MATERNAL SOCIO-ECONOMIC AND CULTURAL INFLUENCE ON FEEDING PRACTICES AND NUTRITIONAL STATUS OF CHILDREN AGED 0-23 MONTHS: A CASE OF MUHEZA DISTRICT

BY

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ABSTRACT

Maternal socio-economic and cultural factors such as marital status, educational level, occupation and economic status may have some influence on feeding practices and hence nutritional status of children under two years of age. This study aimed at investigating maternal social, economic and cultural influences on feeding practices and nutritional status of under two years of age children in Muheza district of Tanga region; using a cross-sectional survey design. A questionnaire was used to collect socio-economic and feeding practices data; focus group discussions were conducted to collect cultural data. Nutritional status assessment was done using summary indices of nutritional status: weight-for-age, height-for-age and weight-for-height. Descriptive and inferential statistics were performed for all variables using Statistical Package for Social Science (SPSS). Anthropometric data was analyzed using Nutrisurvey for SMART software and was later on transported to SPSS for further analysis. More than half of mothers (77.6%) fed their babies colostrum. Nearly half (49%) of the mothers initiated breastfeeding within one hour, and only 19.1% infants were exclusively breastfed. Mothers' educational level and monthly income came out to be significant risk factors for improper initiation of breastfeeding ($P<0.05$). Exclusive breastfeeding was highly associated with educational level of the mothers ($P<0.05$) rather than any other socio-economic variables. The introduction of complementary foods was found to be influenced by marital status ($P<0.05$) and monthly income of the mother ($P<0.01$). Among all under two years of age children surveyed, 11.2% were underweight, 37.5% were stunted, and 6.6% were wasted. There was a significant relationship between feeding practices of under two years of age children and maternal socio-economic and

cultural practices. The study revealed that under-nutrition of the under two children was an important public problem in the area. Family members especially mothers need to be provided with knowledge and skills on child feeding practices so that they could adopt correct feeding practices to overcome the possible consequences of malnutrition.

DECLARATION

I, EMMA V. KILIMALI, declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work and this work has not been previously submitted for a degree award at any university.

12/10/2010

Emma Vincent Kilimali **Date**

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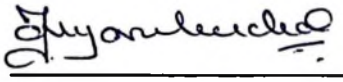
The above declaration is confirmed



19/10/2010

Prof. Nyaruhucha C.N.M **Date**

(Supervisor)

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DEDICATION

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LIST OF ABBREVIATIONS AND SYMBOLS

FAO	-	Food and Agriculture Organization
LAZ	-	Length-for-age index
NBS	-	National Bureau of Statistics
PAHO	-	Pan American Health Organization
RAWG	-	Research and Analysis Working Group.
SD	-	Standard deviation
UNICEF	-	United Nations Children's Fund
URT	-	United Republic of Tanzania
USAID	-	Unites States Agency for International Development
WAZ	-	Weight-for-age index
WLZ	-	Weight-for-length index
WHO	-	World Health Organization
%	-	Percentage

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Breastfeeding and appropriate complementary feeding practices significantly improve child survival by protecting them against diarrhoeal diseases, pneumonia and other potentially fatal infections, while also enhancing quality of life through its nutritional, psychosocial and other benefits (Thairu *et al.*, 2005). To ensure healthy growth and development of infants, exclusive breastfeeding for the first 6 months of life is recommended by the World Health Organization (WHO) (Kramer and Kakuma, 2002). However, proper nutrition of children leading to adequate growth and good health is the essential foundation of human development (Kumar *et al.*, 2006).

Infant feeding and breastfeeding in particular is often best understood as a biocultural phenomena, that is influenced and determined by both biological and cultural factors, so that rather than look for one universal human strategy, the best method may be contingent on local and household environment, cultural customs and beliefs and the particular situation of mother and child (WHO, 2004).

Colostrum is traditionally perceived as dirty and unwholesome in many African societies; however, most mothers with lower education are the ones that still believe that colostrum should not be fed to infants (Ergenekon-Ozelci *et al.*, 2006). The start of breastfeeding is also strongly influenced by the level of education of the mother

(Awumbila, 2003). Introduction of complementary foods is significantly associated with average income of the mother (Anderson *et al.*, 2002).

Child nutrition including initiation, intensity, and duration of breastfeeding and use of complementary foods directly affects health status. Inadequate or inappropriate feeding leads to malnutrition and child morbidity and mortality (NBS, 2005). Malnutrition has serious long-term consequences for the child and adversely influences their development. Most common nutritional problems are protein-energy-under nutrition (PEM), iron deficiency anaemia (IDA), iodine deficiency disorders (IDD) and vitamin A deficiency (VAD) (ACC/SCN, 2000). Recent studies have recognized the link between malnutrition and child feeding practices (Sethi and Kashyap, 2003; Brennan *et al.*, 2004).

Maternal socio-economic and cultural factors such as ethnic origin, age, marital status, educational level, occupation and economic status have great influence on feeding practices and hence nutritional status of infants and young children (Kumar *et al.*, 2006).

1.2 Problem Statement

Nutrition has a great impact on child's life and feeding practices have direct impact on the nutritional status and wellbeing of a child. However, mothers base their child feeding decisions on an array of factors, including their experiences, family demands, socio-economic circumstances, and cultural beliefs. Poor breastfeeding and complementary feeding practices, coupled with high rates of infectious diseases,

are the principal causes of malnutrition in the first two years of life. A number of studies have related the inadequate feeding practices to poor socio-economic status, food insecurity and inadequate health facilities (Kumar *et al.*, 2006; Nyaruhucha *et al.*, 2006). Cultural practices are known to impact on the feeding behaviors and habits of the people but less has been documented about their influence on feeding practices of infants and young child and ultimately their nutritional status.

The demographic health survey conducted in 2004/05 found that exclusive breastfeeding for the first six months is not widely practiced. Data show that only 41 percent of infants below 6 months of age are exclusively breastfed. Seventy percent of infants below 2 months receive breast milk only, compared with just 14 percent of infants 4-5 months of age (figure 1.1). Complementary feeding should start at the appropriate age which is 6 months, however in Tanzania it starts early. Seven percent of children below 2 months, 32 percent of children 2-3 months, and 58 percent of children 4-5 months are given complementary foods (NBS, 2005).

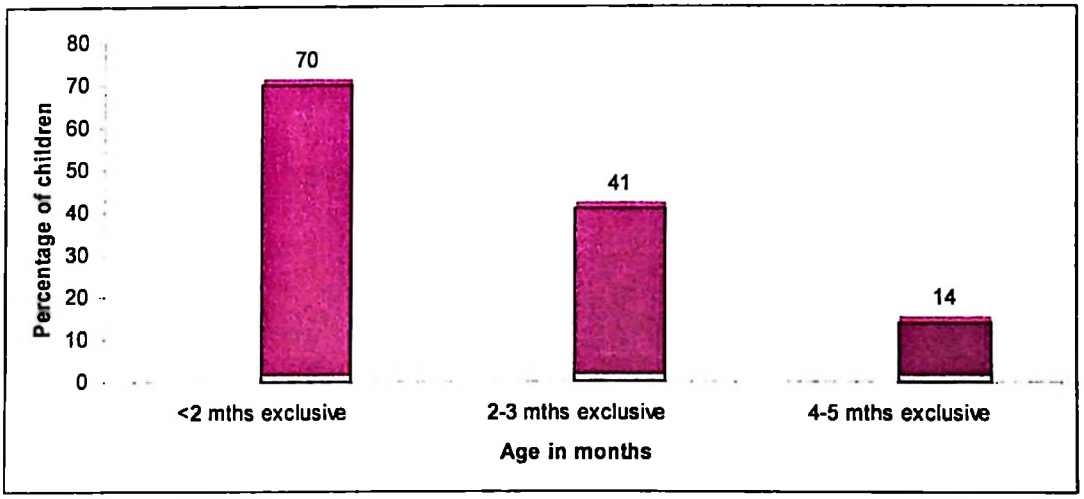

Figure 1: Exclusive breastfeeding by age category 2004/05

In Tanga region, 55.5 percent of mothers initiate breastfeeding within one hour of birth, and 78.4 percent initiate breastfeeding within one day of birth, while 67 percent of children received prelacteal feeds (NBS, 2005). This situation might be attributed to the strong sociocultural practices and economic constraints in the rural areas.

1.3 Justification of the Study

A lot of efforts have been done to promote exclusive breastfeeding; but very little success has been achieved. Feeding and care practices are often directly related to sociocultural and economic factors in the community and to various dynamics prevailing at the household level. The very important factor among all is the sociocultural factors most especially ethnoparenting, attitudes, beliefs, norms and customs of the parents. Information on the feeding practices of infants and young children in Tanzania is scanty, except for some research attempts (Sellen, 1998; Shirima *et al.*, 2000).

In Tanzania, there is variation in feeding practices of children attributed to culture and socio-economic status. However, the extent and the interplay between these dimensions are not well known particularly for Muheza district, therefore, this study intends to contribute to this knowledge using three wards of Muheza District (Tanzania) as a case study. The study investigated maternal socio-economic and cultural influences on feeding practices and nutritional status of infants and young children (0-23 months). Findings will help in designing strategic interventions for improved growth and development of infants and young children in the study area.

1.4 Objectives

1.4.1 General objective

The main objective of this study was to investigate maternal social, economic and cultural influences on feeding practices and nutritional status of under two children in Muheza district of Tanga region.

1.4.2 Specific objectives

i. To identify mothers' cultural practices related to feeding practices of children under two years of age.

ii. To assess dietary intake of infants and young children.

iii. To assess nutritional status of children aged 0-23 months.

iv. To determine maternal socio-economic status and their effect on feeding practices and nutritional status of children under two years.

CHAPTER TWO

2.0 LITERATURE REVIEW

Overview

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential (Martorell *et al.*, 1994). Infant-feeding practices constitute a major component of child caring practices apart from socio-cultural, economic and demographic factors. Somehow, these practices constitute one of the most neglected determinants of young child malnutrition in spite of their important role in growth pattern of children. Recent studies have recognized the link between malnutrition and child feeding practices (Kapur *et al.*, 2005). Socio-economic and cultural practices are known to impact on the feeding behaviors and habits of the people as well as nutritional status (Kumar *et al.*, 2006).

2.1 Infant Feeding Practices

2.1.1 Colostrum and prelacteal feeds

Colostrum is the yellowish or straw-colored fluid produced by the breasts for the first few days after the birth of the baby. Colostrum is highly nutritious and rich in anti-infective properties, it is an important source of nutrition and antibody protection for the newborn, and should be fed to the newborn while awaiting the production of regular breast milk (Mukuria *et al.*, 2006).

Colostrum feeding has been found to decrease infant morbidity especially in developing countries by reducing the risk of diseases and infections such as diarrhea, gastroenteritis, respiratory and other infections (Huffman and Combest,

1990). Despite its great importance for the infants, many women in Tabora Tanzania usually think it is bad because it had stayed inside the body for long time and looks yellow, therefore can harm the baby, provoke diarrhea, vomiting or abdominal pain and hence discard it (Agnarsson *et al.*, 2001).

In Ghana, the practice of discarding colostrum was higher in the rural area (40%) than in the urban area (14%), probably indicating the influence of health education and public health interventions and urbanisation on child feeding practices. The main reasons given for discarding colostrum were: it is "dirty" and can cause baby to contract disease, it contains blood or pus and is therefore not good for babies, it causes abdominal pains, diarrhoea and other digestive problems, it is bad blood, which has stayed in the breast for nine months of pregnancy (Awumbila, 2003).

In Tanzania, a high proportion of babies were reported to have been fed colostrum. This was 100% in Dodoma and 99% in Dar-es-Salaam (Mabila, 2003). A substantial proportion of the mothers in Igunga (46%) and Mbulu (34%) were reported to discard colostrum (Agnasson *et al*, 2001). Mothers from urban areas of Morogoro were less likely to discard colostrum compared to mothers from rural areas (Shirima *et al.*, 2001).

Prelacteal feeding is the act of feeding anything other than breast milk before breast milk is regularly given. In Tanzania, the practice of giving prelacteal feeds is discouraged because it limits the frequency of suckling by the infant and exposes the baby to the risk of infection. It has been reported that 35% of infants are given

prelacteal feeds. Prelacteal feeding is more common in rural areas (37 percent) than urban areas (29 percent), and it also varies by region (NBS, 2005). In Tabora, it was reported that 25% of infants were given prelacteal foods in small amounts by cup or spoon, some times during the first three days of life (Agnarsson *et al.*, 2001).

2.1.2 Breastfeeding

Breastfeeding is of great importance including reduction in dietary antigens and pathogens, which are assumed to provoke an inflammatory response or alters the infant's gut integrity; the promotion of beneficial intestinal microflora by breast milk, which may increase resistance to infection; possible modulation of antimicrobial, anti-inflammatory and immuno-modulating properties of breast milk; and the role of exclusive breastfeeding in maintaining breast health in the mother, thus reducing viral load in breast milk (Rollins *et al.*, 2001). Despite its advantages, however, breast-feeding is declining in developing countries, such as Swaziland (Robertson, 1991). In recent decades the number of young mothers wishing to breastfeed has declined all over the world. The low prevalence and short duration of breastfeeding remains a public concern globally (Sarah and Diana, 2004)

2.1.2.1 Initiation of breastfeeding

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. Initiation of breastfeeding in the first hour and first 24 hours after birth both vary by background characteristics. In a cohort

study from the west of China the breastfeeding rate on discharge was 92% (Xu *et al.*, 2007). This shows high rate of initiation of breastfeeding.

A study done in Vietnam found that 98.3% of the respondents had initiated breast-feeding, with 73.6% of the mothers initiating within the first hour. Colostrum or breast milk was fed to 85.6% of babies as the first meal while the remaining 14.4% were given a fluid other than breast milk (Doung *et al.*, 2004). However, in Tanzania the differences for breastfeeding within the first hour are much greater. Babies of mothers assisted at delivery by health professionals are more likely to initiate breastfeeding within one hour after birth (66 percent) than those whose mothers were assisted by a traditional birth attendant, other attendant, or no one (55 percent and lower) (NBS, 2005).

2.1.2.2 Exclusive breastfeeding

Exclusive breastfeeding is defined as the use of breast milk as the only source of food, to the total exclusion of other supplementary foods such as formulas, water, juices or teas (Labbok and Krasovec, 1990). Several studies have shown that exclusive breastfeeding for the first six months is beneficial to both infant and mother and enhances child health and survival (Dewey *et al.*, 1993). Exclusive breastfeeding significantly improves child survival by protecting against diarrhoeal diseases, pneumonia and other potentially fatal infections, while also enhancing quality of life through its nutritional, psychosocial and other benefits (Thairu *et al.*, 2005).

It is recommended that children should be exclusively breastfed for the first 6 months of life. Early introduction of foods and other liquids reduces breast milk intake, decreases the full absorption of nutrients from breast milk, and increases the risk of diarrhea and acute respiratory infections for infants. It also limits the duration of the mother's postpartum amenorrhea and may result in shortened birth intervals (WHO, 2001a).

To ensure healthy growth and development of infants, exclusive breastfeeding for the first 6 months of life is recommended by the WHO (Kramer and Kakuma, 2002). The importance of hospital breastfeeding policy and attitudes of health personnel in affecting breastfeeding practices has been repeatedly documented (Weng *et al.*, 2003). Unfortunately, exclusive breastfeeding is not practiced universally. Global monitoring indicates that only 39% of infants are exclusively breastfed for less than 4 months following birth (WHO/UNICEF, 2003).

Studies show that many mothers practice breastfeeding but only a few do it exclusively (Doung *et al.*, 2004). Risk factors for not exclusively breastfeeding include having a caesarean section, the time at which the decision to breastfeed was made, the place of residence and whether a prelacteal feed was given (Qui *et al.*, 2009). In Tanzania, exclusive breastfeeding for the first six months is not widely practiced. The data show that only 41 percent of infants below 6 months of age are exclusively breastfed (NBS, 2005).

2.1.2.3 Continued breastfeeding

Continued breastfeeding is important for older infants and young children aged 6-23 months, contributing significantly to overall nutrient intake. For older infants (age 6-11 months), breast milk fills most of the energy needs and remains an important source of vitamin A and C, as well as essential fatty acids. Even for young children 12-23 months of age, breast milk can provide as much as 35-40 percent of their total energy needs. In Tanzania by 1999 the percentage of children who continued to breastfeed from 6-11 months are 96.5%, 2-17 months (89.1%), and 18-23 months (61.9%) (Mukuria *et al.*, 2006).

2.1.2.4 Complementary feeding

Children's daily nutritional requirements per unit of body weight are higher during the first two years of life, this period is crucial than any other time. After the period of exclusive breastfeeding, to meet their evolving nutritional requirements infants should receive, in addition to breast milk, a variety of locally available and safely prepared complementary foods rich in energy and micronutrients (WHO, 2004). It is well recognized that the period of complementary feeding, from 6 to 24 months of age, is one of the most critical times for preventing malnutrition (World Bank, 2005).

Appropriate complementary feeding is: timely – in the sense that foods are introduced when the need for energy and nutrients exceeds what can be provided through exclusive and frequent breastfeeding; adequate – meaning that foods provide sufficient energy, protein, and micronutrients to meet a growing child's

nutritional needs; safe – with regard to foods that are hygienically stored and prepared, and fed with clean hands using clean utensils and not bottles and teats; properly fed – with respect to foods given consistent with a child's signals of appetite and satiety, and that meal frequency and feeding method – actively encouraging the child to consume sufficient food using fingers, spoon or self-feeding – for appropriate age (WHO, 2001b).

There are 10 guiding principles for complementary feeding of the breastfed child (1) duration of exclusive breastfeeding and age of introduction of complementary foods; (2) maintenance of breastfeeding; (3) responsive feeding; (4) safe preparation and storage of complementary foods; (5) amount of complementary food needed; (6) food consistency; (7) meal frequency and energy density; (8) nutrient content of complementary foods; (9) use of vitamin-mineral supplements or fortified products for infant and mother; and (10) feeding during and after illness. The interventions described in this review generally included one or more components related to these guiding principles (PAHO/WHO, 2003).

In Tanzania, complementary feeding starts early. Seven percent of children below 2 months, 32 percent of children 2-3 months, and 58 percent of children 4-5 months are given complementary foods. Although many children receive complementary foods too early, others receive them too late (NBS, 2005). In Ghana food supplementation starts by the age of two months with porridge *(koko)* made from fermented millet or corn dough with little or no sugar. The consistency of the porridge is initially light and often diluted with water, but made thicker as the child

grows older. By age four months, 40% of children in the sample were breastfeeding and having some form of supplementation. Semi-solid foods such as thicker porridge and soups are introduced from 4 months (Awumbila, 2003).

A study in United Kingdom found that solids were introduced before 4 months by 36% of all mothers; this was lowest in England, and more common among mothers who had never breast-fed (43%), or who discontinued breast-feeding before 4 months (39%), than among those who had ever breast-fed (31%), or breast-fed for at least 4 months (25%).These early weaning practices were strongly associated with maternal ethnic group, with most nonwhite mothers being less likely to stop breast-feeding early or to introduce solids early than their white counterparts (Griffiths, 2007).

Another study done in Nigeria found that some children received complementary foods before 4 months (23.0%), 27% at 4 months (27%), 3.5% at 5 months and majority (33.5%) received at 6 months. Others (13.0%) went beyond recommendations to introduce complementary foods after 6 months (Ogunba, 2006). This shows that many children in different societies are weaned at the inappropriate time.

2.1.3 Care-giving

Care has been defined (FAO/WHO, 1992) as the provision of household and community resources in the form of time, attention, love, support and skills to meet the physical, mental, and social needs of nutritionally vulnerable groups. This is

especially true for very young children who are dependent on others for feeding although children up to the age of six years are considered to require special feeding care (Latham, 1995). Care-related behaviors could have an impact on nutrition and health. These behaviors ultimately determine whether or not a child has access to the food and health care necessary for good health and nutrition status (Ramakrishnan, 1995).

Improving complementary feeding requires attention to foods as well as to feeding behavior of caregivers. Infants and young children need assistance that is appropriate for their age and developmental needs to ensure that they consume adequate amounts of complementary food. This is called responsive feeding. Critical dimensions of responsive feeding includes, feeding with a balance between giving assistance and encouraging self-feeding, as appropriate to the child's level of development; feeding with positive verbal encouragement, without verbal or physical coercion; feeding with age-appropriate and culturally appropriate eating utensils; feeding in response to early hunger cues; feeding in a protected and comfortable environment; feeding by an individual with whom the child has a positive emotional relationship and who is aware of and sensitive to the individual child's characteristics, including changes in physical and emotional state (WHO, 2001b).

If a child lives in an area with poor sanitation there is a greater risk of post-measles diarrhea and if the housing is poor there is a greater risk of post-measles pneumonia. Breastfeeding is doubly advantageous, it not only reduces the incidence of infection,

but because intake is maintained and breast milk is easily absorbed, and it reduces the impact of infection on nutritional status. Whereas breast milk is protective, alternative infant feeding methods increase the risk of infection, mainly because contamination leads to the increased intake of pathogenic organisms. Poor hygiene, particularly with bottle-feeding, is a major cause of childhood gastro-enteritis and diarrhea. Infant formula and cows' milk may act as good vehicles and culture media for pathogenic organisms if hygiene measures are not considered (FAO/WHO, 1992).

2.2 Factors Influencing Feeding Practices of Under two Years of Age Children.

2.2.1 Socio-economic factors

Social factors and cultural practices in most countries have a very great influence on what people eat, on how they prepare food, on their feeding practices and foods they prefer. USAID (1998) noted that mother's education was related to knowledge of good childcare practices, such as appropriate meals to be given to the infants, diseases and treatment required all of which can affect the nutritional outcome of the child. Age of the mother may influence the nutritional status of a child in various ways. A young mother who is having a baby for the first time may experience breast-feeding difficulties, which may result into underfeeding of her child. Also, different socio-economic factors related to the age of the mother and her experience in raising children may affect child nutrition and health conditions. Socio-demographic factors are important determinants of breastfeeding (Rogers *et al.*, 1997; Yngve *et al.*, 2001). Evidence particularly from the developing world

indicates that exclusive breastfeeding is rare and early supplementation with water, teas or juices or other fluids is the norm (Semega-Janneh *et al.*, 2001).

2.2.1.1 Maternal education

Mothers generally have a positive attitude towards breastfeeding, but colostrum is usually perceived negatively. In general, having more formal education may help parents understand the health benefits of breastfeeding, and may increase the likelihood of parents to search out information about health practices (Heck *et al* ., 2006). In a study done in Turkey, it was found that, no woman breastfed her infant exclusively. Only 9.9% of mothers initiated breastfeeding within the first hour of birth. Forty per cent of mothers started solid foods before 4 months. Mother's education appeared as a significant factor influencing the introduction of colostrum to the newborn. Mothers with lower education generally believed that the colostrum should not be fed to the infant and that a pregnant woman's milk is unhealthy for the baby. There was also a belief that 'working under the sun' decreased the quality of milk of a mother (Ergenekon-Ozelci *et al.*, 2006). From a study done in Norway, the proportion of mothers with low education was higher among mothers who breast fed for less than three months (64%) than among mothers who breast fed for at least six months (34%) (Angelsen *et al.*, 2001).

2.2.1.2 Maternal age

Breastfeeding rates are lowest for women under the age of 20 years and the initiation of breastfeeding and duration are higher for women older than 25 years (Lawrence *et al.*, 2003). From a study done in the pastoral communities of Tanzania, children of

the younger mothers were more likely to be undernourished than those of older mothers. Half of the children of the mothers who were under 20 years of age were either severely or moderately undernourished compared to less than 20% of either the 20 – 35 or 36– 50 years age groups (Nyaruhucha *et al.*, 2006). Maternal age also may affect breastfeeding as it has been observed that breastfeeding rates increased significantly with increasing maternal age overall and for all race-ethnicity groups. The breastfeeding rates of mothers who were under 20 years of age (43%) were lower compared with mothers who were 30 years and older (75%) or 20-29 years of age 65% (McDowell *et al.*, 2008).

2.2.1.3 Maternal employment/income

Maternal income has been shown to affect breastfeeding in opposite directions, perhaps since maternal income is associated with employment, which may detract from breastfeeding (Roe *et al.*, 1999). In general, income may influence breastfeeding by being a marker of knowledge and attitudes and because women of higher income may be better able to afford feeding supplies. Maternal employment has been shown to decrease breastfeeding; however, in Australia, paternal employment has been positively associated with breastfeeding (Scott *et al.*, 2001). Employment may be an obstacle because of time away from the baby; however, employment may also decrease breastfeeding because women in lower-status occupations may have more obstacles to expressing breast milk at work, or because women with hazardous occupations might be concerned their exposures might affect breast milk (Roe *et al.*, 1999).

2.2.2 Cultural factors

Belief about appropriate time of initiation of complementary foods varies across culture. Nonetheless, cultural food practices are very rarely the main, or even an important, cause of malnutrition. It is true, however, that some traditional food practices and taboos in some societies may contribute to nutritional deficiencies among particular groups of the population (FAO/WHO, 1992).

According to the cohort study in China, Chinese friends or relations of postpartum women would visit the mother and they bring gifts which could be consumed or worn by the new baby as their culture. Recently, infant formula has become the most popular gift for new mothers, which made these women not to practice exclusive breastfeeding (Qiu *et al.*, 2009). A study in Ghana observed the existence of cultural beliefs which encourage breastfeeding for a long duration, but also the early introduction of prelacteal feeds and food supplementation before six months, which inhibits the practice of exclusive breastfeeding. For example, the cultural / traditional value systems attached to the administration of water to new born babies as a sign of welcome was deeply rooted. Specifically, the custom that every visitor including the newborn must be welcomed into the family with water, otherwise the "visitor," in this case the newborn will "return" to where it came from (Awumbila, 2003).

2.3 Assessment of Nutritional Status

Nutritional assessment systems utilize a variety of methods to characterize each stage in the development of a nutritional deficiency state. The methods are based on a series of dietary, laboratory, anthropometric and clinical measurements.

2.3.1 Dietary assessment methods

The first stage of a nutritional deficiency is identified by dietary assessment methods. During this stage, the dietary intake of one or more of the nutrient is inadequate, either because of primary deficiency (low levels in the diet) or because of the secondary deficiency

2.3.2 Anthropometric methods

Anthropometry is one of the methods that can be used to assess and predict performance, health and survival of an individual as well as economic and social well being of populations. Three indices are used in assessing the nutritional status of the children such as weight-for-age, height-for-age, and weight-for height. Weight-for-age index identifies the condition of being underweight for a specific age, usually reflects both acute and chronic under nutrition. Height-for-age is an index that reflects past under nutrition or chronic malnutrition. Weight-for-height index helps to identify children who suffer from acute or current under nutrition or wasting. The indices are used to identify three nutritional conditions; underweight, stunting and wasting (Cogill, 2001).

CHAPTER THREE

3.0 MATERIALS AND METHODS

Overview

This chapter presents the materials and the methods that have been used for the study. It includes description of the study area and study population, study design, sampling procedure, sample size, data collection and data processing and analysis.

3.1 Description of Study Area and Study Population

This study was conducted in December 2008 in Muheza District, Northeastern Tanzania. The district lies west and south of Tanga City and is bordered by Mkinga district to the north, Pangani in the south and Korogwe district in the west. It is one of the eight districts of Tanga Region covering a total area of 1,974 square kilometres and an estimated population of 184,585. The district is topographically divided into highland and lowland zones and administratively divided into 4 divisions comprising 23 wards and 100 villages. According to the census population of 2002 (NBS, 2004) there was an estimated annual population growth rate of 1.48%. Major ethnic groups in the district include the Sambaa people (in the highlands) and Bondei people (in the lowlands).

The climate ranges from hot and humid in the coastal plains to temperate in the mountains. December to March is usually hot with temperatures around 30°C. The May to October temperatures fall to about 24°C to 28°C. Agriculture is the engine of Muheza's economy and main livelihood, employing almost 81.6% of the district's economically active population. The district has about 167,800 hectares of arable

land of which 117,500 hectares or 70% has been cultivated. The fertile soils and good rainfall allow a variety of crops to be grown. Bananas, paddy, cassava and maize are the main food crops but are also sold. The major cash crops include sisal, tea, rubber, cashew nuts, coconuts, and oranges. Several spices and cocoa are also grown; most are exported (URT, 2002; RAWG, 2005).

3.2 Study Design

A cross- sectional design was used in this study. The design allows data collection at a single point in time. It consisted of asking questions to 152 representative mothers and taking measurements useful for descriptive purpose (Babbie, 1990). The research approach and design was inductive which judges from specific individuals to give out the general observation of the socio-economic and cultural factors affecting feeding practices and nutritional status of children under two years.

3.3 Sampling Procedure

The subjects included were mothers with children less than two years of age. Multistage cluster sampling was applied, whereby there were several stages of random sampling. Two out of four divisions of Muheza district were randomly selected in the first stage, one division from the highland and the other from the lowland. From the two divisions, three wards and six villages were randomly chosen. Mothers were randomly sampled in different categories of age, i.e. below 20, 21-35, 36 years and above.

3.4 Sample Size

The sample size was obtained as determined by Fischer *et al.* (1991) formula. Rate of exclusive breast feeding of Tanzania was used for the calculation which is 41%. The attrition rate of 10% was allowed for this study. Absolute sampling error of 5% and confidence interval of 95% was used to obtain the sample size of 152 mother-child pair.

$N = t^2 (pq)/d^2$

Where by:

N = Desired sample size,

t = Standard normal deviate, set at 1.96 corresponding to the 95% confidence interval,

p =Proportion in the target population estimated to have particular characteristics,

q = 1- p (expected non-prevalence)

d = Degree of accuracy set at 0.05.

Inclusion criteria

- Mother should agree to participate to the study
- A mother with a child between the age of 0-23 months at the time of conducting the study

3.5 Data Collection

3.5.1 Household survey

A validated questionnaire was used to collect data. The questionnaire was designed and piloted to a different setting. It covered issues of feeding practices like prelacteal

feeds, colostrum, initiation of breastfeeding, exclusive breast feeding, breastfeeding myths, childcare practices, economic, and ethnic origin of the mother. The questionnaire survey was conducted by the researcher using the local language and Kiswahili, to increase understanding and accuracy of response (Appendix 1).

3.5.2 Anthropometric measurements

The children's anthropometric measurements (weight and length) were taken. Children were weighed without clothes, using a Seca electronic balance (SECA Vogel and hakel, Hamburg Germany) to the nearest 0.1 kg. Length board was used to measure height and recorded to the nearest 0.1 cm. The weight and height measurements were converted into three indices of nutritional status: weight-for-age, height-for-age and weight-for-height. According to WHO criterion based on standard deviation (SD) units termed as Z-scores, children who were more than two standard deviations below the reference median on the basis of weight-for-age, height- for-age and weight-for-height indices were considered respectively to be underweight, stunted and wasted (Cogill, 2001)

3.5.3 Dietary assessment methods

Dietary intake was assessed using food frequency questionnaire. A questionnaire was constructed consisting of different meals that are available in the study area. Mothers were asked on what foods they fed their children in a period of one week, this had the aim of capturing habitual intake of foods. Mothers were asked to agree with the frequency of feeding their children with particular foods in a week (Appendix 2).

3.5.4 Focus group discussions

One focus group discussion in each village was conducted with 5-6 women among groups homogeneous in terms of age, education, socio-economic status and occupation. Participants in the group discussions were recruited with the assistance of community leaders. Included were: mothers aged (21-34 years), respected and influential older women who are considered knowledgeable in the community (grandmothers); and traditional birth attendants. The focus group discussions covered the same topics that were covered in the interview (Appendix 3).

3.6 Data Processing and Analysis

Data from questionnaire was coded, entered and analyzed using the Statistical Package for Social Sciences (SPSS) for Windows (Norusis/SPSS Inc, 2003). Descriptive and inferential statistics such as frequency and cumulative frequency tables were performed for all variables. Comparison of the variables was done to establish factors that are important in influencing feeding practices and nutritional status of infants and young children. Chi-square test for testing the association between different attributes was used. Anthropometric data was processed and analyzed using a computerized Nutrisurvey for SMART software (Erhardt and Golden, 2007) to obtain Z-scores and interpreted according to the WHO cut off points, (WHO, 2005).

CHAPTER FOUR

4.0 RESULTS

Overview

This chapter presents the results of the study on the influence of maternal social, economic status and cultural believes on feeding practices and nutritional status of children under two years of age in Muheza district of Tanga region. The results are grouped under the following sub-sections: maternal social and demographic characteristics, maternal socio-economic characteristics, cultural believes on child feeding, child feeding practices, association between socio-economic factors and feeding practices, nutritional status of the children and association between maternal socio-economic status and the nutritional status of the children.

4.1 Social Demographic Characteristics

A total of 152 mothers with children less than two years of age were interviewed to investigate maternal social, economic and cultural influences on feeding practices and nutritional status of children under two years of age in Muheza district. The majority of the mothers belonged to the Bondei ethnic group (38.2%) followed by the Sambaa 31.6%. Most of the respondents were married (74.3%) followed by single mothers (19.1%). Out of 152 mothers 69.7% had primary school education, only 9.9 % had secondary education and the rest did not go to school. Farming was the main economic activity practiced by most of the respondents (61.8%) and 23% were housewives and the rest employed and business women. The number of household members was categorized in which households with 3 – 5 members were 48.0% as shown in Table 1.

Table 1: Socio-demographic characteristics

Variable	Number	Percent (%)
Ethnic group		
Sambaa	48	31.6
Bondei	58	38.2
Digo	10	6.6
Zigua	9	5.9
Others	27	17.8
Marital status		
Single	29	19.1
Married	113	74.3
Divorced	8	5.3
Separated	2	1.3
Education level		
No formal education	31	20.4
Primary education	106	69.7
Secondary education	15	9.9
Occupation		
Farmer	94	61.8
Employed	14	9.2
Business woman	9	5.9
House wife	35	23.0
Number of household members		
3-5	73	48.0
6-8	68	44.7
more than 8	11	7.2

4.2 Socio-economic Characteristics

Table 2 illustrates the socio-economic factors of the respondents in which 41.4% did not know their average income per month and 25% had average income per month of TShs 91,000 or more. Majority of mothers (77.6%) spend less than TShs 20,000 to buy food for the babies per month and 19.7% mothers were still breastfeeding. More than 51% of respondents had houses built of mud for floors and walls and grass roofed.

Table 2: Socio-economic variables

Variable	Frequency	Percent
Average income per month (TShs)		
31,000 - 50,000	14	9.2
51,000 - 70,000	10	6.6
71,000 - 90,000	27	17.8
91,000 or more	38	25.0
Don't know	63	41.4
Money spend to buy food for the baby per month (TShs)		
Less than 20,000/=	118	77.6
20,000/=	4	2.6
More than 20,000/=	0	0
Still breastfeeding	30	19.7
Type of floor used for the house		
Mud	104	68.4
Concrete	48	31.6
Type of roof used for the house		
Grass	78	51.3
Corrugated iron sheets	74	48.7
Type of the wall used		
Mud	103	67.8
Cement	49	32.2

4.3 Cultural Practices Related to Feeding Practices of Children aged 0-23 Months

Mothers were asked if any of myths are practiced in their community and agree or disagree with a particular myth. More than half of the mothers (71.7%) said the first yellow milk is dirty and not good for the baby while 30.9% mothers said a baby with diarrhea should not be breastfed, as shown in Table 3.

Table 3: Myths practiced by the community

Statement	N	%
A breastfeeding mother has to drink lots of drinks		
Yes	64	42.1
No	88	57.9
A baby with diarrhea should not be breastfed		
Yes	47	30.9
No	105	69.1
A woman who becomes pregnant must not breastfeed		
Yes	135	88.8
No	17	11.2
Breastfeeding women can not take the birth control pills		
Yes	50	32.9
No	101	66.4
A breastfeeding baby needs extra water in hot weather		
Yes	50	32.9
No	102	67.1
The first yellow milk is dirty and not good for the baby		
Yes	109	71.7
No	43	28.3

Information obtained from focus group discussion verified most of the information obtained from the questionnaire. Older women said that it is not right for the child to be fed colostrum because the milk is dirty and not fit for human consumption and may lead to diarrhea. They also said that the baby must drink warm water mixed with salt and sugar when it is born because it is always thirsty and must be introduced to other foods apart from breast milk at the age of 3 months. They also said that when a lactating mother gets pregnant; even when the breastfed child is very young, must not continue breastfeeding because they believed that the breastfed child may die.

4.4 Feeding Practices

4.4.1 Colostrum feeding

The majority of mothers (77.6%) breast feed their children the first milk that is yellowish in color (colostrum) right after giving birth. The reasons given for breastfeeding or not breastfeeding the first yellowish milk are summarized below in Table 4. The majority said they were told by nurses to breastfeed and 20% said the milk is dirty and not fit for the baby.

Table 4: Reasons to breastfeed or not breastfeed colostrums

Reasons	N	%
I was told by nurses that it is good for the baby	70	46.1
The milk is dirty and not fit for the baby	31	20.4
Its good for the baby	25	16.4
The milk is nutritious, contains vitamins, good for immunity	9	5.9
The baby was crying	9	5.9
I was told by my mother to give it to the baby	5	3.3
There was no milk from my nipples	2	1.3
I was HIV positive	1	0.7
Total	**152**	**100**

4.4.2 Initiation of breastfeeding

Less than half of the respondents (49%) initiated breastfeeding within one hour after delivery, while the rest did not (Figure 2).

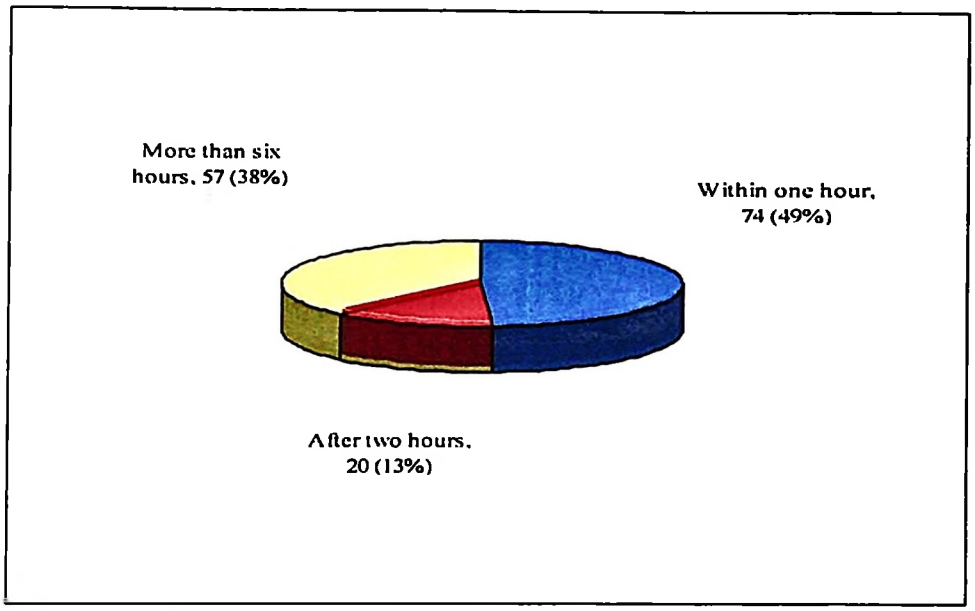

Figure 2: Initiation of breastfeeding (n = 151)

Table 5 shows the reasons given by mothers for delayed or early breastfeeding. The majority (48%) of respondents said the child was crying so decided to breastfeed. Other reasons given are also shown in the table.

Table 5: Reasons given by mothers for delayed or early breastfeeding

Reasons	N	%
The child was crying so I decided to breastfeed her	73	48.0
Advice from the health personnel	30	19.7
Mothers sickness	17	11.2
The baby slept after birth	13	8.6
Had to squeeze the dirty milk	9	5.9
Milk was not coming out	5	3.3
The baby refused breast milk at first	2	1.3
Delivered by Caesarean section	2	1.3
I am HIV positive	1	0.7
Total	**152**	**100**

4.4.3 Exclusive breastfeeding

Only 19.7% mothers breastfed their children exclusively and the rest did not. The reasons given by mothers for breastfeeding exclusively or not are given below in Table 6.

Table 6: Reasons for exclusive breastfeeding or not

Reasons	Frequency	Percen
Breast milk is not enough for the baby	48	31.6
The baby is still young	30	19.7
The baby is always thirst so I had to start giving him water	27	17.8
Breastfeeding exclusively for six months will make the baby refuse other foods during weaning	19	12.5
No enough time to breastfeed due to work	17	11.2
The baby is growing up so needs other foods	3	2
Was advised by my mother in-law to give porridge to the baby	7	4.6
I am HIV positive	1	0.6
Total	**152**	**100**

4.4.4 Frequency of breastfeeding children per day

Majority of mothers (38.8%) breastfed their children 6 – 10 times a day, while 3.9% mothers breastfed 5 times a day or less than that. Only 1.3% mothers breastfeed their children 21 times a day (Figure 3).

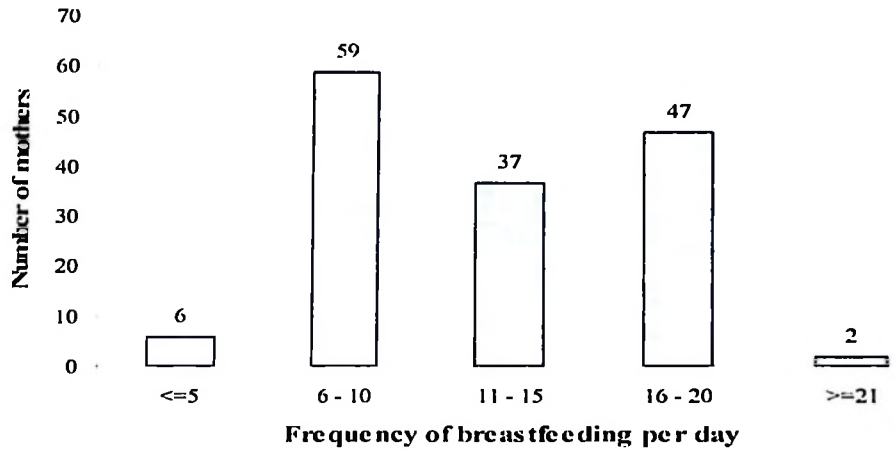

Figure 3: Frequency of breastfeeding per day

4.4.5 Introduction of complementary foods

Majority of mothers (80.3%) had given their children other foods/drinks apart from breast milk at the time of the study. The majority of mothers (42.8%) started feeding their children other foods/drinks apart from breast milk at the age of 3 months. Few mothers (2.6%) started giving their children other types of food apart from breast milk at the age of 1 day to 4 weeks, as shown in Figure 4.

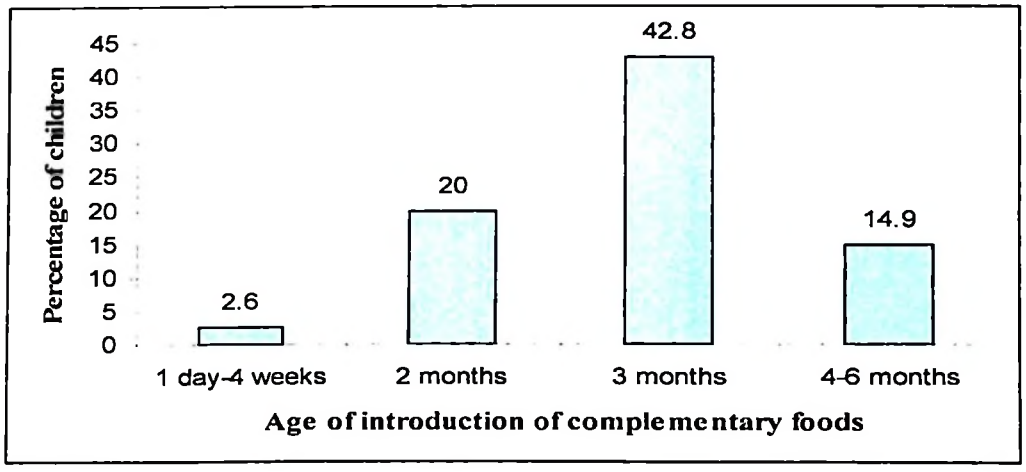

Figure 4: Introduction of complementary foods

When asked what type of food did they give their children, 48.7% said they gave their children porridge. 26.9% provided water to their children, 19.2% gave cows' milk, 3.8% gave their children canned milk and 1.3% gave the children juice.

4.4.6 Meal frequency

The number of children who had been introduced to solid foods at the time of the interview was 80.3%. Results showed that 71.4% of those who were below six months of age received meals two times a day. The children getting two or three meals a day were distributed in all the age groups (Figure 4).

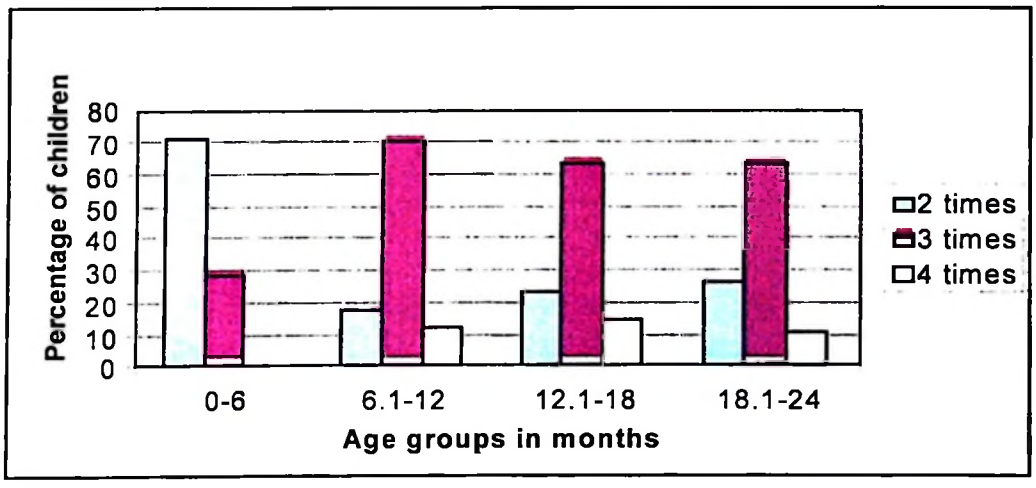

Figure 5: Number of meals per day

4.4.7 Dietary intake of infants and young children

4.4.7.1 Carbohydrate foods

Results obtained from food frequency questionnaire showed a pattern of foods consumed by under two children in Muheza district. It was observed that majority of the children (57.9%) were given maize porridge daily, while 17.1% were given stiff

porridge daily and none of them was given rice and cassava daily. Table 7 summarizes the frequency of consumption of foods according to groups.

Table 7: Carbohydrate consumption

Type of food	Feeding frequency per week				
	Never (%)	Once (%)	2 - 4 times (%)	5 – 6 times (%)	Daily (%)
Porridge (maize)	40.1	0.0	2.0	0.0	57.9
Stiff porridge	72.4	2.0	7.2	1.3	17.1
Rice	94.7	2.0	2.6	0.7	0.0
Sweet potatoes	89.4	0.0	7.9	1.3	1.3
Irish potatoes	75	1.3	16.4	3.3%	3.9
Green bananas	78.3	7.2	11.8	1.3	1.3
Cassava	96.7	0.7	2.0	0.7	0.0

4.4.7.2 Protein consumption

It was noted that 23.7% of mothers gave cow's milk to the children on daily basis and as their main source of protein; beans and sardines (1.3% and 2%) respectively were given to the children on daily bases. However meat, fish and eggs were never given to children on daily bases (Table 8).

Table 8: Protein consumption

Type of food	Feeding frequency per week				
	Never (%)	Once (%)	2 - 4 times (%)	5 - 6 times (%)	Daily (%)
Meat	90.8	9.2	0.0	0.0	0.0
Fish	88.8	3.3	7.2	0.7	0.0
Egg	61.2	10.5	17.1	7.2	0.0
Sardines	79.6	2.6	13.2	3.3	1.3
Milk	53.3	3.9	12.5	6.6	23.7
Beans	73.7	6.6	11.8	5.9	2.0

4.4.7.3 Fruits and vegetables consumption

Results showed high consumption of fruits on daily bases specifically oranges (14.5%). Amaranthus was given to the children (13.2%) at least 5 – 6 times per week (Table 9).

Table 9: Fruits and vegetables consumption

Type of food	Feeding frequency per week				
	Never (%)	Once (%)	2 - 4 times (%)	5 - 6 times (%)	Daily (%)
Mango	92.1	2.0	3.3	0.0	2.6
Orange	64.5	0.7	11.2	9.2	14.5
Avocado	94.7	0.7	3.3	0.7	0.7
Ripe bananas	75.7	2.0	13.2	5.3	3.9
Pawpaw	92.8	2.6	3.9	0.7	0.0
Amaranthus	61.8	1.3	21.7	13.2	2.0
Okra	94.7	3.3	0.7	1.3	0.0
Pumkin leaves	97.4	0.0	2.0	0.7	0.0

4.4.7.4 Fats, confectionery and refreshments consumption

Vegetable oil and water was given to the children on daily bases (25.7% and 53.6%) respectively (Table 10).

Table 10: Fats, confectionary and refreshments consumption

Type of food	Feeding frequency per week				
	Never (%)	Once (%)	2 - 4 times (%)	5 - 6 times (%)	Daily (%)
Groundnuts	98.7	0.0	0.0	0.0	1.3
Coconut	100	0.0	0.0	0.0	0.0
Vegetable oil	71.1	0.7	1.3	1.3	25.7
cake	98.7	0.7	0.7	0.0	0.0
Biscuits	95.4	2.0	2.0	0.7	0.0
Juice	95.4	2.0	2.6	0.0	0.0
Water	46.7	0.0	0.7	0.0	53.6

4.5 Feeding Practices During Illness

Out of 152 mothers with children less than two years of age, 23.7% said their children were ill two weeks before the interview. It was observed that 77.8% took their children to the health facility for treatment; 8.3% took their children to traditional healers while 13.9% took no action. Majority of them (69.4%) continued to feed their children other foods (at least five small meals) and/or breast feeding (at least 8 times) and the 30.6% stopped. A quota (25%) of the mothers did not provide fluids to ill children giving the following reasons: "if you give fluids to a child with diarrhea it increases the rate of diarrhea (66.7%)", "the traditional doctor said not to breastfeed the baby until healed (22.2%) and "whenever the child eats he vomits" (11.1%).

4.6 Socio-economic Status and Colostrum Feeding

Over 80%% mothers who were married fed their children colostrum, while 34.5% single mothers did not give colostrum to their babies. Marital status of the mother was significantly associated with colostrum feeding ($P<0.05$). Mothers' education came out to be a significant factor for colostrum feeding ($P<0.001$). Only 6.7% mothers who had secondary education did not feed colostrum to their babies, unlike majority of the mothers (54.8%) without formal education who did not give colostrum to their children. Many of the housewives and farmers (28.6% and 22.3%) did not feed colostrum to their babies (Table 11).

Table 11: Socio-economic status and colostrum feeding

Variable	Yes (%)	No (%)	Total (%)	Significance
Marital status				*
Single	65.5	34.5	100	
Married	82.3	17.7	100	
Divorced	50.0	50.0	100	
Separated	100.0	0	100	
Education level				***
No formal education	45.2	54.8	100	
Primary education	84.9	15.1	100	
Secondary education	93.3	6.7	100	
Occupation				NS
Farmer	77.7	22.3	100	
Employed	92.9	7.1	100	
Business woman	77.8	22.2	100	
House wife	71.4	28.6	100	
Average income				NS
31,000-50,000	92.9	7.1	100	
51,000-70,000	80.0	20.0	100	
71,000-90,000	81.5	18.5	100	
91,000	84.2	15.8	100	
Don't know	68.3	31.7	100	

NS= Not significant (P>0.05), * = Significant at (P< 0.05),

*** = Significant at (P< 0.001).

4.7 Socio-economic Status and Initiation of Breastfeeding

Majority of the mothers within 21 – 35 age group (45.8%) initiated breastfeeding within one hour, while those who were in the age group of less or equal to 20 years and above or equal 36 years 58.8% and 63% respectively, initiated breastfeeding within one hour and the rest did not. Seventy four mothers (48.7%) of different marital status initiated breastfeeding within one hour. Out of 31 mothers who had no

formal education, 25.8% initiated breastfeeding within one hour after delivery, and the rest did not. Few mothers had secondary education (9.9%), out of them 11/15 (73%) initiated breastfeeding within one hour.

Out of 152 mothers, 61.2% were farmers and nearly half of them 48.4% initiated breastfeeding within one hour. Housewives were 35; out of them 42.9% initiated breastfeeding within one hour and the rest did not. Among mothers with the highest income per month, 65% initiated breastfeeding within one hour. Education of the mother and average income per month were found to be significantly associated ($P<0.05$) with initiation of breastfeeding. However, age group and marital status of the mother and occupation showed no statistical significance association with initiation of breastfeeding ($p>0.05$) (Table 12).

Table 12: Socio-economic status and initiation of breastfeeding

Variable	Within One hour (%)	Within Two hours (%)	More than six hours (%)	Total	Significance
Age group					
<= 20	58.80	11.8	29.4	100	NS
21 - 35	45.80	15.3	39	100	
>= 36	63	0	37.5	100	
Marital status					
Single	36	14.3	50	100	NS
Married	54.00	12.4	33.6	100	
Divorced	25	12.5	62.5	100	
Separated	49	13.2	37.7	100	
Education level					
No formal education	25.80	6.5	67.7	100	*
Primary education	52.40	17.1	30.5	100	
Secondary education	73	0	26.7	100	
Occupation					
Farmer	48.4	12.9	38.7	100	NS
Employed	64.3	21.4	14.3	100	
Business woman	55.6	0	44.4	100	
House wife	42.9	14.3	42.9	100	
Average income					
31,000-50,000	57.1	35.7	7.1	100	*
51,000-70,000	50	10.0	40	100	
71,000-90,000	48.1	7.4	44.4	100	
91,000	65.8	5.3	28.9	100	
Don't know	37.1	16.1	46.8	100.0	

NS= Not significant (P>0.05). * = Significant at (P< 0.05).

4.8 Socio-economic Status and Exclusive Breastfeeding

Majority of the women (78.3%) were between 21 – 35 years old. Only 16% breastfed their children exclusively and the rest did not. Out of 113 who were married 23% breastfed their children exclusively and only 10.3% single mothers breastfed their children exclusively and the rest did not. Out of one hundred and six

women who had primary education, 20.8% breastfed their children exclusively. Thirty one mothers had no formal education and out of them only 6.5% breastfed their children exclusively as shown in Table 13. Exclusive breastfeeding was not found to be significantly associated (P>0.05) with the following variables: age group, marital status, occupation and average income, while maternal education was found to be statistically associated (P<0.05).

Table 13: Socio-economic status and exclusive breastfeeding

Variable	Exclusive breastfeeding			
	Yes (%)	No (%)	Total (%)	Significance
Age group				
<= 20	29.4	70.6	100	NS
21 - 35	16	84	100	
>= 36	37.3	62.5	100	
Marital status				
Single	10.3	89.7	100	NS
Married	23	77	100	
Divorced	12.5	87.5	100	
Separated	0	100	100	
Education level				
No formal education	6.5	93.5	100	*
Primary education	20.8	79.2	100	
Secondary education	40	60	100	
Occupation				
Farmer	19.1	80.9	100	NS
Employed	28.6	71.4	100	
Business woman	0	100	100	
House wife	22.9	77.1	100	
Average income				
31,000-50,000	28.6	71.4	100	NS
51,000-70,000	30	70	100	
71,000-90,000	7.4	92.6	100	
91,000	23.7	76.3	100	
Don't know	19	81	100	

NS= Not significant (P>0.05), * = Significant at (P< 0.05),

4.9 Socio-economic Status and Introduction of Solid Foods

Majority of the mothers (50.5%) within 21 – 35 age group introduced solid foods to their children at the age of 4 – 6 months, while those who were in the age group of less or equal to 20 years and above or equal 36 years 58.3% and 70% respectively, also weaned their children between the age of 4 – 6 months. Sixty two mothers (42.8%) of different marital status weaned their children between the age of 4 – 6 months. Out of 30 mothers without formal education 56.7% weaned their children between the age of 4 – 6 months, and the rest did not. Few mothers with secondary education (55.6%) weaned their children between the age of 4 – 6 months. Out of 84 with primary education, more than half of them 51.2% weaned their children between the age of 4 – 6 months. Out of fifty one mothers who did not know their average income, 37.3% weaned their children between the age of 4 – 6 months. Those with the average income of 91,000 Tshs or more, 65.5% weaned their children between the age of 4 – 6 months. Marital status and average income were found to be significantly associated with introduction of complementary foods ($P<0.01$) (Table 14).

Table 14: Socio-economic status and introduction of solid foods

Socio-economic status	Introduction of complementary foods					
Variable	**1 Day-4 Weeks (%)**	**2 - 3 Months (%)**	**4 - 6 Months (%)**	**More than six months (%)**	**Total**	**Significance**
Age group						
<= 20	16.7	25	58.3	0	100	NS
21 - 35	2	46.5	50.5	1.1	100	
>= 36	0	30	70	0	100	
Marital status						
Single	15.4	50	34.6	0	100	**
Married	0	36.4	62.5	1.1	100	
Divorced	0	85.7	14.3	0	100	
Separated	0	100	0	0	100	
Education level						
No formal education	3.3	36.7	56.7	3.3	100	NS
Primary education	2.4	46.4	51.2	0	100	
Secondary education	11.1	33.3	55.6	0	100	
Occupation						
Farmer	2.6	44.2	51.9	1.3	100	NS
Employed	0	20	80	0	100	
Business woman	0	55.6	44.4	0	100	
House wife	7.4	44.4	48.1	0	100	
Average income						
31,000-50,000	0	20	80	0	100	*
51,000-70,000	0	71.4	28.6	0	100	
71,000-90,000	0	30.8	65.4	3.8	100	
91,000	0	34.5	65.5	0	100	
Don't know	7.8	54.9	37.3	0	100	

NS= Not significant (P>0.05), * = Significant at (P< 0.05),

** = Significant at (P< 0.01).

4.10 Nutritional Status of Children Using Z-Score by Age Groups

4.10.1 Nutritional status of children using weight-for-length

Weight-for-length was assessed using Z-score for all the children (Table 15). The mean Z-score for all children was 0.44 (SD) ±1.48 and fell within the normal

range. Majority of children between the ages of 0-6 months (12.1%) were observed to be moderately wasted, while none of them between the age of 18.1-23 months were wasted.

Table 15: Weight-for-length Z-score classification for children

Age in months	Normal (%)	Moderately wasted (%)	Severely wasted (%)
0-6	87.9	12.1	0.0
6.1-12	97.5	2.5	0.0
12.1-18	94.3	5.7	0.0
18.1-24	100	0.0	0.0
Average	93.4	6.6	0.0

4.10.2 Nutritional status of children using weight-for-age

Table 16 shows weight-for-age as was assessed using Z-score for all the children. The mean Z-score for all children was -0.63 (SD) 1.17 and fell within the normal range. Children between the age of 12.1-18 months (5.7%) were found to be severely underweight.

Table 16: Weight-for-age Z-score classification for children

Age in months	Normal (%)	Moderately underweight (%)	Severely underweight (%)
0-6	82.8	13.8	3.4
6.1-12	95	5	0
12.1-18	91.4	2.9	5.7
18.1-24	89.5	10.5	0
Average	88.8	8.6	2.6

4.10.3 Nutritional status of children using length-for-age

Length-for-age was assessed using Z-score for all the children (Table 17). The mean Z-score for all children was -1.62 (SD) 1.01 and fell within the normal range. Majority of the children (42.1%) between the age of 18.1-24 months were found to be severely stunted.

Table 17: Length-for-age Z-score classification for children

Age in months	Normal (%)	Moderate stunted (%)	Severe stunted (%)
0-6	70.7	27.6	1.7
6.1-12	72.5	25	2.5
12.1-18	54.3	34.3	11.4
18.1-24	31.6	26.3	42.1
Average	62.5	28.3	9.2

4.11 Maternal Socio-economic Status and Weight-for-Length Indicator

Socio-economic status of the mothers was analyzed for their association with nutritional status of the children using weight-for-length indicator (Table 18). Majority of the children (13.8%) whose mothers were single, were moderately wasted, while among the married women, 3.5% children were severely wasted. Marital status, educational level and occupation were not found to be significantly associated with length-for-age index, however; only maternal average income per month came out to be a significant risk factor for stunting ($P<0.001$). High percentages of undernourished children were found among mothers with monthly average income of 51,000-70,000 TShs.

Table 18: Maternal socio-economic status and weight-for-length indicator

Socio-economic status	Nutritional status of children			Significance
	Normal (%)	Moderately wasted (%)	Severely wasted (%)	
Marital status				
Single	86.2	13.8	0.0	NS
Married	88.5	8.0	3.5	
Divorced	100	0.0	0.0	
Separated	100	0.0	0.0	
Education level				
No formal education	87.1	12.9	0.0	NS
Primary education	89.6	6.6	3.8	
Secondary education	86.7	13.3	0.0	
Occupation				
Farmer	87.2	9.6	3.2	NS
Employed	85.7	7.1	7.1	
Business woman	100	0.0	0.0	
House wife	91.4	8.6	0.0	
Average income				
31,000-50,000	85.7	14.3	0.0	***
51,000-70,000	70.0	0.0	30.0	
71,000-90,000	88.9	11.1	0.0	
91,000	94.7	5.3	0.0	
Don't know	88.9	9.5	1.6	

NS= Not significant (P>0.05), *** = Significant at (P< 0.001)

4.12 Maternal Socio-economic Status and Weight-for-Age Indicator

Socio-economic status of the mothers was analyzed for their association with nutritional status of the children using weight-for-age indicator (Table 19). High percentages of children whose mothers were married and single were found to be underweight. Women who were farmers and employed had children who were moderately underweight 9.6% and 7.1% respectively. Marital status, educational level, occupation and average income per month were not found to be significantly associated with weight-for-age index.

Table 19: Maternal socio-economic status and weight-for-age indicator

Socio-economic status	Nutritional status of children			Significance
	Normal (%)	Moderately underweight (%)	Severely underweight (%)	
Marital status				
Single	96.6	3.4	0.0	NS
Married	92.0	8.0	0.0	
Divorced	100	0.0	0.0	
Separated	100	0.0	0.0	
Education level				
No formal education	93.5	6.5	0.0	NS
Primary education	93.4	6.6	0.0	
Secondary education	93.3	6.7	0.0	
Occupation				
Farmer	90.4	9.6	0.0	NS
Employed	92.9	7.1	0.0	
Business woman	100	0.0	0.0	
House wife	100	0.0	0.0	
Average income				
31,000-50,000	92.9	7.1	0.0	NS
51,000-70,000	80.0	20.0	0.0	
71,000-90,000	92.6	7.4	0.0	
91,000	94.7	5.3	0.0	
Don't know	95.2	4.8	0.0	

NS= Not significant (P>0.05)

4.13 Maternal Socio-economic Status and Length-for-Age Indicator

Socio-economic status of the mothers was analyzed for their association with nutritional status of the children using length-for-age indicator (Table 20). Children (12.5%) whose mothers were divorced were severely stunted, and 12.9% children whose mothers had no formal education were severely stunted. Marital status, educational level, occupation and average income were not found to be significantly associated with length-for-age index.

Table 20: Maternal socio-economic status and height-for-age indicator

Socio-economic status	Nutritional status of children			Significance
	Normal (%)	Moderately stunted (%)	Severely stunted (%)	
Marital status				
Single	65.5	27.6	6.9	NS
Married	62.8	27.4	9.7	
Divorced	37.5	50.0	12.5	
Separated	100	0.0	0.0	
Education level				
No formal education	58.1	29.0	12.9	NS
Primary education	62.3	28.3	9.4	
Secondary education	73.3	26.7	0.0	
Occupation				
Farmer	64.9	24.5	10.6	NS
Employed	78.6	21.4	0.0	
Business woman	66.7	33.3	00.0	
House wife	48.6	40.0	11.4	
Average income				
31,000-50,000	50.0	28.6	21.4	NS
51,000-70,000	40.0	60.0	0.0	
71,000-90,000	55.6	29.6	14.8	
91,000	78.9	18.4	2.6	
Don't know	61.9	28.6	9.5	

NS= Not significant (P>0.05)

4.14 Feeding Practices and Nutritional Status of Children

Weaning age had significant effect (P<0.01) on weight-for-age indicator of the child. Children weaned between the age 4-6 months and 2-3 months, (1.9% and 1.5% respectively were found to be severely underweight. Furthermore, time of introduction of complementary foods was significantly associated with length-for-age indicator of the child. About 50% of children weaned at the age of 2-3 months were severely stunted. Colostrum feeding, initiation of breastfeeding and exclusive

breastfeeding were not found to be significantly associated with nutritional status of the children (P>0.05).

Table 21: Feeding practices and nutritional status of children

Feeding practices	Nutritional status of children			Significance
Exclusive breastfeeding				
	Severely wasted (%)	Moderately wasted (%)	Normal (%)	
Yes	6.7	6.7	86.7	NS
No	1.6	9	89.3	
	Severely underweight (%)	Moderately underweight (%)	Normal (%)	
Yes	13.3	26.7	60	NS
No	8.2	28.7	63.1	
	Severely stunted (%)	Moderately stunted (%)	Normal (%)	
Yes	0	13.3	86.7	NS
No	0	4.9	95.1	
Introduction of complementary foods				
	Severely wasting (%)	Moderately wasting (%)	Normal (%)	
1day- 4 weeks	0	50	50	NS
2-3 months	1.9	9.4	88.7	
4-6 months	1.5	6.2	92.3	
> 6 months	0	100	0	
	Severely underweight (%)	Moderately underweight (%)	Normal (%)	
1day- 4 weeks	50	50	0	**
2-3 months	3.8	37.7	58.5	
4-6 months	9.2	2	70.8	
>6 months	10	0	0	
	Severely underweight (%)	Moderately underweight (%)	Normal (%)	
1day- 4 weeks	0	0	100	***
2-3 months	0	1.9	98.1	
4-6 months	0	7.7	92.3	
> 6 months	0	0	100	

NS= Not significant; **= Significant at P< 0.01; ***= Significant P< 0.001.

Table 22: Summary of results of maternal socio-economic status and child's feeding practices

Socio-economic status	Feeding practice	χ^2	df	P- value	Significance
Marital status	Colostrum feeding	0.047	3	0.05	*
	Initiation of breastfeeding	0.215	6	0.05	NS
	Exclusive breastfeeding	0.371	3	0.05	NS
	Complementary feeding	0.001	9	0.01	**
Education level					
	Colostrum feeding	0.000	2	0.001	***
	Initiation of breastfeeding	0.001	4	0.01	**
	Exclusive breastfeeding	0.025	2	0.05	*
	Complementary feeding	0.440	6	0.05	NS
Occupation					
	Colostrum feeding	0.450	3	0.05	NS
	Initiation of breastfeeding	0.497	6	0.05	NS
	Exclusive breastfeeding	0.371	3	0.05	NS
	Complementary feeding	0.742	9	0.05	NS
Average income					
	Colostrum feeding	0.180	4	0.05	NS
	Initiation of breastfeeding	0.018	8	0.05	*
	Exclusive breastfeeding	0.362	4	0.05	NS
	Complementary feeding	0.048	12	0.05	*

NS= Not significant; *= Significant at P<0.05; **=Significant at P<0.01; ***= Significant at P<0.001

Table 23: Summary of the results of maternal socio-economic status and child's feeding practices

Socio-economic status	Nutritional status	χ^2	df	P-value	Significance
Marital status	Weight-for-height	0.678	3	0.05	NS
	Weight-for-age	0.760	6	0.05	NS
	Height-for-age	0.716	6	0.05	NS
Education level					
	Weight-for-height	0.999	2	0.05	NS
	Weight-for-age	0.506	4	0.05	NS
	Height-for-age	0.691	4	0.05	NS
Occupation					
	Weight-for-height	0.214	3	0.05	NS
	Weight-for-age	0.749	6	0.05	NS
	Height-for-age	0.341	6	0.05	NS
Average income					
	Weight-for-height	0.491	4	0.05	NS
	Weight-for-age	0.000	8	0.001	***
	Height-for-age	0.087	8	0.05	NS

NS= Not significant; ***= Significant at P<0.001

Table 24: Summary of the results of child's feeding practices and nutritional status

Feeding practices	Nutritional status	χ^2	df	P value	Significance
Colostrum feeding					
	Weight-for-height	0.079	1	0.05	NS
	Weight-for-age	0.553	2	0.05	NS
	Height-for-age	0.646	2	0.05	NS
Initiation of breastfeeding					
	Weight-for-height	0.428	2	0.05	NS
	Weight-for-age	0.631	4	0.05	NS
	Height-for-age	0.341	4	0.05	NS
Exclusive breastfeeding					
	Weight-for-height	0.096	1	0.05	NS
	Weight-for-age	0.288	2	0.05	NS
	Height-for-age	0.683	2	0.05	NS
Complementary feeding					
	Weight-for-height	0.496	3	0.05	NS
	Weight-for-age	0.007	6	0.01	**
	Height-for-age	0.000	6	0.001	***

NS= Not significant; **=Significant at P<0.01; ***= Significant at P<0.001

CHAPTER FIVE

5.0 DISCUSSION

The importance of good nutrition and appropriate infant feeding practices on achieving optimal health outcomes cannot be over emphasized. It has been documented that appropriate feeding practices have both short and long term impact on nutritional status of children. These include growth failure, increased susceptibility to childhood infections, poor school performance, and impaired intellectual and social development. (De Paoli *et al.*, 2004). It is well recognized that the period from birth to two years of age is the "critical window" for the promotion of good growth, health, and behavioural development. Therefore, optimal infant and young child feeding is crucial during this period. Optimal infant and young child feeding means that mothers are empowered to initiate breastfeeding within one hour of birth, breastfeed exclusively for the first six months and continue to breastfeed for two years or more, together with nutritionally adequate, safe, age appropriate, responsive complementary feeding starting in the sixth month. Maternal nutrition is also important for ensuring good nutrition status of the infant as well as safeguarding women's health (UNICEF, 2008).

5.1 Social and Demographic Characteristics

The objective of this study was to investigate maternal social, economic and cultural influences on feeding practices of infants and young children in Muheza District Tanzania, as a case study. The findings of the study indicated that majority of the mothers belonged to the Bondei ethnic group, followed by Sambaa ethnic group, and this compares with the Tanga region socio-economic profile (URT, 2002).

5.2 Cultural Practices Related to Feeding Practices of Under Two Children

Findings from the focus group discussion indicated that many women still have the belief that colostrums is dirty and not good for the baby. This has been documented in other studies (Agnarsson *et al.*, 2001, Kumar *et al.*, 2006). There are also other community beliefs that are being practiced in the study area that are related to feeding practices, 71.7% agreed that the myth that the first yellow milk is dirty and not good for the baby is still operating in the society (Table 3).

Older women said that it is not right for the child to be fed colostrum because the milk is dirty and not fit for human consumption and may cause diarrhea. The practice has been documented in many other studies done in Africa (Shirima *et al.*, 2000; Agnarsson *et al.*, 2001; Awumbila, 2003). They also said that the baby must drink warm water mixed with salt and sugar when it is born because is always thirsty and must be introduced to other foods apart from breast milk at the age of 3 months. They said that, when a woman gets pregnant even if the child is very young must not be breastfed because they believed that the breastfed child may die. Same findings have been reported from Dodoma that mothers abstain from sex while breastfeeding and that mothers who get pregnant before weaning were ashamed as they would be unable to continue breastfeeding (Mabila, 2003).

Infant feeding and breastfeeding in particular is often best understood as a biocultural phenomena, that is influenced and determined by both biological and cultural factors, so that rather than look for one universal human strategy, the best method maybe contingent on local and household environment, cultural customs and

beliefs and the particular situation of mother and child. Within these, women negotiate practices within a complex web that includes their cultural beliefs, assessment of their own local environment and their child's nutritional status, as well as their own personal circumstances.

5.3 Feeding Practices

The findings of the study indicated that the majority of the mothers were still breast-feeding at the time of the interview, with very few mothers not breastfeeding. The reasons given by the mothers who were not breastfeeding (7.2%) in this study were; the baby wasn't eating well so had to stop breastfeeding so that the baby could eat other foods well, a lot of farm work, or health reasons. These reasons concur with reasons given in another study (Hotz and Gibson, 2001) whereby mothers' personal views made them not to breastfeed their children up to the age of 24 months or more. These findings call for health and nutrition education to these women, which may provide them with the appropriate knowledge on the recommended age to breastfeed their children as well as its advantages.

5.3.1 Colostrum feeding

There were interesting results where by 77.6% mothers fed their babies colostrum. This shows higher rates of feeding colostrum to children compared to a study done in Tabora Tanzania, where only 32% of mothers gave their children colostrum (Agnarsson *et al* ., 2001) and 57% in Morogoro rural (Shirima *et al.*, 2000). However, the rates of colostum feeding are very low compared to those observed in urban areas where 100% mothers gave colostrum to their children (Balati, 2003). A

number of reasons were given such as advice from health personnel (46.1%) and interestingly some said 'colostrums is nutritious, contains vitamins, good for immunity', which explains well the role of nutrition education and the help of health personnel in the study area.

5.3.2 Initiation of breastfeeding

Nearly half (49%) of mothers initiated breastfeeding within one hour after delivery. Many of them gave reasons to start early breastfeeding, majority (48%) said that they breastfed on child's demand and others (19.7%) said they were advised by health personnel (Figure 1). It is clear that these women do not know whether it is right to start breastfeeding within one hour or not but they did so as they were advised. It is very important that mothers are taught on the importance of initiating breastfeeding within one hour so that they may also teach other women who do not deliver at the health facility.

Many of those who did not initiate breastfeeding within one hour said that they had to squeeze the dirty milk first (5.9%) and other reasons. Initiation of breastfeeding seems to be influenced by advice from the health personnel as well as cultural believes.

5.3.3 Exclusive breastfeeding

In the present study, only 19.1% of the babies were exclusively breastfed between birth and two months of age. Majority (42.8%) were introduced to other foods at the age of 3 months, contrary to what is recommended (Mukuria *et al.*, 2006). The

reasons given for the early introduction of other foods or liquids were based on the mothers' own perceptions (Table 6). Other studies reported that the reasons for the introduction of solid foods early are indeed based on the mothers' own perceptions that their infants had not been satisfied with breast milk alone: "Baby always crying, not enough breast milk or baby is hungry" (Savage *et al.*, 1998). Frequency of breastfeeding was lower compared with the recommended (Kramer and Kakuma, 2002), the highest was reported to be 16-20 times per day and night which was practiced by 30.9% of the mothers, and the lowest being 5 times per day and night practiced by only 3.9% of the mothers.

5.3.4 Introduction of complementary feeding

Majority of the mothers (42.8%) introduced complementary food at the age of 3 months. About 65.4% of the mothers had introduced foods or drinks to their infants before four months. This is because most mothers believe that after the age of 3 months most babies require more than breast milk and if not fed with other foods the baby will become unhealthy. The study did not document any of the mothers using infant formula milk, while in many other studies in developed countries or urban areas of Tanzania, mothers use infant formula milk. In a study done in the United States of America, 45.3% mothers were giving infant formula milk (Hediger *et al.*, 2000). Developmental differences of these study areas play a major role for the difference. It is possible that in the present study mothers did not use infant formula milk because they are not easily found in the study area, but also may be due to the low income of the mothers as shown in Table 2.

5.3.4.1 Meal frequency

In terms of meal frequency, the number of daily meals appeared to be influenced by the ages of the children. Most children (70%) between the ages of 6-12 months received meals three times a day, unlike those who were less than six months (71.4%) who received meals two times a day. Many children received meals three times a day, probably due to the fact that other family members also received meals three times a day, which explains that these children are also included in the family meals. The findings are in line with those obtained from Morogoro and Manyara that frequency of feeding was three times per day for most children (Shirima *et al.*, 2000, Nyaruhucha *et al.*, 2006). This practice did not; however, seem to influence the children's nutritional status when compared with other similar studies in which infants older than six months were offered three meals a day (Watts and Siziya, 1998).

5.4 Dietary Intake of Infants and Young Children

Nutrient intake was not determined in this study because most infants were under 12 months and still being breast-fed, and quantifying breast milk would have been difficult. In this study, majority of the children (57.9%) were given maize porridge daily, twenty six (17.1%) were given stiff porridge daily and none of them were given rice and cassava daily. Most of the infants had been weaned with maize-meal porridge by the fourth month. This is inline with a study by Poggensee *et al.*, 2004 who reported that, in Tanzania, the main solid foods given to the children before weaning were maize porridge, ugali, potatoes, rice and bananas. The majority of the women gave one (39%) or two (33%) complementary foods to their children.

Maize porridge was the most common supplementary food in all age groups. More than half (59.9%) of the children were given maize porridge, followed by Irish potatoes (24.9), then green bananas and sweet potatoes 21.6% and 9.5% respectively. This may be due to the fact that the mentioned foods are the ones available and mostly considered as foods in the study area. Available data from other rural areas of South Africa also report that the food intake of infants reflects a high intake of carbohydrate-rich foods (Faber and Benade, 1999).

Most of the children in this study were not a given variety of vegetables, but mostly were given amaranths; which could be due to issues of consistency and ignorance. This deprives children the important nutrients especially micronutrients that are obtained from fruits and vegetables.

Fruits frequently given to the children were oranges and ripe bananas, which may be due to seasonality. This may be compared with a study that was done in the urban areas of the Western Cape and rural areas of Kwa-Zulu Natal, where fruits and vegetables were not consumed regularly (Faber *et al.*, 1997). The use of commercial foods is low in the study area probably because they are expensive and not easily available.

Protein foods that were highly reported to be consumed were cows' milk, eggs and beans. This may well be explained by the fact that majority of the parents were farmers who also kept cattle. The feeding frequency for the majority of the sampled

children was three times per day, which complies well with what was reported elsewhere in Tanzania (Kavishe, 1993).

5.5 Feeding Practices During Illness

In the present study, 23.7% of the children fell sick two weeks before the time of interview. About quota of the mothers did not provide fluids to ill children, others did so because they thought that breastfeeding increases the rate of diarrhea, and others did so as they were instructed by the traditional healers. This shows that mothers did not know what to do when a child is sick, which calls for more nutrition and health education messages which must also take into account the strength of traditional healers. However, child illness did not influence under-nutrition to the children.

5.6 Socio-economic Status and Child Feeding Practices

5.6.1 Colostrum feeding

From the present study, it appears that level of education of the mothers had impact to colostrum feeding, only 1/15 (6.7%) who had secondary education, did not give colostrum to her baby, the association was statistically significant ($P<0.001$), indicating the influence of formal education on colostrum feeding. In many African societies, colostrum is considered dirty and unfit for the babies. A study conducted in Turkey reported mother's education to be a significant factor influencing the introduction of colostrum to the newborns. Mothers with lower education generally believed that the colostrum should not be fed to the infant and that a pregnant woman's milk is unhealthy for the baby (Ergenekon-Ozelci *et al.*, 2006).

Colostrum is traditionally perceived as dirty and unwholesome in Muheza District, however, discarding of colostrum is currently not widely practiced. About three quarters (77.6%) of the babies were given colostrum which support earlier findings (Awumbila, 2003; Mabila, 2003), while another study reported that half of the mothers (46%) discarded it and wash the milk (Agnersson *et al.*, 2001). The practice of discarding colostrum was higher among single and divorced women (34.5% and 50%) respectively. Colostrum feeding and marital status were found to be significantly associated; few married mothers did not give colostrum to their babies compared to single mothers. It is possible that married mothers get advice from mother in-laws who are more experienced in feeding the babies rather than single and divorced mothers. No associations were found between colostrum feeding and mothers' current age, occupation and average income.

5.6.2 Initiation of breastfeeding

In this study, initiation of breastfeeding within one hour was found to be practiced by only 49% mothers. The start of breast-feeding was found to be strongly influenced by education and the average income per month of the mother. The power of education, particularly maternal education, is very strong in predicting initiation of breastfeeding (Table 13), a finding that may be of value in designing breastfeeding promotion programs. Majority of women who had low education or no formal education started breastfeeding more than six hours after delivery. These women and their partners may need special interventions designed particularly to help mothers who did not have formal education. These results are inline with those from Ghana where mothers with secondary education were more likely to initiate

breastfeeding within one hour after birth (Awumbila, 2003). No associations could were found between initiation of breastfeeding and mothers' current age, occupation and marital status.

5.6.3 Exclusive breastfeeding

Exclusive breastfeeding is breastfeeding while giving no other food or liquid, not even water, from birth to the age of six months, with the exception of drops or syrups consisting of vitamins, mineral supplements or medicine. In this study there were several factors that could be associated with exclusive breastfeeding rates. Maternal education level was found to be significantly associated with exclusive breastfeeding; most of the mothers who did not have formal education did not breastfeed exclusively. This shows that formal education helps mothers to understand easily what is being taught by the health personnel pertaining to breastfeeding. No associations were be found between exclusive breastfeeding and mothers' current age, occupation, average income and marital status.

5.6.4 Introduction of complementary foods

The introduction of complementary foods to complement human milk or infant formula or both (i.e. the weaning process), is recognized as one of the most crucial dietary events in an infant's life (Lanigan *et al*, 2001). In the present study, introduction of complementary foods was significantly associated with average income. It is possible that mother's income plays a major role in the family, this has made women to introduce other foods early to their children so that they would get enough time to work rather than breastfeeding as it has been reported in the present

study, those women with lower income have introduced other foods early than those women with high income. These findings can be compared with findings from a study conducted in Cape Metropole in South Africa where introduction of complementary foods was associated with annual household income of the mother (Anderson *et al.*, 2002). No associations could be found between introduction of complementary foods and mothers' current age, occupation and education level.

5.7 Nutritional Status of Children

In this study, children aged between 18-23 months had the highest rate of malnutrition followed by those aged between 12-17 months (Table 17). Children <12 months old were less affected by under nutrition. This may be explained by the fact that, the risk of malnutrition increases sharply at the beginning 12 months, when most children stop breastfeeding and begin relying almost exclusively on solid foods. Thereafter, inadequate breast-feeding, improper weaning foods and high rate of infections are likely to cause subsequent increased rate of under nutrition.

5.7.1 Nutritional status of children using weight-for-length

Children whose weight-for-length is below -2 SD from the median of the reference population are considered wasted or thin, a condition reflecting acute malnutrition. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or recent episodes of illness causing loss of weight. In this study, children who were between the age of 0-6 months were more wasted than others from different age groups. These findings are contrary to findings of a study which reported that

transition period (ages 6-23 months), the prevalence of malnutrition increases substantially in many countries because of increased infections and poor feeding practices (NBS, 2004). It is possible that higher prevalence has been observed during that age due to early and improper introduction of other foods apart from mothers milk which has led to low nutrient intake and hence wasting. However, in the present study, weaning age had significant association with nutritional status as assessed by weight-for-length index.

The 6.6% prevalence of wasting among children in this study is slightly higher than 3% that was reported by the National Bureau of Statistics (NBS, 2005) and lower than 7% that was reported in South Africa (Mushaphi *et al.*, 2008). The prevalence of 6.6% indicates that wasting is a public-health problem in the study area and calls for action to be taken, since wasting is an indication of acute malnutrition.

5.7.2 Nutritional status of children using weight-for-age

Underweight (low WAZ) is an indicator of either acute or chronic under nutrition (severe + moderate) (Table 17) was 11.2%. However, majority (88.8%) of the children had a normal WAZ, which shows that majority of them were not affected by underweight. These results are a bit lower compared with the results of NBS (2005) where 14% were underweight.

5.7.3 Nutritional status of children using length-for-age

The prevalence of stunting was 37.8%, which is, in broad terms, in line with the findings of the National Bureau of Statistics (NBS, 2005) which is 38%. More than

half (62.5%) had normal LAZ. These findings imply that children suffer from longer-term chronic under-nutrition, manifested in high rates of stunting. Possible reasons for this include low-birth weights, inadequate breastfeeding, poor weaning practices as well as insufficient consumption of nutritious food. Improper weaning age came out to be significant risk factor of stunting. Stunting has a lot of consequences in the child's life. Stunted children have reduced cognitive development, poor school performance, and delayed attainment of walking, diminished work capacity and increased risk of degenerative diseases. This pattern highlights that the first two years of life is the most nutritionally vulnerable period for children in Tanzania.

5.8 Impact of Maternal Socio-economic Status on Weight-for-Length, Weight-for-Age and Length-for-Age Indicators

Monthly income of the mother showed an important impact on nutritional status of children. Higher levels of wasting were observed in children whose mothers had lower average income per month of 31,000Tsh to 70,000 Tshs. The association was significant. These findings compare well with the findings of a study done in Nepal (Malla and Shrestha, 2004). However, other socio-economic variables did not seem to influence the children's nutritional status as assessed by weight-for-age and length-for-age index, despite the higher prevalence of under nutrition. These findings contradict other findings that were observed in Manyara, where personal characteristics of the mother, such as age, educational level and marital status were all significantly related with the nutritional status of their under five children (Nyaruhucha *et al.*, 2006).

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Findings of this study indicate that 92.8% of the mothers practiced breast-feeding. Interestingly, 77.6% mothers fed their babies colostrums, and 19.7% breastfed exclusively. Most of the mothers (42.8%) had introduced solid foods by 4-6 months, water, cows' milk and soft porridge being the main weaning foods. It can be concluded that there is a significant relationship between improvement in feeding practices of under two children and maternal socio-economic and cultural practices. Mothers' educational level and average income per month come out to be significant risk factors for improper initiation of breastfeeding among under two children. Exclusive breastfeeding was highly associated with educational level of the mothers rather than any other socio-economic variables. The introduction of complementary foods was found to be influenced by marital status and monthly income of the mother.

Basing on the WHO Z-score classification, prevalence of underweight was 11.2% underweight; 37.5% stunted and 6.6% wasted. Most children (12.1%) who were wasted as well as of underweight (17.2%) between the age 0-6 months. Stunting was found to be most prevalent (68.4%) in the age group 18-24 months. Socio-economic variables did not seem to influence stunting and underweight, while monthly income of the mothers influenced stunting. The study has revealed that under-nutrition of the under two children is an important public problem in the area.

6.2 Recommendations

It is recommended that women in Muheza district be empowered, to able to make the optimal feeding practices, which will eventually help to improve the nutritional status of their children under two years of age. The following aspects need to be addressed:

- Issues on child nutrition especially in feeding practices should be given high priority in district plan.
- All parents, families and communities should be educated for promotion and protection of optimal child-feeding practices for improving nutritional status of children.
- Nutrition surveillance is important, particularly in children under two years of age, in measuring the success of interventions aimed at improving the feeding practices for infants.
- Knowledge and skills should be provided to help care takers prepare nutritionally balanced complementary foods as they wean their children.
- Family members especially mothers need to be provided with knowledge and skills on appropriate child feeding practices so that they could adopt correct feeding practices to overcome possible consequences of malnutrition.

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APPENDICES

Appendix 1: Questionnaire on maternal socio-economic and cultural influences on feeding practices and nutritional status of children aged 0-23 months in Muheza district.

A. BASIC INFORMATION

1. Respondent number.....

2. Age .....

3. Sex.....

4. Ethnic group .....

5. Division .....

6. Ward .....

7. Village .....

B. SOCIO-ECONOMIC INFORMATION.

(Tick the right answer)

7. Marital status

   1) Single

   2) Married

   3) Divorced

   4) Separated

   5) Widow

8. Education level

   1) No formal education

2) Primary school education

3) Secondary school education

4) Advanced level education

5) Higher level of education

9. Occupation

1) Farmer

2) Employed

3) Student

4) Business man/woman

5) Others (specify)

10. What is the total number of household members in your family?

1) 3-5

2) 6-8

3) More than 8

11. Relation with the head of the family?

1) Parent

2) Uncle/auntie

3) Sister/Brother

4) Others (specify) .....

12. What is the average income of the family per month?

1) 31,000-50,000/=

2) 51,000 – 70,000/=

3) 71,000 – 90,000/=

4) 91,000

13. How much do you spend to buy food for the infant

    1) Less than 20,000/=

    2) 20,000/=

    3) More than 20,000/=

14. Type of floor used for the house

    1) Mud

    2) Concrete

    3) Wood

15. Type of roof used for the house

    1) Grass

    2) Corrugated iron sheet

16. Type of the wall used

    1) Mud

    2) Cement

C. SOCIO-CULTURAL INFORMATION.

17. (a) When you gave birth to your child, did you feed her the first milk that is usually yellowish in colour?

1) Yes

2) No

(b) Give reasons for the answer you gave to the question above

18. On average, how many times do you put your child to breast so as to feed him/her? .....

D: FEEDING PRACTICES (ADMINISTED TO MOTHERS WITH CHILDREN 0-6 MONTHS).

22. When did you start breastfeeding your child after delivery?

1) Within one hour

2) After two hours

3) After six hours

23. What is the reason that made you to breastfeed your child within the time given in the question above?

24. (a) Do you breastfeed your child exclusively? (explain what exclusive means)

1) Yes

2) No

(b) Give reasons for the answer given above

25. For how long, do you think your child should continue with exclusive breastfeeding?

1) 3 months

2) 4 months

3) 4-6 months

4) 6 months

26. Have you ever given your child any other food/drink apart from breast milk?

1) Yes

2) No

(b) If yes, when did you start giving such foods/drinks to your child

(c) What type of food drink?

(d) Why did you introduce other foods to your child?

E. FEEDING PRACTICES (ADMINISTED TO MOTHERS WITH CHILDREN 7-24 MONTHS).

27. Is your child still breast feeding?

1) Yes

2) No

If the answer above is No.

28. Why are you not breastfeeding this child?

29. How many times do you feed this child (6-24 months)

1) Two times

2) Three times

3) Four times

4) Others (specify)

30. At what age of the child did you start giving other foods apart from breast milk?

    1) 4 months

    2) 6 months

    3) More than 8 months

31. What foods were introduced?

32. (a) Does your society and family recommend these foods?

    1) Yes

    2) No

If the answer above is No

    (b)Where did you get the idea of giving your child such foods?

33. Did this child have any illness within the previous two weeks?

    1) Yes

    2) No

35. Where was this child taken for treatment if was ill?

    1) Health facility

    2) Traditional doctor

    3) No where

    4) Others (specify)

36. Did you continue feeding on other foods (at least five small meals) and/or breast feeding (at least 8 times) the ill child?

37. Did you give any fluids to the ill child?

    1) Yes

    2) No

If No, why

38. Breastfeeding myths

Tick the right myth that is being practiced in the community.

1. A woman who becomes pregnant must stop breastfeeding. ( )
2. A baby with diarrhea should not breastfeed. ( )
3. A breastfeeding mother has to drink lots of fluids ( )
4. Breastfeeding women cannot take the birth control pill ( )
5. A breastfeeding baby needs extra water in hot weather ( )
6. The first yellow milk is dirty and not good for the baby. ( )

F. ANTHROPOMETRIC MEASUREMENTS OF A CHILD

Name	Sex	Age	Weight (Kg)	Height (Cm)	BMI

Appendix 2: Food frequency questionnaire

Type of food	Never	Once per week	2-4 times per week	5-6 times per week	Daily
Cereal					
Stiff porridge					
Rice					
Tubers					
Sweet potato (mashed)					
Irish potato					
Green banana					
cassava					
pulses					
beans					
Peas					
Cowpeas					
Fruits					
Tomato					
Mango					
Orange					
Avocado					
Ripe banana					
Pawpaw					
Carrot					
Watermelon					
Passion					
Ripe banana					
pineapple					
Other fruits					
Green vegetables					
Amaranths					

Cabbage					
okra					
Cowpea leaves					
Cassava leaves					
Pumpkin leaves					
Eggplant					
Sweet potato leaves					
Other vegetable					
proteins products					
Meat					
Fish					
Egg					
Pork					
Sardines					
Milk					
Fats					
groundnuts					
coconut					
Oils					
Vegetable oil					
Other fats					
confectionary					
Cake					
Biscuits					
refreshments					
juice					
Soda					
Water					

Appendix 3: Checklist for focus group discussion

1. Should breast feeding be considered important for a baby and why?
2. Should the first yellow sticky milk (colostrum) be fed to children? Probe so as to know the reasons.
3. In this community what time is recommended for mothers to start breastfeeding their infants after delivery? What are the reasons behind.
4. How long are children breast fed in this community? (What are reasons for breast feeding for less than 24 months (< 2 yrs)?
5. What other foods other than breast milk are given to children 0-6months? (list types of food?
6. Why are the reasons for giving other foods to children 0-6 months?
7. In your opinion, at what age should other foods be introduced to children and why?
8. What foods are first introduced to a child when trying to introduce the child to other foods apart from breast milk (lists the food and ask for reasons for the particular foods)?
9. What are the cultural beliefs in the community regarding breastfeeding and why are they done?
10. What are the cultural beliefs in the community regarding feeding other foods to children from 0-6 months and why are they done?