STUNTED-OVERWEIGHT AND FEEDING PRACTICES AMONG CHILDREN 6-59 MONTHS OLD IN A WELL-BABY CLINIC: THE CASE OF KENYATTA NATIONAL HOSPITAL, NAIROBI, KENYA.

By

HELLEN CHEPKOECH BALIACH

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DECLARATION

I, **Hellen C. Baliach**, hereby declare that this dissertation is my original work and has not been presented for a degree in any other University.

26-8-2011

Hellen Chepkoech Baliach — Date

This dissertation has been submitted for examination with our approval as university supervisors:

1. 

26th - 8 - 2011

Dr Mwangi, Alice Mboganie, PhD — Date

Head, Applied Human Nutrition,

Department of Food Science, Nutrition and Technology

University of Nairobi

2. 

26th - 8 - 2011

Date

Prof. Wambui Kogi-Makau, PhD

Applied Human Nutrition,

Department of Food Science, Nutrition and Technology

University of Nairobi

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ABBREVIATIONS/ACRONYMS

ACC/SCN Administrative Committee on Coordination/ Standing Committee on Nutrition of the United Nations

ANP Applied Nutrition Program

AFASS Acceptable, Feasible, Affordable, Sustainable and Safe

ANC Antenatal Clinics

BCG Bacille Calmette Guerin

BF Breast Feeding

BM Breast Milk

BMI Body Mass Index

CBO Community Based Organisation

CF Complementary Feeding

CHW(s) Community Health Worker (s)

CI Confidence Intervals

CME Continuous Medication Education

EBF Exclusively Breastfeeding

EPI-INFO A series of microcomputer packages used for nutritional status assessment

FAO Food and Agriculture Organisation

gm Gram

HFW Height for Weight

HOD Head of Department

IBFAN International Baby Food Action Network

ILCA International Lactation Consultant Association

IYCF Infant and Young Child Feeding

KDHS Kenya Demographic and Health Survey

kg Kilogram

MDG(s) Millennium Development Goals

MOPHS Ministry of Public Health and Sanitation

MOH	Ministry of Health
MOU	Memorandum of Understanding
MPC	Maternity Protection Coalition
NGO	Non – Governmental Organisation
NBU	New Born Unit
PDU	Paediatrics Demonstration Unit
PFC	Paediatric Filter Clinic
UDHR	Universal Declaration of Human rights
UNICEF	United Nations Children's Funds
SPSS	Statistical Package for Social Sciences
WFA	Weight for Age
WFH	Weight for Height
WHO	World Health Organisation
χ^2	Chi-square

OPERATIONAL DEFINITIONS

Anthropometry: physical measurement of weight, length or height of the children

Body Mass Index (BMI): Indicates a person's weight in proportion to height/length, calculated as weight in (kg) divided by the height in (m^2). The measure of weight adjusted for height used to determine weight categories. Due to children's changing body compositions over time and the different growth rates of boys and girls, BMI for children is age and gender specific. BMI for age is determined using gender-specific growth charts that place a child in a percentile relative to weight and height (WHO, 2006).

BMI-for-Age: is a growth indicator that relates BMI to age.

Code of marketing of breast milk substitutes: Set of rules governing breast milk substitutes in an industry.

Complementary feeding: Giving infants and young children food or drink in additional to Breast milk.

Exclusive Breastfeeding: Giving infants no other food or drink but breast milk only and rather drops of syrups containing vitamins, minerals or medicine.

Obesity: A condition of malnutrition where there is deposition of excess fats around the body, particularly in subcutaneous tissues that arises from intake of food in excess of the body energy

requirements. It can be measured using the Weight to height ratio. The terms obese and overweight are often used interchangeably, although the terms at risk of overweight and obesity are preferred to refer to children whose excess body weight poses medical risks.

Stunting: Growth failure in a child that occurs over a slow cumulative process as a result of inadequate nutrition and/or repeated infections. It is defined as Weight-for-Height Z-scores < -2.

Window of Opportunity: A period from conception up to two years of life (i.e. 1000 days from conception). This is the most appropriate period for any nutrition interventions to improve nutritional status of infants and young children or a brief period of time in which it is particularly advantageous to do something .When the window of opportunity emerges, some people say that "opportunity is knocking" suggesting that someone would be a fool to ignore the chance. Someone must take a decisive action at the time or risk wondering what would have happened had she or he acted.

Codex Alimentarius Commission: refers to a commission that was created in 1963 by FAO and WHO to develop food standards, guidelines and related texts such as codes of practice. The main purposes of this programme are protecting health of consumers and ensuring fair trade practices in the food trade, and promoting coordination of all food standards work undertaken by international governmental and non-governmental organizations (FAO, WHO 2010).

The Codex Alimentarius standard: Refers to provisions of an advisory nature in the form of codes of practice, guidelines and other recommended measures to assist in achieving the purposes of the Codex Alimentarius. The Commission standard has expressed the view that codes of practice might provide useful checklists of requirements for national food control or

enforcement authorities and implements the Joint FAO/WHO Food Standards which is to protect the health of consumers and to ensure fair practices in the food trade.

The *Codex Alimentarius*: is a latin word, meaning Food Law or Code forming a collection of internationally adopted food standards presented in a uniform manner.

ABSTRACT

In Kenya, weight of under five year old children is taken monthly as routine growth monitoring procedures. Linear growth of the children is however not monitored unless under special circumstances yet the early stage of life is a period when growth is very critical and if retarded, it may never be reversed in lifetime. World Health Organisation has recommended that Weight-for-Height be also monitored in well baby clinics but this is yet to be implemented fully in Kenya. In fact the indicator of stunting, that is, height-for-age z-score has not been used in well baby clinics. Furthermore, no efforts have been focused on children who may be stunted and overweight at the same time. Currently, only malnourished children in paedriatics wards are assessed for stunting but the well babies are assessed for weight only.This study was therefore endowed to assess the prevalence of stunted-overweight and feeding practices among children attending the well baby clinic in Kenyatta National Hospital.

A cross sectional survey employing both descriptive and analytical methods was conducted at Kenyatta National Hospital. A pretested structured questionnaire was used to collect both qualitative and quantitative data from a sample of 330 mothers/guardians with infants and young children aged 6-59 months attending the well baby clinic at the hospital. Information was sought on demographic and social-economic characteristics of the household, child feeding practices and health, morbidity experience and immunization status. Anthropometric measurement included the weight and height of the children.

Qualitative data on feeding practices were collected through the Key Informant Interviews (KII), Focus Group Discussion (FGD) and observations. Key informant interviews were used to obtain

information from health service providers while a focus group discussion was used to collect information from the mothers/caregivers.

Data analysis was done using Statistical Package for Social Sciences (SPSS) and EPI-INFO programs. Univariate analysis was used to assess the association between nutritional status and feeding practices. The WHO reference Z-scores-for-age was used to assess the Body Mass Index –for-age (BMI) of the children.

A significantly high proportion of the study children were males as compared to females (χ^2 p-value<.000, 95%: CI =1.39 – 1.5).

The number of children attending the clinic drastically decreased with age from 81.4 % at infancy to 1.5 % at 36-59 months old.

Most of the children (92.7%) fell in the "window of opportunity" category, (the period < 24 months of age).

Overall, 15% of the children were stunted and 12% were at risk of being stunted. There was no significant difference in stunting between boys and girls.

The prevalence of overweight and obese children was 11.8 % while the prevalence of stunted-overweight was **3%**.Those underweight but also stunted were 4.9%, while 7.1% were stunted but with normal weight. There was a highly significant correlation between stunting and the body mass index of the children (p= 0.000). However, there was no significant relationship between stunted-overweight and feeding practices among the children.

It was estimated that only weight but not length of the children was routinely assessed and a total of 328 (99.4%) children did not have their length recorded at birth. The assessment of stunted-overweight using weight-for-age showed that 9.4% of the children had normal weight-for-age but were stunted. Those who were stunted overweight and stunted-underweight using weight-for-age were 2.7% and 2.9% respectively. The ratio for the undernourished (14.3%) and over nourish (14%) was **1:1** when the weight for age was used.

In conclusion, there is some coexistence of stunting and overweight (3%) among children 6-59 months of age in the well baby clinic at Kenyatta National Hospital. This could possibly be higher if a higher sample were obtained from the age group of 24-59 months, as this age group was not well represented among the children attending the well baby clinic. Feeding practices are not significantly associated with stunted-overweight probably because of the small number of stunted overweight children obtained.

There is need to conduct a comprehensive community-based growth monitoring research to provide for more explanation on prevalence of stunted-overweight and its determinants. We recommend for routine monitoring of linear growth among under fives alongside weight monitoring.

CHAPTER ONE: INTRODUCTION

1.1 Background

Attaining optimum weight and height takes place at the period of window of opportunity, a period from conception up to two years of life (i.e. 1000 days from conception). It is the most appropriate period for any nutrition interventions to improve nutritional status of infants and young children and a period when optimum feeding and health care to the infant should be provided. A child may never regain the ideal growth and especially the height if lost at the period and the condition becomes permanent and irreversible.

In Mexico, the prevalence of concurrent overweight or obesity and stunting was approximately 5% in non-indigenous children, and over 10% in indigenous children 24–60 month (Fernald, 2007), while in South Africa, 19% children aged 3 years were both stunted and overweight (Mamabolo , et al 2007).

In the most recent (2008-09) Kenya Demographic and Health Survey (KDHS) results, there is no record of stunted-overweight in Kenya. The anthropometric data collected on the nutritional status of children is done by measuring the height and weight with the aim of calculating the three indices namely weight-for-age, height-for-age, and weight for height. The three nutritional status indicators namely stunting, underweight, and wasting are assessed and recorded but no record or mention on stunted-overweight among the children (CBS 2009). Thus very little is known about the prevalence of stunted-overweight in Kenya.

The recently developed growth card that is being used in most parts of the country does not have indicator of stunted-overweight. Although it has included the stunting indicator, there is no inclusion on the assessment of the child's BMI which is the most preferred predictor of child's weight in relation to height and best used to assess the stunted-overweight status.

Hoffman et al (2006) claimed that earlier under-nutrition would have effect on fat metabolism resulting in overweight and stunting in childhood growth era. The possibility of coexistence of the so called "double burden" of nutritional status was found in a study carried out in the year 2000 and the results confirmed the coexistence of stunting and overweight among school aged children in Western Kenya (Abdulkadir et al 2007).

Mortality rate among children under five years has been increasing in Kenya over the last 20 years (WHO and UNICEF, 2003). It is currently estimated at 74 per 1000 live births and this implies that one in every nineteen children born in Kenya dies before his or her fifth birth day while one in every 14 does not survive to age five. Inappropriate breastfeeding and complementary feeding practises among the children contribute to the 10,000 deaths per year (CBS, 2009).

In Kenya infant and young child feeding practices are sub-optimal. About 58% of babies start breastfeeding within one hour of birth. About 32 % of babies are exclusively breastfed within the first six months. Early cessation of breast feeding (BF) is not recommended before two years of age; yet duration of any breastfeeding in Kenya is 21 months which is similar to the duration documented in previous KDHS survey of 2003, to imply that there has been little change in

breastfeeding patterns. The median duration of any breastfeeding is longer (21 months) in rural areas than in the urban (19 months) with Nairobi Province having the shortest median duration of 15 months. The women with no educational level tend to breast feed slightly longer (21 months) than those who at least have some secondary education (19 months) (CBS, 2009). Furthermore, the Kenya's Millennium Development Goal (MDG) is to reduce child mortality and morbidity rate per 1000 live births from 120 in the year 2005 to 33 in 2015 and so there is need to improve feeding practices (MPHS, 2009).

System support in Kenya shows a decrease in the Baby Friendly Hospital Initiative from 70% in 1994 to 5.7% in 2003. This means that optimal breast feeding practices are not being encouraged from the child is born. As a result, proper feeding practices have remained low due to reduced education and advice of mothers in the hospital. Thirty five percent of children less than five years of age in Kenya are stunted and 14 % are severely stunted. Overall, 7 percent of children are wasted and 2 % are severely wasted while 16% of children under five years are underweight and 4 % are severely underweight (CBS 2009).

1.2 Problem Statement

One in every three under five children are stunted and this rate has remained high over the last decade. The proportion of stunted children declined from 35 % in 2000 to 30% in 2004 and up to 35% in 2008-09 but the proportion of stunted children have remained unchanged (CBS, 2009). Although the underweight rates are lower, the contribution of stunted-overweight in making these rates is not clear. Recently, WHO (2006) has recommended that Weight-for-Height be also monitored in well baby clinics but this is yet to be fully implemented in Kenyan Child Health Clinics which monitor only weight. Hence no specific nutritional advice is provided in the clinics

for children that might have stunted-overweight. Furthermore, no efforts have been made in Kenya to establish the prevalence of stunted-overweight/obesity and its relation to feeding practices among infants and young children (CBS, 2004).

1.3 Justification

Infant and young child feeding practices affect both weight and linear growth of a child. Therefore it is possible that a child may have appropriate weight for age although stunted and this may give the health service provider an untrue picture leading to the advice that the child is growing well. Inappropriate feeding practices may lead to poor nutritional status; hence it is important to monitor both weight and linear growth of children from both low and high social-economic environments to the best of unbiased knowledge.

Cultural beliefs and human rights associated with infant and young child feeding may contribute towards the way children are fed which may in turn affect the nutritional status of the children. In addition, this could be a contributing factor to the reported increments in the prevalence of Diabetes type 1 and 2, cancer and cardiac diseases in children (MPHS and WHO, 2008).

1.4 Aim of the Study

The aim of this study was to contribute towards improving the nutritional status of infants and young children in Kenya through proper growth monitoring procedures and adequate feeding practices.

1.5 Purpose of the Study

The purpose of the study was to highlight the importance of monitoring linear growth in addition to weight of infants and young children in well baby clinics.

1.6 Objectives of the Study

1.6 .1 Main Objective

The main objective was to determine the prevalence of stunted-overweight and its relationship to infant and young child feeding practices among children aged 6 to 59 months attending well baby clinics at Kenyatta National Hospital.

1.6.2 Specific Objectives

The specific objectives were to:-

1. Establish social-economic and demographic characteristics, and the source of livelihood of the families of the study children in order to relate these with children nutritional status and feeding practices and to scope their context.
2. Determine the nutritional status with special interest in establishing the prevalence of stunted-overweight of children aged 6 to 59 months attending the clinics.
3. Establish child feeding practices and relate them with the nutritional status of the study children.
4. Determine the morbidity experience and relate with it the nutritional status of the study children.

1.7 Research Questions

1. What is the prevalence of stunted-overweight/obesity among the study children?

2. Is the data collected by the health worker in well baby clinic adequate for monitoring the growth of young children?
3. Are child feeding practices, socioeconomic and demographic characteristics associated with stunted-overweight/obesity among the children?

1.8 Research Hypothesis

1.Stunted-overweight/obesity among children less than 5 years attending well baby clinics is high (>10%)(SCN, 2006)

2. Feeding practices, socio-economic and demographic characteristics are significantly associated with stunted-overweight/obesity among children 6-59 months old.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Nutritional status is directly related to feeding practices especially among infants and young children whose growth and development is determined by the dietary intake and health conditions. The early stage of life is a period when growth is very critical and the growth faltering process is never reversed in lifetime. In Kenya, weight alone is taken as part of the routine procedures and usually it is very easy to tell if a child is underweight but stunting is not really assessed unless under special circumstances. Overweight children are also noticed but relating the status with stunting does not occur, thus stunted-overweight may go unnoticed. Many children could be stunted and overweight at the same time but are usually recorded as healthy if their weight for age falls within the normal limit, although they are too short for their age but too heavy for their height.

2.2 Stunting

Stunting is defined as growth failure in a child that occurs over a slow cumulative process as a result of inadequate nutrition and repeated infection resulting in a height for age less than -2 z scores of the median value of WHO (2006) reference standards. Height-for-age is a measure of linear growth. A child who is below -3SD of the median value of WHO (2006) reference standards is considered severely stunted (SCN, 2OO6) while a child above +3 z-scores length/height for-age is considered very tall. Tallness is rarely a problem, unless it is so excessive that it may indicate an endocrine disorder such as growth-hormone-producing tumour. A child in this range is referred for further assessment if suspected to have an endocrine disorder

(e.g. if parents of normal height have a child who is excessively tall for his or her age). Height-for-age of children below 5 years is normal when z scores > -1, ≤ 1. Stunting occurs when babies are born underweight because the mother was poorly nourished or because the mother herself was stunted. Stunting levels indicates overall poverty and chronic malnutrition (WHO, 2006).

Internationally, 39 % (209 million) of children under five in the developing world are stunted. Stunting rates are highest in Asia and sub-Saharan Africa. In Kenya, 35% of children are stunted, a condition that is rarely reversed in later childhood (CBS, 2009). A high proportion (37%) of male children under five years are stunted as compared with 33 percent of females. At the provincial level, Eastern province (42%) has the highest proportion while Nairobi province has the lowest proportion (29%) of stunted children. Since 2003, the proportion of stunted children has remained unchanged. The analysis of the indicator by age group shows that stunting levels have increased in the 6-11 months and 48-59 months of age categories. However the proportion of stunting declines with the increase in the wealth quintile while mother's education level has an inverse relationship with stunting levels (CBS, 2009). The effects of stunting are permanent. Stunted children may never regain the height lost and most will never gain the core spending weight. Unfortunately when the "window period of opportunity" of early childhood is closed, the associated cognitive damage is often irreversible (UNICEF, 2007).

Stunting indicates deficit in length and it takes some time to develop. It results from extended period of inadequate food intake, poor dietary quality, increased morbidity or a combination of these factors (Gibson, 2005). The fact that stunting happens over time, means that a child has endured painful debilitating cycles of illness, depressed appetite, insufficient food and

inadequate care for a long time. Some of the causes of stunting include low birth weight, insufficient feeding, inadequate care and nutrient depletion caused by repeated bouts of illness culminated overtime in a child whose height is less than that of other children of the same age. The underlying causes are poverty, inability of families to provide adequate care for their children, lack of clean water and long distance between home and health clinic or a failure in early growth (UNICEF et al, 2002).

The immediate causes of stunting in the young child are both inadequate feeding and repeated illnesses (CBS, 2009). Hence stunting is a standard mark and is more related or associated to environmental rather than genetic factors (Waterlow et al., 1980).

2.3 Overweight and Obesity in Children

The terms obese and overweight are often used interchangeably, although the terms at risk of overweight and overweight are preferred to reference children whose excess body weight poses medical risks. Overweight children have an increased risk of becoming overweight during adulthood and increase the risk for certain medical and psychological conditions. Genetics, behaviour, and family environment play a role in childhood overweight. Hence, overweight children are encouraged to be active, decrease screen time, and develop healthful eating habits. The prevalence of overweight in children in the United States (US) has recently reached epidemic levels with approximately 16 % overweight or obese. The magnitude of overweight in developing countries is rising especially among the affluent, posing a challenge of double-burden of malnutrition (Hoffman et al, 2006)

2.3.1 Causes of Overweight and Obesity in Children

The cause of childhood overweight is a complex interaction of many variables including genetics, behaviour, environment, and certain socio-demographic characteristics. Certain genetic characteristics may increase an individual's susceptibility to excess body weight. It has been shown that overweight tends to run in families suggesting a genetic link. In some cases, parental obesity is a stronger predictor of childhood overweight than the child's weight status alone.

Behavioural characteristic such as weight gain occurs as a result of energy imbalance, specifically when a child consumes more calories than the child uses. Several behaviours can contribute to weight gain including nutrition, physical activity, and sedentary behaviours.

An increase in availability and consumption of high-calorie convenience foods and beverages, more meals eaten away from home, fewer family meals, and greater portion sizes all may contribute to childhood overweight. Further, many children's diets do not meet nutrition guidelines. Decreased opportunities and participation in physical activity is another behaviour that contributes to overweight children. Being physically active not only has positive effects on body weight, but also on blood pressure and bone strength. While physical activity levels have decreased, sedentary behaviours, such as watching television, playing on the computer and with video games have increased. Several studies have found a positive association between time spent watching television and prevalence of overweight in children. Sedentary behaviour, and specifically television viewing, may replace time children spend in physical activities, contribute to increased calorie consumption through excessive snacking and eating meals in front of the television, influence children to choose high-calorie, low-nutrient foods through exposure to food advertisements, and decrease children's metabolic rate.

There are a variety of environmental factors that can potentially contribute to childhood overweight, including home, childcare settings, school, and the community. The school and community settings are other environments where children learn about eating and physical activity habits.

Socio-Demographics characteristics such as certain ethnic minority and socioeconomic populations have increased rates of childhood overweight. Low-income families face numerous barriers including food insecurity, lack of safe places for physical activity, and lack of consistent access to healthful food choices, especially fruits and vegetables (Robert et al, 2011).

2.3.2 Consequences of Childhood Overweight

Overweight children and adolescents are at increased risk for several health complications. Such as likelihood to exhibit risk factors for cardiovascular disease (CVD) including high blood pressure, high cholesterol, dyslipidemia and type 2 diabetes (Kimani-Murage et al 2010).

Additional health complications associated with overweight children include sleep apnoea, asthma, liver damage and obesity in adulthood. Childhood overweight has psychological and emotional consequences because they are at risk of an increased risk of teasing and bullying, low self-esteem, and poor body image. The causes of childhood overweight are a complex interaction of many variables and the contributing factors include genetics, behaviour, environment, and certain socio-demographic factors (Bellows and Roach, 2004).

2.3.3 Assessment of Childhood Overweight/Obesity Using Body Mass Index

Body Mass Index (BMI) is a measure of weight adjusted for height used to determine weight categories. Due to children's changing body composition over time and the different growth rates of boys and girls, BMI for children is age and gender specific. BMI for age is determined using

gender-specific growth charts that place a child in a percentile relative to weight and height. Weight categories are determined based on these percentiles (Bellows and Roach, 2004).

2.3.4 Promoting Healthy Habits and a Healthy Weight

Lifestyles and behaviours are established early in life; therefore, a focus on healthful behaviours is vital to promoting healthy weight. The primary goals of overcoming childhood overweight should be healthful eating and increased activity. It is important for children to consume enough calories to support normal growth and development without promoting excessive weight gain. The home, childcare setting, school, and community are all integral to a more healthful environment for our children.

Parents, caregivers, teachers, and community members can promote healthy nutrition and physical activity habits and a healthy weight among children by encouraging healthy eating habits such as serving a wide variety of foods, including fruits, vegetables, whole grains, and low-fat dairy products. Provide children with a variety of foods to ensure they get all the nutrients they need for proper growth and development.

Promoting physical activities such as; accumulating a minimum of 60 minutes of moderate-to-vigorous physical activity among the children each day is important to ensure that a child receive adequate daily physical activities. Activity bouts can be all at once or in several bouts spread throughout the day. It is also important to increase opportunities for children to engage in physical activity throughout the day. Incorporating daily recess and physical education into the school day will help ensure that children are getting the recommended 60 minutes of physical activity each day. Parents should become good role models by engaging in activities with children.

Other healthy habits include limiting screen and television time to less than two hours per day and keep televisions and video games out of children's bedrooms to help them limit the amount of screen time (Robert et al, 2011).

2.4 Stunted Overweight/Obesity

Stunted overweight refers to a condition where both overweight and stunting status co-exists in an individual and BMI-for-age and height-for-age are above 2 z-scores. The indicators for stunted-overweight include the BMI-for-age and stunting status.

A study carried out in Mexico to document the prevalence of overweight or obesity concurrent with stunting in rural low-income Mexican children and to identify demographic and socio-economic characteristics that could help identify families at risk of having an overweight/obese and stunted young child in that population. The Results showed that the prevalence of concurrent overweight or obesity and stunting was approximately 5% in non-indigenous children, and over 10% in indigenous children 24–60 months (Fernald, 2007).

Nutrition transition in developing countries has been associated with higher prevalence of overweight. In Yaounde Cameroon, a study whose aim was to identify the factors associated with concurrent stunting and overweight in urban preschool children showed that a low-income family and a low maternal educational level were independent risk factors for a child to be stunted-overweight. Mother under-evaluation of child's weight is a factor associated with stunting-overweight and overweight in children. A mother being overweight was also related to higher birth weight of her children. Unlike stunted children, stunted-overweight children lived with both their parents and had an older mother. Short maternal stature and mother's over-

evaluation of her child's height were independent factors associated with stunting (Said-Mohamed et al, 2009).

In South Africa, a study by, Mamabolo et al (2007) showed that 19% of children aged 3 years were both stunted and overweight. Having a mother as a student increased the risk for stunting while a working mother increased the risk for overweight. The results of the study highlighted the importance of evaluating anthropometric status in terms of both stunting and overweight and the importance of normal length and weight being attained at 1 year of age, since this in turn predicted nutritional status at 3 years of age.

In western Kenya a nutritional phenomenon which was put forward by Popkin et al explains that stunting coexisting with overweight was due to an earlier malnutrition occurrence(s) in the subject child. This was further confirmed by Hoffman et al (2000) who claimed that earlier under-nutrition would have effect on fat metabolism resulting in overweight and stunting in childhood growth era. Concomitantly, seasonality growth vis-à-vis "harvest cycle" also offers an explanation for the possibility of coexistence of the so called "double burden" of nutritional status, for example stunting and overweight for school age going children. (Abdulkadir et al, 2007).

2.5 Growth Reference Standards Used in Developing Countries

Since the late 1970s, the National Centre for Health Statistics (NCHS) reference has been in use throughout the world. This reference, based on data from several samples of children from the United States of America (USA), provided a description of the attained growth of American children. In 1993, the WHO undertook a comprehensive review of the uses and interpretation of

child growth references. The review concluded that new standards had to be developed to show how children across countries should grow rather than merely describing how they grew at a particular time and place. It was also highlighted that the NCHS reference was biased towards Caucasian bottle fed children, thus highlighting the needs for new growth standards reflecting conditions which would encourage proper growth and development in all settings. Following this review, in 1994, the World Health Assembly endorsed the development of a new set of international tools to assess infant and young child growth across the globe. The Assembly stressed the need to move beyond past approaches and towards the more desirable goal of describing how children should grow when their needs are met. World Health Organization undertook the Multicentre Growth Reference Study (MGRS) between 1997 and 2003 in order to come up with an ideal reference standard in monitoring the nutritional status. The MGRS combined a longitudinal follow-up of children from birth to 24 months of age and a cross-sectional survey of children aged 18 to 71 months. Primary growth data and related information were gathered from 8,440 healthy breastfed infants and young children from diverse ethnic backgrounds and cultural settings (Brazil, Ghana, India, Norway, Oman and the USA). The MGRS was purposively designed to produce a standard by selecting healthy children living under conditions likely to favor the achievement of their full genetic growth potential. The study population lived under socioeconomic conditions favorable to growth such as fundamental health-promoting practices, namely breastfeeding and not smoking. Lactation counseling was provided by trained lactation counselors to the mothers enrolled in the study. These child growth standards also support the notion that given the same environmental conditions, growth potential is independent of ethnic origin and these standards can apply in any country. The WHO standards include sex-specific percentiles and Z-score (SCN, 2006).

2.6 Weight Monitoring in Kenya

For the last years, Kenya had adopted road to health card for monitoring children's weight-for-age only. The card combined the road to health for both boys and girls: The indicator for underweight only was used and it is still in use in several parts of the country. However due to the realisation for the need to monitor stunting by using length/height-for-age for girls and separate for boys, Kenya has adopted the weight for age (Weight-for-Age) and the length/height-for age (HfA) indicator but has not adopted the BMI-for-age indicator. A mother and chi'd health booklet has been launched in Kenya which applies the use of growth record for each sex since girls and boys grow differently in sizes. The growth charts in the booklet have been derived from the WHO Multicentre Growth Reference Study. The growth charts help to identify normal growth or growth problems and trends that suggest that a child would be at risk of malnutrition. Ministry of Public Health and Sanitation in collaboration with Ministry of Medical Services and partners has worked on the mother child health booklet for a period of 2 years before it .vas first disseminated in Nyanza province and later in coast province. Currently the booklet is in use in all Provinces and Districts. There was a consensus on developing a mother-child health book that would contain all mother and child disease prevention and promotive services from the antenatal period up to the age of 5yrs (Daily Nation, 23rd April, 2009).

2.7 Breast Feeding Practices

2.7.1 Early Initiation of Breast Feeding

It is recommended that a new baby is introduced to breastfeeding (BF) immediately after birth or between the first 30 minutes to one hour after birth.

The initiation of breast feeding (BF) early enough will stimulate an increase in the production of breast milk (BM) hence the mothers do not have to give other feeds to their babies. The

colostrums protect the baby from infection as it boosts the immunity of the baby. Furthermore, evidence shows that 22% of neonatal deaths could be saved if all infants were breastfed within the first hour. In Kenya, 52.3 percent of children start breast feeding within one hour of birth (CBS 2009)

Early initiation of breasting feeding that is, within 30 minutes to one hour of delivery increases the likelihood of BF success and enhances bonding which in long term reduces the child mortality rate. Delayed initiation of breastfeeding varies from region to region and is closely linked with cultural beliefs as well as health facility practises. Giving pre-lacteal feeds before initiating breastfeeding is a widespread practise across Kenya (MOH/GOK, 2008)

2.7.2 Exclusive Breast Feeding

Exclusive breast feeding means giving a baby only breast milk and no other liquids or solids, not even water. Drops or syrups consisting of vitamins, mineral supplements or medicines are permitted (WHO and UNICEF, 2006).

The government of Kenya and the World Health Organisation recommends exclusive breastfeeding (EBF) for the first six months of life for optimal growth and development this protects babies against common childhood illnesses and has long term health benefits such as provision of perfect nutrients, protection against infections, and BM is easily digested and is utilised efficiently (MOH, 2008).

Breastfeeding helps bonding and development of the child and protects mother's health.

The age between 0-24 months is referred to as a window of opportunity period of time in which it is particularly advantageous to do something during that moment, meaning that a baby needs to be fed well by exclusively breast feeding since if it does not happen, the golden chance will

have been missed forever. And if not missed, a child would grow optimally thus taking advantage of the period and not ignoring the chance is advisable (WHO, 2003).

Some mothers' situations may not allow for breast feeding such as death of the mother, sickness, immediate adoption of the child after birth or Human Immunodeficiency Virus (HIV) status. As a general principal, in each population, irrespective of HIV infection rates, breastfeeding should continue to be protected, promoted and supported. Infant feeding recommendations for HIV-positive women is that when replacement feeding is acceptable, feasible, affordable, sustainable and safe avoidance(AFASS) by HIV-infected person is recommended, otherwise, exclusive breastfeeding is recommended during the first months of life. Mixed feeding should be avoided because it brings the risk of infection and diarrhoea and other infectious diseases (WHO, UNICEF 2006). All mothers who are HIV positive status or of unknown HIV status should be encouraged and supported to exclusively breastfeed for the 6 months and continue breastfeeding with appropriate complementing feeds introduced thereafter (WHO. 2OO9)

While breastfeeding rates around the world have been on the rise, in Kenya the rate of exclusive breastfeeding has been at low percent for years. The trend of exclusive breastfeeding however has increased from 3% in 2003 to 32 % in 2008 according to KDHS of 2003 and 2008 respectively (CBS, 2004, 2009). This is still low compared to other developing countries. The exclusive-breastfeeding rate is 83.8 percent in Ethiopia and 55 percent in India.

Every day 68 percent of Kenyan infants have lowered immunity and are being exposed to an increased risk of disease because they are receiving other foods and liquids before they are six months old. Breast Milk (BM) is said to save approximately 5% of total death of children less

than two years of age (CBS, 2009). Lowered risk of Sudden Infant Death Syndrome (SIDS); increased intelligence, decreased likelihood of contracting middle ear infections, cold, and flu bugs, decrease risk of some cancers such as childhood leukaemia, lower risk of childhood onset diabetes, decreased asthma and eczema, decreased dental problems, decreased risk of obesity later in life and decreased risk of developing psychological disorders (WHO, 2005).

The EBF for the first 6 months of life is globally recognised as the most effective preventive intervention for ensuring child survival but the practice is moving up slowly among Kenyan mothers. In Kenya, poor breastfeeding and infant feeding practices contribute to more than 10000 deaths per year (MPHS and WHO, 2008)

A common belief among mothers, family members and health workers is that mothers do not have enough milk for the first few days after delivery affect the EBF among mothers. Going back to work by a mother, work load among mothers and inadequate family support, poor breast feeding techniques and attachments affects breast feeding negatively.

2.7.3 Continuing Breast Feeding

The duration of breastfeeding in Kenya is longer (21 months) as compared to other countries. The proportion of children below 5 years who are still being breastfed declines with age although the duration is longer in rural areas (21 months) than in urban area (19 months). Girls are breast fed slightly longer than boys. At the provincial level breast feeding is longest (26 months) in Eastern province and shortest in Nairobi province (15 months). Among the educated group, the breast feeding duration (19 months) is shorter than among those with no education (21 months) (CBS, 2009)

Breastfeeding should continue from birth up to two years or beyond since it offers health benefits into and after toddlerhood. Kenyan guidelines recommend that at six months, if replacement feeding is still not AFASS, continuation of breast feeding with additional complementary foods is recommended among the HIV-positive mothers. All breastfeeding should stop at once when a nutritionally adequate and safe diet without breast milk can be provided (UNICEF and USAID, 2007).

2.7.4 Breast Feeding as a Human Right

All human beings have human rights. Women and children are subjects of human rights not objects of charity. BF is part of fundamental human rights such as the right to food and health, and it contributes to every woman's right to health by reducing the risk of certain illnesses. The act of breast feeding is an essential component of good child care, contributing to healthy growth and psychosocial development. Every woman has the right to breast feed her child. Almost all governments have legally obliged themselves to fulfil the rights contained in international agreements such as the convention on the rights of a child, social and cultural rights and elimination of all forms of discrimination against women. Many rights linked to the right to breastfeed can be found in these agreements (MPHS and WHO 2008).

Maternal pregnancy is a window period of opportunity where the mother needs to eat adequate diet in order to meet all the micronutrient requirements needed by the growing foetus so that a healthy infant would be born free from malnutrition such as underweight and stunting status for every child deserves adequate nutrition right from conception. Therefore creating a good environment for mothers to successfully breastfeed omission since children have a right to access

safe and nutritious food, and nutrition is a universally recognized component of the child's right to enjoyment of the highest attainable standard of health (IBFAN, 2004).

Optimal breastfeeding practices are essential to meet the nutritional needs of children in the first years of life. Furthermore, analysis of child survival strategies as a right to life demonstrated that exclusive breastfeeding for the first 6 months and the continued breastfeeding from 6-11 months are among the most effective preventive interventions in reducing child mortality by 19 per cent contributing significantly to attainment of the Millennium Development Goals (MDG1), (Jones et al, 1995).

2.7.4.1: The International Code of Marketing of Breast Milk Substitutes.

The code aims to protect infant health through breastfeeding. It does not ban breast milk substitutes but sets out appropriate ways of marketing them. It applies to breast milk substitutes including infant formula, other milk products, and foods and beverages including bottle fed complementary foods when marketed or otherwise represented to be suitable for use as partial or total replacement of breast milk; it also covers bottles and teats. It clarifies the responsibilities of governments concerning information about infant and child feeding and their relation to company information (MOH et al, 2008).

Material warnings are compulsory; it is forbidden to idealise breast milk substitutes. Advertisements are forbidden for the general public, and companies cannot seek to contact pregnant women or mothers. Promotion of products and distribution of free samples to health care system are forbidden. Companies cannot distribute free samples to health professionals;

information they give has to be factual and scientific; if they fund activities there should be no conflict of interest (WHO and UNICEF 2000).

Company personnel are not allowed to train mothers or pregnant women nor pay employees on commission with aim of encouraging them to advertise their products.

Labels must include warnings, clear instructions for use in appropriate language, no idealised text or image. Products have to meet Codex Alimentarius Commission Standards of quality. It is the responsibility of governments to implement, monitor and report progress to World Health Organisation (WHO). Companies must abide by the provisions of the international code at all levels in marketing of breast milk substitutes. NGO's should monitor and report violations (WHO and UNICEF, 2003).

2.8 Complementary Feeding

Supplementation of breast milk starts early in Kenya, with 60 percent of children aged 4-5 months being given complementary food. Most of the supplements given to children are plain water or other milk. Curiously 10 % of babies who are below two months and 36 percent of those below six months of age are given complementary food, presumably mushy or semi-solid food. By age 6-9 months, 83 percent of children are given complementary foods thus increasing babies' risks of infection, poor nutrition, and diarrhoea-a major killer of young children worldwide, especially in developing countries (CBS 2009)

Qualitative assessments identified several factors and beliefs that contribute to poor breastfeeding practises. For instance mothers and health workers believe that women are not able to produce enough breast milk to meet an infant's needs for 6 months. Mothers believe that

babies need water to quench their thirst. It is common practice for infants to receive animal milk, porridge, fruits and vegetables before six months.

Many families and communities in Kenya believe that exclusive breast feeding for six months is not feasible. Many mothers who work outside the home and leave their babies during the day are unable to exclusively breastfeed because they do not plan appropriately, have difficulty expressing breast milk or simply believe it is not feasible to breastfeed while working. Inadequate knowledge, cultural beliefs, maternal workload and societal norms contribute to the low exclusive breast feeding rates in Kenya (SCN News, 2003).

Unhygienic food preparation and storage predisposes many infants to diarrhoeal diseases. Prolonged consumption of nutritionally inadequate diets leads to growth faltering (MPHS and WHO, 2008).

Young children are particularly vulnerable to growth faltering and malnutrition during this transitional period (6-24 months) when complementary feeding (CF) is initiated. Appropriate complementary feeding depends on accurate information and skilled support from the family. The types of complementary feeding given to young children vary across the country. Poor feeding practises in the country result from inadequate knowledge of optimal complementary feeding practises, work load and household food insecurity. Furthermore, inadequate knowledge about appropriate foods and feeding practises is often a greater determinant of malnutrition than the lack of food (WHO, 2004).

About 84% of infants are receiving foods and liquids other than BM, which have substandard nutrient quality and comprise bulky starches. The CF diets are limited in diversity and do not meet the nutrient requirements of a growing child. The frequency at which these foods are

provided and the amounts consumed are often less than required for normal growth (UNICEF and WHO 2006).

2.9 Gaps in Knowledge

In Africa as a whole 35% of children less than 5 years of age are believed to be stunted, 42 % of which are in sub-Saharan Africa. In South Africa a greater proportion of younger children are stunted (21-48%) rather than underweight (8%-15%). Experience has shown that these chronically malnourished children are susceptible to increased morbidity and mortality, and are the most vulnerable group of communities. (Albert et al, 2007).

Stunting is associated with both under- and over nutrition. High prevalence of overweight associated with stunting raises many questions about the aetiology and outcomes of both under- and over nutrition. The phenomenon of childhood obesity accompanying stunting has been reported in other developing countries as well as in developed ones. In Kenya, stunted children are not immediately obvious in a population; a stunted three-year old child could look like a well-fed two-year old (CBS, 2004). Therefore assessment is necessary in order to capture stunting among children attending well baby clinic and other clinics in Kenya. There is need to carry out an anthropometric assessment in order to determine the prevalence of children who are obese, overweight or normal and stunted at the same time, while determining the feeding practices and relating it to the nutritional status is also important.

CHAPTER THREE: STUDY SETTING AND METHODOLOGY

3.1 Study Area

The study was conducted at Kenyatta National Hospital (KNH), the largest referral hospital in Kenya and sub- Saharan Africa, which is situated at Community Area off Ngong Road in Nairobi. KNH is the oldest hospital in the country, having been founded in 1901 as the Native Civil Hospital. By then it was called King George Hospital. It is currently the largest national referral, teaching and research hospital in Kenya. It was the only national hospital in Kenya before Moi Teaching and Referral Hospital in Eldoret was established. Up to 1987, KNH operated as a department of the Ministry of Health (MOH), as per legal notice No 109. However, KNH in 1987 as per legal notice No. 109 (Kenya Gazette Supplement No. 23 of 10th April 1987) was established as a state corporation under the State Corporation Act (KNH, 2010).

KNH sits on land area of 45.7 hectares. Within the KNH complex are the College of Health Sciences (University of Nairobi) the Kenya Medical Training College (KMTC), Centre for Public Health Research (CPHR), Kenya Medical Research Institute (KEMRI), National Radiation Protection Center and the National Laboratory Service of the MOH and NASCOP (KNH, 2010).

KNH has 6,000 staff capacity, 50 wards with total bed capacity of 1800, of which 209 beds are for the Private Wing. Total annual admissions average 89,000 in-patients. KNH has 22 out-patient clinics with an annual average outpatient attendance of 600,000. There are 24 theatres (16 specialised) and an Accident & Emergency Department. KNH has an Annual Budgetary allocation of Kshs. 2.6 billion (KNH, 1996).

Well baby clinic is part of the clinical departments in paediatrics that attends to children below the age of five years. The department of paediatrics provides inpatient, outpatient, filter and emergency services. This department collaborates with the Kenya Medical Training Colledge (KMTC) and the College of Health Sciences (University of Nairobi) to offer facilities for training and research to the medical students. The department organises programmes such as Kangaroo Mother Care held at New Born Unit (NBU). It also offers refresher courses to its staff such as Lactation Management and Infant and Young Child Feeding (IYCF) course and Emergency Triaging Assessment (KNH, 2010)

3.1.1 Study Population

The study population consisted of mothers and caretakers with infants and young children aged 6-59 months attending the well baby clinic for immunization.

The respondents included mothers/fathers and guardians or relatives who accompanied the children to the well baby clinic and who knew well about child feeding habits and stayed with the baby.

The majority of the children who attended the well baby clinic came from within Nairobi province. The clinic attends to any child being brought for immunization services. Attendance is about 1540 children in a month, among them an average of 560 was above 6 months of age as per the well baby clinic monthly records.

3.2 Study Design

The study conducted from October to December 2009, was a cross sectional survey with descriptive and analytical components. It also involved a retrospective aspect of qualitative information on feeding patterns.

3.3 Sampling

3.3.1 Sample Size Determination

Sample size was determined using the Fisher *et al.*, (1991) formula

$$N = 2Z^2 pq/d^2$$

Where:

N = the desired sample size

p = proportion of population with stunting as per 2003 survey carried at Kenya – 30%

q = 1-p = 1- 0.30 = 0.7

Z = Standard normal deviation set at 1.96 (for 95% confidence interval).

d = Degree of accuracy desire set at 0.05

$N = 1.96^2 \times 0.3 \times 0.7 / 0.05^2 = 323$

5% attrition = 5 x 323 / 100 = 17

N = 323 +17 =340.

A total of 340 children aged between 6-59 months met the inclusion criteria in the study. However due to incomplete responses, 330 children (which was more than the calculated minimum) were included in the data analysis.

3.3.2 Sampling Procedure

Multi-stage sampling design which encompasses purposive and random sampling at different stages was employed. Kenyatta National Hospital was purposively selected and specifically its well baby clinic that offers a big catchment area for the study population. There are two well baby clinics at PDU and clinic 18.

A purposive selection of sample of 340 children was done in the well baby clinic at KNH using probability proportionate to size sampling technique. Together, a total of 330 respondents and their children were purposively selected from the Well Baby Clinic to form the sample by use of the method outlined in Figure 1. Key informant interviews were conducted on eleven health workers; five were the nurses among whom, three working at well baby clinic and two working in labour ward. Others were three nutritionists working at well baby clinic and one from the wards, and two doctors working at Paediatrics Filter Clinic (PFC).

The team that was conducting the FGD was composed of three who included the principal investigator as the facilitator, research assistant as the recorder and another research assistant as the guide who registered the participants and who mobilised them. The research assistant was given instructions on how to randomly select 10-12 mothers/fathers with children aged 6-59 months from the well baby clinic to participate in the FGDs. The participants were those who had not been interviewed.

3.3.2.1 Inclusion Criteria

Only children aged between 6-59 months and attending the well baby clinics for immunization, and other services were included in the study.

3.3.2.2 Exclusion Criteria

Sick children with chronic illnesses and the inpatients who were referred from the wards were all excluded. Those who were below six months of age, those within the desired age but not accompanied by their parents or care givers, and those visiting the clinic for the second time and had been interviewed during study period were also excluded.

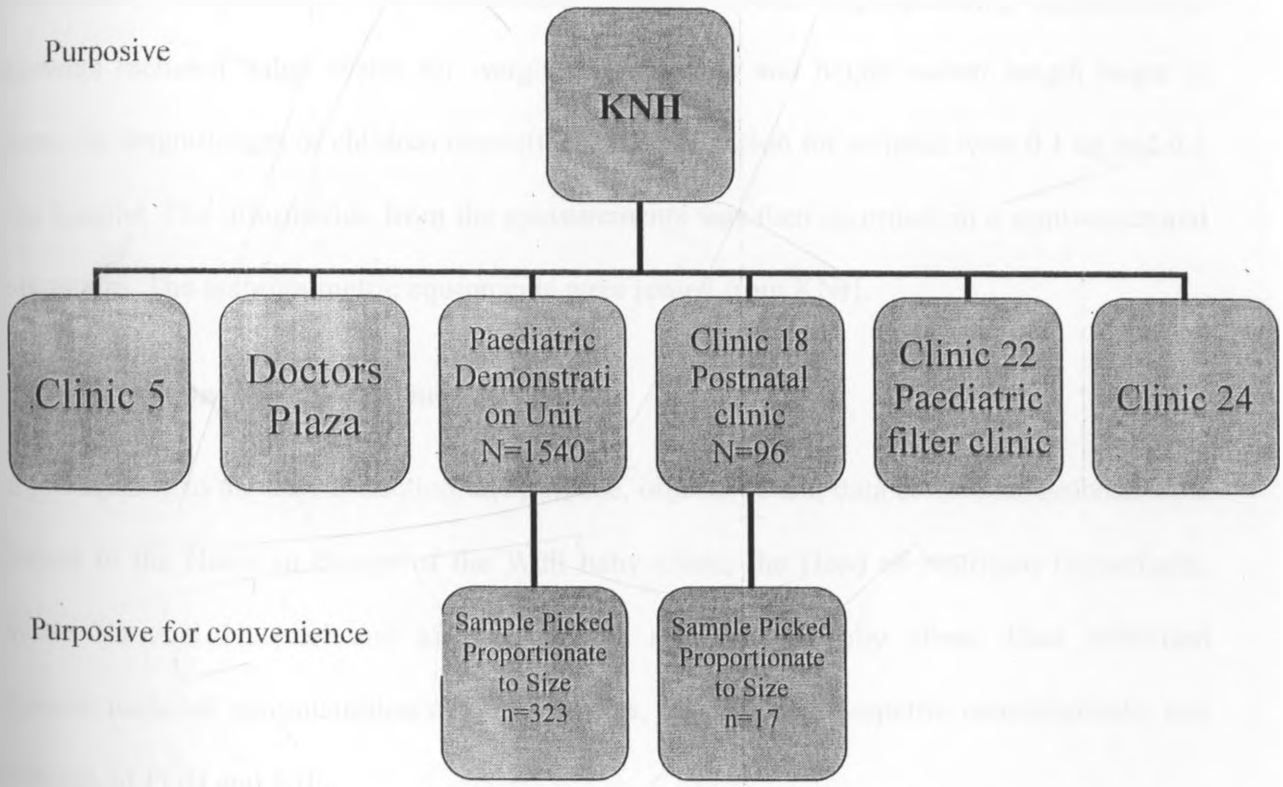

Figure 1 Flow chart on Sampling Procedure

3.4 Data Collection Tools and Instruments

The tools used in data collection included semi-structured questionnaires that also incorporated, food frequency and dietary food diversity questionnaires as well as focus group discussion(FGD) and key informant interview(KII) guides (annex 9). All were written in English language but translated into Swahili language to those who did not understand English.

The semi-structured-previously pre-tested questionnaire consisted of sections on household demographic and socio-economic characteristics, child feeding practices, health, and anthropometric measurements of the children (Annex 7.The anthropometric measurement equipments included Salter scales for weight measurement and height meter/ length board to measure the height/length of children respectively. The precision for weights were 0.1 kg and 0.1 cm for lengths. The information from the measurements was then recorded on a semi-structured questionnaire. The anthropometric equipments were rented from KNH.

3.5 Data Collection Techniques and Procedures

As a prerequisite to the data collection, the purpose, objectives and data collection methods were explained to the Nurse in charge of the Well baby clinic, the Head of Nutrition Department, Kenyatta National Hospital and all the workers at the well baby clinic. Data collection techniques included administration of questionnaire, taking anthropometric measurements, and conducting of FGD and KIIs.

Before interviewing the caregivers, informed consent was obtained after confirming whether the person accompanying the child was the real parent or a care giver/person that spent most of time or lived with the child

3.5.1 Recruitment and Training of Field Assistants

The five field enumerators/ assistants were recruited based on a command of good English and Kiswahili and strong background nutrition knowledge and ability to work with young children and mothers. Priority was given to those who were previously on attachment at KNH. The selection criteria for the field assistants included having a degree or higher Diploma in Nutrition and Dietetics and who had prior participated in health research and who accepted the proposed pay per day.

Training of Field Assistants

The recruited field assistants were trained for three days. Training curriculum included the administration of the questionnaire, interview technique, anthropometric measurements, extraction of secondary data, and ethics in the well baby clinic. The training program and the topics covered are shown in annex 1. The purpose and the objective were to be able to collect quality and reliable data through well trained field assistants. The field assistants were given opportunity to measure children under keen supervision of the principal investigator. Although the questionnaire was in English it was administered in both Kiswahili and English. Time was spent in translating the questionnaire to Kiswahili to avoid altering the meaning of the information.

3.5.2 Pre-testing of Tools

The semi-structured questionnaire was pre-tested on 32 individuals attending well baby clinic in Embakasi health centre to ensure that the tool was appropriately designed to collect the intended interviews. Appropriate changes and revisions were made on the questionnaire after pre-testing.

Qualitative data collection tools were pre-tested through informal interview with a few women in the Embakasi health centre and key informants who were not included in the actual study. The pre-testing of the data collection tools improved the quality and validly of the data.

3.5.3 Data Collection Procedures

Prior to the actual collection of the data, the principal researcher made several visits to the study area for the purposes of familiarisation and self introduction. During the visits to the study area, the intentions of the research were explained to the nurses and the nutritionists working in the unit.

A semi-structured pre-tested questionnaire was used to collect data on anthropometry, vaccination, morbidity experiences and child feeding practices of the children aged 6-59 months. Qualitative data on feeding practices, and data collected at the clinic by the health workers and perceptions on the nutritional status was collected through FGDs and KIIs.

3.5.3.1 Age and sex of the child

The date of birth (DOB) of the child was obtained from monitoring clinic cards since most of the children had immunization cards. A few who did not have the cards would remember the birth weights. Birth length was checked and the respondents were also asked about the birth length of their children. Sex was obtained through observation and asking the respondents or checking the monitoring cards.

3.5.3.2 Administration of Questionnaire and Interviewing Techniques

Techniques included interviewer's style, non-verbal cues, and interviewers'.expectations. The interview was done in a way that encouraged the respondents to talk freely and openly. They were shown warmth, responsiveness and general interest and all their responses were accepted without personal reactions, judgements or bias either verbally or non-verbally.

Secondary data involved recording the child's information from the clinic card and the use of any available data from the hospital record such as dietary and diseases history.

Procedures on how to ask questions included the following: Asking all questions in the order in which they appeared in the questionnaire, asking all the questions exactly as they were written and not offering explanations unless instructed to do so, no suggestion of answers, nor interpretation of respondent's responses/answer.

Demographic and social-economic characteristics

The household socio-economic and demographic characteristics data included those of both the child and the respondent, that is: Respondent sex and age, marital status, relationship to the index child, number of siblings to the index child, religion of the respondent, education level, occupation, main contribution to the household total income per month and the respondent place of residence, child age and sex, and place and date of birth.

Child feeding practices

The infant and young child feeding practices included breast feeding practices such as, breastfeeding initiation, duration, frequency of breast feeding , and complementary feeding

practices such as time of introduction of feeds, number of feed in a day, foods not allowed for children, salt in food, child's food preparation, food consumption frequency, and dietary diversity and food frequency. Information on human rights and beliefs related to infant and young child feeding practices was also collected.

Morbidity and sanitation

The mother/caregiver was asked to recall any form of illness that the index child had suffered within the two week period prior to the study. Ailments that could have an effect on child health were listed on the questionnaire (see annex 7 section C). The ailments included malaria, fever, respiratory infections, diarrhoea, pneumonia, measles and others.

3.5.3.2 Anthropometric Measurements

The four variables (weight, height, sex and age) were taken from the index child for the purposes of computing the anthropometric indices namely the Weight-for-Height (WFH), Height-for-Age (HFA) and Weight-for-Age (WFA). Step by step procedures were followed when taking the measurements. Standardized methods were applied to ensure correct measurements. The primary data was obtained from the mothers/caregivers on how they perceived the weight and length or height of their children.

Measuring the Weight of the Child using Electronic Scale

Electronic weighing scale was used for those children who refused to be weighed using Salter scale.

Prior to the field work the scales were checked for accuracy using a standard package of 2kg.

When using the electronic scale mother and child were weighed simultaneously (picture I) in annex 10. The measurer minimized the clothing on the child. The measurer then asked the mother to stand on the scale and recorded the reading to the nearest 0.1 kg. The measurer then passed the child to the person nearby in order to take the weight of the mother alone. The weight of the child was obtained by finding the difference between the two readings (Cogill, 2003).

Measuring the Weight of the Child using Salter Scales

The weight of the child less than 2 years old was taken using a Salter scale, calibrated in kilograms and grams (UN, 1986). Each child was weighed without any clothing. For each child two measurements were made and recorded twice to the nearest 100 gms (0.1kg) and the average was calculated to improve the accuracy The children who were more than two years old were weighed dressed with undergarments and with shoes off using a bathroom scale that weighed to the nearest 0.1 kg as shown in picture 1 Annex 10.

Measuring the Height/Length of the Children

Length measurement was done on those below two years of age. A length board was used to measure the recumbent length of the index child aged between 6 and 24 months (picture 2 in Annex 10).

A vertical height was measured for children aged 2 years and above (picture 3 in Annex 10).

The data collector placed a measuring board on a hard flat surface against a wall or table to ensure that the board was not moving, and asked the mother to remove any material that could cause interference with the measurement like shoes. The respondent was then asked to walk the child to the board and kneel in front of the child. Picture2 in annex 10 shows length taking measurement procedures. The assistant placed the questionnaire and pencil on the ground and knelt on both knees on the right side of the child. The measurer knelt on the right knee on the child's left in order to give maximum mobility, the assistant then placed the child's feet flat and together in the centre of and against the back and base of the board then placed the right hand just above the child's ankles and the left hand on the child's knees and against the board. She ensured that the child's legs were straight and heels and calves were against the board and informed the measurer when she had completed positioning the feet and legs. The measurer then informed the child to look straight ahead at the mother making sure the child's line of sight was level with the ground. The measurer placed open left hand under the child's chin. The measurer gradually closed the hand without covering the child's mouth or nose and the shoulders were level, hands at child's side, the head, shoulder blades and buttocks were against the board. Then the measurer lowered the headpiece on top of the child's head and pushed through the child's hair. Both the measurer and assistant ensured that the child was in the correct position. Finally the measurer read and called out the measurement to the nearest 0.1 cm and removed the headpiece and the hand from the child's head and chin respectively. The assistant immediately recorded the measurement. Lastly the measurer checked the recorded measurement on the questionnaire for accuracy and legibility and instructed the assistant to erase and correct any errors (Annex 10) (Cogill, 2003)

Dietary Data

A semi-stractured questionnaire was used to collect qualitative data on the child feeding practices and child dietary diversity.

Dietary Diversity Score

The 14 groups included in the Individual Dietary Diversity Score (IDDS) were Cereals; Vitamin A rich vegetables and tubers; White roots and tubers; Dark green leafy vegetables; Other vegetables; Vitamin A rich fruits; Other fruits; Organ meat; Flesh meat; Eggs; Fish; Legumes, nuts and seeds; Milk and milk products; Oils and Fats, Vitamin A rich food sources are counted separately and meats are sub-divided into two groups (organ meats and other).The last two groups in the questionnaire are not included in the score(annex7 section D). The food groups were classified into low (≤ 3 food groups), medium (4-5 food groups), and high (food groups $\geq$ 6). DDS, means, Standardized Deviation (SD) and frequencies were calculated (FAO and FANTA, 2008).

Focus Group Discussion

The FGD was conducted in Kiswahili language among the two groups of ten and eleven mothers and fathers respectively. The principal investigator together with two of the field assistants facilitated the FGD. The principal investigator acted as a moderator while the field assistants recorded and took the notes/points.

The principal investigator gave a brief introductory remark and introduced the field assistant to the audience, who then explained the purpose of the meeting that lasted up to two hours. The ice was broken by giving chance to each participant to introduce him/herself. The aim of the FGD was to identify people's perception on foods in relation to nutritional status and the feeding

patterns and human rights issues relating to foods, the knowledge, attitudes, on child feeding practices. (Annex 8)

Key informant Interview

Key-informant interviews used a checklist of guidelines for health as shown in (Annex 9). A special questionnaire was used to interview health workers to collect valuable information on nutritional data collected in the well baby clinic by the health providers. Key informant interviews were conducted on the health care workers to gather information on human rights to breast feeding by the mothers, advocacy, the use and the kind of data collected at the baby clinic by the health workers.

3.6 Ethical Considerations

3.6.1 Ethical Consideration during the Interview

It was the responsibility of the survey team to minimize the discomforts and inconveniences of the survey and anthropometric measurements. The purpose, contents and the objectives of the survey was explained in a non-threatening and culturally relevant manner. The listener was given an opportunity to ask questions and to decline participation if necessary. Safety of the child was provided by following adequate procedure to ensure that no accidents occurred amongst the children during measurements and interviewing of the parent.

Ethical clearance was sought from the KNH/ University of Nairobi (UON) Ethical Research Committee (ERC) before commencing the study. The letter of clearance by ethical committee is shown in Annex 6.

Researchers avoided unethical acts like plagiarism, fraud and dishonesty. The researchers were not involved in acts of smoking nor engaged in seducing men in the process of the interview. They were also mindful of the dress code. Confidentiality and privacy were maintained. The researchers avoided physical acts and psychological comments that could cause harm to the respondent and also sought voluntary and informed consent before interviewing.

3.6.2 Ethical Issues Concerning Research Process in Relation to Respondents

Research permit was obtained from ethical clearance committee at the Kenyatta National Hospital Ethical and Research Committee. Before data collection, an informed oral consent from every respondent was obtained. There was no coercion to elicit information from the respondent who would decline to be interviewed. Confidentiality of the information obtained was maintained. Further consent was obtained from each respondent before the interview. The confidentiality of the information received was assured to the respondents.

The ethical issues included ensuring that no researcher abuses the trust of respondent. One was not to make false promises such as a promise to go back to them. The wishes of the respondents were respected. Confidentiality was maintained by not in any way disclosing to others information gained from a respondent. Voluntary and informed consent was sought which had no strings attached such as rewards and promises, all the time considering the respondents first where there was conflict in research.

Privacy of the respondents was protected and the rights to remain anonymous were maintained. There was no access to the information by any other person because it was locked and kept well.

An identity number was used in place of names in order to protect the child. During the data set entry, reporting and processing, the name of the respondent was not used, but instead, the identity number was used. The identity number was used in accordance with the questionnaire number to ensure maximum protection of the child (Meme and Kogi-Makau, 2004).

Consent seeking procedure was given in details and it included the explanation to the mother/caregiver regarding the reasons for the study (Refer to consent form annex 1).

3.7 Data quality Control

The equipment were carefully calibrated and standardized as necessary. Two readings of the anthropometric measurements were taken and recorded in order to enhance the validity of the data. There was very close supervision by the principal investigator throughout the study in order to collect quality data. All the open ended questions were manually coded. Each questionnaire was counter checked for completion before leaving the data collection site. Proper training of the field assistants was ensured in order to produce quality data. The data was cleaned through running of the frequencies and cross tabulation after the data entry to ensure there were no mistakes that could have occurred during the data entry this also facilitates checks on outliers.

The respondents were informed about the reason for the research being carried out hence reliable information was collected.

3.8 Data Handling and Analysis

3.8.1 Data Entry and Cleaning

Data entry templates were developed and formed a basis for data entry into the computer and data summary developed with the help of a statistician. The data were entered into the computer as soon as it was available and errors noted were corrected by counterchecking of the

questionnaires. Data cleaning, recording and post data coding was carried out. The questionnaire was checked for any errors at the end of each day of the actual survey.

3.8.2 Statistical Data Analysis

Descriptive statistics used included the measure of central tendency dispersion and percentages. The Chi-square (χ^2) test was used to determine differences between proportions, Odds ratio to estimate the relative risk and correlation to test the strength of association. Non-parametric tests, regression and logistic analysis tools were used to estimate relation between variables that contributed to stunting and overweight/normal and extent to which these variables affected the nutritional status of the study children. These statistical tools were applied using the computer software packages, SPSS and EPI-INFO that was used to convert the anthropometric measurements to anthropometric indices. BMI-for-age was used to categorise children in terms of their weight status. Categorization of the study children according to their nutritional status was based on the WHO, 2006 growth reference standards. Table 1 shows the z-scores cut-off points for the remaining categories.

Table 1 Cut-off Points for Levels of Nutritional Status

Nutritional status	Severe	Moderate	Mild	Normal
Stunting	<-3 zs	<-2 zs	<-1zs	>-1 zscore:
Underweight	<-3 zs	<-2 zs	<-1 zs	>-1 zs
Wasting	<-3 zs	<-2 zs	<-1 zs	>-1 zs
Stunted-overweight	Stunting <-2, overweight > + 2			

Source: WHO, 2006

The BMI for age was analysed using body mass index; a growth indicator that relates BMI to age. It is determined using gender-specific growth charts that place a child in a percentile relative to weight and height (WHO, 2006).

Cut off points are interpreted as follows for BMI for age (table 2).

Table 2 Cut off Points for BMI-for-Age

Z-scores	Above 3	Above 2	Above 1	**0(median)**	**Below-1**	Below -2	Below -3
BMI	Obese	Overweight	Risk of overwt	**Normal**	**Normal**	Wasted	Severely Wasted

Source :(WHO, 2006)

CHAPTER FOUR: RESULTS

4.0 Introduction

This chapter outlines results on demographic and socio-economic characteristics, the study respondents, nutritional status, feeding practices, morbidity, health status and hygiene status of the study children as well as sanitation of the households. A total of 340 children aged between 6-59 months met the inclusion criteria in the study. However due to incomplete responses, 330 children were included in the study, a number greater than the expected minimum sample size of 323. The incomplete responses included those parents/guardians who declined to be interviewed or who were interviewed mid-way.

4.1 Demographic Characteristics of the Respondents and their Households.

Table 3 shows selected demographic characteristics of the study respondents who accompanied their children to the well baby clinic. Majority of those who accompanied the children to the well baby clinic were females, Christians and the baby's own mother. A small proportion of fathers accompanied the baby's to the clinic while the rest of the children were accompanied by either other relatives or the house helps. The majority of the respondents were married, 10% were single and a few were either single, engaged, divorced, widowed, separated or cohabiting.

Table 3 Selected Demographic Characteristics of the Respondents

Respondents Characteristics		% of Respondents N=330
Sex	Females	96.1
	Males	3.9
Religion	Christians	97.6
	Muslims	2.6
Relation to Index Child	Mother	93.0
	Father	2.4
	Other relatives	3.9
	House helps	0.9
Marital Status	Married	87.6
	Singles	10
	Others	2.4

4.1.1 Age Distribution of the Study Mothers

The mean age of the mothers who brought babies to the clinic was 29 ± 5.3 years. The majority of the mothers were aged 20-34 years with about two-thirds being 25-34 years. Small percentages (< 2%) of the mothers were adolescents (15-19 years old) while < 5% were aged 40-45 years (figure 2). The stem and leaf showed a normal distribution in terms of age.

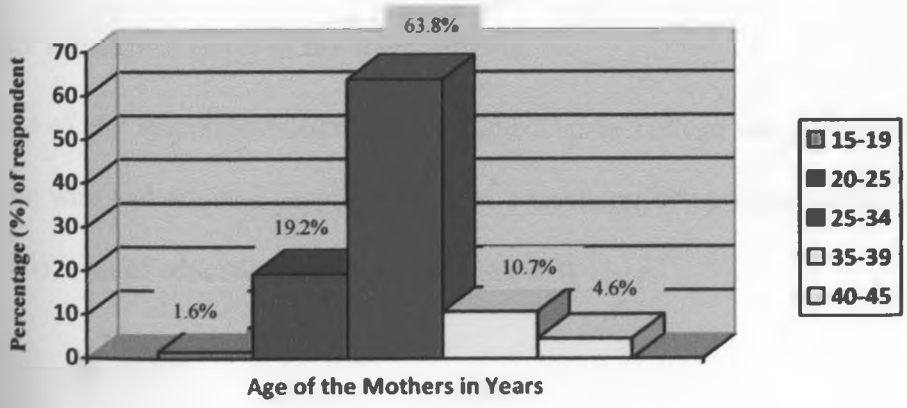

Figure 2 Distribution of the Study Mothers by their Age

4.1.2 Number of Siblings in the Household

Figure 3 shows the distribution of study households by the number of child siblings. Almost half of the households had only one child while one-third of the households had two siblings. The rest of the households had three to five siblings.

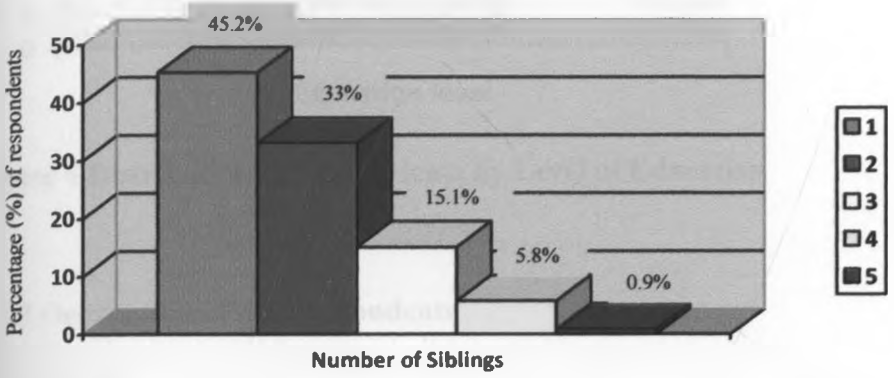

Figure 3 Number of Siblings in the Household

4.2 Social-economic Characteristics of the Respondents and their Households

4.2.1 Education Level of the Respondents

Most of the respondents (45%) had studied up to college and polytechnic level, followed by those who had attained secondary school education (28%), upper primary (14%) and university (13%) level of education in that order (Figure 4).

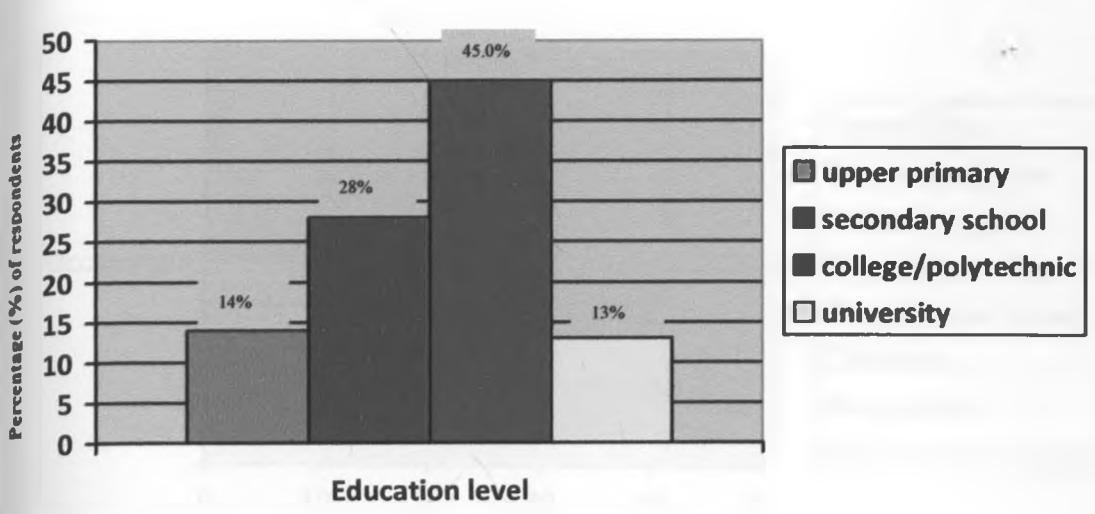

Figure 4 Distribution of Respondents by Level of Education

4.2.2 Occupation of the Respondents

Majority of the respondents were formally employed, followed by housewives and those who owned small businesses in that order. The rest were unemployed, students, small scale farmers or casual labourers (Figure 5 below).

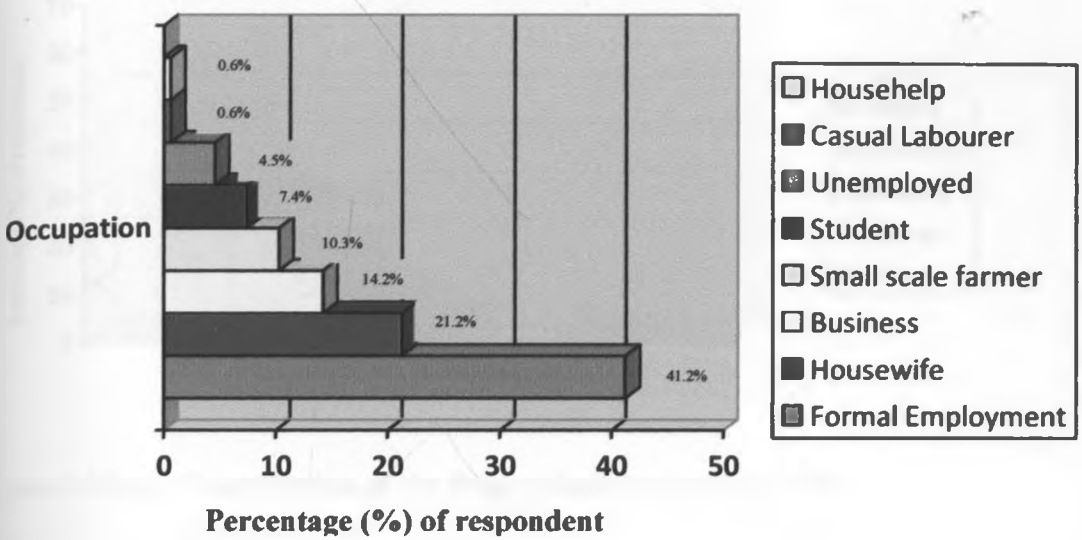

Figure 5 Occupation of the Respondents

4.2.3 Contribution of the Respondent to the Household

Two thirds of the respondents contributed money to the household, while 28.2 % contributed childcare. A few respondents contributed nothing and 3% contributed labour among other contributions. Respondents contributed in more than one way to the household and most of them contributed both money and childcare at the same time (Figure 6).

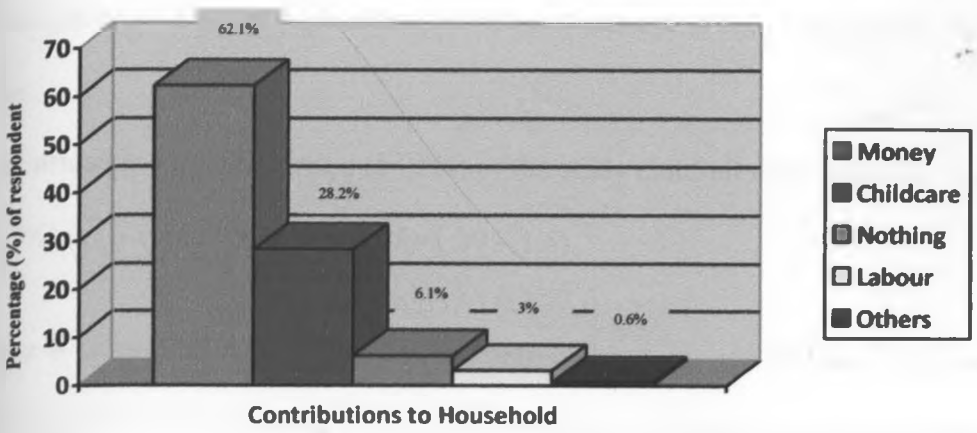

Figure 6 Major Contribution of the Respondents to the Household

4.2.4 Household Monthly Income

Figure 7 shows the distribution of the study households (n=283) by monthly income. The mean income was Kshs 45,000 with the percentiles distribution at lower one third of Kshs. 18,000, mid one third of Kshs. 30,000 and upper one third of Kshs. 50,000. Forty seven respondents declined to respond to the question and only two respondents earned below a dollar a day. About a half (49.5%) of the households earned upto Kshs 40,000 per month, while one-third (33%) earned more than 40,000 per month.

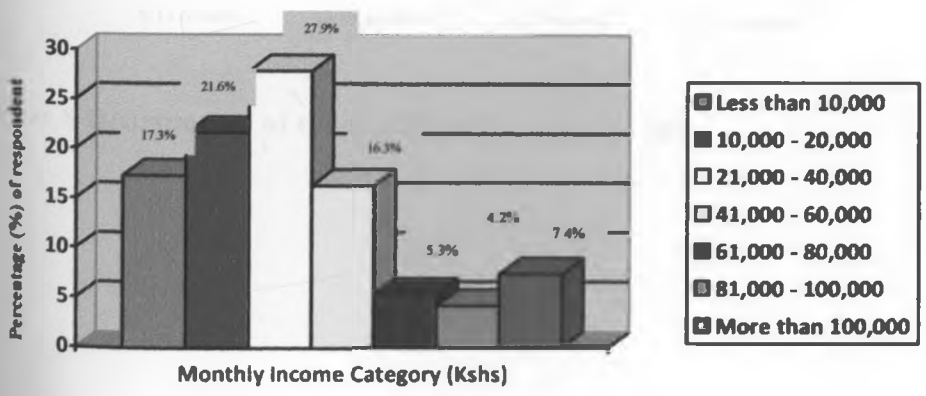

Figure 7 Household Income Categories per Month

4.3 Age and Sex Characteristics of the Study Children

The majority (97.9%) of the children were born in hospital while the rest (2.1%) were born at home.

A significantly high proportion (54.1%) of the study children were males as compared to females (45.9%) (χ^2 p-value<.000, 95%: CI =1.39 – 1.5).

Figure 8 shows the distribution of the study children by age and sex. The number of children attending the well baby clinic drastically decreased with age from 81% at infancy to <2 % at 36-59 months old. The vast majority of the children (92.7%) fell in the "window of opportunity" category, (the period < 24 months of age).

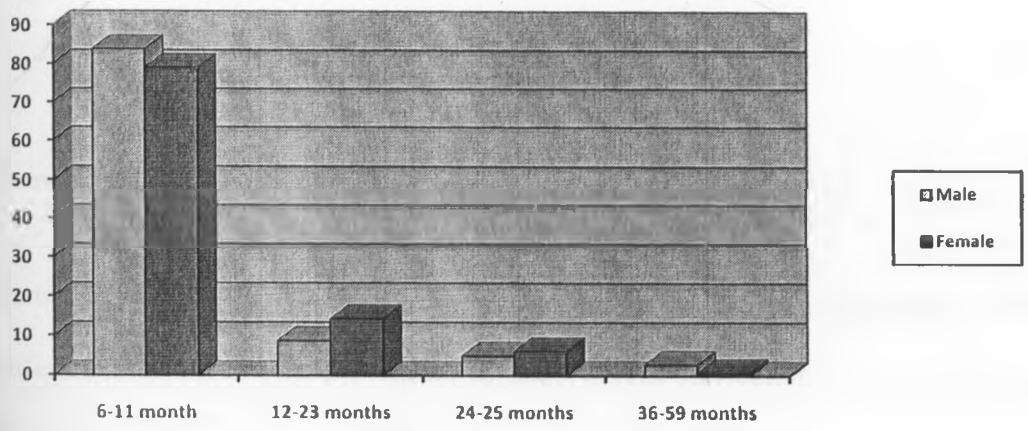

Figure 8 Distribution of the Children by Age and Sex

4.4 Nutritional Status of the Study Children.

4.4.1 Weight for Age

Table 4 shows the distribution of the study children according to weight for-age-status. Global underweight (WAZ<-2) was 14.3%, with 9.1% and 5.2% being moderately and severely underweight respectively. The prevalence of overweight was similar to Global underweight.

Table 4 Prevalence of Underweight

	Percentage weight-for-age status				
Age in months N=329	**Severe underweight (n=17) (zs<-3)**	**Moderate underweight (n=30) (zs<-3)**	**Normal (n=237) (zs> -1 and< 1)**	**Overweight n=45 (zs >2)**	**Totals N=329**
6-11(n=268)	4	8.5	56.2	12.8	81.5
12-23(n=37)	0.9	0.3	9.70	0.3	11.2
24-59(n=24)	0.3	0.3	6.10	0.6	5.5
Total(n=329)	5.2	9.1	72.0	13.7	100

4.4.2 Prevalence of Underweight by Sex

There were more male than female children attending the well baby clinic (table 5).There was no significant difference in the prevalence of underweight between males and females $\chi^2 = 1.59$, $p = 0.931$

Table 5 Prevalence of Underweight by Sex

Sex of the child	Percent % of children			
	Severe underweight (n=10)	Moderate underweight (n=17)	Normal (n=299)	Total
Male (n=182)	60	58.8	55.5	55.8
Female (n=144)	40	41.2	44.5	44.2
Total (n=326)	100	100	100	100

4.2.3 Percent Distribution of Nutritional status-for-age Z-scores at Different Age Groups

The mean weight for age Z-scores at different age groups showed that stunting, underweight and wasting decreases with age. Figure 9 shows the trends in the nutritional status by age. Stunting, underweight and wasting in the age groups was not significant (F, p>0.5). The ANOVAs results showed that WAZ, F= 0.463, P-value= 0.630 while HAZ,F=0.275,P-value=0.760 and WHZ,F=0.492,P-value 0.612.

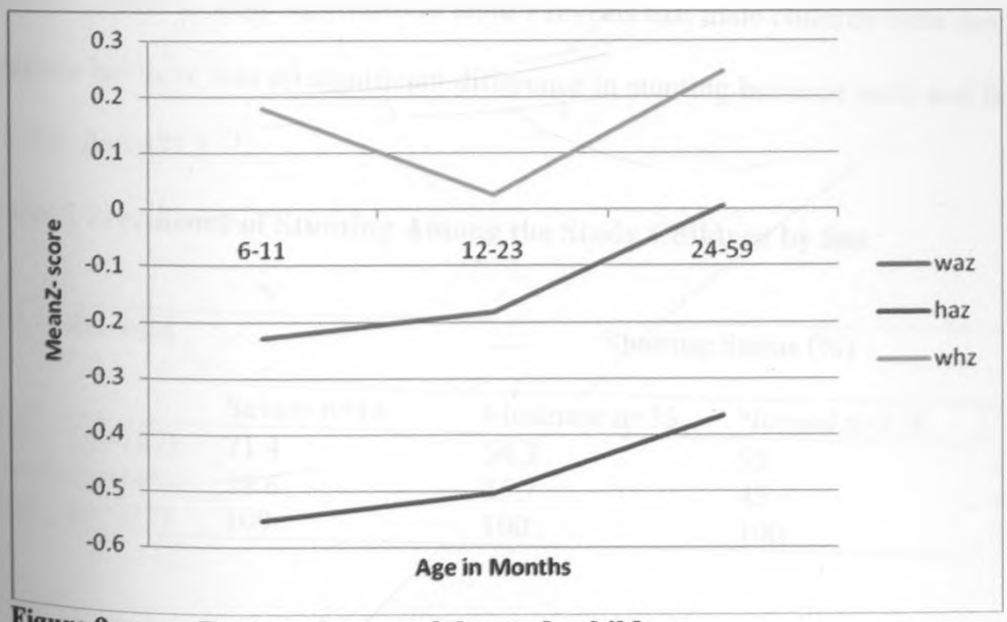

Figure 9 mean Z-scores by age of the study children

4.4.4 Height for Age

The prevalence of global stunting among the study children was 15 % while severely and moderately stunting was 4.3 % and 10.7% respectively.

There was no significant association between age and stunting status of the children (χ^2 =0.228, p-value=0.341). Table 6 shows the prevalence of stunting by age of the study children.

Table 6 Prevalence of Stunting among the Study Children by Age

Age of child (months)	Height-for-age status (%) N=327			
	Severe stunting n=14	Moderate stunting n=35	Normal n=278	Total
6-11	57.1	65.7	61.6	61.8
12-23	42.9	22.9	27.2	27.4
24-59	0	11.4	11.2	10.8
Total N= 327	100	100	100	100

4.4.4.1 Prevalence of stunting among the study Children by Sex

The prevalence of stunting shown in table 7 reveals that male children were more than the female children but there was no significant difference in stunting between male and female children(χ^2 =1.543, P=0.477.)

Table 7 Prevalence of Stunting Among the Study Children by Sex

Sex of the child	Stunting Status (%)			
	Severe n=14	Moderate n=35	Normal n=278	Total
Male (n=182)	71.4	54.3	55	55.7
Female (n=145)	28.6	45.7	45	44.3
Total (n=327)	100	100	100	100

4.4.5 Weight for Height

The prevalence of global acute malnutrition (GAM) was 6.8% (CI: 1.35-2.15)

Table 8 shows the prevalence of acute malnutrition by sex of the children. More males were severely and moderately wasted as compared to females although this difference was not statistically significant, (χ^2=1.383, p-value=0.501).

Table 8 Weight for Height by Sex of the Children

Sex of the child	Wasting status (%)			
	Severe n=8	Moderate n=14	Normal n=303	Total N=325
Male n=180	75	57.1	54.8	55.4
Female n=145	25	42.9	45.2	44.6
Total n=325	100	100	100	100

More children (7.1%) aged 6-11 months were malnourished than those above two years (6.2%), although there were more severely malnourished children between one and two years of age (table 9).

There were no significant differences in the acute malnutrition rates between age groups (χ^2=3.020. P-value=0.806).

Table 9 Prevalence of Acute Malnutrition by the Child Age

Age (months) N=325	Severe wasting (%) n=8	Moderate wasting (%) n=14	Normal (%) n=303
6-11	50	71.4	62.5
12-23	37.5	21.4	26.9
24-59	12.5	7.2	10.6
Total	100	100	100

4.2.6 Body Mass Index for age

Table 10 shows the distribution of study children by BMI-for-age. There were slightly more underweight than overweight children among the study group. The prevalence of overweight and obesity among the children was 11.8 %.

Table 10 Body Mass Index for Age of Study Children

Weight status Using Body Mass Index for age z-scores	Study children (N=330)	
	N	%
Underweight (z-scores<-2)	50	15.2
Normal Weight (z-scores>-1>1	241	73
Overweight (z-scores>2<3)	39	11.8
Total	330	100

There was no statistically significant difference between the BMI-for-age of male and that of female children (p value =0.599) (Table 13). However in both genders, the prevalence of overweight was >10%.

Table 11 Body Mass Index-for-age by Sex

Weight status using BMI-for-age	Study children (%)		
	Male(n=183)	Female(n=147)	Total N=330
Underweight zs<-2	16.9	13.0	15.2
Normal z-scores >-1<=1	71.6	74.8	72.7
Overweight z-scores >=2	11.5	12.2	12.1

4.2.7 Stunted Overweight

The indicators for stunted-overweight include the both BMI-for-age and height-for-age. Those individuals with both z-scores greater than+ 2 had overweight and stunting status co-existing in same individual.

Among the total (49) number of children who were stunted, 46.9% had normal BMI-for-age, 32.7% were severely and moderately underweight and stunted while 20.4% were stunted and overweight as shown in figure 10.

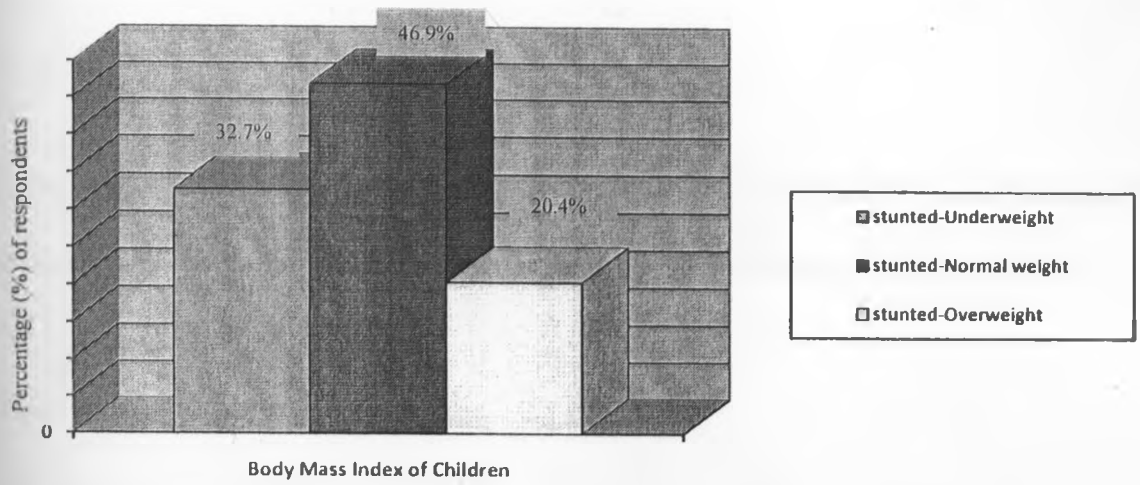

Figure 10 shows the Prevalence of stunted-overweight

Table 12 shows the Prevalence of stunted-overweight. Overall, the prevalence of stunted overweight was 3% while those who were stunted and underweight were 4.9 % and the rest (7.1 %) had normal weight for their height although stunted. There was a correlation between height-for-age status and BMI-for-age, r=0.11, p=0.047.

Table 12 Relationship between Stunting and BMI-for-age

	Stunting Status (%)		
BMI for-age z-scores	**severe<-2 Stunting status<-3 (n=49)**	**Normal (n=281)**	**Total N=330**
Underweight <-2 n=50)	4.9	10	14.9
Normal <1=<-1 n=241)	7.1	66.1	73.2
Overweight >2(n=39)	3	8.9	11.9
Total	15	85	100

Of the 10 stunted and overweight children, 70 % were males while 30% were females. Majority of the stunted-overweight children were between 6 to 11 months as shown in table 13.

Table 13 Stunted-overweight by Age

Age (months) N=330	Stunted overweight (%)	Others (%)	p-value
6-11 (n=269)	3.3	96.7	*
12-24 (n=55)	-	100	*
36-59 (n=6)	16.7	83.3	*

* The values are insignificant for chi square test

Table 12 Relationship between Stunting and BMI-for-age

	Stunting Status (%)		
BMI for-age z-scores	**severe<-2 Stunting status<-3 (n=49)**	**Normal (n=281)**	**Total N=330**
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Normal <1=<-1 n=241)	7.1	66.1	73.2
Overweight >2(n=39)	**3**	8.9	11.9
Total	15	85	100

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12-24 (n=55)	-	100	*
36-59 (n=6)	16.7	83.3	*

* The values are insignificant for chi square test

4.2.8 Relationship between Stunting and Weight for Age among the Study Children

Among the total number of the children (49) who were stunted, and using weight-for-age indicator only, 18.4% were stunted-underweight (severe and moderate) and a similar proportion were also stunted-overweight. The rest were stunted but with ideal weight for their age. Similar proportions were also observed in the total sample of children.

The ratio between the underweight and the overweight in total was also 1:1 (figure 11). Thus, there was an equal prevalence of both the over-nourished and the under-nourished children.

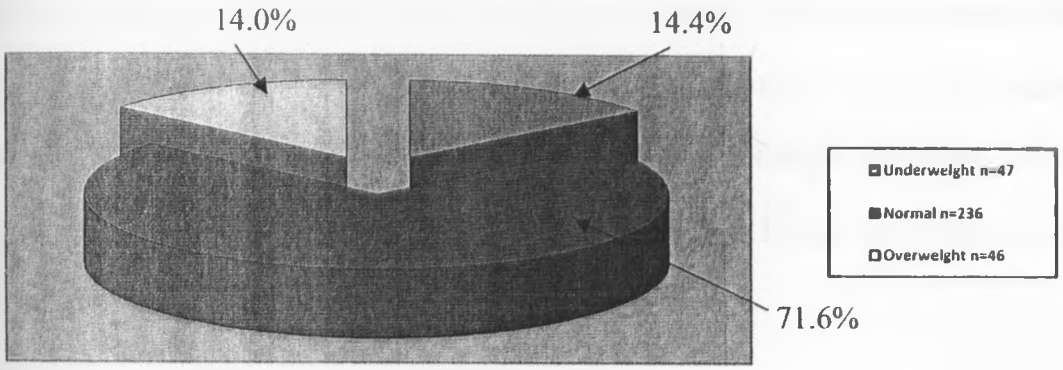

Figure 11 Prevalence of Weight for Age among the Children

4.2.8 Nutritional Data Collected and Action Taken by Service Providers at the Clinic

The nutritional data collected by the service providers at the baby clinic included weight, dietary history and breastfeeding history. The data act as an indicator for referring the severe and moderately underweight children and those who were sick were referred to the children's outpatient for medical treatments. The data collected was used for planning in budgeting for the

procurement and purchase of vaccines and supplements in the department. Service providers used the data to advise the client accordingly. The data were used to compile into quarterly reports that are then presented by the department to funding agencies supporting the department like WHO and UNICEF. The data were finally used for accountability of the department as a proof that they attended to a particular number of children over a given period of time. Data were given as a weekly report to the office of the deputy director clinical services.

Health worker reported that female children were more malnourished than male children.
The clinic gets cases of mild to moderate malnutrition that are referred to the nutritionist at the Paediatric Demonstration Unit (PDU) situated right at the well baby clinic. The majority of the malnutrition cases were reported to come have from Ukambani, slum areas especially Kibera and Mathare. There was a reduction in the rates of malnutrition reported by the clinic over the years. The reason for the reduction in the malnutrition rate was attributed to the dietary education and advice given to the clients attending the well baby clinic. 4.5.1 Mothers' Perception about the Children's Ideal Height when they grow up.

Asked about their preferences on the ideal height of their children when they are adults, more than half of the mothers preferred medium height; over one-third preferred tall and only 2.1% preferred short children. Less than 10% were indifferent on the height that they preferred their children to attain. (Figure12).

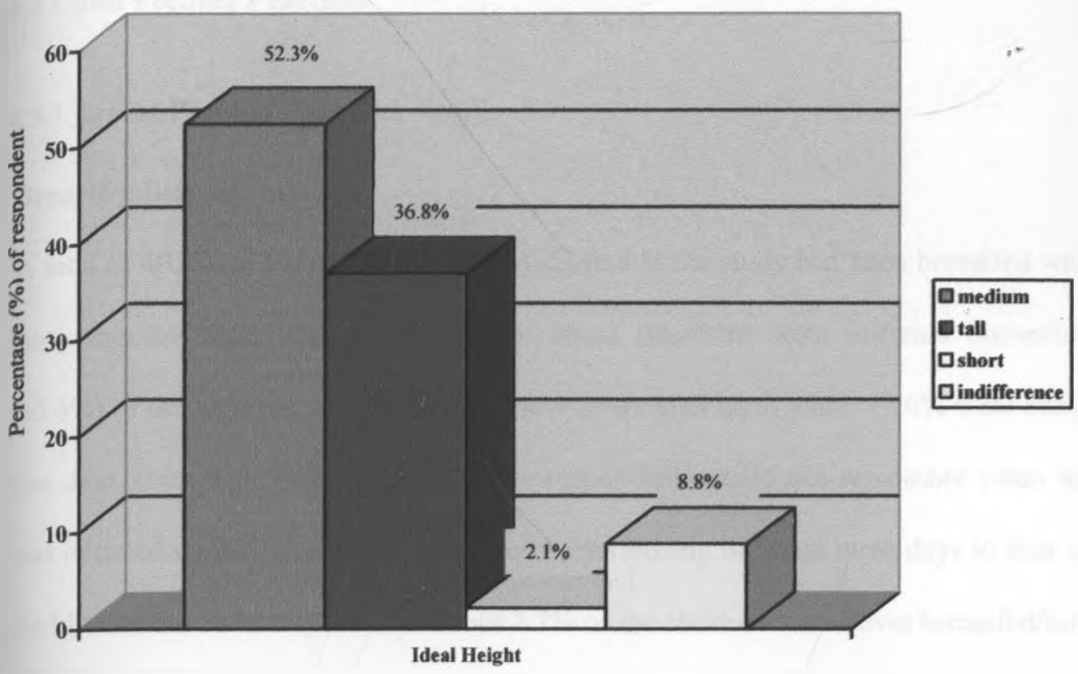

Figure 12 Mothers Perception about the Children's Ideal Height when they Grow Up

4.5.2 Mother's Perception about the Children's Ideal Weight when they grow up

Concerning the preferred weight of their children, majority (81.8 %) of the parents preferred children with medium weight while 12.7% preferred fat children, 2.4% preferred lean children but 2.7% were indifferent about the ideal weight of their children.

According to the FGDs, medium weight was reported as the most preferred 'ideal weight'. Others reported that weight and height depends on family and the parents' genes. Most reported as 'mambo ya mungu.' meaning the growth of children is a mystery and only God who is the creator determines the growth of the children. They view fat children as sick and should see a doctor or reduce the extra weight. On the other hand, others perceived the fat/overweight children as healthy and having had a good care by their guardians with provision of enough food to eat.

4.3 Child Feeding Practices

4.3.1 Breast Feeding Practices

Breastfeeding Initiation

A total of 40.4% of the children who participated in the study had been breastfed within the first thirty minutes after birth among whom about one-third were initiated immediately. About (30.4%) of the children were breastfed a few hours after birth while 17.6% were breastfed one to two days after birth. Some (4.2%) of the respondents could not remember when breastfeeding was initiated while others (4.8%) initiated breastfeeding between three days to four months after the birth of the child (Figure 13). About 2.7% of the children were never breastfed/initiated.

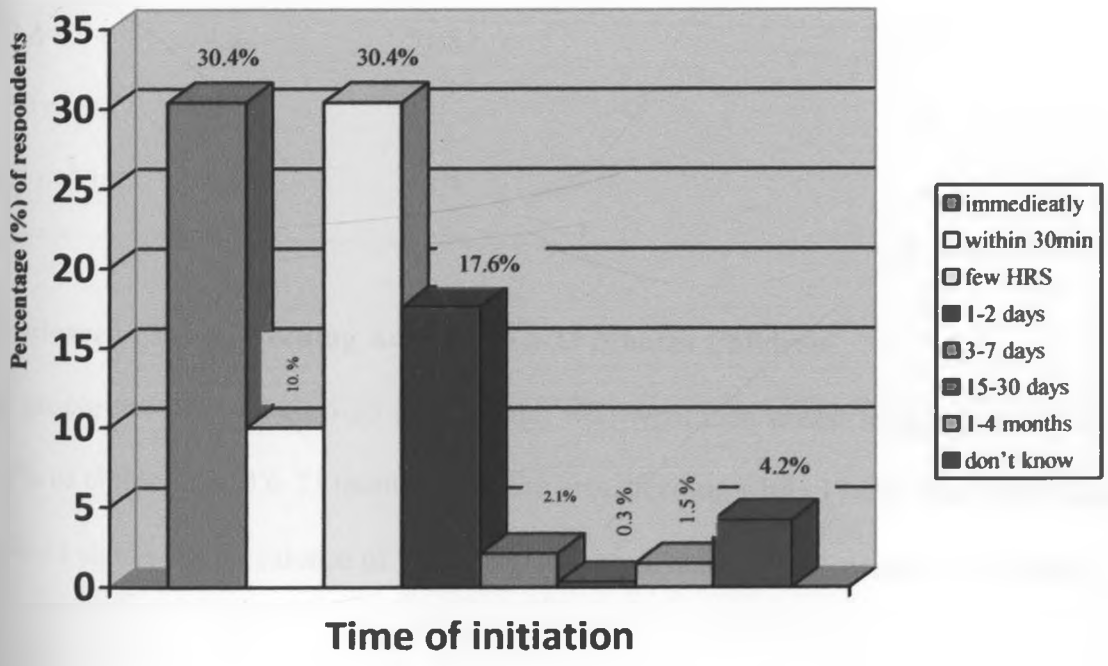

Figure 13 Distribution of study children by time of Initiation of Breast Feeding

Breastfeeding Status of Children by age

Among the study children, 75.4% were still breastfeeding at the time of the study. Over half of the children (56.7%) were reported to have exclusively breast fed for six months. A small proportion (2.7%) was never breast fed. However, some (3.5%) continued with exclusive breastfeeding even after the child was above six months of age while a few could not remember the exact duration that the child was exclusively breastfed (table 14). But 21.7% were not breastfeeding but had been breastfed earlier, making the total number of children who ever breastfed to 97.3%. Most (88.9%) of the children above two years were not breastfeeding at the time of the interview and a few were still breast feeding.

Table 14 Breast Feeding Status by Age

Age in months	Breast feeding Status (%)		
N=330	Breastfeeding	Exclusively breast fed for 6 months	Never breast fed
6-23 n=294	74.2	51.8	2.7
24-59 n=36	1.2	4.9	0
Total n=330	75.4	56.7	2.7

Prevalence of Breast Feeding Among the 6-23 Months Children

The proportion of children 6-23 months old, who were then breast feeding was 75.4%. About 82.9% of children aged 6-23 months old were breastfeeding while 17.1% were not breastfeeding. Table 15 shows the prevalence of breastfeeding by age among 6-23 months old children.

Table 15 Prevalence of Breast Feeding by Age among the 6-23 Months Children

Age in months (N=294)	Yes (%) (N=244)	No (%) (N=50)
6-11(n=202)	71.3	56
12-23 (n=92)	28.7	44
Total	100	100

Age at which breast milk alone was considered enough for their Children

More than half (52.2%) of mothers believed that breast milk was enough up to six months of age. Table 16 give a summary of time at which the breast milk was believed to be enough for the infant.

Table 16 Age at which Breast Milk alone was Enough for their Children

Age at which BF is enough	Number of children(N)	Percentage (%)
Less than one month	6	1.9
1-5 months	117	36.8
Up to 6 months	166	52.2
Above 6 months	11	3.5
Does not know/cannot remember	18	5.6
Total	333	100

Reasons why the study children were not breastfeeding

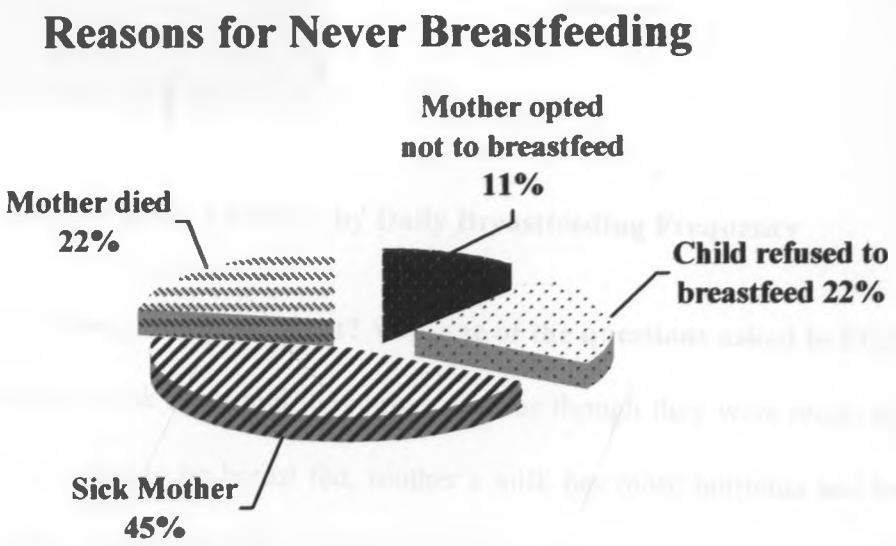

Figure 14 Reasons for not Ever Breastfeeding

Breastfeeding Frequency in 24 hours

Figure 15 shows the distribution of study children by breastfeeding frequency per day

The vast majority of the respondent breast fed their children on demand (8 times a day or more), while some mothers breast fed five to seven times, two to four times or only once daily..

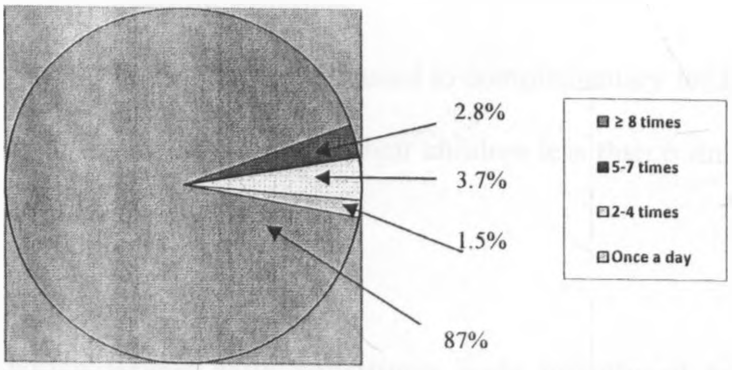

Figure 15 Distribution of study Children by Daily Breastfeeding Frequency

'How does Breast Feeding become a Right? Was one of the questions asked in FGD.

When they are born they look for it and they breast feed as though they were receiving it in the womb, when sick they need to be breast fed, mother's milk has more nutrients and breast milk prevents the child from becoming sick. But they outlined reasons why a child may not breast feed.

According to the respondents, the duration of breast feeding depend on the children themselves. Some breast feed as long as two years and beyond, others refused to B/F or are stopped by their mothers if they refused to eat food.

On the other hand, when asked if it was a must for mothers to breast feed the response was 'no 'due to medical reason such as cancer, HIV/AIDS, Hepatitis B or C. For mothers who were HIV positive, they can be given ARVS that reduces the infection. Others were not sure if it was a right for the mother to breast feed or not.

4.3.2 Complementary Feeding Practices

On average, the study children were introduced to complementary feeds at the age of 5±1.68 SD months. Over half of the respondents fed their children less than 6 times per day, while the rest were fed six or more times per day.

4.3.2.1Age at which Breast Milk substitutes were introduced to the infants before six months

According to FGDs, it was reported that mothers introduce other foods / liquids before the child was six months of age. They gave other food if the mother was HIV+ for fear of infecting the child with the human immune-suppression virus. Others believed they did not have enough breast milk while others were advised by relatives especially their mothers-in-law to introduce foods to the baby early so that the baby could grow and develop well.

A working mother was reported to introduce these foods early into the child's diet since time to express breast milk was not adequate.

Some health workers also played a major role in early introduction of these foods when they advise mothers to introduce formulae milk to a child before six months of age since they believed it was similar to the breast milk.

The common reasons for children having stopped breastfeeding are shown in Figure 16. Some of them had earlier on breast fed but had stopped breastfeeding by the time the study was conducted.

The reasons given by respondents for children (n=78) who were not breast feeding were as follows: Having a sick child, child did not want to eat the food, mother going back to work/school, mother's death, separated from the child while in prison, mother having inverted nipples, mother died or mother refused to breast feed her child so that the child can eat or mother not having enough milk, amongst other reasons.

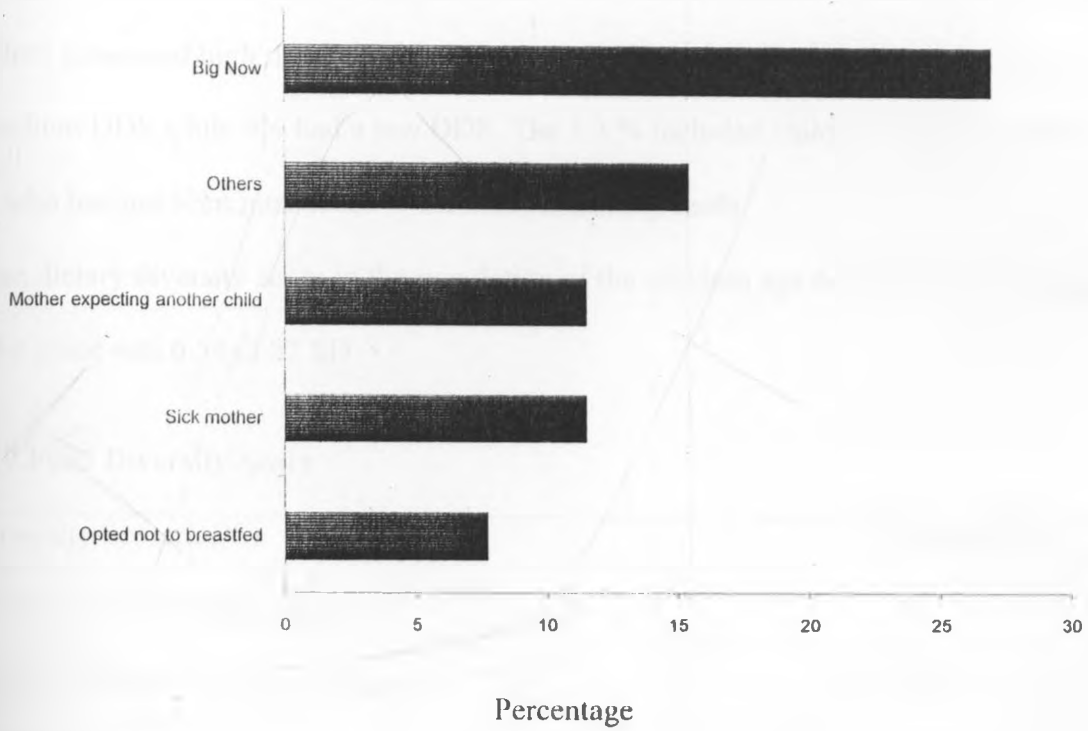

Figure 16 Reasons why the study Children had Stopped Breastfeeding

Some (n=78) of the children had stopped breastfeeding because they were considered big then. Among them 28.6% were below two years yet their mothers claimed that they were too old to be breast feed. About 71.4% were above two years of age.

4.3.3 Food Consumption Frequency of the Index Child

Most of the children consumed milk, fruits fortified porridge, and vegetables daily. Eggs, mutton, beef, fish, legumes, plain porridge, and tea were rarely consumed. Majority of the children (91.7%) did not take fermented porridge as shown in annex 1.

4.3.4 Food Diversity Score

The individual diversity score were computed based on 14 food groups (FAO/FANTA, 2008). Table 17 shows the distribution of the Dietary Diversity Score (DDS). About three quarters of the children consumed high number of food groups within the twenty four hours and only 12.4% had a medium DDS while 9% had a low DDS. The 5.2 % included children who were still breast feeding who had not been introduced to the complementary feeds.

The mean dietary diversity score in the population of the children age 6-59 months attending the well baby clinic was 6.54±2.82 SD

Table 17 Food Diversity Score

Food Diversity Score(DDS)	Percent (%)
Low DDS (n=30) ≤ 3 food groups	9.1
Medium DDS (n=41) 4-5 food groups	12.4
High DDS (n=242) food groups ≥ 6	73.3
Exclusively BF (n=17) food groups	5.2

4.3.5 Relationship between Child Feeding Practices and Nutritional Status

There was a very high significant relationship (χ^2 =p-value 0.000) between wasting status and children who were fed on salted food. But stunting status, BMI-for-age, underweight did not show any significant relationship with the all other feeding practices. All children who were

stunted-overweight were exclusively breastfed for six months while 90% were still breastfeeding and 80% were fed on salted food as shown in annex 6.

4.3.6 Risk Factors Associated with Nutritional Status

Univariate analysis showed that the number of siblings were significantly associated with wasting (OR= 3:6 95% CI=1.1-11.5, P= 0.003). There was also high significant relationship between wasting and sex of the child (OR=0.4, 95% CI-0.2-0.8, P=0.01. The other factors were not significantly associated with children nutritional status (annex 3)

There was no significant relationship between risk factors such as sex of the child, number of siblings in the household, education level of caregiver, income level of the respondents, child birth weight, feeding practices and illnesses use of mosquito net water treatment and the underweight status, although the likelihood of becoming underweight was nine times likely among those not fed on salted food and those who had received the vitamin A in the last six months (annex 3).

The number of siblings in the family remained significant to the stunting status OR=1.9; 95% CI=1.0-3.6 p-value =0.005. However those with middle income level were less likely to be stunted as compared to those of very low income (earning less than a dollar a day) and those of higher income (above 40,000 Kenya shilling per month). Children with high and normal birth weight were 6 times less likely to be stunted as compared to those of low birth weight as shown in annex 4.

4.3.7 Relationship between Health practices and Nutritional Status

The health practices that were assessed included vitamin A supplementation for the last six months, use of mosquito net, immunization, de-worming ,presence of illnesses, use of treated and adequate water or having a toilet.

Using chi-square, the results indicated a highly significant relationship between stunting status and child having slept under mosquito net and having a toilet in the household (p-value of 0.000). Likewise, there was a highly significant relationship between BMI-for-age of the children and having been sick for the previous two weeks with (p-value 0.001).

Having a toilet and the BMI-for-age were significantly related (p-value=0.021). There was a significant relationship between underweight status and having a toilet (p-value 0.002).

The rest of health practices and nutritional status did not show any significant relationship as shown in the annex 7.

4.3.8 Beliefs and Rights Related to Young Child Feeding Practices

Of the (56.7%) mothers who were exclusively breastfeeding at the time of the study, the majority, (92.4%) reported that their breast milk was enough for the baby. Most of them (85.9) believed that breast milk was enough for the child from birth up to 6 months old while 5.4% believed that it would be enough even after the age of 6 months.

Interestingly among those (42%) who did not breastfeed exclusively for six months, majority (77.2%) still believed that breast milk was enough for the child from one to six months of age, but 4.7 % of them believed that breast milk would be enough up to the age of one month. A

small proportion (3.2 %) could not tell how long the breast milk alone would have been enough for the baby.

Majority (81.1 %) of the respondents practiced breastfeeding in public places. Those who did not breastfeed in public places provided the reasons shown in figure 17.

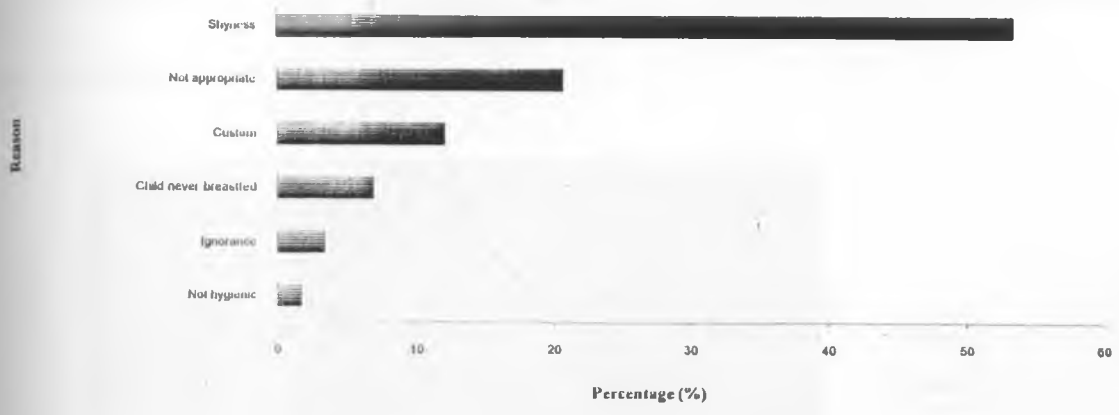

Figure 17 Percentage Distribution of Mothers by Reasons for not Breast Feeding at Public Places

According to Key informant interviews (KII) and based on its experience, mothers believed they did not have enough milk for their currently breast feeding baby especially if they think they did not have adequate breast milk.

According to FGDs, ignorance on the adequacy of breast milk alone for the first six months of life of a baby was a major contributing factor especially when the child was perceived to be crying a lot. Some mothers with small sized breasts believed that they could not produce enough milk. Others believed in the effectiveness of infant formulae milk and did not have confidence that their milk alone was enough for the child. Poor feeding habits lead to the production of little milk from the breasts making the mothers further believe that they were not capable of producing

enough milk. Some mothers were stressed financially hence could not be in the right composure to breastfeed properly.

4.3.8.1 Are there Foods Infants are not Allowed to Eat

More than half (n=211(64.7 %) of the respondents did not believe that there are foods that children are not allowed to eat and a third (1/3) n=115 (35.3 %) believes there were foods that should not be given to infants and children. Some respondents gave more than one food item that were prohibited (figure 18).

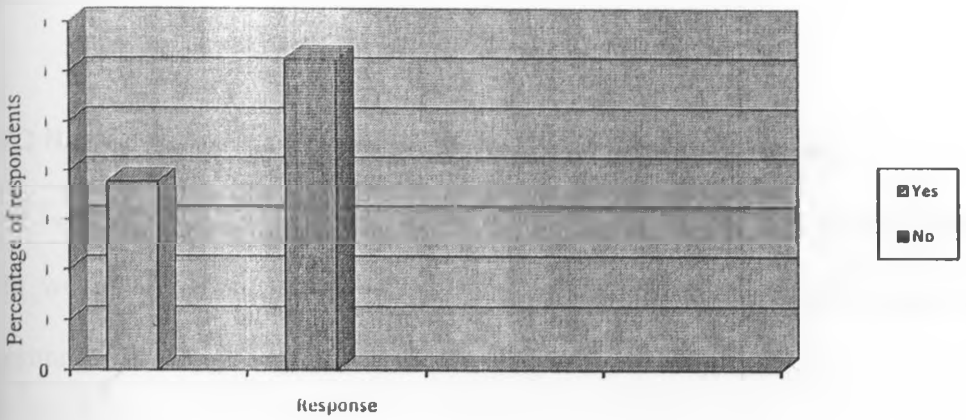

Figure 18 Responses as to Whether there were Foods not to be given to Infants to Consume

Foods not allowed are shown in the table 18. Eggs were the most prohibited foods given to infants. Other foods included tea, banana, spiced foods, avocado, pumpkin, processed foods

Others that were mentioned included juices, ugali, green grams, pawpaw, soda, spinach, fermented foods, onion, mixed flours, soya, omena, porridge, cabbage, potatoes, biscuits, chips, oil, weetabix, plant proteins, honey, sweets, margarine, family food / serving, pork, Cassava, maize, sausage, arrow roots and fatty foods.

Table 18 Percentage Foods not allowed to the Infants

Food item	Number(n)	Percentage (%)
Eggs	31	24.4
Meat	11	8.7
Githeri	9	7.1
Fish	6	1.8
Milk	6	1.8
Chapati	5	1.2
Rice	4	1.2

They were allowed to take green leafy vegetables especially spinach, starchy food like porridge, bananas and fruits.

5.3.8.2 Reason given for Foods not allowed for Infants to Consume

The reason given for foods prohibitions to infants and children include cultural reasons and health workers advice against certain foods. Most foods were believed to cause allergy or inappropriate for the young children. The data are shown in table 19.

Table 19 Reasons Given for Foods not Allowed for Infants to Consume

Reason	Frequency n=126	Percentage (%) (100 %)
Allergies	27	21.4
Inappropriate for children	20	15.7
Hard to chew	10	7.9
Child would refuse to take	8	6.3
Health workers advice not to consume	6	4.7
Fatty foods	5	3.9
Too high in protein	5	3.9
Others	45	35.7

Other reasons given included problem in digesting it, claim that food once choked neighbors' child to death, parents refused the child to take certain foods, food may causes constipation, sickness, overweight and obesity, weight loss dental problems, has chemicals, amongst customary belief that they children should not consume because it was a taboo, make them sleepy and drunk.

Some of the respondents gave up to five reasons as to why certain foods were not allowed for infants and young children.

4.3.8.4 Relationship between Stunting Status and Foods not Allowed for Children

There was no significant relationship between stunting and foods not allowed for the children. More respondents (64%) believed that all of types of food should be given than (35.1%) who believed that some foods should not be given to children as shown in table 20.

Table 20 Relationship between Stunting Status and Foods not Allowed for Children

	Are there foods not allowed for infants to Eat			OR	P-Value	CI at 95 %
Nutritional status	Yes (%) (n=114)	No (%) (n=211)	Total N=325	0.789	0.583	0.410-1.519
Stunted	13.2	16.1	15.1			
Normal	86.8	83.9	84.9			
Total	100	100	100			

Human right was explained as' haki ya mtu' or 'haki yako ndio utosheke' 'haki za kibinadamu' to mean right to life, expressions and speech. Men were reported to have their own rights and women too do have their own different rights. The children's rights included the upbringing, life, education, eating a healthy diet, shelter, clothing, and right to cleanliness.

The responses given when asked if it was the right of the baby to breast feed and the responses was yes unless mother had complications such as cancer, infection with HIH/AIDS, if the mother had no milk, fear of the breast hanging if a working mother or if lacking adequate time due to much work load/ pressure.

4.3.9 Foods Associated with Height and Weight

Further, in FGD, foods associated with height were not reported since the respondents did not know if they existed or not. They have never heard of any food associated with gaining of the height/length but linear growth was entirely regarded as 'mambo ya mungu' meaning God the creator determines how the child should grow in length. They claimed that, if there were such foods then the short people would eat them to make them grow tall.

Several foods were associated with weight gain and the foods were believed to make the child add weight included rice, weetabix, sausages, cake, hamburger, ice cream, sodas, and artificial juices and fats amongst others.

When asked, the respondents reported that body fat distribution as per the gender/sex was high among the girls as compared to the boys and that depended mainly on individual lifestyle.

Regarding the question on the number of times they believed a child should be fed in twenty four hours (day), the majority replied 8 times, 4-6 hours and a few responded that feeding be done when a child wants.

Asking them if they have seen children who are fat and short at the same time, and the responses were yes and they gauged them by the size and height of their age groups. A child would be considered short-for-age if his age mates were taller and considered underweight (thin for age) if his age mates were heavier than him. They say/perceive the thin child to be taller, and the fat child as always shorter.

They responded that a child was known to be obese or overweight as per child records on the weight monitoring clinic card. Others were believed to add weight since the mother's milk was perceived to be nutrient dense or if she eats a balanced diet, while others were believed to be naturally fat regardless of the kind of feeding.

4.4 Morbidity Experience

Table 21 shows the distribution of study children morbidity experience.

Over a third of (38.3%) of the study children had suffered illnesses within two weeks preceding the study (329). The most prevalent ailment was cough and colds followed by fever, diarrhoea

and vomiting and others such as allergies in that order .Some of the children had up to a maximum of three diagnosed ailments in the 14 days prior the study period.

Table 21 Prevalence of Diseases among the Study Children

Diseases	Prevalence (N=126) (%)
Coughs and colds	59.1
Fever	18.9
Diarrhoea and vomiting	14.2
Others	7.90

4.4.1 Relationship between Nutritional Status and Presence of Sickness

Table 22 shows the distribution of diseases and the nutritional status of the children

Table 22 Distribution of Diseases and the Nutritional Status of the Children

Disease status	Nutritional status of the Children			
	% underweight	% stunted	% wasted	% stunted-overweight
Sick(n=126)	38.2	38.4	38.6	1
Non-sick N=203	61.8	61.6	61.4	2.1

Table 23 Relationship between Nutritional Status and Presence of Sickness.

Nutritional status		% Sickness in the last 14 days			
		Diarrhoea and vomiting n=20	Coughs and colds n=94	Fever n=48	Others n=33
Underweight <-2	Global underweight	10.6	10.8	8.6	15.6
Stunting z-scores <-2	Global stunting	35	19.1	19.1	30.3
Wasting z-scores <-2	Global wasting	5.3	10.8	6.4	9.4
Stunted-overweight (stunting z-scores<-2 and wt z-scores > +2)	Stunted-overweight	20	30	20	30

4.4.2 Relationship between Body Mass index and Sickness

Table 24 shows the relationship between the body mass index and the presence of sickness within groups. More (22.2%) children who had been sick were also underweight as compare to those who were not sick (10.8%). Majority of the overweight children (14.8%) were not sick for the previous two weeks prior to the study period. The Chi-square test indicated significant relationship (p=0.005) between the sick and the body mass index of the children.

Table 24 Relationship between Body Mass index and Sickness

Body Mass Index for-age	Been sick in the last 14 days (%)		
	Yes (%) (n=126)	No (%) (n=203)	Total (%)
Under weight	22.2	10.8	15.2
Normal	70.7	74.4	72.9
Overweight	7.1	14.8	11.9
Total	100	100	100

CHAPTER FIVE: DISSCUSSION

5.1 Social-economic and Demographic Profile

The fact that children attending the well baby clinic are accompanied mostly by their mothers indicates poor/low male participation in the child health care. This could be due to cultural beliefs that child care is a woman's domain. Similar results are also stated in a study (Onyango. et al, 2010) that was carried out in Western Kenya. The findings indicated that the prevailing cultural norms in the western Kenya region determine gender norms and the subsequent male involvement in reproductive health issues. Additionally, the traditional ways in which reproductive health programs are implemented play an important role in influencing not only the involvement of men but also their knowledge and appreciation of reproductive health issues.

Majority of the mothers of the study children are aged 20-24 and only a few mothers are teenagers. This may be attributed to improved level of education and as stated in KDHS that the proportion of teenage mothers have declined from 19% to 15% between 2003 to 2009. The study area being an urban set up conforms to other social indicators of development as education and use of family that influence a delay in onset of childbearing. One-third of uneducated teenagers have began childbearing as compared to only one-tenth of those with some secondary education and above (CBS, 2009)

The fact that most of the respondents are married means that the children are brought up by both parents since very few parents are single, engaged, divorced, widowed, separated or cohabiting.

For most of mother's, the bearing age group lies between 20 to 34 years. This shows that the child bearing age has risen with age.

Most of the households are small with one to two children (78%) per family as compared to the national ideal number of children. This may mean that the families are just starting or they opt for small families. About 6.7% have about four children, similar to the national desired ideal number.

The well baby clinic records show more males than females in the clinic, and this corresponds with the high prevalence of male children who attends the clinics in Kenya.

The age distribution of the children who attended the well baby clinic is highest among six to one year. Majority are children up to two years of age. Being a well baby clinic that attends all children between birth and 59 months, it is expected that nearly the same proportion of younger children who attends the well baby clinic be the same as the proportion of older children who attended the same well baby clinic. But this was not the case since only a few children attend the well baby clinic. This means that several children above 2 years of age do not attend the well baby clinic. Majority attend the clinic for the immunizations and thereafter, they are no longer brought for weight monitoring and vitamin A supplementation. However, a few come for vitamin A supplementation which is at an interval of 6 months. Furthermore the average number of children aged 6-59 months who attend the well baby clinic per month was about 1540, 350 0f whom were above 6 months.

Majority of the children are born at facility level and this is expected being an urban set up. Surprisingly, there are a few mothers who give birth at home.

5.2 Nutritional Status of Children

More male children in the well baby clinic are more nutritionally disadvantaged when compared with female children (CBS, 2009). A lot of research has been done that explain the likelihood of sex-related differences among them the cultural issues and child care practices. The study at well baby clinic reveals that a higher proportion of male children under five years are stunted compared to the female children. The analysis of the indicator by age group (CBS, 2009) shows that stunting levels have increased in the 6-11 months from 15.3% in 2003 to 21.6% in 2008-09 and among 48-59 months from 27.9% to 30.4% of age categories. In this study the prevalence of stunting was the highest among 6-11 months old children. The results of this study reveal an even higher prevalence of stunting if the trends continue to rise since there are a higher number of those who are at risk of stunting.

Overall prevalence of stunting is lower in the well baby clinic situated in Nairobi area. This is further corroborated by the findings of the (CBS, 2009) that found Nairobi province area to have the lowest proportion of stunted children in Kenya. This may be due to improved social and human development efforts and successful health interventions by the ministry of health and the Hospital.

Over-nutrition and under-nutrition has remained a challenge in the society and especially in the urban setup. The distribution of study children by BMI-for-age shows that, there are slightly more children who are underweight as compared to those who are overweight and obese. This is attributed to high prevalence of double burden of the disease.

Among the total number of children who are stunted, majority have normal BMI-for-age because their weight is regarded as normal for their height. There is a possibility that if the stunting trends continues over time, these children may become stunted-overweight. They are diagnosed as normal children who need no nutritional intervention and are sent home without nutritional intervention because they have ideal weight for their height.

The (3%) prevalence of stunted-overweight represents the children whose stunting status co-exists with the overweight status. A similar research has been carried out in South Africa Thirty-one (19%) children were both stunted and overweight. Gaining more weight within the first year of life increased the risk of being overweight at 3 years by 2.39 times while having a greater length at 1 year was protective against stunting (Mamabolo, et al, 2007), and another study in Mexico shows that the prevalence of concurrent overweight or obesity and stunting was approximately 5% in non-indigenous children, and over 10% in indigenous children aged between 24–60 months (Fernald, 2007).

The stunted-overweight children are likely to be counselled on weight reduction but their stunting status remains unknown because the length/height is not taken in the well baby clinic and the indicator of stunted-overweight is not assessed. There are slightly more children who are stunted-underweight as compared to those who are stunted-overweight.

The severely and moderately underweight but also stunted, are likely to be given advice on weight increment but not on the stunting status, thus allowed to go back home even though the child is still stunted.

Furthermore length is neither taken nor recorded for children and this makes it very difficult to diagnose those who are stunted and stunted-overweight.

Length may be taken and recorded during medical and nursing student's examinations to show that length should be assessed but due to reasons such as shortage of staff, child presenting with normal physical features and having a normal weight makes it unnecessary to measure the length according to the staff working at KNH. Height is not taken at the well baby clinic. When the child attains normal weight and looks normal because all other features appear normal, the health workers feel there was no need to take and record the length. But the health workers are aware that the length of the children should be measured and recorded during birth as per the standard operating procedures.

Although Kenya has adopted WHO standards, weight and length is yet to be adopted but the BMI-for-age has not been adopted. The reasons why BMI-for-age has not been adopted as a guideline are yet to be established.

When weight-for-age is used to assess for stunted-overweight, majority of children have normal weight for their height. About **2.7 %** are stunted-overweight and others are stunted and severely or moderately under weight. Weight-for-age is being used in the clinic to assess the nutritional status of the children. Although Kenya has adopted the WHO growth standard and the use New Mother and Child Health Booklet "Afya ya Mtoto na Mama" that was launched on 23rd April 2010 by the Ministry of Public Health and Sanitation the well baby clinic still uses the old one. The old card uses only weight-for-age indicator and combines indices for both boys and girls

unlike the new booklet that contains separate records of weight-for-age and length/height-for - age for boys and girls.

However, those children who are underweight or overweight are sent to the nutritionist for intervention. The children may be stunted but they are sent back home unnoticed.

Majority of those who are diagnosed as being at risk of being overweight are also found to be stunted at the same time. These are the children who attend the clinic but miss nutritional intervention.

Use of Data Collected in the Clinic

The clinic receives both well and a few malnourished children. Health workers report that the prevalence of male children is more malnourished than female children. That relates to the trends where more males are reported to be more malnourished than the females in Kenya (CBS, 2009 and 2004). Only weight and age and child sex is assessed but not the height despite the presence of the height board in the well baby clinic.

The clinic receives cases of mild to moderate malnutrition are referred to the nutritionist at the Paediatric Demonstration Unit (PDU) situated right at the well baby clinic. Malnutrition cases come from Ukambani and slum areas especially Kibera and Mathare. These are the areas known to suffer from malnutrition in the country. There is a great reduction in the rates of malnutrition in the well baby clinic over the years. This is due to an improved dietary education and advice in the well baby. But the high stunting rate may be due to lack of linear growth monitoring and no advice is given.

Perception on Ideal weight and height of the children when they grow up

More than half of Mothers wish to have medium height for their children while 37% prefer to have all children. They claim that weight and height depends on family members' size and height or the parents' genes. This means that the respondents are not aware about the effects of feeding practices in relation to nutritional status and especially the height. Most report that the size and height/length as' mambo ya mungu.' meaning the growth of children is regarded as a mystery and only God who is the creator determines the growth of the children. Then God said" let us make man in our image according to our likeness" (Bible, 1798). Majority of the respondents who are Christians believe that they have no power to decide on the nutritional status for what God created is said to be good and perfect and that human beings have no control over.

5.3 Children Feeding Practices and the Nutritional Status

The study establishes a high (97.3%) prevalence of breastfeeding. This compares well with the studies by CBS (2008) where the prevalence is at 97%.

Over half of the children are exclusively breastfed for six months in the well baby clinic. The rate is higher than the national breast feeding rate. This may be due to increased IYCF program in the antenatal clinics and in the facility where majority of the mothers gave birth. Much training is ongoing for the health workers and clients are also trained on IYCF. The importance of breastfeeding is given to the mothers when to exclusively breastfeed for 6 months and continued breastfeeding for up to two years and beyond (WHO and UNICEF, 2006). A good proportion of mothers indicate initiating breastfeeding within the recommended 30 minutes to one hour. Many Kenyan and international guidelines on infant and young child feeding support breastfeeding up to or beyond two years of age (PAHO/WHO, 2003 and WHO, 2005). But the

study revealed that the duration of breastfeeding is similar to the CBS duration which is the shortest at 15 months and is lower than the UNICEF recommendation of infant and young child breastfeeding guidelines.

However there is a contradiction between the percentage of the mothers who report to have exclusively breastfeed and those who introduce complimentary feeding at 6 months. This may be because the mothers give contradicting information because they know the expected responses.

The reason why children are not breastfeeding is because they are regarded as big, yet they are below two years to imply that most of the respondents were still ignorance about the age at which children should stop breastfeeding.

Complementary Feeding Practices

Recommendations for complementary feeding reveal that mothers should start giving foods at six months of age and according to the code of marketing of breast milk substitutes, set of rules governing breast milk substitutes in an industry should allow for protection of the infant and young child feeding practices. The law is required to regulate the sale and marketing of the BM substitutes. This study has shown that about half of the respondents start to introduce other foods before 6 months of age.

Food Diversity Score

The fact that the majority of the children consume a high number of food groups may mean that the respondents have access to food varieties from the markets within the urban centres. A few consume either medium or low food groups.

In central region of Limpopo province of South Africa, the stunted-overweight children consumed less animal proteins but more vegetables high in phytates and energy-dense diet of poor quality (Mamabolo et al, 2006)

The number of stunted overweight is small as compared to that of a study carried out in China where both stunting and overweight status conditions coexist in same child and stunted-overweight children consume more high energy dense foods with lower dietary score, less proteins, polyunsaturated fat and iron. Overall, stunted overweight children consumed lower amounts of vegetables, fruits, white meat and more milk. Limited dietary diversity and intake of high-energy-dense foods were notably observed among stunted overweight children. Furthermore, being stunted and/or overweight was associated with an increased likelihood of unhealthy lipid profiles (Public Health Nutrition et al, 2011), unlike this study where the prevalence of stunted overweight children was very small and is not possible to determine the relationship with the food diversity of the children.

Relationship between Health Practices and Nutritional Status

There is a high significant relationship between stunting status and child having slept under mosquito net or having a toilet in the household shows that use mosquito net and availability of toilet that may affect the presence of disease. Household toilets are related to childhood illnesses because a latrine facility is regarded as a health hazard. On the other hand, the use of a net prevents the child from malaria infection. The relationship between other health practices and the nutritional status of the study children reveals no significant relationship. Research shows that there is a high morbidity among the children within households without toilets and tnose with shared toilets (ANP, 2004).

Beliefs, Perceptions and Rights Related to Young Child Feeding Practices

About one-sixth of the mothers do not breast feed in public may be regarded as denying the child the right to breastfeed at all times (on demand) and at that period a child may be given other breast milk substitute. Customs and shyness are some of the reasons affecting breastfeeding.

The Codex Alimentarius Commission Standards, a commission that was created in 1963 by FAO and WHO is meant to develop food standards, guidelines and related texts such as codes of practice under the Joint FAO/WHO Food Standards Programme. The main purposes of this programme are protecting health of consumers and ensuring fair trade practices in the food trade and promoting coordination of all food standards work undertaken by international governmental and non-governmental organizations (FAO, WHO 2010). This is expected to govern and allow all the individuals to know their rights as the consumers.

Although the majority reports that breast milk is enough for the baby, some who report that it was not enough, are likely to give other foods to show that the beliefs and perception affects the child feeding patterns that would in turn affect the nutritional status of the children. Nevertheless, a few mothers still continue to practice exclusive breastfeeding despite their beliefs that the milk is not enough.

None of the interviewees have an idea about foods that promotes linear growth. The ignorance may be attributed to failure to diagnose the stunting status that results from lack of routine assessment of length/height of the children. But they are very much aware of the foods related to weight gain. This is because weight is taken and translated in the well baby clinic

Some vital foods are not allowed for infants due to the caregivers' beliefs and teachings given to mothers by relatives and the health workers. About 35 % believe that there are foods not allowed for infants. These foods include eggs, meat, fish and milk that promote proper growth and development and especially the linear growth of a growing infant.

Some respondents do not add salt to foods at six months of age and some do not know if the salt is iodized or not. This can be translated to mean denial to right to information because children who are not fed with salted food are denied rights to nutrients such as iodine and sodium necessary for the optimal growth and development.

5.4 Morbidity experience

The immunization coverage at the well baby clinic is very high because all the children have been given vitamin A supplements in the last six months. Vitamin A in a well baby clinic is expected to be 100 % but this was not the case for about 5.5 % who were never supplemented with the vitamin A.

Relationship between Body Mass Index and Sickness

The leading cause of illness is coughs and colds which is common among the young children, may be attributed to air pollution in the urban set up. The 30% of the stunted-overweight children, who were sick, may have suffered from long term sickness and obvious cause is not known in this study. Other studies show that additional health complications associated with overweight children include sleep apnoea, asthma, and liver damage, diabetes, kidney disease and cardiovascular diseases. Other contributing factors include genetics, behaviour, environment, and certain socio-demographic characteristics (Bellows 2010).

The association between illness and the body mass index of the children shows that those infants who were sick within 14 days of the study were more likely to be overweight than those who were not sick. The unpredicted result calls for further research to be able to find out the possible causes of the stunted overweight.

CHAPTER SIX: CONCLUSION AND RECOMMEDATIONS

6.1 Conclusion

Study has found some coexistence of stunting and overweight among children 6-59 months of age in well baby clinic at Kenyatta National Hospital.

The study has provided baseline information on prevalence of stunted-overweight among the children. The root cause of this finding cannot be explained at this stage.

The overall nutritional status and feeding practices did not show any significance relationship except for wasting and feeding the child with salted food, therefore further research is necessary to be able to find out the dietary determinants.

Beliefs and perceptions, which may affect the dietary intake that would in turn affect the nutritional status of the children, are present among the study respondents.

In the well baby clinic, only weight, age and child sex was assessed but not the height of the children.

Hypothesis Testing:

The hypothesis is rejected since it is way below 10%. Stunted-overweight is within the acceptable levels as per the standard reference.

6.2 Recommendations

Call for community based Growth monitoring or a cross sectional survey to be conducted for the pre-school children age 3-6 years to confirm the prevalence of the stunted and overweight. Research is required in order to provide for more explanation on the prevalence of stunting and overweight and their respective determinants.

Implement an intensive training on foods that contribute to linear growth and should be included in Kenyan feeding guidelines.

Further research should be conducted and follow up the children (longitudinal studies to ascertain the actual determinants leading to stunted overweight). .; therefore further well designed research to investigate root causes of these findings will be required.

To call for more research on the phenomena related to stunted-overweight and provide accurate explanations of the stunting and overweight coexistences and their respective determinants.

The study acts as a basis for improved advice by health workers not to first provide advice when weight is low, but also address growth failure in terms of stunting and overweight among stunted children.

Results will be used as evidence by health providers and policy maker on the need to monitor length/height alongside weight. Length should be recorded at birth and monitored until a child is five years.

There is need to create awareness regarding beliefs and perceptions, that may affect the dietary intake that would in turn affects the nutritional status of the children. Results will be used as

evidence by health providers and policy maker on the need to monitor length/height alongside weight.

Since most children aged 3-5 years do not attend the well baby clinic, provides evidence on the needs to monitor stunting alongside weight in Kenyan health facilities during growth monitoring procedure.

CHAPTER 7: REFERENCES

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ANNEXES

Annex 1 Field Assistant Training Program and the Curriculum

Day	Time	Topics/Curriculum	Learning methods	Learning Aids
1	8.00 a.m-1.30 p.m.	The common terms to be used. Interviewers Expectation. Purpose of the training and the outline of survey procedures. Interviewers style Non verbal Cues	Lecture Discussions	Notes / hand outs
1	2.00 am-5.00 p.m.	The division of the responsibility. Anthropometric measurements. Ethics during measurements Dietary data 24 hour	Lecture Discussions Practical's Demonstrations Actual practice	Samples of Questionnaires/Weighing scales/Height Meter/ Mid-upper/ Upper Arm Circumference, Tapes/Clinic cards
2	8.00 am-5.00 pm	How to administer the questionnaire. Nutrition Indicators	Lecture Demonstrations Practical's	Questionnaires
3	8.00am-5.30p.m.	Maintain proper and ethical behaviour during data collection. Questionnaire Administering and Interview technique Overall conduct and General ethics in field work	Discussions Focus Group Discussion Life Experience Stories Practical/role play Role play Measurements	Hand outs Questionnaire

Annex 2 Summary of Food Consumption Frequencies for Children at Well Baby Clinic

Food item N=330	Daily	4-6days	2-3days	Once week	Twice a month	Once a month	Never consumed
Milk	84.8	0.6	1.8	1.8		0.9	9.2
Eggs	0.9	0.9	23.5	17.4		8.5	48.8
Beef	5.2	5.2	30.7	10.4	0.3	7.4	40.8
Fish	4.0	1.8	14.3	19.5		19.8	40.5
Fruits	76.5	2.7	6.7	0.9	0.3	1.2	11.6
Legumes	12.2	6.1	33.6	16.5	0.9	4.9	25.7
Green Vegetable	59.8	4.9	11.6	2.1		0.6	21.0
Fortified	72.9	1.5	0.6	1.5	-	1.5	21.8
Plain Porridge	9.5	-	0.9	0.3	-	1.5	87.7
Fermented	2.8	0.3	1.2	1.2	-	2.8	91.7
Tea	20.6	0.9	3.1	4.0	-	2.5	69.0
Ugali	18.7	11.9	30.6	10.7	-	4.6	23.5
Rice	8.3	9.5	30.8	14.2	-	4.0	33.2
Bread	32.4	2.1	11.3	11.0	-	2.8	40.4
Margarine	48.8	2.5	6.4	4.0	0.3	3.7	34.4
Pumpkin	28.3	8.4	18.6	7.7	0.3	6.1	30.5
Carrots	45.5	6.8	16.2	7.5	0.3	2.3	21.4
Spinach	47.7	8.4	17.7	5.5	0.3	1.3	19.0
Green banana	27.5	12.4	21.9	11.4		5.2	21.6
Cerevita	15.0		10.0	5.0			70.0
Weetabix	3.9	1.2	2.7	1.2		0.6	91.4
Formula	12.5						87.5
Arrowroots	0.6		0.6	0.9	0.6		97.3
Sweet Potatoes	0.3		0.6	0.9	0.6		97.6
Cerelac	2.1	0.6	0.9		0.3		95.0
Cornflakes	0.3		0.3				99.4
Groundnuts	0.3						97.3
Liver			0.9				99.1
Nan	1.8		0.3				97.9
Spaghetti and Noodles	0.6	0.3	0.3	0.9		0.3	97.6
Cake	0.6	0.6		0.6			98.2
Omena(dagaa)				0.3			99.7
Chips	0.3		0.3	0.6			98.8
Chapati			0.6	1.8		0.3	97.3
Chocolate			0.3				99.7
Yoghurt	0.3			0.3			99.4

Annex 3 Association of Risk Factors to the Nutritional Status by Univariate Analysis

Moderate and severe wasting (below -2 Weights for Height Z-scores)

	Cases n=56	Non-cases n=206	OR	P - value	95% Confidence Interval
Sex					
Males	39	104	1		
Females	17	102	0.4	0.01*	0.2 - 0.8
Number of siblings					
None	21	101	1		
One	20	65	1.5	0.26	0.7 - 2.9
Two	31	9	1.4	0.46	0.6 - 3.4
More than three	8	6	3.6	0.03*	1.1 - 11.5
Education level of parents					
Upper primary	4	28	1		
Secondary school	15	62	1.7	0.38	0.5 - 5.7
College/ polytechnic	28	93	2.1	0.19	0.7 - 6.7
University	9	23	2.8	0.13	0.7 - 10.4
Level of income					
Less than 10,000 KeS	7	28	1		
11,000 – 20,000 KeS	6	40	0.6	0.40	0.2 - 2.0
21,000 – 40,000 KeS	14	51	1.1	0.86	0.4 - 3.0
More than 40,000 KeS	29	87	1.3	0.55	0.5 - 3.4
Child currently breast feeding	44	163	1.0	0.95	0.5 - 2.1
Child ever breastfed	56	205	0.0	1.00	0.0 - .
Are there foods not allowed for infants	16	78	1.5	0.20	0.8 - 2.9
Preparation of child diet					
Family serving	13	47	1		
Specially prepared for child	25	101	0.9	0.79	0.4 - 1.9
Both family serving and special food	15	52	1.0	0.92	0.4 - 2.4
Not on complementary feeding	3	6	1.8	0.44	0.4 - 8.4
Birth weight					
Low Birth Weight	6	25	1		
Normal Birth Weight	37	140	1.1	0.84	0.4 - 2.9
High Birth Weight	13	41	1.3	0.62	0.4 - 3.9
Child fed on Salted food	47	178	1.1	0.78	0.5 - 2.7
Vitamin A in last 6 mths	52	199	2.2	0.23	0.6 - 7.8
Use mosquito net	54	190	0.4	0.29	0.1 - 2.0
Dewormed in last 6 mths	8	32	1.1	0.81	0.5 - 2.6
Child been sick in last 14 days	18	82	1.4	0.29	0.7 - 2.7
Do you treat water	52	196	1.5	0.51	0.5 - 5.0

Annex 4 Moderate and Severe Underweight

	Cases (n=93)	Non cases (n=136)	OR	p-value	95% Confidence Interval
Sex of child					
Males	53	74	1		
Females	40	62	0.9	0.70	0.5 - 1.5
Number of siblings					
None	38	68	1		
One	33	40	1.5	0.21	0.8 - 2.7
Two	16	21	1.4	0.43	0.6 - 2.9
Three	6	6	1.8	0.34	0.5 - 5.9
Education level of caregiver					
Upper primary	9	22	1		
Secondary school	32	36	2.2	0.10	0.9 - 5.4
College/ Polytechnic	43	57	1.8	0.17	0.8 - 4.4
University	9	21	1.0	0.93	0.3 - 3.1
Income level					
Less than 10,000 KeS	14	19	1		
11,000 – 20,000 KeS	18	19	1.3	0.60	0.5 - 3.3
21,000 – 40,000 KeS	24	33	1.0	0.98	0.4 - 2.4
More than 40,000 KeS	37	65	0.8	0.53	0.3 - 1.7
Preparation of child diet					
Family serving	18	36	1		
Specially prepared	43	65	1.3	0.42	0.7 - 2.6
Both family and special	26	32	1.6	0.22	0.8 - 3.5
No complementary feeding	6	3	4.0	0.07	0.9 - 17.9
Birth weight of child					
Low Birth Weight	13	13	1		
Normal Birth Weight	61	96	0.6	0.29	0.3 - 1.5
High Birth Weight	19	27	0.7	0.48	0.3 - 1.9
Child currently breastfeeding	76	103	0.7	0.28	0.4 - 1.3
Child exclusively breastfed before 6 mths	53	73	0.9	0.62	0.5 - 1.5
Breastfeeding in public	79	105	0.7	0.35	0.4 - 1.5
Are there foods not allowed for the child	31	47	1.1	0.85	0.6 - 1.8
Child fed on salted food	76	123	1.9	0.12	0.8 - 4.1
Vitamin A in last 6mths	88	132	1.9	0.36	0.5 - 7.2
Mosquito net present	85	128	1.5	0.43	0.5 - 4.2
Dewormed in 6 months	25	24	1.1	0.76	0.5 - 2.3
Child sick in last 14 days	36	49	0.9	0.68	0.5 - 1.5
Treat water	86	132	2.7	0.12	0.8 - 9.5

Annex 5 Moderate and Severe Stunting

HAZ	Cases (n=68)	Non cases (n=196)	OR	p-value	95% Confidence Interval
Sex of child					
Males	33	111	1		
Females	35	85	1.4	0.25	0.8 - 2.4
Number of siblings					
None	25	98	1		
One	28	58	1.9	0.05*	1.0 - 3.6
Two	11	3	1.4	0.39	0.6 - 3.4
Three	1	0	1.0	0.95	0.3 - 4.1
Education level of caregiver					
Upper primary	7	25	1		
Secondary school	21	56	1.3	0.55	0.5 - 3.6
College/ Polytechnic	35	88	1.4	0.47	0.6 - 3.6
University	5	27	0.7	0.52	0.2 - 2.4
Income level					
Less than 10,000 KeS	8	27	1		
11,000 – 20,000 KeS	14	32	1.5	0.43	0.5 - 4.3
21,000 – 40,000 KeS	20	46	1.5	0.44	0.6 - 3.9
More than 40,000 KeS	26	91	1.0	0.92	0.4 - 2.4
Preparation of child diet					
Family serving	19	41	1		
Specially prepared	31	96	0.7	0.30	0.3 - 1.4
Both family and special	15	53	0.6	0.20	0.3 - 1.3
No complementary feeding	3	6	1.0	0.95	0.2 - 4.8
Birth weight of child					
Low Birth Weight	11	20	1		
Normal Birth Weight	44	133	0.6	0.22	0.3 - 1.4
High Birth Weight	13	43	0.5	0.21	0.2 - 1.4
Child currently breastfeeding	51	158	1.4	0.36	0.7 - 2.7
Child exclusively breastfed before 6 mths	38	116	1.1	0.63	0.7 - 2.0
Breastfeeding in public	55	162	1.1	0.74	0.5 - 2.3
Are there foods not allowed for the child	23	73	1.1	0.64	0.6 - 2.1
Vitamin A in last 6mths	63	170	2.5	0.14	0.7 - 8.8
Child fed on salted food	57	170	1.2	0.65	0.5 - 2.7
Dewormed in 6 months	15	25	0.5	0.07	0.2 - 1.1
Child sick in last 14 days	21	79	1.5	0.18	0.8 - 2.7
Treat water	64	187	1.3	0.70	0.4 - 4.4
Mosquito net present	63	183	1.1	0.85	0.4 - 3.3

Annex 6 Relationship between Child Feeding Practices and Nutritional status

	NUTRITIONAL STATUS (%)															
	Stunting status n=49			Wasting n=324			BMI for-age =330				Underweight					
Feeding practices	Normal=280	Stunted n=49	χ^2 p-value	Normal n=302	Wasted n=22	χ^2 p-value	Under WT	Normal	Over WT	χ^2 p-value	Under WT	normal n=236	Over WT n=46	χ^2 p-value	Stunted WT n=10	χ^2 p-value
Ever B/fed	270	49	0.365	295	22	0.742	47	237	37	0.506	47	230	43	0.147	100	+
EXC B/fed for 6 -24months	159	49	0.878	174	9	0.800	21	139	25	0.246	27	124	33	0.006	100	+
Breast fed outside home	219	40	0.352	239	19	0.892	42	188	32	0.189	37	187	37	0.682	90	+
Child fed on salted food	233	41	0.444	255	17	**0.000***	39	209	29	0.128	39	201	36	0.543	80	+
Currently breast feeding(6-24)	208	49	0.258	229	22	0.590	41	179	29	0.183	40	172	36	0.183	90	+

+Chi-square test for stunted-overweight could not be calculated due to small numbers.

* Chi-square test for assessing statistical differences

Annex 7 Relationship between Health Practices and Nutritional Status

	NUTRITIONAL STATUS (%)														
	Stunting status n=329			Wasting n=324			BMI for-age =330				Underweight				
Health practices	Normal=280	Stunted n=49	χ^2 p-value	Normal n=302	Wasted n=22	χ^2 p-value	Under WT	Normal	Over WT	χ^2 p-value	Under WT	normal n=236	χ^2 p-value	Stunted WT N=10	χ^2 p-value
Vitamin A for the last 6 months	81.0	9.5	0.247	88.5	6.2	0.458	14.3	69.8	10.4	0.100	8	86.7	0.495	80	***
Child slept under mosquito net night	80.2	12.8	0.000*	86.4	6.8	0.423	14.0	69.0	10	0.74	6.8	86.2	0.022	90	***
Fully immunized for age	83.8	15.0	0.701	92.0	6.7	0.863	14.9	72.0	11.9	0.691	8.3	90.5	0.832	100	***
De-worming for the last 6 months	12.5	3.3	0.722	86.4	6.8	0.423	3.0	11.2	1.5	0.858	1.5	14.1	0.990	10	***
Been sick for the last 2 weeks	32.7	5.8	0.932	34.3	4.4	0.31	8.5	27.1	2.7	0.001*	3.7	34.5	0.704	40	***
Take treated water	80.1	9.9	0.064	87.0	6.5	0.959	14.9	67.7	11.0	0.704	7.7	85.8	0.796	90	***
Water adequate	60.2	11.3	0.640	74.4	5.9	0.803	12.8	58.7	9.2	0.897	11.3	69.2	0.64	60	***
Have a toilet	97.1	12.5	0.000*	89.5	5.9	0.030	13.6	70.3	11.2	0.021**	7.1	88.3	0.002**	80	***

***= not significant since the numbers were too small to tabulate the chi-square test.

*= level of significance was very high p<=0.001,
**p<0.05

Annex 8 Copy of the Consent Form

General Information on the Research Study

Study Title: Feeding Practices and Stunted Obesity among Young Children Aged 6-59 Months attending well baby Clinic.

Introduction

am from the University of Nairobi and six others are helping me to carry out the research. We e doing research on children and their feeding pattern to determine their nutritional status. search is the process of learning the answer to a question. In this study we want to learn how improve the dietary quality for very young children in order to improve their development.

vitation to participate: You and your child are being asked to participate in this research dy. Mothers with children from six to five months of age are being asked to participate in the dy. If you agree that you and your child will participate in the study, you will be asked to sign reference. Some of the issues that will be discussed and the questions that would be asked y make you feel uncomfortable, but you can choose not to answer any time. This information give us will remain fully confidential. You will be given relevant information about the ly, while it is ongoing and after the results are available.

pose of the study: we want to highlight the importance of monitoring the nutritional status of nts and young children attending well baby clinic in terms of both linear growth and weight as well as feeding practices.

at is involved in the study: In this study, there will be different groups of children.6 to 59 ths shall be assessed by taking weight and height. Mothers will be asked questions' ding child's feeding practices using a questionnaire. Trained assessors will observe and s the children. The time for the child assessment can take from 30- 45 minutes, but does de feeding breaks where necessary. Also, if the child sleeps, the assessment takes longer se we don't wake the child. We shall begin with your information first, then the child nation and finish with anthropometrical assessment.

Your child's health will be checked and we also want to measure your child's length/height and weight. If your child is found to have a condition that requires treatment we will refer to a relevant services provider within the hospital, such as treatment and nutritional education. We also ask your permission to take a picture for you and your child together if absolutely necessary, and we also want to ask you questions about your child. The purpose of this is to see the child's progress in terms of physical growth and the types of food your child is usually taking.

Risks. There are no real risks being involved in the study. We will ask your permission to carry out the nutritional assessment by taking the weight and the height and MUAC while ensuring safety during the process of taking the measurements.

Benefits of being in the study. The information from the study will be communicated to you and feedback shall be given at the end of the study. The mother will benefit by knowing the importance of weight and height taking and attending the well baby clinic until the child is five years of age.

Participation is voluntary, and refusal to participate will involve no penalty or loss of benefits to which you or your child are otherwise entitled in this clinic.

Reimbursements for "out of pocket" expenses will not be made and no expected payments are given since full participation is voluntary.

Confidentiality: The researchers will safeguard any information obtained during this study and make every effort to keep it confidential. Neither your name nor your child's names will appear on the research forms or any of the reports. A separate list which connects your name to the study number will be kept locked in a separate file from the data and will not be seen by anyone except the study leader and the coordinator. Only the grand information about the entire group that participated will be reported. No information about you or your child, or information that connects you to the study, will be given to anyone without your wish and your written permission. All information collected on you and your child during the study will be recorded

and will be only available to the research staff at the University of Nairobi. It will be kept confidential to the extent permitted by law. Picture taken of yourself and your child will only be used as information on the child's development, and will be analysed by myself only.

If you are willing to participate in this study, please sign this document to show that you have understood and allowed us to examine you/your child. You will also be given the participant information sheet which has a written summary of the research.

Do you wish to ask any questions at this time?

May I now ask you to sign this form consenting to your child being entered into this study and allowing us to interview.

We thank for your co-operation and time. Please feel free to approach us should you have any queries in the future.

SIGNATURES

If you voluntarily agree to participate in the other parts of the study, please sign your name or place your thumbprint below.

Participants Name(Print):---------- Participant Signature: ---------- Date: ----------

Study Staff Conducting
Consent Discussion (print): ---------- Study Staff Signature: ---------- Date: ---------

If you have read this consent form, or had it read and explained to you, and you understand the information, and you voluntarily agree to take a picture with your child, please sign your or place your thumbprint below.

Participant Name: ---------- Participants Signatures: ---------- Date: ----------
(Print)

Study Staff Conducting
Consent Discussion (Print): ---------- Study Staff Signature: ---------- Date: --------

Annex 9 Copy of the Ethical Research Clearance 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

Ref: KNH-ERC/ A/334

15th October 2009

Hellen C. Baliach
Dept. of Applied Human Nutrition
University of Nairobi

Dear Hellen

RESEARCH PROPOSAL: "FEEDING PRACTICES AND STUNTED-OBESITY AMONG YOUNG CHILDREN AGED 6-59 MONTHS ATTENDING WELL BABY CLINICS AT KENYATTA NATIONAL HOSPITAL(KNH), NAIROBI" (P225/7/2009)

This is to inform you that the Kenyatta National Hospital/UON Ethics and Research Committee has reviewed and approved your above revised research proposal for the period 15th October 2009 - 14th October 2010.

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 specimen must also be obtained from KNH-ERC for each batch.

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

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

Yours sincerely

DR. L. MUCHIRI
AG SECRETARY, KNH/UON-ERC

c.c. Prof. K.M. Bhatt, Chairperson, KNH/UON-ERC
The Deputy Director CS, KNH
Supervisors: Dr. A. M. Mwangi, Applied Human Nutrition, UON
Prof. Wambui Kogi-Makau, Applied Human Nutrition, UON

Annex 10 Questionnaire and Tools

Feeding Practices and Stunted Overweight among Young Children Aged 6-59 Months Attending Well Baby Clinic at Kenyatta National Hospital (KNH) Nairobi-Kenya

[For the structured questions circle the right answer] Note to the enumerator: stress that these questions apply only to the respondent who was the parent or guardian to the index child.

Section A

Socio-economic and Demographic Characteristics of the Households and Care Givers

Name of interviewer ..... Date of interview [dd/mm/yr] .....

Name of Respondent ..... Place of residence .....

Province---------- District----------

1. Sex of respondent 1= Male 2= Female
2. Age of the respondent ..... (Years)
3. Marital Status of the respondent 1= Married 2= Divorced 3= Separate
   4= Widowed 5= Single 6= N/applicable
4. Relationship to index child 1 = Mother 2 = Father 3= Brother/ sister
   4= Grandparent 5= Aunt/ uncle 6= House help 7= Other (specify) -----
5. Number of siblings to index child .....
6. Religion of the respondent
   1= Christian 2= Muslim 3= Others (Specify).....
7. Education level of the respondent
   1= Lower primary 2= Upper primary 3= Secondary school
   4= College/polytechnic 5= University 6= None 7= Other (specify) ----------

8. Occupation of the respondent 1=Farmer 2=Housewife 3=Unemployed 4=Student 5=Small-scale trader 6=Businessmen 7=Casual labourers 8=Formal employment 9=Child 10=Others (Specify)------

9. Main contribution to Household. 1= Nothing 2= Money 3= Labour 4= Childcare 5= others (Specify)----------

10. Household income per month (total amount everybody brings to the household) ……..KSh.

Section B

Index child information

11. Index child's first name ----------

12. Date of birth (dd/mm/yr)----------

13. Age in months----------

14. Sex of the child? 1=Male 2=Female

15. Where was the child born? 1=Home 2=Health facility 3=others specify

Child feeding information (6-59 months)

Breast feeding practices

16. Is the (NAME) child currently breast-feeding? 1= Yes 2=No.

(If **No** go to Q **19, 20, and 21**)

17. If **Yes** to **Q16**, what type of breast-feeding is he/she on?

1= Exclusive Breast feeding ……..2= Complementary feeding and breast feeding …

3= others (specify)……

18. If **Yes** to **Q16** how often is the child breast feeding in 24 hours? ----------

19. If **No** to **Q 16**, did the child ever breast feed earlier on?1=yes 2=No

20. If **No** to Q 16, what are the reasons for not breast feeding? 1. Big now 2=Sick child 3=Sick mother 4=Refused to breast feed……. 5= Not enough milk… 6=opted not to breast feed 7=Others (specify)…….

21...If **No** to **Q 16**, at what age did the child stop breastfeeding? ---------- [Age in months]

22. When was the (NAME) child first put on the breast?

1= immediately after birth……. 2=within the first 30 minutes---- 3= few hours after birth….. .. 4= One to two days after birth……..5= cannot remember……6= others (specify) ……

23. Was the child exclusively breast fed for 6 months? 1=yes 2=No

24. If the child is/ was exclusively breastfed, is/was the breast milk enough for the baby?

1=yes 2=No.

25. How many months is/was your breast milk alone is/was enough for this child

----------Months

26. How often was the (NAME) child breast-fed in 24 hours?

1= On demand 2= every three hours 3=Four times 4=Five times

5= Eight times ……..6= Others (specify)……

27. Do you breast feed your child outside home/public places? 1=Yes 2=No

28. If not why don't you breast feed in public? 1=Shyness 2=Ignorance

3=Custom 4=others _____ (specify)

Complementary Feeding Practices

29. How many times do you feed (NAME) your child in a day besides breast milk? ----------

30. How many times do you believe a child with the same age with your child should be fed per

day? ----------

31. At what age did you start giving other foods /fluids to (NAME) the baby? --------- Months.

32. a) Are there foods that your infants are not allowed to eat? 1=Yes 2=No

b) If yes which are these foods? [Fill in table below. Do not fill in shaded column

c) Why are infants not allowed to eat these foods? [Fill in table below. Do not fill shaded-Column]

FOOD	CODE	REASON	CODE

33. How do you prepare your child's diet? (Tick one or more if applicable) from------

1=family serving. 2=specially prepared for the child. 3= Bought from outside. 4=donated.

5= Other (Specify)._____

34. Do you normally buy commercial complementary foods for the child? 1=Yes 2=No

35. Is the child receiving any supplemental feeding from a feeding program? 1=Yes 2=No

36. If **Yes** in Q 34 which programme? ----------

37. If **Yes** in quiz 34 since when? ----------

38. Is the child feeding on food with salt 1=yes 2=No

39. At what age did you introduce salt to this child's diet months--------?

40. Is the salt iodized? 1=yes 2=No 3= cannot tell

Section C

Child Health Information

41. Has the (NAME) child taken vitamin A capsules in the last 6 months 1=yes 2=No

42. Did (NAME) the child sleep under a mosquito net last night? 1=Yes 2= No

43. Does (NAME) the child have a vaccination card? 1= Yes. 2=No

[If the card is available, fill in the information as per table below]

Serial no	**Name of child**	**Q44** BCG at Birth 1=Yes 2=No	**Q45 DPT** 1=Yes 2=No			**Q46 OPV (Oral polio vaccine)** 1=Yes 2=No				**Q47 Measles** 1=Yes 2=No	**Q48 Fully Immunized** 1=Yes 2=No
			DPT 1	DPT 2	DPT 3	OPV 0	OPV 1	OPV 2	OPV 3		
1											

49. Birth weight of the index child (check in the health card) _____

50. Length at birth in CM----------

Morbidity and Nutritional Status

51. Has the child been dewormed in the last six months? 1=Yes 2=No

52. Has the (NAME) index child been sick within the last 14 days? 1= Yes..... 2=No

53. **(If yes in Q 47),** State the sickness? 1=Diarrhea 2=cough/common cold 3=malaria

4=worms 5=fever 6=pneumonia 7=ARI 8=Measles 9=Others(specify)

_____?

54. What action did you take when child was sick?

1=No assistance sought 2=Own medication 3=Traditional healer

4=Private clinic/ Pharmacy 5= Public health facility 6= Other_____

55. How **tall** would you like this child to be when grown up? 1=Short 2=Tall 3=Medium

56. How **fat /heavy** would you prefer your child to become? ----- 1=Medium 2=overweight

3=lean body 4=others (specify)

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

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

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

SANITATION AND HYGIENE

57. What is the main source of your drinking and domestic water?

1=River 2=Tap 3=Borehole 4=Stream 5=Harvest rain water 6=Dam/pod

7=others_____

58. Do you treat your drinking water? 1=Yes 2=No

59. If **Yes**, how do you treat it? 1=Boil 2=use chemicals 3=Leave it to decant 4=others (specify) _____

60.If **No** why don't you treat it? ----------

61. Who drinks the treated water? 1=child 2=everybody

62. How do you store your drinking water? 1=covered container 2=Not covered

63. Do you have water in adequate supply? 1=Yes 2=No

64. How much water do you think is adequate for your household---------- (can use Jerry cans to estimate liters/day)

65. Do you have a toilet for your household? 1=Yes 1=No

(If No, go to Q 67)

66. If **Yes** to Q 65 what type of toilet is it? 1=Flash 2=Latrine 3=Others(specify)

67. If **No** in Q 65 how do you dispose human waste in your family?

1= Neighbors' 2= Bush 3=Flying toilet 4=Other (specify) _____

Section D

68. Food consumption frequency (Index child only)

Ask the respondent if the child ate any of these foods. Record against the number of times the food item is consumed.

FOOD EATEN	NO. OF TIMES CONSUMED									
	No. Of days consumed in a week							After two weeks	Once a month	Never Consumed
	1	2	3	4	5	6	7			
Milk										
Eggs										
Beef\mutton\chicken										
Fish										
Fruits										
Legumes,beans,ndengu										
Green vegetables										
Fortified porridge										
Plain porridge										
Fermented porridge										
Tea										
Ugali\maize										
Rice										
Bread										
Margarine										
Potatoes										
Pumpkin										
Carrots										
Spinach										
Green Banana										
Others(specify)										

Plain porridge-porridge made from one or more flours and sugar and water only without any other added ingredients.

Fortified porridge -micronutrients and other types of foods added, .e.g. milk, Soya, eggs familia flour is fortified.

69. DIETARY DIVERSITY QUESTIONNAIRE

Please I would like to ask you about the foods and drinks (meals and snacks) that your child ate yesterday during the day and at night (24 hours), whether at home or outside the home. Please recall all foods and beverages that the child ate starting with the first food eaten in the morning.

Write down all food and drinks mentioned by the respondent. When the respondent has finished, probe for meals and snacks not mentioned.

70. How many meals [1] has the (NAME) index child had in the last 24 hours (from this time yesterday to now)? ----------

Breakfast	**Snack**	Lunch	Snack	Dinner	Snack

When the respondent recall is complete, fill in the food groups based on the information recorded above. For any food groups not mentioned, ask the respondent if a food item from this group was consumed.

Question Number	Food group	Examples	YES=1 NO=0
1	CEREALS	corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products) + insert local foods e.g. `ugali, nshima, porridge or pastes or other locally available grains	

2	VITAMIN A RICH VEGETABLES AND TUBERS	pumpkin, carrots, squash, or sweet potatoes that are orange inside + other locally available vitamin-A rich vegetables (e.g. red sweet pepper)	
3	WHITE TUBERS AND ROOTS	white potatoes, white yams, white cassava, or other foods made from roots	
4	DARK GREEN LEAFY VEGETABLES	dark green/leafy vegetables, including wild ones + locally available vitamin-A rich leaves such as amaranth,cassava leaves, kale, spinach etc.	
5	OTHER VEGETABLES	other vegetables (e.g. tomato, onion, eggplant) , including wild vegetables	
6	VITAMIN A RICH FRUITS	ripe mangoes, cantaloupe, apricots (fresh or dried), ripe papaya, dried peaches + other locally available vitamin A-rich fruits	
7	OTHER FRUITS	other fruits, including wild fruits	
8	ORGAN MEAT (IRONRICH)	liver, kidney, heart or other organ meats or blood-based foods	
9	FLESH MEATS	beef, pork, lamb, goat, rabbit, wild game, chicken, duck, or other birds	
10	EGGS	chicken, duck, a hen or any other egg	
11	FISH	fresh or dried fish or shellfish	
12	LEGUMES, NUTS AND SEEDS	beans, peas, lentils, nuts, seeds or foods made from these	
13	MILK AND MILK PRODUCTS	milk, cheese, yogurt or other milk products	
14	OILS AND FATS	oil, fats or butter added to food or used for cooking	
15	RED PALM PRODUCTS	Red palm oil, palm nut or palm nut pulp sauce	
16	SWEETS	sugar, honey, sweetened soda or sugary foods such as chocolates, candies, cookies and cakes	
17	BEVERAGES	, coffee, tea, alcoholic beverages OR local examples	
			YES=1 NO=0
Individual level only	Did your child eat anything (meal or snack) OUTSIDE of the home yesterday?		

A meal refers to the number of times the child is fed served and eaten at one time (includes all of the three commonly known foods and snacks: - breakfast, lunch and supper/dinner and snacks).
71. Total number of food groups consumed by the index child: ----------

Section E

Anthropometric measurements and oedema status for children aged 6 – 59 months or (65 – 109.9cm) attending well baby clinic.

No.	Measurements	1st Measurement	2nd Measurement	Average
72	Length (cm)<24 mths Height (cm)>or=24mths			
73	Weight (kg)			
74.	MUAC (cm)			
75.	Oedema (Yes=1 No=2)			

Annex 11 Focus Group Discussion Question Guide

Date---------- Time: ----------Venue: ----------

Nationality: ----------Name of the facilitator: ……..

Name of the Field Assistant(s):----------

S.NO	Name of the mother	Age	Occupation	Marital status	Remarks
1					
2					
3					
4					
5					

Guide Line Questions

1. What do you understand by the word human right?

2. Do you believe that it is a baby's right to breast feed?

3. If yes how does it become a right?

4. Does the mother have a right to breast feed also?

5. In what way does it become a right?

6. What common reasons lead to failure by the mothers to exclusively breast feed for 6 months?

7. Do mothers breast feed continuously for two years or beyond?

8. If no, outline the reasons.

9. What make some of the mothers to believe that they do not have enough milk?

10. How many times should a child be fed in a day?

11. What common foods are children give at different per specific ages?

Annex 12 Key Informant Interview Guide

Date: ----------

Name of the Respondent: ----------

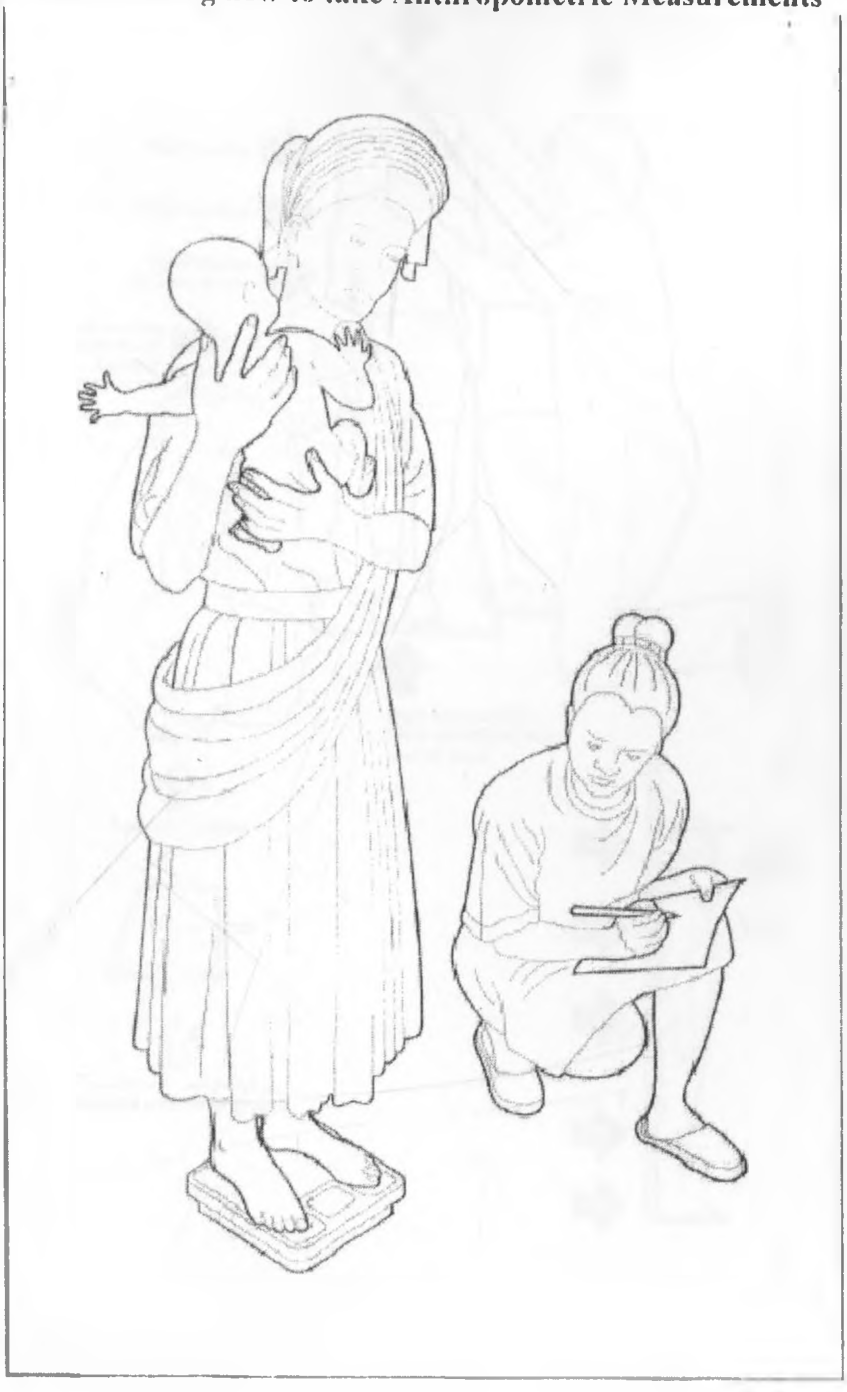
Title/Position: ----------

Guide----------

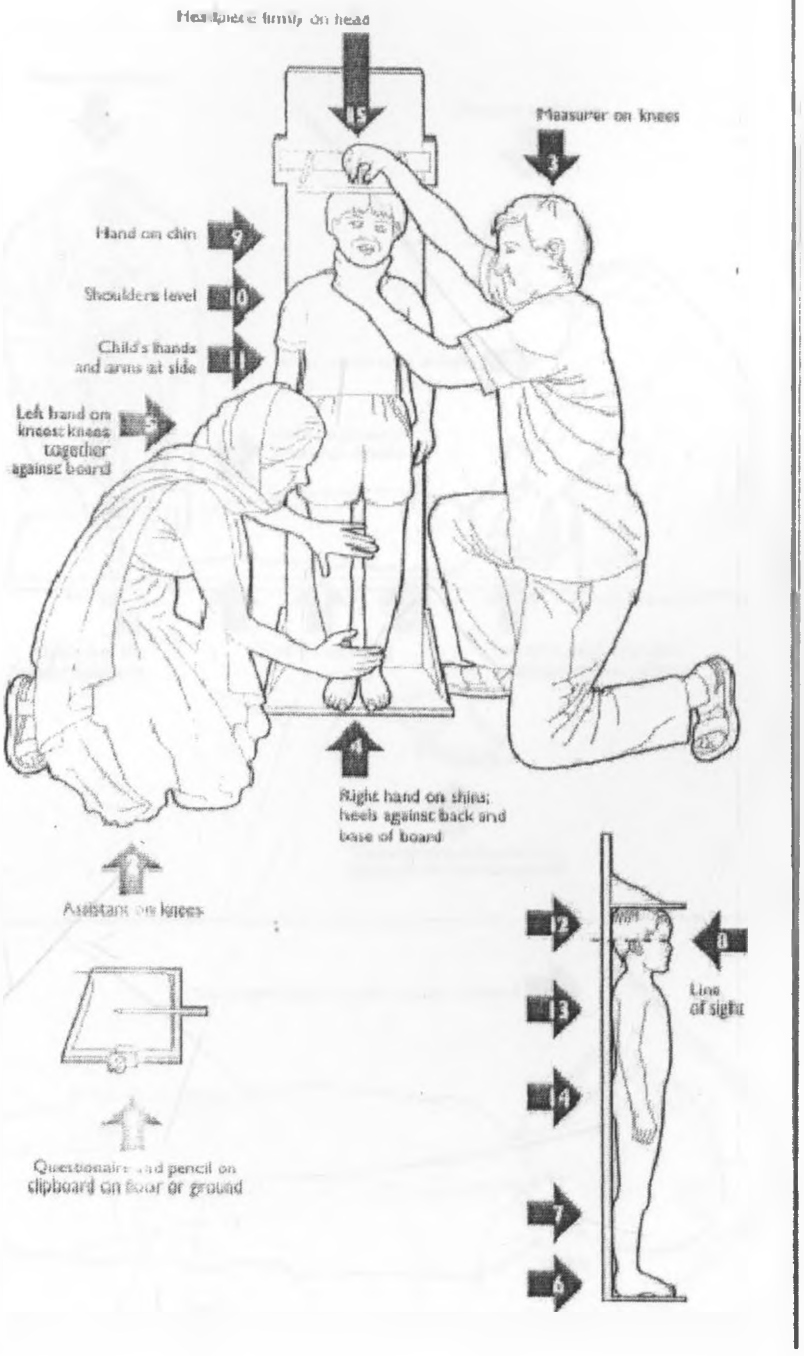
1. What is the type of nutrition data collected in this clinic?
2. What do you use the data for?
3. Do you get malnourished children?
4. What type of malnutrition?
5. How do you deal with them?
6. What reasons makes the mothers believe they do not have enough milk?
7. What reasons contribute to introduction of other foods/liquids before 6 months of age?
8. If given longer time to breast feed, will you continue breast feeding on demand?
9. If not, please explain the reasons why.

Annex 13 Anthropometric, Weight and Height Measurements

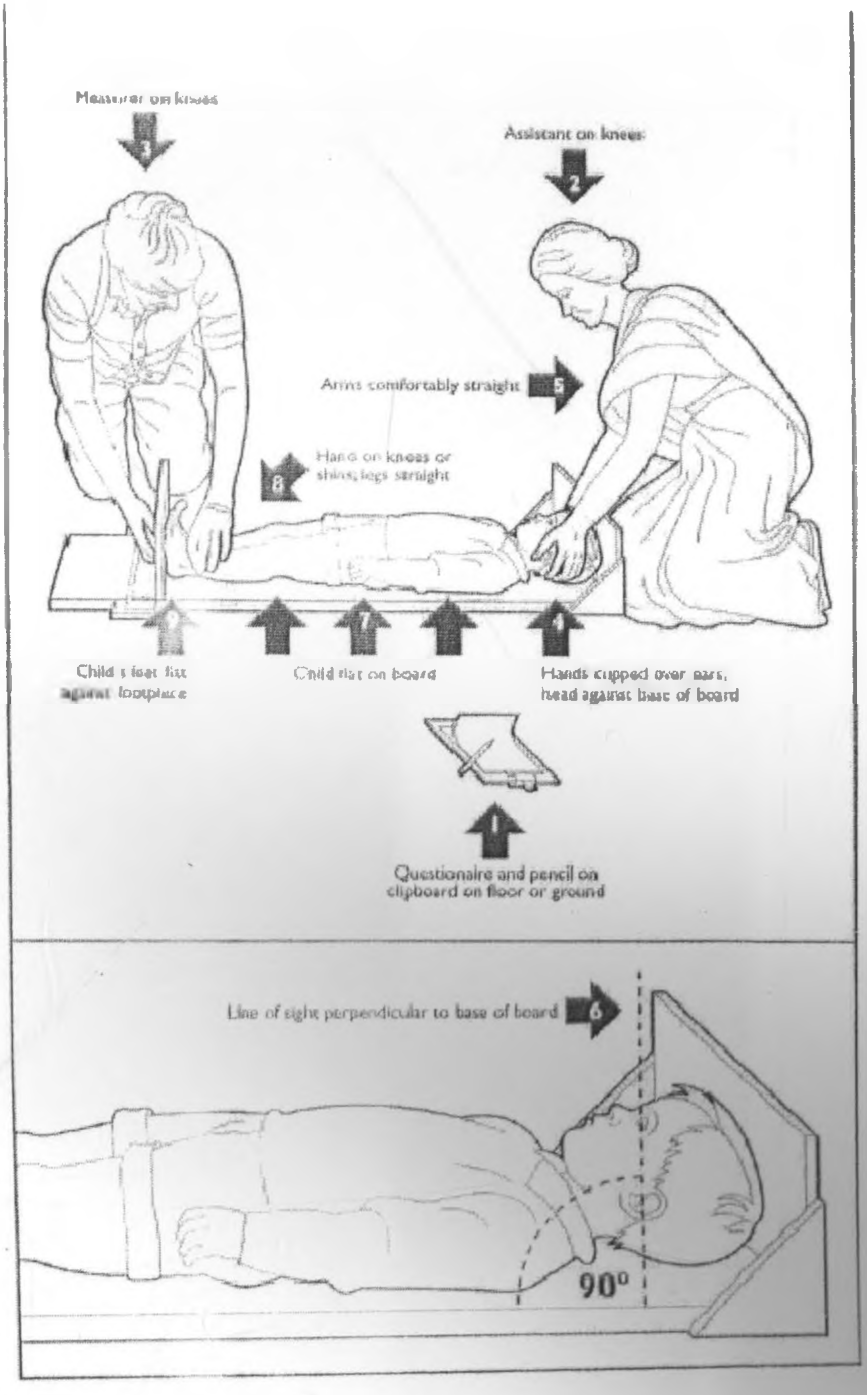
Picture showing how to take Anthropometric Measurements



Weight measurement 1



Height Measurement 2



Length measurement 3