 1= Common tap
- 2=Own tap
- 3= River
- 4= Rain
- 5= Borehole

Q7. Type of fuel used for cooking _____

- 1=Paraffin
- 2= Charcoal
- 3= Firewood
- 4= Gas
- 5= Electricity
- 6= Others (Specify)

Q8. Observe whether there is a radio _____

- Code: 1= Yes 2= No

Q9 Observe whether there is a TV

- Code 1= Yes 2= No

Q10. Family Housing

- Code: 1= rented
- 2= own

Q11. What is the main source of livelihood for the household?

- Code: 1= Farming
- 2= Formal employment
- 3=Business
- 4=Casual Labour
- 5= Remittances
- 6= Gifts/ Begging

12.CARE PRACTICES QUESTIONS: (Circle appropriate response)

a) Who takes care of the child in your (mother) absence?

- 1= father 2= sibling 3= Grand mother 4= Domestic worker 5= Friends 6= others (specify)

b) Is the child still breastfeeding? 1=yes 2=No

c) When did you initiate breastfeeding? 1= 30 minutes after delivery 2= 1hr after delivery

3= within first day 4= the following day after delivery.

C) Did you practice exclusive breastfeeding ?

1= yes 2= no

d) If yes, for how many months?

e) What is the best age at which to stop breastfeeding a child?

Months _____

f) At what age did you start giving other foods/fluids to the baby?

..... Months

g) How many times do you feed your child/day 1 2 3 4 5 6 others(specify)

h) Are there foods that children are not traditionally allowed to eat? 1= Yes 2= No

i) If yes , which are these foods? List them.....

j) Why are these foods prohibited in the community?.....

k) Please tell me the foods/fluids you gave to your child for the last two days

l) Of the following foods, how many times do you feed the child in a week?.

Maize meal.....

Beans.....

Bananas.....

Eggs.....

Meat.....

Vegetables.....

Irish potatoes.....

Green grams.....

Peas.....

Fruits.....

Cassava.....

Sweet potatoes.....

Weetabix.....

1= 2-4 times 2= 5-7 times 3= 8-10 times 4= more than ten times

5= not eaten (specify why) 6= rarely eaten

m) What do you use for feeding liquids to the child?

1= bottlefeeding 2= cup feeding 3= cup and spoon feeding

n) If the child is still breastfeeding, how do you intend to stop breast feeding _____

13.NUTRITIONAL LITERACY QUESTIONS

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

b) If yes, where did you receive the education? 1= MCH clinic, 2= Relatives 3= Friends

4=School, 5= Seminar/ workshop 6= Mass media/radio 7= others(specify)

C) Has anybody demonstrated to you the preparation of the following? i)weaning foods

1=yes 2= no

ii)Oral rehydration solution 1= yes 2=no

iii) Suitable food for a sick child 1= yes 2= no

iv) Who demonstrated the above mentioned to you?.....

d)Is nutrition literacy useful to you? 1=yes 2= No

i) If yes why?.....

ii) If no give reasons?.....

e)Have you ever heard of the three food groups? 1=yes 2=No

f) Please name them for me.....1.....2.....3.....

g) Which food group does each of the following foods belong ? use the codes 1,2,3

Maize meal.....

Potatoes.....

Sukumawiki.....

Beans.....

Milk.....

Oranges.....

Millet

Fish.....

h) What causes diarrhea? Name two causes

.....

.....

i)How can diarrhea be prevented? Give one suggestion

.....

j)Give one reason why a child should be immunized.

.....

k) At what age should a child complete the immunization schedule?.....months

l) Show a picture of a marasmic child to the mother/caregiver then ask, Is this child healthy?

1=yes 2= No

i) Mention two signs 1.2.....

ii) What do you call this condition?.....

iii) What causes this condtion?.....

iv) Can a child with this condition be cured? 1=yes 2=No

v) If no, why not?

vi) If yes , how can it be cured?

Q14. Does household have mosquito net (s)? _____ 1= Yes 2= No

Q15-24 Feeding and immunization status of children aged 6 –36 months in the household.

First Name	Q15 Age (months) (If name of child above 24 months, skip to Q 18)	Q16 (If 6-24 months) Are you breastfeeding ¹ name? (if no, skip to Q15) 1=Yes 2= No	Q17 (If 6-24 months) If breast feeding, how many times/day? 1=2 times or less 2=3-6 3=On demand	Q18 (If 6-24 months) If not breast feeding, how old was name when you stopped breast-feeding? 1= less than 6 months 2=6-11 months 3=12 - 18 months 4= \geq 18 months 5= Never breastfed	Q19 (If 6-24 months) At what age was name given water/ foods other than breast milk? 1=0-3 months 2=4-5 months 3=6 months 4=7 months or more.	Q20 (If 6-24 months) How many times do you feed name in a day (besides breast milk)? 1= 1-4 times 2= 5 or more times	Q21 (If 24- 36 months) How many times do y name in a day 1= 1-4 times 2= 5 or more times
1							
2							
3							
4							

<p>Q 22</p> <p>Has child been provided with Vitamin A in the last 6 months? (show sample)</p> <p>1=Yes 2= No</p>	<p>Q23</p> <p>Has the child ever been given polio vaccine</p>	<p>Q24</p> <p>(If \geq 9 months old)</p> <p>Has name received his/her full immunization?</p> <p>1=Yes 2= No Verify orally?</p> <p>1=Yes</p>
---	--	---

¹Child having received breast milk either directly from the mothers or wet nurse breast within the last 12 hours

			2= No

Age verification:

3= clinic card

4= Birth certificate

5= Mother can remember (oral)

Q25-32 Anthropometry for children aged 6 – 36 months or (65 – 109.9cm) in the household

First Name	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32
	Child Sex	Birth-date (dd/mm/y)	Age (months)	Weight (kg)	Height (cm)	Oedema	MUA C (cm)	W/H Z-Score
<i>Follow same order as per table above</i>	<i>1=Male 2=Female</i>					<i>1=yes 2= No</i>		
1								
2								
3								
4								

Q33-38 Morbidity for children aged 6 – 36 months or (65 – 109.9cm) in the household

First Name <i>Follow same order as per table above</i>	Q33 Diarrhea ² in last two weeks 1= Yes 2= No	Q34 Serious ARI ³ in the last two weeks 1=Yes 2= No	Q 35 Febrile illness/ suspected Malaria ⁴ in the last two weeks 1=Yes 2= No	Q36 (If ≥9 month) Suspected Measles ⁵ in last one month 1=Yes 2= No	Q37 Did (name) sleep under a mosquito net last night? 1=Yes 2= No	Q38 Where did you seek healthcare assistance when child was sick? (If yes in Q29 – 31) 1=No assistance sought 2=Own medication 3=Traditional healer 4=Private clinic/ Pharmacy 5= Public health facility

² Diarrhoea is defined for a child having three or more loose or watery stools per day

³ ARI asked using the three signs : cough, rapid breathing and fever

⁴ Suspected malaria/acute febrile illness: - the three signs to be looked for are periodic chills/shivering, fever, sweating and sometimes a coma

⁵ Measles : a child with more than three of these signs– fever and, skin rash, runny nose or red eyes, and/or mouth infection, or chest infection

Q 39 Food Consumption & Dietary Diversity Food group consumed: What foods groups did members of the household consume in the past 24 hours (from this time yesterday to now)? Include any snacks consumed.	Did a member of your household consume food from any these food groups in the last 24 hours? <i>1=Yes</i> <i>0= No</i>	<i>*Codes:</i> 1= Own production 2=Purchases 3=Gifts from friends/ relatives 4=Food aid 5=Bartered
Type of food		
1. Cereals and cereal products (e.g. maize, spaghetti, rice, bread)?		
2. Milk and milk products (e.g. goat/cow fermented milk, milk powder)?		
3. Sugar and honey?		
4. Oils/fats (e.g. cooking fat or oil, butter, ghee, margarine)?		
5. Meat, poultry, offal (e.g. goat, beef; chicken or their products)?		
6. Pulses/legumes, nuts (e.g. beans, lentils, green grams, cowpeas; peanut)?		
7. Roots and tubers (e.g. potatoes, arrowroot)?		
8. Vegetables (e.g. green or leafy vegetables, tomatoes, carrots onions)?		
9. Fruits (e.g. water melons, mangoes, grapes, bananas, lemon)?		
10. Eggs?		
11. Fish and sea foods (e.g. fried/boiled/roasted fish, lobsters)?		
12. Miscellaneous (e.g. spices, chocolates, sweets, beverages, etc)?		

Q40 In general what is the main source of staple food in the household? (*Use codes in 40 above) _____

Q41 Total number of food groups consumed in the household:

Q42 How many meals⁶ has the household had in the last 24 hours (from this time yesterday to now)? 1= One 2=Two 3= Three

Sanitation and Health Facilities

⁶ A meal refers to food served and eaten at one time (excluding snacks) and includes one of the three commonly known: - breakfast, lunch and supper/dinner

Q43a Access to sanitation facility (toilet or latrine)? 1= Yes
2=No

Q43b If No, What is the reason, circle the appropriate answer: 1= None
Available 2= Distance too far 3= Other Specify _____

Q44a Access to health facilities? 1= Yes 2=No

Q44b If No, What is the reason, circle the appropriate answer: 1= None
Available 2= Distance too far 3= Security Concerns 4= Cannot afford

Q 45 How far is the nearest health facility?Km orminutes

Q46 Which means of transport do you use to get there? 1.
=Walking 2.=Bicycle ride 3.= Matatu ride 4.= Others (specify)
.....

Q 47 Is the distance far for you? 1.= Yes 2.=No

Thank you very much for your time!!



UNIVERSITY OF NAIROBI
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25th June 2009

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: HANNAH MUTHONI KIARIE - A56/71903/08

The above named is a student at the University of Nairobi, pursuing a Masters in Applied Human Nutrition. She will be carrying out research in your locality from July to September 2009.

The title of her project is "Care Givers Formal And Nutrition Literacy And Nutritional Status Of Pre-School Aged Children In Munyu, Thika District, Central, Kenya".

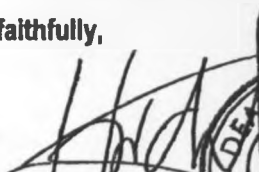
The overall objective of the study is to determine the linkage between the level of formal and nutrition literacy of the care givers to the care practices and nutrition status of children 6-36 months old.

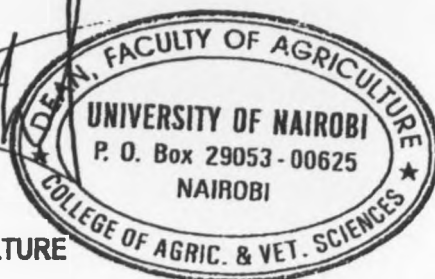
SPECIFIC OBJECTIVES

1. Determine the socio-economic characteristics of households in the sampled households.
2. To determine the care practices on the children by the caregiver. and the level of water, sanitation and hygiene of house hold.
3. Determine the level of morbidity among the pre-school age children.
4. Determine the nutritional status of children 6-36 months using anthropometry.
5. Determine the level of nutritional and formal literacy among care givers and relate to nutritional status of the children.

Your assistance, cooperation and participation in ensuring the student meets her targets is highly appreciated.

Yours faithfully,


PROF. J.H. NDERITU,
DEAN,
FACULTY OF AGRICULTURE



JHN/awm



The child is sitting on the floor, looking up at the ceiling. The child's hand is raised to their face, and they appear to be in a state of distress or discomfort. The background is dark and indistinct.

1. The child is sitting on the floor, looking up at the ceiling. The child's hand is raised to their face, and they appear to be in a state of distress or discomfort. The background is dark and indistinct.

2. The child is sitting on the floor, looking up at the ceiling. The child's hand is raised to their face, and they appear to be in a state of distress or discomfort. The background is dark and indistinct.

Appendix 5: Training Curriculum for Enumerators.

Introduction

This curriculum was designed to guide the training of research assistants who undertook the collection of data during my research that took place at Munyu Location of Thika District on Care Givers' Formal and Nutrition Literacy and its Influence on Nutritional Status of Pre-school Children aged 6-36 months.

The purpose of the curriculum was to develop competencies to perform the specified job during the research period which took place from August to September 2009. The minimum qualification for the assistants was Kenya Certificate of Secondary Education (K.C.S.E). The training took two days.

Training Methodology

A range of training techniques were used which encompassed lecture, discussion, demonstration and practicals.

Objectives

By the end of the training the learners were expected to be able to:

1. Explain the ethics and rights of respondent.
2. Take weight, height, Mid Upper Arm Circumference (MUAC) and administer the questionnaire.
3. Interview the clients within 45 minutes
4. Introduce themselves well and assure clients of confidentiality
5. Obtain consent from them before interviewing them.
6. Maintain confidentiality of the client not discussing them with other people.

Taking weight, height and MUAC

Weight

Make certain you have the scale, weighing pants, infant sling or basket and a five foot piece of rope.

Using a salter scale, the zero weight on the scale should be checked before any weight is taken.

Hang the scale from a tree branch or ceiling beam.

Use a piece of rope to lower the scale to eye level. Place the hook of the scale on the rope

Wipe the pants with methylated spirit.

Ask the mother to undress the child. Place the child in the pants and hang the scale to take the weight.

Read the weight to the nearest 100gms.

It should be taken twice and an average is then calculated.

Height

For children less than two years old, length is taken while for those ones above two years, height is taken.

For length, place the board on a hard flat surface i.e ground, floor or a steady table. Place the foot piece at the end of the board.

Ask the mother to remove any footwear or headgear on the child.

Kneel on the ground or floor with both knees behind the base of the board.

The measurer should kneel on the right side of the child so that he/she can hold the foot piece with the right hand.

Read the length to the nearest 0.1cm. Take two readings then calculate an average.

For children above two years,

Using a height board, the subject will stand with heels together, arms to the side, legs straight relaxed and barefoot.

Position the head in a horizontal plane and let the subject look straight ahead.

The heels, buttocks, shoulder blades and back of the head should be against the vertical board of the height board

Measurement should be read to the nearest 0.1cm.

Ensure that the eye level should be with the headboard to avoid errors.

MUAC

This is taken on the left side of the child.

Bend the hand at right angle and using the MUAC tape mark the centre from the tip of the shoulder to the elbow.

Place the hand straight and at the marked tip take the measurement round the arm.

Two measurements should be taken then average calculated.

Interviewing

They were to start by introducing themselves.

Explain the purpose of the study and assure the client confidentiality

Ask for consent.

Record time started and time you finish ensuring that you take not more than 45 minutes.