

**CHILDCARE PRACTICES AND NUTRITIONAL STATUS OF CHILDREN  
UNDER FIVE YEARS OLD IN SOUTHLAND INFORMAL SETTLEMENT  
NAIROBI COUNTY**

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**H57/70709/2007**

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## **DECLARATION OF ORIGINALITY**

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## **DEDICATION**

I dedicate this dissertation to my husband Dr. Thomas Nzioki Kibua whose generosity and mentorship inspired me to complete this work. My children and grandchildren for their unconditional love, patience, there encouragement strengthened me to continue working. The nutritionists and all nutritionally vulnerable children of Southland Informal Settlement in Nairobi County.

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## **ACRONYMS**

ACC	Administration Co-ordination Committee
AED	Academy for Education Development
AIDS	Acquired Immune Deficiency Syndrome
APHRC	African Population and Health Research Centre
BASICS	Basic Support for Institutionalizing Child Survival
CDF	Community Development Fund
CHWs	Community Health Workers
ERC	Ethical and Research Committee
FGD	Focus Group Discussion
GM	Growth Monitoring
HAZ	Height for Age Z Scores
HIV	Human Immune-Deficiency Virus
IBFAN	International Baby Foods Action Network
IFPRI	International Food Policy Research Institute
IMCI	Integrated Management of Childhood Illnesses,
IMAM	Integrated Management of Acute Malnutrition
IYCF	Infant and Younger Child Feeding
ITN	Insect Treated Nets
KDHS	Kenya Demographic and Health Survey
KENSUP	Kenya Slum Upgrading Program
KG	Kilograms
KNBS	Kenya National Bureau of Statistics
KNH	Kenyatta National Hospital
MCH	Maternal and Child Health
MoH	Ministry of Health

NGO	Non-Governmental Organisation
PEM	Protein Energy Malnutrition
SD	Standard Deviation
SCN	Sub-Committee on Nutrition
SPSS	Statistical Package for Social Sciences
UN	United Nations
UNDP	United Nation Development Programme
UNICEF	United Nations Children's Fund
UoN	University of Nairobi
URTI	Upper Respiratory Tract Infection
USAID	United States Agency for International Development
WB	World Bank
WAZ	Weight for Age Z Scores
WHZ	Weight for Height Z Scores
WHO	World Health Organisation

## OPERATIONAL DEFINITIONS TERMS

The following are the operational terms used in this study:

**Breastfeeding:** Breastfeeding refers to giving of human breast milk to children while exclusive breastfeeding is feeding infants with breast milk only from 0– 6 months with no other liquids or solids except vitamins or mineral drops and medicines.

**Child care Practices:** Child care practices refer to child rearing practices by the mother and other caregivers for the wellbeing of their children under the age of five years. Such practices will include breastfeeding, infants and young child feeding and health seeking behaviour.

**Nutritional Status:** Is defined using the following anthropometric indicators: Height for Age (HAZ) Z scores, Weight for Age (WAZ) Z scores, and Weight for Height (WHZ) Z scores.

**Height-for-Age Z scores:** This compares the height or length of a child to the reference weight of another child of the same age. Children with HAZ of -2SD are considered stunted.

**Weight-for-Age Z scores:** This compares the weight of a child to the reference weight of a child with the same age. All children with WAZ less than -2SD is considered malnourished.

**Weight-for-Height Z scores:** This compares weight of a child with the reference weight of a child of the same height. All children with WHZ of -2SD is considered malnourished/wasted.

**Complementary Feeding:** Complementary feeding refers to food given in addition to breast milk to an infant after 6 months.

**Diarrhoea:** Diarrhoea is defined by the World Health Organization as having 3 or more loose or liquid stools per day, or as having more stools than is normal for a person.

**Household:** Household refers to people who live together in the same homestead / compound and operate as a unit, including unrelated servants and relatives who share food from the same pot and share other resources of livelihood and are answerable to the same household head.

**Household Size:** Refers to the total number of people living in a household for at least 3 months prior to the study period.

**Index Child:** This is the youngest child among the under-fives.

**Malnutrition:** In this study malnutrition was defined using anthropometric indicators of height-for-age, weight-for-age, and weight-for-height Z scores. Moderate malnutrition was defined using the cut off points of less than minus 2 Z scores while severe malnutrition was defined using cut off points of less than minus 3 Z scores.

**Nutrients:** Chemical substances obtained from food and used in the body to provide energy, structural materials regulating agents to support growth, maintenance and repair of body tissues.

**Nutritional Care of Sick children:** Nutritional care of sick children refers to quality of food and care given to children during illness.

**Psychosocial Support for Children:** It refers to the process of meeting children's emotional, social, mental and spiritual needs. All of these are essential elements of positive human development. Some of these include: Talking to a child, touching and playing.

**Utilisation of Health Services:** Utilisation of health services refers to where the mothers went for antenatal care services and attended by health personnel mostly doctors and nurses during pregnancy. It includes places of delivery, the maternity hospitals, health centres or hospitals whenever the mother is sick during pregnancy and lactation. It also refers to maternal and child health (MCH) clinics where the child is taken for immunizations and vitamin A to be given for both mother and child after delivery.

**Z-Score:** Refers to the number of standard deviation below or above the reference median value, (WHO 2006).



## ABSTRACT

**Study Background:** Child care practices play a major role in improving the nutritional status of children under-five year old. Poor child care practices have been found to contribute significantly to malnutrition leading to higher morbidity and mortality rates in this age group. This study was undertaken to assess the effect of care practices in Southland Informal Settlement scheme in order to understand how it influences nutritional status of children.

**Objectives:** The main objective of this study was to assess child care practices and nutritional status of under five year old children in southland informal settlement Nairobi county.

**Methods:** This was a descriptive cross sectional study with sample size comprising of 248 children. The main aim was to establish the nutritional status of children below five years old and to identify childcare practices provided to these children. The study population consisted of children aged 0-59 months whose caregivers gave consent to participate in the study. A Systematic Random Sampling method was employed and households with children under five years old were registered. The data was collected using structured questionnaires and focus group discussion guides. A total of 248 children were taken anthropometric measurements to determine their nutritional status and their caregivers interviewed to give information about the child. Interviews were also conducted among 21 caregivers in two focus group discussions. Descriptive statistics were generated and the WHO anthro software version 3.2.2 was used to convert anthropometric measurements into anthropometric indices of weight for height (WHZ), Z scores, weight for age (WAZ,) and height for age (HAZ). The Statistical Package for Social Sciences (SPSS) version 18 was used to analyze the socio demographic/ socio economic data and care practices in order to establish the associations between variables with nutritional status of children.

**Results:** Stunting prevalence among children ( $<-2$  z-scores) was 31.9% with older children most vulnerable in these age groups: 12- 23 months (46.3%), 24-35 months (38.3%) and 36-47 months (28.4%) respectively. Male children were commonly affected by stunting (33.6%) than underweight and wasting. Underweight ( $<-2$  z-scores) was 9.7% among all the children with older children most affected in these

age groups 24-35 months (12.8%) and 36-47 months (10.4%) with female children most affected by underweight (10.3%). Wasting was the least (<-2 z-scores) 6% with older children most vulnerable as well in these age groups 24-35 months (8.5%) and 48-59 months (7.7%) and 36-47 months and male (7.6%) children most affected by wasting than female (4.3%) children. Various types of variables were tested to establish significant difference. The chi-square test used to find association at significance levels showed positive relationship between stunting and the following childcare practices; weight at birth ( $p=0.015$ ); breast feeding ( $p=0.006$ ); duration of breast feeding ( $p=0.004$ ); how food was served to child to eat ( $p=0.057$ ) and the households income ( $p=0.015$ ). Wasting showed positive relationship with breast feeding ( $p=0.028$ ); alternative caregiver when mother is sick or away ( $p=0.001$ ) and underweight was only positively associated with types of common illnesses ( $p=0.004$ ). Other factors tested to establish the determinants of child nutritional status was water, sanitation and hygiene practices which showed no significant difference with child nutritional status. It is important to note that malnutrition prevalence among children in Southland slum settlement was nevertheless well below the national levels.

**Conclusions:** Prevalence of malnutrition was high among the study children with chronic malnutrition more pronounced among older children between 12-47 months. Male children were most affected by stunting than female children. Wasting and underweight was more pronounced in the female children.

The factors found to be associated with nutritional status of children and stunting were; weight at birth; breast feeding and duration of breast feeding; how food is served to the child and household income. Wasting showed positive relationship with breast feeding, alternative caregiver when the mother is sick or away. Underweight showed associated with common childhood illness.

Water, sanitation and hygienic practices were not associated with child nutritional status, however there was high proportion of children with stunting (60.9%) and underweight (29.6%), evidenced by the proportion of children who had diarrhoea (17.4%) during the study. There was also evidence of strained sanitation facilities in the study area with households to latrine ratio exceeding the population of over 1,600 people with a total of 243 pit latrines during the time of the study.

**Recommendations:** The Nairobi County should put measures in place to empower caregivers in the Informal Settlements through finance for the needy to improve and sustain their income generating activities in view of improving their household income in order to protect child nutritional status and prevent malnutrition.

Community health workers (CHWs) deployed in southland slum community should intensify health and nutrition education activities and address feeding practices targeting mothers and other caregivers. The focus areas should be on growth monitoring, breastfeeding promotion and infant and young child feeding as recommended by WHO/ MOH enhanced by Ministry of Health.

The Nairobi County and the area chief should oversee the welfare of the slum dwellers in a bid to improve household to latrine ration with central focus on all initiatives toward promoting hygiene practices and sanitation. These can be achieved through provision of plastic containers per plot for solid waste, which is emptied at an affordable fee to enhance hygiene practices.

# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background**

The care practices impacting on child nutritional status include care of pregnant and lactating mothers; breast feeding and feeding young children; care of children during illness; psychosocial care and cognitive stimulation of children; hygiene practices; home health practices and food preparation and storage, (Raamji, 2009). To provide substantial child care requires resources such as, education and knowledge that capacitate the mother/caregiver to provide appropriate care without bias and misconceptions (food taboos). These practices are to a large extent dependent on values of child care and beliefs about child rearing practices, (Johnson, 1995).

Childcare providers require good health, nutritional status, stress free environment and support especially when sick, to be able to provide care for their children. They also need to be relieved from household workload constrains obstructing effective care when the house works exceed child care, (Engle and Memon 1997). The household members available such as fathers, close relatives, alternative caregivers and even the community should offer social support by sharing household role on child care, so that mothers can have adequate milk production and be alert, free from stressful depression in order to concentrate on childcare and whatever goes on around the home, (Johnson 1995). On the other hand, the child needs to be in good health and nutritional status to respond to the care given, (Engle and Memon 1997).

Mothers/caregiver need control, autonomy and decision making roles on childcare and the empowerment, over the purchasing power of household foods and family food allocations with minimal restrictions for effective care practices, (Johnson 1995). Mothers require time to be with their children, to hold, touch and play with the child for psychological and psychosocial stimulation of growth and mental development, (Johnson, 1995).

Child nutritional status is as a result of child care provided and the current status of a child in terms of food intake and health, (Raamji, 2009). Inadequate food intake leads to child under nutrition while accumulated food deprivation leads to poor child growth and development as a result of chronic malnutrition from nutrient deficiency. Excessive or in excessive calories and protein intake can lead to protein energy

malnutrition (PEM) in the form of over feeding with both energy and protein foods (obesity); under feeding with too little of protein and energy foods (marasmus) and feeding more with the energy foods (kwashiorkor), (Lochuo et al 2013). This is a common occurrence in developing countries and appears in mild to moderate forms of malnutrition. Malnutrition kills, maims and disables .World Health Organizations, Basic Support for Institutionalizing Child Survival and United Nations Children Fund, (WHO, BASICS, UNICEF, 1999).

In developing countries, poor maternal nutrition affects the natural growth of the foetus/infant, International Food Policy Research Institute and Sub Committee on Nutrition, (IFPRI /SCN, 2000). The process of foetus / infant becoming malnourished often starts in utero (uterus) and may persist for girls and women after birth and even throughout their life cycle, (IFPRI /SCN, 2000). Maternal nutrition plays a critical role in foetal growth and development. Nutrition is the major intrauterine factor that alters the expression of foetal developmental genome (genes). Poor maternal nutrition brings about life long consequences that extend into adolescent and adulthood, thereafter, spinning round affecting several generations especially girls, (Guoyao et al, 2004). This occurs as results of poor maternal and child feeding practices that never changes in an individual girl/woman throughout her growing life time, (IFPRI/SCN, 2000).

It has been estimated that in 2009, 8.1 million children under five years old world wide died, mostly from preventable causes such as pneumonia, diarrhoea, malaria and neonatal conditions. About 90% of these deaths happened in 42 countries, with half of them occurring in 6 countries worldwide. Although causes of child mortality differ from country to country, malnutrition, pneumonia and diarrhoea remain the most often associated cause of deaths among children below five years old. Other causes include Malaria, measles, water, sanitation, poor hygiene related diseases, and Human Immune-Deficiency Virus / Acquired Immune Deficiency Syndrome, (HIV/AIDS), (UNICEF, 2008).

According to World Bank, water and sanitation services of the informal settlements are a major public health and livelihood problem, (WB 2006). Between 60% and 93% of slum households are dependent on water vendors for their water supply, (WB 2006). The state of sewerage and human waste disposal in the informal settlements

pose a major threat to health. Majority of slum dwellers rely on shared toilets others use open areas or plastic bags (flying toilets) for defecation. Many toilets are public facilities financed by Community Development Fund (CDF), and Non-Governmental Organizations (NGOs) and managed by slum community groups. Others are private and operate on a pay-as- you use basis, (Grellety, 2008).

A report by World Health Organization indicated that, in urban areas, thousands of children still die every day from preventable diseases related to inadequate provision of water and sanitation, (WHO,2010). It is estimated that in 2010, 96% of the urban population use unimproved water sources compared to 81% of the rural population, (WHO, 2010). This means that most of those who suffer water related challenges are the urban poor, often living in slum areas or informal settlements following rapid urban growth, and lacking safe drinking water, adequate sanitation services and access to health, (WHO,2010).

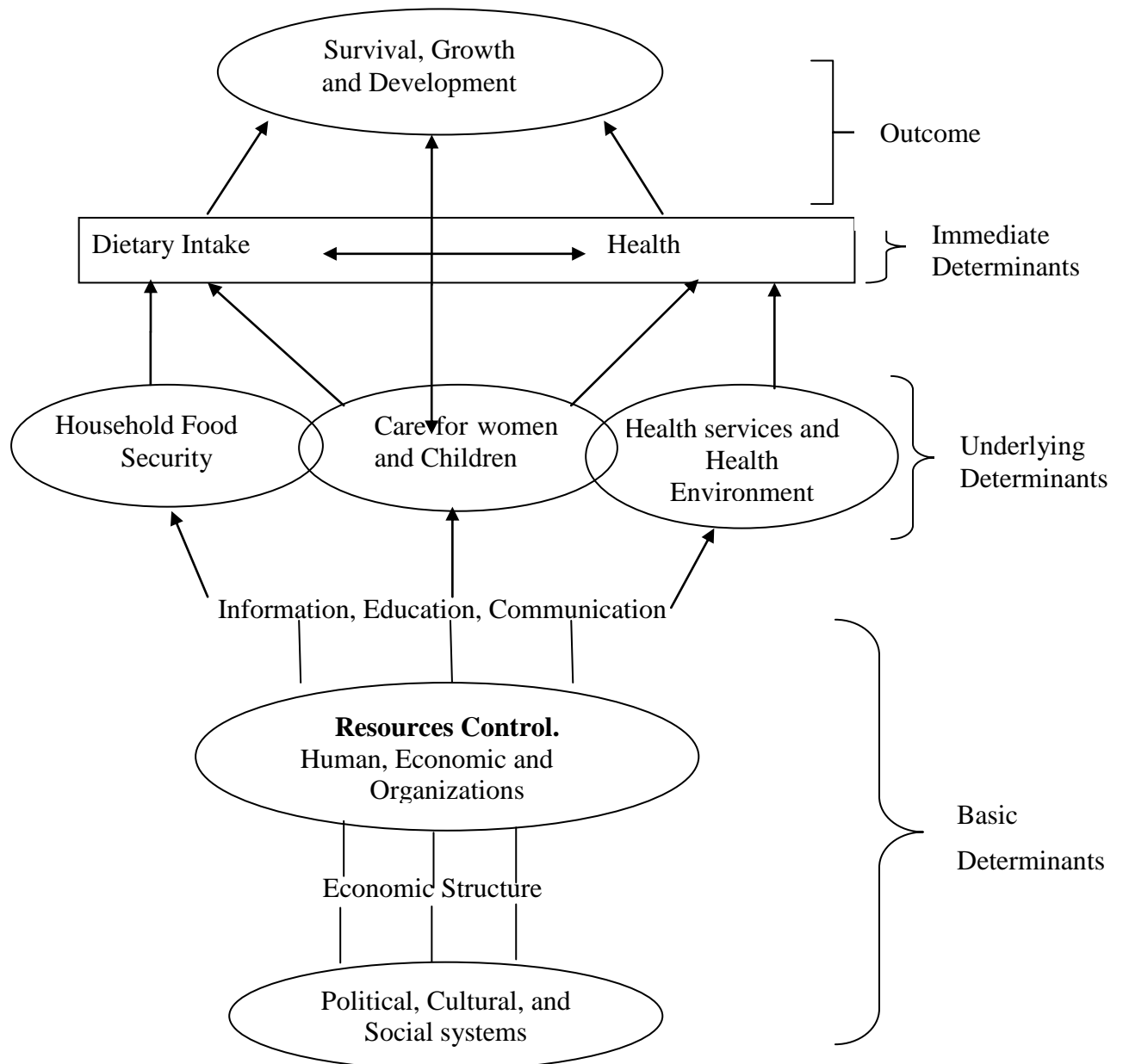
A study on malnutrition revealed deteriorating nutritional status for young children in Sub-Saharan Africa (African Population and Health Research Centre), (APHRC 2012). The under nutrition burden contributes to 1.1 million deaths in children under-five years old, (Horton, 2010). About 40% children below five years old are stunted and 22% are underweight worldwide, with 36 countries, accounting for 90% of the stunted children and of these countries, 21 of them are in Africa, (Grantham et al, 2007). In comparison to other regions in the world, the prevalence of malnutrition in Sub Saharan Africa has not changed in the last 20 years, (UNICEF, 2008).

The report by Kenya Demographic and Health Survey showed that child malnutrition rates are high with quarter of the acutely malnourished children living in some parts of western Kenya, (KDHS, 2008/09).The Survey data shows that the nutritional status of children below five years have improved slightly in the past few years. At the national level, 35 percent of children under five are stunted, up from 33% in the 2003. Further 7% of children are wasted, up from 1% 2003 and 16% are underweight down from 20% in 2003, (KDHS, 2008/9).

The UNICEF conceptual framework in figure 1 gives enhanced grouped factors that contribute to malnutrition based on: (1) immediate determinants that influence child nutritional status, such as inadequate dietary intake, health and disease (2) underlying

determinants such as household food security; underlying maternal and child care; and health services and the environmental. The other determinants are basic factors which include the actual resources and control, human, economic and organizations, political, cultural, and social systems; Information, Education, Communication. These factors are captured in the conceptual frame work for child survival, growth and developmental determinants, (Levitt et al 2011).

### Determinants of Child Survival, Growth and Development



**Figure 1:** UNICEF Conceptual Framework on Growth and Developmental  
Source: Engle, Lhotska and Armstrong 1999

## 1.2 Statement of the Problem

Childcare practices are increasingly being recognized as a crucial input to child health and nutrition, along with food security, availability of health services, and a healthy environment, (Kulwa et al, and 2006). Although significant gains have been made in the fight against malnutrition, the nutritional status of children in urban areas is not improving, (Kulwa et al, and 2006). Poor child care practices of young children affect their nutrition intake leading to malnutrition, (UNICEF, 2010).

Globally, 148 million children under-fives are underweight for their age and an estimated 178 million have stunted growth in developing countries. Over 2 million deaths are directly attributed to stunting and severe wasting, (UNICEF, 2010). Majority of these children live in Asia (111.6 million) and Africa (56.9 million). Africa is the only continent in which malnutrition among children is rising, but malnutrition most pervasively remaining in Asia, (UNICEF, 2010). A Report by UNICEF indicated that in 2010, children under five deaths reduced to 7.6 million, down from 8.1 million in 2009; 8.8 million in 2008 and 12.4 million in 1990. According to UNICEF about half of these deaths occurred in Africa resulting from one or a combination of infections such as diarrhoea, pneumonia, URTI, measles and malaria. These infections reduce child's immunity weakening the body systems, making a child susceptible and vulnerable to recurrent infections and diseases, threatening their lives or leading to child's deaths, (Blck, Morris and Bryce, 2003).

Malnutrition is one of the leading nutritionally related conditions among children under five years old in urban slums, (WB, 2002 and APHRC, 2002). It is estimated that 2.1 million children in Kenya are stunted. This is a serious national development concern. These children are unlikely to reach their full physical and mental capacity that negatively affects their level of education and working potential, (KDHS 2008/09). According to KDHS wasting and stunting did not change much among children under five years old between 2000 and 2008, with only slight changes in underweight. Wasting rates in 2000 was 6.0 % with slight decrease to 4.8% in 2003 and an increase of 7% in 2008. Underweight indicated a decrease trend from 2000, 21.2%, 2003 19.1% and, 16% in 2008/2009. Stunting was 35.3% in 2000 with a decrease to 30.6% in 2003 and up again to 35% in the recent KDHS. These statistics may not have changed much since 2008 / 2009 to date, (KDHS, 2008/2009).



### **1.3 Justification**

Many people in the whole world are migrating to cities, Kenya is not an exception. The Nairobi population was estimated in 2008 to be 3, 125, 000, up from 1,380,000 in 1990, with a city population growth rate of 3.8%. Majority of these people settle in cheaper areas in the city such as the informal settlements where 70% of the urban populations live with limited access to water and sanitation, housing and social services, (UN Habitat, 2010). Southland informal settlement is among the slums settlements where these immigrants settle. It is an informal settlement which is isolated and surrounded by middle class estates. It has poor infrastructure, poor sanitation and the dwellers are of low income class directly impacting on food security.

The study information will help in the establishment of factors that contribute to malnutrition in the southland informal settlement scheme in order to upgrade and reduce the effects of malnutrition. Information gathered will be useful to all the stakeholders for interventions and control of malnutrition. The information is also appropriate in policy, planning, and decision making for Nairobi county. It would as well be useful for any future baseline studies that could be conducted at the southland informal settlement.

### **1.4 Research Question**

The study attempted to answer the question:

What are the child care practices that influence the nutritional status of under-five year old children in Southland Informal Settlement in Nairobi County?

### **1.5 Null Hypotheses**

The following hypotheses were tested:

1. There is no relationship between maternal demographic characteristics and nutritional status of under-five year's old children;
2. Child care practices have no influence on the nutritional status of under-five year's old children;
3. Water and hygiene practices have no influence on the nutritional status of

under-five year's old children.

## **1.6 Objectives**

### **1.6.1 General Objective**

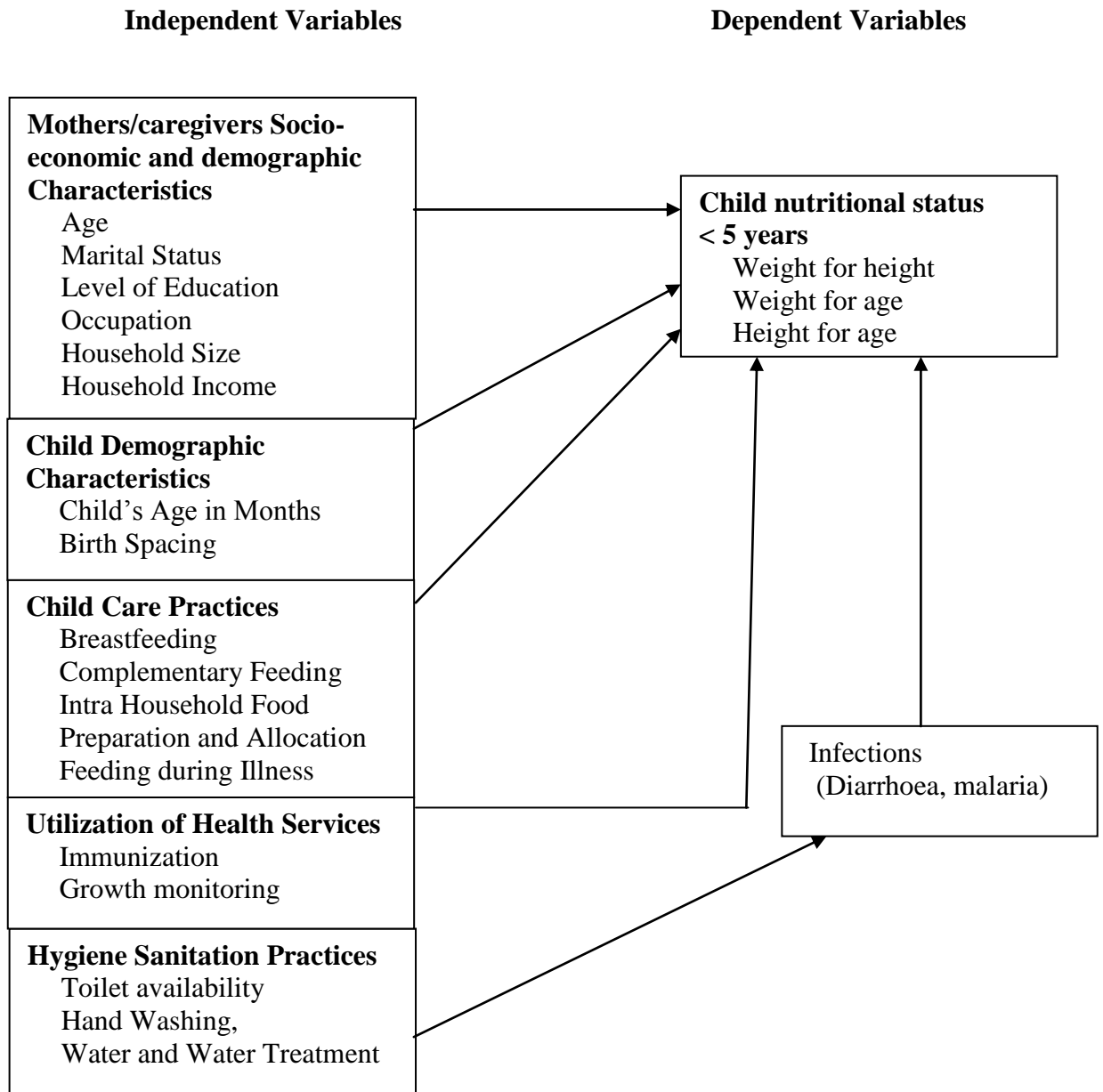
To assess child care practices and the nutritional status of children under five years old in Southland Informal Settlement, Nairobi County.

### **1.6.2 Specific Objectives**

The specific objectives of this study were to:

1. Determine social demographic characteristic of respondents/caregivers and children in Southland informal settlement slum;
2. Assess childcare practices of mothers/caregivers;
3. Assess the nutritional status of children under-five year old;
4. Determine the relationship between respondents/caregivers social demographic characteristics and nutritional status of children under five years old;
5. Establish the relationship between child nutritional status and child care practices of children under five years old; and
6. Determine the hygiene practices influencing the nutritional status of children under five years old.

Figure 2 shows the schematic framework on how various factors for this study interacted. It also shows the relationship between independent and dependent variables.



**Figure 2:** Conceptual Framework

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

Health and nutrition in children are closely linked and highly dependent on care practices, (Smith and Haddad 2000). Care entails all measures and behaviors that translate available food, health and resources into good child growth and development. Although child care is assumed to be exclusively a mother's domain, it is, in fact the domain of all the other caregiver's e.g. entire family, community and the society at large, (Smith and Haddad, 2000).

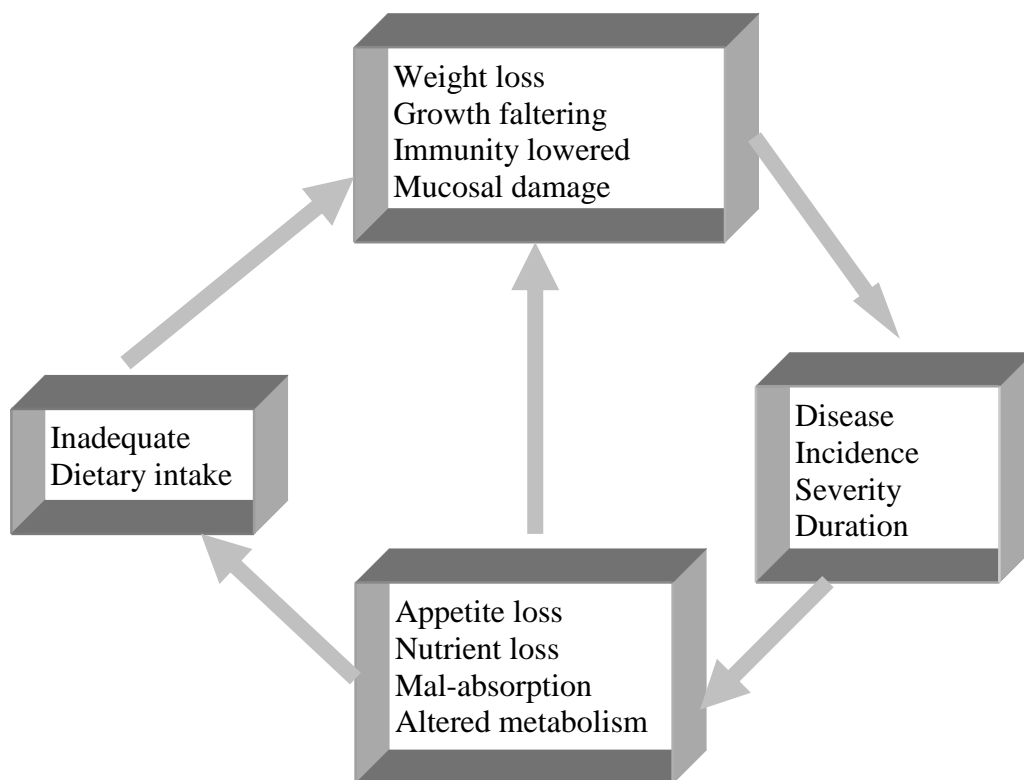
Care refers to behaviors and practices of caregivers: the mothers, father, sibling , community, society, and other care providers of food, health care, stimulation and emotional support necessary for child's survival, growth, and development, (Tsehai, 2004). Care giving involves feeding, provision of shelter and emotional security, 's child stress reduction, clothing, feeding, bathing and supervision of child's bowel movement (toilet). Others includes; preventing and attending to child's illnesses; nurturing and showing affection; interaction and stimulation; playing and socializing; protection from exposure to pathogens and providing safe environment for exploration, prenatal care, curative and preventive health or traditional health and provision of care by members of an extended family network, (Tsehai, 2004).

Child Care practices during complimentary feeding are very crucial particularly the food started to a child should be nutritious to promote developmental growth of a child, (Luter and Dewey, 2003). Children fed frequently with balanced meals are protected from malnutrition while infrequent child feeding contribute to child malnutrition. This is due to the fact that, child stomach cannot accommodate large amount of food at once, (Smith and Haddad, 2000). During complementary feeding the food given to a child should be rich in nutrients or (balanced food) to promote developmental growth of a child. Feeding frequency has been found to protect malnutrition. (Smith and Haddad, 2000).

Poor child feeding practices can be as a result of child rearing practices that influence nutritional status of children. These can be cultural and behavioral care practices interfering with child feeding practices, (Siddarth and Ramji 2009).

During complementary feeding, good hygiene and proper food handling is recommended, (WHO, 2010).Hygiene is crucial during complementary feeding, especially during food preparation and storage, (Monte, 2004). At this point, care providers are required to be extra conscious on contaminative items causing infection especially diarrhea. Diarrhea can be prevented through hygiene practices which operate at the personal, household and community levels. Household hygiene includes issues related to how care providers handle water and sanitation; faecal disposal especially among young children; quality of child play areas and cleanliness and hand washing to prevent food contamination, (Monte, 2004).

The vicious cycle of malnutrition, however, lowers the body’s ability to resist infections by undermining the proper functioning of the immune mechanisms. This leads to more severe and frequent episodes of illnesses that lasts longer and in turn increases the body requirements for nutrients. The frequent episodes of illnesses further affects young child eating pattern through loss of appetite, mal-absorption and altering metabolism leading to loss of nutrients, Sub-Committee on Nutrition/ Administration Co-ordination Committee (SCN/ACC, 1992), (Figure 3).



**Figure 3: Malnutrition and Infection, Source: SCN/ACC, 1992**

### **2.1.1 Child Care during Illness**

Child morbidity leads to depletion of body nutrient stores through increased metabolism such as fever, loss of appetite, reduced food and nutrient intake, leading to demand for nutrients intake, International Baby Foods Action Network (IBFAN, 2010).

Disaggregated data show that infant and under-five mortality rates for the poorest slum residents are often higher than in similar groups in rural areas (APHRC 2002, UN H 2003). Infant mortality rate in Nairobi slums is 96 per 1,000 live births – higher than any other region of Kenya and 25% higher than the national average of 77 (see figure 5). Under-five mortality rates in the slums (151 per 1,000 live births) are more than double the Nairobi average of 62 and greater than for rural Kenya (113 per 1000 live births) (UN-Habitat, 2006; APHRC, 2002).

The care practices during illness especially with diarrhoea are important to control dehydration. Feeding and management of symptoms such as fever, mouth sores and breathlessness is crucial. Health care seeking behavior at the nearest health center or clinic or hospital determines the care that a child receives during illness. Where feeding is affected, special attention is needed especially during diarrhea. Oral rehydration therapy is necessary in counteracting the effects of dehydration caused by diarrhea, (Ahmed, 2012).

The management of ill health in children need health care seeking behavior and should be extended to a child's safety at home, (Chege, 2011). Child's environment at home is important and needs to be viewed as a multidimensional and not restricted to feeding and psychosocial care only, (Chege, 2011). Psychosocial care practice influence nutritional status of children and cognitive stimulation that help in support of child developmental growth, influencing social emotional and interaction between caregiver and a child, (Februhartantly, 2007).

## **2.2 Maternal/Caregivers Characteristics**

A review of literature on maternal age, marital status, maternal education, maternal occupation, household income and household size is presented below.

### **2.2.1 Maternal Age and Marital Status**

Age specific fertility rates have been found to be higher within the age range of 20-24 in the rural areas and 25-29 in the urban areas, (KDHS, 2008/09). The age at which child bearing starts has important health implications for care practices of a child. A study conducted in Uganda showed that stunting and wasting were higher among children of younger mothers than those of older mothers, (Efata, 2000). In yet another study done in Mbarara slums in Uganda, the level of stunting was higher among children of younger mothers compared to those of older mothers. This was attributed to the fact that older mothers have more and better experience in child care practices than their young counterparts, (Mehangye, 1999).

### **2.2.2 Maternal Education**

Childcare practices and education goes hand in hand. Children of educated mothers have a great chance of survival and healthy growth and development than children from mothers less educated, (Augustine et al, 2009). A mother's level of education and access to information determines whether the mother understands care practices of a child such as the duration of breastfeeding, when the child should be weaned; which foods to initiate for the first introduction; how foods can be best cooked for a child; whether water will be boiled or treated for drinking; why hands washing is important; how a child contract diseases like diarrhoea; how diarrhoea control treatment is administered at home and when a child will be weighed, vaccinated, and taken for health care services for growth monitoring and when sick, (Augustine et al, 2009).

Maternal education is said to be associated with the level of care provided to the children. Education increases both the ability of a mother to earn more income and the ability to appreciate the importance of child care giving. Educated mothers have better interactive abilities with their children than those mothers with little or no education, maternal education has been linked to increased levels of prenatal and postnatal care, (Augustine, et al, 2009). On family planning, it has been found that less educated women do not plan child births as opposed to the educated mothers who are able to plan the intervals between births, (Martinez et al, 2012).

A study conducted in Zimbabwe found education to have a significant negative effect on the duration of breastfeeding. The study indicated that the illiterate mothers breastfed their children for a significantly longer period than mothers who had post-primary education, (Matsvimbo, 1997).

In Kenya, mother's level of education was found to have an inverse relationship with the three nutritional indicators Weight for age, Height for age Weight for Height (WA, HA, WH). Children of mothers with secondary education were found to have the lowest levels of stunting and underweight (19.3%), and (10.6%) respectively while (34.2%) and (34.5%) of children whose mothers had no education at all were stunted and underweight respectively. Mothers with no education at all were also found to have children with the highest levels of wasting (12.8%) compared to (2.8%) of wasting among children whose mothers had primary education, (KDHS2008/09).

In yet another study done in Kenya in Lower Nyakach Kisumu District, it was established that literate mothers with at least five years of primary education had significantly more underweight children than the illiterate mothers. Literature review therefore shows conflicting evidence to the relationship between maternal education and nutritional status of the children, (Opiyo, 1993).

### **2.2.3 Maternal Occupation**

Women are forced to search for formal occupational employment to subsidize family resources and improve quality of living in the family. Women who are not in the formal employment spend more time than men in all working activities, in addition to child care. Mothers often must gather fire wood; fetch water; prepare food for the family and do farm work which could be productive or not, (Muhoozi, 1999). Some studies suggest that when mothers work outside the home, even on their own farms, their children are more likely to be malnourished, especially if they do not control income or if a child is under one year old. Other studies have found no negative effects on nutritional status of children from working mothers. On the other hand, some studies have found positive effect when mothers work was well paid, (Muhoozi, 1999).

The results of a study carried out in Tanzania showed that the prevalence of childhood malnutrition was higher in households of employed mothers than households of



mothers who were housewives or self-employed. The prevalence of underweight was found to be more among children in well paid group of mothers than it was among children of mothers with low and no income. However, the same study observed that the levels of stunting were high among children of mothers with no income and also those with low income and middle income compared to those of high income mothers, (Mugyabuso,1996).

In many developing countries, women generally are involved in a lot of economic earning activities, but are rarely involved in the control of income, household resources, and decision making. A study done in rural Bomet and Murang'a Districts in Kenya showed that women are the major workers in agricultural farms. The same women are however, not involved in decision making on how the produce would be sold, and how the money from the farm sales would be used or allocated. The same study also showed that women especially those in the rural areas, face many problems, including gender inequality, illiteracy, legal and political discriminations. These are constraints that seriously limit women involvement in decision making on childcare practices and access to quality food supply through purchase, as well as quality health care services, and in all other spheres of life, (Nyagawa, 1997).

#### **2.2.4 Household Size and Household Income**

The effects of care practices and the household size on a child nutritional status are still controversial. Some argue that the size is small then the mother has more time to take care of the needs of the children. However, others argue that if the family composition is large, the other members of the household can contribute to the wellbeing of the child through financial contributions and child care, (Muhoozi, 1999).

The socio-economic status of a family influences the availability of resources for care to the household. An economically well off family is more likely to have a better nutritional status because of the purchasing power of sufficient nourishing foods. It is a fact that limited resources lessen the quality and quantity of food purchased by each family, (Golpadas, Patel, and Bakshi, 1998).

A study carried out in Uganda showed higher malnutrition levels in smaller households than in larger households. It was found that stunting in smaller household

and in the large household was almost the same with minimal difference of 39.2% and 27.7% respectively, (Mehagnye, 1999). A study carried out in Kibwezi in Kenya showed that children in households that did not receive remitted income were severely malnourished than children whose families received remittance, (Wright, 1998)

### **2.3 Infant and Young Child Feeding Care Practices**

Child care is one of the key underlying causes of childhood malnutrition. Child care is manifested in the way a child is fed, nurtured, socialized and guided. Nutritional care encompasses all measures and behaviors that translate available food into good child health growth and development, (UNICEF, 2006). In accordance with the Global Strategy on Infant and young child feeding, UNICEF's overall is to protect, promote and support optimal infant and young child feeding practices. The expected results are improved nutrition status, growth, development, health and ultimately the survival of infants and young children, (UNICEF 2008). Child care is practiced commonly by women who carry out some of the care activities such as breast feeding and feeding of young children; psychosocial stimulation of children and support for their development; complementary food preparation, feeding and storage practices; hygiene practices and care for children during illness and adoption of health seeking practices, (Engle, Memon and Haddad, 1999).

#### **2.3.1 Breastfeeding**

The world health organization (WHO) recommends that a new born baby is introduced to breastfeeding immediately after birth between the first 30 minutes to one hour, (WHO, 2010). Breastfeeding care practices are influenced by early initiation of breastfeeding and should start immediately from birth to stimulate and increases the production of breast milk hence the mother does not have to give other feeds to her baby, (UN et al, 2000). The first milk, the colostrum protects the baby from infections as it boosts the immunity of the baby. Evidence shows that 22% of neonatal deaths would be prevented if all infants were breastfed within the first hour of life. In Kenya, 52.3% of children start breastfeeding within one hour after birth, (WHO, 2010).

Breastfeeding care practices are influenced by early initiation of breastfeeding and should start immediately from birth, (Breast milk contains unique immunological

properties which protect children against infections and chronic diseases, (UNICEF, 2009).

In Kenya, breastfeeding is nearly universal with 97% of children born having been breastfed for some period of time in most of the provinces. Overall, 58% of children are breastfed within one hour after birth and 86% within one day after birth. About 42% of the children are said to be given prelacteal feeds either due to loss of mother or the mother's illness after delivery or when there is not enough milk in the breast, (KDHS 2008/2009).

### **Exclusive Breastfeeding**

Exclusive breastfeeding is unique and ideal for growing children up to 6 months. The first 6 months of life is globally recognized as the most ideal period before introducing a child on other feeds, (Nankunda, 2012). It is recommended that even in the hottest driest climates, exclusive breastfeeding provides all the fluid a healthy infant needs to satisfy thirst and control dehydration and no extra fluids are needed, (Nankunda, 2012). Exclusive breastfeeding is an effective preventive intervention for ensuring child survival although the practice is moving up slowly among Kenyan mothers, (Nankunda, 2012). Poor breastfeeding and infant feeding practices contribute to more than one thousand deaths per year, (Nankunda, 2012).

Exclusively breastfed children are protected from common childhood illnesses infections i.e. diarrhoea, upper respiratory tract infections and malnutrition. Breast milk contains disease fighting substances that support the body with natural immune system which protect children against infections and chronic illnesses. Breastfed babies have been found to grow well mentally, physically and psychologically when in close contact with their mothers, (UNICEF 2009).

The optimal breastfeeding promotion including exclusive breastfeeding cannot be successfully practiced if the knowledge, attitude, and the cultural beliefs are not adequately addressed. Exclusive breastfeeding for up to six months requires the mother and her infant to be in close proximity for the six months period and leaving expressed breast milk for separation of a short duration, (Pevera et al, 2011).

Babies who are exclusively breastfed have fewer illnesses and are better nourished than those who are fed other foods and drinks. If all babies were fed only on breast milk for the first six months of life, the lives of an estimated 1.5 million infants would be saved every year and the health and development of millions of others would be greatly improved, (UNICEF,2008).

### **2.3.2 Complementary Feeding Practices**

Complementary feeding practices is giving other foods to children whether manufactured or locally prepared in addition to breast milk after six months in order to satisfy nutritional requirements for a child, (KDHS 2008/09). Breast milk alone is the right food and drink an infant needs until the age of six months, (WHO and PAHO, 2008). After six months, the child needs a variety of foods in addition to breast milk, although breast milk on its own is sufficient to meet all nutritional needs of a child, complementary feeds with appropriate solids are required to meet the additional requirements for energy and nutrients after six months, (KDHS, 2008/09).

Children with or without mothers need a variety of additional foods after 6 months, and should continue with breastfeeding through its second year and beyond, (MoH 2002).A mother who may be employed or working away from her home can continue breastfeeding when she is with the child, and make sure she breastfeeds as often as possible, (Dewey, 2008).

Introducing complementary foods when the child is six months old is to reduce the risk of malnutrition (KDHS, 2008/09). Early introduction of complementary foods is common practice in Kenya. But children should be given solid or semi-solid complementary foods after six months and in addition continue breastfeeding till when the child is fully put on family diet, (KDHS, 2008/09). Children with or without mothers need a variety of additional foods after 6 months, and should continue with breastfeeding through its second year and beyond, Ministry of Health (MoH 2002). Mothers who may be employed or working away from her home can make sure she continues breast feeding as often as possible when she is with the child, (Dewey, 2008). Further early complementary feeding is discouraged because of high likelihood of food contamination. Again the digestive system of a child is still premature and cannot handle complex or bulky foods, (Dewey et al, 1999).

In Kenya, for example 24% of newborn, less than two months of age are given, complementary foods or liquids. At the age 4-5 months, 60% breast fed children are given solids or semi-solid foods, (KDHS, 2008/ 2009). Early complementary feeding is discouraged because of high likelihood of food contamination. Again the digestive system of a child is still premature and cannot handle complex or bulky foods, (Dewey et al, 1999). This shows that complementary feeding practices are generally poor in most developing countries, exposing many vulnerable children to irreversible outcomes such as malnutrition and significantly increased risks of infectious diseases like diarrhea and pneumonia, (UNICEF 2008).

The most common used complementary foods for breast feeding children under 3 months are milk 51%, food made from grains 72%, fruits and vegetables 53%, tubers, roots and legumes 15% respectively. Between 6 months and 8 months, 81% of children are already receiving complementary foods. On the other hand, protein rich food (meat, fish, poultry and eggs are introduced gradually from 6 months to 8 months, (KDHS, 2008/2009).

According to United States Agency for International Development/ Academy for Education Development, malnutrition is more common during this transitional period. Families may not be aware of special needs of infant especially the first time mothers. Food complementary foods preparation from a family pot is important and how to use foods available locally to feed a child. Families may also be too poor to provide sufficient nutritious foods to a child, (USAID/AED, 2002).

The faulty feeding practices as warned by WHO, begins by giving any other foods than breast milk before the recommended time, (WHO, 2010). The WHO further warns that starting complementary feeding too early or too late is a major cause of poor nutritional status of infants and young children, (WHO, 2010).

### **2.3.3 Feeding During Illness**

Feeding practice is important during common childhood illnesses, such as pneumonia, diarrhoea, measles, HIV/AIDS, malaria and fevers. These conditions lead to serious feeding problems and interfere with nutritional status of children. Diarrhoea is the most common and most often, is caused by faulty in infant feeding practices, particularly unhygienic food preparation for a child and where a child is given foods

other than breast milk. Early detection of these conditions help to control the possibility of malnutrition, (WHO, BASICS/ UNICEF, 1999).

It is essential to encourage a sick child to eat, although sick children have no appetite, giving a sick child foods little by little at a time often is important United Nation Development Programme, (UNDP et al, 2002). It is good to continue with exclusive breastfeeding to a sick child and giving extra fluid especially when the child has diarrhea to help prevent dehydration. If illness and poor appetite persist for more than a few days, the child needs to be taken to a health worker (health professional) for evaluation and treatment. The child is not fully recovered from an illness until the weight records about as much as when the illness began, (UNDP et al, 2002).

#### **2.3.4 Intra Household Food Preparation and Allocation**

Intra household food preparation and allocation need hygiene practices, clean environment and nutritious food for a child nutritional status. Food preparation for children is very important to consider the consistency and the nutrients density necessary for the promotion of growth and development of children. The trend of maintaining high standards of hygiene practices is difficult, especially among the poor and those living in congested areas. Washing of hands, keeping cooked and left over foods covered are important aspects in food preparation, (Crowley, 2010).

Children should not be served meals in a common dish with adults. Young children eat slowly and may not get enough food. They should have their own plate or bowl to ensure they eat what they are given and the parents or caregivers can see how much they have eaten. Young children need encouragement and those with developmental disability require extra help when eating and drinking, (UNDP et al, 2002).

Intra household food distribution/allocation in countries like Africa and Asia is ignored. Mostly where traditions are closely observed, girls and women are generally less cared for by their families and even the society. It is common for men (in both regions) to eat the most and the best, leaving the women and children to eat last and the least. For example, in South East Asia, a mother will serve her son first with the best foods and herself with her daughters last with little food at the expense of her own and her daughters' health and nutritional wellbeing, (Lindatorm and Haddad 2008).

## **2.4 Health Care Practices**

### **2.4.1 Utilization of Health Services**

Availability, accessibility, affordability and utilization of health care services are major care practices that impact on maternal and child health in most developing countries. However, utilization of health services does not mean seeking for curative services, but also practicing health promotion and disease prevention behavior to ensure early detection and seek treatment in good time, (WHO/BASICS/UNICEF, 1999). Where services are available, affordability is very low due to high levels of poverty, (MoH, 2005).

In Nairobi's slums, women seek maternal and child health care from privately owned, substandard and often unlicensed clinics and maternity homes within their communities. While unable to offer many of the functions of basic care, these facilities are well perceived both in terms of access and quality, presumably because they invest time in women, building trust and confidence, (Fotso and Mukiira, 2012).

A study done in sub-Saharan African countries in 2002-2003 showed that health cost ranged from 6% in Namibia, 62% in Chad and 45% in Kenya, (MoH, 2005). After these results, Kenya Government introduced the 10/20 policy in 2004 which now governs the user fees policy in the first level health care centers and dispensaries respectively. This was introduced as a means of improving access to health care by the poor. The introduction of 10/20 policy meant that patients seeking health care at public dispensaries only pay 10 shillings and 20 shillings in health centers for consultation and drugs respectively. And in large hospitals, the government introduced cost sharing and waiver system to increase access for hospital admissions by the poor, (MoH, 2005).

### **2.4.2 Immunisation**

Each year, 1.7 million children in the world die from preventable and immunizable diseases, (Ndiritu et al, 2006). Children who are immunized are protected from diseases such as, (polio, measles) which most often, lead to disability or death. It is necessary for the parents to know why, when, where and how many times the child should be immunized. Parents also should know that it is safe to immunize the child

even if the child has an illness or a disability or is suffering from nutritional deficiencies, ( Ndiritu et al, 2006).

It has been proven that communicable disease spread quickly among people living in crowded areas. For this reason, all children living in congested conditions, particularly in the informal settlements, refugee or disaster situations camps, should be immunized immediately, especially against measles and Tuberculosis, (Ndiritu et al, 2006).

### **2.4.3 Birth Weight and Growth Monitoring**

Birth weight is a strong indicator, not only of mother's health and nutritional status but also new-born chances of survival, growth, long term-health and psychosocial development. A low birth weight, less than 2.5 kilograms raises grave health risks for children. Low birth weight is a public health problem in most developing countries. About 15.5% of all babies worldwide are born with low birth weight. Of these, 95.6% are in developing countries, (WHO/UNICEF, 2004).A study done in sub-Saharan Africa showed that child birth weight was strongly associated with stunting and the association has been well documented and understood, (Hien and Kam, 2008). Another study conducted in Kenyan slums of korogocho and viwandani Nairobi county found that children birth weight had influence on their nutritional status, (Abuya,et al, 2012).

Growth monitoring and promotion is a process of weighing a child and graphing the weight on the assessing growth chart, providing counseling to mothers and motivating them for other actions to improve child growth,(WB, 2004).On each visit to a health center, the weight/height of every child should be measured using accurate and well balanced scales. Recording the weight and height of children serve three important purposes:(1) help to detect children at high risk of developing PEM; (2) used to follow and monitor the growth of an individual child; (3)used to track passed records on child illness and the treatment, (UNICEF,2007).

## **2.5 Water, Sanitation and Hygiene Practices**

Water, Sanitation and hygiene practices in homes/houses are important part of livelihood, (KDHS, 2008/ 2009). Water is essential for life, health and requirement for human dignity in household, (KDHS, 2008 / 2009) .In extreme situations water



may be insufficient and unavailable to meet basic needs, (UNICEF, 2010). In such cases, supply of safe drinking water is of critical importance for survival, (UNICEF, 2010). Poor sanitation water and hygiene have many other serious repercussions which are health related problems caused by poor hygiene and consumption of contaminated water, (UNICEF, 2010).

United Nations Children's Fund estimates indicated that about 884 million people worldwide lack access to safe water, and yet water is a fundamental requirement for good nutrition. UNICEF also estimated that about 2.5 billion people lack access to adequate sanitation with only 18% of rural dwellers having access to adequate sanitation services, (UNICEF, 2010).

In Kenya, 63% of households get drinking water from an improved source. It is estimated that about 91% and 54% of the Kenyan urban and rural population respectively have access to safe drinking water. About 24% of rural households obtain drinking water from lakes, rivers or streams. In urban areas, 6% households use non-improved source of drinking water, and the proportion is far higher for rural households estimated at 46%, (KDHS, 2008/2009).

Among the improved sources the proportion of household with piped water into the plot accounts for 15% of households, with urban areas accounting for 33%. This is further estimated that 12% rural households source of drinking water is covered protected dug wells. The minority of households (32%) is within less than 30 minutes from their water source with urban 6% and rural 39%, (KDHS, 2008/2009).

Where there is suspicion of water contamination, 45% households treat their drinking water. The main method of treatment is boiling, with 29% of households practicing, while 18% of households add bleach or chlorine such as water guard to make water safer for drinking. Appropriate water treatment methods are more common among urban households at 57% than among rural households 40%, (KDHS, 2008/2009).

Hygiene ways of living are important practices in the prevention of illness and disease brought about by poor sanitation and unclean environment, (Wood, Glanville and Vaughan, 2008). The state of sewerage and human waste disposal in the informal settlements pose a major threat to health. Access to latrine which everyone uses is very crucial and it must be properly constructed, in good position and kept

clean,(Wood, Glanville and Vaughan, 2008). If the latrine has to be used by children, the opening should be constructed with children in mind and made small to avoid children falling into the pit. Those children who are unable to use the latrine, their excreta should be collected and deposited into a pit latrine by the care giver, (Wood, Glanville and Vaughan, 2008).

The spread of disease can also be reduced through hand washing after defecating, handling baby's faecal matter, preparing food, feeding children or eating to reduce the transmission of diarrhoea germs. Washing with water alone is not enough to remove faecal contamination. Hands must be washed with agents such as soap, mud, ashes that require the hands to be rubbed together. To reduce diarrhoeal diseases, adequate supply of water for hygiene purposes is important. Many times when water is scarce, people are likely to save it for drinking and cooking rather than personal hygiene. The more water is available the more people will campaign to promote hand washing, (Wilson, 1993).

Ensuring sanitation facilities is a millennium development goal that Kenya shares with other countries. In Kenya urban households are only slightly more likely than rural households to have an improved toilet facility, 30% and 20% respectively. The most common toilet facility in rural area is open pit latrine with a slab or without. In urban areas toilet facilities are shared in the homestead especially among middle class homes. In urban slum areas, 52% of households share toilets and about 12% have no toilet facility at all, (KDHS, 2008/2009). According to a study done by Grellety at Mathare Valley indicated that the areas that have scarce toilet facilities end up using plastic bags (flying toilets) and that many public toilets facilities often are financed by NGOs and managed by community groups while others are private operating on a pay-as-use basis, (Grellety, 2008)

In housing situations, airborne diseases from poor environmental hygiene is common especially tuberculosis. Such poor environment is characterized by improper and inappropriate housing, crowded rooms where many people may opt to live and sleep and also unhygienic personal habits that make some diseases more likely to spread i.e. through poor fecal handling, coughing carelessly, contamination of hands, food, and water, (Wood, Glanville, Vaughan, 2008).

## 2.6 Psychosocial Care Practices

Psychosocial care is a practice of mother-child bond and best in early life of a child when cognitive behaviors, emotions and social behaviors of a child are developing, (Delange, 2010). Mothers who have malnourished children are apathetic and appear to have more personal and family problems. They are isolated and have low self-esteem, (Carvalhaes and Benicio, 2006).

The quality of psychosocial care is often determined by the interaction between mother and child. A protective effect on nutritional status is seen by talking to the child, storytelling, hugging the child, having a safe and attractive environment and encouraging independence, (Carvalhaes and Benicio, 2006).

Psychosocial care practices are important in the promotion of growth and development of children, (Murray and Hornbacker, 1997). Child growth and development is influenced by social and psychological ability of a caregiver and the child. Good psychosocial care in the first three years of life has a positive effect on nutritional status of a child and also influence the social, emotional and cognitive development of a child's cues delivered through the provision of affection, attention, interaction and responsiveness from a mother/caregiver, (Ramakrishnan, 1995).

Parents should be involved as far as possible with their children's care and they should be taught the importance of play, (Delange, 2010). Children who are not stimulated can have reduced psychomotor activities that can affect their milestones during growth period mostly crawling, standing and playing with other children. The moment children become less active and demanding, parents tend to provide less stimulation. (Delange, 2010).

A study on psychosocial care and complementary feeding of children in Nigeria found that about 77% of the mothers in the study cared for their own children while 23.1% used caregivers (Agunba, 2008). A similar study was conducted by Delange indicated that psychosocial care among children who were on complementary feeding, 58.7% were assisted to eat by their mothers and motivated to eat, 76.4% sat with their mothers as they ate, 23.6% were forced by their mothers to eat and 76.2% ate on their own, (Delange, 2010).

## **2.7 Gaps in Knowledge**

The southland slum is surrounded by middle class estates unlike other informal settlements like Kibera, Mathare and Kariobangi slums and hence has severe food insecurity. Foods sold are very expensive because of the class of people surrounding the slum. The slum dwellers always cross over to Kibera to buy food at a cheaper cost.

Many studies on child nutrition status have been done in most of the slum areas in Nairobi County with the evidence of severe malnutrition but none has been conducted at the Southland informal settlement.

Southland informal settlement dumping site is located at the middle of the slum unlike other slum where refuse disposal sites are away from the people.

There are neither public nor private health care facilities in Southland informal settlement unlike other informal settlements with several small clinics and private nursing homes.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Study Design**

This was a descriptive and cross-sectional study and to determine the childcare practices and the nutritional status of children below five years of age at Southland Informal Settlement in Nairobi County.

### **3.2 Study Site and Location**

The study was conducted at the Southland informal settlement of Nairobi county. The settlement is located in Mugumoini Location (formerly Wilson Airport Location) in Langata Constituency. The settlement borders Rubia Estate, Onyonka Estate, Southland Estate and Civil Servant Estate. According to Mugumoini Administration office, Southland occupies an area of 15 acres with a population of 1620 people living in 540 households, (*Area chief, Mungumoini administration office*). The area is closer to a number of health institutions. The nearest health facilities are: The Nairobi West Health Centre and the Langata Health Centre at Otiende Estate both managed by the Nairobi County, the Kenyatta National Hospital, Mbagathi District Hospital managed by the Ministry of Health and the St Mary's Hospital, a private hospital managed by the Catholic Church.

### **3.3 Study Population**

The study population comprised of the following:

1. Children under five years old residing at the southland informal settlement.
2. Respondents/caregivers of children residing at the South land informal settlement who gave information about the child in the focus group discussion.

#### **Inclusion criteria:**

**The following was used as the inclusion criteria**

- i) Household with children under five years old.
- ii) Respondents/caregivers who gave informed consent and assent to participate in the study.

- iii) Respondents/caregivers who have lived at the Southland informal settlement area for five years and over.

**Exclusion Criteria:**

**The following was used as the exclusion criteria**

- i) Children with mental conditions and disabilities were excluded from the study sample.
- ii) Children whose mothers did not consent to participate in the study.

**3.4 Sampling and Sample Size**

**3.4.1 Sample Size Determination**

The sample size was determined using the following formula for prevalence studies, (Fisher, 1991).

$$n = \frac{z^2 p (1 - p)}{d^2}$$

Where,

n = is minimum sample size.

Z = is the table value for standard normal deviate corresponding to 95% significance level (= 1.96).

Prevalence of stunted children in Nairobi was, 22.7% as per KDHS survey 2008 / 2009.

D =Margin error, set at ± 0.05.

Substituting the values in the above formula, the sample size became:

$$\frac{1.96^2 \times 0.23 \times 0.77}{0.0025} = (272)$$

**ASSUMPTION:** Each household had a child under five years old. Given that the population of households is less than 10,000, the sample size was

then adjusted to:

$$nf = n / 1 + (n / N)$$

Where: nf is the adjusted sample size;

And N was the household population size (= 540)

$$nf = n / (1 + (n / N)) = 277 / (1 + (277/540)) = 185$$

With 20% non-response rate, the size for this study was then increased by 37 children to come up with a sample of 222 households.

### **3.4.2 Nutritional status of study children**

In order to assess nutritional status of children, anthropometric measurements were collected from the calculated sample of 248 children. The weight and height data were converted into nutritional status indicators of weight for height (WHZ) weight for age (WAZ) and height for age (HAZ) using WHO anthro software, (WHO, 2006). Children with a Z-score of less than minus 2 were considered to be malnourished.

### **3.4.3 Sampling Procedure**

#### **Stage 1: Selection of Settlement**

Southland informal settlement was purposively selected. Southland is a small informal settlement that no studies have been done compared to other informal settlements in Nairobi County. The informal settlement is isolated and surrounded by middle class estates. It has poor infrastructure, poor sanitation and the dwellers are of low income class. Since nothing much is known about the slum, it is worth exploring the extent of child care practices that promote child nutritional status.

#### **Stage 2: Selection of Households**

##### **Simple Random Sampling**

Multistage sampling method was used in this study to select households with children under five years old from a list of households with children in southland informal settlement. The eligible children were those aged between 0 and 59 months and those who met the inclusion criteria.

##### **Sampling frame**

The sampling frame included 540 households with children below five years old in the study area.

A census was conducted to register children from all households with children below five years old by moving from door to door and registering the names of their

parent's. The respondents/caregivers of these eligible households were selected to participate after giving informed consent and signed for their children to participate in the study.

### **Stage 3: Selection of Study Participants**

All children selected from each of the eligible registered households were included in the study, even if the household registered had more than one child below-five year-old, whether twins or brothers/sisters, both were included in the study.

#### **3.4.4 Selection of Participants for Focus Group Discussion**

Two groups were purposively formed for focus group discussions (FGD) to gather qualitative information for verification and validation using guideline with open ended questions, (Appendix 1 part 10). The respondents/caregivers who participated in the focus group discussion did not participate in the individual questionnaire's interviews. Two groups of 10 and 11 caregivers were formed for the focus group discussion.

### **3.5 Study Instruments**

- 1) The instruments used for the study were structured questionnaire, (Appendix 1, part 1).
- 2) Focus group discussion guides check list, (Appendix 1 part 10).

The questionnaire contained questions on the following:

#### **3.5.1 Independent Variables were:**

- a) Social demographic characteristics respondent/care givers

Age and marital status

Education

Occupation

Household size and

Household income

- b) Child care practices

Breastfeeding practices



Complementary feeding practices

Health seeking behavior

Immunization

Growth monitoring

c) Hygiene and Sanitation Practices

Water treatment

Use and types of toilets

Refuse disposal

d) Psychosocial care practices

School going

Respondent/ caregiver communication with the child

**3.5.2 Dependent Variables were:**

a) Child nutritional status

Weight for height

Weight for age

Height for age

**3.6 Data Collection**

**3.6.1 Assessment Equipment**

The equipment for taking anthropometric measurements of weight and height/length included salter scale and height measurement board. The salter scale was used for weighing the children who could not stand and bathroom scales for older children who could stand. Wooden height boards were used for taking length/height of the children.

**3.6.2 Anthropometric Measurement Procedure**

The anthropometric measurements of weight and height were taken from eligible children as the procedure described in the next sections and illustrated in appendix 7.

**Weight:** Each research assistant was equipped with a salter scale with a maximum capacity of 25 kilograms and demarcations at every 100 grams. Children were weighed without clothes, suspended in bags until their feet were off the ground. The scales were suspended on a timber post strong enough to hold the child. Two readings that did not differ by more than 0.1 kilograms were taken and the average of the calculated number recorded down.

**Height/length:** A wooden length board was used to take the recumbent length of children who were less than two years old. Two research assistants were required to correctly position the child and ensure accurate measurement of length is taken. Two readings that did not differ by 0.5 cent-meters were taken and their averages recorded down. Height measurements were also taken using a height board for children who were over 24 months.

### **3.6.3 Recruitment and Training of Interviewers**

Six research assistants who were community health workers with good command of English and Kiswahili languages were recruited to assist in the data collection. They were mature persons; form four leavers who were working and living in Southland Slum and understood the area well. They were chosen to serve as research assistants and guides.

The research assistants were trained after recruitment with emphasis on how to fill the questionnaires and how to translate questionnaires from English to Swahili languages. This was done in order to create rapport and reduce the level of bias which could occur if the questions were not well understood, presumably making the data collection more reliable.

The principle researcher conducted two days training on data collection techniques relevant to the study on: the use of survey instruments and the administration of questionnaires; interview techniques; the procedures of data collection; and the procedures of taking anthropometric measurements. The field assistants worked in pairs to reduce interpersonal and interview bias. The principle investigator made interviewers as much alike in their field behaviour as possible and this contributed to higher achievement. The interviewers were informed on counter checking of the questionnaires after completion and at the end of every day.

#### **3.6.4 Pre - Test**

The instruments were pre tested for validation purposes at Raila Informal Settlement. Twenty questionnaires were administered to establish the reliability of the instrument. Revisions were made on the basis of the pre -test results to ensure that all questions were well constructed and well understood by the interviewers and the interviewees.

#### **3.7 Data Analysis**

Data were checked to ensure that all the entries were correct. Data entry and analysis was done using Statistical Package for Social Science (SPSS) version 20 for windows. Anthropometric data were analysed using anthropometric programme for data analysis (WHO, 2006). The socio-demographic and socio economic data analysed using SPSS programme were then merged with the WHO anthro data. Descriptive statistics was determined during the analysis. The Chi-squared test of significance was applied for bivariate analyses. In addition data from focus group discussions (FGDs) were analysed using content analysis, summarized in form of themes.

#### **3.8 Ethical Considerations**

The study was jointly approved by The Kenyatta National Hospital and; The University of Nairobi, Ethical Research Committee (KNH/UoN-ERC) (Appendix 6) Permission was also sought as well from the Southland local leaders, the Chief, and the Assistant Chief of the area. Participating mothers were assured that any information they gave would be treated with confidentiality and that any name or information that would identify them as respondents / caregivers would not be given to anyone or appear in any report at all. Only respondents / caregivers who gave consent were interviewed and only children under five years old were included in the study population.

## **CHAPTER IV: RESULTS**

This chapter presents analysed data gathered during the study. The results are categorised into (1) social demographic characteristics of the respondents/caregivers: age, sex, marital status, education level, occupation, household income, and household size; (2) Social demographic characteristics of children: age in months, sex, and birth spacing with immediate child. Presents also are : (3) child care variables such as (a) breastfeeding and complementary feeding practices; foods withheld during illness; (b) child health status and health seeking behaviour; immunizations and growth monitoring; utilization of mosquito nets;(c) water, sanitation and hygiene practices; and (d) child psychosocial support. Further statistical analysis was done to determine whether there was relationship between the outlined variables and nutritional status of study children.

Although the sample size calculated was 222, a total of 257 households with children less than five years old were registered for the study, and their respondents/caregivers were interviewed using questionnaires and anthropometric measurements taken using salter and bath room scales to determine child nutritional status. Among the households selected, five respondents/caregivers declined to respond to the questions four had left for their rural homes. This led to non-response rate of 3.5%. Therefore a total of 248 respondents/caregivers completely responded to the questions which have been analysed.

### **4.1 Characteristics of Study Respondents/caregivers**

The socio-demographic characteristics of the study respondents/caregivers presented in this section are: age, marital status, education, occupation, household income and household size, (Table 1).

#### **4.1.1 Age of the respondents**

The age of the respondents ranged from 16 to 44 years with a mean age of 27.04 years, a median of 27 years and standard deviation of 5.32 years. More than half 65.3% of the study participants were aged 21-29 years while 28.2% were aged between 30-39 years and 4.4% were aged less than 21 years. Only 2% was aged above 40 years, (Table 1).

#### **4.1.2 Marital Status of the Mothers**

Majority (90.7%) of the respondents/caregivers were married and living with their spouses. Only 9.3% were either single/ divorced/separated and widowed, (Table 1).

#### **4.1.3 Education Levels**

Results on education levels of the respondents/caregivers showed that 47.1% of the caregivers had attained primary education, 45.2% had attained secondary education, and 6.5% had gone to college. Only 1.2% caregivers did not have formal education, (Table 1).

#### **4.1.4 Household Socio-Economic Characteristics Occupation**

Slightly more than half (52.4%) of the respondents/caregivers were unemployed/ housewives and 33.9% had small scale businesses. A small number (13.3%) of respondents were employed with a monthly salary while 0.4% had a small garden along the roadside. Regarding household income, 31.9 % had income of Kenya Shillings 5000 to 6000, 28.4% had income between Kenya shillings 3000 to 4000, and 20.1% had income more than Kenya shillings 6000 Kenya shillings. Other households, 10.9% earned income of between Kenya shillings 1500 to 2000 and 8.7% earned income of between Kenya shillings 500–1400. Only 7.7% had no income at all, (Table 1).

In the focus group discussion, mothers reported getting most of their income from: “*vibarua, biashara ya kuuza mitumba na mboga, na kutegemea wazee.*” (Business of selling second hand clothes, vegetables and getting help from their husbands). Another mother said “*nowadays you don’t depend on a man, you have to struggle*”.

In a different focus group, the mothers reported other businesses bringing some income as “*tailoring, washing clothes at the estates close to by, selling brewed liquor and others employed in kiosks close by*”.

#### **4.1.5 Household Size**

Approximately 70.2% of the households had 3 to 4 persons while 12.9% household ad 1-2 persons and 16.9% households had more than 5 persons, (Table 1).

**Table 1: Socio-Demographic Characteristics of the Respondents (n=248)**

<b>Characteristics</b>	<b>Number</b>	<b>Percentage</b>
Age of the respondent		
< 20 years	11	4.4
21-29 years	162	65.3
30-39 years	70	28.2
> 40 years	5	2.0
<b>Total</b>	<b>248</b>	<b>100</b>
Marital Status		
Married	225	90.7
Single/Divorced/Separated/Widowed	023	9.3
<b>Total</b>	<b>248</b>	<b>100</b>
Education		
Primary	117	47.1
Secondary	112	45.2
No education	3	1.2
<b>Total</b>	<b>248</b>	<b>100</b>
Occupation		
Business	84	33.9
Salary (employed)	33	13.3
Housewife/unemployed	130	52.4
Farmer	1	0.4
<b>Total</b>	<b>248</b>	<b>100</b>
Household Income		
500-1400	20	8.7
1500-2000	25	10.9
3000-4000	65	28.4
5000-6000	73	31.9
>6,000	46	20.1
No income	19	7.7
<b>Total</b>	<b>248</b>	<b>100</b>
Household Size		
1-2	32	12.9
3-4	174	70.2
>5	42	16.9
<b>Total</b>	<b>248</b>	<b>100</b>

#### **4.2 Socio-demographic Characteristics of Children**

The socio demographic characteristics presented in this section are: child age; child sex and birth spacing, (Table 2).

#### 4.2.1 Age of Study Children

The mean age was 32.50 months and the standard deviation was 15.5. The children aged less than 5 months was 0.4% while those aged 6-11 months and 12-23 months were 4.0% and 27.8% respectively. Among those aged 24-35 months were 20.6% and 36-47 months and 48-59 months were 23.8% and 23.4% respectively, (Table 2).

#### 4.2.2 Sex and Birth Spacing of Study Children

The proportion of males was 52.8% while that of females was 47.2%, giving a male: female ratio of 1: 1.08. About the birth spacing, over one-half 61.7% of children were first born, 31.9% had birth spacing greater than 24 months and 6.5% had birth spacing less 24 months, (Table2).

**Table 2: Demographic Characteristics of Study Children (n=248)**

Characteristics	Number	Percentage
<b>Age in months</b>		
0-5	1	0.4
6-11	10	4.0
12-23	69	27.8
24-35	51	20.6
36-47	59	23.8
48-59	58	23.4
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Sex</b>		
Male	131	52.8
Female	117	47.2
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Birth spacing with immediate older child</b>		
First born	153	61.7
>24 months	79	31.9
< 24 months	16	6.5
<b>Total</b>	<b>95</b>	<b>100</b>

#### 4.3 Infant and Young Child Feeding Practices

##### 4.3.1 Breast Feeding

Results from the study indicated that about 70.6% of the children had had stopped breast feeding and 29.4% were still breastfeeding. The findings on the duration of breast feeding indicated that 35.8% children were breast fed for over 24 months,

32.9% were breast fed between 7-23 months and only 1.2% was breast fed for 1-6 months, (Table 3).

#### **4.3.2 Complementary Feeding**

Overall (96.8%) of children had been introduced to other foods while 3.2% had not been given any other foods at the time of the study period. Among the children who had been introduced to other foods, 43.9% of the children were introduced to other foods at the age of 1-5 months while 39.7% and 16.4% were introduced to other foods at 6 months and 7-12 months respectively. However, 13.7% of the mothers did not respond to this question, (Table 3).

The first foods introduced to children were cereal-based gruel (porridge) 43.3%, milk/formula milk 30.0%, fruits/ fruits juice/water/glucose water 17.9%. Other foods introduced were mashed foods (pumpkins/potatoes/*ugali*/bananas) 8.8%, (Table 3). Mothers in the focus group discussion were asked when they introduce food to their children and this is what they had to say: *“it is done at six months”*, *“at 3 months”* *“it can be done with mashed fruit when the infant is 3 days old because the male children do not get satisfied on breast milk alone”*. *“If you go back to work, you have to stop breastfeeding”*, *“if the baby is not getting enough breast milk you can give complementary foods to a child”*

#### **4.3.3 Gender Preference on Feeding**

The study results showed that 65% of the children were served food individually while 35% of the children were served together with other family members. The results also indicated that, 14.4% of the respondents preferred serving more food to a boy child and only 2.8% served more food to the girl child while the majority (82.8%) served both boys and girls equally, (Table 3).



**Table 3: Breast Feeding and Complimentary Feeding Practices (n=248)**

<b>Feeding Status</b>	<b>Number</b>	<b>Percentage</b>
<b>Breastfeeding</b>		
Children that were still breastfeeding	73	29.4
Children who had stopped breastfeeding	175	70.6
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Duration of Breast Feeding</b>		
1-6 months	3	1.2
7-23 months	80	32.9
24 months and above	87	35.8
<b>Total</b>	<b>170</b>	<b>100</b>
<b>Have you started giving other foods to this child</b>		
Yes	240	96.8
No	8	3.2
<b>Total</b>	<b>87</b>	<b>100</b>
<b>Age at which other foods were initiated</b>		
1-5 months	94	43.9
6 months	85	39.7
≥ 7 months	35	16.4
No answer	34*	13.78
<b>Total</b>	<b>214</b>	<b>100</b>
<b>Foods first introduced</b>		
Milk and Infant formula	72	30.0
Fruits juice/ glucose water	43	17.9
Cereal based gruel porridge	104	43.3
Mashed potatoes/bananas/pumpkins/ugali	21	8.8
<b>Total</b>	<b>240</b>	<b>100</b>
<b>How Children are Served</b>		
Individually	156	65.0
Together family members	84	35.0
<b>Total</b>	<b>240</b>	<b>100</b>
<b>Preference in Quantity of Food Served to child</b>		
More to the boy child	31	14.4
More to the girl child	6	2.8
Equally	178	82.8
<b>Total</b>	<b>215</b>	<b>100</b>

#### 4.4 Immunization

The immunization and child monthly growth monitoring are presented in this section.

The immunization status of children was obtained from their immunization card.

Where such card was not available, the immunization information was given by the

respondents / caregivers. Almost all, (95.2%) of the children were fully immunized, (Table 4).

As appertains to Bacille Calmette Guerin (BCG) immunization, 99.2% of study children had been given as confirmed by presence of a scar on the left hand. Only 0.8% had no scar and their caregivers could not remember whether were given or not. With regard to Oral Polio Vaccine (OPV) immunization at birth, 99.2% children had been given. For the OPV1, OPV2 and OPV3 vaccine, the percentage of those who reported receiving the vaccine was 99.2%, 97.6% and 96.8%, respectively. About 0.8% of the respondents could not remember whether their children had received the Polio vaccine while 1.6% and 2.4% of the children did not get the OPV2 and OPV3 doses, respectively, (Table 4).

Concerning diphtheria, pertusis and tetanus (DPT) immunization, 98.0% received the first (DPT1) dose, 96.8% the second (DPT2) dose while 96.4% got the third dose of (DPT3). There were a few children, who did not receive the first DPT dose (1.2%) of (DPT1), and 2.4% second dose (DPT 2) and the third dose 2.8% (DPT3). Only 0.8% did not know whether their children had full DPT coverage. The overall coverage for measles immunization was high (94.4%). There was a small percentage 4.8% that had not measles vaccine and a small percentage 0.8% did not know whether their children had been immunized against measles, (Table 4).

**Table 4: Immunization Coverage Among the Study Children (n=248)**

Immunization	Immunization Given		Immunization not given		Don't know if was given	
	Number	Percentage	Number	percentage	Number	Percentage
BCG	246	99.2	0	0.0	2	0.8
OPV0	246	99.2	0	0.0	2	0.8
OPV1	246	99.2	0	0.0	2	0.8
OPV2	242	97.6	4	1.6	2	0.8
OPV3	240	96.8	6	2.4	2	0.8
DPT	243	98.0	3	1.2	2	0.8
DPT 2	240	96.8	6	2.4	2	0.8
DPT 3	239	96.4	7	2.8	2	0.8
Measles	234	94.4	12	4.8	2	0.8
Fully immunized (All children)	236	95.2	12	4.8		

## 4.5 Weight at Birth and Growth Monitoring

### Weight at Birth

Most (93.1%) of the children were weighed at birth while 1.6% did not know if their children were weighed or not. Only 5.2% did not weigh their children at birth. Among the children who were weighed at birth, 8.7% were born with low birth weight of < 2.5kg while the majority, (91.3%) had a weight above 2,500 grams.

### Growth Monitoring

About 56.9% of the mothers took their children for growth monitoring and promotion services while the rest, 43.7% did not take their children for growth monitoring and promotion services, (Table 5).

**Table 5: Child birth Weight and Growth Monitoring (n=248)**

<b>Growth Monitoring</b>	<b>Number</b>	<b>Percentage</b>
<b>Was child weighed at birth?</b>		
Yes	231	93.1
No	13	5.2
Don't remember/home deliveries	4	1.6
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Birth weight</b>		
<2.5 kg	20	8.7
> 2.5 kg	211	91.3
<b>Total</b>	<b>231</b>	<b>100</b>
<b>Monthly growth monitoring</b>		
Yes	141	56.9
No	107	43.1
<b>Total</b>	<b>248</b>	<b>100</b>

## 4.6 Child Illness and Care Practices

Health status of children showed that 60.1% of the children had suffered an illness two weeks prior to the study while 39.9% reported that their children were not sick two weeks prior to the study. From the results 55.0% of the children suffered from URTI mainly common cold and pneumonia while 17.4% of the children suffered from diarrhoea and abdominal pain, 21.5% suffered malaria, 9 6.0% had others illness, (Table 6).

The majority (98%) of the respondents sort health care for their sick children, only 2% of the respondents did not seek treatment for their sick children. Among those who sort health care, 81.2% of the respondents took their children for medical treatment at the hospital while 16.8% bought drugs from the local chemists and 2.0% did not seek any treatment for their children, (Table 6).

In the focus group discussion mothers reported that: *“most common illnesses affecting children under five years was diarrhoea and abdominal pain due to ingestion of dirt as children tend to pick anything to eat and also food sold at the kiosks and local food vendors makes the children sick”*. When asked what they give to their children when having diarrhoea, all the mothers in the group agreed that: *“decreasing breastfeeding and giving more water with little salt and sugar the diarrhea reduce”*. Others said *“Breastfeeding children more frequent than usual it is best”*. *“Children refuse to eat when having diarrhea and is only breast milk a child agrees to take. “One mother said “A child with diarrhea should feed on demand especially with boiled and well-cooked bananas, plenty of porridge, fruits and water”*.

Then when asked how they manage a sick child, mothers agreed that: *“it is good to feed children frequently because sick children are weak due to some of the treatments given, that’s why it is necessary to feed them frequently”*. When asked where they get information, mothers acknowledged to have gotten information at: *“child welfare clinics, from the teachers during school meetings, grandparents, neighbors and friends and from traditional healers especially when the child is sick”*.

### **Foods Withheld During Diarrhoea/Illness**

Slightly the over a third 35.1% of the respondents caregivers reported withholding food from sick children and 64.9% did not withhold food from their sick children. The most common food reported withheld during illness was milk and milk products 44.8% and food cooked with oil, 18.4% Other foods withheld were starch foods 16.1%, beans 11.1% fruits/fruit juice 4.6% and eggs 4.6%, (Table 6).

The data of the alternative caregiver (a person left with a child) when mother is sick or away indicated that, 76.2% of the children were left under the care of the family members and 18.5% were left under the care of a friend/house help. Only 5.2% children were left at the day care centers).

**Table 6: Child Illness and Care Practices (n=248)**

<b>Illness and health seeking practices</b>	<b>Number</b>	<b>percentage</b>
<b>Illness</b>		
Sick	149	60.1
Not sick	99	39.9
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Type of common illnesses</b>		
Diarrhoea/abdominal pain	26	17.4
Malaria	32	21.5
URTI/Pneumonia/common cold	82	55.0
Others	9	6.0
<b>Total</b>	<b>149</b>	<b>100</b>
<b>Whether the child got treatment</b>		
Yes	146	98.0
No	3	2.0
<b>Total</b>	<b>149</b>	<b>100</b>
<b>Place of treatment</b>		
Hospital	121	81.2
Chemist	25	16.8
No treatment	3	2.0
<b>Total</b>	<b>149</b>	<b>100</b>
<b>If food was withheld during diarrhoea /illness</b>		
Yes	31	35.1
No	56	64.9
<b>Total</b>	<b>87</b>	<b>100</b>
<b>Foods withheld during diarrhoea /illness</b>		
Milk and Milk Products	39	44.8
Food Cooked with Oil	16	18.4
Starch foods	14	16.1
Fruits and Fruit Juices	4	4.6
Eggs	4	4.6
Beans	10	11.5
<b>Total</b>	<b>87</b>	<b>100</b>
<b>Child left with</b>		
Family members	189	76.2
Friend/House-help	46	18.5
Day care	13	5.2
<b>Total</b>	<b>248</b>	<b>100</b>

#### 4.7 Utilization of Insecticide Treated Nets

The use of the insecticide treated nets and the reason of not using them are presented in this section, (Table 7).

The results showed that 55.6% of the respondents reported that their children were using insecticide treated net while 44.4% reported not using insecticide treated nets.

The reason cited by respondents for not sleeping under the net by those who did not use was lack of a net (54.5%) while only 1% said there were no mosquitoes to necessitate the use of a net while the rest 44.5% of the respondents did not give any reason for not using a net, (Table 7).

**Table 7: Utilization of Insecticide Treated Mosquito Net (n=248)**

<b>Utilization of Mosquito Net (n=248)</b>	<b>Number</b>	<b>Percentage</b>
<b>Children sleeping under ITN</b>		
Yes	138	55.6
No	110	44.4
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Reason for not sleeping under ITN (n=110)</b>		
Don't have a net	60	54.5
No mosquitoes	1	1.0
No reason	49	44.5
<b>Total</b>	<b>110</b>	<b>100</b>

#### **4.8 Water and Hygiene Practices**

Hygiene practices during food and vegetable preparation; household water source; drinking water treatment; sanitation and hygiene practices are presented in this section, (Table 8).

##### **Vegetable Preparations**

With respect to hygiene practices and action taken before handling food, the majority (99.6%) of the respondents reported washing hands before preparing meals. About cutting vegetable before or after washing, majority, and 80.2 % reported cutting vegetables after washing and 19.8% reported cutting vegetable before washing, (Table 8).

##### **Household Water Source**

The main source of household water supply in the southland informal settlement was metered Nairobi County and sewerage company water 99.6%. Only one respondent 0.4% reported obtaining water from the river. Majority, (98.4%) of the respondents fetched water within a distance of less than a kilometre away from their houses, (Table 8).

## **Drinking Water Treatment**

In terms of drinking water treatment, slightly more than half 69.8% of the respondents reported boiling their drinking water while 14.9% used chemical liquids such as Water guard to treat the water before drinking and only 1.2% filtered their drinking water, while 14.1% did not treat their drinking water, (Table 8).

During FDGS, mothers said that; *“the water in the residential area is bad when it is not boiled and should not be drunk”*. When asked if they regularly treat drinking water, some of the mothers said *“we don’t have time to boil the water”*. And others said *“cannot afford fuel to boil the water due to poverty”*. *“I cannot use the little fuel I have to boil drinking water, God will protect my children”*. Said one of the mothers.

## **Sanitation and Hygiene**

Majority (97.7 %) of the households used ordinary pit latrines for human excreta disposal systems, the remaining 2.0% used different means of defecation, such households closets 1.2% ( in house in houses toilet), flying toilets 0.4% and potty 0.4%. All 100% respondents/caregivers reported washing hands after visiting the toilet. When asked what they do after using the toilet, they all agreed that *“the toilets are never clean and they fear any little mistake can give their children diarrhea and that’s why they make sure to wash hands”*.

## **Refuse Disposal**

Fifty six percent (56.0%) of the respondents reported that they disposed the refuse by burning; burying and putting in the dustbins while 44.0% threw their refuse to the bush and open dumping sites, (Table 8).

**Table 8: Water and Hygiene Practices (n=248)**

<b>Water and Sanitation</b>	<b>Number</b>	<b>Percentage</b>
<b>Vegetable preparation</b>		
Cut after washing	199	80.2
Cut after washing	49	19.8
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Source of Water</b>		
City Council tap water	247	99.6
River	1	0.4
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Distance to Water Source</b>		
< than 1 kilometre	244	98.4
> than 1 kilometre	4	1.6
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Household Water Treatment</b>		
Use of chemicals	37	14.9
Filtration	3	1.2
Boiling	173	69.8
Do nothing	35	14.1
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Use of toilets</b>		
Yes	243	97.7
No (But used other means)	5	2.0
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Types of Toilets</b>		
CDF/Pit latrine	243	97.7
Closet	3	1.2
Flying toilet	1	0.4
Potty	1	0.4
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Practice before visiting toilet</b>		
Washing hands	248	100.0
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Refuse Disposal</b>		
Burning, Burying and putting in dustbins	139	56.0
Throw in the bush or Dumping site	109	44.0
<b>Total</b>	<b>248</b>	<b>100</b>

#### **4.9 Psychosocial Care Practices**

In this section, psychosocial care practices presented are: child school attendance; child /mother (parent) communication on issues affecting a child, (Table 9).



#### 4.9.1 Children Attending School and Child to Mother Communication

About 57% of the children had not yet attained school going age while 42.7% of the children were attending school. A high proportion 76.6% of respondents/caregivers reported communicating to their children on various issues compared to 23.4% who reported that they did not communicate to their children on issues affecting them. Different issues were communicated to children such as finding out why their children were sad and emotional (26.3%) and if the child could have been sick. About 2.2% of caregivers discussed about harmful things that might happen at school and if the children can avoid them. Some caregivers talked about school performance 12.8% and assisted children to do their homework. Others 15.6% talked on discipline and good character at school and at home. About 13.4% encouraged their children to eat and 15.1% talked on personal hygiene and its importance while 14.5% reported creating time to play with their children, (Table 9).

**Table 9: Children’s Psychosocial Care Practices (n=248)**

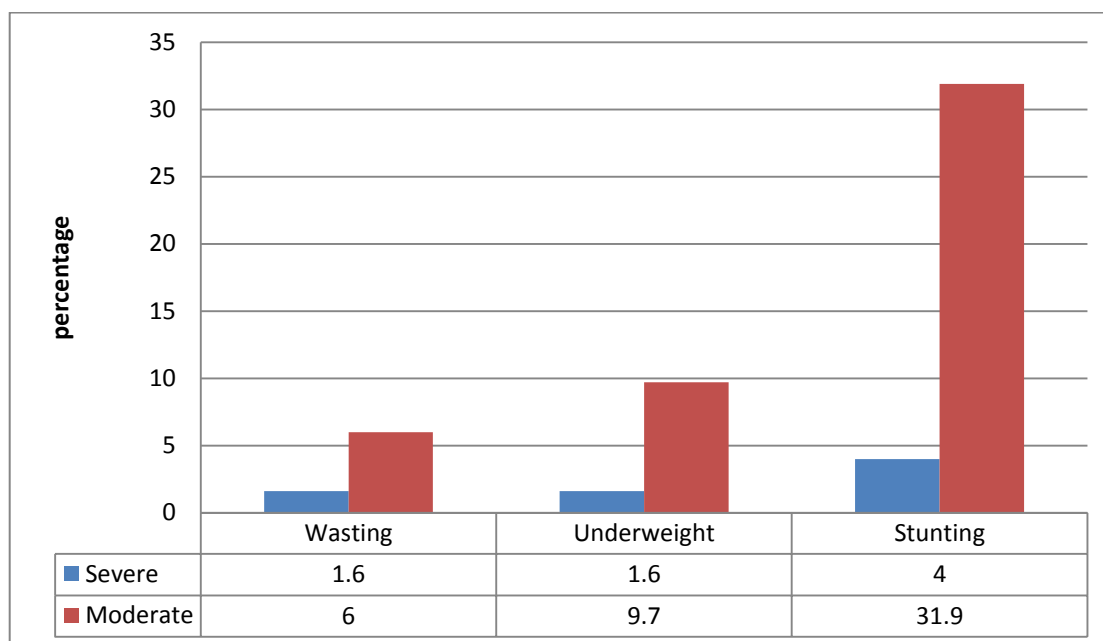
<b>Psychological Support</b>	<b>Number</b>	<b>Percentage</b>
<b>School attendance</b>		
Yes	106	42.7
No	142	57.3
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Talking to child</b>		
Yes	190	76.6
No	58	23.4
<b>Total</b>	<b>248</b>	<b>100</b>
<b>Issues respondent talked to Children</b>		
Children sickness, Emotion distress	47	26.3
Discipline and good character	28	15.6
Personal Hygiene	27	15.1
Playing with a child	26	14.5
School performance	23	12.8
Encouragement to eat	24	13.4
Harmful things at school	4	2.2
<b>Total</b>	<b>179</b>	<b>100</b>

#### 4.10 Prevalence of Malnutrition among Study Children

##### 4.10.1 Overall Prevalence of Malnutrition

The overall stunting prevalence was 31.9% (95% CI: 25.9% - 37.9%), underweight 9.7%, (95% CI: 5.8%- 13.6%) and wasting of 6% (95% CI: 2.9 – 9.2%). Severe

stunting was 4% (95% CI: 1.4% – 6.7). Severe wasting and underweight were 1.6% each. (95% CI: 0% – 3.4), (Figure 4).



**Figure 4: Overall Prevalence of Malnutrition (n=248)**

#### 4.11 Prevalence of Malnutrition among Study Children by Age

Presented in this section is the overall prevalence of malnutrition among study children by age in the three indicators of wasting, underweight and stunting,

##### 4.11.1 Wasting Status

Wasting or acute malnutrition represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the results of inadequate food intake or recent episodes of illness causing loss of weight and the onset of malnutrition.

##### 4.11.2 Prevalence of Wasting by Age

The prevalence of wasting among all the children was %<-2SD 6%, (95% CI: 2.9%-9.2 %) and %<-3 SD 1.6%, (95% C :I 0% -3.45 %).Wasting prevalence was higher among children aged 24-35 months having 8.5% (95% CI: 0%-17.6%) while those aged 48 – 59 months had 7.7% (95% CI: 0%-15.9%) with 7.5% among those aged 36-47 months (95% CI: 0.4%-14.5%) and the least prevalence among those aged 12 – 23 months with 3.0 % (95% CI: 0-7.8%), (Table 10).

### **4.11.3 Underweight Status**

Weight for age is a composite index of height for age and weight for eight. It takes into account both acute and chronic malnutrition.

### **4.11.4 Prevalence of Underweight by Age**

The prevalence of underweight among all the children was  $\% < -2$  SD 9.7%, (95% CI: 5.8%-13.6 %) and  $\% < -3$ SD 1.6%, (95%CI: 0%-3.4%). Underweight prevalence was highest among children aged 24–35 months and 36 – 47 months, 12.8% (95% CI:2.2-23.4) and 10.9% (95% CI: 2.4-18.5) respectively, with 9.6% (95% CI:0.6-18.6) among those aged 48-59 months, and 7.5% (95% CI: 0.4-14.5) among those aged 12-23 months , (Table 10).

### **4.11.5 Stunting Status**

Stunting reflects failure to receive adequate nutrition over a long period of time, and is also affected by recurrent and chronic illness. Height for age, therefore, represents the longer term effect of malnutrition and is not easily reversed by changes in dietary intake.

### **4.11.6 Prevalence of Stunting by Age**

Prevalence of stunting (height for age)  $\% < -2$ SD was 4% (95% CI: 1.4%-6.7 %) and  $\% < -3$ SD was 31.9% (95%CI: 25.9%-37.9%). Among the children age groups, stunting prevalence was higher among the younger children than the older children, with those aged 12-23 and 24–35 months having the prevalence of 46.7%, (95% CI: 33.6%-.59%) and 38.3%, (95% CI: 23.3%-53.3%) respectively. The least affected children by stunting were found among those aged 48 – 59 months with of 13.5%, (95% CI: 3.2 - 23.7), (Table 10).

**Table 10: Prevalence of Malnutrition among Study Children by Age (n=248)**

Age in months(n=248)	Weight –length/height (%) Z Scores				
	%<-3SD			%<-2SD	
	n	%	95% CI	%	95% CI
Total	248	<b>1.6</b>	0-3.4	<b>6.0</b>	2.9-9.2
0-5	1	<b>0.0</b>	0 -50	<b>0.0</b>	0 -50
6-11	14	<b>0.0</b>	0 -3.6	<b>0.0</b>	0 -3.6
12-23	67	<b>0.0</b>	0 -0.7	<b>3.0</b>	0 -7.8
24-35	47	<b>2.1</b>	0 -7.3	<b>8.5</b>	0 -17.6
36-47	67	<b>4.5</b>	0 -10.2	<b>7.5</b>	0.4-14.5
48-59	52	<b>0.0</b>	0 -1	<b>7.7</b>	0 -15.9
Age in months (n=248)	Weight-for-age (%) Z score				
	%<-3SD			%<-2SD	
	n	%	95% CI	%	95% CI
Total	248	<b>1.6</b>	0-3.4	<b>9.7</b>	5.8-13.6
0-5	1	<b>0</b>	0-50	<b>0</b>	0-50
6-11	14	<b>0</b>	0-3.6	<b>0</b>	0-3.6
12-23	67	<b>0</b>	0-0.7	<b>7.5</b>	0.4-14.5
24-35	47	<b>2.1</b>	0-7.3	<b>12.8</b>	2.2-23.4
36-47	67	<b>4.5</b>	0-10.2	<b>10.4</b>	2.4-18.5
48-59	52	<b>0</b>	0-1	<b>9.6</b>	0.6-18.6
Age in months(n=248)	Length/ height- for-age (%) Z score				
	%<-3SD			%<-2SD	
	n	%	95% CI	%	95% CI
Total	248	<b>4</b>	1.4-6.7	<b>31.9</b>	25.9-37.9
0-5	1	<b>0</b>	0 -50	<b>0</b>	0-50
6-11	14	<b>7.1</b>	0 -24.2	<b>21.4</b>	0 - 46.5
12-23	67	<b>9</b>	1.4 -16.5	<b>46.3</b>	33.6 – 59
24-35	47	<b>2.1</b>	0 -7.3	<b>38.3</b>	23.3 - 53.3
36-47	67	<b>1.5</b>	0 -5.1	<b>28.4</b>	16.8 - 39.9
48-59	52	<b>1.9</b>	0 -6.6	<b>13.5</b>	3.2 -23.7

#### 4.12 Prevalence of Malnutrition among Study Children by Sex

The information presented in this section is the prevalence of wasting, underweight and stunting by sex.

##### 4.12.1 Prevalence of Wasting by Sex

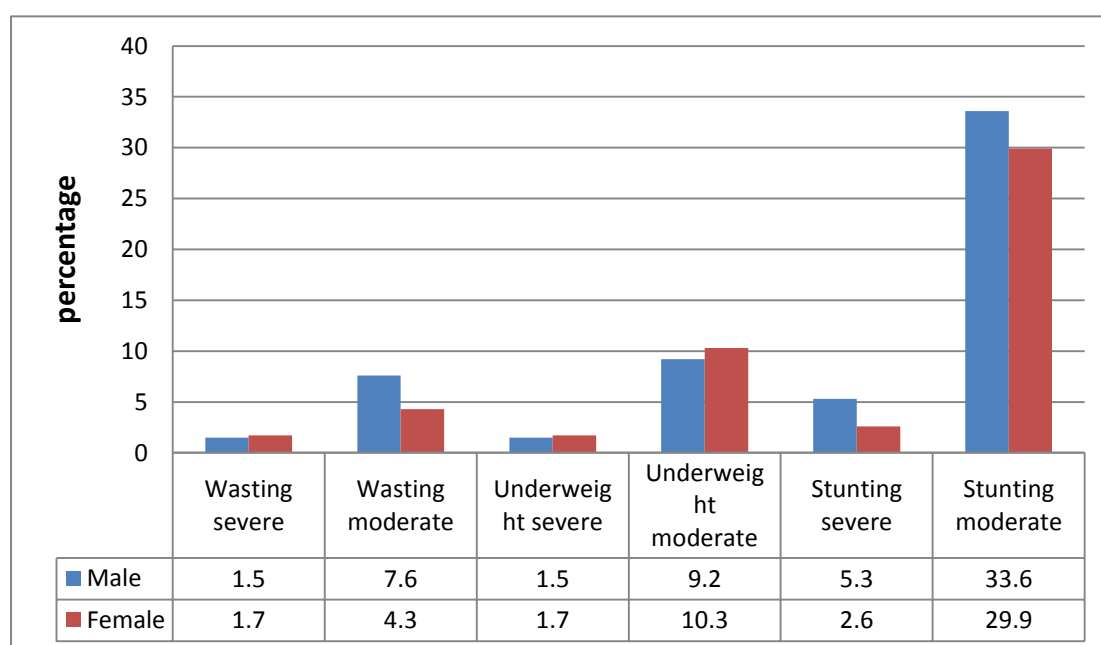
There were more male children with moderate wasting 7.6% (95% CI: 2.7-12.6%) compared to female children 4.3% (95% CI: 0.2-8.4) the prevalence of severe wasting was high among female children 1.7% (95% CI: 0 - 4.5%) than male 1.5% (95% CI: 0 - 4%), (Figure 5).

#### 4.12.2 Prevalence of Underweight by Sex

Female children were most affected by both moderate and severe underweight 1.7% (95% CI: 0.5-4.5) and 10.3% (95% CI: 4.3%-16.2 %) than male children with a moderate of 9.2 % (95% CI: 3.8%-14.5%) and severe of 1.5% (95% CI: 0 %-4%), (Figure 5).

#### 4.12.3 Prevalence of Stunting by Sex

Stunting prevalence was 33.6% (95% CI 25.1-42.1%) moderate among male children and 29.9% (95% CI: 21.2-38.6%) moderate among female children with severe of 5.3% among male children and female 2.6% respectively, (Figure 5).



**Figure 5: Prevalence of Malnutrition by Sex (n=248)**

### 4.13 Prevalence of Malnutrition among Study children by Age and Sex

This section presents the prevalence of malnutrition among the study children on the three indicators of wasting, underweight and stunting by age and sex, (Table 11)

#### 4.13.1 Prevalence of Wasting by Age and Sex

Among the children assessed, male children aged 24-35 months and 48-59 months had moderate wasting of 11.1% (95% CI:0-24.8%) and 12% (95% CI:0-26.7%) respectively. The female children aged 24-35 months had severe wasting of 9.4% (95%CI: 0-21%) and moderate wasting of 6.3 % ( 95% CI: 0-16.2%), (Table 11).

#### **4.13.2 Prevalence of Underweight by Age and Sex**

The prevalence of underweight in both sexes was slightly lower in male children 9.2% (95% CI: 2.7-12.6) than female 10.3% (95% CI 0.2%- 8.4%). The age group most affected by underweight among the male children was 24-35 and 48-59 months with the prevalence of 18.5 % (95% CI: 2%-35%) and 12.0% (95% CI: 0-26.7%) respectively. In female children, the age group most affected by underweight was age 12-23 months and 36-47 months with a prevalence of 10.0% (95% CI: 1.5-29.8%) and 15.6% (95% CI: 0-21.4%) respectively, (Table 11).

#### **4.13.3 Prevalence of Stunting by Age and Sex**

The stunting prevalence was slightly high among female children aged 12-23 months, 46.7% (95% CI 27.1-66.2%) compared to male children of the same age group, 45.9% (95% CI: 28.5-63.4%). The least prevalence of stunting was among male children aged 6-11 months 14.3% (95% CI: 0%-47.4%), and the female children aged 48-59 months with the least prevalence of stunting 11.1% (95% CI 0%-24.8%), (Table 11).

**Table 11: Prevalence of Malnutrition by Age and Sex (n=248)**

Age group n=248	Weight-for-length/height % Z score									
	Male					Female				
	%<-3SD			% <-2SD		%<-3SD			% <-2SD	
	n	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI
Total:	<b>131</b>	1.5	0- 4	<b>7.6</b>	3.8-14.5	117	<b>1.7</b>	0 - 4.5	<b>4.3</b>	4.3-16.2
0-5						1	<b>0</b>	0 -50	<b>0</b>	0 -50
6-11	7	<b>0</b>	0- 7.1	<b>0</b>	0-7.1	7	<b>0</b>	0 -7.1	<b>0</b>	0 -7.1
12-23	37	<b>0</b>	0-1.4	<b>5.4</b>	0-14	30	<b>0</b>	0 -1.7	<b>0</b>	0 -22.4
24-35	27	<b>3.7</b>	0-12.7	<b>11.1</b>	2-35	20	<b>0</b>	0 -2.5	<b>5</b>	0 -17.1
36-47	35	<b>2.9</b>	0 -9.8	<b>5.7</b>	0-14.8	32	<b>6.3</b>	0 -16.2	<b>9.4</b>	1.5 -29.8
48-59	25	<b>0</b>	0 -2	<b>12</b>	0-26.7	27	<b>0</b>	0 -1.9	<b>3.7</b>	0-19.1
Age group n=248	Weight -for- age (%) Z score									
	Male					Female				
	% <- 3 SD			% <-2 SD		% <- 3 SD			% <- 2SD	
	n	%	95% CI	%	95% CI	n	%	95% CI	%	(95% CI)
Total:	<b>131</b>	<b>1.5</b>	0- 4	<b>9.2</b>	2.7-12.6	<b>117</b>	<b>1.7</b>	0 - 4.5	<b>10.3</b>	0 .2- 8.4
0-5						1	<b>0</b>	0 - 50	<b>0</b>	0 - 50
6-11	7	<b>0</b>	0 - 7.	<b>0</b>	0 -7.1	7	<b>0</b>	0 - 7.1	<b>0</b>	0 - 7.1
12-23	37	<b>0</b>	0 -1.4	<b>5.4</b>	0 - 14	30	<b>0</b>	0 -1.7	<b>10.0</b>	0 - 1.7
24-35	27	<b>3.7</b>	0 -12.7	<b>18.5</b>	0 -24.8	20	<b>0</b>	0 -2.5	<b>5.0</b>	0 - 17.1
36-47	35	<b>2.9</b>	0 - 9.8	<b>5.7</b>	0 -14.8	32	<b>6.3</b>	0 -16.2	<b>15.6</b>	0 - 21.4
48-59	25	<b>0</b>	0 - 2	<b>12.0</b>	0 -26.7	27	<b>0</b>	0 - 1.9	<b>7.4</b>	0 - 12.7
Age group n=248	Length/ height- for-age (%) Z score									
	Male					Female				
	% <- 3SD			%<- 2 SD		% <- 3S D			%<- 2 SD	
	n	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI
Total:	<b>131</b>	5.3	1.1-9.6	<b>33.6</b>	25.1- 42.1	<b>117</b>	<b>2.6</b>	0 -5.9	<b>29.9</b>	21.2 -38.6
0-5						1	<b>0</b>	0 -50	<b>0</b>	0 - 50
6-11	7	<b>4.3</b>	0 - 47.4	<b>14.3</b>	0 -47.4	7	<b>0</b>	0 -7.1	<b>28.6</b>	0 - 69.2
12-23	37	<b>8.1</b>	0 - 18.3	<b>45.9</b>	28.5- 63.4	30	<b>10</b>	0 -22.4	<b>46.7</b>	27.1- 66.2
24-35	27	<b>3.7</b>	0 - 12.7	<b>37</b>	17 - 57.1	20	<b>0</b>	0 -2.5	<b>40</b>	16 - 64
36-47	35	<b>2.9</b>	0 -9.8	<b>34.3</b>	17.1- 51.4	32	<b>0</b>	0 - 1.6	<b>21.9</b>	6 - 37.8
48-59	25	<b>4</b>	0 - 13.7	<b>16</b>	0 -32.4	27	<b>0</b>	0 -1.9	<b>11.1</b>	0 - 24.8

#### 4.14 Relationship between Respondents Socio - Demographic Characteristics and Wasting.

Table 12, presents the association between respondent age, marital status, occupation, education and child nutritional status on wasting, underweight and stunting. From the results there was no significant difference between the respondent's social demographic characteristics and child nutritional status. However, the result of the study showed that children who belonged to the youngest respondents aged between 21-29 years were stunted 53.7 % (n= 87), 27.2% (n=42) were underweight and 17.4%

(n=39) were wasted, compared to children from older respondents aged between 30-39 years and over 40 years. Children of the married respondents had a higher prevalence of stunting 60.9% (n=137) followed by underweight 29.3% (n=66) and wasting having the least 17.4% (n=39), (Table 12).

Caregivers who had attained primary and secondary education had a high proportion of children with stunting at 57.3% (n=67) and 63.4% (n=71) respectively, than underweight as 29.1% (n=34) and 30.4% (n=34) respectively. Wasting had the least prevalence in the same category was 17.1% (n=20) and 17.9 (n=20) respectively. Unemployed respondents had higher number of 63.8% (n=83), of children with stunting closely followed by underweight 27.7% (n=36) and the least being wasting representing 13.8 (n=18) compared to those who were on salary employment and businesses, (Table12).

The results on household income showed that households with income between Kenya shillings 5000-6000 had more children 63.1% (n=46) with stunting, 30.1% (n=22) underweight and 24.7% (n=18) with wasting than households with less income. There was significant difference ( $p=0.015$ ) between household income and stunting. The findings on household size showed households with 3-4 persons had highest number of 62.6 % (n=109) of children with stunting, 29.9% (n=52) underweight and 15.5% (n=27) wasting while household with 1-2 and 5 persons or more had fewer children with malnutrition, (Table 12).



**Table 12: Relationship between Socio-Demographic Characteristics and Child Nutritional Status (n=248)**

Variables	n	Wasting			Underweight			Stunting		
		n	%	p-value	n	%	p-value	n	%	p-value
<b>Respondents</b>										
<b>age</b>										
<20	25	3	27.3	<b>0.566</b>	5	45.5	<b>0.841</b>	15	54.4	<b>0.525</b>
>21-29	162	25	15.4		42	27.2		87	53.7	
30-39	70	11	15.7		21	30.0		44	62.9	
>40	5		2.9		2	40.0		3	60.0	
<b>Marital status</b>										
Married	225	39	17.4	<b>0.334</b>	66	29.3	<b>0.814</b>	137	60.9	<b>0.384</b>
Single/divorced widowed /separated	23	2	8.7		6	26.1		22	95.7	
<b>Education levels</b>										
Primary	117	20	17.1	<b>0.814</b>	34	29.1	<b>0.952</b>	67	57.3	<b>0.811</b>
Secondary	112	20	17.9		34	30.4		71	63.4	
College	16	1	6.3		4	25		9	56.3	
No education	3	0	0		0	0		2	66.7	
<b>Occupation</b>										
Unemployed/ House wives	130	18	13.8	<b>0.719</b>	36	27.7	<b>0.757</b>	83	63.8	<b>0.294</b>
Business	84	19	22.6		28	33.3		43	51.2	
Employed with salary	33	4	12.1		8	11.1		20	60.6	
Farmer	1	0	0		0	0		0	0	
<b>Household income</b>										
500-1400	20	0	0	<b>0.59</b>	3	4.5	<b>0.118</b>	8	40.0	<b>0.015</b>
1500-2000	25	2	5.1		11	16.7		18	72.0	
3000-4000	65	7	10.8		16	24.2		35	53.8	
5000-6000	73	18	24.7		22	30.1		46	63.1	
>6000	46	12	26.1		14	21.2		28	60.9	
<b>Household size</b>										
1-2	32	7	17.1	<b>0.490</b>	9	12.5	<b>0.988</b>	16	50.7	<b>0.783</b>
3-4	174	27	15.5		52	29.9		109	62.6	
>5	3	7	17.1		11	15.3		24	57.1	

#### 4.15 Relationship between Infant and Young Child Feeding Practices and Child Nutritional Status

Table 13 presents the association between breastfeeding; duration of breastfeeding; types of food first introduced; how child is served to eat and preference of food served to a child. From the results, there was no significant difference between

child nutritional status and food first introduced; how child is served to eat and preference of food served to child. However, there was higher number of stunted and underweight children who had stopped breastfeeding at the time of study 54.3% (n=95) and 24.6% (n=43) respectively than wasting 16.0% (n=28). From the results, there was significant difference between breast feeding and stunting ( $P=0.006$ ) and breast feeding and wasting, ( $p=0.028$ ), (Table 13).

Children who breast fed between 7-24 months had stunting of 60.0% (n=48) than those who breastfed for over 24 months 50.6% (n=44). However, underweight and wasting was lower among those breastfed for 7-24 months 32.5% (n=26) and 12.5% (n=10) respectively. There was significant difference between duration of breast feeding and stunting, ( $p=0.004$ ), (Table 13).

**Table 13: Relationship between Child Nutritional Status and Feeding Practices**

Variables	n	Wasting			underweight			Stunting		
		n	%	p-value	n	%	p-value	n	%	p-value
<b>Breastfeeding status (n=248)</b>										
Still B/F	73	13	17.8	<b>0.028</b>	29	38.7	<b>0.081</b>	54	74.0	<b>0.006</b>
Stopped B/F	175	28	16.0		43	24.6		95	54.3	
<b>Duration of B/F (n=170)</b>										
1-6 m	3	0	0	<b>0.640</b>	0	0	<b>0.237</b>	2	66.7	<b>0.004</b>
7-24m	80	10	12.5		26	32.5		48	60.0	
24 m and above	87	17	19.5		17	19.5		44	50.6	
<b>Initiation of B/F (n= 214)</b>										
1-5m	94	15	16.0	<b>0.198</b>	27	28.7	<b>0.671</b>	54	57.4	<b>0.287</b>
6m	85	18	21.2		27	31.8		55	64.7	
>7 months	35	4	10.8		8	12.9		18	51.4	
<b>Food first Introduced (n=240)</b>										
Milk/infant formula	72	8	11.1	<b>0.479</b>	27	37.5	<b>0.234</b>	43	59.3	<b>0.603</b>
Fruits juice/ water/glucose	43	7	16.3		14	20.3		28	65.1	
Cereal based gruel	104	22	21.2		25	24.0		62	59.6	
Mashed potatoes / ugali/ bananas/ pumpkins.	21	3	4.3		3	14.3		10	47.6	
<b>How child is served to eat,(n=240)</b>										
Individually	156	27	17.3	<b>0.268</b>	44	28.2	<b>0.351</b>	99	63.5	<b>0.246</b>
Together with family members	84	13	15.5		25	29.8		44	52.4	
<b>Preference of food service to child (n=215)</b>										
More to boy child	31	4	11.4	<b>0.268</b>	6	10.5	<b>0.783</b>	21	67.7	<b>0.057</b>
More to girl child	6	0	0		3	5.3		0	0	
Equally	178	31	17.4		48	27.0		99	55.6	

#### 4.16 Relationship between Child Illness, Health Seeking Behaviour and Child Nutritional Status

Table 14 presents the relationship between child illnesses; types of common illness; place of treatment, care giver left with a child when mother was sick or away and child nutritional status on wasting, underweight and stunting.

Among the children who were reported to have suffered an illness prior to the study, 59.4% (n=87) were stunted, 27.5% (n=41) were underweight and, 13.4% (n=20) were

wasted. The most common illness was common cold/pneumonia (URTI) with high number of children with stunting prevalence of (30.5) % (n=25), underweight 25.6% (n=21) and wasting of 12.2% (n=10). A high number of children among those left with family members when their mothers were sick or away were stunted 60.3% (n=114), 27.2% (n=52) were underweight and 16.9% (n=32) were wasted than those left with friends. From the results there was a significant difference between child illness and wasting  $p=0.04$ . The child care giver when mother was sick or away was significantly associated with wasting  $p=0.001$  while child common illnesses was significantly associated with underweight  $p=0.040$ , (Table 14).

**Table 14: Relationship between child illness, health seeking Behavior and Child Nutritional Status (n=248)**

Characteristics	n	number wasted			number underweight			number stunting		
		n	%	p-value	n	%	p-value	n	%	p-value
<b>Child illness</b>										
Sick	149	20	13.4	<b>0.041</b>	41	27.5	<b>0.214</b>	87	58.4	<b>0.479</b>
Not sick	99	20	20.2		31	31.3		62	62.6	
<b>Type of common illness</b>										
Pneumonia/common cold (URTI)	82	10	12.2	<b>0.656</b>	21	25.6	<b>0.04</b>	25	30.5	<b>0.756</b>
Diarrhea/Abdominal pain	26	4	15.4		6	23.0		18	69.0	
Malaria	32	5	15.6		10	31.3		18	56.3	
Others	9	1	9.5		4	44.4		7	77.7	
<b>Place of Treatment</b>										
Hospital	121	16	13.2	<b>0.848</b>	16	13.2	<b>0.988</b>	73	60.3	<b>0.548</b>
Chemist	25	4	16.0		4	16.0		11	44	
No treatment	3	1	4.8		1	33.3		1	33.3	
<b>Who was left with a child when Mother is Sick or away</b>										
Family members	189	32	16.9	<b>0.001</b>	52	27.5	<b>0.128</b>	114	60.3	<b>0.924</b>
Friends/house help	46	4	8.7		46	28.3		28	60.9	
Day care center	13	5	38.5		7	29.0		7	53.8	

#### 4.17 Relationship between Immunization, Growth Monitoring and Child Nutritional Status.

Table 15 presents the relationship between immunization / growth monitoring and child nutritional status. The findings showed that among the children who were fully immunized at the time of study 58.9% (n=139) were stunted, 28.4 % 4 (n=67) were underweight and 16.9% (n=40) were wasted. None of the children who were not fully immunized was malnourished. High proportion of stunting 57.9% (n=124) was found among children who were weighed at birth with birth weight of  $\geq 2.5$ kg compared to underweight 29.0 % (n=62) and wasting 17.8% (n=38) while those children who weighed  $< 2.5$ kg at birth had stunting prevalence of 70.0% (n=14), and wasting of 10.0% (n=2). There was a significant difference between child birth weight and stunting,  $p=0.015$ , (Table 15).

**Table 15: Immunizations/Growth Monitoring and Child Nutrition Status (n=248)**

Immunization/ Growth monitoring	n	Wasting			Underweight			Stunting		
		n	%	p-value	n	%	p-value	n	%	p-value
<b>Fully immunized</b>										
Yes	236	40	16.9	<b>0.082</b>	67	28.4	<b>0.191</b>	139	58.9	<b>0.117</b>
No	12	1	8.0		0	0		10	83.3	
<b>What was the birth weight?</b>										
<2.5kg	20	2	10.0	<b>0.829</b>	0	0	<b>0.890</b>	14	70.0	<b>0.015</b>
$\geq 2.5$ kg	21	38	17.8		62	29.0		124	57.9	
Do not know	14	1	7.1		0	0		11	78.6	

#### 4.18 Relationship between Nutritional Status of Children and the Household Water and Hygiene Practices

Table 16 shows the relationships between source of water; water purification; type and use of toilets; refuse disposal in relation to child nutritional status. The results indicated that there was no significant difference between water/hygiene practices and the child nutritional status. However findings of the study showed that households

that obtained water from the tap had a higher number of children with stunting 60.3% (n=149), underweight 29.1% (72) and wasting of 12.5% n (n=31). Among the respondents caregivers who reported boiling drinking water, a high number of children were stunted 60.7% (n=105) with underweight of 28.7% (n=49) and wasting of 17.1% (n=30) while respondents who reported using chemicals to purify drinking water 54.1% (n=20) children were stunted, 29.7% (n=11) underweight and 16.2% (n=6) wasted. Respondents who reported doing nothing to drinking water had 60% (n=21) children with stunting, 28.6% (n=10) with underweight and 14.3% (n=5) children with wasting. *(NB: Due to small numbers on use and type of toilets p value was not computed for the nutritional status relationship association).* (Table 16).

Higher prevalence of stunting 60.9% (n=148) children were from households which had access and used CDF /pit latrines compared to underweight of 29.6% (n=72) and wasting of 16.9% (n=41). None of the children were malnourished among the households which used other methods for defecation, (Table 16).

The results of the refuse disposal showed high number 56.0% (n=139) of respondents who disposed their refuse hygienically through burning, burying and putting in dustbins. However 44.0 % (n=109) disposed their refuse poorly by throwing in the dumping site and in the bush. (Table 16).

**Table 16: Relationship between Sanitation, Hygiene and Child Nutrition Status (n=248)**

Variables	n	Wasting			Underweight			Stunting		
		n	%	p-value	n	%	p-value	n	%	p-value
<b>Source of Water</b>										
Tap water	247	31	12.5	<b>0.978</b>	72	29.1	<b>0.938</b>	149	60.3	<b>0.680</b>
River	1	-	-		0	0		0		
<b>Water Treatment</b>										
Boil	210	30	17.1	<b>0.99.</b>	49	28.3	<b>0.453</b>	105	60.7	<b>0.792</b>
Chemicals	37	6	16.2		11	29.7		20	54.1	
Do nothing to water	35	5	14.3		10	28.6		21	60.0	
Filter	3	5	14.3		3	100				
<b>Use of Toilet</b>										
CDF/Pit Latrines	243	41	16.9		72	29.6		148	60.9	
Flying toilets	1	0	0		0	0		0	0	
Closet	3	0	0		0	0		0	0	
<b>Refuse disposal</b>										
Burning/ throw in dust bins	139	26	18.7	<b>0.357</b>	39	28.1	<b>0.803</b>	88	63.3	<b>0.232</b>
Throw in bush, through in dumping site	109	15	13.8		31	28.4		61	63.3	

Note: Due to small numbers on use and type of toilets p value was not computed for the nutritional status association.

#### **4.19 Relationship between Use of Insecticide Treated Mosquito Nets and Child Nutritional Status**

Table 17 shows the relationships between insecticides treated nets and child nutritional status. The findings showed no significant difference between child nutritional status and the use of ITN. However results of the study indicated that among the children who slept under ITN had 52.2% (n=72) were stunted, 30.4% (n=42) were underweight and 30.0% (n=25) were wasted. Those who did not sleep under ITN, 60.9% (n=67) had stunting, 27.3% (n=30) were underweight and 12.0% (n=16) had wasting, (Table 17).

**Table 17: Use of Insecticide Treated Mosquito Nets (n=248)**

Variables	n	Wasting			Underweight			Stunting		
		n	%	p-value	n	%	p-value	n	%	p-value
<b>Sleeping under ITN</b>										
Yes	138	25	30.0	<b>0.794</b>	42	30.4	<b>0.836</b>	72	52.2	<b>0.527</b>
No	110	16	12.0		30	27.3		67	60.9	
<b>Reason for not sleeping under ITN</b>										
Do not have nets	60	52	-	<b>0.833</b>	12	20	<b>0.833</b>	33	55	<b>0.199</b>
No mosquitoes	1	1	17		-	-				
No reason	49	41	43.6		17	34.7		33	67.3	

#### 4.20 Relationship between Child Nutritional Status and the Psychosocial Practices

Table 18: shows relationship between psychosocial care practices and child nutritional status. The findings indicated that children who were not going to school had higher proportion of stunting, underweight and wasting 71.1% (n=101) and 37.3% (n=53) 17.6% (n=25) respectively compared to school going children who had least proportion with stunting prevalence of 45.3% (n=48) underweight of 17.9% (n=19) and wasting of 15.1% (n=16) respectively. The respondents who had time to communicate with their children, majority 76.6% (n=190) communicated to their children on different issues affecting them and over half 23.4% (n=58) did not communicate to their children. Test of association showed a significant difference between school going children and stunting p=0.001 and underweight p= 0.005, (Table 18).



**Table 18: Relationship between Child Nutritional Status and Psychological Care Practices**

Variables	n	Wasting			Underweight			Stunting		
		n	%	p-value	n	%	p-value	n	%	p-value
<b>Child going to school</b>										
Yes	106	16	15.1	<b>0.381</b>	19	17.9	<b>0.005</b>	48	45.3	<b>0.001</b>
No	142	25	17.6		53	37.3		101	71.1	
<b>Issues talked to child</b>				<b>0.074</b>			<b>0.240</b>			<b>0.105</b>
Sick/emotional stress	47	3	6.4		10	21.3		17	36.2	
Harmful things at school	4	3	75		0	0		1	25.0	
Performance	23	3	13.0		7	30.4		4	17.4	
Discipline/ good character	28	3	10.7		4	14.3		5	17.9	
Encouragement to eat	24	7	29.2		8	33.3		7	29.2	
Personal hygiene	27	4	14.8		11	40.7		7	25.9	
Playing with a child	27	9	34.6	7	26.9	7	26.9			

## **CHAPTER V: DISCUSSION**

### **5.1 Respondents/ Caregiver Social Demographic characteristics**

#### **Maternal Age**

Over half of the caregivers age was between (21- 29) years of age reflecting a relatively young population within the reproductive age in the study area. This kind of age distribution was expected since only respondents/ caregivers with children aged 0-59 months were included and this study confirms this position. These age category were comparable with Kipruto study at Korogocho which found caregivers within the reproductive age of 24 years. The study found no significant difference between maternal age and nutritional status of children. This was similar to previous studies done in Uganda and in Nairobi that found no significant difference between maternal age and nutritional status of children, (Efata, 2000 and Ibtisam, 1998). Stunting prevalence was high among children of younger mothers than older mothers. This was similar to a study done in Mbarara slums in Uganda, (Efata, 2000). This later findings could be attributed to the fact that older mothers have more and better experience in child care practices than their young counterparts.

#### **Marital Status**

A higher proportion of respondents /caregivers were young, married and living with partners. The findings were higher than the national findings (51%) of caregivers who were married. Implying that majority of children in this study sample were living with both parents. This is in line with studies conducted in Nairobi, (Murage et al, 2011) which indicated that a high proportion of married respondents. The high marriage status reflected in both studies may be due to school dropout and poverty in the slum settlements, subsequently leading to early marriage.

Malnutrition was found to be higher among children of respondents who were married than those who were single, divorced, separated or widowed contrary to a study conducted by Mehangye,1999) which found high malnutrition rate among children of single parents than married ones. Besides, the high level of malnutrition among study children, there was no significant association between marital status and child nutritional status. These findings were unexpected and can be explained by the fact

that majority of the respondents were married or living with a partner. The findings were similar to a study done in Uganda (Efata, 2000) and contrary to findings of a study done among the under five slum children of Dhaka that found a significant difference between marital status and nutritional status of children, (Rahman et al, 2013).

### **Maternal Education**

In the current findings, the respondents/ caregivers who had attained primary, secondary and college education had children with higher prevalence of stunting than underweight. These findings were similar to findings from a study done in Nairobi slums, (Abuya et al, 2012) and contrary to KDHS, 2008/09 that found respondents with secondary education having the lowest levels of stunting and underweight children. Also contrary to study findings from Bolivia, (Frost et al, 2005), Jamaica, (Handa, 1999) and Kenya, (Kabubo, et al 2008). Research by Abuya in Korogocho showed a strong linkage between maternal education and children's health.

Acute malnutrition rate was noted to be similar for both those who attained primary and secondary education with college having the least. This was contrary to the KDHS 2008/09 findings which showed that respondents /caregivers with no education had children with the highest levels of wasting than those with any form of education. Low education level explains why majority of the respondents/caregivers are unemployed and have low income levels experienced at the southland slum. In general, children born to educated women suffer less from malnutrition, because any formal education of mothers directly transfers knowledge to future mothers. The literacy and skills that women acquire in school enhance their ability to recognize illness and nutritional problems and seek help and treatment for their children, and able to read instructions and apply what they read. educated women are more likely to get steadier and higher paying jobs with higher income and to live in better neighborhoods, which have a positive influence on child health and nutrition, (Abuya, Ciera and Murage, 2012).

### **Maternal Occupation**

Unemployed respondents/caregivers had higher proportion Stunted children compared to those who were employed and on businesses. However there was no significant

association between occupation and the nutritional status of the children. This is consistent with study done in Kibera slums Nairobi, (Ibtisam,1998) and contrary to a study done in lower Nyakach Kisumu district (Opiyo, 1993) as well as studies carried out in urban slums in India and Dhaka, (Vyas, et al, 2011) and (Rahman et al, 2013). The main source of income for households in the informal settlements is low paying casual and unstable jobs in the formal and informal sector and petty trades as it is supported by the FGD statements that they get most of their income from “*vibarua*),*biashara ya kuuza mitumba na mboga, nakutegemea wazee* ”, (business of selling second hand clothes and vegetables and getting help from their husbands). This can be explained by the fact that unemployed mothers earn no income and depend solely on either their husbands, relatives and others friends for their daily living, making the household food security non reliable, unlike when mothers have income of their own to control and translate it to improving nutritional security of the households, as more of it is availed for food purchased, (Chaudhury, 1991).

### **Household Income**

In the current study, households with income at least Kenya shillings five thousand and above had children with stunting. This was not expected but could be explained by the fact that the caregivers were probably working away from home hence spent less time on care for their children. This finding is similar to a study by Yuko Ada that found significant association between household with high income and stunting, (YukoTada, 2001) and contrary to a survey done at Mukuru slums, by Katilu and Kabuki which found children with stunting among the households with low income, (Katilu and Kabuki 2008).

### **The Household Size**

The study findings indicated that household size was lower than the national average household size of (4.2 persons) and also lower than the findings of a study by Kipruto in one of Nairobi slums Korogocho which found household size of (4.6 persons), (Kipruto, 2013). However, this does not concur with the KDHS, 2008/09 which recommended the standard of (3.1 persons) in urban areas. The study findings showed households with (3-4) persons had high proportion of children with stunting. This is contrary to a study done in Uganda which indicated higher stunting levels

(39.2%) in smaller household than the larger household (27.7%), (Mehagnye, 1999). Household size has implications on food availability and consumption patterns of that particular household including access to social and economic support and also may have implications on the labor availability, (Mwandime, 1995).

## **5.2 Nutritional Status of the Study Children**

The finding on moderate and severe wasting in the current study were comparable to a similar study conducted in Kibera whose findings for moderate wasting was (2.6%) and (0.6%) for severe wasting, (Olack, 2011), but lower than KDHS prevalence of wasting (7.0%) moderate wasting and (2%) severe wasting. (KDHS, 2008/09). Moderate and severe Underweight prevalence was also found lower than the national average of (16%) and (4%) respectively, (KDHS2008/09). However, the findings were comparable to a study conducted in Kibera by Olack where moderate underweight was (11.8%) and severe underweight was (3.1%). In the current study, severe stunting proportion among children was lower than the national average of 35%, and moderate stunting of (14%), (KDHS, 2008/09). The current findings were also lower than the study findings by (Olack, 2011) where severe stunting was (47%) and moderate stunting (24.4%).

Older children are not likely to have wasting like the young age group, however, high prevalence of wasting was found in older children aged 23-35 months and 48-59 months in the current study. This is similar to a study by Olack 2008 which found children with wasting in these age groups, and also similar to a study done in rural Ghana that showed children with wasting in the same age category. These findings could have been contributed by recent illness without sufficient dietary intake as a result of food shortage experienced by the dwellers of southland slum and feeding practices or other events.

Underweight was found higher among the female children than male children in the current study. This is in line with a study by UNICEF which found underweight most common among the female children, (UNICEF, 2009). The under nutrition among the female children could be as a result of food preference, serving more food in favour of a male child. This could also be as a result of recurrent illness suppressing

child's appetite leading to underweight of a child, or nutritional deficiency subjecting a child to susceptibility to infections.

There was higher stunting prevalence among the male children than female children in the current study. This is comparable to a study by Olack which found stunting most common in male children. Also similar to a study done in Sub-Saharan Africa that showed the under five male children are more likely to become stunted than their female counterparts, (Engebretsen et al, 2007). Stunting among male children could be linked to the time of complementary feeding introduced to child's diet.

Young children are not likely to be stunted like the older children. Stunting prevalence was found higher among the younger children.. This is similar to a study done in India in which stunting was most commonly found in these age groups, (Mital et al, 2007). These results could be attributed to poor complementary feeding practices as a result of inadequate energy and protein intake.

These results implied that malnutrition has not changed much in the informal settlements with chronic malnutrition more pronounced. Chronic malnutrition is an indication of low height for age which reflects long-term inadequate food intake, leading to limited optimal child growth and development and affecting long term performance at both school and work. These results also highlight the long-term inadequate food intake experienced by the urban slum dwellers as a consequence of chronic food insecurity, a poor health environment and poor care and feeding practices. This is evidenced by the fact that after 36 months, stunting is resistant to intervention, (Bhutta et al 2008). In Kenya, more than one third of the children are stunted, which is equivalent to 2 million children under fives, (KDHS, 2008/9).

### **5.3 Childcare Practices**

This section presents the highlights on infant and young child feeding practices. The optimal infant and young child feeding practices are crucial to improving the health and nutritional status of children. Adequate complementary feeding of children from 6 months onwards is particularly important for growth development and the prevention of under nutrition, (UNICEF 2008).

## **Breast Feeding**

High proportion of children had stopped breastfeeding compared to those who were still breastfeeding. This is however, contrary to a study done in Korogocho and Viwandani slums of Nairobi that found (95%) children still breastfeeding at the time of the study, (Muchina and Waithaka, 2010). The study was also contrary to a study done in Uganda by Engebretsen that found most children still breastfeeding at the time of study, (Engebretsen et al, 2007). Beside the study findings establishing the association between breast feeding with stunting, proportion of breastfeeding duration among children 6 months and below was very low (1.2%). Children breast fed for over 24 months and between 7-23 months was Slightly more than a quarter (35.8%) and (32.9%). This compares well with WHO recommended duration time of 21months for any breastfeeding among Kenyan children. This gave an impression that children stop breastfeeding early and others later in life as expressed by some mothers during the FGD, that: *“children should be given other foods at six months”*. *“at 3 months”* *“it can be done with mashed fruit when the infant is 3 days old, if is a male child because male children do not get satisfied on breast milk alone”* *“if you go back to work, you have to stop breastfeeding”* *“if the baby is not getting enough breast milk you can give other foods to the child”*.

## **Complementary Feeding**

Higher proportion (43.9%) of children was introduced on complementary feeding before 6 months compared to those initiated after 6 month. Porridge (with unknown composition) was found to be the most popular first complementary food given to children in the current study. This findings is similar to a study by (Oniango, Mutuku and Malaba, 2003) that found mothers give porridge, mashed potatoes, bananas, yams, cow’s milk and goat’s milk as first foods, and also similar to studies done in Korogocho and Viwandani slums of Nairobi that found porridge, water and juices to be the most common complementary foods given to infants, (Murage et al, 2011).

## **Gender Preference**

The study findings showed no significant difference between gender preference on food service and nutritional status. Although the study was conducted in an urban slum setting where most people irrespective of where they are, have risen above

gender preference on food service. Higher proportions of children were served food equally, but still, male children were served more food than girl child according to the findings. This is supported by a study done in India and Pakistani that found gender differentials perpetuated by women themselves during breastfeeding and even during supplementation stages. These mothers served their son first, with the best foods and herself with her daughters last, with little food at the expense of her own and her daughters' health and nutritional wellbeing, (Haddad and Lindatorn, 2008). Other studies done in and china have attributed to the advantage enjoyed by the male child to infant rearing practices that favour the male child like giving more food and education. (Griffiths et al, 2004). Complementary feeding and the gender preference according to Forthun, indicated that a well to do families have better overall health and wellbeing than poorly families which are at increased risk of poor nutritional status,(Forthun, 2012).

#### **5.4 Child Morbidity and Health Seeking Behavior**

##### **Child Morbidity**

About sixty percent (60.1%) of the study children were found to have suffered an illness two weeks prior to the study. This was in line with studies by Magadi, Taffa and Chepngeno that found a fairly large proportion (66%) of children ill with URTI and fever, (Magadi, 2004, Taffa and Chepngeno, 2005). The common childhood illness reported compares well with the major childhood illness reported in Kenya, (KDHS, 2008/09) and also compares well with the UNICEF report, that indicated acute upper respiratory tract infections as one of the leading causes of childhood morbidity and mortality throughout the world, (UNICEF, 2008). Child illness was found associated to underweight in the current study. This was similar to a study by (Rodriguez et al, 2011) which found illness associated with underweight. Child illness (morbidity) leads to depletion of body nutrient stores through increased metabolism from fever, loss of appetite, reduced food and nutrient intake, leading to demand for nutrients intake, (IBFAN, 2010). The high prevalence of upper respiratory tract infections found in the informal settlements could be attributed to crowded and housing congestion in the southland informal settlement. The prevalence of malaria among the study children was also prominent and this could largely be attributed to poor environmental management, such as dumping of garbage and the stagnation of water which favours



mosquito breeding. Among the children who were reportedly ill, a close to one hundred percent (98%) sought health care with majority taking their children to hospital for treatment. This concurs with KDHS (2008/2009) that sick children sort treatment at the health facility. About (81.2%) who were sick still (16.8%) bought drugs from the chemists. This is in line with study by (Taffa 2005) where 60.5% and (KDHS2008/09) 49% bought drugs and oral hydration to their children due to financial constraints and unaffordable medical consultations.

### **Immunization**

The study findings showed that nearly all the children were fully immunized for their age. This study found no significant difference between immunization coverage and the child nutritional status. This is consistent with the most recent KDHS findings which showed high percentage of immunization coverage, (from 57% in 2003 to 77% in 2008/9). Also the findings were consistent with the Preliminary results from the Concern Baseline Survey done in Mathare valley, by Lilly Schofield, (2009) that found high immunization coverage in the slums. The study was contrary to a study done in Korogosho, (Magadi, (2004) which indicated that immunization for the Nairobi slum children compare rather poorly with the rest of the Kenyan population, including the rural areas. Child health is a critical issue in the slums, as manifested by the low proportions of immunization coverage. This is proven as a tool for controlling and even eradicating viral diseases and the high prevalence of common childhood illnesses, (Magadi 2004).

## **5.5 Weight at Birth/ Growth Monitoring**

### **Weight at Birth**

Over ninety percent of the children weighed at birth had weight  $\geq 2.5$  kg in the current study. These findings compares well with KDHS findings of children in Nairobi County (94.0%) who had similar weight levels of  $\geq 2.5$  kg at birth. However, there was significant difference between birth weight of children and stunting. The findings are similar to studies done in Korogocho and Viwandani slums of Nairobi by Abuya that found birth weight of children to have an influence on nutritional status of children, (Abuya, et al, 2012). The findings also were contrary to a study conducted in Dar salaam among children attending maternal and child health clinics that found that

children who weighed <2.5 kg at birth had positive association with child nutritional status, (Matee et al, 1997). In sub-Saharan Africa, birth weight is strongly associated with stunting and the association has been well documented and understood, (Hien and Kam, 2008).

### **Growth Monitoring**

Slightly more than half (56.9%) of the children were taken for growth monitoring and only 43.1% were not taken for growth monitoring. Children born with weight less than 2.5 kg require monthly growth monitoring which is recognized as an effective means of detecting early growth faltering and providing a critical opportunity for taking the preventive actions needed, (Brown, 1990). A child's birth weight and size are important indicators of a child vulnerability to childhood illness and chance of survival, (KDHS, 2008/09).

### **5.6 Use of Insecticide Treated Mosquito Nets**

Half of the study children used the insecticide treated mosquito nets as they slept. This compares well with KDHS report that (51%) of children under-five years were sleeping under insecticide treated mosquito net, (KDHS 2008/09). The findings also were comparable to a study done in Iganga District Eastern Uganda where consistency of sleeping in ITNs was relatively high (73 percent), (Kagaha, 2008). It is important to know that the use of ITNs plays a primary role in global campaigns to reduce (roll back) malaria in tropical Africa, (Gu and Novak, 2009). ITNs influence malaria transmission by killing and diverting mosquitoes away from the net user (vector), (Stone, 2012). Considerable effort has been invested in the procurement and distribution of ITNs for malaria control in Kenya, (KDHS, 2008/09).

### **5.7 Water, Sanitation and Hygiene Practices**

#### **Water and Sanitation**

Most (99%) of the households were lucky to have provision of piped water from city council, Nairobi County. This is contrary to a study by World Bank in Nairobi slums which showed that (60% and 93%) of households depended on water vendors for their water supply, (World Bank 2006). Over half of the caregivers boiled their

drinking water. The proportion was higher than the KDHS 38% of those who boiled water for drinking. Although there was no significant difference between drinking water treatment and purification was noted. This could be attributed to the fact that southland informal settlement is lucky to piped water and as is indicated in the report by Bartlett, poor urban communities around the world, thousands of children die every day from preventable diseases related to the inadequate provision of water and sanitation. (Bartlett,2003). The water and sanitation services of the informal settlements in Nairobi are a major public health and livelihood problem. The high cost of water generally 4-5 times the price per liter charged by Nairobi Water and Sewerages Company restricts the amount of water used by a household, increasing the risk of water borne diseases and poor hygiene standards, (Umande Trust 2006).

### **5.8 Faecal Disposal**

Higher proportion (98%) of the southland slum dwellers had access to lavatory. In the study area, higher proportion of toilets (97.7%) were shared public facilities (pit latrines) often financed by CDF and managed by community groups. The study found no relationship between faecal disposal and nutritional status of children. This study was contrary a study conducted in Ethiopia which indicated that poor environmental sanitation constitute a threat to children's nutritional security in urban slums, (Girma and Genebo, 2002). Where sanitation is poor, people defecate in the open, or into plastic bags or papers and thrown out with the household garbage. Excreta can accumulate rapidly in open areas and on garbage piles; (flying toilets) uncollected garbage is frequently dumped in drainage ways, which quickly clog drainage way. A study by Bartlett, indicated that when waste water and storm water cannot be easily drained, flooding spreads waste and excreta widely throughout the surrounding area, (Bartlett, 2003). This means that inadequate drainage and waste collection pose problems, mostly to children. Children tend to play wherever there are interesting opportunities for exploration. Many times children may be drawn to wade or play in standing water and drainage ditches or to scavenge in piles of garbage.

### **5.9 Psychosocial Care**

In the current study the children attending school (45.3%) were malnourished with stunting. This could be due to long day in school playing and may be with little or

nothing to eat. About caregivers who talked to their children (76.6%) of them talked over issues affecting children at school. This is in line with Carvalhaes and Benicio study which found that talking to a child is vital. It increases emotional stimulation to a child and chance of preventing malnutrition, because children would not improve with only food, but also need attention, (Carvalhaes and Benicio, 2006). Small proportion of caregivers (14.5%) played with their children in the current study. This was in line with a study done by Delange, that Psychosocial care is a practice of mother-child bond best in early life of a child when cognitive behavioral, emotions and social behaviors of a child are developing, (Delange, 2010). Also supported by Ginsburg finding which indicated that mothers who play with their children as part of a child psychosocial care creates a good measure of mother and child bonding for growth and developmental stimulation, (Ginsburg, 2007). Parents should be involved as far as possible playing with their children. Playing with a child is important for emotional stimulation, building confidence, socialization and behavior of a child. The quality of psychosocial care is often determined by the interaction between mother and child. A protective effect on nutritional status is seen by talking to the child, storytelling, hugging the child, having a safe and attractive environment and encouraging independence, (Carvalhaes and Benicio, 2006).

## **CHAPTER VI: CONCLUSIONS AND RECOMMEDATIONS**

This section presents the conclusions and recommendations of the study on prevalence of malnutrition and related factors among children aged 0-59 months at the Southland Informal Settlement, Nairobi County.

### **Conclusions**

The study revealed a high prevalence of malnutrition in Southland Informal Settlement with chronic malnutrition more pronounced. Majority of the respondents were young, with low education levels and with no formal employment. This could have greatly contributed to low household income which was significantly associated with stunting.

The prevalence of stunting was the most prominent in children age 12-35 months. Male children were the most vulnerable. Underweight was common among female children aged 24-47 months most affected and wasting was common among children aged 24-59 months with the male children most affected.

Stunting was significantly associated with weight at birth; breast feeding and duration of breast feeding; how food was served to a child and the household income. Breast breastfeeding, alternative caregiver when mother is sick / away was associated with wasting and common childhood illness with underweight. All these factors seemed to have contributed to poor nutritional status of the study children at the southland informal settlement.

Sanitation and unhygienic practices were not associated with child nutritional status. However the general environmental sanitation was poor with some households having dirty water drainage close by and households to latrine ratio exceeding ten households in the study area increase the risk of water borne diseases and poor hygiene standards. This is evidenced by the number of children who had diarrhoea (n=28) during the study. Poor sanitation and unhygienic practices and strained latrine ratio could have contributed to high number of malnutrition in the study area.

## **Recommendations**

There is need for empowering caregivers economically through income generating activities and the finance for the needy credits facilities, so that they can form saving and loan groups. These will strengthen their resources base to meet the health and the nutritional needs of the children.

The Nairobi County should support Kenya Slum Upgrading Programs, (KENSUP) aimed to improving living standards of slum dwellers especially children with a view to improve child welfare through (i) Nutrition and health education and counseling; (ii) Integrated management of childhood illnesses (IMCI); (iii) Improvement of quality for integrated management of acute malnutrition (IMAM); and (iv) Continuation of surveillance to monitor the child nutrition, health and food security situation.

The CHWS should be empowered to promote optimal Infant and Young Child Feeding Practices as recommended by WHO/UNICEF and enhanced by Ministry of Health of Kenya. In addition CHWs should work hand in hand with southland slum community and address good hygiene practices and appropriate sanitation for children under five years through the Ministry. This will help reduce morbidity such as common cold, diarrhoea and malaria which was common illnesses reported among the study children.

It will also be important to involve the administration, the (chief) and other people who oversee the welfare of the slum dwellers to ensure required sanitation facilities are put in place and where need be construction of new facilities to improve hygiene practices and increase the household to latrine ratio. In addition they should request for plastic containers for each plot which is emptied at affordable fee to enhance hygiene practices and keep the environment clean. The Southland Slum Settlement with a high population of over 16,000 people had a total of 243 pit latrines during the time of the study.

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## Appendix 1 Questionnaire

### Part 1: Socio-economic Characteristics

1. Age of the respondent\_\_\_\_\_
2. Marital Status
  1. Married 2. Single, Divorced, Separated, Widowed
3. Mother's/care giver's level of education
  1. No education 2. Primary 3. Secondary 4. College
4. Occupation of the Mother /care giver
  1. Unemployed/housewives. 2. Business. 3. Salaried
  4. Others (Specify)\_\_\_\_\_
5. Household Size (persons) 1. 1- 2 2. 3 - 4 3. 5 above
6. What is your approximate household monthly income from all sources?
  1. 500-1400 2. 1500-2000 3. 3000-4000
  4. 5000-6000 5. Other (Specify)\_\_\_\_\_

### Part 2: Child demographic Characteristics

7. Child's DOB\_\_\_\_\_ Childs age in months\_\_\_\_\_ Sex male\_\_\_\_\_ female\_\_\_\_
8. The birth spacing between this child and the immediate older child in\_\_\_\_\_Months.

### Part 3: Child's History of Illness and care practices

9. Has the child been sick in the past one- month? 1. Yes 2. No  
If yes, what was the child suffering from? ( List)
10. If the child was sick, where did you seek treatment?
  1. Hospital 2. Bought drug (chemist or drug store)
  3. Other (specify\_\_\_\_\_)

11. Are there foods that are withheld from the child during diarrhea or other illness?

1. Yes      2. No

If yes, which foods do you withhold?

1. Milk and milk products   2. Fruits / fruit Juices      3. Porridge

4. Foods cooked with oil   5. Other (specify \_\_\_\_\_)

#### **Part 4: Immunization/ Growth Monitoring**

12. Is there an immunization record or card for your last child?

1. Yes, seen the card      2. Yes, not seen the card      3. No

13. Please check for the completeness of the immunizations listed below on the card and tick accordingly. If the card or book is not available, ask the mother whether the child has received the following immunization and put the answer in the spaces provided.

<b>Immunization</b>	<b>Yes (1) Given</b>	<b>No. (2) Not given</b>	<b>Do not know</b>
BCG			
OPV 0			
OPV 1			
OPV 2			
OPV 3			
DPT 1			
DPT 2			
DPT 3			
Measles			
Fully Immunized			

Any others? Specify \_\_\_\_\_

14. From the above immunization information, is the child fully immunized for age?

1. Yes      2. No

15. Was your child weighed at birth?

1. Yes      2. No      3. Don't know

If yes how much did the child weigh in kg \_\_\_\_\_



16. Do you take the child every month for growth monitoring and promotion at the health facility?

1. Yes                      2.No

If not, what is the reason\_\_\_\_\_?

17. Does your child sleep under an insecticide treated net?

1. Yes                      2. No                      3. Do not have a net.

4. Other (specify)\_\_\_\_\_                      If not why?\_\_\_\_\_

### **Part 5: Feeding Practices**

18. Is your child still breastfeeding?

1. Yes                      2. No

19. How long do you want to breastfeed this child? \_\_\_\_\_ (Months)                      2. Not breast feeding

20. Have you started giving your child other foods apart from breast milk

1. Yes                      2. No

If yes, at what age did you begin giving other foods? 1. 1-5 months

2. 6 months                      3. 7 months and above

21. Which food did you first introduce to your child? (*Choose only one*)

1. Milk/ Milk products                      2. Fruit juices / glucose water                      3. Cereal based gruel (porridge)

4. Other (specify)\_\_\_\_\_

22. How do you prepare vegetables for cooking?

1. Washing before Cutting                      2. Cut before washing

3. Other (specify)\_\_\_\_\_

23. How is the child served to eat?

1. Individually                      2. Together with family member

Others\_\_\_\_\_

24. Whom do you prefer serving more food to eat?

1. More to boy child                      2. More to girl child                      3. Equally                      4. Don't know

25. Who takes care of the child when you are sick or away from home?

1. Family members’
2. Friend/house helps
3. Leave at local day care centre

**Part 6: Household water and hygiene practices**

26. (a) Where do you get water for domestic use?

1. River
2. Tap

27. What do you do to the water before drinking?

1. Boil
2. Filter
3. Use of chemicals
4. Nothing
5. Other (specify\_\_\_\_\_)

**Part 7: Sanitation and hygiene practices**

28. What type of toilet/latrines are available where you stay

1. Pit /CDF Latrine
2. Closet
3. Potty
4. Flying Toilet
5. Other (specify)\_\_\_\_\_

29. How do you dispose refuse at home?

1. Burn, Bury or put in the dust bin
2. Throw in the bush, throw at the dumping site

**Part 8: Anthropometry**

30. Measure and record the weight and height of the child aged under fives that the mother has consented (*if the mother has two children under fives, measure both*)

Measurement	First Child		Second Child	
	1 <sup>st</sup> reading	2nd reading	1 <sup>st</sup> reading	2nd reading
Child Height (cm)				
Child Weight (Kg)				

**Part 9: Psychosocial support**

31. Does your child go to school? 1. Yes 2. No

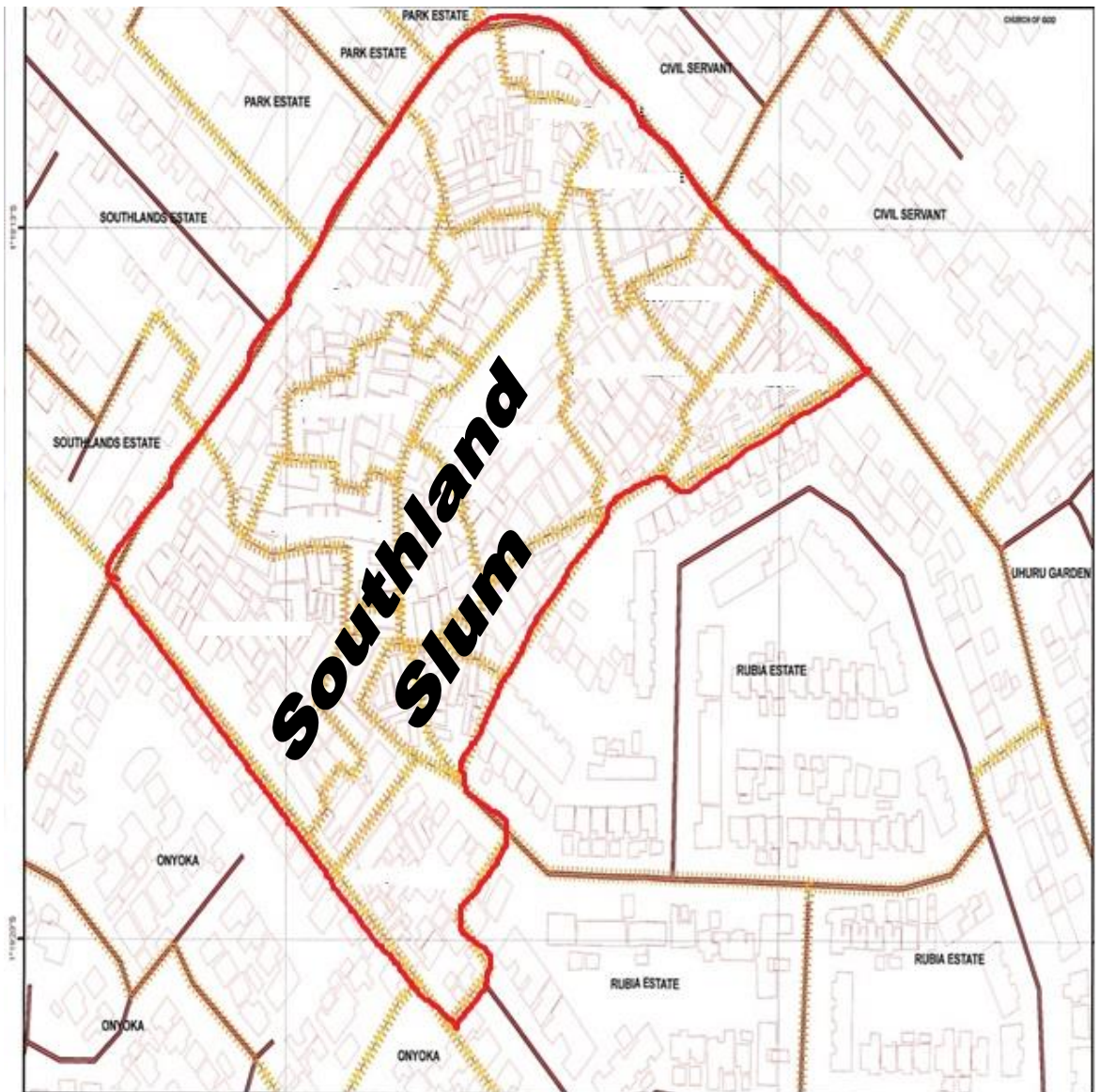
32. Do you talk with your child on any issues that could be affecting him/her? Yes/No? If yes specify\_\_\_\_\_

## **Part 10: Group discussions Guides**

1. At what age do mothers stop breast feeding?
2. What makes mothers stop breastfeeding their children?
3. What are the practices (if any) do mothers have in the context of infant and young child feeding ?
4. How do you prepare vegetables before cooking?
5. When do mothers introduce complementary foods to their children?
6. Who are the alternative caregivers when mothers are sick or away?
7. Do mothers make arrangements on feeding children when they are away?
8. What are the common health problems children get?
9. Does mother's breast feed children when they are sick or having diarrhoea?
10. What food do mothers commonly withhold when children have diarrhoea / ill?
11. Is there any special food given to children when ill or having diarrhoea?
12. Where do mothers go for help when the children are sick?
13. Where do mothers get general information about child care?
14. Do they practice what they are told?
15. What is the common source of household income?
16. What do you do before and after visiting the toilet

Thank you for participating, (*Shukranikwakushirikikwako*).

## Appendix 2: Map of the Study Site Southland Informal Settlement



### **Appendix 3: Consent Form Explanation / Form for Participation in the Study.**

**Study Title:** Child Care Practices and nutritional Status of Under-five year old Children in Southland Informal Settlement.

My name is Grace Kibua, a post-graduate student in the School of Public Health, College of Health Sciences, University of Nairobi. I would like you to participate in a research study whose aim is to assess childcare practices and the nutritional status of children under five Years old at the Southerland informal settlement

#### **Purpose**

The Purpose of the study is to assess childcare practices and nutritional status of children under-five years old. Child care practices play a major role in child nutritional status. Poor child care practices have been found to contribute significantly to malnutrition leadings to mortality and morbidity rate in this age group. Since there is need to carry out a study on this issue within our society, requesting you and your child to participate in this research study. This consent form is to give you information and help you to decide If you AGREE / DON'T AGREE to participate in this study. You may ask questions on the risks and benefits of the study on your child and on yourself.

#### **Participation**

You are required to respond to questions related to child care practices. The questions asked will include: respondents/caregivers social demographic factors; child care factors and child's illness status in the past two weeks and hygiene and sanitation factors among children under five years old.

#### **Confidentiality and Privacy**

Participation through filling in of questionnaire is entirely voluntary. Your confidentiality will be safeguarded; your identity and records relating to your participation will remain confidential. No names of participating households will appear in the final report or any publication resulting from the study. Giving accurate information will enable us derive correct interpretation of the research findings.

**Benefits**

Your child may not directly benefit from the study but the information obtained from the study will be used by the stakeholder’s, policy makers and the government to plan for interventions targeting the children under five years to improve their nutritional and health status. In addition, children that are found malnourished shall be referred to the nearest public health facility.

**Risks:** There are no major risks for you and your child participating in this study. The only anticipated risk is that the child may feel discomfort when his/her weight and height are taken. The equipment that will be used to take weight and height of the children are not invasive and thus will cause no harm to your child.

**Contact Persons**

If there this any part of this consent explanation that is not clear, you are free to ask the investigator before signing. In case you have any questions, problem or concern related to the study please contact my supervisors in the school of Public Health, University Of Nairobi on the following numbers: 020-2724639/2723251, or the KNH/UoN Ethics & Research Committee, P.O Box 20723, Nairobi Kenya;Tel.020-7293000.I can also be conducted on 0711-797998 for any queries.

Participants’ agreement to participate:

I have fully understood the research objectives and I hereby sign as an indication of consent for my child to participate in this study

----- Date.....

Signature

..... Date.....

Left thumb

(Only those who can’t read and write)

#### Appendix 4: Time Line 2013- 2014

	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	SEP
Proposal development										
Proposal submission										
Recruitment and Training of research assistants										
Pre-testing the questionnaires										
Analysing the pretested questionnaires										
Field work to collect data										
Data entry and cleaning										
Data analysis										
Report writing and finalization										
Submission of the final report And final report presentation										

#### Appendix 5: Budget

	Items and time period	Amount in Kshs.
Training and pre testing	6 research assistants x 400x1 day	2,400
Field work for data collection	6 research assistants x 400 x 8 days	42,000
Data entry, cleaning and analysis	10 days	20,000
Printing and binding		10,000
Stationery		5,000
Production of research instruments	300 copies	7,200
Transport	10 days	20,000
Photocopying		15,000
<b>Total Amount</b>		<b>121,600</b>

## Appendix 6: Approval from KNH/Ion- Ethical Review Committee



**KENYATTA NATIONAL HOSPITAL**  
Hospital Rd. along, Ngong Rd.  
P.O. Box 20723, Nairobi.  
Tel: 726300-9  
Fax: 725272  
Telegrams: MEDSUP", Nairobi.  
Email: [KNHplan@Ken.Healthnet.org](mailto:KNHplan@Ken.Healthnet.org)  
26<sup>th</sup> April 2011

Ref: KNH-ERC/ A/102

Grace Kibua  
School of Public Health  
University of Nairobi

Dear Grace

**RESEARCH PROPOSAL: "ASSESSMENT OF CHILD CARE PRACTICES AND THE NUTRITIONAL STATUS OF UNDER FIVES IN SOUTHERLAND AND INFORMAL SETTLEMENT, NAIROBI" (P38/2/2011)**

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This is to inform you that the KNH/UON-Ethics & Research Committee has reviewed and **approved** your above revised research proposal for the period 26<sup>th</sup> April 2011 – 25<sup>th</sup> April 2012.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimens must also be obtained from KNH/UON-Ethics & Research Committee for each batch.

On behalf of the Committee, I wish you a fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of the data base that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely,

  
**PROF A N GUANTAI**  
**SECRETARY, KNH/UON-ERC**

c.c. The Deputy Director CS, KNH  
The HOD, Records, KNH  
Supervisors: Opiyo, R.O.B, School of Public Health, UON  
Prof. Mutuku A. Mwanthi, School of Public Health, UON  
Dr. Dismas Ongore, School of Public Health, UON



## Appendix7: Procedure for taking Anthropometric Measurements

Steps for taking the weight of a child using Salter Scale:

Hook the scale to a tripod or a stick held horizontally by two people at eye level.

Suspend the weighing pants from the lower hook of the scale and readjust the scale to zero.

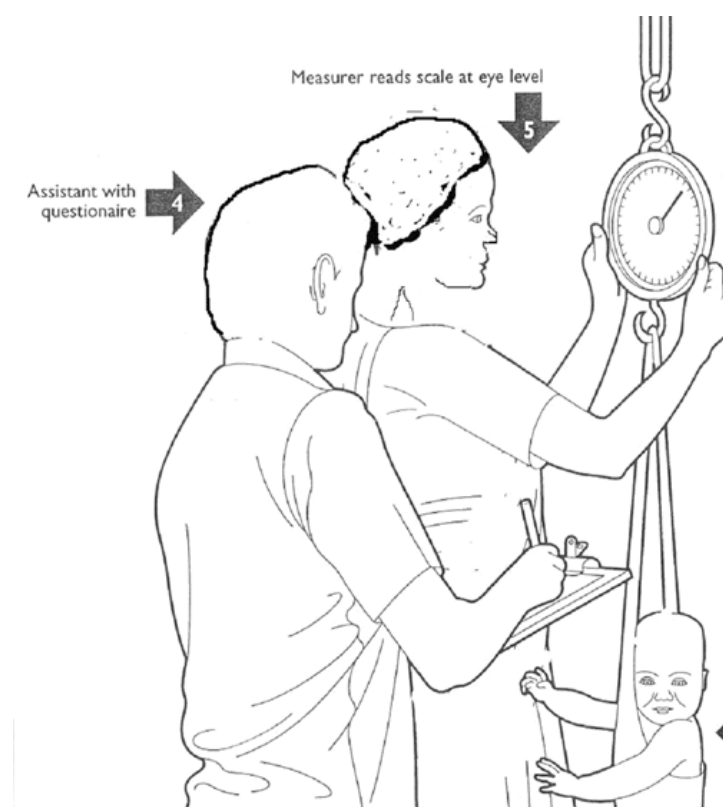
Undress the child and place him/her in the weighing pants.

Hook the pants to the scale.

When the child is settled and the weight reading is stable record the weight to the nearest 100g. Make sure that nobody touches the pants or the scale during weighing.

Ensure that the child hangs freely without holding onto anything.

Read and announce the value from the scale. The assistant should repeat the value for verification and record it immediately.



Source: IMAM guidelines in Kenya

**Electronic scales**, if available, can be used for children that can stand

**steps for taking the weight of a child/adolescent using electronic scales:**



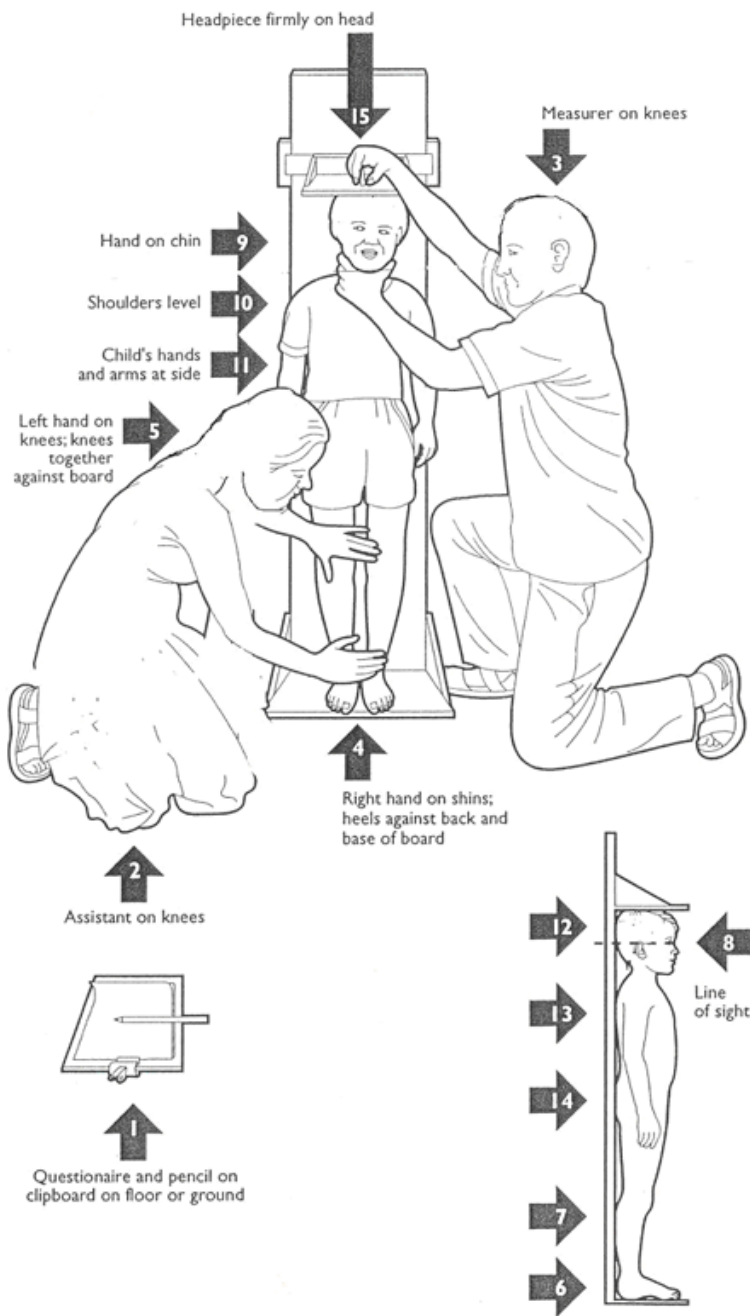
- Place the electronic scale on a flat, level surface.
- Check and readjust the weight reading to zero.
- Undress the child.
- Make him/her stand on the middle of the scale's surface.
- When the child is settled and the weight reading is stable record the weight to the nearest 100g. Make sure that nobody holds the child during weighing and that the child stands freely without holding onto anything.
- Read and announce the value from the scale. The assistant should repeat the value for verification and

record it immediately.

*Source: IMAM guidelines in Kenya*

**Steps for taking accurate height measurements:**

- Set the measuring board vertically on a stable level surface. Remove the child's shoes and any head-covering.
- Place the child on the measuring board, standing upright in the middle of the board. The child's heels and knees should be firmly pressed against the board by the assistant while the measurer positions the head and the cursor. The child's head, shoulders, buttocks, knees and heels should be touching the board.
- Read and announce the measurement to the nearest 0.1cm. Record and repeat the measurement to the measurer to make sure it has been correctly heard.



Source: IMAM guidelines in Kenya

### Taking the Length

This measurement is taken for children below two years of age and/or for those who are less than 85 cm.

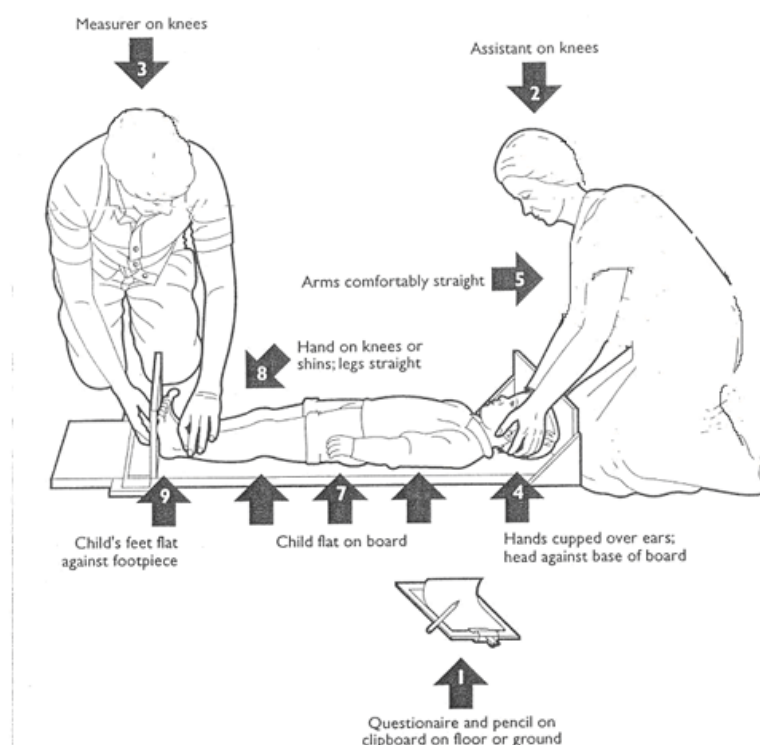
Check the child's birth date from official documentation (e.g. health card, immunization card, birth certificate) provided by the caregiver.

### Steps for taking accurate length measurements:

- Place the measuring board horizontally on a flat, level surface. Remove the child's shoes and any head covering.
- Place the child so he/she is lying down and face up in the middle of the board. Allow the assistant to hold the sides of the child's head and position the head until it is touching the head board.
- Allow the measure to place his/her hands on the child and firmly hold the child's knees together while pressing down. The soles of the feet should be flat on the foot piece, toes pointing up at right angles.

The measurer should immediately remove the child's feet from contact with the footboard with one hand while holding the footboard securely in place with the other.

Read and record the measurement as shown in diagram below.



Source: IMAM guidelines in Kenya