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ASSESSING INFANT AND YOUNG CHILD FEEDING PRACTICES ON NUTRITIONAL STATUS OF CHILDREN (0-23 MONTHS) IN THE KUMBUNGU DISTRICT OF GHANA

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ABSTRACT

Infant and young child feeding practices have been identified as one of the major determinants of children's nutritional status and account to a large extent for the high rates of malnutrition among children in Ghana. This study is aimed at determining infant and young feeding practices in relation to nutritional status of children under two years in the Kumbungu District of Ghana. This was a cross-sectional study conducted on 274 pairs of children and their mothers who were randomly selected. Anthropometric measurements (weight and height/length) were measured to assess the nutritional status of the children. The breastfeeding and complementary practices of the mothers were examined. Purposive sampling was also used to select two mother-to-mother support groups and two focused group discussions were conducted. The relationship of these feeding practices provided by mothers and the nutritional statuses of the children were analyzed using logistic regression analysis.

The prevalence of underweight, stunting and wasting in the study area was 20.8%, 21.9% and 19.7% respectively. Close to 60% of the children (57.8%) were introduced late to the breast. Only 8.1% of the children less than 6 months were receiving exclusive breastfeeding. All the three indices of malnutrition were positively associated with the early introduction of complementary foods. About, 60.0% of children under 6 months were receiving bottle feeding.

Nutrition education; encouraging exclusive breastfeeding and appropriate and timely complementary feeding is important in semi-rural and farming communities in developing countries such as Ghana and in the Kumbungu District to be specific in order to combat the prevalence of childhood malnutrition.

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DECLARATION

Student

I hereby declare that this thesis is the result of my own original work and no part of it has been presented for another degree in this university or elsewhere:

Candidate's Signature……Date:……..

Name: Jane Frances Bajaaba Pedavoah

Supervisor

I hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines on supervision of thesis laid dowm by the University for Development Studies.

Supervisor's Signature…….Date……..

Name: Dr. Benson B Konlaan (PhD)

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DEDICATION

To my beloved daughter Lyza Gabrielle Akiwele Degurah that she may grow in the fear of the Lord.

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ABBREVIATIONS/ACRONYM

ANC	Antenatal Care
BF	Breastfeeding
CDC	Center for Disease Control and prevention
CF	Complementary feeding
CHPS	Community-based Health Planning and Services
CI	Confidence Interval
CWC	Child Welfare Clinic
DHMT	District Health Management Team
GHS	Ghana Health Service
HA	Height for Age
IYCF	Infant and Young Child Feeding
MDG	Millennium Development Goals
MICS	Multiple- Indicator Cluster Survey
MOH	Ministry of Health
NCHS	National Centre for Health Statistics
OR	Odds ratio
PAHO	Pan American Health Organization
RING	Resiliency in Northern Ghana
SD	Standard Deviation
SPRING	Strengthening Partnerships, Results and Innovation in Nutrition Globally
TBA	Traditional Birth Attendant

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TZ	"Tuozaafi"
UDS	University for Development Studies
UNICEF	United Nations Children's Fund
WA	Weight for Age
WFP	World Food Programme
WH	Weight for Height
WHA	World Health Assembly
WHO	World Health Organization

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OPERATIONAL DEFINITIONS

Malnutrition generally refers both to under-nutrition and over-nutrition, but in this study, the term refers solely to a deficiency of nutrition.

Anthropometry: Human body measurements.

Stunting or **Height-for-age** is the proportion of children under-five years who fall below minus 2 and minus 3 standard deviations from the median height-for-age of the WHO (2006) reference value.

Underweight or **Weight-for-age** is the proportion of children under-five years who fall below minus 2 and minus 3 standard deviations from the median weight-for-age of the WHO (2006) reference value.

Wasting or **Weight-for-height** is the proportion of children under-five years who fall below minus 2 and minus 3 standard deviations from the median weight-for-height of the WHO (2006) reference value.

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CHAPTER 1

INTRODUCTION

1.0 Background of Study

Optimal nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. A child who has good nutrition performs better in school, grows into a healthy adult and in turn gives his/her children a better start in life. However, for a child to have a good nutrition basically depends on the feeding practices offered by mothers or care-takers. Millennium Development Goal-1 (MDG-1) is targeted at reducing under-nutrition by half. However, in developing countries 146 million children under-5 years suffer from under-nutrition which is one of the main factors that causes malnutrition (UNICEF, 2007). In Africa, malnutrition continues to contribute to 4.9 million annual child deaths and is a leading cause of diseases and disabilities in children (WHO, 2002; UNICEF, 2007).

Malnutrition contributes to 60% of deaths among children in Sub Sahara Africa annually. In West Africa, twenty-seven countries are making no progress toward Millennium Development Goal-4 (MDG-4) due to chronic malnutrition, and pervasive poverty (WHO, 2006; UNICEF, 2008). The immediate consequences of poor nutrition during the formative years of a child include significant morbidity, mortality, delayed mental and motor development. In the long-term, early nutritional deficiencies are linked to impairments in intellectual performance; work capacity, reproductive outcomes and overall health during adolescence and adulthood. Poor breastfeeding and feeding practices, coupled with high rates of infectious diseases, are the principal causes of malnutrition during the first two years of life (Kramer *et al*, 2001).

Current guidelines for infant feeding, developed jointly by the World Health Organization and the United Nations Children's Fund in 2003, emphasize exclusive breastfeeding for the

first six months of life and the subsequent addition of appropriate complementary foods to meet the increasing energy requirements for infant growth (UNICEF/WHO, 2003). Continued breastfeeding is recommended for the first two years and beyond. These guidelines also emphasize the importance of continued feeding during illness in order to maintain the infant's immune and nutritional status (PAHO/WHO, 2003).

Breast milk alone is the ideal nourishment for infants for about the first six months of life. It contains all the nutrients, antibodies, hormones and antioxidants an infant needs to thrive. It protects babies from diarrhoea and acute respiratory infections, stimulates their immune systems, response to vaccination and confers cognitive benefits as well (Oddy, 2001).

Continued breastfeeding to two years, accompanied by appropriate complementary feeding, maintains good nutritional status and continues to help prevent diarrhoea. It has been estimated that improved breastfeeding practices could save some 1.5 million children a year. Yet few of the 129 million babies born each year receive optimal breastfeeding and some are not breastfed at all (WHO, 2008a). Besides, proper complementary feeding reduces mortality by 6% yet in most developing countries the complementary feed given to these infants and young children are usually contaminated and inadequate (WHO, 2008b). For the reduction by two-thirds of under-five mortality to be achieved, there is the necessity for rapid improvement of feeding of these children. These feeding practices constitute one of the most neglected determinants of young child malnutrition in spite of their important role in growth pattern of children (Childinfo, 2009).

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1.1 Problem Statement

In Sub-Saharan Africa more than one-quarter of the children under five years are underweight and this has caused an aggregation of malnutrition rate of nearly 30.0%. In West Africa, 36.0% of the children under 5 are either moderately or severely underweight (UNICEF, 2008). Narrowing further down to Ghana, the percentage of children

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underweight, stunting (indicating chronic malnutrition) and wasting (indicating acute malnutrition) are 18.3%, 22.4% and 5.4%, respectively (UNICEF, 2008a). The rate of timely initiation of breast milk is still very low in Ghana that is 60% of infants are deprived of this basic right (UNICEF, 2008). One of such areas is the Kumbungu District. According to the District report, the prevalence of underweight of children 0-11 months is 11.7%, 12-23 months is 16.4 and 23-59 months is 12.7% (District Annual Report, 2012). For the past 2 years, the nutritional status of the children under 5 years in the District has been deteriorating at a very alarming rate. It has been estimated that 40.8% of the children under 5 years are underweight (District Annual Report, 2012). However, there are no records on stunting and wasting. Underweight is one indicator of malnutrition which causes low resistance and increases the risk of dying from pneumonia, diarrhoea, malaria, measles and AIDS. These factors together are responsible for half of all deaths in children under five (WHO, 2004). It is important to explore the role of infant and young child feeding practices in the etiology of malnutrition in Kumbungu, since growth retardation is very high among children under two years (critical stage) in the District.

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1.2 Research Questions

1. What is the prevalence of malnutrition (stunting, wasting and underweight) in Kunbungu District

2. What percentage of children (under 6 months) is receiving exclusive breastfeeding in Kumbungu District?

3. What complementary feeding practices are adopted by mothers with children less than two years in Kumbungu District?

4. What is the relationship between child feeding practices and the nutritional status of children under two years in Kumbungu District?

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1.3 General Objective

To assess infant and young child feeding practices and nutritional status of children less than two years in Kumbungu District.

1.4 Specific Objectives

1. To determine the prevalence of malnutrition of children under two years in the District.
2. To study the breastfeeding practices among mothers with children less than two years in the District.
3. To explore the complementary feeding practices among mothers with children under two years in the District
4. To establish the relationship between the feeding practices of children under two years and malnutrition.

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1.5 Rationale of Study

In order to achieve Millennium Development Goal- 4 by 2015, the nutritional status of children under-5 years should not be taken for granted in Ghana. The findings from this research will help to know the actual burden of malnutrition pertaining in the district and will form a baseline for interventional study.

Besides, by the examination of the feeding practices of mothers, an effective health education programme will be drawn. This will take into consideration the local conditions, including culture and availability of local foods so that it can be fully implemented. Furthermore, this research will help to provide to a wide range of individuals, policy makers, program planners, health care providers, and community leaders, scientifically based information necessary to develop culturally appropriate health messages for optimal infant and young child feeding.

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1.6 Conceptual Framework

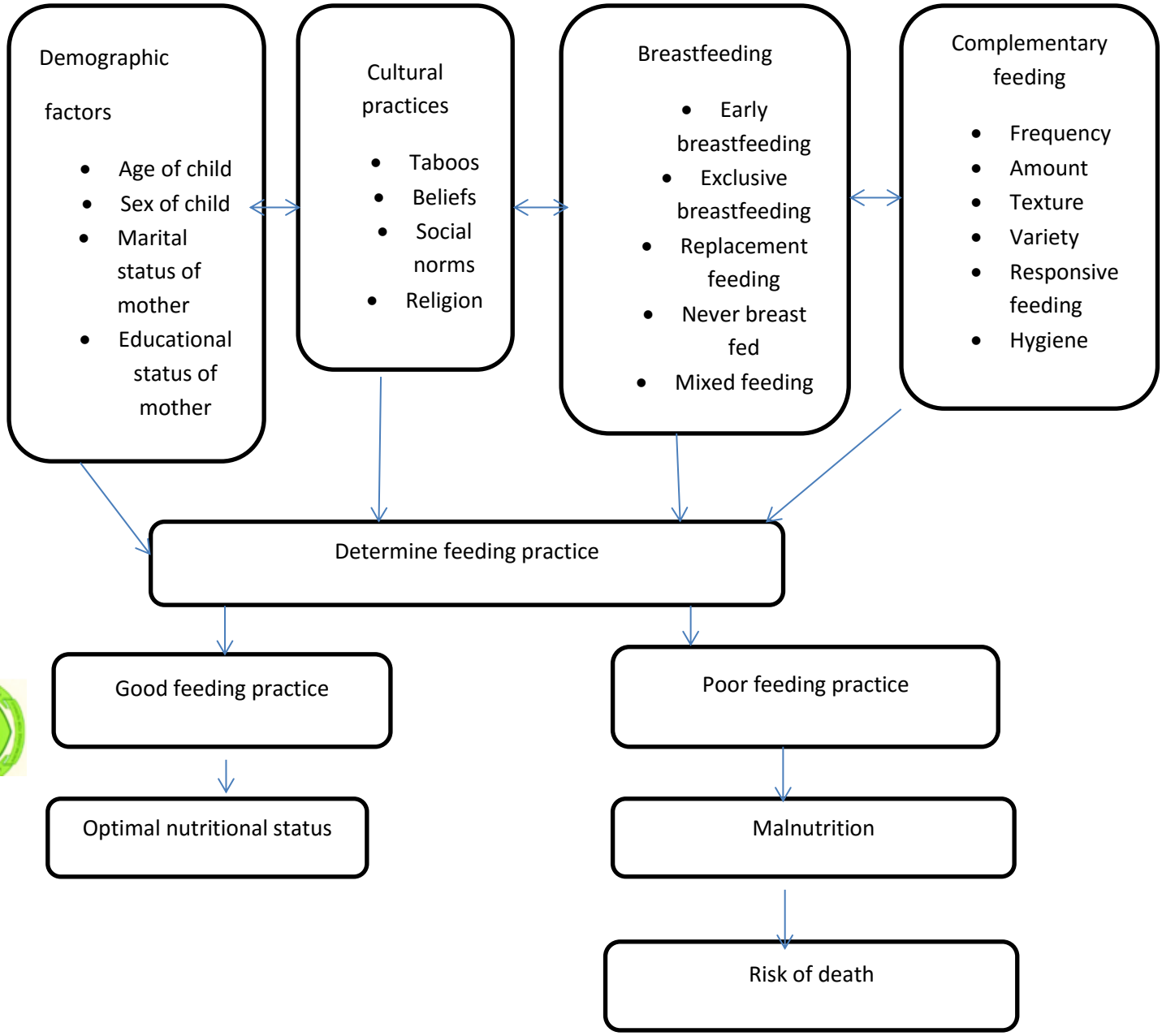

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Figure 1.1: Determinants of Infant and Young Child Feeding practices

Source: Author's work, 2014

Figure 1.1 above shows the factors influencing child feeding practices, and the relationship of such practices with malnutrition.

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A study done in Eritrea has shown that poor feeding practices which lead to malnutrition result from a number of factors which include demographic factors such as the age of child, sex of child, educational level of mother; as the level of maternal education increases, the level of wasting also decreases (ANON, 2003). Breastfeeding practices such as early initiation; initiation of breast milk within the first hour of life and exclusive breastfeeding are important. A study conducted in Ghana revealed that 1,117,000 infants can be saved if mothers are made to initiate breastfeeding within the first hour of life (Edmond *et al* 2007). Breastfeeding on demand maintains good nutritional status (UNICEF, 2007). Complementary feeding practices such as; the texture of food, the amount, the variety, the frequency, hygiene and responsive feeding are factors which when compromised can lead poor feeding which will affect the nutritional status of the child (PAHO/WHO, 2003). Given the established relationship between malnutrition and a range of adverse health outcomes that is to say child mortality, slowed growth, impaired learning abilities (UNICEF, 2009)

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1.7 Research Hypothesis

There is an association between infant and young child feeding practices and nutritional status of children between 0 and 23 months of age.

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CHAPTER 2

LITERATURE REVIEW

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2.0 Introduction

Optimal nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. It has been established that the period from birth to two years of age is a "critical window" for the promotion of optimal growth, health and behavioral development. It is very difficult to reverse stunting in children after 2 years of age (Martorell *et al.,* 1994). Inappropriate feeding practices such as breastfeeding and complementary feeding are responsible for one-third of the cases of malnutrition in infants, and also accounts for the poor nutrition, and over half (53%) deaths by infectious disease (WHO, 2004). Kumar (2006) established the link between malnutrition and child feeding practices.

2.1 The Concept of Malnutrition and its Causes

Malnutrition literally means "bad nutrition" and it entails both over- and under-nutrition. In relation to trends of malnutrition globally, the latter is much prevalent in developing countries including Ghana. The World Food Programme (WFP) defines malnutrition as "a state in which the physical function of an individual is impaired to the point where he or she can no longer maintain adequate bodily performance process such as growth, pregnancy, lactation, physical work or resisting and recovering from disease" (WFP, 2005).

Malnutrition can result from a lack of macronutrients (carbohydrates, protein and fat), micronutrients (vitamins and minerals), or both. Macronutrient deficiencies occur when the body adapts to a reduction in macronutrient intake by a corresponding decrease in activity and an increased use of reserves of energy (muscle and fat), or decreased growth.

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Consequently, malnourished individuals can be shorter (reduced growth over a prolonged period of time) and/or thinner than their well-nourished counterparts. 'Hidden Hunger', or micronutrient malnutrition, is widespread in developing countries. It occurs when essential vitamins and/or minerals are not present in adequate amounts in the diet. The most common micronutrient deficiencies are iron (anaemia), vitamin A (xerolphthalmia, blindness), and iodine (goiter and cretinism). Others, such as vitamin C (scurvy), niacin (pellagra), and thiamin or vitamin B1 (beriberi), also can occur during acute or prolonged emergencies when populations are dependent on a limited, unvaried food source.

2.2 Prevalence of Malnutrition

Stunting or low height for age is caused by long-term insufficient nutrient intake and frequent infections. This generally occurs before age two and its effects are largely irreversible. These effects include delayed motor development, impaired cognitive function and poor school performance. Nearly one-third of children under five years in the developing world are stunted yet there are certain countries where the prevalence exceeds this estimation (UNICEF, 2008a). In Malawi, stunting prevalence was 50% (UNICEF, 2008a). However, in Ghana, the prevalence of moderately and severely stunted are 22.4% and 7.4% respectively among children under five (UNICEF, 2008a). Stunting begins at birth and continues through 40 months but after 24 months it cannot be reversed (WHO, 2006). In Botswana, stunting prevalence was 38.7% (Mahgoub *et. al*, 2006).

However, a study conducted in the Manya Krobo a district in Ghana revealed that 20% of the children under 5 were stunted (Nti, 2007). Wasting or low weight for height is a strong predictor of mortality among children under five. It is usually the result of acute significant food shortage and/or disease. Wasting proportion of under-five falls below minus 2 and minus 3 standard deviations from the median weight-for-height of the WHO/NCHS. There are 24 developing countries with wasting rates of 10 percent or more, indicating a serious

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problem urgently requiring a response (UNICEF, 2007). Underweight or weight for age prevalence is usually the proportion of less than five falling below minus 2 standard deviations (This termed as moderate underweight) and 3 standard deviations (severe underweight) from the median weight-for-age of the WHO/NCHS (UNICEF, 2008). Underweight is reversible and reflect either acute or chronic malnutrition. This implies that weight gain can be adequate even while the process of stunting continues. Usually weight faltering concentrates between 3 and 12 months however, after 12 months the child can be stunted and underweight but his/her weight for height ratio can improves (WHO, 2006; UNICEF, 2007). On the average children in the rural areas are twice as likely to be underweight as those in the urban areas (UNICEF, 2008). The prevalence of underweight in Ghana goes to confirms this. The rates are 11.5% and 21.4% for rural and urban, respectively. Besides usually boys and girls have similar prevalence rates. In Ghana the prevalence is 18.3% and 17.1% for boys and girls respectively (UNICEF, 2008). In Botswana, malnutrition is significantly higher among boys than girls (Mahgoub *et. al,* 2006). In Bangladesh and India, the prevalence of underweight is 48 percent and 45.5%, respectively (Rayhan *et. al,* 2006; ANON, 2006).

Again, severe degree of malnutrition is high in children under two years. This is confirmed by a study done in India where the proportions of underweight (45.5%) and stunting (81.8%) were found maximum among children aged 12-24 months (Ray *et al,* 2001; Kumar D, 2006). In Tanzania, 31% of the children under 5 were undernourished, some (6%) of them severely undernourished (Nyaruhucha *et al,* 2006). A study done in Alexandria revealed that stunting of the infants increases rapidly with age from 12.6% among infants under six months to 30.4% among those aged from 9 - < 12 months. The percentage of stunted infants varied greatly by education of the mothers, it was doubled from 14.7% among those of mothers of high level of education to 28.9% of non-educated mothers with a significant high risk of 2.31

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times (Deghedi *et al*, 1999). Ergin *et al*, (2006), reported in their findings that the prevalence of malnutrition among children under five years in a Turkish population was 10.9% for stunting, 4.8% underweight and 8.2% wasting.

2.3 Breastfeeding

Breastfeeding impacts growth in several ways, such as through reduction of morbidity due to infections, stronger immunological response to disease due to transfer of maternal antibodies and provision of the optimum balance of nutrients, growth factors, enzymes, hormones and other bioactive factors. For example, reviews of evidence on the effects on child health and growth of exclusive breastfeeding for six months have presented lower morbidity from gastrointestinal and allergic diseases, which in turn can prevent growth faltering due to such illnesses (Kramer *et a*l, 2004)

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In addition, breastfeeding and responsive feeding provide constant positive interactions between mother and child which can contribute to emotional and psychological development of infants. There is also strong evidence of higher performance in intelligence tests among those subjects who had been breastfed as infants (Horta *et al*, 2007).

More than one third of child deaths occur during the first fragile month of life while early breastfeeding provides critical nutrients, protects infants against deadly diseases and fosters growth and development (Childinfo, 2009a).

More than 95% of children less than five years in Africa are currently breastfed but this is often inadequate because many people feed their infants with water and other liquids alongside the breast milk. As a result, the rate of exclusive breastfeeding is particularly low in West Africa (Linkage, 2002). Unlike exclusive breastfeeding (EBF), breastfeeding per se is generally not a problem in Ghana. This is evidenced by the fact that as high as 98% of

all infants younger than six months are being breastfed; and even at age 12 - 15 months, 95% of children continue to receive breast milk along with complementary foods.

2.3.0 Initiating Breastfeeding

Growing evidence points to the impact of early initiation of breastfeeding on neonatal mortality. A 2006 study in rural Ghana showed that early initiation within the first hours of birth could prevent 22% of neonatal deaths, and initiation within the first day, 16% of deaths (Edmond *et al*, 2006), while a study in Nepal found that approximately 19.1% and 7.7% of all neo-natal deaths could be avoided with universal initiation of breastfeeding within the first hour and first day of life respectively (Mullany *et al*, 2008).

In 38 out of 60 high mortality countries, the average proportion initiating breastfeeding within the first hour was 36% which predicted that 1 million neonatal lives could have been saved worldwide out of 4 million neonatal deaths (Edmond *et al*. 2006). A study carried out on childhood feeding practices in Ethiopia revealed that 99.8% of the children were initially breastfed. Thus, the initiation of breastfeeding is not a problem (Anon, 2003d). However, in Anganwaris areas of urban Allahabad delayed initiation of breast-feeding and deprivation from colostrum was found among the mothers of children under 5 (Kumar, 2006).

In general, the practice of giving colostrum has turned out to be widespread as early commencement of breastfeeding is improving. Particularly, children in urban areas (55%) are to be expected to be breastfed within the first hour after delivery in dissimilarity to infants in rural and deprived areas (50%) (GSS and ICF, 2009)

2.3.1 Exclusive Breastfeeding

Breastmilk alone is enough to meet all the nutritional needs of infants for the first six months of life. Breastfeeding, especially six months of exclusive breastfeeding, has a significant

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effect in the reduction of mortality from the two biggest contributors to infant deaths: diarrhoea and pneumonia, as well as on all-cause mortality (Black *et al*, 2008).

In 1979 WHO and UNICEF recommended an exclusive breastfeeding (EBF) period of 4 or 6 months however, WHO expert committee in 2001, upon assessing the extent of EBF concluded that for optimal nutritional status of a child, an EBF period of 6 months must be adhered to.

International guidelines recommend exclusive breastfeeding for the first six months based on scientific evidence of the benefits for infant survival, growth, and development. Breast milk provides all the energy and nutrients that an infant needs during the first six months yet barely one in three infants is exclusively breastfed during the first four months of life (WHO, 2008b).

Exclusive breastfeeding, which is, giving only breast milk for the first six months of life, is crucial to preventing the deaths newborns and infants. This practice can prevent an estimated 1.3 million death each year by protecting against diarrhoea, pneumonia and hastens recovery during illness (WHO, 2008b). Unfortunately, many people are unaware of breast milk benefits and in many of the world's poorest countries, water and other liquids are added to the baby's diet for the first months of life risking infection from harmful bacteria and other pathogens (MoH, 2005,). A cross study done in Northern Senegal confirms that water was introduced to 85% of the infants during the first 3 months of their lives even though there was no significant association between the early introduction of water and wasting and stunting of the infants. However, stunting was associated with age and drinking of tap water (Gupta *et al.*, 2007).

In Ghana, water and glucose solutions are widely given to infants, beginning in the first few months of life. Mothers and grandmothers explained that water may be given to infants immediately after birth, because they are thirsty after the exhaustion of the birth process or

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as a cultural gesture to welcome the child into the world. Water also is used to cleanse the mouth of a baby after breastfeeding. In addition, grandmothers believed that "breast food" and water are different and that a baby needs both, just as adults do (Dewey, K. (2003).

A cohort study done in Beijing revealed that infant boys and girls exclusively breast-fed from 0 to 4 months had the highest weight at 0-6 months (Gong *et al*., 2008). A study done in Europe also confirms that the pattern of growth of children who were fed according to the WHO recommendations showed higher weight during the first 2 to 3 months of life and lower weight and length from 6 to 12 months. Between 12 and 36 months of age, differences between groups were small and clinically not relevant (Haschke *et al*, 2000)

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2.3.2 Duration of Breastfeeding

Prolonged breastfeeding is common and the median duration ranges between 16 and 28 months. The statistics in Sub-Saharan Africa shows that: 28% of infants are exclusively breastfed up to 6 months; 65% of children 6-9 months with complementary feeding; and 38% of children less than five years are stunted. The trend in various countries in West Africa varies. As far as exclusive breastfeeding is concerned, the trend is as low as 6% in Burkina Faso, 10% in Cote d'Ivoire, 18% in Togo and 17% in Nigeria. In relation to the practice of complementary feeding with breast milk for aged 6-9 months the rates are: 49% in Burkina Faso, 54% in Cote d'Ivoire, 65% in Togo and 63% in Nigeria (UNICEF, 2004).

A study done in Europe showed that the duration of breast-feeding was negatively correlated with increment in length and weight until 12 and 24 months (Haschke *et al*, 2000). A study done in Tanzania showed that breastfeeding duration of more than one year was common among the mothers however; fifty-four percent of the mothers weaned their children as early as two months after birth (Nyaruhucha *et al*., 2006).

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2.3.3 Termination of Breastfeeding

Knowledge of exclusive breastfeeding by mothers often leads to an improvement in complementary feeding practices (Lisa *et al*., 2000). In India an interventional study where nutritional education was given to mothers to improve awareness about infant feeding in the variety, quantity, quality and consistency of complementary feeding showed that, 80% initiate breastfeeding after 3 days of birth, 54.3% absence of exclusive breastfeeding 86% delayed complementary feeding practices which were inadequate in quality, quantity, frequency and consistency (Sethi *et al.*, 2002).

Breastfeeding on demand, continued breastfeeding to two years, accompanied by appropriate complementary feeding, maintains good nutritional status and continues to help prevent diarrhoea (UNICEF, 2007). Average length of breastfeeding nevertheless, is a bit higher among children in rural and deprived areas (21 months), compared with 19 months for those in urban areas (GSS/ICF Macro, 2009). Just like breastfeeding, weaning is equally a process rather than an episode; a process that comprises three related stages: introduction of complementary foods; the period of complementary feeding along with breastfeeding; and the cessation of breastfeeding (Moffat, 2001).

Inadequate food intake and/or poor nutrient content of the weaning foods in each of the three stages could lead to negative growth outcomes such as stunting and wasting. In Ghana for instance, children (29%) aged 6 to 8 months bear the highest burden of wasting while those between ages 18 to 23 months (40%) are more likely to be stunted than those less than 6 months (4%) old (GSS /IFC Macro, 2009).

2.4 Complementary Feeding

After six months of age, to meet all of a child‘s nutritional requirements, breastmilk needs to be complemented by other foods, although it continues to be an important source of nutrients as well as impacting disease morbidity and mortality (Jones *et al*, 2003). At this

age children have high nutritional needs for rapid growth, and appropriate complementary feeding provides key nutrients (e.g. iron and other micronutrients, essential fatty acids, protein, energy, etc.). Inadequate complementary feeding lacking in quality and quantity can restrict growth and jeopardize child survival and development.

Complementary food is the additional nutrient-rich food and drink that is recommended for children from six months of life. The transition from exclusive breastfeeding to complementary feeding (which includes continued breastfeeding) typically covers the period from 6 to 18–24 months of age. This is a very vulnerable period as it is the time when malnutrition starts in many children. Thus, it is essential that infants receive appropriate, adequate and safe complementary foods to ensure the right transition from breastfeeding to the full use of family foods. Most nutritionists agree that children need solid food in addition to breast milk when they are age 4-6 months in order to reach their full growth potential (Dewey et. al., 1999). Improper complementary feeding was found as significant ($P < 0.05$) risk factors for underweight in Anganwari areas of urban Allahabad (Kumar, 2006).

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However, available data on the global situation of complementary feeding provide some insight to the extent of the problem (WHO, 2010). According to the State of the World‘s Children 2010, only 58 percent of breastfed children between the ages of six and nine months in developing countries had received any complementary foods in the past 24 hours.

2.4.0 Introduction of Complementary Foods

Time of introduction and type of complementary food given to an infant are very important for the child’s nutritional status. According to current recommendations (WHO 1995, 1998; Agnerson *et al.*, 2005), complementary feeding should be introduced into child’s diet starting around the age of 6 months. Castle and others, 2001 observed, a strong association was found between age of introduction of complementary feeding and child nutritional status. Significantly more mothers of malnourished children (34%) introduced complementary

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feeding before 6 months of age than mothers of well-nourished children (5%). In Bangladesh, complementary feeds were started by mothers when their infants were 27 days. Mothers reasons for this are the fact that breast milk is not sufficient and causes diarrhea. The conclusion was that early complementary feeding is associated with infant malnutrition (Haider *et al.*, 1996). Similarly, in Northern Senegal, 60% of infants were fed with complementary foods before they were 6 months (Gupta *et al*., 2007). However, a study conducted in Mali revealed that many infants were not introduced to complementary feeds until they were 6 months yet all of them had already been given water. Thus, none of the infant was exclusively breastfed (Anon, 2002). A study conducted in the Manya Krobo district of Ghana revealed that 14% of the children at the age of 3 months were receiving complementary feeding (Nti, 2007).

2.4.1 Type of Complementary Food

Though the primary causes of growth differentials in children could be many, weaning foods nevertheless remain a key determinant. This is pretty evidenced by observations that children in both industrialized and developing countries experience early growth patterns that are comparably the same during the period of EBF (Waterlow, 1981 cited in Weaver, 1994). According to Weaver (1994), weaning foods should under ideal circumstance be clean, contain high energy and protein, easy to ingest and digest, culturally appropriate, and locally available. In many traditional communities however, complementary foods are often made from cereal based flours such as maize, rice, etc. that are not only difficult to digest but nutritionally poor.

Nti and Lartey (2007) in a study on young child feeding practices and nutritional status in rural Ghana reported a general use of *unfortified koko* (a low nutrient porridge) as the first complementary food among 65% of mothers. Only 27% of the respondents studied had

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fortified their complementary food with legume flour and groundnut paste. Similar observations were made by Fjled *et al.* (2008) in the city of Mazzuka in southern Zambia, where the common complementary food that is introduced from age 2 to 6 months is maize flour light porridge often fortified with vitamin A, salt, pounded groundnut etc.

A scientific review on complementary feeding has revealed that porridge, (koko), and other forms of food given to children less than five are inadequate (Brown, 1998). A study done in Tanzania revealed that the most common type of weaning food was maize porridge (gruel) mixed with cow's milk (46%) (Nyaruhucha *et al*, 2006). However, in Senegal, the main food items were watery millet gruel and family diet (millet or rice). Gruel was given in response to perceived breast-milk insufficiency. Length-for-age and weight-for-length were significantly lower among infants supplemented with millet gruel (Simondon *et al*, 1995)

2.4.2 Frequency of Feeding

The minimum feeding frequencies recommended, the number of times a child must be fed with complementary feed depends on his/age and whether the child is been breastfed or not. Guidelines for breastfed children are: At 6 months start complementary foods with a frequency of 2 to 3 meals per day, the amount should be 2 to 3 tablespoons full per meal and then you increase it gradually, the texture of the food should be thick and it should contain a variety of animal foods, legumes, staples and fruits/vegetables. For infants from 6 up to 9 months, the frequency should 2 to 3 meals, the amount should be 2 to 3 tablespoonsful per feed and increase gradually to half of 250ml cup/bowl, the texture is thick porridge/mashed/pureed family foods and it should be a variety of animal foods, legumes, staples and fruits and vegetables. From 9 up to 12 months, the infant should be given 3 to 4 meals per day, the amount should be half of 250ml cup/bowl, the texture should be finely chopped family foods, finger/sliced foods with a variety of animal food, legumes, staples and fruits and vegetables. From 12 up to 24 months, the infant should be given 3 to 4 meals

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per day, the amount should be three-quarters to 250ml cup/bowl, the texture should be sliced/family foods and should include a variety of animal food, legumes, staples and fruits and vegetables. Responsive feeding is very important in complementary feeding, the caregiver should be able to identify and interpret the infant's cues that communicate feeding needs. Hygienic practices are also important in complementary feeding, washing hands with soap and water before feeding the infant, after changing the infant's diapers and a place of convenience for the household (PAHO/WHO, 2003). For non-breastfed infants and children 0-23 month, meals should be given 4-5/day, with 1-2 snacks as desired (WHO, 2005).

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2.5 Bottle-Feeding

In a study in south India, mothers were counseled about the choice of appropriate complementary foods and feeding frequency. The intervention group had improved feeding practices such as avoiding of feeding bottle and increased various type of complementary food improvement (Hague *et al.*, 2002). Bottle-feeding is practiced by 2% and 3% of mothers of infants under four months in Eritrea and Zambia (ANON, 2002; ANON, 2003).

Unlike countries including Namibia, Nigeria, Tunisia, and Sudan, where the rate of bottle-feeding is as high as 30% (Sante, 2002), the percentage of bottle-fed infants in Ghana is estimated at 5% among infants younger than 2 months and 21% among those aged 6-8 months (GSS/ICF Macro , 2009).

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CHAPTER 3

METHODOLOGY

3.0 Introduction

This chapter seeks to address the methodology that was employed in the study. It basically talks about the study area, type of study, the study population and sample size, data collection tools and techniques, data analysis and handling and ethical consideration**.**

3.1 Study Area

Kumbungu district is one of the 26 districts in the northern region. The district has five sub-districts. The district shares boundary with Tamale Metro to the South, West Mamprusi and West Gonja to the North, Savelgu District in the East and Tolon district in the West respectively. The district has one hundred and forty two (142) communities.

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3.1.0 Climate

Temperatures are generally high with the maximum of 42°C occurring in the dry season, between March and April. Temperatures are lowest (21°C) between December and January. The mean monthly temperature is 27.0°C. The dry season is characterized by the Harmattan wind, which is dry, dusty and cold in the morning and very hot at noon. Humidity is very low causing dry skin and cracked lips to human beings.

The rainfall pattern is erratic, beginning in early May to late October. The peak of the rainfall is in July and august with prolonged dry spells in September. Erosion and floods are common due to the torrential nature of the rains. The irregular distribution of the rainfall is a great limitation to crops and vegetative growth.

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3.1.1 Population Characteristics

The district has an estimated population of 55,412 (a projection from the 2010 Population Census with 2.8 % growth rate) with approximately 142 communities, which are sparsely populated and far apart. The main ethnic group is Dagomba with the immigrant population being of various extractions, for example, Dagarbas and Frafras. Languages spoken include Dagaare, Frafra, Dagbani, Mamprusi, Hausa and English.

Religious practices include that of the **Traditionalists**, the **Christianity** and **Islam**. The Paramount Chief, the Kumbunlana and his sub- divisional chiefs and elders rule the land. Festivals celebrated include the '**KpiniChugu**", "**konyuruChugu**", ***ChimsiChugu***, ***BugumChugu*** *and* ***DambaChugu*** festivals.

Literacy in the district is low (21%). This is particularly the case with the girl-child and the women-folk. They form the most vulnerable groups in the society and therefore are targeted for Reproductive and Child Health services as Women-in-Fertile Age (WIFA) group and Children less than five (5) years of age.

3.1.2 Sanitation

Sanitation is very poor in the district. The people go to toilet in the open and in the bush is common practice. Garbage and refuse are littered all around and in the major towns there are a few refuse dumps. About 10% of the population have access to build toilets. There is no cesspit in the district to dislodge liquid waste in the district.

3.1.3 Potable Water

The major sources of water supply in the district include the following: wells, boreholes, hand-dug wells and pipe borne water.

3.1.4 Economic Activities

The main economic activity is farming with the cultivation of food crops such as yams, maize, beans, groundnuts, and green leafy vegetables. The women and children throughout the district also engage in picking of shear nuts extensively, and the oil extracted for domestic and commercial purposes. Cattle, sheep, goat and guinea fowl rearing is also carried out.

A small proportion of the population is involved in trading. There are market days, which occur once in a week in the district capital. These fall to a large extent on different days of the week allowing the movement of traders and buyers from other parts of the district and beyond to transact business throughout the district.

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3.1.5 Transportation

Means of transport is always available, one can move in and out of Kumbungu within 24 hours under normal circumstances whilst relying on public means. Motorcycles are used to a great extent bicycles rather less.

3.1.6 Health Infrastructure

The district has ten (10) health facilities namely: Kumbungu health centre**,** Kings Medical centre**,** Kpulinyin CHPS, Gbullung Clinic**,** Gizaa CHPS**,** Voggu CHPS**,** Cheshegu CHPS**,** Mbanayili CHPS**,** Dalun health centre**,** Singa CHPS. The Reproductive and Child Health unit offers all Public Health services. The CHPS zone offers public health services as well as curative services and the health Centre also offers OPD service.

3.2 Study Design

The study is a descriptive study with an analytical cross sectional design conducted to examine infant and young child feeding practices and nutritional status of children less than two years in Kumbugu district.

3.3 Study Population

The study included all households within the communities with children less than two years and their mothers in Kumbungu District.

3.4 Sample Size

The sample size for this study was determined using the following formula (Snedecor and Cochran, 1989).

$N=z^2\ pq/d^2$ where

N is the sample size desired

z is the statistical certainty chosen= 1.96 at a confidence level of 95%

p is the estimated prevalence of malnutrition = 0.22

q is the proportion of well- nourished children = 1-p = 1-0.22=0.78

d is the precision desired = 0.05 (5%)

$$n = \frac{(1.96)^2 \times (0.22)(0.78)}{(0.05)^2}$$

$$n = \frac{3.8416 \times 0.1716}{0.0025}$$

n = 263.68 = 264

An attrition value of ten (10) was added. Therefore the sample sized that was used for the study was 274 women with children aged 0-23 months.

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3.5 Sampling Techniques

A simple random sampling was made. The data was collected from all the five sub-districts. In kumbungu sub district, 67 children were sampled, 57 from Dalun sub district, 55 from Gbullung sub district, 50 from Gupanarigu sub district and 45 from Voggu sub district which have the following total number of children under five 465, 341,264, 248 and 233 respectively.

In each sub-district, 5 communities were chosen; making a total 25 communities. The communities were listed according to numbers. The numbers were written on pieces of paper. Each paper was folded and put in a box and some selected people were asked to pick from the box. Any number that was picked, the community with that number was selected. Choosing the households was done by counting the houses from the chief's palace, each third house was chosen but if a house was chosen and there was no child less than two years then the next house was selected. In a single household only one child was selected if there was more than one child who qualified for the study, then one of them was randomly selected. Children who were reported to be sick by their mothers were excluded.

Purposive sampling was used to sample two mother-to-mother support groups for two focused group discussions to be held. This was done because they were the only functional mother-to-mother support groups in the selected communities during the time of data collection.

3.6 Study Variables

Variables were categorized into dependent and independent variables

Dependent Variable: Nutritional status (Stunting, Underweiught and Wasting)

Independent Variables: initiation of breastfeeding, exclusive breastfeeding, breastfeeding on demand, time of weaning, early introduction of complementary feeds, frequency of

feeding, types of complementary foods, educational level, age of mother, marital status, religion, occupation of mothers, occupation of fathers, parity.

3.7 Data Collection Techniques and Tools

Primary data was collected by the administration of semi-structured questionnaires which were made up of both open and close-ended questions. Besides, focus group discussions for mothers were held. The nutritional status was determined using anthropometric measurements. The tools used in the collection of anthropometric data collection were Salter Hanging scale and Infantometer.

Recumbent length was measured with an infantometer copy of UNICEF prototype ranging from 30-110 cm. The young children were held by their mothers to foster a sense of security for the baby. In measuring the length, diapers were removed because they might make it difficult to hold and straighten the baby's legs together. The child's head was positioned so that the crown touched the headboard which helped to position the head and his/her body laid flat on the board. The child's feet were placed flat against the foot piece and the knee held to straighten the legs.

In weighing the children, they were put in weighing pants and hanged gently on the hook of the scale, which was already hanging on a firm support. The scale was then read at the eye level and recorded using a pencil.

3.7.0 Focus Group Discussion

Focused group discussions were held Mother-to-Mother Support Groups about infant and young child feeding practices women in their communities adapted and also resources available in the communities to improve nutritional status of their children.

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3.8 Pre -Testing

Data collection technique and tools were pre-tested at Tolon District which has similar profile as Kumbungu in terms of socioeconomic factors. Corrections were made where necessary. The tools were checked for validity and reliability.

3.9 Data Handling

Two research assistants were identified and trained to standardized data collection procedures. Soft copies of data were coded and hard copies were locked in a locker in the office of the principal researcher. Data entry and cleaning was done on a computer using SPSS programme. Regular verification and validation of data sets was done. Logical and consistency checks were programmed into data entry system. Also, data set was checked regularly during field work. All inconsistencies were resolved through discussion by research team.

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3.10 Data Analysis

The Data was analyzed based on the stated objectives using Epi-ena for SMART 2011, SPSS and Epi-info software. Where appropriate, results were presented as frequencies, tables, bar graphs. The sex specific WHO 2006 reference curves for height-for-age, weight-for-age, and weight-for-height incorporated in Epi info software was used to transform the anthropometric data that was obtained into weight-for-age (W/A), height-for-age (H/A) and weight- for- height (W/H). Some statistical assessment was made by comparing means, standard deviations and 95% confidence intervals (CI95%) where appropriate. Multivariate and regression analysis were done and Odds Ratios were used to determine the relationships and strength between variables. Level of significance was set at $P < 0.05$. The confounding factor of infection and disease was dealt with by not including sick children. Qualitative data was analyzed manually.

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3.11 Quality Control

1. The sample size was a true representation of the study population

2. All selected participants fully participated for a correct assessment to be made

3.12 Ethical Consideration

Permission for this research was obtained from the District Health Administration (DHA), the Chiefs and Assembly men of the communities as well as individuals who were interviewed. Mothers, families and all participants were educated on the relevance of the study and were included in the research based on their decision to participate. All information provided to the interviewers was strictly confidential and records were securely stored in a locker. Feedbacks were also sent to the DHA and the communities as they have freely participated and devoted their time for the study.

3.13 Limitation of Study

There was a problem of recall bias concerning some feeding practices such as initiating breastfeeding and breastfeeding on demand among others.

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CHAPTER 4

RESULTS

4.0 Introduction

This chapter provides detailed analysis to describe the influence of Infant and Young Child Feeding (IYCF) practices on the nutritional status of children (0-23 months) in Kumbungu District, the nutritional status of children 0-23 months in the study area, the breastfeeding practices among mothers of studied children, complementary feeding practices among children 6-23 months, and the relationship between the feeding practices among children 0-23 months and their nutritional status.

A total of 274 women were sampled for the interview and were all included in the analysis.

4.1 Socio-demographic Characteristics of Respondents

Of the 274 respondents studied, the mean age was 27.5 ± 2.6 years with the minimum and maximum ages of 20 and 40 years respectively.

Almost all the respondents (99.3%) were married with more than half (56.6%) of the respondents having less than four children. Majority of the respondents (83.6%) had no form of formal education. Almost all the respondents (98.5%) were Muslims and majority of the respondents (79.9%) belong to small households (<6 member households). The study area was predominantly farming communities as more than two-thirds (93.4%) of the respondents used farming as a main source of livelihood (Table 4.1).

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Table 4.1: Showing the Socio-demographic characteristics of the respondents, their frequencies and percentages n= (274).

Variable	Frequency	Percentage
Age of respondents		
19-24	75	27.4
25-29	103	37.6
30-34	69	25.2
35-39	22	8.0
40-44	5	1.8
Marital status		
Co-habiting	2	0.7
Married	272	99.3
Number of children		
< 4 children	155	56.6
4 + children	119	43.4
Educational level of Respondent		
None	229	83.6
Primary	32	11.7
JHS	8	2.9
SHS/Vocational	5	1.8

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Religion		
Christian	4	1.5
Muslim	270	98.5
Size of family		
Small (< 6 members)	219	79.9
Large (6 + members)	55	20.1
Husband's occupation		
Government worker	6	2.2
Farmer	256	93.4
Unemployed	3	1.1
Others	9	5.3

Source: Field survey (2014)

4.2 Nutritional Status of Children Under Two Years

The prevalence of underweight, stunting and wasting in the study area was 20.8%, 21.9% and 19.7% respectively (Figure 4.1).

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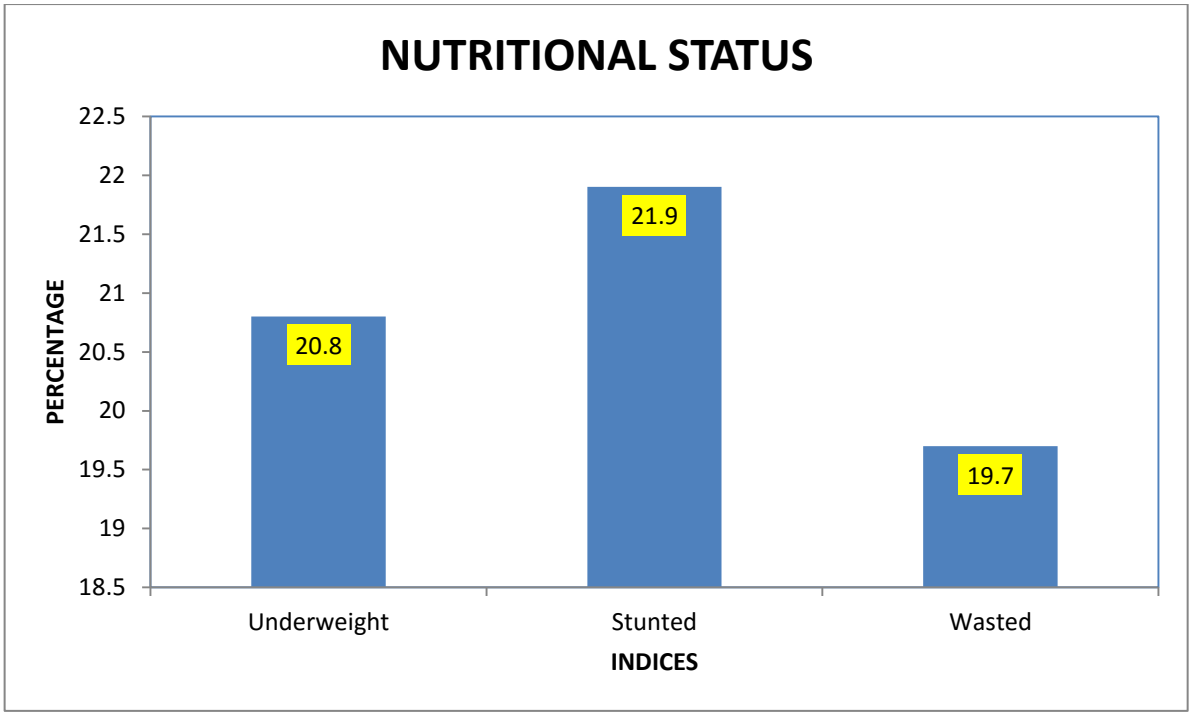

Figure 4.1: Nutritional Status of children under two years

The finding of this study shows a significant association between the age of child and nutritional status. Underweight and stunting were found to be significantly associated with the age of child ($p<0.001$ and $p=0.030$ respectively). The older the child, the more malnourished they are. Malnutrition was observed among children older than nine (9) months. However, although wasting also showed similar trend, the association was not significant ($p=0.060$) (Table 4.2).

Sex of child however, did not show significant relationship with the nutritional status of children ($p>0.05$) although malnutrition was more observed among male children (Table 4.2).

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Table 4.2: Showing the Nutritional Status by Age and Sex of children (n=274)

Variable	N	Nutritional status		X^2	p-value
		Normal	Malnutrition		
Age					
			Underweight		
<6 months	119	107(89.9)	12(10.1)	24.54	<0.001
6-9 months	37	33(89.2)	4(10.8)		
10-12 months	33	21(63.6)	12(36.4)		
13-23 months	85	56(65.9)	29(34.1)		
			Stunting		
<6 months	119	98(82.4)	21(17.6)	8.86	0.030
6-9 months	37	33(89.4)	4(10.8)		
10-12 months	33	25(75.8)	8(24.2)		
13-23 months	85	58(68.2)	27(31.8)		
			Wasting		
<6 months	119	103(86.6)	16(13.4)	7.33	0.060
6-9 months	37	31(83.8)	6(16.2)		
10-12 months	33	24(72.7)	9(27.3)		
13-23 months	85	62(72.9)	23(27.1)		

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Sex					
			Underweight		
Male	151	115(76.2)	36(23.8)	1.89	0.17
Female	123	102(82.9)	21(17.1)		
			Stunting		
Male	151	114(75.5)	37(24.5)	1.34	0.25
Female	123	100(81.3)	23(18.7)		
			Wasting		
Male	151	119(78.8)	32(21.2)	0.47	0.49
Female	123	101(82.1)	22(17.9)		

Source: Field survey (2014)

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The study showed that, all the mothers had ever breastfed their children. The results showed that 89.4% of the mothers initiated breastfeeding on the first day of their delivery; of which almost half (46.5%) of them did initiate breastfeeding after an hour of delivery. Almost all (99.6%) the children studied were still breastfeeding at the time of the study. More than half (59.2%) of the mothers studied practiced exclusive breastfeeding. There was sub-optimal breastfeeding practices observed among the mothers studied as most (70.4% and 92.0%) of them breastfed their children not up to the recommended minimum of six times during the day and night respectively. The study revealed an average of 5.3 and 3.6 number of breastfeeds during the day and night respectively (Table 4.3).

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Table 4.3: Breastfeeding Practices of Respondents

Item	Frequency	Percentage
Initiation of breastfeeding (Days)		
First day	245	89.4
Second day	27	9.9
Third day	2	0.7
Initiation of breastfeeding (Time)		
Within 30 minutes	57	23.3
Within 1 hour	74	30.2
More than 1 hour	114	46.5
Still breastfeeding		
Yes	273	99.6
No	*1	0.4
Do you give water to child		
Yes	206	75.2
No	68	24.8
Age water was introduced to child		
< 6 months	81	39.3
At 6 months	122	59.2
>6 months	3	1.5

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Number of times breastfed during day		
<6 times	193	70.4
6+ times	81	29.6
Number of times breastfed during night		
<6 times	252	92.0
6+ times	22	8.0

Source: Field survey (2014)

*Mean number of breastfeeds per day and night were 5.3 (5.02-5.67) and 3.6 (3.49-3.80) respectively.

*Stopped breastfeeding at 21 months

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Almost half (43.7%) of the children less than 6 months studied were already given water (Table 4.4).

Table 4.4: Distribution of Children given Water expressed in Percentages n (%)

Age group of child	**Is child given water**		
	Yes	**No**	**Total**
< 6 months	52(43.7)	67(56.3)	**119**
6-9 months	36(97.3)	1(2.7)	**37**
10-12 months	33(100)	-	**33**
13-23 months	85(100)	-	**85**

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Total	**206(75.2)**	**68(24.8)**	**274**

X^2=11.87, p<0.001

Source: Field survey (2014)

The study found a significant relationship between age of child and time of introduction of water (p<0.001). Of the children less than 6 months, majority (84.6%) were introduced to water before 6 months. However, majority (77.8%, 84.8% and 68.2%) of the children aged 6 to 9 months, 10 to 12 months, 13 to 23 months respectively were introduced to water at 6 months of age (Table 4.5).

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Table 4.5: Age Child was introduced to Water expressed in Percentages n (%)

Age group of child	**Age water was introduced to child**			
	< 6 months	**At 6 months**	**> 6 months**	**Total**
< 6 months	44(84.6)	8(15.4)	-	**52**
6-9 months	7(19.4)	28(77.8)	1(2.8)	**36**
10-12 months	5(15.2)	28(84.8)	-	**33**
13-23 months	25(29.4)	58(68.2)	2(2.4)	**85**
Total	**81(39.3)**	**122(59.2)**	**3(1.5)**	**206**

X^2=63.70, p<0.001

Source: Field survey (2014)

There was no significant relationship found between age of child and number of breastfeeds during both day and night although more of the children aged between 10 and 12 months met the minimum number of breastfeeds of 6 plus times compared to the other age groups during the day time. However, during the night the recommended minimum number of

breastfeeds was more observed among children less than 6 months compared to the other age groups (Table 4.6 and 4.7).

Table 4.6: Number of times Child is Breastfed during the day expressed in Percentages n (%)

Age group of child	Number of times breastfed during day		
	< 6 times	**6+ times**	**Total**
< 6 months	80(67.2)	39(32.8)	**119**
6-9 months	27(73.0)	10(27.0)	**37**
10-12 months	19(57.6)	14(42.4)	**33**
13-23 months	67(78.8)	18(21.2)	**85**
Total	**193(70.4)**	**81(29.6)**	**274**

X^2=6.20, p=0.10

Source: Field survey (2014)

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Table 4.7: Number of times Child is Breastfed during the night expressed in Percentages n (%)

Age group of child	Number of times breastfed during night		
	< 6 times	**6+ times**	**Total**
< 6 months	106(89.1)	13(10.9)	**119**
6-9 months	35(94.6)	2(5.4)	**37**
10-12 months	31(93.9)	2(6.1)	**33**
13-23 months	80(94.1)	5(5.9)	**85**
Total	**252(92.0)**	**22(8.0)**	**274**

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X^2=2.40, p=0.49

Source: Field survey (2014)

Out of the 274 children studied, 154 children representing 56.2% had already started complementary feeding and 19.5% of the children were given porridge only as complementary food whiles 64.3% were given porridge, rice and TZ. Less than half (45.5%) of the children had started complementary feeding at the age of 6 months. More than half (61.7%) of the children were fed 3 times in a day and most (74.7%) of the children were given snacks in between main meals. More than half (59.1%) of the children were reported to have consumed a fruit with shea fruit being the most (54.9%) consumed fruit among the children studied. Most of the children (63.6%) were reported to have consumed a vegetable with bra being the most (49.0%) consumed vegetable.

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Table 4.8: Complementary Feeding Practices

Item	Frequency	Percentage
Have you started complementary feeding		
Yes	154	56.2
No	120	43.0
Age complementary feeding was started		
< 6 months	20	13.0
6 months	70	45.5
>6 months	64	41.6
Type of complementary foods		
Koko	30	19.5

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Rice	1	0.6
Koko and rice	7	4.5
Koko and TZ	14	9.1
Rice and TZ	3	1.9
Koko, rice and TZ	99	64.3

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Number of times complementary food is given		
2 times	38	24.7
3 times	95	61.7
4 times	21	13.6
Snack given between meals		
Yes	115	74.7
No	39	25.3
Consumption of fruits in the last 24 hours		
Yes	91	59.1
No	63	40.9
Types of fruits consumed		
Mango	28	30.8
Banana	10	11.0
Orange	3	3.3
Shea fruits	50	54.9

Consumption of vegetables in the last 24 hours		
Yes	98	63.6
No	56	36.4
Types of vegetables consumed		
Ayoyo	37	37.8
Bra	48	49.0
Aleefu	9	9.2
Kuuka	4	4.1

Source: Field survey (2014)

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The study found that some of the children (5.9%) were introduced to other liquids and semi-solid foods aside water when they were below 6 months of age and there was a significant relationship between age of child and start of complementary feeding. Start of complementary feeding increased as child advanced in age (Table 4.9).

Table 4.9: Child started Complementary Feeding expressed in Percentages n (%)

Age group of child	**Started complementary feeding**		
	Yes	**No**	**Total**
< 6 months	7(5.9)	112(94.1)	**119**
6-9 months	29(78.4)	8(21.6)	**37**
10-12 months	33(100)	-	**33**
13-23 months	85(100)	-	**85**
Total	**154(56.2)**	**120(43.8)**	**274**

X^2=221.76, p<0.001

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Source: Field survey (2014)

Data from the field revealed that, among children less than 6 months, majority (71.4%) had already started complementary feeding, those between 6 and 9 months and 10 and 12 months majority (48.3% and 54.5% respectively) started complementary feeding when the children were exactly 6 months old. However, those between 13 and 24 months majority (47.1%) started complementary feeding when the children were more than 6 months (Table 4.10).

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Table 4.10: Age of Child and time Complementary Feeding started expressed in Percentages n (%)

	Age complementary feeding started			
Age group of child	**< 6 months**	**6 months**	**> 6 months**	**Total**
< 6 months	5(71.4)	2(28.6)	-	**7**
6-9 months	5(17.2)	14(48.3)	10(34.5)	**29**
10-12 months	1(3.0)	18(54.5)	14(42.4)	**33**
13-23 months	9(10.6)	36(42.4)	40(47.1)	**85**
Total	**20(13.0)**	**70(45.5)**	**64(41.6)**	**154**

X^2=26.86, p<0.001

Source: Field survey (2014)

The reason the mothers gave for the late introduction of semi-solid or solid foods during a focus group discussion is because the mother has plenty breast milk. One woman in a focus group discussion (with an 8 month old child) reported that "*Usually I have plenty milk in my breast and therefore do not see the need to start giving my child any special complementary food"* (Mma Ayishetu, Gupanarigu).

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Local complementary foods which have been reported to be given to the children under the study included koko, rice, and "TZ". The study found a significant relationship ($p<0.001$) between type of complementary food given and the age of children. Children of younger ages (<6 months) are started on porridge only and as they grow other semi-solid foods are added or started and gradually stop or shift from the porridge based to more semi-solid as the child ages (Table 4.11).

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Table 4.11: Type of Complementary Food given to Child expressed in Percentages n (%)

	Type of complementary food						
Age group of child	**Koko**	**Rice**	**Koko and rice**	**Koko and TZ**	**Rice and TZ**	**Koko, rice and TZ**	**Total**
< 6 months	7(100)	-	-	-	-	-	**7(100)**
6-9 months	18(62.1)	-	2(6.9)	3(10.3)	-	6(20.7)	**29(100)**
10-12 months	3(9.1)	-	1(3.0)	4(12.1)	2(6.1)	23(69.7)	**33(100)**
13-23 months	2(2.4)	1(1.2)	4(4.7)	7(8.2)	1(1.2)	70(82.4)	**85(100)**
Total	**30(19.5)**	**1(0.6)**	**7(4.5)**	**14(9.1)**	**3(1.9)**	**99(64.3)**	**154(100)**

$X^2=89.04$, $p<0.001$

Source: Field survey (2014)

There was a significant relationship (p=0.02) found between number of complementary feeds given and the age group of children studied. Number of feeds given increased as the child advances in age and majority (57.1%, 48.3%, 63.6%, and 65.9%) of the children were fed three (3) times a day in addition to breast milk among all the age groups (<6, 6-9, 10-12, 13-23 months respectively) (Table 4.12).

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Table 4.12: Number of times Complementary Food is given and Age of Child expressed in Percentages n (%)

	Number of times of complementary feeding			
Age group of child	**2 times**	**3 times**	**4 times**	**Total**
< 6 months	3(42.9)	4(57.1)	-	**7**
6-9 months	14(48.3)	14(48.3)	1(3.4)	**29**
10-12 months	6(18.2)	21(63.6)	6(18.2)	**33**
13-23 months	15(17.6)	56(65.9)	14(16.5)	**85**
Total	**38(24.7)**	**95(61.7)**	**21(13.6)**	**154**

X^2=15.04, p=0.02

Source: Field survey (2014)

Consumption of infant formula was not observed to be common among the children studied as less than one-third (16.8%) of the children studied were reported to have consumed infant formula of which cerelac was the most (95.7%) consumed infant formulation. Majority (71.5%) of the children studied were not fed using a feeding bottle (Table 4.13).

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Table 4.13: Consumption of Infant Formula

Item	Frequency	Percentage
Infant formula		
Yes	46	16.8
No	228	83.2
Type of infant formula		
Lactogen	2	4.3
Cerelac	44	95.7
Has child been fed using feeding bottle		
Yes	78	28.5
No	196	71.5

Source: Field survey (2014)

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4.3: Relationship between Feeding Practices and Nutritional Status

4.3.0 Underweight

Introduction of water to children was found to have a significant relationship with underweight in a binary analysis. Majority of those who were underweight were found to have been introduced to water already compare to those who were yet to be introduced (24.3% versus 10.3% p=0.01) and majority of those who were reported to have been

introduced to water at 6 months were underweight compared to those who were introduced before 6 months (31.1% versus 14.8%, p=0.02).

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Tables 4.14a, 4.14b and 4.14c below show the feeding practices of the study sample, their age at onset of feeding and the nutritional status of subjects (n=274)

Table 4.14a: Underweight level among children 0-23 months of age

Variable	N	Nutritional Status		X^2	p-value
		Normal n(%)	Underweight n(%)		
Child still breastfeeding					
	273	216(79.1)	57(20.9)	0.26	0.61
Water given to child					
	206	156(75.7)	50(24.3)	6.06	0.01
Type of complementary foods given					
Koko	30	22(73.3)	8(26.7)	6.80	0.24
Rice	1	-	1(100)		
Koko and Rice	7	7(100)	-		
Koko and TZ	14	11(78.6)	3(21.4)		
Rice and TZ	3	2(66.7)	1(33.3)		

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Koko, rice and TZ	99	65(65.7)	34(34.3)		
Number of complementary feeds given per day					
2 times	38	28(73.7)	10(26.3)	3.41	0.18
3 times	95	68(71.6)	27(28.4)		
4 times	21	11(52.4)	10(47.6)		
Child given infant formula					
	46	33(71.7)	13(28.3)	1.87	0.17
Initiation of breastfeeding					
Within30 minutes	57	47(82.5)	10(17.5)	1.83	0.40
Within1 hour	74	56(75.7)	18(24.3)		
1+ hour	114	95(83.3)	19(16.7)		
Age water was introduced to child					
<6 months	81	69(85.2)	12(14.8)	8.04	0.02
At 6 months	122	84(68.9)	38(31.1)		
>6 months	3	3(100)	-		
Age complementary feeding started					
< 6 months	20	14(70.0)	6(30.0)	0.94	0.62
At 6 months	70	46(65.7)	24(34.3)		
>6 months	64	47(73.4)	17(26.6)		

Source: Field survey (2014)

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4.3.1 Stunting among children 0-23 months of age

Introduction of infant formula was found to partially have an inverse relationship with stunting in a binary analysis. More of those who were introduced to infant formula were stunted (32.6% versus 19.7%, p=0.05). Although not statistically significant, stunting was found to be more prevalent among children who were introduced to complementary feeds early in life (<6 months) compared to those who started at 6 months (35% versus 25.7%).

Table 4.14b: Stunting level among children 0-23 months of age

Variable	N	Nutritional Status			
		Normal n(%)	Stunting n(%)	X^2	p-value
Child still breastfeeding					
	273	213(78.0)	60(22.0)	0.28	0.60
Water given to child					
	206	158(76.7)	48(23.3)	0.96	0.33
Type of complementary foods given					
Koko	30	24(80.0)	6(20.0)	4.75	0.45
Rice	1	0(0.0)	1(100)		
Koko and Rice	7	6(85.7)	1(14.3)		
Koko and TZ	14	9(64.3)	5(35.7)		
Rice and TZ	3	2(66.7)	1(33.3)		

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Koko, rice and TZ	99	74(74.7)	25(25.3)		
Number of complementary feeds given per day					
2 times	38	30(78.9)	8(21.1)	1.08	0.58
3 times	95	71(74.7)	24(25.3)		
4 times	21	14(66.7)	7(33.3)		
Child given infant formula					
	46	31(67.4)	15(32.6)	3.71	0.05
Initiation of breastfeeding					
Within30 minutes	57	43(75.4)	14(24.6)	2.67	0.26
Within1 hour	74	55(74.3)	19(25.7)		
1+ hour	114	95(83.3)	19(16.7)		
Age water was introduced to child					
<6 months	81	61(75.3)	20(24.7)	1.01	0.60
At 6 months	122	94(77.0)	28(23.0)		
>6 months	3	3(100)	-		
Age complementary feeding started					
< 6 months	20	13(65.0)	7(35.0)	1.40	0.50
At 6 months	70	52(74.3)	18(25.7)		
>6 months	64	50(78.1)	14(21.9)		

Source: Field survey (2014)

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4.3.2 Wasting among children 0-23 months of age

There was no significant (p>0.05) relationship found between wasting and some infant and young child feeding practices in a binary analysis. Although not significant (p=0.67), the findings revealed that, wasting among children increased as the duration for initiation of breastfeeding increased.

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Table 4.14c: Wasting level among children 0-23 months of age

Variable	N	Nutritional Status		X^2	p-value
		Normal n(%)	Wasting n(%)		
Child still breastfeeding					
	273	219(80.2)	54(19.8)	0.25	0.62
			-		
Water given to child					
	206	164(79.6)	42(20.4)	0.24	0.62
Type of complementary foods given					
Koko	30	22(73.3)	8(26.7)	8.20	0.15
Rice	1	0(0.0)	1(100)		
Koko and Rice	7	7(100)	-		
Koko and TZ	14	10(71.4)	4(28.6)		
Rice and TZ	3	1(33.3)	2(66.7)		
Koko, rice and TZ	99	75(75.8)	24(24.2)		
Number of complementary feeds given per day					

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2 times	38	28(73.7)	10(26.3)	0.20	0.91
3 times	95	72(75.8)	23(24.2)		
4 times	21	15(71.4)	6(28.6)		
Child given infant formula					
	46	35(76.1)	11(23.9)	0.62	0.43
Initiation of breastfeeding					
Within30 minutes	57	48(84.2)	9(15.8)	0.79	0.67
Within1 hour	74	61(82.4)	13(17.6)		
1+ hour	114	90(78.9)	24(21.1)		
Age water was introduced to child					
<6 months	81	69(85.2)	12(14.8)	3.65	0.16
At 6 months	122	92(75.4)	30(24.6)		
>6 months	3	3(100)	-		
Age complementary feeding started					
< 6 months	20	15(75.0)	5(25.0)	1.66	0.44
At 6 months	70	49(70.0)	21(30.0)		
>6 months	64	51(79.7)	13(20.3)		

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In a binary regression analysis, type of complementary feed given and age water was introduced to child were the main predictors of underweight among the children studied. Compared to those who were given semi-solid foods, those who were given solid foods were about 1.01 times likely to become underweight (AOR=1.01, 95% CI [1.00-1.02]). More so compared to those who were introduced to water early (<6 months), those who were

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introduced to water at 6 months were about 4.28 times more likely to be become underweight (AOR=4.28, 95% CI [1.37-13.40]) (Table 4.15a).

Time of initiation of breastfeeding was the pointer of stunting among the children studied in the regression analysis. Compared to those who were initiated to breastfeeding within the first 30 minutes after delivery, those who were initiated after the 30 minutes were about 0.57 times more likely to become stunted (AOR=0.57, 95% CI [0.33-0.96]) (Table 4.15b).

There was no significant statistical relationship found between wasting and infant young child feeding practices with the regression analysis (Table 4.15c)

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Table 4.15a: Underweight and Infant and Young Child Feeding Practices

					95% C.I.for EXP(B)	
		Wald	**Sig.**	**Exp(B)**	**Lower**	**Upper**
Step	Child still breastfeeding	-	1.00	-	-	.
1a	Type of complementary foods given	4.45	0.03	1.01	1.00	1.02
	Number of complementary feeds given per day	0.29	0.59	1.21	0.60	2.46
	Is child given infant formula	1.98	0.16	2.12	0.74	6.02
	Initiation of breastfeeding	0.98	0.32	0.77	0.46	1.29
	Age water was introduced to child	6.25	0.01	4.28	1.37	13.40
	Age complementary feeding started	3.13	0.08	0.49	0.22	1.08
	Constant	-	1.00	11635913.70		

Source: Field survey (2014)

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Table 4.15b: Stunting and Infant and Young Child Feeding Practices

					95% C.I.for EXP(B)	
		Wald	Sig.	Exp(B)	Lower	Upper
Step 1a	Child still breastfeeding	-	1.00	-	-	.
	Type of complementary foods given	0.02	0.88	1.00	0.99	1.01
	Number of complementary feeds given per day	0.11	0.74	1.13	0.55	2.32
	Is child given infant formula	3.29	0.07	0.42	0.16	1.07
	Initiation of breastfeeding	4.47	0.03	0.57	0.33	0.96
	Age water was introduced to child	0.46	0.50	0.68	0.23	2.05
	Age complementary feeding started	0.07	0.79	0.90	0.41	1.99
	Constant	-	1.00	1842797274.26		

Source: Field survey (2014)

Table 4.15c: Wasting and Infant and Young Child Feeding Practices

				95% C.I.for EXP(B)	
	Wald	Sig.	Exp(B)	Lower	Upper

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Step 1a	Child still breastfeeding	-	1.00	-	-	.
	Type of complementary foods given	0.01	0.91	1.00	0.99	1.01
	Number of complementary feeds given per day	0.08	0.77	0.90	0.44	1.84
	Is child given infant formula	0.16	0.68	1.24	0.44	3.46
	Initiation of breastfeeding	0.11	0.74	1.10	0.64	1.87
	Age water was introduced to child	1.49	0.22	2.01	0.66	6.14
	Age complementary feeding started	0.92	0.34	0.68	0.31	1.50
	Constant	-	1.00	71866700.13		

Source: Field survey (2014)

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CHAPTER 5

DISCUSSION OF RESEARCH RESULTS

5.0 Introduction

This chapter elaborates on the relevance of the observations made from the study and the consequence on the nutritional status of children less than two years. The findings are discussed in relation to available literature on the subject coupled with the current policy guidelines. It also elaborates on the infant and young child feeding practices and it's implication to the children in Kumbumgu District and similar settings.

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5.1 Socio-demographic information of Respondents

The analysis of the socio-demographic characteristics of the respondents in this study show that as many as 83.6% of them have not attended school. The highest educational attainment was a Senior High School level and primary was the lowest level. Almost three percent (2.9%) had primary education. Only 1.8% of the respondents attained secondary education which is similar to a study done in Eritrea (ANON, 2003).

5.2 Nutritional Status of Children under Two Years

Knowing the prevalence rates of underweight, wasting, and stunting is important for determining the overall health of the community and for monitoring achievements toward mid-decade goals for nutrition and child health set by international organizations (Bloss *et al*, 2004; WHO, 2006). Based on the data analyzed, it was revealed that 20.8% of the children were underweight, 21.9% were stunted and 19.7% were wasted. Stunting (low H/A) is a public health problem worldwide. The 21.9% stunting figure obtained from the survey is a little below the national figure of 22.7% prevalence of children under five reported by MICS in 2011. Mahgoub *et.al* (2003c) reported a 38.7% prevalence of stunting among children under five in Botswana which is high compared to the 21.9% from the survey findings.

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The study revealed that 19.7% of the children under two years are wasted however in UNICEF's 2007 report, it is stated that countries with 10% or more wasted under-fives require urgent response. Since 19.7% is far above the 10% there is the need for an intervention. This finding is higher as compared to the national figure of 6.2% (MICS 2011). Furthermore, this study revealed that, 9.3% males and 4.0% females were wasted. The sex of the child was significantly associated with wasting (P = 0.01). The males were 0.23 times more at risk of wasting than the females.

Underweight is reversible and reflect either acute or chronic malnutrition. This study revealed that 20.7% of children under two are underweight. This is higher compared to the findings of the study done in Aydin province of Turkey which showed a prevalence of 4.8% for underweight (Ergin *et al.*, 2006).

The overall finding revealed that 23.8% of males and 17.1% of females were underweight even though there was no significant association between sex and underweight. This is similar to the underweight prevalence in Ghana reported by UNICEF in 2008 as 18.3% and 17.1% for boys and girls respectively. The proportions of underweight (34.1%), stunting (31.8%) and wasting (27.1%) were found to peak among children aged 13-23 months, which is confirmed by a study done in India (Kumar, 2006) where the proportions of underweight (45.5%) and stunting (81.8%) were found to be highest among children aged 13-24 months.

5.3 Breastfeeding Practices

This study revealed that 100% of the children have ever been breastfed and 99.4% were breastfeeding on demand which is similar to the finding of a study conducted in Mali which revealed breastfeeding on demand took place throughout the interview period (ANON, 2003c). This study revealed that 89.4% of mothers initiated breastfeeding on the first day of their children's life which is similar to the 71% obtained by Edmond *et al* (2006) in Ghana.

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Initiation of breastfeeding within the first hour of life is important because a study conducted in Ghana by Edmond *et al* in 2007 revealed that 1,117,000 infants can be saved if mothers are made to initiate breastfeeding within the first hour of life. However, in Kumbungu District, only 46.5% of the mothers studied breastfed their children within the first hour of life. This however is above the thirty six percent (36.0%) obtained in a study conducted among 10,000 infants in rural Ghana (Edmond *et al*, 2007).

More than half of the children (59.2%) were exclusively breastfed, compared to the 62.0% and 41.0% obtained from a study conducted in Ethiopia and Zimbabia, respectively (Anon, 2003c; Anon, 2004). In a focus group discussion, a Traditional Birth Attendant (TBA) said certain cultural and /or religious practices in the community had an effect on EBF. "*Pakopilla moagu" is a concoction that is used by women after delivery to protect the child from diseases and harm. If the baby is a boy, he is bathed with the concoction for three days; and for baby girls, it is done for four days. Besides bathing, the baby is further made to drink a little. (TBA, Cheyohi)*

Another respondent recalled that since this is a predominantly moslem community '*some fathers give a concoction prepared by writing some Quranic verses and washed for the baby to drink, to protect the baby from evil forces and harm'. (Mma Afishetu, Gupanarigu)*

Some mothers introduced water at 6 months even though they had started giving semi solids foods earlier. When these women were asked for the reason behind their actions, they reported that the health workers at the Child Welfare Clinic said they should give water only when the child was 6 months old. They understood that they could give food but not water.

There was sub-optimal breastfeeding practices observed among the mothers studied as most (70.4% and 92.0%) of them breastfed their children not up to the recommended minimum of six times during the day and night respectively as recommended by WHO. The study found an average of 5.3 and 3.6 number of breastfeeds during the day and night respectively.

A report (UNICEF, 2008) suggests that Breastfeeding on demand should be continued till the child is at least two years and must be accompanied by appropriate complementary feeding in order to maintain good nutritional status and help prevent diarrhoea. This study revealed that only 0.4% of the respondents had weaned the children while 99.6% were still breastfeeding their children as recommended and that whether the child has been weaned or not had no association with his or her nutritional status.

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5.4 Complementary Feeding

Complementary feeding should start at about six months with continues breastfeeding on demand both day and night. When giving complementary foods, think: Frequency, Amount, Thickness, Variety, Active/ responsive feeding and Hygiene per the IYCF guidelines. These indicators are age specific and hence must be taken into consideration, at 6-8 month, meals of complementary food 2-3 times /day, with 1-2 snacks as desired; at 9-23 month, meals of complementary food 3-4 times/day, with 1-2 snacks as desired (PAHO/WHO, 2003). For non-breastfed infants and children 0-23 month, meals should be given 4-5/day, with 1-2 snacks as desired (WHO, 2005).

The study found a significant relationship between age of child and time of introduction of water ($p<0.001$). Of the children less than 6 months, majority (84.6%) were introduced to water before 6 months. This goes to confirm a study done in Ghana where water and glucose solutions are widely given to infants, beginning in the first few months of life (Dewey, 2003). However, majority (77.8%, 84.8% and 68.2%) of the children aged 6 to 9 months, 10 to 12 months, 13 to 23 months respectively were introduced to water at 6 months of age. The study found that some of the children (5.9%) were introduced to other liquids and semi-solid foods aside water when they were below 6 months of age and there was a significant relationship between age of child and start of complementary feeding.

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The adverse health consequences expected from early complementary feeding include gastrointestinal and respiratory infections and delayed growth and cognitive development. From early introduction of breast milk substitutes, the adverse health consequences include increased future risk of obesity and chronic diseases (Perez- Escamilla, 1994; Haisma, 2003). It is recommended by the WHO that children must be introduced to complementary foods alongside breast milk when they are 6 months old since breast milk alone is not sufficient at these stages (WHO/UNICEF, 2003).

This study revealed that, among children less than 6 months, majority (71.4%) had already started complementary feeding, those between 6 and 9 months and 10 and 12 months majority (48.3% and 54.5% respectively) started complementary feeding when the children were exactly 6 months old. However, those between 13 and 24 months majority (47.1%) started complementary feeding when the children were more than 6 months. The reason the mothers gave for the late introduction of semi-solid or solid foods during a focus group discussion is because the mother has plenty breast milk. There was significant association between the age when complementary foods were introduced $p<0.001$. This study also revealed that 78.4% of the children 6-9 months were being given complementary food while 21.6% were not, this being almost twice the percentage (43%) of infants' age 6-9 months who received solid food in Ethiopia (ANON, 2003d).

5.4.0 Type of Complementary Foods given to Children

Local complementary foods which have been reported to be given to the children under the study included koko, rice, and "TZ". The study found a significant relationship ($p<0.001$) between type of complementary food given and the age of children. Children of younger ages (<6 months) are started on porridge only and as they grow other semi-solid foods are added or started and gradually stopped or shift from the porridge based to more semi-solid as the child ages.

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There was a significant relationship (p=0.02) found between number of complementary feeds given and the age group of children studied. Out of the 274 children studied, 154 children representing 56.2 had already started complementary feeding and 19.5% of the children were given porridge only as complementary food whiles 64.3% were given porridge, rice and TZ. Less than half (45.5%) of the children had started complementary feeding at the age of 6 months. More than half (61.7%) of the children were fed 3 times in a day and most (74.7%) of the children were given snacks in between main meals.

The study found that some of the children (5.9%) were introduced to other liquids and semi-solid foods aside water when they were below 6 months of age and there was a significant relationship between age of child and start of complementary feeding. Start of complementary feeding increased as child advanced in age.

Data from the field revealed that, among children less than 6 months, majority (71.4%) had already started complementary feeding, those between 6 and 9 months and 10 and 12 months majority (48.3% and 54.5% respectively) started complementary feeding when the children were exactly 6 months old. However, those between 13 and 24 months majority (47.1%) started complementary feeding when the children were more than 6 months

Consumption of infant formula was not observed to be common among the children studied as less than one-third (16.8%) of the children studied were reported to have consumed infant formula of which cerelac was the most (95.7%) consumed infant formulation. Majority (71.5%) of the children studied were not fed using a feeding bottle. There was no relationship (P > 0.05) between the introduction of infant formula and underweight and wasting but there was a relationship with stunting (p=0.05)

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5.4.1 Consumption of Fruits and Vegetables

As recommended (PAHO/WHO,2003), children above the age of 6 months should be given vitamin A rich fruits and vegetables daily yet in the present study only 13.4% of the children have been given any fruit for the past 24 hours before the study. More than half (59.1%) of the children were reported to have consumed a fruit with shea fruit being the most (54.9%) consumed fruit among the children studied. Fruits such as pawpaw, mango, which are rich in vitamin A were not given to the children and when mothers were asked, it came to light that they could not afford to buy them for the children when they are not in season. Most of the children (63.6%) were reported to have consumed a vegetable with "bra" being the most (49.0%) consumed vegetable.

Majority (74.7%) of the children studied were given snacks in-between meals and this is in line with WHO guidelines which says children from 6 up to 24 months should be given 1 to 2 snacks in addition to their meals plus breastfeed. Besides, there was a significant association between whether child has being given fruits for the past 24 hours and underweight. The children who were not given fruits were 1.5 times more at risk of underweight than those who were given fruits. However there was no association between whether child has being given fruits for the past 24 hours, stunting and wasting.

5.5 Bottle Feeding

Bottle feeding (specifically bottles with nipples at their tips) is not recommended because improper sanitation with bottle-feeding can introduce pathogens to the infant. This present study revealed that 28.5% of the mothers have ever fed their children using bottles with nipples at their tip and 71.5% had never bottle fed their children. This (28.5%) is far above the 13% of women who fed their children with a feeding bottle with a nipple in Ethiopia (ANON, 2003d).

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There was a significant relationship between been the children who had ever been bottle fed and stunting, these children were 1.3 times at risk of stunting. But, there was no significant association between the children who had ever received a bottle feed and wasting (P = 0.38) and stunting (P=0.47).

Furthermore, the study revealed that there was significant relationship between the children who were still receiving bottle feeding at the time of the data collection and underweight. These children were 1.4 times increased in risk of underweight. Besides, there was no significant relationship between the children who were still receiving bottle feeding at the time of the data collection and stunting and wasting. Surprisingly these children were rather protected from stunting by 0.7 times.

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CHAPTER 6

CONCLUSION AND RECOMMENDATION

6.0 Conclusion

In conclusion, 20.8%, 21.9% and 19.7% of the children under two in the Kumbungu District are underweight, stunting and wasting respectively in the children aged 13-23 months.

The study findings showed that, all the mothers had ever breastfed their children. Although most (89.4%) of the mothers initiated breastfeeding on the first day of their delivery, majority of them (46.5%) initiated breastfeeding after an hour of delivery. Almost all (99.6%) the children studied were still breastfeeding. More than half (59.2%) of the mothers studied practiced exclusive breastfeeding. There was sub optimal breastfeeding practices observed among the mothers studied as most (70.4% and 92.0%) of them breastfed their children not up to the recommended minimum of six times during the day and night respectively.

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The study found a significant relationship between age of child and time of introduction of water ($p<0.001$). Of the children less than 6 months, majority (84.6%) were introduced to water before 6 months. However, majority (77.8%, 84.8% and 68.2%) of the children aged 6 to 9 months, 10 to 12 months, 13 to 23 months respectively were introduced to water at 6 months of age.

The study brought to bear that, there was a significant association between the age of child and nutritional status of children (underweight and stunting). Underweight and stunting were more associated ($p<0.001$ and $p=0.03$ respectively) with the age of children. The older they are, the more malnourished they become. Malnutrition was more observed among children older than nine (9) months. However, although wasting also showed a similar trend, it did not show significance ($p=0.06$)

Sex of children however, did not show significant relationship with the nutritional status of children ($p>0.05$) although malnutrition was more observed among the male children.

The study found a significant relationship between age of child and time of introduction of water ($p<0.001$). Of the children less than 6 months, majority (84.6%) were introduced to water before 6 months. However, majority (77.8%, 84.8% and 68.2%) of the children aged 6 to 9 months, 10 to 12 months, 13 to 23 months respectively were introduced to water at 6 months of age.

Out of the 274 children studied, 154 children representing 56.2 had already started complementary feeding and 19.5% of the children were given porridge only as complementary food whiles 64.3% were given porridge, rice and TZ. Less than half (45.5%) of the children had started complementary feeding at the age of 6 months. More than half (61.7%) of the children were fed 3 times in a day and most (74.7%) of the children were given snacks in between main meals. More than half (59.1%) of the children were reported to have consumed a fruit with shea fruit being the most (54.9%) consumed fruit among the children studied. Most of the children (63.6%) were reported to have consumed a vegetable with bra being the most (49.0%) consumed vegetable.

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6.1 Recommendations

6.1.0 District Health Administration Team

- The District health administration team in the Kumbumgu District should organize community IYCF training for volunteers in the various communities so that they would counsel mothers on feeding practices and make follow ups to the mothers who have peculiar problems.
- There is need for the team to provide complete records of the nutritional status of the children under 5 years in the district for proper monitoring and evaluation.

6.1.1 Health worker

- Midwives must help the mothers to initiate breastfeeding early (within 30 minutes after delivery) and educate traditional birth attendants on the importance of early initiation of breastfeeding and they should also assist mothers to initiate breastfeeding early using interpersonal communication.
- Health workers should explain the meaning of exclusive breastfeeding to the mothers and discourage mothers from introducing artificial milk and water to the children below the age of 6 months during antennal and child welfare clinics.
- Again health workers should encourage mothers to introduce complementary foods when their children are 6 months old. This can be done during antennal and child welfare clinics
- Health workers should educate mothers on the importance of eating fruits and encourage them to give their children fruits every day.
- Food demonstrations should be organized in the communities to provide knowledge and skills of preparing nutritionally balanced local complementary foods in households.

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Appendix 1

My name is Jane Frances B Pedavoah, a postgraduate student of the school of Medicine and Health Sciences, UDS- Tamale pursuing MSC Community Health and Development. I am carrying out this research as part of my academic work. Could you please spare me few minutes of your time and respond to the questions below as honestly as possible. Information provided will be treated as private and confidential.

BREASTFEEDING PRACTICES

1. Date of birth of child……....

2. What is the order of birth of this child? …….. .

3. Has your child had any infection for past two weeks? a. Yes [ ] b. No [ ]

4. Has your last child ever been breastfed? a. Yes [ ] b. No [ ]

5. When did you start breastfeeding this child? a. The very first day after delivery [ ] b. The second day [ ] c. The third day [ ] d. The fourth day [ ] e. Others (specify)……..

6. If breastfeeding began on day one, please indicate the hours after delivery breastfeeding commenced? a. Within 30 minutes after birth [ ] b. Within one hour after birth [ ] c. Within two hours after birth [ ] d. Others (Specify) ……. …..

7. Are you still breastfeeding your child? a. Yes [ ] b. No [ ]

8. If 7 is **no**, what age did you stop breastfeeding the child? Specify…….. (Months)

9. Do you give water to your child? a. Yes [ ] b. No [ ]

10. If 9 is **yes**, at what age of the child did you start giving water?

Specify..... (Months)

11. On the average how many times do you breastfeed your child in a day?

A.Three times [ ] b. Four times [ ] c. Five times [ ] d. Six times [ ] e. Seven times [ ]

f. Eight times [ ] Others (specify)…….

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12. How many times do you breastfeed during the night?

.....

COMPLEMENTARY FEEDING [IF APPLICABLE]

13. Have you started giving complementary foods to your child? a. Yes [ ] b. No [ ]

14. If yes to 13, at what age of the child did you start? Specify ……. (Months)

15. What local complementary foods have you introduced to your child?

a. Koko [ ] b. Rice [ ] c. TZ [ ] d. Fufu [ ] e. Others (specify) ……

16. How many times do you give the child complementary foods in a day?

a. 2 times [ ] b. 3 times [ ] c. 4 times [ ]

17. Do you normally give the child snack in between the main meals? a. Yes [ ] b. No [ ]

18. In the past 24 hours have you given your child any fruit? a. Yes [ ] b. No [ ]

19. If yes above, what fruit have you given your child? a. mango [ ] b. banana [ ] c. orange [ ] d. shea fruit [ ] e. others (specify) ……

20. In the past 24 hours, have you given your child any green vegetables? A. Yes [ ] b. No [ ]

21. If yes above what vegetables have you given your child? a. ayoyo [ ] b. bra [ ] c. aleefu [ ] d. kuuka [ ] e. others (specify) ……

22. Do you give your child any infant formula? a. Yes [ ] b. No [ ]

23. If **yes above**, what type of formula do you give your child?

a. SMA [ ] b. Lactogen [ ] c. Cerelac [ ] d. Others (specify) …….

24. Do you feed the child with a feeding bottle which has a nipple? a. Yes [ ] b. No [ ]

DEMOGRAPHIC CHARACTERISTICS OF MOTHERS

25. What is your age? A. 19-24 [ ] b. 25-29 [ ] c. 30-34 [ ] d. 35-39 [ ] e. 40-44 [ ]

26. What is your highest level of education attained?

a. None [ ] b. Primary education [ ] c. JHS [ ] d. S.S.S/vocational / technical [ ] e. Tertiary education [ ]

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27. How many children (still birth, dead or alive) have you delivered?

a. One [ ] b. Two [ ] c. Three [ ] d. Four [ ] e. Five [ ] f. Others (specify).....

28. To what religion do you belong? a. Traditional region [ ] b. Christian [ ]c. Moslem [ ]

d. Others (specify).....

29. What is your marital status? a. Single [ ] b. Co-habiting [ ] c. Married [ ] d. Divorced/Separated [ ] e. Widowed [ ]

30. What is your husband's occupation? a. government worker [ ] b. self-employed [ ] c. unemployed [ ] d. Others (specify).....

31. What is the size of your family? a. 3 [ ] b. 4 [ ] c. 5 [ ] d. 6 [ ] e. Others (specify) ……

ANTHROPOMETRY

Age of child (months) …….

Sex: a. Male [ ] b. Female [ ]

Weight of child (in kg; 1decimal place**)** ……

Height of child (in cm; 1 decimal place) ……...

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APPENDIX 2

FOCUS GROUP DISCUSSION GUIDE

BACKGROUND INFORMATION

What are your statuses in this community?

.....

.....

.....

.....

.....

BREASTFEEDING PRACTICES

What duration after delivery do mothers usually initiate breastfeeding?

……

……

Do mothers usually exclusively breastfeed their children?

……

……

COMPLEMENTARY FEEDING PRACTICES OF MOTHERS

At what age of the child do you usually introduce complementary foods?

……

……

Why this age?

……

……

When do you introduce water to the infants?

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……

……....

What are some the complementary foods mothers give to their children?

……

……

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