

**EFFECT OF CHILDCARE PRACTICES ON THE NUTRITIONAL STATUS
OF CHILDREN AGED 6-24 MONTHS IN MOROGORO URBAN AND
KILOSA DISTRICTS**

BY

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ABSTRACT

The purpose of this study was to assess the effects of childcare practices on the nutritional status of children aged 6-24 months in Kilosa and Morogoro Urban districts. A sample of 300 mother-child pairs was randomly selected and interviewed using a structured, pre-tested questionnaire. The data were analyzed using the Statistical Package for Social Sciences (SPSS) software. The study revealed that, some of the socio-economic characteristics such as marital status, family size, education of the mothers, source of income, sex and age of the child had a positive effect on the nutritional status of the children. About 76.1% (n=285) of the children were currently breastfeeding. Majority of mothers (75%) started breastfeeding immediately after delivery i.e. first hour post delivery. The prevalence of exclusive breastfeeding was 24.4%, however the frequency of feeding of the children was lower than the recommended 5 times/day. There was high immunization coverage (98%) and growth monitoring visits. The study also revealed that, most of the mothers (98%) delivered their babies in health facilities and were assisted by trained medical personnel during delivery. In addition, the diseases which were associated with unhygienic conditions namely diarrhoea (35.3%), running nose (37.9%), cough (38.2%) and vomiting (16.8%) affected many children compared to malaria (4.6%) and fever (40.4%). Poor nutritional status was more prevalent among the children aged 19-24 months. Prevalence of stunting in Morogoro urban and Kilosa districts were 15 and 18% respectively, however the prevalence of underweight was slightly lower in Morogoro urban (14.5%) than Kilosa district (14.9%). The study also

revealed that, nutrition education intervention for the mothers improved significantly their child-care practices related to breastfeeding, feeding frequency, personal hygiene and hygiene of the general environment. It was concluded out of the study that, mothers should be educated and encouraged to start the antenatal clinic early (1 month) and whenever possible, they should start the pre-natal clinic before conception. This will help in advising them on appropriate care practices during gestation e.g. appropriate weight gain based on pre-conception BMI.

DECLARATION

I, Charwe Deborah Donald, do hereby declare to the Senate of the Sokoine University of Agriculture that this dissertation is my original work and has not been submitted for award of a degree in any other University.

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MSc. Human Nutrition

Date

The above declaration is confirmed

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DEDICATION

This work is dedicated to my Lord, God who provided me the strength and grace to successfully complete this work.

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LIST OF ABBREVIATIONS AND SYMBOLS

ACC/SCN	Administrative Committee on Coordination Sub-Committee on Nutrition
CHO	Carbohydrates
CSPD	Child Survival Protection and Development
DER	Daily Energy Requirement
EPIINFO	Word Processing, Database and Statistics for Public Health Software
FAO	Food and Agriculture Organization of the United Nations
kcal	Kilocalories
kg	Kilogram
MCH	Maternal Child Health Clinic
MOH	Ministry of Health
NBS	National Bureau of Statistics
TDHS	Tanzania Demographic and Health Survey
TFNC	Tanzania Food and Nutrition Centre
TRCHS	Tanzania Reproductive Child Health Survey
UNICEF	United Nations Children's Fund
URT	United Republic of Tanzania
WAZ	Weight for Age z-score
WHO	World Health Organization
WHZ	Weight for Height z-score

CHAPTER ONE

INTRODUCTION

1.1 Background

The best global indicator of children's wellbeing is growth because infections and unsatisfactory feeding practice or a combination of both are the major factors affecting their physical growth and mental developments (WHO, 2000). Poor growth is attributed to a range of factors closely linked to overall standard of living and ability of population to meet their basic needs such as access to food, housing and health care. The assessment of growth not only serves as a means to evaluate health and nutritional status of the children but also provide a good measure of inequalities in human development.

Globally, 31% of under five years are reported to be stunted, 27% are underweight and 10% are wasted (UNICEF, 2004). Hunger and undernutrition contribute to more than half of the ten million preventable under-five child deaths that occur in low- and middle-income countries each year, yet the causes of child hunger are predictable, preventable and can be addressed through affordable means (WFP/UNICEF, 2006).

Despite an overall decrease of stunting in developing countries in 2000, child under nutrition still remains the major health problem in these countries. The prevalence of stunting in developing countries has decreased from 47% in 1980 to 33% in 2000; however progress has been variable in different regions (WHO, 2000). Malnutrition in early childhood is common in many developing countries (UNICEF, 2001), thus care for young children needs to be an integral part of health care programmes. Attention also needs to be given to the unborn children through care of their mothers.

There is an association between severity of anthropometric deficits and mortality. Substantial contribution is made by all degree of malnutrition to child mortality (WHO, 2000). Strong evidence exists to show that, poor growth is associated with delayed mental development and that there is relationship between impaired growth status and both poor school performance and reduced intellectual achievements. Growth retardation in early childhood is also associated with significant functional impairment.

Malnutrition continues to be a major cause of high infant and under five mortality in Tanzania. According to UNICEF (2001), malnutrition is the underlying cause of more than half of all child mortality. The main forms of malnutrition include protein energy under nutrition (PEU), iron deficiency anemia (IDA), iodine deficiency disorder (IDD) and vitamin A deficiency disorders (VAD).

Child survival, nutrition, health and development all depend on household food security, health environment and available health services as well as adequate care for children and women (UNICEF, 1990). Food and health for children are all considered necessary but not sufficient conditions for good nutritional outcome, thus childcare as an underlying determinant for good nutrition becomes important. It has been recognized that, positive childcare behavior and child oriented intra-household processes can promote child growth and even in impoverished environment where malnutrition and poor growth are widespread (Ahmed *et al.*, 1993).

UNICEF (1990) broadly defined care as the provision in the household and community of time, attention and support to meet the physical, mental and social needs of the growing children and other members of the family. Breastfeeding,

complementary feeding, hygiene, healthcare and interaction between caregivers and the child as well as physical care are still limited in many developing countries.

1.2 Problem Statement

Infants and young children are the most severely affected by PEU because of their high energy and protein needs relative to growth rate and their particular vulnerability to infection. Children's health is most in danger from about three months of age until they can feed themselves, perhaps at about three years of age (IFPRI, 2002). During this period several weaning practices can have an adverse effect on child nutrition. One factor is the age at which complementary food is introduced to the child, others include the methods of food preparation, the frequency of feeding and the energy density of the complementary foods. In all circumstances, young children need to be fed frequently during the day. Mothers may have difficulty in feeding children often enough if they are working in the fields; thus the high workload of the mothers may be an important constraint to adequate child feeding (UNICEF, 1998a).

Despite education in nutrition and health and access to adequate food, undernutrition, stunting and wasting remain high in many areas and the rates of improvements are slow. Several nutrition surveys conducted in Tanzania showed that, prevalence of stunting among children under the age of five years has remained at 43-44 % (TRCHS, 2000).

Several programmes have been established nationwide to address the nutrition and health aspects of the children such as growth monitoring, immunization, supplementation and provision of antenatal and postnatal healthcare. Despite these

efforts, improvement in the nutrition status of the children has not been dramatic. According to UNICEF (1990), lack of maternal and child care is one of the underlying causes of under nutrition. The exact rate of child care practices and how they affect the overall nutritional status of the child is not clearly known. This study aims at investigating childcare practices and how they influence the nutritional status of children aged 6-24 months.

1.3 Justification

The conditions of urban poverty, most importantly the high proportion of women working away from home, the dependence on cash income, and the deteriorating environmental conditions, pose special challenges to the care of children. Childcare practices play a great role in influencing the nutritional status of the infants and young children (UNICEF, 1998). However, studies done in Morogoro region did not investigate the role of child care practices in the prevalence of undernutrition, wasting and stunting. This study aims at identifying childcare practices and investigates how they influence the nutritional status of children aged between 6 and 24 months in Kilosa and Morogoro Urban districts of Tanzania.

1.4 Objectives

1.4.1 Overall Objective

To identify childcare practices and investigate how they influence the nutritional status of children aged 6-24 months in Kilosa and Morogoro Urban Districts, Tanzania.

1.4.2 Specific objectives

- i. To identify the socio-economic and demographic characteristics of the households in Kilosa and Morogoro Urban districts.
- ii. To identify the childcare practices in Morogoro Urban and Kilosa districts.
- iii. To determine how childcare practices affect the nutritional status of the children.
- iv. To determine the influence of educational intervention on the childcare practices and the nutritional status of the children

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview of Malnutrition

Malnutrition simply means a state of bad or inappropriate nutrition or it can also be termed as a condition in a person caused by an unbalanced diet either too little or too much food, or a diet missing one or more important [nutrients](#) (de Onis, 2000). Malnutrition is a major public health problem in Asia and Africa and is one of the main causes of morbidity and mortality among infants and young children (Bhandari *et al.*, 2001).

Undernutrition has been widely recognized as a serious health problem in developing countries (ACC/SCN, 2000). It plays a big role in more than half of the nearly 11 million deaths in developing countries (UNICEF, 2003). According to UNICEF (2003) about 175 million children in developing countries are stunted i.e. shorter than they should be for their age and shorter than they could be accounted for any genetic variation. Stunting is a basic indicator of chronic undernutrition. It is associated with long term reduction of dietary intake, and closely related to repeated episode of illness, inadequate and poor quality diet.

Undernutrition contributes to more than half of all under-five childhood deaths throughout the developing world. The associated effects of poverty, inadequate access to food, infectious diseases, and inadequate breastfeeding and complementary feeding practices often lead to illnesses, growth faltering, nutrient deficiencies, delayed development, and death, particularly during the first two years of life (UNICEF, 2003).

In the developing world, the word undernutrition conjures up a picture of a grossly underweight or wasted child. Such a child is markedly underweight for his/her age, as well as for his/her height. If the state of under-nutrition persists for an extended period of time, the height of the child will also be affected. This gives rise to the disease state of short stature or nutritional stunting (UNICEF, 1998). Therefore it would be apparent that acute under nutrition occurring over a short period of time results in an underweight or wasted child. Chronic undernutrition occurs over a longer period of time and produces a stunted child. It is possible to have both a wasted and stunted child, the end result of severe under-nutrition, occurring over a prolonged period of time.

It is estimated that, half of South Asia's children are malnourished to some degree while in Africa, one in every three children is underweight. The WHO (1995) estimated that, malnutrition was associated with over half of all childhood deaths in the developing world. This was mainly because malnutrition predisposed children to various diseases that could run a more serious and prolonged course.

In Tanzania malnutrition continues to be a major cause of morbidity and mortality among under five children. In Tanzania protein energy under nutrition (PEU) is relatively low during the first six months of life, but increases rapidly, reaching peak at 12 to 24 months of age. The ultimate manifestation of this problem is in the high infant and young child mortality rates, which stand at 104 -165 per 1000 live births (UNICEF, 2003). About 10% of the children deaths in Tanzania are attributable to severe PEU (Kingamkono, 1999). PEU, which comes in various forms such as kwashiorkor, marasmus or marasmic-kwashiorkor combined with other diseases,

such as malaria, diarrhea and respiratory tract infections, account for more than 50% of all infant and young children deaths (World Bank, 2000). These prevalence rates decreased to 38% (stunting) and 3% (wasting) in the year 2004, TDHS (2005) cited by NBS (2005). Common forms of malnutrition include, [protein-energy under-nutrition](#) and micronutrient deficiencies. PEU refers to inadequate intake or utilization of [energy](#) and [proteins](#) in the body. [Micronutrient](#) under-nutrition refers to inadequate availability of some essential nutrients such as [vitamins](#) and [trace elements](#) that are required by the body in small quantities. Micronutrient deficiencies lead to a variety of disorders and impair normal functioning of the body. Deficiency in micronutrients such as vitamin A reduces the capacity of the body to resist diseases. Deficiencies of [iron](#), [iodine](#) and vitamin A are common and widely prevalent and represent a major [public health](#) challenge. An array of afflictions ranging from stunted growth, reduced intelligence and various cognitive abilities, reduced sociability, leadership and assertiveness behaviors, activity and energy, muscle growth and strength, and poor health are all implicated to nutrient deficiencies (UNICEF, 2000).

2.2 Effect of Under-nutrition on Child Growth and Development

A malnourished child becomes weak and vulnerable to various infections which also tend to run a more severe course. These infections in-turn aggravate the state of malnutrition. Consequently, the child enters a vicious circle of events, from which it becomes difficult to escape. The child can easily be killed by an overwhelming infection (WHO, 2003).

The state of chronic malnutrition, affects the activity of the child, such that he would not be able to extract the maximum out of life. His play would be adversely affected and school performance and learning capacity would be impaired. There would be impairment of intellectual ability and a reduced linear growth. Eventually, his productivity in life would be poor, affecting both himself and the community (WHO, 2000).

2.3 Causes of Under-nutrition

Undernutrition is a complex problem with no single simple solution, among its causes are inappropriate feeding practices and repeated incidence of childhood illnesses. According to UNICEF (1998) conceptual framework, the causes of undernutrition can be clustered into immediate, underlying, as well as basic causes.

2.3.1 Immediate causes

These are problems which are related to low frequency of feeding; low energy density of consumed food staples; and diseases particularly malaria, diarrhoea, measles, intestinal worms and respiratory infections. HIV/AIDS is also becoming an increasingly important cause of infant and adult under-nutrition and deaths. Immediate causes affect individual directly unlike the underlying factors which have a second party involved.

2.3.2 Underlying causes

These are factors that lead to inadequate dietary intake and infection. These factors include inadequate household food security; inadequate caring capacity of the vulnerable groups; and inadequacies in the quality and quantity of the basic services such as health, education, housing, water and sanitation. The poor economic

situation combined with climatic conditions (floods, drought); environmental problems such as deforestation and low production technology are also part of the causes. These factors indirectly influence the nutritional status by influencing the immediate causes.

2.3.3 Basic causes of poor nutrition

Basic causes affect both the underlying and immediate causes. Basic causes include political, cultural, religious, economic and social systems which limit the utilization of the potential resources. Unfavorable terms of external trade and the debt burden are also part of the basic causes. These problems have been made worse by high population growth that outpaces the growth of essential services and the rate at which potential and actual resources are exploited.

2.4 Child Care Practices

Care is the provision in the household and the community of time, attention and support to meet physical, social and mental needs of the growing child and other household members (World Development, 1999). A child's environment has a tremendous effect on the way he/ she grows. Child survival, growth and development depend not only on food intake and health but also on the amount and the quality of care from the parents and the caregivers. Therefore caregivers should always ensure that they create an enabling environment to fulfill the growth and development of children.

According Engle *et al.* (1997) model of care, childcare practice can be categorized into four groups which include:- feeding behaviors, these includes exclusive breastfeeding and complementary feeding especially those related to frequency,

amount and quality of the foods; hygiene and sanitation behaviors related to food (preparation, cooking and processing) personal (physical cleanliness) and homestead (sewage and garbage disposal); psychosocial care related to the provision of mothers/caregivers recreational activities such as playing and educational activities as well as responding to child coos such as physical, visual and verbal interactions; and health seeking behaviors for both mother and child. These include both preventive and curative (immunization, deworming, giving vitamin/mineral supplements and growth monitoring) and management of childhood illnesses.

2.4.1 Feeding behaviour

This is an essential practice to a child and determines the child's nutritional status (TRCHS, 2000). It includes both breastfeeding as well as complementary feeding. It encompasses use of appropriate foods (quality, quantity and frequency) at the right time taking into account the stages of growth and development. Breast milk contributes significantly to the nutrition and health of infants and children, not only after birth, but also during the entire complementary (weaning) period (Arifeen *et al*, 2001). Continuing breastfeeding up to two years, accompanied by appropriate complementary feeding, maintains a good nutritional status and helps to prevent childhood diseases.

WHO/UNICEF (2000) recommend that, children should be breastfed exclusively for the first 4-6 months and thereafter supplemented with safe and nutritionally adequate foods until they are at least 24 months old (Onyango *et al*, 1999). This is because after six months of age, breast milk alone can no longer supply the required daily energy and other nutrients. The energy requirements outpace the energy supplied

from milk after six months. The amount of milk produced by the mother at this stage of lactation is far lower than the amount required producing the needed calories. Moreover, even if the milk would be adequate, the gastric capacity of the infant wouldn't allow such intake. Table 1 indicates the energy intake from breastmilk by children who are 6-24 months old from mothers in developing countries. Depending on the mother's breast milk output -low, average or high, the rest of the daily energy requirement should be supplied from complementary foods.

Table 1: Energy intakes from breast milk by children in developing countries, by age group ¹

Age group (months)	Breast milk intake (kcal)		
	Low (-2 SD)	Average	High (+ 2 SD)
6-8	908	1728	2548
9-11	656	1586	2515
12-23	377	1448	2519

¹The categories low, average and high correspond to energy intake from breast milk being low (mean \pm 2SD), average and high (mean \pm 2SD)

Source: (WHO, 1998b).

2.4.2 Breastfeeding

Early initiation of breastfeeding is beneficial for the mother and the child. Breastfeeding has unique biological and emotional influences on the health of both the mother and the child. It facilitates establishment of a strong bond between the mother and the child (WHO, 1998a). Breast milk alone is ideal nourishment for infants for the first six months of life due to the combination of providing the most adequate and nutrient balanced type of food (Table 2).

Optimal breastfeeding practices include exclusive breastfeeding (breast milk with no other foods or liquids) for the first six months, followed by breast milk and complementary foods (solid or semi-solid foods) from about six months of age and

continue breastfeeding for up to at least two years of age while receiving complementary foods.

From the child's perspective, the first breast milk is important because it contains colostrum, which is rich in all the nutrients, antibodies, hormones and antioxidants needed by the infant to thrive (Dewey *et al.*, 1998). The milk protects infants from diarrhea and acute respiratory infections, it stimulates their immune systems and according to some studies, it also confers cognitive benefits (Manda, 1999). These protective effects are the most likely explanation for the generally better growth performed during the first few months of life in poor communities for infants who receive nothing other than breastfeeding (WHO, 1998b).

Table 2: Estimated nutrients content in mature human milk

Nutrients	Amount	Nutrient	Amount
Lactose (g L ⁻¹)	72.0± 2.5	Calcium (mg L ⁻¹)	280±26
Protein (g L ⁻¹)	10.5± 2.0	Copper (mg L ⁻¹)	0.25±0.03
Fat (g L ⁻¹)	39.0 ± 4.0	Iron (mg L ⁻¹)	0.3±0.01
Vitamin A (µg RE L ⁻¹)	500	Zinc(mg L ⁻¹)	1.2±0.2
Vitamin C (mg L ⁻¹)	40± 1.0	Selenium (µg L ⁻¹)	20±5
Vitamin D (µg L ⁻¹)	0.55± 0.1	Chromium(µg L ⁻¹)	50±5
Vitamin E (mg L ⁻¹)	2.3± 1.0	Magnesium (mg L ⁻¹)	0.3±0.1
Vitamin K (µg L ⁻¹)	2.1 ±0.1	Manganese (µg L ⁻¹)	6±2
Biotin (µg L ⁻¹)	4 ±1	Potassium (mg L ⁻¹)	52535±
Folate (µg L ⁻¹)	85 ±37	Sodium (mg L ⁻¹)	180±40
Niacin (mg L ⁻¹)	1.5± 0.2	Phosphorus (mg L ⁻¹)	140±22
Pantothenic Acid (mg L ⁻¹)	1.8± 0.2	Fluoride (µg L ⁻¹)	16±5
Riboflavin (mg L ⁻¹)	0.35± 0.02	Iodine (µg L ⁻¹)	110±40
Thiamin (mg L ⁻¹)	0.21± 0.03	Chloride(mg L ⁻¹)	420±60

Source: (WHO, 1998a)

Several studies in Thailand, Peru, and Honduras (Brown *et al*, 1990) showed that early initiation of complementary foods replaces breast milk and does not increase caloric intake. None of these studies reported any benefits for the child's growth as a result of early complementary feeding. Because breast milk is generally higher in nutritional value (Table 2) than the complementary foods and liquids, replacement can negatively affect macronutrient and micronutrient intake of young children.

In Tanzania changing lifestyles, the breakdown in the traditional family structures and the related lack of adequate information often reinforce harmful customs that result in adoption of modern child care practices such as provision of milk formulas (Shirima, 1996). The practice has been common among the elite and employed women in urban areas. Studies done in developing countries (Nyangawa, 1993) showed that, duration of breastfeeding was declining due to a number of factors such as urbanization, relative high incomes, changes in lifestyles and employment of women outside their homes (Shirima, 1996). For instance, in urban areas, there were

noticeable differences between the low and high-income mothers in the duration of breastfeeding. According to Kingamkono (1999), 11% of the low-income mothers in Tanzania stopped breastfeeding when the children were below the age of one year compared to 70% of mothers in high-income. Equally, the bottle feeding rate for infants rose from 1% in 1992 to 9% in 1996 (NBS, 1997). In rural areas, prolonged coexistence of breastfeeding and complementary feeding is typical. Unless in a very rapid succession of pregnancies, there is no tendency towards abrupt complementing. Mothers continue to breastfeed until the child desists by itself, milk dries up or the mother becomes pregnant. Considering the potential health advantages of breastfeeding, it should be strongly promoted. Governments are obliged under Article 24 of the Convention of Rights of the Child, to ensure that all sectors of the society know the benefits and support breastfeeding (UNICEF, 1998b).

2.4.3 Complementary foods

Foods or non-milk fluids that are provided in parallel with breast milk are referred to as complementary foods. The period during which other foods are provided along with breast milk is the period of complementary feeding. When complementary foods are specially designed to meet the nutritional or physiological needs of the young child, they are referred to as transitional foods. Where the complementary foods given to the young children are the same as those consumed by the rest of the family members, these are referred to as family foods (WHO, 1998a).

Table 3 provides the recommended energy intake by children who are 6-23 months of age from complementary food at average, high and low level of breast milk intake.

Table 3: Energy needed from complementary foods by children in developing countries to meet daily requirements by the level of breast milk intake¹

Age group(months)	Level of breast milk intake				
	DER (Kcal)	B/milk (Kcal)	High	Average	Low
6-8	2858	1728	314	1130	1946
9-11	3469	1586	962	1883	2824
12-23	4586	1448	2050	3138	4184

¹The categories low, average and high correspond to energy intake from breastmilk being low (Mean-2SD), average (Median SD=0) and high (Mean +2SD)

Source: WHO (1998a).

The traditional complementary foods in Tanzania are based on starchy staples, usually cereals such as maize, sorghum, rice and finger millet and non-cereals such as cassava, sweet potatoes, yams, bananas and plantains (Mosha *et al.*, 2000). Nutritional problems associated with the use of these starchy staples in complementary foods have been widely reported (Mosha, 1984). Generally, complementary foods in Tanzania were found to be very poor in providing nutrients required by infants. These foods are often deficient in fats, iron and vitamins (especially vitamin A). In addition, they are often contaminated from unclean water, unwashed hands and utensils, and unsanitary storage facilities. According to Gibson *et al.* (1998), meeting micronutrient needs from complementary foods appears to be the greatest challenge. Based on requirements in Table 4: adequate amounts can be attained by processing, fortification, and supplementation of the staples or use of animal products.

Table 4: Recommended daily intake of breast milk and complementary foods for children at various age groups

Nutrients	Breast milk and complementary foods		Estimated nutrients needs from complementary foods	
	6-8 months	9-12 months	6-8 months	9-12 months
Protein (g)	9.1	9.6	2.0	3.1

Fat (g)	26-39	31-47	25	41
Vitamin A (RE)	350	350	13	42
Calcium (mg)	525	525	336	353
Iron (mg)	11	11	11	11
Zinc (mg)	5.0	5.0	3.8	4.3

Source: WHO (1998a).

The FAO/WHO (2000) reported indicated that, dietary fat should range from 30-45% of total dietary energy for children below 2 years of age, although lower fat intakes may be compatible with good health and nutrition if requirements for essential fatty acids are met. Nutrition projects such as the Joint Support Nutrition Programme (JNSP) and Child Survival Development and Protection Program (CSPD) were introduced to address some of the dietary related problems in Tanzania (Moshia, 1984). These projects identified improved complementary food formulations as a means of reducing undernutrition levels using local food resources available. They focused on reducing dietary bulk and enriching the plain porridges with nutrients for complementing children.

In rural areas, poor maternal education, taboos and customary food practices seem to contribute significantly to the undernutrition among the young children. In developing countries fruits and green leafy vegetables are rarely given to children. Most of the rural women introduce food to children before six months, so that women can work many hours in the field without disturbances especially when the child is fed with solid foods. For the employed women, most of them fail to practice exclusive breastfeeding because they spend many hours in office; therefore they are obligated to give solid foods to the children before the age of six month. Poor

complementary feeding exposes children to various infections such as diarrhea, cough, fever and measles (TFNC, 2006).

2.4.4 Hygiene and sanitary practices

Most of the causes of illness and death among youth children are those, which find their way through water and food (UNICEF, 1998b). A hygiene practice affects directly the cleanliness of the environment and determines the number of infective agents children ingest. They are divided into personal and household hygiene practices. Personal hygiene practices include hand washing, bathing and cleanliness of the child while household hygiene practices include cleaning of the house and children's playing ground, adequate liquid and solid waste disposal, use of sanitary facilities and use of safe potable water (UNICEF, 1997). According to Armar – Klemesu *et al.*, (2000) and Maxwell *et al.*, (2000), hygiene practices are classified into 5 groups. These include personal hygiene, use of protected water sources, food preparation, storage of domestic utensils and environmental and disposal of human faeces.

2.4.5 Caregivers – child interactions during feeding

The recent focus on childcare has resulted in studies of child feeding practices many of which involve caregivers-child interactions. All those interactions have received little attention in the past. The influence of the child characteristics on caregiver behavior has developed interest among researchers (Engle *et al.*, 1997). Likewise the importance of feeding style and the role of the caregivers in ensuring adequate dietary intake through active and responsive feeding has been researched (Engle *et al.*, 2000).

Characteristics of the child may have major influence on a variety of caregiver's behaviors. The child's age for instance may influence behavior in a variety of ways linked to both child's actual developmental stage and also to caregiver's expectations for the child of a given age. The child's gender may also be an important determinant of caregiver's behavior particularly in some cultures. Caregiver's perceptions of the child's health, vulnerability, appetite, and growth may all influence care and child feeding practice characteristics of the caregiver. It also plays a role in caregiver's responsiveness and sensitivity to the child's needs (Engle and Riccuti, 1995; Valenzuela, 1997).

There are several factors which affect the amount of care provided by the caregivers to the child. These include education, knowledge and beliefs, health and nutritional states of the caregivers, mental health, lack of stress and self-confidence of the caregivers, autonomy, control of resources and intrahousehold allocation of resources, workload and time constraints of the caregiver and social support received by the provider (Birch and Fisher 1995, Engle *et al.*, 1997 PAHO/WHO, 2003).

2.4.6 Psychosocial care

The provision of affection, warmth and responsiveness to the child demands and the encouragement of autonomy, exploration, and learning to the child correlate with better nutritional status of the child. Several studies done in developing countries revealed that, undernourished children who have been given verbal and cognitive stimulations had higher rate of growth than those who had not (UNICEF, 1997).

2.4.7 Health care practices

Health care practices include prevention of illness and subsequent home treatment.

For example caregivers recognize and diagnose diarrhoea and provide remedies including oral dehydration solution (UNICEF, 1977; FAO, 1997). Caregivers should also recognize the critical moment when a child needs to be taken to a health facility for treatment. Preventive and/or curative cares are also essential. Example is use of MCH services for growth monitoring and immunization. Curative services must be used as soon as the child needs the treatment. UNICEF (2000) estimated that, one third of all births are not registered, increasing the number of children denied access to basic healthcare services. In Morogoro region, growth monitoring, immunization as well as supplementation is done during specific village days to children less than five years as an outreach programme in order to increase the coverage. According to CSPD (2003), growth monitoring coverage in the region was 99% in the program areas. Home based protection such as control of pests (such as rats, insects) and avoiding accidents such as burns, fall and poisoning are important aspects that caregivers need to take into consideration. The caregivers must strive to make the home environment safe.

In Tanzania, women's health status continues to be compromised by early and repeated pregnancies, inadequate family planning and maternal health care services especially in the rural areas. This has implication for both infants and maternal mortality and morbidity (URT, 2005). There is a considerable variation on the number of women who get assisted by health workers during delivery between rural and urban areas. Urban women are twice than likely as rural women to have a health

attendant during delivery. In Morogoro region, 54% of mothers deliver in health facilities (NBS, 2002). Other health activities which are done include immunization of the mothers, provision of supplements like iron for the anaemic mothers and also education on breastfeeding and complementary feeding of their babies.

2.4.8 Health service

In societies where health care is widespread, women's status may not affect their access to reproductive health care services. In other societies, however, increased empowerment of women is likely to be associated with increased ability to seek out and use health services to better meet their reproductive health needs. The more empowered a woman, the more likely she is to receive ANC and delivery care from a medical professional. The pattern is less clear regarding the relationship between women's status and postnatal care (NBS, 2005). Problems in accessing health care are felt most acutely by rural women; older women; women with larger families; divorced, separated, or widowed women; and women not working for cash.

2.4.8.1 Support for breastfeeding

It is crucially important for new mothers to initiate exclusive breastfeeding during the first hour of life. Both WHO and UNICEF recommend that the infant receives only breast milk for the first six months and no additional food and drink including water. The infant should be breastfed on demand (UNICEF, 2004). While breastfeeding is a natural act, it is also a learned behaviour. Those who might lack the confidence to breastfeed need the encouragement and practical support of the baby's father and their family, friends and relatives. Health workers, women's organizations, the mass media and employers can also provide support (UNICEF,

2004). According to NBS (2005) initiation of breastfeeding in the first hour and first 24 hours after birth in Tanzania varies by background characteristics. Children (66%) of mothers assisted at delivery by health professionals are more likely to initiate breastfeeding within one hour after birth than those whose mothers were assisted by traditional birth attendants, other attendant or no one (55% or lower). Further still, the breastfeeding support at family levels depends on many factors such as culture, education and wealth quantile. Comparison of urban and rural parts of Tanzania shows that breastfeeding support and initiation within one hour after birth is more common in urban areas (67%) than rural areas (58%).

2.4.9 Appropriate childcare index

Table 5: Appropriate childcare index

Care practices	Components of childcare	Scores
Child feeding practices	Time of initiation of breast milk Breastfeeding Use of pre lacteal feeding Exclusive breastfeeding and complementary food Food diversity Number of meal per day/frequency of feeding	0-3“Poor”, 4-5 “average”, 6 “good”
Health seeking practices	Attendance to the antenatal care Assistance during birth Immunization for age Attendance to growth monitoring Place for child’s treatment	0-2 “Poor”, 3 “average”, 4 and above “good”
Hygiene practices	Mothers/caregivers cleanness ^a No stagnant water House swept Garbage organization Unwashed utensils water treatment Water covered (drinking) Presence of fecal/non fecal matter	0-3“Poor”, 4-5 “average”, 6 “good”
Psycho-social care	Cooking the child’s food Feeding the child Washing the child’s clothes Bathing the child Taking the child to the MCH clinics Teaching the child skills ^b	0-3“Poor”, 4-5 “average”, 6 “good”

^aHair, face, nose, hands, nails, clothes and feet; ^btalking, stand, and walking

Source: Arimond *and* Ruel (2002), Ama-klemesu *et al.*(2000), Ruel *et al.* (1999).

CHAPTER THREE

METHODOLOGY

3.1 Study Area Description

Morogoro region is one of the 20 regions in Tanzania Mainland. The region lies between latitude 5° 58" and 10° 0" South of the Equator and longitude 35° 25" to the East. It is bordered by seven other regions; Arusha and Tanga regions to the North, Coast region to the East, Dodoma and Iringa to the West and Ruvuma and Lindi to the South. It occupies a total land area of 72,939 square kilometers which is approximately 8.2% of the total land area of Tanzania mainland.

Administratively, Morogoro region has six districts namely Kilombero, Morogoro Rural, Morogoro Urban, Kilosa, Ulanga and Mvomero. The districts are divided into thirty divisions; which in turn are divided into 140 wards. Ulanga district is the largest occupying 33.6% of the total regional land area but it is the one with the least number of villages (14.2% of the total). Morogoro rural has the largest number of divisions (33%), wards (30%) and villages (47%).

3.1.1 Climate

The annual rainfall ranges from 600 mm in low lands to 1200 mm in the highland plateau. However, there are areas which experience exceptional drought (with less than 600 mm of rainfall, these areas are Gairo and Mamboya divisions in Kilosa districts and Ngerengere division in the East of Morogoro Rural districts. The average annual temperature varies between 18°C on the mountains to 30°C in river valley. In most part of the region the average temperatures are almost uniform at 25°C. In general, the hot seasons run from July to September.

3.1.2 Economic activities

Major economic activities in Morogoro region include subsistence and commercial farming, small scale enterprises and commercial retail primary and secondary manufacturing industries. The major cash and food crops include maize, rice, vegetables and fruits.

3.1.3 Health services

According to NBS (2002) the main health services which are found in Morogoro region are dispensaries, health centers and hospitals. The number of dispensaries in 2000 was 226 of which public dispensaries were 159 and 67 were private. The number of health centers in the region was 26 in 2000 out of which four centers were private while 22 health centers were public. Furthermore, Morogoro region had 12 hospitals in 2000. Basic services which are available for the children (6-24 months) include growth monitoring, vitamins supplementation, immunization, deworming and health education to their mothers.

3.1.4 Growth monitoring, immunization, and vitamin A supplementation

Growth monitoring is usually done monthly and during specific village days to children less than five years as an outreach programme in order to increase coverage. Outreach helps to increase accessibility to immunization for the children whose caregivers find it difficult to visit the health facilities due to financial and time constraints. It is done monthly at set dates. If the growth is faltering, appropriate action is taken to improve the child's nutritional status. According to CSPD (2003), growth monitoring coverage in the region was 99%.

Immunization is done monthly during village health days as an outreach programme to children aged one to nine months. Immunization is sometimes done on the course of the week when the date is not coinciding with the outreach visits or to caregivers whose appointment reached when the child was away from his/her routine clinic immunization date. Vitamin A supplementation is carried out during outreach programmes and village health days to children aged 9, 15 and 24 months. Maternal education is also part of the child and reproductive health (MCH) services. Mothers are educated on the importance of the breastfeeding, timing of introduction of complementary food and basic childcare practices. Supplementation with iron is done to children and mothers who are anaemic. Children are also provided with deworming things.

3.2 Study Design

This study was longitudinal in design whereby the data were collected over a period of time. The study was conducted in two districts i.e. Morogoro Urban and Kilosa whereby children aged between 6-24 months were involved.

3.2.1 Sampling frame

The population consisted of children aged 6-24 months and their respective mothers/ caregivers in Morogoro Urban and Kilosa districts. People excluded from the study were caregivers who were still young (less than 18 years of age) those who were not mentally stable and children who were proven to be HIV positive. For households which had more than one child in the selected age only the younger child was selected into the study.

3.2.3 Sampling technique

Stratified random sampling method was used to select two districts which were located in urban and rural areas. Random selection was done to obtain one division, one ward and finally one village in which 300 children in the age 6- 24 months were randomly selected from the health clinic registers.

3.2.4 Sample size

Prevalence of malnutrition in Morogoro Urban and Kilosa districts were 7.5% and 14% respectively. Based on this proportion, the sample size was calculated using Fisher *et al.* (1991) formula. From the prevalence data the sample size was determined at 95% confidence interval.

The sample size was calculated using the Fisher *et al.* (1991) equation;

$$N = 2 (Z^2 p q) / d^2$$

Where:

N = desired sample size (when population is greater than 10,000)

Z = standard normal deviate, set at 1.96 corresponding to 95% confidence interval.

P = proportion in the target population estimated to be malnourished (0.215) in both Morogoro Urban and Kilosa districts

q = (1 –p) Proportion of the children who are well nourished (0.785)

d = degree of accuracy desired (0.1)

$$N = 2 \times 1.96^2 \times 0.215 \times 0.785 / 0.1^2 = 129.67 \approx 130 \text{ children}$$

An additional of 40 children 20 from each district (18%) were added to compensate for attrition and refusals. Thus the sample size was 300 (150 mother/district) and consisted of child- mother/caregiver pairs. Thus 150 households were selected from Morogoro urban and the other 150 households were selected from Kilosa district.

3.3 Data Collection

3.3.1 Instrument for data collection

The data were collected through questionnaires which consisted of both open and closed ended questions. The questionnaire was divided into seven sections. Section A solicited information about the mothers/caregivers and the children; section B solicited information about social and demographic information of the mother/caregiver such as education, occupation, religion and sex; section C solicited information about the socio-economic of the child's parents such as source of income and expenditure on food and basic needs. Section D collected maternal information i.e. if the mother was working or not, how far was the working place from home and the time spent on the child. In addition, information on usual food intake and morbidity in the past 14 days prior to the study were collected and recorded in section D. The childcare practices, enumeration of the caregivers and measurement of anthropometric measurement were covered in section E, F and G respectively.

3.3.2 Administration of the questionnaire

Data collection was done by a research team of four postgraduates students in nutrition. The team went through the questionnaire together and streamlined the questions. They were well conversant in both English and Kiswahili languages. They

had adequate experience in taking anthropometric measurements. Before the data were collected, there was a short debriefing on the interview procedure.

The questionnaire was pre-tested before starting data collection in a randomly selected sample of 20 households in Morogoro Rural district. These households were out of the study area but had similar characteristics to the study sample. The pre-test questionnaires were not included in the final analysis. Ambiguous and unclear questions were corrected before administration of the questionnaire.

The questionnaires were administered through face to face interviews whereby the enumerators asked questions directly to the mothers/caregivers and recorded the answers in the questionnaire. The data collection was done in the morning hours and in the evening for the mothers who were not present at home in the morning.

Ten mother/caregiver-child pairs were randomly selected in each district. The selected mothers/caregivers were taught on appropriate childcare practices. These mothers/ caregivers were expected to improve their childcare skills and hence their childcare practices. The mothers/caregivers were followed for six months to monitor their behavior modification and improvement in childcare practices and the overall effect in the nutritional status of their children.

3.3.3 Measurements

3.3.3.1 Anthropometric measurement

Anthropometric measurements of height/length and weight were taken for use in the computation of nutritional status indices namely weight for age, weight for height

and height for age. The anthropometric measurements were taken according to WHO (1986).

3.3.3.2 Recumbent length

Length board was used for measuring children who were less than 24 month of age. Before taking the length, the board was positioned on a hard flat surface. With the mother/ caregivers help, the child was gently laid on the board with the crown of the head against the fixed head board facing directly up so that the child's line of sight was perpendicular to the measuring board. The first enumerator held the child to ensure the child was placed with the crown touching the headboard, the child buttocks touching the backboard and the shoulders and hips at the right angles to the long axis of the body. The second enumerator kept the legs straight against the backboard, sliding the footboard against the bottom of the feet with the toe pointing upward. The measurement was read by the second enumerator and recorded to the nearest 0.1 centimeter. Two measurements were taken and recorded after each reading. The average length was computed during data processing and this made the actual length of the child.

3.3.3.3 Height

This was obtained by the use of stadiometer with precision of 0.1cm for the children who aged 6-24 months. The bare footed child was asked to stand straight on the stadiometer which was placed on a flat surface and to look straight ahead. With the help of the mother, the heels were maintained together and the body was placed so that the shoulder blades, buttocks and heels were touching the vertical surface of the stadiometer. The feet were maintained flat on the floor slightly apart, with the legs

and back straight and arms at the sides. The shoulders were relaxed and in contact with the stadiometer. As the child stands still, the enumerator took the measurement. Two measurements were taken for each child and recorded to the nearest 0.1 cm. The average height was computed during the data processing and used as actual height of the child.

3.3.3.4 Weight

A Salter scale (Model 235CMS Weighing Equipment, London) was used for weighing the children. The scale was adjusted to zero before each child was weighed. With minimum clothing and without shoes on, the child was put into weighing pants. The straps of the pants were attached to the hook of the scale gently; the child was lowered and allowed to hang freely. When the scale pointer was stationary the reading was recorded to the nearest 0.1kg. Two readings were taken and recorded for each child and the average computed during data processing.

3.3.4 Dietary intake

The interviewers asked the respondents to recall the type and amount of all the food and drinks consumed by the child during the 24 hours period preceding the survey. The respondent was asked to recall the time the food was eaten, the name and the approximate quantities.

3.4 Data Analysis

Epi-Info anthropometry program (Epi- Info, Version 6) was used to convert raw anthropometric data (length/height and weight) of the children into z-scores that were used to classify children into levels of nutrition status according to the WHO (1986).

Statistical package for social science (SPSS) version 11.5 was used for analysis of data. Means and standard deviation were computed for continuous variables, frequencies and proportions were computed for categorical variables. Associations and relations between nutritional status indices and other variables were tested by chi-square; correlation coefficient and comparison of the means were done using student t-tests. The level of significance was set at $p \leq 0.05$ for all analyses. The data on 24 hr recall were used to check on the type of foods which was mostly given to the children.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-economic and Demographic Characteristics of the Household

Table 6 summarizes the socio-economic and demographic characteristics of the surveyed households. Results showed that, household size in Morogoro Urban was 4 ± 2.34 while in Kilosa was 5 ± 2.14 persons ($P = 0.015$). The household size was associated with the length of time that the mothers spent with child, due to the fact that, as the family size increases the time that the mothers spend on the children also decreases. A study by Petro *et al.*(2003) showed that, the time the mother spends on the care of the child had no correlation with the children's health i.e. children whose parents spend more time at work were found to have good nutritional status compared to those who spend much of their time with their children. This could be explained by the relationship and affection that children developed towards their care provider which tended to influence their feeding and living conditions (UNICEF, 2003). Parkinson and Drewett (2001) reported that, maternal work either part-time work or fulltime work has no any association with the children's nutritional status. Mothers tended to adopt work patterns to fit the specific needs of their young children.

The age difference between the index child and the older siblings was insignificant ($P = 0.132$), among the households surveyed. In Morogoro Urban, the mean age of the children was 4.57 ± 3.11 years while in Kilosa district the mean age of the children was 5.51 ± 4.91 years.

The data showed that, most of the mothers (46.2%, n = 285) were married. Kilosa district had fewer mothers who were married (32.1%, n=135) compared to Morogoro Urban (59.9%, n=150). The study also revealed that, most children who had poor nutritional status belonged to mothers who were married (41.9%, n=285) compared to those who belonged to single (14.5%, n = 285). This observation was in agreement with findings by Kumar (1985) who reported that, children from female headed households had better nutritional status than those coming from male headed households. Marital status can therefore be one of the important factors contributing to the childhood undernutrition.

The average age of the mothers/ caregivers in Morogoro Urban district (25.87 ± 8.07 years) was significantly higher ($P=0.047$) than that of their counterparts in Kilosa district (19.37 ± 10.12 years). For that reason, the average age of the mother at first birth was significantly lower ($P=0.047$) in Kilosa district (19.15 ± 2.92 years) compared to Morogoro Urban district (19.90 ± 3.31 years). According to NBS (2005) one fourth of women involved in Tanzania Demographic and Household Study (2005) women start reproduction at the age range of 15-19 years.

The study also observed that, the average amount of money spent on index child's food per month in Kilosa districts was $2,677.37 \pm 2,342.72$ Tshs while in Morogoro Urban the average expenditure was $4,353.72 \pm 4,805.4$ ($P=0.002$). Likewise, households in Morogoro Urban district spent more money on family food compared to households in Kilosa district ($P= 0.025$). Table 6 data indicate that, employed mothers in Kilosa district were fewer (14.7%, n=135) than those in Morogoro Urban district (21%, n=150). Employment is essentially for a women in providing the

family with good income, household can afford enough and well balanced meals and improves the living standards at the household level.

About 95% (n=150) of the respondents in Morogoro urban district were living in houses roofed with corrugated iron sheets, while 69.9% (n=135) of their counterparts in Kilosa district, Kilosa district had a large number of houses thatched with grass (8.1%, n=135) compared to Morogoro urban (1.4%, n=150). Furthermore 52.7% (n=135) of the houses in Kilosa district had mud/soil floors compared to 17% (n=150) in Morogoro urban districts had cemented floor (Table 6). From this observation it shows that families in Kilosa district had low living standards and hence provide poor care to their family.

4.2 Child Feeding Practices and Dietary Intake

4.2.1 Initiation of breast milk after birth

Early initiation of breastfeeding is important for both the mother and the child. Early suckling stimulates the release of prolactin, which helps in the production of milk, and oxytocin, which is responsible for ejection of milk. It also stimulates the contraction of the uterus after childbirth. The colostrum which is produced in the first few days after delivery and provides natural immunity to the infant. It is recommended that, children be fed colostrum immediately after birth and continue to be exclusively breastfed even if the regular breast milk has not yet come down.

About two thirds of children in both districts initiated breastfeeding immediately/within first one hour after birth (Table7). Out of these 72.6 % (n=150) were from Morogoro Urban while 65.9% (n=135) were in Kilosa district. Furthermore, 18.5 % (n=150) of the children in Morogoro Urban and 29.6% (n=135)

of children in Kilosa district initiated breastfeeding after the first hour (Table7). The time of initiation of breastfeeding differs significantly ($P=0.046$) between the two districts, with Kilosa initiating breastfeeding earlier than Morogoro Urban district. Some of the mothers from both districts could not remember the time they initiated breastfeeding to their babies. Result from other studies in Tanzania indicated that, 59% of mothers initiated breastfeeding within 30-45 minutes after delivery (NBS, 2005).

Table 6: Socio-economic and demographic characteristics of the surveyed households

Characteristics	Morogoro Urban		Kilosa district	
	n	%	n	%
Marital status				
Married	82	59.9	44	32.1
Single	16	11.7	19	13.9
Divorce	0	0	2	1.5
Widow	4	2.9	7	5.1
Cohabitate	35	25.5	65	47.4
Household size				
1-3	50	34.2	49	35.8
4-6	90	61.6	72	52.6
>6	6	4.1	16	11.7
Maternal education level				
No education	13	8.7	10	7.2
Primary	107	71.4	93	68.8
Secondary	13	8.7	9	6.8
Vocational/university	18	12.2	23	17.2
Maternal occupation				
Civil/private servant	31	21.1	20	14.7
Business(petty/medium scale)	57	38.8	18	13.2
Casual labourer	21	14.3	12	8.8
Housewife	20	13.6	3	2.2
Farming	14	9.5	79	57.8
Father support to family				
Nothing	44	47.8	17	13.0
Everything	16	17.4	25	19.1
Partial	27	29.3	81	61.8
No father/absent	3	4.3	8	6.1

4.2.2 Child feeding practices

The research findings show that, about three quarters (74% n=285) of the index children in both districts were still breastfeeding at the time of the study. Out of these, 50.7% (n=150) of the children were from Morogoro Urban, while 49.3% (n=135) were from Kilosa district. Despite the large number of children being breastfed, three quarters (75.1%, n=285) of the total children were not breastfed exclusively. Children in both districts were also given pre-lacteal foods, warm water being the most common pre-lacteal drink given (54.7%, n=285) (Table 7). Besides the nutritional aspects, human milk also contributes to the development of both active and passive immunity. This protects children against illness thus decreasing the need for early medication and reduces the burden to health resources (Mwasyete, 2004).

Table 7: Child feeding practices and dietary intake of the studied children

Characteristics	Morogoro Urban		Kilosa	
	N	%	N	%
Currently breastfed				
Yes	39	73.3	104	77.0
No	107	26.7	31	23.0
Exclusive breastfeeding				
Yes	33	22.4	36	26.5
No	114	77.6	99	73.5
Pre-lacteal foods				
Warm water	147	95.8	134	98.9
Sugar water	0	0	1	1.1
Soft porridge	1	1.4	0	0
Tea /infusion	1	1.4	0	0
Juice	1	1.4	0	0
Reason for pre-lacteal foods				
Baby was crying	117	80.7	95	70.9
Mother was sick	0	0	3	2.2
No enough milk	11	7.6	9	6.7
Resume work	5	3.4	3	2.2
To wean	12	8.3	24	17.9
Initiation of breast milk				
After first hour	27	18.5	40	29.6
Within first hour	106	72.6	89	65.9
Don't remember	13	8.9	6	4.4

A study done by Davis (2000) found that, exclusive breastfeeding of children influences their nutritional status and growth. Human milk contains a balance of nutrients that are easily digested, absorbed and utilized in the body. After six months of age, breast milk alone is no longer able to satisfy the child's increased physiological needs for energy and specific macro- micronutrients, therefore other foods should be given. The introduction of complementary foods along with breast milk has an important implication on the health and nutritional status of children.

More than half of the children (76.1%, n=285) were given other foods than breast milk when they were 0-3 months of age. The main reasons for introducing complementary food earlier than the recommended 6 months were; babies cried frequently (76%, n=285), mothers had no enough milk for their children (7%, n=285), returning to work (10%, n=285) and mothers were sick (7%, n=285). Exclusive breastfeeding for six months is strongly recommended but it has not been practiced widely due to the reasons advanced. Some mothers give complementary foods to their children as early as one month of age.

The reasons behind were that, mothers themselves did not get enough food and well balanced meals during lactation which reduced the volume of breast milk produced. This means that, the children got little breast milk and as a result they cried frequently. To avoid the trouble caused by the children, mothers would supplement the child with other foods so that they can work comfortably and the babies can relax and stop crying. According to Mamiro (2003), traditional complementary foods in Tanzania are based on starchy staples, usually cereals such as maize, rice, sorghum and root tubers such as yams, sweet and round potatoes. These foods have been

reported to be poor sources of nutrients required for optimal growth of children. Early introduction of complementary food has been reported in Tanzania (NBS, 1998; TRCHS, 2000) and other parts of Africa and Latin America (Petro et al, 2003). This bad practice of early supplementation can result into diarrhoea due to maldigestion, food allergies and food sensitivity.

Most (67.8%, n=285) of the mothers who were employed worked near their homes; while 32.2% (n= 285) worked away from their homes. Results showed further that, majority of the mothers (66.8%, n= 285) left their children with caregivers during working hours. The average age of the caregivers was 13 ± 2.254 years (ranges 13-15years) ($P = 0.05$). Women unemployment level in the study sample was significantly ($P \leq 0.05$) higher (45%) than the national average of 13% (TRCHS, 2002). Table 6 data show that, majority of the mothers/ caregivers (56%, n=285) had primary education. Only few mothers/caregivers had attained secondary education (13%, n=285) and university education (1%, n=285), respectively. About 20%, (n=285) of the mothers had no formal education. Maternal/caregivers education is important because it helps to understand instructions in child care. According to Ruel *et al.* (1999), maternal schooling is very important for child health, nutrition and well being. Various studies (Kulwa *et al.*, 2006) have demonstrated that, maternal schooling is associated with improved child nutrition and health.

4.3 Home Environment, Sanitation and Hygiene

Majority of the households (80%, n=285) from both districts used tap water. Kilosa had more households using river water (31.3%, n = 135) compared to Morogoro Urban (96.6%, n=150). More than 50% (n=285) of the households in Kilosa and

Morogoro Urban districts boiled water as a method of water treatment. Other methods used for water treatment were chemical disinfection 4.6% (n= 285) and filtration (6.3%, n=285). About 41.9% (n=150) of the households in Morogoro Urban and 58.1% (n=135) in Kilosa district did not sterilize their drinking water. It was reported that, more than three quarters of the total households (85.5%, n=285) covered their water after treatment. Water and environmental sanitation have a great impact on the nutritional status and the overall well being of women and children. Waterborne diseases such as typhoid and dysentery are caused by intake of unclean water. Unclean or insanitary practices such as improper disposal of human excreta can enhance multiplication of harmful bacteria and worms, which in turn affect the health status of children. Majority (96.9%, n=150) of the respondents in Morogoro Urban used tap water, while in Kilosa district most respondents (64.2%, n = 135) used river water. The use of tap water greatly eased the mother's workload i.e. having water taps near the residence helped to reduce the time mothers and children spent in fetching water.

Results of the study revealed that, majority of the households (63.9%, n=285) used composite pits for disposing refuse. Burning and burying the solid wastes were also practiced in some households (Table 8). Some households in Morogoro Urban (23.4% n= 150) and Kilosa districts (39.1% n = 135) threw their solid wastes in open space (P=0.033). Physical examination of the household compounds revealed that, more than half of the households (56%, n=285) were dirty. Kilosa district was found to be better than Morogoro Urban in keeping their environment clean. Observation of the cleanness of the children and caretakers showed that 28.1% (n=135) of the children in Kilosa district were dirty while 33.1% (n=150) of their counterparts in

Morogoro urban were dirty. Majority of the caretakers/mothers in both Morogoro Urban and Kilosa districts were clean (Table 8). It was also observed that, most of the children had dirty hands (51.8%, n=285), clothes (68.3%, n=285), nails (54.3%, n=285) and hair (76.6%, n=285). Observations made on the mothers/ caregivers revealed that, 51.2% (n=285) of the mothers had clean hands, 68.3% (n=285) had clean clothes and 73.7% (n=285) clean hair. In addition 50% (n=285) of the children's hands and nails found unclean when they were taking their food. This shows that there was a possibility of the children to eat dirty foods especially if they had not practice hand washing before and after meals.

Table 8: Distribution of the households by water treatment, source of water and refuse disposal

Characteristics	Morogoro (U)		Kilosa	
	N	%	N	%
Source of drinking water				
Tap water	145	96.6	42	31.3
Well	2	1.4	6	4.5
Rivers	3	2.0	87	64.2
How long from the source				
More than an hour	7	0.7	6	4.4
Half an hour	143	99.3	129	95.6
Method of water treatment				
None	44	29.7	61	44.9
Chemical treatment	6	4.1	7	5.1
Boiling	90	60.8	54	39.7
Filtration	8	5.4	13	10.3
Is stored water covered				
Yes	131	87.5	113	83.5
No	19	12.5	22	16.5
Place of solid waste disposal				
Composite pit	100	70.9	75	56.4
Bury and burn	7	5.0	4	3.0
Threw away in open place	33	23.4	52	39.1
Use of dustbins	1	0.7	2	1.5
Child's is clean ^a	97.5	65	81	60.0
Mothers/caregivers is clean ^a	105	70	91.8	68.0

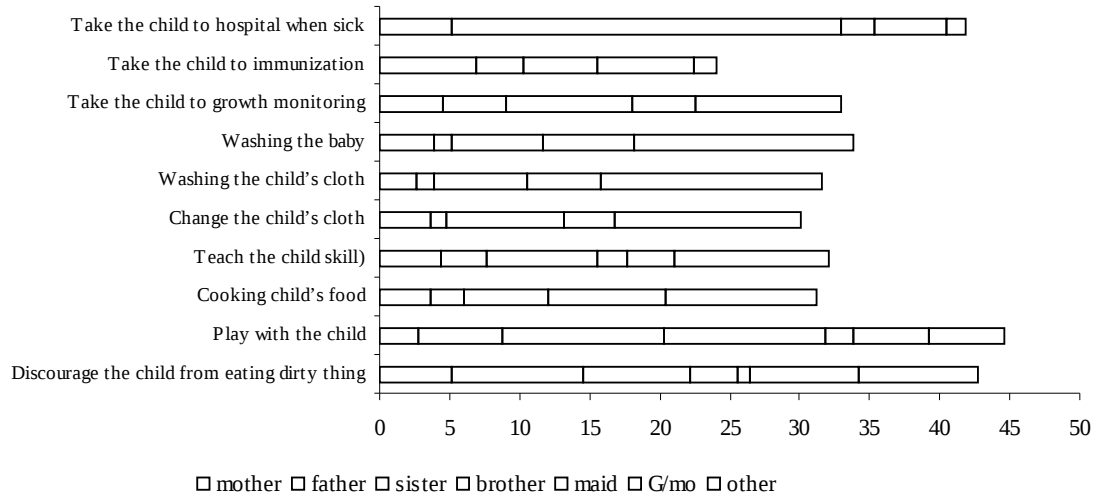
^a Physical observation of hair, face, nose, hands, nails, clothes and feet

4.4 Psycho-social Interaction and Affectionate Practices

Generally, mothers were the ones who were mostly involved in caring practice (Table 9). The study showed that, there were differences in the psychosocial interactions among the care providers and the children in the two districts. Figures 1 and 2 show the various individuals involved in providing care for children in both districts. Fathers (27.7%, n=150) participated by taking the children to the hospital when sick. In Kilosa district, approximately 59% (n=135) of mothers participated in providing care while in Morogoro Urban only (41%, n=150) of the mothers were involved in similar care. These results suggested that care of the children involved many people in the family but the mother took the key role. Due to involvement of many people in the care of the child, the nature and quality of care provided differed considerably (Thuita *et al.*, 2002; Efata, 2000; Luboya, 2002). A study done by Mseche and Mtenga (2005) showed that, although child care in households involved many people the mothers were the principle care providers. Fathers participated only in special care events but seldom would they be involved in daily care activities.

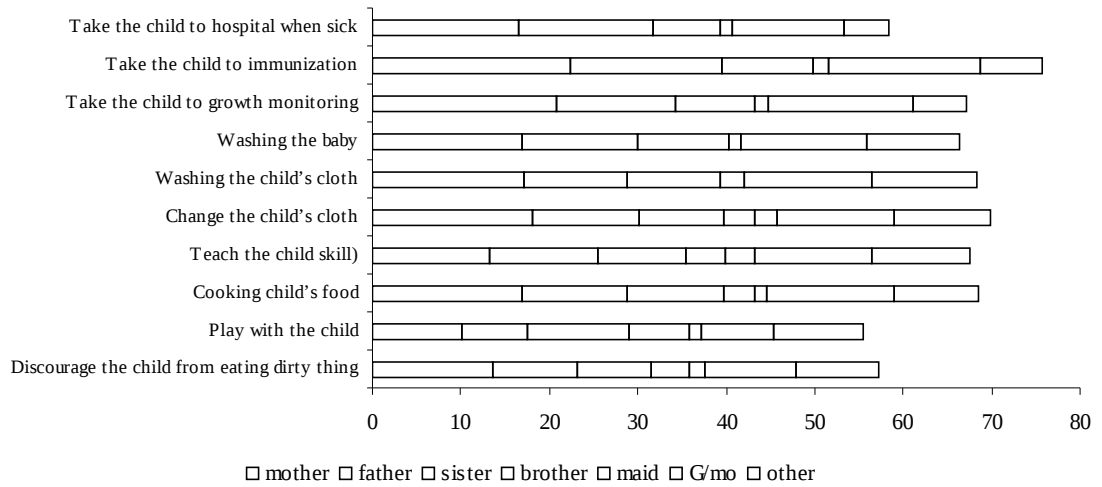
Table 9: Psychosocial practices of mothers and other caregivers

Practice	Mothers		Others	
	N	%	N	%
Cooking child's food	176	62	109	38
Cooking child's food and feeding child	103	36	182	64
Washing child's cloth	154	54	131	46
Bathing child	160	56	125	44
Taking child to the MCH clinics	256	90	29	10
Teaching the child to stand, walk and talk	114	40	171	60



Others: siblings, neighbours and aunts

Figure 1: Participation in various childcare activities (Morogoro Urban district)



Others: siblings, neighbours and aunts

Figure 2: Participation in various care activities (Kilosa district)

4.5 Child and Maternal Healthcare Practices

Proper medical attention and hygienic conditions during delivery can reduce the risk of complications and infections that can cause the death or serious illness of both the mother and the newborn. Efforts to reduce health risks to mothers and children by

increasing the proportion of babies who are delivered in healthcare facilities are highly pertinent. In this study, 98 % (n=285) of mothers attended antenatal clinics. However, majority of the mothers (64.7%, n=285) in both districts started antenatal clinics at their fourth month of gestation (Table 10). At the time of delivery, 45.3% (n=135) of the mothers from Kilosa district and 54.7 % (n=150) of their counterparts in Morogoro Urban were assisted by trained personnel (doctors or trained nurses). Only a small proportion of the mothers (14.6%, n=285) from both districts were assisted by traditional birth attendants (TBA). Traditional birth attendants attended more women in Kilosa district (72.5%, n=135) than in Morogoro Urban district (27.5%, n=150) (P= 0.006).

4.5.1 Management of the children when ill

About three quarter (71.9%, n=150) of children in the study were reported to be sick in the last 14 days preceding the survey. About 99.6% (n=285) of mothers/ caregivers sent their children to health facilities for treatment when ill. Only few respondents in Kilosa district (5%, n=135) used herbs for treatment of illnesses. Majority of the children (84.5%, n=285) were treated in hospitals and only few of them (10.5%, n=285) were treated at their homes. The average distance from homes to the nearest health facility for both districts was approximately half an hour to one hour walk.

In order to ensure infants and young children have a good health start in life, it is essential to immunize them against communicable diseases such as polio, measles and tuberculosis before their first birthday. The study revealed that, 99.7% (n=285) of the children in the study were fully immunized. Similar results were observed in

studies done in different regions of Tanzania (Mtwara, Kilimanjaro and Morogoro) which showed that, more than 95% of children were fully immunized (MOH, 2004). It was also revealed that, 97.4% (n=285) of the study children were taken to MCH for growth monitoring. Majority of children in the study (72.4%, n=285) had normal weight or increasing weights for their ages during the study. Conversely, 68.6% (n=135) of the children in Kilosa district and 31.4% (n=150) in Morogoro Urban district had weight below normal or decreasing weights for their respective ages. Only few children (8.8%, n=285) had stable growth rates. Mothers attending growth monitoring were likely to have well nourished children if they comply with the childcare aspects taught in the maternal and child health clinics (Table 10).

Maternal care during pregnancy and delivery influences health and the nutritional status of both mother and the child (UNICEF, 2001). It was observed in the study that, most deliveries were overseen by trained personnel. This was a good indication of maternal care. According to NBS (2005), there was a slight increase (41% to 46%) in the number of delivery mothers who were assisted by health professionals in the year 2004. A study done by Macharia *et al.* (2005) revealed a strong relationship between knowledge of the mothers and health seeking behaviours. Educated mothers were more likely to seek health advices from health care professionals, thus they were more likely to improve their health status and that of their children.

4.5.2 Common types of diseases for the children

Diseases that children suffered from in the last two weeks prior to the survey were diarrhoea (30.5%, n= 285), cough (38.2 %, n=285), vomiting (16.8 %, n=285) and running nose (37.9%, n=285), fever (40.4 %, n=285) and malaria (4.6%, n=285).

Diseases which were associated with unhygienic conditions namely diarrhoea, running nose, cough and vomiting affected many children while malaria and fever affected 4.6% and 40.4% respectively. It was also revealed that 35.3% (n=80) of the children who had poor nutritional status were suffering from diarrhoea (P =0.001) (Figure 3).

Many of the children who were reported to have diarrhoea in both districts had been breastfed exclusively for less than four months (57%, n=285) (Figure 3). A study done in Tanzania by TRCHS (2000) showed a close association between exclusive breastfeeding duration and episodes of diarrhoea. One of the leading childhood diseases in the world is diarrhoea which has a close relationship with malnutrition. The vicious cycle between

Table 10: Distribution of maternal health care and management of illnesses for children

Characteristics	Morogoro Urban		Kilosa	
	N	%	N	%
Received antenatal care (%)				
No	0	0.0	4	3.0
Yes	150	100.0	131	97.0
Age antenatal clinics				
Immediately after conceiving	54	38.0	44	32.6
More than 3 months	88	62.0	91	67.4
Assistance during delivery (%)				
TBA	11	7.9	29	21.5
Trained person	127	91.4	105	77.8
Untrained person	1	0.7	1	0.7
Place of treatment when ill				
Home	7	6.9	14	14.3
Hospital	95	93.1	74	75.5
Others	0	0.0	10	10.2
Attending MCH growth monitoring				
Yes	5	3.6	2	1.6
No	132	96.0	127	98.4
Immunization status				
Complete immunized	116	81.7	111	81.6
Not complete immunized	0	0.0	1	0.7
Child below 9 month	26	18.3	24	17.6
Weight during last session				
Normal/ increasing	117	84.2	80	60.2
Decreasing	16	11.5	35	26.3
Constant/stable	6	4.3	18	13.5
If sick in the last 14 days				
Yes	98	68.1	101	75.9
No	46	31.9	32	24.1

diarrhoea and malnutrition adversely affect on the growth of children. According to the Ministry of Health (2004), about 90% of the preschool children in Tanzania who suffer from different degrees of malnutrition, diarrhoea is an underlying cause. Poor hygiene and sanitation are the major causes of diarrhoea. A study in Morogoro (CSPD, 2000) revealed that, malaria was the leading killer disease for children under the age of five years.

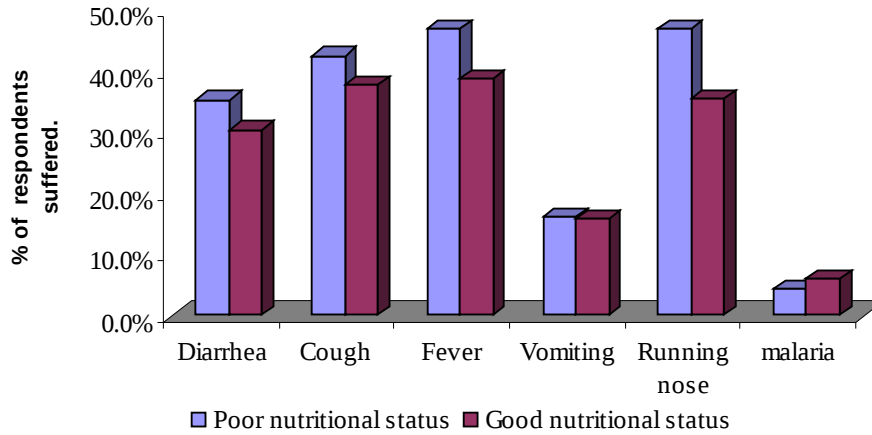


Figure 3: Types of diseases that the children suffered from in the past two weeks in relation to their nutritional status

4.6 Nutritional Status of the children

4.6.1 Overview

Anthropometry is a measure of the variation in physical dimensions and gross motor composition of the human body at different levels and degree of nutrition (Gibson, 1990). Anthropometric measurements are widely used in the assessment of nutritional status, when a chronic imbalance between intake of protein and energy occurs. They are of two types, body dimensions that include measurement of weight, height, mid-upper arm circumference and head circumference while others are measures of the body composition which include body fat and fat free mass. In children, anthropometric measurements serve as proxy indicators for their well being because they reflect the burden of diseases in the community as well as caring practices (Preble and Piwoz, 2000). In this study, weight, height and age were used to derive three key nutritional indicators namely weight for height, weight for age and height for age. Figure 4 summarizes the nutritional status of the children in the

surveyed household. More than 76% (n=285) of the children had normal WAZ, WHZ and HAZ. Morogoro urban had a larger proportion of children (40.3%, n=150) with good nutritional status compared to Kilosa district (35.8%, n=135). The mean WHZ and HAZ scores were higher in Kilosa than in Morogoro urban district.

Stunting level (low HAZ) in the surveyed districts was lower than the regional average which is 25%. Stunting for Morogoro urban and Kilosa districts were 15 and 18%, respectively. Prevalence of underweight (low WAZ) among children in the surveyed districts were slightly higher than the regional average. The regional prevalence of underweight was 14%, while for Morogoro urban and Kilosa districts was 14.5 and 14.9%, respectively. Wasting was generally low among the children involved in the study. Prevalence of wasting among children was 4% in Morogoro urban, 2.5% in Kilosa and 2% at the regional level.

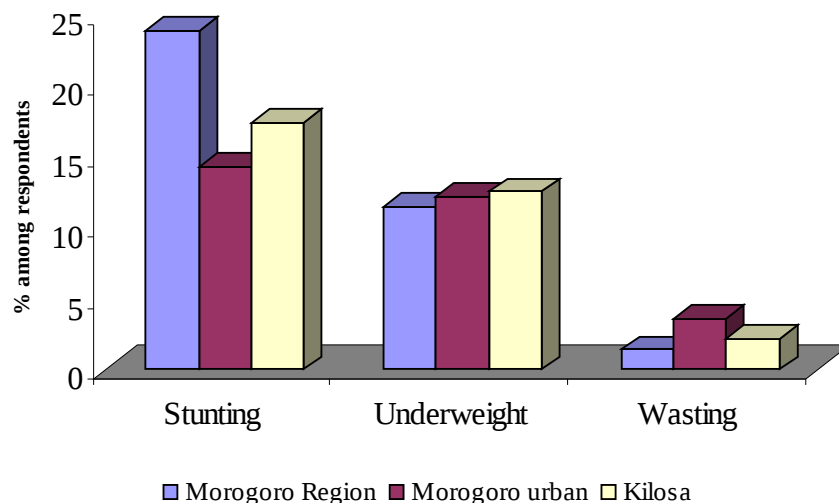


Figure 4: Distribution of under- nutrition among children in the surveyed districts

4.6.1.1 Weight for height

Low weight for height is an index for acute under nutrition (thinness or wasting) and it is generally associated with failure to gain weight or severe loss of weight. Table 11 data indicate that, only few children (2.2%, n=135) in Kilosa district were moderately wasted.

4.6.1.2 Weight for Age

Results also indicated that, there were only few children who were underweight. Kilosa had higher number of severely (3.7%, n=135) and moderately (8.8%, n=135) underweight children than Morogoro Urban district, however the differences were not significant (P=0.886).

4.6.1.3 Height for Age

Low height for age (stunting) is as an indicator for chronic under nutrition, associated with poor overall economic conditions and repeated exposure to adverse conditions. From Table 11, 8.1% (n=135) of children in Kilosa district were severely stunted, while 6.8% (n=150) of their counterparts in Morogoro Urban district were stunted. The rate of stunting in Kilosa was therefore higher than that of Morogoro Urban district.

4.6.1.4 Nutritional status by age categories

It was observed in the study that, the age group 19-24 months had poor nutritional status relative to age groups 6-12 and 13-18 months ($P=0.017$). Age group range 6-12 and 19-24 months showed similar cases of severe underweight children while age group 19-24 had a larger proportion of children who were moderately underweight ($P=0.570$). The observed poor nutritional status among 19-24 month children could be due to physiological transition whereby the child's immunity acquired from the mother was diminishing and the children were building their own immunity. A study by Mwasyete (2004) also showed that, prevalence of malnutrition is lower for children below 12 months and higher for children above 19 months. This is the most vulnerable group as most children are also affected by various diseases such as diarrhoea, malaria as well as respiratory track infections. It has also been reported (Urassa and Hussein, 1998) that, at this age period mothers often deliver another baby or are expecting, thus the care given to the children decreases. Ruel *et al.* (1999) reported that, when the children reach 18 months, mothers tended to engage themselves in economic activities and often delegate the care of the children to their elder siblings. At this time children have completed immunization and are no longer taken to MCH clinic where growth monitoring is done and growth faltering can be easily detected.

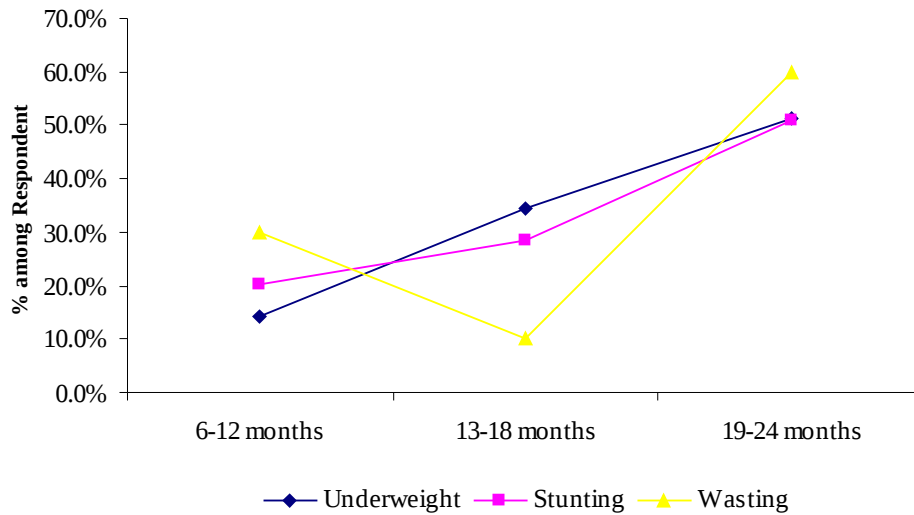


Figure 5: Malnutrition within age categories

4.6.1.5 Nutritional status by sex

It was revealed in the study that, male children had poorer nutritional status than their female counterparts ($P=0.026$). Likewise, more male children were wasted compared to female children in both Morogoro Urban and Kilosa districts ($P=0.009$) (Table11). It was also observed that, the proportion of boys who were underweight and stunted was bigger than that for girls, however the differences were insignificant ($P=0.140$ and 0.447 , respectively).

Table 11: Distribution of WA, HA and WH Z-scores for children at different age groups

4.7 Education Intervention and Its Effect on the Nutritional Status of Children

Nutritional status	No of children in Morogoro (U)						No of children in Kilosa						Total no. of children					
	6-12 mo		13-18 mo		19-24 mo		6-12 mo		13-18 mo		19-24 mo		6-12 mo		13-18 mo		19-24 mo	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
WAZ (U/weight)																		
Normal	27	23	13	18	21	25	28	17	10	20	24	18	55	40	23	38	45	
Moderate	1	0	3	1	7	2	1	0	5	1	3	2	2	0	8	2	10	
Severe	1	0	2	0	0	1	1	1	0	0	3	0	2	1	2	0	4	
WHZ (Wasting)																		
Normal	27	22	17	19	26	26	26	18	14	17	25	15	53	40	31	36	51	
Moderate	1	1	1	0	2	0	0	0	0	2	3	3	1	1	1	2	5	
Severe	1	0	0	0	0	1	3	0	1	2	2	2	4	0	2	1	2	
HAZ(Stunting)																		
Normal	29	24	13	17	20	21	23	15	11	18	24	15	52	39	24	35	44	
Moderate	0	0	1	2	5	3	4	1	3	1	3	3	4	1	4	3	8	
Severe	0	0	4	0	3	3	3	2	1	2	3	2	3	2	5	2	6	

After the education intervention on appropriate childcare practices, there was a modest increase in the nutritional status of children in both districts. Among the changes which were observed during the study period were:

- i) Frequency of feeding of the children, increased from 3 to an average of 4 meals per day;
- ii) Mothers started to devote more time for the care of their children and teaching them different skills. Sanitary practices such as bathing the children was done properly by both father and mother;
- iii) Mothers started to share the knowledge about exclusive breastfeeding and importance of antenatal clinic;
- iv) Cleanness of the places used by children to play was improved. Cleanliness of the kitchen and food handling areas was also improved.
- v) Mothers also increase the frequency of breast feeding to an average of 10 times during daytime and as per demand feeding during the night.

4.8 Mother/Childcare Practices that are Predictors of the Children's Nutritional Status

Table 12 summarizes the care practices that positively correlated with the nutritional status of children. Marital status of the mother, family size, sex, age, source of income and financial support, education of the mothers, exclusive breastfeeding, number of meals per day, sickness of the child two weeks prior to the survey, distance from health facilities, the age at first birth and availability of a trained attendant (health professional) when the child was ill or the mother was delivering were strong predictors of good/bad nutritional status of the child. Other factors such as the amount of money spent on a family, time at which the mother starts breastfeeding after delivery, if the child was still breastfeeding, type of prelacteal foods given, place of treatment, attending growth monitoring, immunization, cleanness of the environment, water treatment and source of water had no direct association with the child's nutritional status. They cannot therefore be used to predict the nutritional status of the child.

Table 12: Association between various childcare practices and nutritional status

Characteristics	Association
Mothers marital status	s
Amount of money spent on a child	ns
Amount of money spent for the family	ns
Number of people in the household	s
Sex of the index child	s
Age of the index child	s
Source of income and financial support	s
Education of the mother	s
Time at which the mother starts breastfeeding	ns
Exclusive breastfeeding	s
Number of meals per day	s
If the child is still breastfeeding	ns
Type of prelacteal food	ns
Sickness of the child in two weeks prior the study	s
Distance from health facilities	s
Place of treatment	ns
The age at first birth	s
Attendance to growth monitoring	ns
Immunization	ns
Help from the health professional	s
Cleanness of the environment	ns
Water treatment	ns
Who fetched water for the household use	ns
Is drinking water covered	ns
Source of water	ns

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study assessed the effect of childcare practices on the nutritional status of children aged 6-24 months in Morogoro Urban and Kilosa districts. Results of the study showed that, socio-economic characteristics namely marital status, family size, education of the mothers, source of income, sex and age of the child had positive effect on the nutritional status of the children. The amount of money spent for family food did not show any association with the nutritional status of the children.

Child feeding practices were generally poor as compared to UNICEF/WHO guidelines. On average mothers breastfed for 18 months, Mothers complemented their children with other foods besides breast milk as early as 0-3 months of age (average 3 months). Reasons for early complementation were children cried frequently and mothers did not have enough milk. Frequency of feeding of the children was lower (3 times a day) than the recommended 5 times a day.

Household care resources did not appear to influence children's nutritional status whereas maternal employment and education constrained good childcare practices. Alternative caretakers took more important role in feeding practice and caring for the children as mothers got involved in economic activities. During the study, it was observed that, in Kilosa district fathers participated well in taking the children to hospital when they were sick.

The general cleanliness of the environment and that of the babies as well as their mothers/caretakers was generally poor. Although the hygienic practices did not significantly affect the nutritional status of the children, however there were hygiene related indicators such as diseases e.g. diarrhoea that were positively associated with nutritional status.

Mothers started antenatal clinic late (at the fourth month and above) and missed the initial evaluation that was essential for the gestation. The study also observed that majority of mothers delivered their children in a hospital and were assisted by trained personnel. In addition, there was high (81.6%) immunization coverage in both districts.

Poor nutritional status was more prevalent among children aged 19-24 months. Prevalence of stunting and underweight was lower in Morogoro Urban than in Kilosa districts. However, Morogoro Urban district had higher prevalence rate of wasted children compared to Kilosa district. It was also noted in the study that, education intervention improved the childcare practices and the nutritional status of the children.

5.2 Recommendations

It was observed that in the study that, in Kilosa district fathers participated well in taking the children to hospital when they were sick. Hence childcare interventions should not focus exclusively on women; rather should encourage the involvement of fathers in childcare practices. Mothers should be educated and encouraged to start the antenatal clinic very early (1st months) and whenever possible, they should start the

clinic before conception. This will help in advising them appropriate care practices during gestation e.g. appropriate weight gain based on pre- conception BMI.

The existing nutrition education programme should be intensified, paying special attention on the importance of caring practices for children aged 0-5 years. When conducting nutrition training, it should involve both fathers and mothers since this would help in emphasizing the aspect of nutrition at the household level.

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APPENDIX

Questionnaire on child care practices and in Morogoro urban and Kilosa districts

A: Rapport

1. Household number
2. Ward name
3. Name of the interviewer.....
4. Date of survey (day, month, year)
5. Respondent nameSex, 1) male 2) female
6. Relation to household head; 1) husband 2) parents 3) relative
7. Marital status of head of the household.....1) married 3) single 3) separated/divorced 4) Widowed.

B: Socio-demographic information

Fill in provided space or circle if appropriate.

8. Record the following information for all the household members (see codes below).

S/No.	Name	Sex	Relation to HHH	Age	Marital status	Religion code	Education code	Occupation code
1.								
2.								
3.								
4.								
5.								

Education

1. Preschool child
2. Completed primary school
3. Not completed primary school
4. Attending secondary school
5. Attending secondary school
6. Completed secondary school
7. Not completed secondary school
8. Attending "A" secondary school
9. Completed "A" secondary school
10. Not completed "A" secondary school
11. Adult/informal education

Religion

1. Christian
2. Muslim
3. Other (specify)

Relation to HHH

1. HHH
2. Wife
3. Son
4. Daughter
5. Other (specify)

Occupation

1. Preschool
2. Student child
3. Casual labourer
4. Housewife
5. Business/self employed
6. Housework and farming
7. Salaries employed
8. Other (specify)

Marital status

1. Single
2. Married

Sex

1. Male
2. Female

3. Widowed
4. Separated/divorced
5. Cohabitate

C: Socio-economic information

9. What is the type of roofing for the main house?
 1. Crass thatched
 2. Makuti
 3. Corrugated iron sheets
 4. Other (specify)
10. Record the type of floor of main house
 1. Mud/soil
 2. Cement
 2. Wooden
 4. Other
11. What are the sources of your income? (Circle the stated sources)
 1. Employment
 5. Casual labour
 2. Livestock farming
 6. Aid from relatives
 3. Crop farming
 7. Farming crops and livestock (mixed farming)
 4. Business
 8. Others (specify).
 - ...
12. How much do you spend for child's food per week? (Tshs).....
13. How much do you spend for household's food? (Tshs).....

D: Maternal information

14. What financial support that further provides?
 1. Nothing
 4. Father absent/No father
 2. Partial
 5. Don't know
 3. Everything
 - 6.No answer
 7. Other (specify)
15. Location were the mother works.....
 1. Home
 3. Home and away from home
 2. away from home
 - 4.Other.....
16. How many hours does the mother work per day.....
17. How many hours does the mother spend with the child
18. What arrangement does the mother take for the care of the young child when she is away from the child?
 1. At home with working mother
 2. Bring with mother to work elsewhere
 3. Leave with caregiver > 13 years
 4. Leave with child caregiver under thirteen years
19. What was your age when you gave birth to your first child?

.....

- 20. Who assisted you the time of giving birth?
1. TBA 2. Trained person 3. Untrained person 4. Others (specify)
.....
- 21. Age different (months) between the index child and the older one
.....
- 22. Age different (months) between the index and the younger one
.....

