THE INFLUENCE OF FEEDING PRACTICES ON NUTRITIONAL STATUS OF CHILDREN (0-23 MONTHS) IN THE BIBIANI-ANHWIASO-BEKWAI DISTRICT OF GHANA

BY

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A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILMENT FOR THE REQUIREMENTS FOR THE AWARD OF MASTERS OF PUBLIC HEALTH (MPH) DEGREE IN HEALTH EDUCATION AND PROMOTION

MASTER OF SCIENCE
IN HEALTH EDUCATION AND PROMOTION

NOVEMBER, 2008

DECLARATION

I declare that except for references to other people's work which have been duly acknowledged, this work is the result of the original research work taken by me under supervision. It has neither in part nor whole submitted for a degree elsewhere.

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DEDICATION

To the Almighty God who has been my help and provider. Daddy, everything I have you gave me. I am eternally grateful.

ACKNOWLEDGEMENT

I am very grateful to the Almighty God for His divine help, love, grace, wisdom and protection throughout my stay on KNUST campus and for knowledge and strength He gave me to finish this programme successfully.

I am also grateful to my supervisor, Dr Anthony K. Edusei, for his contributions, guidance and patience. To all the lecturers in the Community Health Department especially, Dr E.N.L. Browne, I say thank you God richly bless you for impacting your knowledge to me. I also thank the DHMT of the Bibiani Anhwiaso- Bekwai District for your support during the data collection.

My appreciation also goes to my family especially my big brother, Mr. Vincent Kwaku Gyasi for supporting financially at the right time. To my parents, Mr. and Mrs. Gyasi, my sisters Vivian and Rita thanks for care and support. To Victor Gyasi thanks for the many times you printed this thesis. I thank the Lighthouse Family in Kumasi Apache especially Bro. Gideon, Sis Stella Yandow, Bro Seth Gyamfi and Bro. Ernest.

My gratitude also goes to all my colleagues, especially Mrs. Catherine Emelia Enchill, Mr. Yussif Sumaila, Ms. Bessie Banini, Mr. Fredrick Agbemey, Mr. Joseph Addae-Donkor, Dr. Samuel Ayamba, Mrs. Dinah Abena Adjaloo, Mr. Eric Amankwah, Mr. Donatus Asossega, Ms. Jasmine D. Kuntoh and all who helped in one way or the other to make this project a success, I am very grateful. To my very good friends: Ms Mirth Fafa Avotri, Mr. Dominc Dadzie, Ms. Benedicta Kofi, Mr. Peter Paintil, Mr. Emmanuel Bockman and Mr. Andrews Salakpi. Thanks for your help and I am eternally grateful.

DEFINITION OF TERMS

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

Anthropometry: Human body measurements.

Stunting or **Height-for-age** is the proportion of under-five falls below minus 2 and minus 3 standard deviations from the median height-for-age of the WHO/NCHS.

Underweight or **Weight-for-age** is the proportion of under-five falls below minus 2 and minus 3 standard deviations from the median weight-for-age of the WHO/NCHS.

Wasting or **Weight-for-height** is the proportion of under-five falls below minus 2 and minus 3 standard deviations from the median weight-for-height of the WHO/NCHS.

ABBREVIATIONS/ACRONYM

AMPESI	Staple food prepared from boiled plantain, yam and stew.
BF	Breastfeeding
CF	Complementary feeding
CI	Confidence Interval
DHMT	District Health Management Team
GHS	Ghana Health Service
KOKO	Local complementary food made from fermented corn dough.
MASHED KENKEY	Local complementary food made from fermented corn dough
MPOTOMOTO	Local complementary food made from ripe plantain, cocoyam, palm oil and dry fish.
NCHS	National Centre for Health Statistics
KNUST	Kwame Nkrumah University of Science and Technology
MDG	Millennium Development Goals
MOH	Ministry of Health
OR	Odds ratio
PAHO	Pan American Health Organization
SD	Standard Deviation
TUOZAFI (TZ)	Local complementary food made from millet and eaten with soup
UNICEF	United Nations Children's Fund
WHA	World Health Assembly
WHO	World Health Organization

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Abstract

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential.

This study aimed at determining the feeding practices in relation to nutritional status of children under two years in the Bibiani Anhwiaso - Bekwai District of Ghana. A cross sectional study was conducted on 369 pairs of children and mothers which were randomly selected in 2008. The nutritional status of the children was assessed using anthropometric measures such as Weight-for-Age (underweight), Height-for-Weight (wasting) and Height-for-Age (stunting). The breastfeeding and complementary practices of the mothers were examined. The relationship of these feeding practiced provided by mothers and the nutritional statuses of the children were analyzed using chi-square.

It was revealed that 18.3% of the children were underweight, 17.0% were stunted and 6.0% were wasted. 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. The children who were not being given fruits were 1.5 fold increased in risk of underweight.

The feeding practices of most mothers were not as recommended by WHO. There is the need for the promotion of proper infant feeding practices in the Bibiani Anhwaiso district through Health Education.

CHAPTER 1

INTRODUCTION

1.0 Background of study

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. A child who has adequate 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 an adequate nutrition basically depends on the feeding practices offered by mothers or care-takers. MDG-1 is targeted at reducing under-nutrition by half. However, in the developing countries 146 million children under-5 suffer from under-nutrition which is one of the main factors that causes malnutrition (UNICEF, 2007). In Africa, malnutrition continues to contribute to half of the 9.7million annual child deaths and is a leading cause of diseases and disabilities in children (WHO, 2002; UNICEF, 2007). In Sub-Saharan Africa, four million children die from preventable diseases annually of which 60.0% is as a result of malnutrition. In West Africa, Twenty-seven countries are making no progress toward 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 deficits are linked to impairments in intellectual performance; work capacity, reproductive outcomes and overall health during adolescence and adulthood. Thus, the cycle of malnutrition continues, as the malnourished girl child faces greater odds of giving birth to a malnourished, low birth

weight infant when she grows up. Poor breastfeeding and complementary feeding practices, coupled with high rates of infectious diseases, are the principal proximate 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, 2008b). 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, 2008a). 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).

1.1 Statement of Problem

One of the most critical factors for children's health and development is their nutritional status. Children who are undernourished are less able to fight off infections and more likely to die young. Globally, 50-60% of child deaths are attributable to under-nutrition; a third of these are due to inadequate complementary feeding followed by poor breastfeeding practices and too low birth weight (Childinfo, 2009). Breastfeeding initiation within the first hour of life is only 36% worldwide. If this rate is increased to 99% then 1 million of the 4 million neonatal deaths could be saved (Edmond et al., 2006; Lawn et al., 2005; Save the Children, 2001). Besides, 1.3 million infants' deaths could be avoided through exclusive breastfeeding yet the rate is only 38% which means 62% of the infants born are deprived of exclusive breastfeeding. Undernourished children who survive the dangerous early years will struggle to fulfill their full physical and mental potential and will be less able to escape from poverty (Edmond et al., 2006; Lawn et al., 2005). In developing countries, 206 million of children under five years are stunted, 60 million are wasted and 167 million are underweight. One third of the

nutritional statuses of these children are due to the fact that only 40% are exclusively breastfed, and most complementary foods given to children are very watery (Onis, 1997; UNICEF, 2008). 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% the children under 5 are either moderately or severely underweight (UNICEF, 2008). Narrowing further down to Ghana, the percentage of children 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 is Ghana that is 60% of infants are deprived of this basic right (UNICEF, 2008).

One of such areas is the Bibiani- Anhwiaso-Bekwai district. For the past 2 years the nutritional status of the children under 5 years in this 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, 2008). However, there are no records on stunting and wasting. For the past four years this district has had no nutrition officer thus there is the lack of reliable data on which policies can be based (District Annual Report, 2008). Underweight is one indicator of malnutrition which causes low resistance and increases the risk of dying from pneumonia, diarrhoea, malaria, measles and AIDS that are responsible for half of all deaths in children under five (WHO, 2004). In this district, there is thus a high rate of morbidity and 25 out of 3,314 children died in 2007 (District Annual Report, 2008).

It is important to explore the role of infant feeding practices in the etiology of malnutrition in Bibiani- Anhwiaso-Bekwai, since growth retardation is very high among children under two years (critical stage) in this District. Many infants and young children are being denied proper adult life when with proper feeding one third of these infants and young could have access to proper adult.

1.2 Rationale of Study

Malnutrition is killing 9. 7 million children yearly, a reduction in malnutrition in children under-5 will in turn reduce the rate of child mortality in the district (UNICEF, 2007). In reducing infectious disease incidence and severity, breastfeeding could readily reduce child mortality by about 13%, and improved complementary feeding would reduce child mortality by about 6 % (Pelletier et al, 2003). There is therefore the need to examine the breastfeeding and complementary feeding pattern of mothers in the district and educate mothers on proper infant-feeding practices. There is no other means by which MDG-1 and MDG- 4 can be achieved by 2015 if the nutritional status of children under-5 is taken for granted in this district. The information or knowledge that will be obtained from this research will help to know the actual burden of malnutrition pertaining in the district and will form the baseline for an 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.

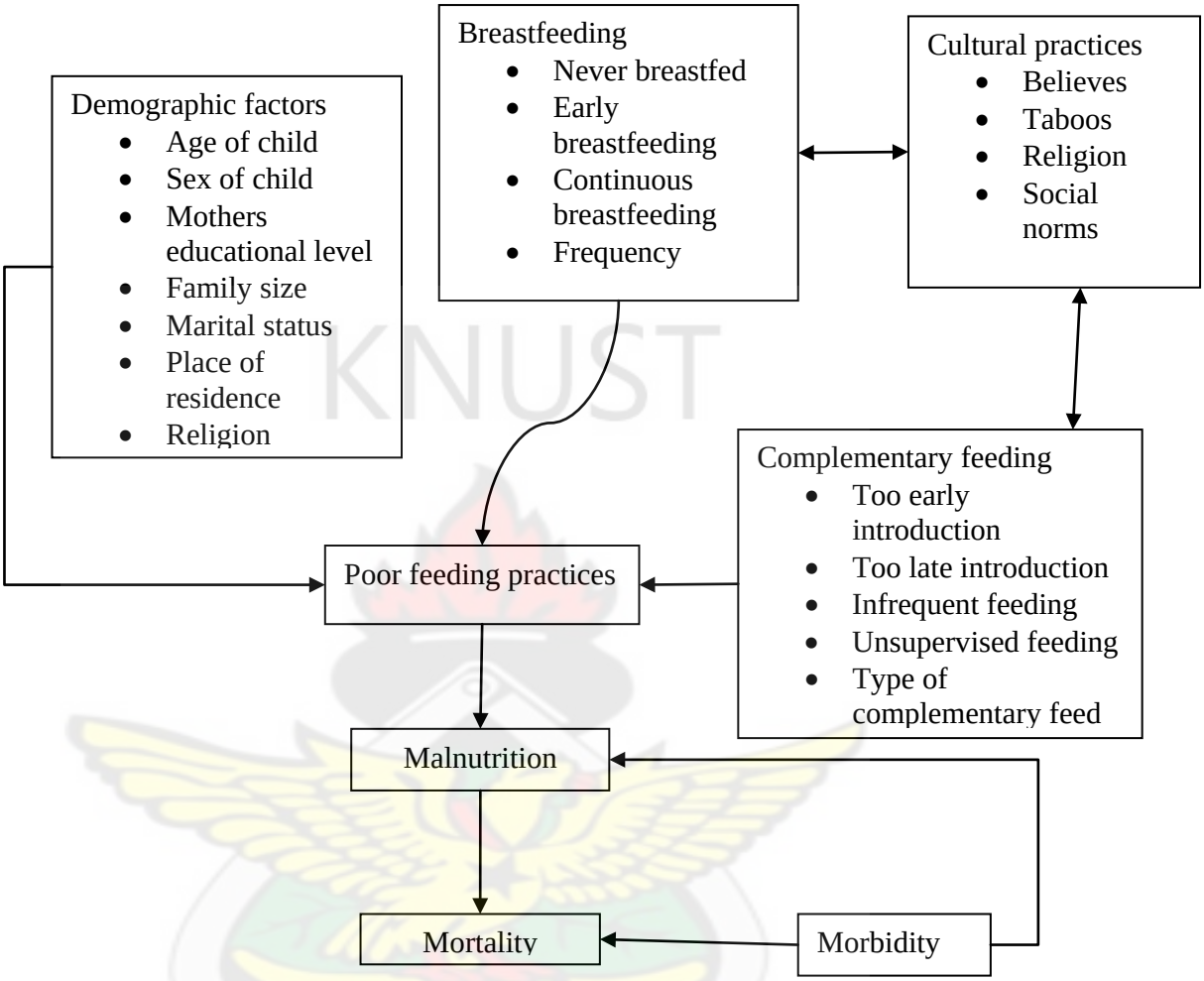
1.3 Research Hypothesis

There is an association between feeding practices and nutritional status of children between 0 and 24 months.

1.4 Conceptual Framework

Figure 1.1 shows the factors influencing infants and young children feeding practices, and the relationship of such practices with nutritional status.

Fig 1.1 Conceptual Framework



Definitions of terms

Too early complementary feeding is the introduction of complementary feed before the child is 6 months.

Too late complementary feeding is non introduction of complementary food when the child is 6 months old.

1.5 Research Questions

A. What is the prevalence of stunting in the district?

B. What is the prevalence of wasting in the district?

C. What is the prevalence of underweight children?

D. What percentage of children (under 6 months) is receiving exclusive breastfeeding?

E. At what time is complimentary foods introduced to the children?

F. How frequent are children above 6 months fed with complementary food within a day?

G. How do infant feeding practices influence the nutritional status of children under two years?

1.6 General Objective

To determine the feeding practices in relation to nutritional status of children under two years.

1.7 Specific Objectives

1. To determine the nutritional status of children under two years.
2. To study the breastfeeding practices among mothers with children under two years.
3. To examine the complementary feeding patterns among mothers with children under two years.
4. To establish the relationship between the feeding practices of children under two years and their nutritional status.

1.8 Profile of Study Area

Bibiani- Anhwiaso-Bekwai District is located in the North Eastern part of Western Region of Ghana. The district is bounded on the North by Atwima Mponua District in the Ashanti Region, South by the Wassa Amenfi in the Western Region, West by the Sefwi Wiawso District in the Western Region and East by the Denkyira North and Amansie East in the in the Central Region and Ashanti region, respectively. The total land area of the district is 873 km square.

It has 119 communities and a total population of 124,728 people. Out of this, 19,824 are children under 5 years and 30,895 are women in their fertile age (Projection from 2000 National population and Housing census). All the communities are connected to the national electricity grid. The main source of water are bole holes, hand dug wells and streams. The indigenous people are Sefwi, and are predominantly farmers. The major food crop produce are palm oil, maize, plantain, cassava, cocoyam, yam, garden eggs, pepper, tomatoes, orange, coconut and pear. The vegetation of the district is mainly tropical rain forest. The district has three major markets. Few of the inhabitants are staff of the three mining companies in the district, civil servants, and private business men. The main roads linking the district, Kumasi (62km) and Goaso are all asphalted. There are feeder roads linking peripheral communities which need urgent attention. The main means of transport is by taxi or minibus. Telephone and internet services are available.

The district has 3 Hospitals, namely Bibiani Government Hospital, Ghana Bauxite Company Hospital at Awaso and Central African Gold Ltd Hospital at Bibiani. There

are three Health Centres namely Anhwiaso Health Centre, Bekwai Health Centre and Chirano Health Centre. Besides, there are 6 six Community Clinics and 2 private clinics. The district has the following health staff: 2 public Health Nurses, 13 Midwives, 4 Medical Assistants, 32 Community Health Nurses and 4 Ward Assistants. According to the district report, the prevalence of underweight of children 0-11 is 11.7%, 12-23 is 16.4 and 23-59 is 12.7% (District Annual Report, 2008).

CHAPTER TWO

LITERATURE REVIEW

Adequate nutrition during infancy and early childhood is fundamental to the development of

each child's full human potential. It is well recognized that the period from birth to two years of age is a "critical window" for the promotion of optimal growth, health and behavioral development. After a child reaches 2 years of age, it is very difficult to reverse stunting that has occurred earlier (Martorell et al., 1994). In appropriate feeding practices such as breastfeeding and complementary feeding are responsible for one-third of the cases of malnutrition in infants. Improper feeding practices can account for poor nutrition which contributes to 1 out of 2 deaths (53%) associated with infectious disease (WHO, 2004). Recent studies have recognized the link between malnutrition and child feeding practices (Kumar, 2006).

2.1 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 in the developing world are stunted yet there certain countries where the prevalence exceeds this estimation (UNICEF, 2008a). A study conducted in Malawi revealed that stunting prevalence was 50% (UNICEF, 2008a). However, in Ghana, the rate of children under five are moderately and severely stunted are 22.4% and 7.4% respectively (UNICEF,

2008a). Stunting begins at birth and continues through 40 months but after 24 months it can not 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 per cent or more, indicating a serious 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). However, 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 13-24 months (Ray et al, 2001; Kumar D, 2006). The term malnutrition generally refers both to under-nutrition and over-nutrition. 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 times (Deghedi et al, 1999).

A study done in Aydin province of Turkey showed that the prevalence of malnutrition in children under five years was found as 10.9% for stunting, 4.8% for underweight and 8.2% for wasted (Ergin et al, 2006).

2.2.0 Breastfeeding

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).

2.2.1 Initiating breastfeeding

A study conducted among 10,000 infants in rural Ghana revealed that neonatal mortality could be reduced by 24% if 99% of infants initiated breastfeeding on day one of life and 31% if 99% of infants initiated breastfeeding within the first hour, saving 867,000 and 1,117,000. (Edmond et al, 2006)

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 world wide 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).

2.2.2 Exclusive breastfeeding

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 worlds 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 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 no relevant (Haschke et al, 2000)

2.2.3 Duration of breastfeeding

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).

2.2.4 Termination of breastfeeding

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).

2.3 Complementary feeding

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).

2.3.1 Introduction of complementary feeding

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 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).

2.3.2 Type of complementary feeding

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)

2.3.3 Frequency of feeding

The minimum feeding frequencies recommended, the number 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 6-8 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).

2.4.0 Bottle-feeding

Bottle-feeding is practiced by 2% and 3% of mothers of infants under four months in Eritrea and Zambia (ANON, 2002; ANON, 2003).

CHAPTER 3
METHODOLOGY

3.1 Study Design

The present study was conducted from July, 2008 to October, 2008 using an analytical cross sectional study design.

3.2 Data Collection Technique and Tools

Primary data were collected by the administration of structured questionnaires which was 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 are Salter-like Hanging scale and Infantometer.

Recumbent length was measured with the 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 made 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.

3.3 Study Population

The study populations were children under two years and their mothers in Bibiani Anhwiaso Bekwai District.

3.4 Study variables

Variables were categorized into dependent and independent variables

Dependent variable: Nutritional status

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, Educational level, Religion, Occupation of mothers, Occupation of fathers, Parity. Refer to table 3.1

Table: 3.1: Below defines the variables for the study.

	VARIABLE	OPERATIONAL DEFINITION	INDICATOR	TYPE OF VARIABLE	EXPECTED OUTCOME	OBJECTIVE COVERED
DEPENDENT VARIABLE	Nutritional status	Weight and height in relation to age	Result of measure of wt/ht as compare with WHO standard	Continuous	Stunting, wasting or underweight	Nutritional Status
INDEPENDENT VARIABLE	Breastfeeding	Early breastfeeding	Within the first hour after birth	Binary	Children must be breastfeed within the first hour	Breastfeeding
		Exclusive breastfeeding	Feeding with only breast milk	Ordinal	Children should be exclusively breastfed for 6 months	
		Breastfeeding on demand	As the child wants: day and night	Binary	Child must have access to breast milk at anytime.	
		Time of weaning	The age of child the mother terminates breastfeeding	Discrete	Continuous breastfeeding for 24 months and	

					beyond	
	Complementary feeding	Time of introduction of complementary food	Age of child when complementary feed was introduced	Discrete	Child should be given complementary feed >6 months	Complementary feeding
	Complementary feeding	Frequency of feeding	Number of times a child is fed with complementary food.	Discrete	2-3 times at 6-8months;3-4times at 9-11months;3-4 times with snacks given 1-2 times	
		Supervised feeding	Who supervises feeding if any	Discrete	Complementary feeding should be supervised	
		Type of complementary	Local or commercial	Binary	Either locally prepared at home Food from venders Already made commercial/can foods	

3.5 Sampling Technique

A total of 37 communities were randomly selected, and in each community the center of the community was located and a bottle thrown. The mouth of the bottle gave the starting point for the sampling process. At this point a systematic random sampling of individual households were chosen at regular intervals which were obtained by dividing the total number of households in the community by 10 since 10 children were selected in each community. In a single household only one child was selected if there were 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.

3.6 Pre-testing

Data collection technique and tools were pre-tested at Atwima Mpoma District which has similar profile as Bibiani- Anhwiaso-Bekwai in terms of socioeconomic factors. Corrections were made where necessary. The tools used were valid and reliable.

3.7 Sampling size

Sampling units were children under two years and their mothers. A sample size of 369 was calculated using the Epi info Stat calculator based on 22.40 prevalence of stunting in the nation with 5% error, 95% confident interval and a population size of children under two 10628.

3.8 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. Research team had access to data only when permission was granted by the principal researcher. Data entry and cleaning was done on a computer using SPSS version 11.0 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.

3.9 Data Analysis

The Data were analyzed based on the stated objectives using the SPSS version 11 and Epi-info software (version 3.4). Where appropriate, results were presented as frequencies, tables, histograms and pie charts.

The sex specific 1978 CDC/WHO normalized version of the 1977 NCHS reference curves for height-for-age, weight-for-age, and weight-for-height incorporated in Epi info software were used to transform the anthropometric data obtained into weight-for-age (W/A), length-for-age (H/A) and weight- for- length (W/H).

Some statistical assessment was made by comparing means, standard deviations and 95% confidence intervals (CI95%) where appropriate. The chi-square analysis and Prevalence 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.

3.10 Ethical Considerations

Ethical clearance for this research was obtained from the District Health Administration, Kwame Nkrumah University of Science and Technology Ethical Board, 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 DHMT and the communities as they have freely participated and devoted their time for the study.

3.11 Limitation of study

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

3.12 Study Assumptions

1. The mothers and care givers were truthful in answering the questions asked.
2. The definition of the children who were not sick as reported by mothers was actually assumed as clinically fit and was included in the study.

CHAPTER 4

RESEARCH RESULTS

4.1 Background information of study subject

4.1.1 Mothers.

Table 4.1 Background characteristics of respondents

CHARACTERISTICS	NUMBER OF RESPONDENTS(N)	PERCENTAGE (%)
Age (In years):		
15-19	41	11.1
20-24	118	32.0
25-29	87	23.6
30-34	75	20.3
35-39	29	7.9
40-44	14	3.8
45-49	4	1.1
Above 49	1	0.3
Total	369	100
Marital Status:		
Single	27	7.3
Married	331	89.7
Divorced	9	2.4
Widowed	2	0.5
Total	369	100
Educational Level completed:		
No formal education	74	20.1
Primary	242	65.6
Middle/JSS	46	12.5
Secondary	6	1.6
Tertiary	1	0.3
Total	369	100
Religion:		

Christianity	314	85.3
Islam	25	6.8
Traditional	2	0.5
Pagan	27	7.3
Total	368	100
Occupation of mothers:		
Unemployed	36	9.8
Farming	251	68.6
Trading	37	10.1
Artisans	40	10.9
Government workers	2	0.5
Total	366	100
Occupation of fathers:		
Unemployed	9	2.4
Farming	202	54.9
Trading	93	25.3
Government workers	19	5.2
Mining	11	3
Non applicable	34	9.2
Total	366	100
Parity of mothers:		
1	97	26.3
2	80	21.7
3	66	17.9
4	49	13.3
5	38	10.3
6	22	6
7	5	1.4
8	3	0.8
9	3	0.8
10	4	1.1
11	2	0.5
Total	368	100

The mean age of the respondents was 26.3 years with a standard deviation of 6.3 while most of them (55.6%) were within the range of 20-29 years. Majority of the respondents (89.7%) were married and 7.3% were single. Moreover, marital status had a significant relationship (P = 0.001) with underweight and stunting (P = 0.01) but not wasting (P = 0.08). There was a significant relationship (P = 0.01) between mothers with husbands and stunting but not with underweight and wasting. However, for those mothers who were not with husbands (single, divorced or widowed) had children who were 4 times more likely of being children stunted than those who had husbands (OR = 4.0; CI= 0.12-0.53). However, there was no significant relationship between the marital status of the mother and wasting in children.

The findings also revealed that 65.6% of respondents had education up to primary level and 20.1% had no formal education. There was a relationship between maternal educational level and underweight (P=0.08) but no significant relationship between maternal educational level and stunting or wasting in children.

Majority (85.3%) of the respondents are Christians while 6.8% where Moslems and 7.3% where pagans. Using the chi-square analysis revealed that there was no significant relationship between religion and the nutritional status of the children.

Among the mothers interviewed, 9.8% were unemployed, 68.6% were farmers, 10.1% were traders, 10.9% artisans and 0.5% were government workers. There was a significant relationship between the occupation of mothers and underweight (P = 0.03), stunting (P = 0.01) but not with wasting (P =1.10). Again, 2.4% of the respondents said

their husbands were unemployed, 54.9% said they were farmers, and 5.2% were government workers. However, 9.2% of the respondents had no husbands. The occupation of fathers had a significant relationship with stunting (P = 0.01) but not with wasting.

Concerning parity, 79.2% of the respondents from one to 4 births while, 20.8% have had more than 4 births. Using the chi-square analysis revealed that there was a significant relationship (P = 0.01) between parity and underweight. Again there was a significant association (P = 0.03) between parity and wasting. But parity had no significant relationship with stunting. Moreover, there was a significant association between bottle feeding and the family size (P = 0.01).

4.1.2 Children under two years.

The mean age of the children was 10.9 (months) with a standard deviation of 6.0 (months) and 95% confidence interval of 11.7-12.3. The mean birth order of the children was 3 and 95% confident that the population's mean lies in a CI of 2.9-3.3. Birth order had a significant relationship with underweight (P = 0.01) and wasting (P = 0.03) but not with stunting.

The mean birth weight of the children sampled is 2.95 and 95% confident that the population's mean lies between in a CI of 2.88-3.01. Birth weight had a significant relationship with stunting (P = 0.01) but not wasting and under weight.

4.2 Nutritional status of the children under two years

The prevalence of moderate and severe underweight was 14.2% and 4.1%, respectively. Moderate and severe stunting were 12.6% and 4.4%, respectively, while 5.5% were moderately wasted and 0.5% were severely stunted as shown in table 4.2.

Table 4.2 Distribution of Age of child (months) and nutritional status

Age of child	N	Moderately Underweight	Severely Underweight	Moderately Stunted	Severely Stunted	Moderately wasted	Severely wasted
0-5 months	90	1(1.1%)	0(0%)	6(6.7%)	1(1.1%)	0(0%)	0(0%)
6-12 months	118	24(20.3%)	4(3.4%)	15(12.7%)	3(2.5%)	8(6.8%)	0(0%)
13-18 months	116	21(18.1%)	10(8.6%)	18(15.5%)	12(13.3%	10(8.6%)	2(1.7%)
19-23 months	42	6(14.3%)	1(2.4%)	7(16.7%)	0(0%)	3(7.1%)	0(0%)
Total	366	52(14.2%)	15(4.1%)	46(12.6%)	16(4.4%)	20(5.5%)	2(0.5%)

Source: Author's work 2008

The highest prevalence of malnutrition was among the age group 13-18 months of which 65.8% fell below minus 2 and minus 3 standard deviations from the median. Using chi-square analyses there was a significant association between the age of child and underweight (P = 0.01), stunting (P = 0.01) and wasting (P = 0.03). Table 4.3 shows the distribution of gender and nutritional status of the children.

Table 4.3 Distribution of the Sex of child and nutritional status

SEX	N	Moderately Underweight	Severely Underweight	Moderately Stunted	Severely Stunted	Moderately wasted	Severely wasted
Male	191	28(14.7%)	13(6.8%)	20(10.5%)	12(6.3%)	16(8.4%)	2(1.0%)
Female	178	26(14.6%)	3(1.7%)	26(14.6%)	6(4.4%)	5(2.8%)	0(0%)
Total	369	54(14.6%)	26(7.0%)	46(12.5%)	18(4.9%)	21(5.7%)	2(0.5%)

Source: Author's work 2008

The prevalence of underweight among the males was 21.5% while that of the females 16.3%. Again, 9.2% of males were wasted while 2.8% females were wasted. However, 16.8% males were stunted while 19.0% females were stunted. Using the chi-square analysis, there was no significant association (P = 0.25) between the sex of the child and underweight or stunting (P = 0.33) but there was a significant association between the sex of the child and wasting (P = 0.01; OR=0.23; CI=0.08-0.72). The males were 0.23 times at risk of wasting than the females.

4.3 Breastfeeding practices of the mothers

4.3.1 Ever breastfed.

The findings show that all the mothers have ever breastfed their children if they were not at the time of the data collection.

4.3.2 Breastfeeding on demand

Majority (99.4%) of the mothers breastfed or were breastfeeding on demand, while 0.6% were not or did not. When respondents were asked the average number of times their children breastfed at night, 54.5% said they suck the breast throughout the night, 31.7% said they breastfeed 3-5 times before day. Very few of respondents (0.3%) said

their children do not wake up to suck their breast at night. No relationship was established between the sex of the child and the number of times the child breastfeeds at night. When respondents were asked the average number of times they breastfeed their children during the day, 94.7% of respondents said they breastfeed through the day, implying that the number times were uncountable.

4.3.3 Initiation of breastfeeding

Table 4.4 shows the distribution of the age of child in days when breastfeeding was initiated.

Table 4.4 Distribution of Children by age (in days) when Breastfeeding was initiated

Age of child	N	Percentages
Day 1	268	72.8%
Day 2	80	21.7%
Day 3	20	5.4%
Total	[1]368	100%

Source: Author's work 2008.

Most (72.8%) of the mothers initiated breastfeeding on the very first day of birth while 27.2% did not.

Table 4.5 Distribution of Children by age (in hours) when Breastfeeding was initiated

Age of Child (in hours)	N	Percentages
Within the first one hour of life	40	15.6%
Beyond the first one hour of life	216	84.4%
Total	257	100%

Source: Author's work 2008

[1] 1 missing value

Among those who initiated breastfeeding on the first day, 67.1% initiated breastfeeding during the first 6 hours of birth. However, early initiation was 15.6% that is the percentage of children who were put on the breast within the first hour of life.

4.3.4 Exclusive Breastfeeding

The study revealed that only 8.1% of the children less than 6 months who were assessed were being exclusively breastfed while 91.9% were not. For the children aged 6 to 23 months, 17.9% of them were exclusively breastfed whilst 82.1% were not.

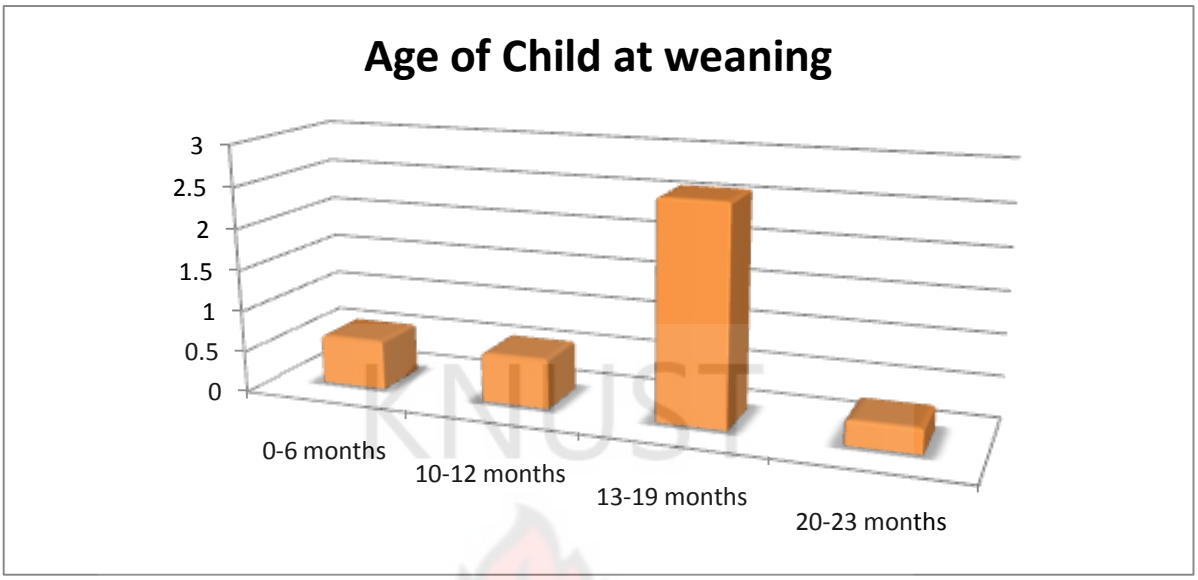
4.3.5 Duration of Breastfeeding

Most (97.8%) respondents with children below 6 months were still breastfeeding and majority (94.2%) of the respondents whose children were between 6-23 months were also still breastfeeding their children.

4.3.6 Termination of Breastfeeding

Some respondents (0.3%) terminated the breastfeeding of their children at 1 month of life whilst others 0.3% terminated breastfeeding when the children were between 4-6months. Again 0.5% of mothers weaned their children when they were within the age group 10-12 months. A little above two percent (2.2%) of mothers weaned when their children were within the age group 13-18 months and 0.5% weaned when their children when they were 19 months old. However, few mothers 0.3% weaned their children when they were within the age group 20-23 months

Fig.4.1 Age of child (months) at weaning



Source: Authors field work, 2008.

Most of the mothers (95.9%) were still breastfeeding as at the time of the study while 4.1% had weaned their children. This is represented by Fig 4.1.

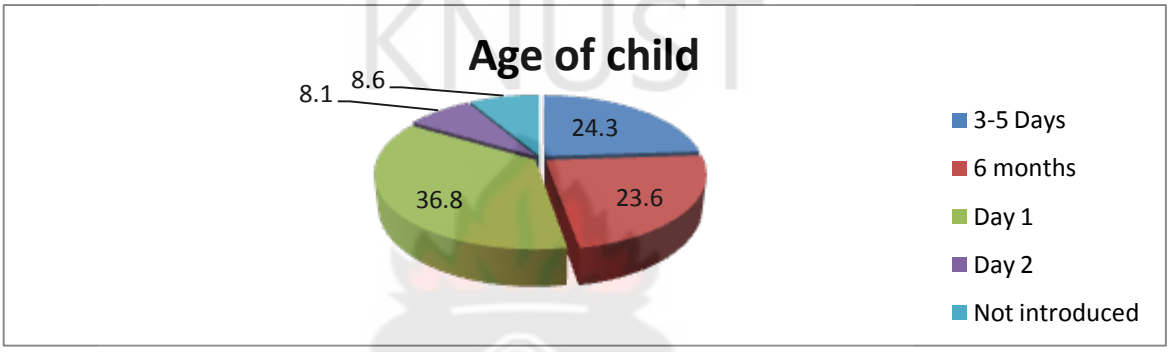
4.4 Complementary feeding patterns of the mothers

4.4.1 Introduction of Complementary feeding

Most (68.2%) of respondents started giving water to their children when they were less than 6 months old. Few (8.1%) of the children less than 6 months had not been give water. However, 36.8% of respondents reported giving their children water on the very first day of life, because there was no milk in their breast. However, 23.6% started giving water to their children when they were 6 months old. In a focus group discussions revealed that complementary foods are introduced earlier than what is recommended. One woman (40 years) stated: *As for this sub district and it surroundings if any one*

report of introducing complementary feed at 6 months then she is a liar. We all give the children water to drink starting from day one. When there is no milk in the breast we give the children sugar solution and evaporated milk in feeding bottles. Another stated: *I gave sugar solution on the first day so that the children will get energy since there is no milk in my breast.* Figure 4.2 shows the age of the child when introduced to water.

Fig 4.2 Distribution of age of children at first introduction of water



Source: Author's Field Work, 2008.

More than half (52.2%) of the respondents introduced their children to water before they turned 6 months.

4.4.2 Introduction of liquids and semi solid foods

Some of the respondents (29.9%) introduced their children to other liquids and semi solid foods aside water when they were below 6 months of age. Yet 34.0% of respondent whose children where 6 months and above did introduced their children to liquids and semi solid foods aside water when the children were 6 months as recommended. However, some respondents introduced their children to liquids and semi solids aside water very late. These includes the 4.6%, of respondent who introduced liquids and semi solids when the children were 7 months, 2.7% of respondent who introduced liquids and semi solids when the children were 8 months old and of

respondent who introduced liquids and semi solids when the children were 1.4% between 9 and 10 months old. However, 3.7% introduced their children to other liquids when they were 12 months and over. 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 (with a 7 month old child) stated: *Usually I have plenty milk in my breast and therefore do not see the need to start giving my child any special complementary food. When I am eating he want to eat I will give him.* When chi-square analysis was performed, there was an association between the age when other foods aside water were introduced and wasting (P=0.01), underweight (P= 0.04) but not stunting (P=0.32).The association was achieved using the chi-square analysis.

Table 4.6 Distribution of Age of child (months) and complementary feeding status

Age of child in months	**Receiving Complementary foods**		**Total**
	Children who receives	**Children who do not**	
0 to 5	24(26.7%)	66(73.3%)	90(100%)
6 to 15	161(92.5%	13(7.5%)	174(100%)
16 to 23	92(92.9%)	7(7.1%)	99(100%)
Total	277(76.3%)	86(23.7%)	363[2](100%)

Source: Author's work 2008.

The study also showed that 26.7% of the children below 6 months were receiving semi solids foods as at the time of data collection while 14.6% of children beyond 6 were neither receiving semi solid or solid foods.

[2] 5 Missing values

4.4.3 Frequency of complementary feeding

The table 4.7 shows the distribution of the breastfed children and the many times they are fed during the day.

Table 4.7 Distribution of Age of child (months) and the number of times the child is fed with complementary feed daily.

Age of child in months	Frequency of complementary feed					
	No C.F	Once	Twice	3-4 times	More than 4 times	Total
6 to 8	7(19.4%)	2(5.6%)	7(19.4%)	19(52.8%)	1(2.8%)	36(100%)
9 to 23	27(11.4%)	16(6.8%)	41(17.3%)	145(61.2%)	8(3.4%)	237(100%)
Total	34(12.5%)	18(6.6%)	48(17.6%)	164(60.1%)	9(3.3%)	273(100%)

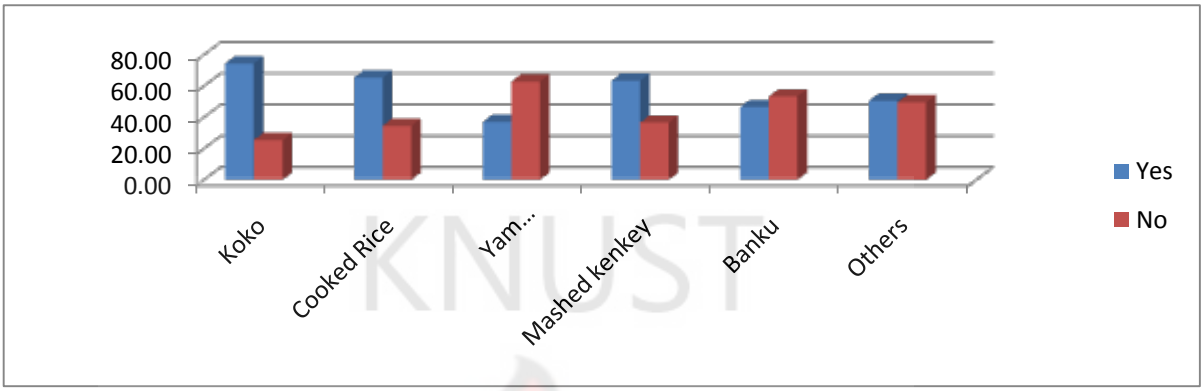
Source: Author's work 2008.

Few (12.5%) of the respondents who were supposed to be giving complementary feed along side breast milk to their children were not but instead feed the children with only breast milk. Moreover, 5.6% of the respondents with children within the age group 6-8 months fed them only once a day. Again, more than half of the respondents (64.6%) with children within the age group 9-23 months old fed these children 3 to 4 times on the average a day. This study also revealed that 77.8% of the children 6-9 months were being given complementary food while 22.2% were not.

4.4.4 Types of local complementary foods

Some of the local complementary foods which have been given to the children include koko, cooked rice, cooked yam, mashed "kenkey", "banku", "mpotompto", "ampesi" and "fufu". The figure 4.3 shows the distribution of these local complementary foods.

Fig 4.3 Distribution of the different types of complementary feeds given to the children



Source: Author's Field work 2008

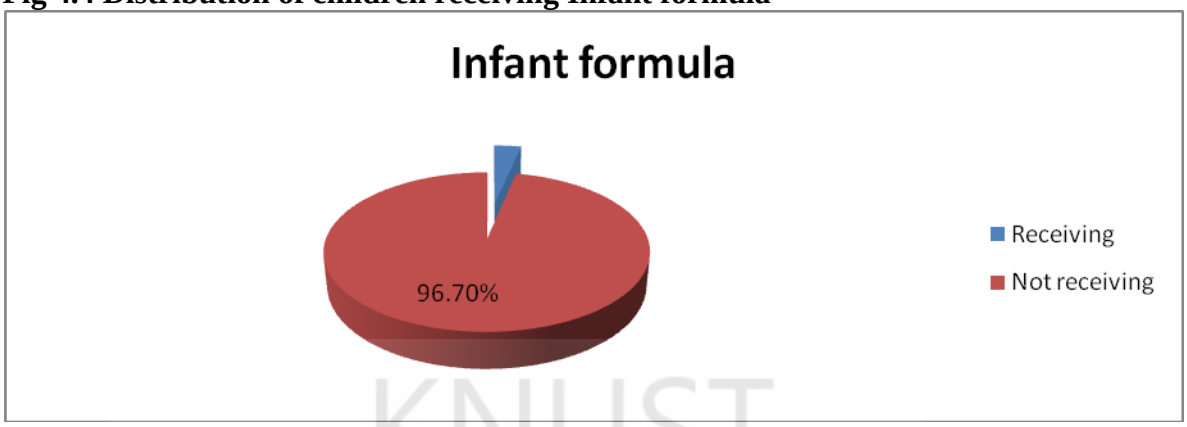
Almost one third (74.5%) of the mothers reported to be giving their children to *'koko'* and 65.4% reported to be giving their children cooked rice. Again, 37.1%, 63.4%, 46.6% of the mothers were giving their children to yam pudding (*mpotompoto*), mashed kenkey and "*Banku*" respectively. Little more than half (50.6%) respondents were giving other foods like to "*ampesi*" and "*fufu*". However, proportion of children 6-23.9 months of age who received foods from 4 or more food groups[3] were 44.7%.This was obtained during a 24 hour recall.

4.4.5 Infant formula

Some of the infant formulas that have been introduced to the children were Cerelac, Lactogen and SMA. The figure 4.4 shows the distribution of children receiving Infant formula.

The 7 foods groups used for tabulation of this indicator are:
- grains, roots and tubers, - legumes and nuts, - dairy products (milk, yogurt, cheese), flesh foods (meat, fish, poultry and liver/organ meats), - eggs,- vitamin-A rich fruits and vegetables, - other fruits and vegetables

Fig 4.4 Distribution of children receiving Infant formula



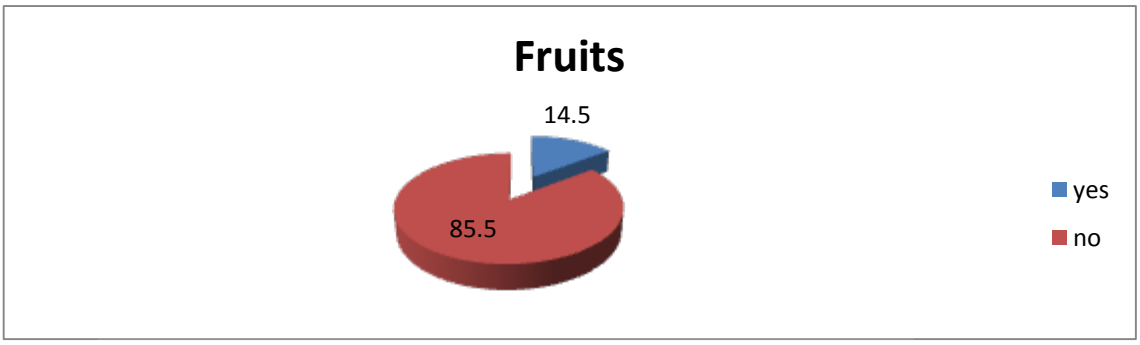
Source: Author's Field work 2008

Few (3.3%) mothers were actually feeding their children with infant formula such as cerelac, lactogen and SMA and 6.9% of the respondents had introduced their children to infant formula (cerelac, lactogen and SMA).The figure 4.4 shows the percentages of mothers who were still feeding their children with infant formula at the time of the data collection.

4.4.6 Fruits

Mothers were asked whether they had given their children any kind of fruit for three days prior to the interview and 85.5% said no, while 14.5% responded yes. The results are presented in figure 4.5.

Fig.4.5

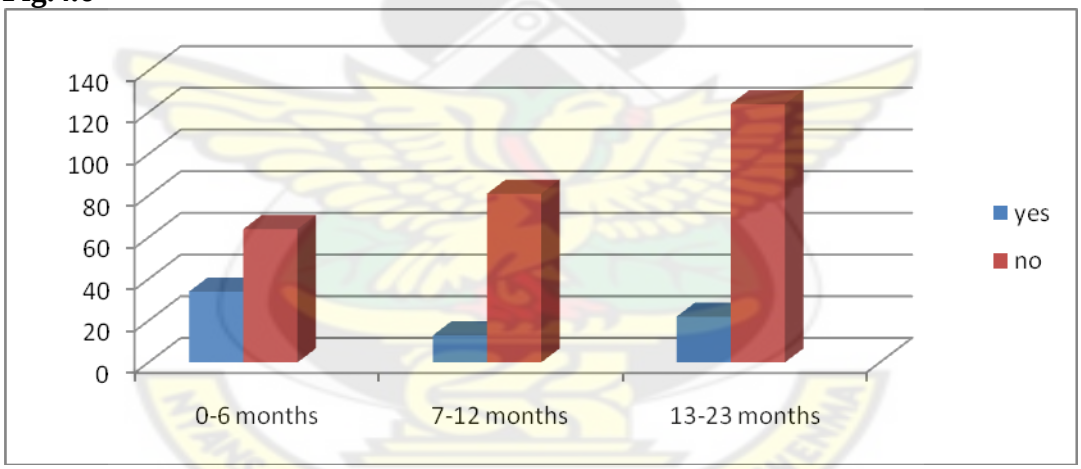


Source: Author's Field work 2008.

4.4.7 Bottle-feeding

The figure 4.6 shows the distribution the children who were receiving bottle feeding at the time of the data collection.

Fig.4.6



Source: Author's Field work 2008

Most (71.8%) of the respondents have ever fed their children using bottles with nipples at their

tip whereas 28.2% had never bottle fed their children. However, at the time of the data collection, 20.9% of the children between 0 and 24 months were being bottle fed. However, 60.0% of mothers with children under 6 months were still bottle feeding as at the time of the data collection.

4.5 Relationship between the feeding practices and nutritional status of the children.

4.5.1. Ever breastfed

There was no significant association between ever breastfed children and wasting (P = 0.80), underweight (P=0.63) and stunting (P=0.65).

4.5.2. Breastfeeding on demand

Table 4.8 Breastfeeding on demand Verses underweight

Breastfeeding on demand	Underweight	Normal	Total
Yes	64(18.4%)	284(81.6%)	348(100%)
No	1(50%)	1(50%)	2(100%)
Total	65(18.6%)	285(81.4)	350(100%)

Source: Author's work 2008

Few (18.4%) of the children who were breastfed on demand were underweight whereas 81.6% were not underweight. However, 50.0% of those who were not breastfed on demand were underweight. There was no significant relationship/association between breastfeeding on demand and underweight (P= 0.25).

Table 4.9 Breastfeeding on demand and stunting

Breastfeeding on demand	Stunted	Normal	Total
Yes	60(17.3%)	288(82.8%)	348(100%)
No	1(50%)	1(50%)	2(100%)
Total	61(17.5%)	289(82.6%)	350(100%)

Source: Author's work 2008

Few (17.3%) of the children who were breastfed on demand were stunted while 82.8% were not. However, 50.0% of those who were not breastfed on demand were stunted. There was no significant association (P = 0.22) between breastfeeding on demand and underweight.

Table 4.10 Breastfeeding on demand and wasting

Breastfeeding on demand	Wasted	Normal	Total
Yes	20(5.8%)	327(94.2%)	348(100%)
No	1(50%)	1(50%)	2(100%)
Total	21(6.0%)	328(93.7%)	350(100%)

Source: Author's work 2008

Few (5.8%) of the children who were breastfed on demand were wasted while 94.2% were not. However, 50% of those who were not breastfed on demand were wasted. There was a significant association (P=0.01) between breastfeeding on demand and wasting. The children who were not breastfed on demand were 4 times at risk of wasting as compared to those who were receiving breast milk on demand (OR = 4.4; CI= 0.3-0.78).

4.5.3 Initiation of breastfeeding.

Table 4.11 Age of child (days) when breastfeeding was initiated versus stunting

Age of Child (days)	Stunted	Normal	Total
Day 1	46(17.7%)	214(82.3%)	260(100%)
Day 2	15(17.4%)	71(82.6%)	86(100%)
Day 3	0(0%)	3(100%)	3(100%)
Total	61(16.5%)	308(83.5%)	369(100%)

Source: Author's work 2008.

Whereas majority (82.3%) of the children who were put on the breast-milk were normal nutritionally, 17.7% of them were stunted. Most (82.6%) of the children who were put on the breast the second day were normal, but 17.4% were stunted. However, none of those put on the breast the third day was stunted. There was no association (P = 0.73) between the day breastfeeding was initiated and stunting. Few (5.6%) of the children put on the breast the very first day were wasted while most (94.2%) were not. The result is

presented in table 4.12.

Table 4.12 Age of child (days) when breastfeeding was initiated versus wasting

Day breastfeeding was initiated	Wasted	Normal	Total
Day 1	15(5.6%)	245(94.2%)	260(100%)
Day 2	6(7.0%)	80(93.0%)	86(100%)
Day 3	0(0%)	3(100%)	3(100%)
Total	21(5.7%)	348(94.3)	369(100%)

Source: Author's work 2008.

Only (7.0%) of the children put on the breast the second day of life were wasted whereas most (93.0%) were not. None of those put on the breast the third day was wasted. There was on association (0.8%) between the day breastfeeding was initiated and wasting. Few (18.5%) of the children who were put on the breast the very first day were underweight while 94.2% were not. Again, 7.0% of the children who were put on the breast the second day were underweight and 80.2% were not as shown in the table 4.13.

Table 4.13 Age of child (days) when breastfeeding was initiated versus underweight

Day breastfeeding was initiated	Underweight	Normal	Total
Day 1	48(18.5%)	212(81.5%)	260(100%)
Day 2	17(19.8%)	69(80.2%)	86(100%)
Day 3	0(0%)	3(100%)	3(100%)
Total	65(17.6%)	304(82.4%)	369(100%)

Source: Author's work 2008.

None of those put on the breast the third day was wasted. There was on association between the day breastfeeding was initiated and underweight. Among those who were put on the breast the very first day of delivery, some were initiated early that is the first one hour after delivery while others were late that is beyond the first hour of delivery.

The table 4.14 shows the relationship between the age of child (hours) when breastfeeding was initiated and underweight.

Table 4.14 Relationship between the age of child (hours) when breastfeeding was initiated and underweight

Breastfeeding initiation	Normal	Underweight	Total
early bf initiation	126(82.9%)	26(17.1%)	152(100%)
Late bf initiation	86(81.1%)	20(18.9%)	106(100%)
Total	212(82.2%)	46(17.8%)	258(100%)

Source: Author's work 2008

In terms of underweight, the children who received late initiation (18.9%) of breast feeding exceeded those who had early initiation (17.1%). There was no association (P = 0.72) between the (age of children) hours when breastfeeding was initiated and underweight. Table 4.15 shows the relationship between the age of child (hours) when breastfeeding was initiated and wasting.

Table 4.15 Relationship between the age of child (hours) when breastfeeding was initiated and wasting

Breastfeeding initiation	Normal	Wasting	Total
early BF initiation	146(96.7%)	5(3.3%)	151(100%)
Late BF initiation	96(90.6%)	10(9.4%)	106(100%)
Total	242(94.2%)	15(5.8%)	257(100%)

Source: Author's work 2008

Most (96.7%) of the children who were introduced to breastfeeding within the first hour of birth were normal whereas 3.3% were wasted. There was no association (P=0.05) between early initiation of breastfeeding and wasting when the Chi-square analyses was used. Even though most (80.9%) of the children who received early breastfeeding were normal, a great number (84.9%) of those who were introduced late to breastfeeding were

also normal. As shown in Table 4.16.

Table 4.16 Relationship between the age of child (hours) when breastfeeding was initiated and stunting

Breastfeeding initiation	Normal	Stunting	Total
early bf initiation	123(80.9%)	29(19.1%)	152(100%)
Late bf initiation	90(84.9%)	16(15.1%)	106(100%)
Total	213(82.6%)	45(17.4%)	258(100%)

Source: Author's work 2008

There was on association (P = 0.4) between the times breastfeeding was initiated and stunting.

4.5.4 Termination of breastfeeding

The study revealed that whether the children had been weaned or not had no association to their nutritional status.

4.5.5 Introduction of complementary feeds.

Some (5.2%) of the children who were introduced to water before the age of 6 months were wasted, 17.0% were underweight and 16.3% of them were stunted. Also, there was no significant association between the age at which water was introduced to the children and wasting (P = 0.3), underweight (P = 0.2) or stunting (P = 0.9). Using the chi square analysis, there was a significant relationship (P = 0.01) between the age of the child when semi-solids were introduced and wasting. Again, there was a significant relationship (P = 0.03) between the age of the child when semi-solids were introduced and stunting. However, there was a significant relationship (P = 0.04) between the age of the child and when semi-solids were introduced and underweight. There was no

association between too early introduction of semi-solid foods and any of three indices of malnutrition. Also, there was no association between late introduction of complementary feeds and under weight (P = 0.90), stunting (P = 0.50) or wasting (P = 0.26). Table 4.17 shows the proportions underweight, stunting and wasting of children who were reported to be receiving complementary feeds and those who were not.

Table 4.17 Complementary feeding status and nutritional status

Complementary feeding status	Underweight	Stunted	Wasted	Total
Yes	60(22.6%)	53(20.0%)	17(6.4%)	265(100%)
No	5(5.9%)	8(9.4%)	4(4.7%)	85(100%)
Total	65(18.6%)	61(17.4%)	21(6.0%)	350(100%)

Source: Author's work 2008.

There was a significant association between the complementary feeding status of the child and underweight (P = 0.001; OR=4.6; C.I=0.83-0.55).The prevalence odds ratio was 4.6 which implies that that those who were not receiving CF even though they were supposed to were more than 4 times at risk of being underweight than those receiving complementary feeding. Again, there was a significant association between the complementary feeding status of the child and stunting (P = 0.016; OR = 2.4; C.I= 0.19-0.91) but not wasting.

4.5.6 Types of Complementary feeds

The research revealed that the giving of "*Koko*" to the children was associated with under weight (P = 0.01; OR = 0.20; CI= 0.01- 0.51) and that those who were not receiving "*Koko*" were 0.2 times protected against underweight than their counterpart. Again, stunting was also associated to the taking in of "*Koko*" (P = 0.015; OR= 0.40; CI = 0.18-0.85) and that those who were not taking in "*Koko*" were 0.4 times protected

against stunting than those who were receiving "*Koko*". But there was no association between taking in "*koko*" and wasting (P = 0.85). Moreover, the eating of cooked rice was also associated with underweight (P = 0.02; OR = 0.40; CI= 0.19-0.72) and that those who were not receiving cooked rice were 0.4 times protected against underweight. Again, the eating of cooked rice was also associated with stunting (P = 0.04; OR = 0.51; CI= 0.27- 0.96) and that those who were not receiving cooked rice were 0.5 times protected against stunting. However the eating of cooked rice was not associated with wasting. The giving of mashed kenkey to the children was significantly associated with underweight (P = 0.01; OR= 0.40; CI= 0.19-0.71) and that those who were not receiving mashed kenkey were 0.4 times protected against underweight. Again, stunting was associated with the taking in of mashed kenkey (P = 0.01; OR= 0.3; CI= 0.16-0.65). Yet, the eating of mashed kenkey was not associated with wasting. However, the taking in of *Banku* and other foods like "*Ampesi*", "*Fufu*" or "*Tuozafi (TZ)*" were not associated to any of the three indices of malnutrition.

4.5.7 Introduction of infant formula

Table 4.18 shows the relationship between infant formula and underweight.

Table 4.18 Introduction of infant formula and underweight

Whether infant formula has been introduced	Underweight	Normal	Total
Yes	2(8.3%)	22(91.7%)	24(100%)
No	263(80.7%)	63(19.3%)	326(100%)
Total	285(81.4%)	65(18.6%)	350(100%)

Source: Author's work 2008.

Few (8.3%) of those who had been introduced to infant formula were underweight while

91.7% were normal. However, 80.7% of those who had never being introduced infant formula were underweight and 19.3% were not. There was no significant (P =1.4) relationship between the introduction of infant formula and underweight.

Table 4.19 shows the relationship between the introduction of infant formula and stunting.

Table 4.19 Introduction of infant formula Verse stunting

Whether infant formula has been introduced	Stunted	Normal	Total
Yes	4(16.7%)	20(83.2%)	24(100%)
No	57(17.5%)	269(82.5%)	326(100%)
Total	61(17.4)	289(82.6%)	350(100%)

Source: Author's work 2008

Some (16.7%) of those who had been introduced to infant formula were stunted while 83.2% were normal. However, 17.5% of those who had never being introduced infant formula were also stunted and 82.5% were not. There was no significant relationship between the introduction of infant formula and stunting.

Table 4.20 shows the relationship between the introduction of infant formula and wasting

Table 4.20 Introduction of infant formula Verses wasting

Whether infant formula has been introduced	Wasted	Normal	Total
Yes	2(8.7%)	21(91.3%)	23(100%)
No	19(5.8%)	307(94.2%)	326(100%)
Total	21(6.0%)	328(94%)	349(100%)

Source: Author's work 2008

Few (8.7%) of those who had been introduced to infant formula were wasted while

91.3% were normal. However, 5.8% of those who had never being introduced infant formula were wasted and 94.2% were not. There was no significant relationship between the introduction of infant formula and wasting.

4.5.8 Fruits

There was a significant association between whether child had been given fruits for the three days prior to the interview and underweight. The children who were not given fruits were 1.5 times at risk of underweight (P=0.001; OR=1.5; CI=0.61-0.75) than their counterparts. There was no association between the taking in of fruits and stunting or wasting.

4.5.9 Bottle feeding

There was a significant relationship between children who were still receiving bottle feeding at the time of the data collection and underweight. These children were 1.4 times at risk of underweight (P = 0.01; OR=1.4; CI=0.65-3.10). Also, there was significant relationship between children still receiving bottle feeding at the time of the data collection and stunting and wasting. Surprisingly, these children were rather protected from stunting 0.7 times (P=0.001; OR=0.7; CI=0.37-1.5) and wasting (P = 0.001; OR=0.8; CI=0.27-2.64) 0.8 times. There was also a significant relationship between children who had ever received a bottle feed and stunting. These children were 1.3 times a risk of stunting. However, no significant association between neither ever received a bottle feed and wasting (P = 0.38) nor stunting (P = 0.47).

CHAPTER 5
DISCUSSION OF RESEARCH RESULTS

5.1 Socio-demographic information

The research brought to light that as many as 79.9% of respondents have attended school. The highest educational attainment was a tertiary level and primary was the lowest level. Over twenty percent did not have any formal education. Only 1.6% of the respondents attained secondary education which is similar to a study done in Eritrea (ANON, 2003). However, none of the children whose mothers attained secondary education was stunted or wasted, but 50.0% were underweight. Maternal education has an inverse relationship with wasting. As the level of maternal education increases, the level of wasting also decreases. This is confirmed by a study done in Eritrea (ANON, 2003). Moreover, in this present study there was a relationship between maternal educational level and underweight (P = 0.008). The research revealed that parity had significant influence on the child's nutritional status specifically wasting and under weight, but not stunting-a finding which was similar that of Esima et. al., (2001).

The study revealed that, marital status had a significant relationship with underweight (P = 0.001), stunting (P = 0.01) but not wasting (P = 0.08). There was a significant relationship between mothers having husbands and stunting but not with underweight and wasting. However, for those mothers who did not have husbands (single, divorced or widowed), their children were 4 times more likely to be stunted than the children of mothers those who had husbands.

5.2 Nutritional status of the 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 18.3% of the children were underweight, 17.0% were stunted and 6.0% were wasted.

Stunting (low H/A) is a public health problem worldwide. It is a measure of cumulative deficient growth and a feature of a complex syndrome including developmental delay, impaired immune function, reduced cognitive development, metabolic disturbance leading to accumulation of body fat, loss of lean mass, and risk of hypertension (Branca, 2002; Martins, 2004). This study revealed that 12.6% and 4.4% of the children under two are moderate and severe stunting, respectively. This is half that of the national moderate (22.4%) and severe (7.4%) stunting prevalence of the children under five reported by UNICEF in 2008. However, 17.0% prevalence of stunting revealed in the findings is lower compared to 50% prevalence in Malawi (UNICEF,2008) and 38.7% in Botswana (Mahgoub et. al, 2006) though these studies used children under 5 years of age. A survey conducted in Mali (ANON, 2003c) revealed that 17% of the children under three were stunted, which confirms the 17% obtained in this study.

Wasting, or low weight for height or acute malnutrition is a strong predictor of mortality among children under five. It is usually the result of acute significant food shortage and/or disease (UNICEF, 2007). The study revealed that 6% of the children under two

are wasted however in UNICEF's 2007 report, it is stated that countries with 10% or more wasted under fives require urgent response. Since 6% is not far from 10% there is the need for an intervention. This finding is higher as compared to the 5% obtained from a survey done in Zambia and 4.0% in Mozambique. However it is lower than the 9.0% and the 8.2% obtained in Ethiopia and Aydin province of Turkey respectively (Anon, 2003b; Ergin et al., 2006; Anon, 2002). 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 or weight for age prevalence is usually the proportion of less than five falling below minus 2 standard deviations (This is 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 study revealed that 18.3% 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 21.5% of males and 16.3% of females were underweight even though there was no significant association between sex and underweight. However, the prevalence of underweight was higher among the boys than the girls. 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 (56.7%), stunting (59.7%) and wasting (68.2%) 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). Even though underweight and stunting were not significantly associated with breastfeeding on demand, wasting was. The children who were not breastfed on demand were 4 times at risk of wasting as compared to those who were receiving breast milk on demand. This confirms the fact that breastfeeding on demand maintains good nutritional status (UNICEF, 2007).

This study revealed that 70.5% of mothers initiated breastfeeding on the first day of their children's life which is similar to the 71% obtained by Edmond et al in 2006) in Ghana. However, 29.5% of mothers withheld breast milk which is the natural food for babies and contains antibodies which will fight against diseases but rather gave artificial milk and water. Initiation of breast milk 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 Bibiani Anhwiaso Bekwai District, only 15.6% of the children had the opportunity to have their mothers' breast in their mouth within the first hour of life. This is a little more than half the proportion (36.0%) obtained in a study conducted among

10,000 infants in rural Ghana (Edmond et al, 2007). The age of the child in hours when breastfeeding was initiated was significantly associated with wasting (P = 0.004) but not stunting and underweight.

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 4.1% of the respondents had weaned the children while 95.9% 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 statuses.

5.4 Complementary feeding

Some (68.6%) of respondents introduced their children to water before they turned 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). Even though only 23.6% of the children were introduced to water at 6 months as recommended (PAHO/WHO, 2003), yet some (0.9%) had introduced semi solid foods earlier than the required 6 months. Indeed a small minority of the children (8.1%) 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).

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.

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). However, this present study revealed that 56.0% of the children below 6 months received semi solid foods too early, is not far form the 60.0% obtained in Northern Senegal (Gupta et.al, 2007).

Again, some (34.0%) of the children received semi solids foods at the age of 6 months as recommended by WHO. However among the 34.0% some children were actually receiving water and artificial milk even though they were less than 6 months old. This finding is similar to that of a study conducted in Mali where none of the children were truly exclusively breastfed even though many infants did not receive “food” until they were 6 months (ANON, 2003c).

It is recommended by the WHO that children must be introduced to complementary foods along side breast milk when they are 6 months old since breast milk alone is not sufficient at these stages (WHO/UNICEF, 2003). However, in this present study, 13.0% of the children (6-12 months) were lately introduced to complementary foods late. The

mothers explained during a focus group discussion that when they have plenty of breast milk for their children, they find it unnecessary to introduce their children to complementary feeds when they are 6 months old. There was significant association between the age when other foods aside water were introduced, and wasting (P = 0.01) and underweight (P = 0.04) but not stunting (P = 0.32). This study also revealed that 77.8% of the children 6-9 months were being given complementary food while 22.2% were not, this being twice the percentage (43%) of infants' age 6-9 months who received solid food in Ethiopia (ANON, 2003d).

A minority (13.0%) of the respondent who were supposed to be giving complementary feed along side breast milk to their children were not but instead were feeding the children with only breast milk. There was a significant association between the complementary feeding status of the child underweight (P = 0.001, C.I.0.83-0.55). The prevalence odds ratio was 4.6 which implies that those who were not receiving CF even though they were suppose to, were more than 4 times at risk of being underweight than those receiving complementary feeds.

5.4.1 Type of complementary foods

The research revealed that the giving of *"Koko"* to the children was associated with under weight and that those who were not receiving *"Koko"* had a risk reduction of 0.2 times. Thus not giving Koko protected the children from becoming underweight. Again, stunting was also associated to the taking in of *"Koko"* and that those who were not

taking in *"Koko"* were 0.4 times protected against stunting. However, there was no association (P = 0.85) between the eating of *Koko* and wasting.

Moreover, the eating of boiled rice was also associated with underweight and that those who were not receiving cooked rice were 0.4 times protected against underweight. Again, the eating of boiled rice was also associated with stunting and that those who were not receiving cooked rice were 0.5 times protected from stunting. However the eating of rice was not associated with wasting.

Furthermore, the drinking of mashed kenkey was significantly associated with underweight and that those who were not receiving mashed kenkey were 0.4 times protected against underweight. Again, stunting was associated with the taking in of mashed kenkey. Those who were not receiving mashed kenkey were 0.3 times protected from stunting. However, the eating of mashed kenkey was not associated with wasting. The taking in of Banku and other foods like *"Ampesi"*, *"Fufu"* or *"Tuozafi (TZ)"* were not associated to any of the three indices of malnutrition.

Moreover, few (6.9) % of the children had ever been introduced to infant formula while 92.7% of the children were never introduced to any infant formular.3.3% and 4.1% had been introduced to Lactogen and Cerelac respectively. There was no relationship (P > 0.05) between the introduction of an infant formula and underweight, stunting or wasting.

5.4.2 Fruits

As recommended (PAHO/WHO,2003), children above the age of 6 months should be given fruits daily yet in the present study only 13.4% of the children have been given any fruit for the past three days. Besides, there was a significant association between whether child has being given fruits for the past three days and underweight P (0.009 < 0.05). The children who were not given fruits were 1.5 fold increased in risk of underweight done their counterpart. However there was no association between whether child has being given fruits for the past three days, 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 71.8% of the mothers have ever fed their children using bottles with nipples at their tip and 28.2% had never bottle fed their children. This (71.8%) is 7 times higher than the study done Ethiopia where the percentage was 13 (ANON, 2003d).

Again, 60.0% of the children under 6 months were being bottle fed as at the time of the study a percentage which far exceeds the 4.0% obtained in Zambia (Anon, 2003b) and 20.9% of children between 0 and 24 months were being bottle fed at the time of the data collection. However, there was significant relationship between been the children who had ever received a bottle feed and stunting, these children were 1.3 times a 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 present 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 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 (P=0.001; OR= 0.7; CI=0.37-1.5) and wasting (P = 0.001; OR= 0.8; CI= 0.27-2.64) by 0.8 times.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

In conclusion, 12.6% and 4.4% of the children under two in the Bibiani Anwhiaso District are moderately and severely stunted, while 18.3% were underweight and 6.0% were wasted. Besides, the proportions of underweight (56.7%), stunting (59.7%) and wasting (68.2%) were high in the children aged 13-23 months.

All the children studied in the district have ever been breastfed and 94.4% on demand. However, 57.8% were not initiated to the breast early and only 8.1% of the children less than 6 months were receiving exclusive breastfeeding. More than ninety-five percent (95.9%) mothers had not weaned their children.

Even though the early introduction of water was not associated with malnutrition, 68.2% did not adhere to the WHO recommendation of not giving water to infant below 6 months. Again 66.0% of the children where not introduced to complementary foods at the right time, were introduced either too early or too late. It was also revealed that some mothers introduced artificial milk to their children on first and second days of life when they perceived that there was no breast milk in the breast for the children. Malnutrition was significantly associated with the age at which complementary feeds were introduced. Those who were supposed to be given complementary foods but were not were 4.6 and 2.4 times at risk of underweight and stunted, respectively as compared to

their counterparts who were given the complementary foods.

The giving of "*Koko*", cooked rice or "*mashed kenkey*" to the children were found to be associated with underweight and stunting while, "*Banku*" and other foods like "*Ampesi*", "Fufu" or "*Tuozafi (TZ)*" was not associated to any of the three indices of malnutrition.

Most (60.0%) of the children under 6 months were fed from bottles with nipples even though it was not associated with malnutrition. Besides, only 13.6% of children were given fruits and within the past three days prior to the interview of study and this was associated with underweight. The children who were not given fruits prior to the interview were 1.5 times likely to be underweight.

6.2 Recommendations

6.2.1 Government

- The government should implement the National Health Promotion (MoH, 2005). In that, they should employ health education specialist in every region and district. People with first degrees in heath related programmes should be employed in the education of people on health issues.

6.2.2 The Ministry of Health

- The Ministry of Health in collaboration with other non-governmental agencies such as the UNICEF should conduct similar study from time to time to monitor the nutritional status of children under two years and the kind of feeding

practices their mothers use.

- There is the need for the Ministry of Health and non-governmental agencies to introduce an intervention of health education immediately. This can be done by specifically using interpersonal communication to get family members to understand the recommended infant feeding practices.

- A further study on the quality and quantity of food given to the children is very necessary. This will give a baseline data for an effective health education programme on complementary foods in the district.

6.2.3 District Health Management Team

- The district health management team in the Bibiani Anhwiaso Bekwai District should organize a meeting with the chiefs and queen mothers of the various sub-districts and get them to identify the problem of malnutrition and its effects, provide solutions and then encourage them to participate in solving the problem.

- 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.

6.2.4 Health workers

- Midwives and nurses must help the mothers to initiate breastfeeding early (within 30 minutes after delivery) and must assist women who deliver through caesarean sections to initiate breastfeeding within the first one hour after

delivery.

- The traditional birth attendants should be educated 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.

- Health workers should discourage mothers on bottle feeding by talking about it always at antennal and child welfare clinics.

- Knowledge and skill should be provided to practice the provision of nutritionally balanced local complementary foods in households. This can down using the local Fm stations.

- There is the need for every member of the community to participate in

preserving the children under 5 from being underweight, stunted and wasted. Therefore, the health workers can have special health educational talks at the communities where doubts and confusions can be cleared for easy participation.

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APPENDIX A

Questionnaire administered to the participants who were the mothers of children between under two years in the study area of Bibiani Anhwiaso- Bekwai district.

BREASTFEEDING PRACTICES

1. Date of birth of child……....
2. Age of child in months …….. ……..
3. What was your child's birth weight …….
4. What is the order of birth of this child? …….. .
5. Has your child had any infection for past two weeks?

   A. Yes [ ]

   B. No [ ]

6. Has your last child ever been breastfed?

   A. Yes [ ]

   B. No [ ]

7. 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)……..

8. 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……. …..

9. Are you still breastfeeding your child?

a. Yes [ ]

b. No [ ]

10. If the answer is **no**, what age did you stop breastfeeding the child?

Specify…….. (Months)

11. Do you give water to your child?

a. Yes [ ]

b. No [ ]

12. If 8 is **yes**, at what age of the child did you start?

Specify..... (Months)

13. Have you started giving complementary foods to the child?

a. Yes [ ]

b. No [ ]

14. If **yes** to 10, at what age of the child did you start?

Specify ……. (Months)

15. Do you give the child breast milk anytime the child asks for?

a. Yes [ ]

b. No [ ]

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

b. Two times [ ]

c. Three times [ ]

d. Four times [ ]

e. Five times [ ]

f. Six times [ ]

f. Seven times [ ]

Others (specify)…….

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

.....

COMPLEMENTARY FEEDING

18. [If applicable] what local complimentary foods have you introduced to your child?

a. Koko [ ]

b. Rice (cooked) [ ]

c. TZ [ ]

d. Fufu [ ]

e. Others (specify) …….

19. How many times do you give the child complementary foods?

a. 2 times [ ]

b. 3 times [ ]

c. 4 times [ ]

20. Do you normally give the child snack in between the main meals?

a. Yes [ ]

b. No [ ]

21. Do you give your child any infant formula?

a. Yes [ ]

b. No [ ]

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

a. SMA [ ]

b. Lactogen [ ]

c. Cerelac [ ]

Others (specify) …….

23. Do you feed the child with a feeding bottle which has nipple?

a. Yes [ ]

b. No [ ]

DEMOGRAPHIC CHARACTERISTICS

24. What is your age ……. (Years)

25. What was your highest level of education attained?

a. None [ ]

b. Primary education [ ]

c. S.S.S/vocational / technical [ ]

d. Tertiary education [ ]

26. What is the sex your child?

a. Male [ ]

b. Female [ ]

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 did you belong?

a. Traditional region [ ]

b. Catholic [ ]

c. Pentecostal [ ]

d. Moslem [ ]

e. Methodist [ ]

f. Others (specify).....

- What is your marital status?

a. Single [ ]

b. Co-host [ ]

c. Married [ ]

d. Divorced/Separated [ ]

e. Widowed [ ]

30. What is your husband's occupation?

a. government worker [ ]
b. self employed [ ]
c. unemployed [ ]
j. Others (specify).....

31. What is the size of your family?

a. 2 [ ]
b. 3 [ ]
c. 4 [ ]
d. 5 [ ]
e. Others (specify) ……

ANTHROPOMETRY

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

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

APPENDIX B

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 feed 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?

……

……
……

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