

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND
TECHNOLOGY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF COMMUNITY HEALTH**



**DETERMINANTS OF MALNUTRITION IN CHILDREN LESS
THAN FIVE YEARS IN THE BOSOMTWE DISTRICT,
ASHANTI, GHANA**

**BY
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NOVEMBER, 2008**

**KWAME NKRUMAH UNIVERSITY OF
SCIENCE AND TECHNOLOGY, KUMASI**

COLLEGE OF HEALTH SCIENCES

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MASTER OF SCIENCE (M.SC) IN HEALTH
SERVICE PLANNING AND MANAGEMENT**

**BY
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NOVEMBER, 2008

DECLARATION

I hereby declare that this submission is my own work towards the M.Sc and that, to the best of my knowledge, it contains no materials previously published by another person nor material which has been accepted for the award of any degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

This thesis is dedicated to Nana Kofi Sarfo Adom. (M.Sc baby, my son).

KNUST



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ABBREVIATION AND ACRONYMS

AK	-	Atwima Kwanwoma
ANC	-	Antenatal Care
DHA	-	District Health Administration
GHS	-	Ghana Health Services
GSS	-	Ghana Statistical Services
GDHS	-	Ghana Demographic Health Survey
KNUST	-	Kwame Nkrumah University of Science and Technology
MDGs	-	Millennium Development Goals
MOH	-	Ministry of Health
SPSS	-	Statistical Package for Social Sciences
UNICEF	-	United Nations Children Fund
UN	-	United Nations
WFP	-	World Food Programme
WHO	-	World Health Organisation

TABLE OF CONTENT

	Page
Declaration.....	i
Dedication.....	ii
Acknowledgement.....	iii
Abbreviations/Acronyms.....	iv
Table of Content.....	v
List of Tables.....	x
List of Figures	xi
Abstract.....	xii
CHAPTER ONE Introduction.....	1
1.0 Background information.....	1
1.1 Problem Statement.....	3
1.2 Rationale of study.....	4
1.3 Research questions.....	4
1.4 Objectives.....	5
1.4.1 General Objective.....	5
1.4.2 Specific Objectives.....	5
1.5 Conceptual Framework.....	6
1.6 Scope of the study.....	7
1.7 Organisation of work.....	8

CHAPTER TWO LITERATURE REVIEW.....	9
2.0 Introduction	9
2.1 Brief concept of malnutrition and causes	9
2.2 Measuring nutritional status of children less than 5 year.....	10
2.3 Influence of socio-economic characteristics on children nutritional status....	11
2.4 Maternal health care and child morbidity relationship with malnutrition	12
2.5 Feeding practices, water and sanitation and malnutrition.....	12
2.6 Malnutrition rates among children less than 5 years.....	13
 CHAPTER THREE METHODOLOGY.....	 14
3.0 Study Design.....	14
3.1 Study Area.....	14
3.2 Study Population.....	16
3.3 Study variable.....	16
3.4 Sample size.....	17
3.5 Sampling Techniques.....	17
3.6 Data Collection Techniques and Tools.....	18
3.6.1 Pre-testing of Tools.....	18
3.6.2 Structured Interviews.....	18
3.6.3 Anthropometric Technique.....	18
3.6.4 Key Informant Interview.....	19

3.7	Data Analysis	19
3.8	Ethical Consideration.....	20
3.9	Study Assumptions.....	20
3.10	Limitations.....	20
CHAPTER FOUR		
RESULTS.....		21
4.0	Introduction.....	21
4.1	Socio-demographic characteristics.....	21
4.2	Influence of socio-economic characteristics on malnutrition	23
4.3	Influence of Maternal health seeking behaviour and child morbidity on the nutritional status of the child	25
4.4	Influence of feeding practices, water source and sanitation on child malnutrition	27
4.5	Malnutrition estimate among children in the district.....	29
CHAPTER FIVE		
DISCUSSION		32
5.0	Introduction	32
5.1	Background characteristics	32
5.2.	Influence of socio-economic characteristics on nutritional status of the child.....	33
5.3	Influence of Maternal health seeking behaviour and child morbidity on nutritional status of the child.....	35

5.4	Influence of feeding practices, water source and sanitation on child Malnutrition.....	36
5.5.	Malnutrition estimate among children in the district.....	37
CHAPTER SIX		
	CONCLUSION AND RECOMMENDATION.....	39
6.0	Conclusion.....	39
6.1.1	Influence of socio-economic characteristics on nutritional status of the child.....	39
6.1.2	Influence of Maternal and Child health seeking behaviour on nutritional status of the child.....	39
6.1.3	Influence of feeding practices, water source and sanitation on child malnutrition.....	39
6.1.4	Malnutrition estimate among children in the district.....	40
6.2	Recommendation.....	40
6.2.1	Community and Opinion Leaders should.....	40
6.2.2	District Health Administration should	40
6.2.3	District Assembly should.....	40
6.2.4	Parent should.....	41
6.3	Concluding Remarks.....	41
	REFERENCES	42
	APPENDIX A: STRUCTURED INTERVIEW GUIDE FOR HOUSEHOLD.....	45
	APPENDIX B: STRUCTURED INTERVIEW FOR KEY INFORMANTS.....	50
	APPENDIX C: ANTHROPOMETRIC MEASUREMENTS.....	52

LIST OF TABLES

Table No.	Title	Page
3.1	Population Distribution by Sub-districts and the number of communities in the Bosomtwe district	15
3.2	Distribution of Health Facilities in the district 2007	15
3.3	Operational definition of Study Variables	16
4.1	Background characteristics of respondents	22
4.2	Relationship between socio-economic factors and malnutrition	24
4.3	Influence of Maternal health seeking behaviour and child morbidity on nutritional status of the child	26
4.4	Influence of feeding practices, water source and sanitation on child malnutrition	29
4.5	Descriptive statistics of background characteristics of respondents	30
4.6	Influence of characteristics on the malnutrition	31

LIST OF FIGURES

Figure No.	Title	Page
1.1	A conceptual frameworks showing the factors that influences malnutrition directly or indirectly	6
4.1	Summary of background characteristics of respondents	21
4.2	Major meals given to children per feeding time	28
4.3	Distribution of malnutrition of children	30



ABSTRACT

This was a descriptive study with a cross-sectional design on the determinants of malnutrition among children less than five years in the Bosomtwe district, Ashanti, Ghana. The socially related factors accounting for the high level of malnutrition in the Bosomtwe district is unknown. The aim was to assess the social, demographic, economic, health related predictors for malnutrition among children less than five years.

A total of 200 children less than five years were randomly selected and their mothers interviewed using a pre-tested and standardised questionnaire.

The study was conducted during August 2008, the harvest season. For women, who are the main caretakers, the harvest season is one of the busiest period of the year.

The findings indicate that using Z scores, 32% of the children were malnourished, with 23% being severely malnourished. The predictors for malnutrition included the age of the mother ($p=0.00$), number of children ($p=0.02$) employment status ($p=0.05$), and types of water sources used ($p=0.00$).

It is recommended that collaborative effort of community leaders, health managers and district assembly should intensify education provide infrastructures that would enable mothers improve the nutritional status of children less than five years in the district.

CHAPTER ONE

INTRODUCTION

1.0 Background Information

Children less than five years worldwide are known to be vulnerable and susceptible in many respects, especially on matters on health. Nutritional deficiencies and malnutrition generally affect children more than any other group. Poor nutrition occurs in developing countries, as well as in more prosperous areas of the world. WHO Progress Report (2002) indicates that hunger and malnutrition remain the most devastating problems to the world's poor and needy.

As many as 800 million persons worldwide are affected by malnutrition. More than half the childhood deaths in developing countries are related to malnutrition (Benson, and others., 2004). Nearly 30% of humanity suffers from one or more of the multiple forms of malnutrition (WHO, 2000). In a recent series of articles on child survival published in the *lancet*, Daelmeans and Saadeh, (2003), highlighted the importance of addressing childhood malnutrition as a prerequisite for achieving internationally agreed goals to reduce malnutrition and child mortality. Child growth is therefore internationally recognized as an important public health indicator.

Several efforts are being made globally and locally to reduce the malnutrition burden especially in developing nations. The forth Millennium Development Goals (MDG) intends among others to reduce under-five mortality by $2/3^{\text{rd}}$ by the year 2015. This has led to the development of a more integrated and holistic strategies in a manner as to ensure maximum benefits to the vulnerable groups especially children. The major intervention in this direction has been that relating to establishing and promoting exclusive breast feeding and promoting nutritionally adequate diets for children less than five years. In 1979 WHO and UNICEF recommended an exclusive breastfeeding (EBF) period of 4-6months however, WHO expert committee in 2001, upon assessing the extent of EBF concluded that for optimal nutritional status of a child, an EBF period of 6month must be adhered to. Field studies show that complementary foods introduced between four and six months of age replace nutrients from breastfeeding and confer no advantage on growth or development (Dewey *and others*, 1999; and Gupta *and other*, 2002).

Consequently, UNICEF and the Ministry of Health, Ghana recommended exclusive breastfeeding for the first six months of the infant's life. More than 95% of children less than five years in Africa are currently breastfed but this is often inadequate because many people feed their infants with water and other liquids alongside the breast milk. As a result, the rate of exclusive breastfeeding is particularly low in West Africa (Linkage, 2002).

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

In Ghana, the Ghana Health Services (GHS) and Teaching Hospitals acting within the policy frame work of the Ministry of Health (MOH) is implementing a strategy called High Impact and Rapid Delivery (HIRD) of intervention. The interventions include strategies of improving exclusive breast feeding, complementary feeding, de-worming among others for children less than five years in particular (GHS, 2007). This initiative which begun in 2005 is aimed at preventing avoidable deaths due to ill-health resulting from infection and more importantly malnutrition among children less than five years.

Under the supervision of the Regional Health Administration, Ashanti Region, the Bosomtwe district, bedevilled with the problem of malnutrition among children under five, is implementing the HIRD intervention. Efforts in this direction include health education, promoting of better nutrition for children, and ensuring breast feeding. In fact, there is a comprehensive and integrated effort at the health facility and community levels in the district to ensure that children are properly taken care of by their parents, nutrition wise.

1.1 Problem Statement

Malnutrition include under nutrition, specific nutrient deficiencies, and over nutrition; and it kills, maims, retards, cripples, blinds, and impairs human development on a truly massive scale worldwide.

In Ghana, the malnutrition rates for all age groups of children less than five years have increased steadily over the past six years. According to the GHS Annual Report, 2007, it peaks in the 12-23 months age group. In 2007, almost eight percent (7.8%) of children aged 0-11 months were found to be malnourished. This shows a steady increase from 4.1% in 2005 to 4.9% in 2006 to the current figure. For children aged 12- 23 months, 10.1% were malnourished in 2007 as compared to 8.2% in 2006. The highest rate of 28.2% was recorded by Upper West region, while Brong-Ahafo recorded the lowest rate of 3.3%. The malnourished rate among children 24-59 months age group was 7.3% in 2007 as compared to 6.2% in 2006.

The rate of malnutrition among children less than 5 years in Ashanti region as compared to others regions is suggested to be relatively low (GHS, 2007), however, in nominal terms, the regions recorded one of the highest cases. The Bosomtwe district, a district in the Ashanti region, is predominantly rural with high cases of malnutrition that affect children less than five years. In 2004, the district recorded a malnutrition rate of 6.9% which decreased to 5.5% in 2005 (DHA, 2006). Even though the rate is decreasing, the district has expressed concern about the trend and is unable to predict the socially related causes coupled with interventional factors that have accountant for the trend. This research is intended to examine the extent to which malnutrition status of children in the district is related to the social and economic characteristics of their parent and also with reference to access to health services interventions on malnutrition.

1.2 Rationale for the Study

It is a known fact that our children are the greatest assets of a country. They are the future leaders. Providing optimum health to children in terms of physical, social, and intellectual development should thus be a priority concern of everybody. Malnutrition has been a problem worldwide which has been tackled in various ways but the problem still lives with us. In fact it continues to kill millions of children daily. There continue to be several challenges in unraveling the intervention barriers in terms of caregivers' attitude and perception about the nutritional status of their children. More complex understanding is the behavioral or socio-demographic influences of the caregiver that affect the child. The consequence of the negligence of caregivers in ensuring better nutritional care of the children is obvious.

In Ghana, under-five mortality has been increasing over the past decade. According to the GHS, 2007 annual report, under-five mortality have increased from 108/1000 live births in 1998 to 111/1000 live births in 2003. Admittedly, a major contributory factor has been poor nutrition care to children less than five years. The children who are very vulnerable and susceptible to infection are exposed to poor nutritional regimen by caregivers resulting in avoidable deaths.

The findings of the study would inform better contextual planning and management of malnutrition generally, and that related to children less than five years in particular. It would provide the framework by which specific indicators could be used to assess the risk of malnutrition for a child thereby implementing the appropriate measures to curtail it. The indicators intended to be deduced from the characteristics and health behaviour of the mothers, would inform policy makers and health professionals generally, as to possible markers that can guide the design and implementation of intervention to prevent malnutrition.

1.3 Research Questions

1. What socio-economic characteristics of parents significantly influence the nutritional status of children less than five years at Bosomtwe district?
2. Does maternal health seeking behaviour and child morbidity have a relationship with the nutrition status of the children less than five years in the district?

3. What is the extent of relationship between household feeding practices, water sources and sanitation on the incidence of malnutrition in the district?
4. What proportion of children less than five years is malnourished and does the distribution relate to the child's sex, and age?

1.4 Objectives

1.4.1 General Objectives

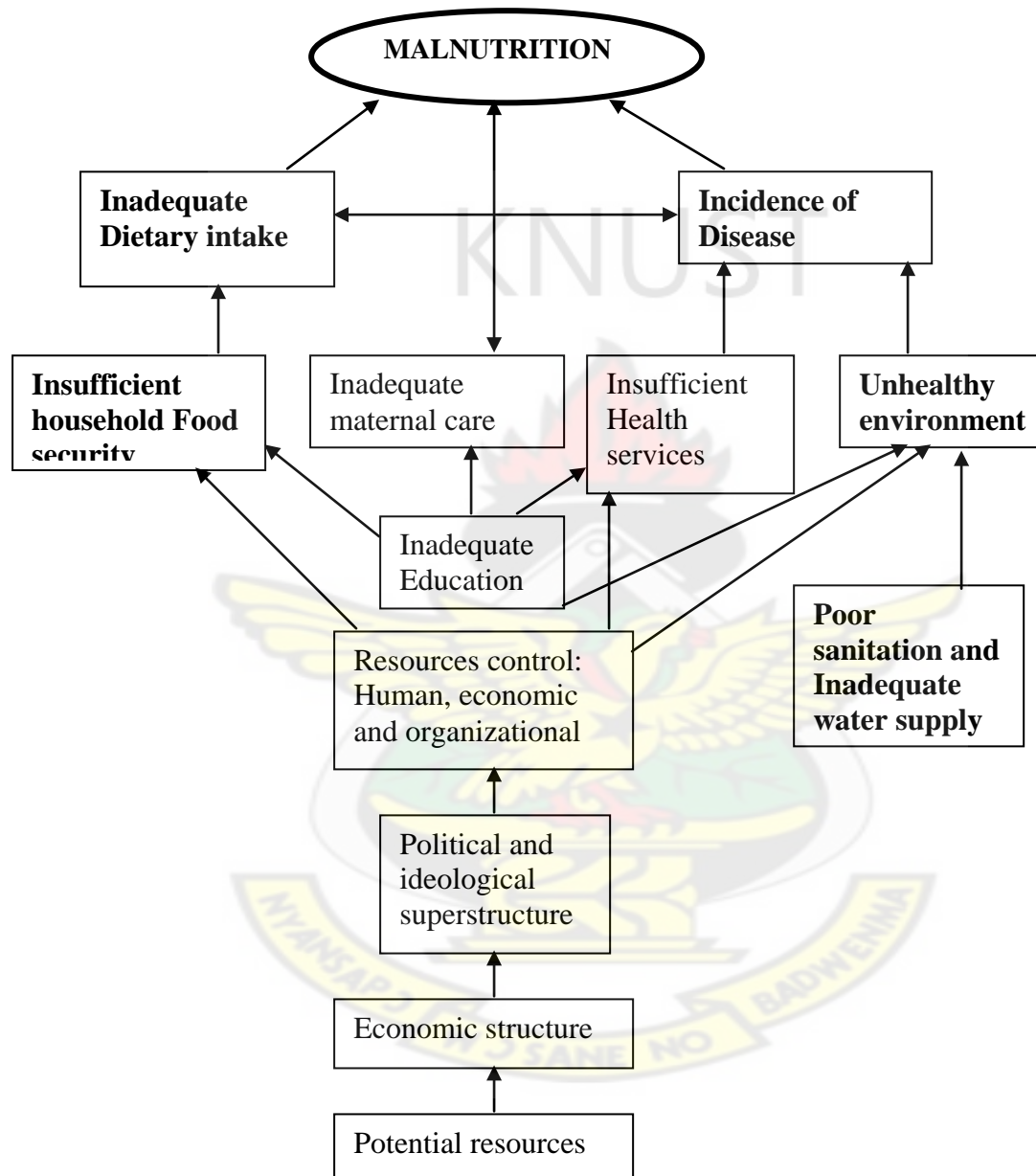
The general objective of the study was to examine, the extent to which parents' characteristics, health behaviour, and household determinants relate to the nutritional status of the children less than five years in the Bosomtwe district.

1.4.2 Specific objectives

1. To explore the relationship between the socio-economic characteristics of parents and the nutritional status of children less than five years in the district.
2. To examined the influences of maternal health seeking behaviour of mother and childhood morbidity among malnutrition children less than five years in the district.
3. To determine how household feeding practices, water sources and refuse disposal and how these relate to the nutritional status of children less than five years in the district.
4. To estimate the proportion of malnutrition forms among the children and the relation between it and their sex, and age.
5. To make recommendation to stakeholders from the evidence gathered as to how malnutrition occurrence could be reduced in the district.

1.5 CONCEPTUAL FRAMEWORK

Figure 1.1: A conceptual frameworks showing the factors that influences malnutrition directly or indirectly



SOURCE: UNICEF 1998

Access to good nutrition is directly influenced by food intake, health status and caring practices. Adequate care for women and children encompassing all measures and behaviours that translates into availability of food and health resources into good child growth and development. Consumption of unsafe water and inadequately protected water sources, coupled with inappropriate disposal of waste and unhygienic conditions in and around homes, has significant implication for the spread of infectious diseases and contribute immensely to the incidence of diarrhoea. Persistent diarrhoea in children is a major cause of malnutrition.

Women who are malnourished are more likely to face reproductive health problems that can lead to maternal and infant death. Improved nutrition reduces the severity of some diseases and minimizes the incidence of others.

A fundamental determinant of nutritional status is food security, which in turn is determined by the availability of and access to food supplies. Availability of food is defined as the capacity of the country to ensure the physical presence of food supplies at all times to all people, either through local production or through importation. Access to food is defined as the ability of people to obtain, whenever required, food supplies for their basic requirements.

Health, Educational, Roads, Agricultural and other social infrastructure are necessary in ensuring a well integrated approach that ensures the individual becomes well informed and equipped in accessing and using the right food sources to improve his or her health status. The lack of these would affect the nutritional status of the child. Underpinning this is the economic status of the country and how it fuels the quality of services provided by these structures to solve deficiencies in the malnutrition dynamics. Political will and power both local and National is therefore relevant in addressing the state nutrition in the Nation and more especially among children less than five years.

1.6 Scope of the Study

This study focuses mainly on household characteristics with more particular attention to parents. These characteristics include socio-demographic, economic, food availability, educational level among others. It also focus of maternal health seeking attitudes in terms of use of antenatal care (ANC) services, time of use of the service and influences relating care

giving of the child such as practices of on exclusive breast feeding and complementary feeding.

The study therefore did not examine socio-political structures that support or affect the nutritional status of children less than five years in the districts. In other words, the impact of health, agricultural, educational and leadership structures and their influences on the nutritional status of the child, were not directly examined under this study.

1.7 Organisation of work

This report is organised in six chapters. The first chapter describes the background of the study, problem statement and defines the objectives and the scope of the study. The second section reviews related literature on malnutrition generally and examines findings made from other authors on the subjects. The third section gives a description of the methods, materials, tools and procedures used in gathering information and analysing the results. It also highlights the ethical and assumptions underpinning the conduct of this study. The fourth chapter focuses on presentation of results in the forms of tables and charts arranged in accordance with the objectives of the study. The fifth and sixth chapters are on the discussion, and conclusions and recommendations respectively. The discussion session elaborates what could account for the observations made and further its implication on the management of malnutrition among children less than five years. In addition, it does so by examining other findings relative to other settings especially those in Ghana. The conclusion and recommendation session of the report would bullet issues noted in the findings and also suggest what can be done by an identifiable agency to solve the problem.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Child growth is internationally recognized as an important public health indicator for monitoring nutritional status and health in populations. Children who suffer from growth retardation as a result of poor diets and recurrent infection tend to have more frequent episodes of severe diarrhoea and are more susceptible to several infectious diseases such as malaria, meningitis and pneumonia. A number of studies (Brown, 1998 Ojeifeitimi *and others.*, 2003; and Benson, and others., 2004) have demonstrated the association between increasing severity of anthropometric deficits and mortality. The substantial contribution to child mortality of all degrees of malnutrition is now widely accepted. In addition, there is strong evidence that impaired growth is associated with delayed mental development, poor school performance and reduced intellectual capacity (WFP, 2005). This chapter therefore reviews the concept of malnutrition, influences of social, economic, and health related factors affecting children less than five years.

2.1 Brief concept of malnutrition and causes

Malnutrition literally means “bad nutrition” and it entails both over- and under-nutrition. In relations to trends of malnutrition in nations, the later is much prevalent in developing countries including Ghana. The World Food Programme (WFP) defines malnutrition as “a state in which the physical function of an individual is impaired to the point where he or she can no longer maintain adequate bodily performance process such as growth, pregnancy, lactation, physical work or resisting and recovering from disease” (WFP, 2005). Malnutrition can result from a lack of macronutrients (carbohydrates, protein and fat), micronutrients (vitamins and minerals), or both. Macronutrient deficiencies occur when the body adapts to a reduction in macronutrient intake by a corresponding decrease in activity and an increased use of reserves of energy (muscle and fat), or decreased growth. Consequently, malnourished individuals can be shorter (reduced growth over a prolonged period of time) and/or thinner than their well-nourished counterparts. 'Hidden Hunger', or micronutrient malnutrition, is widespread in developing countries. It occurs when essential vitamins and/or minerals are not present in adequate amounts in the diet. The most common micronutrient deficiencies are

iron (anaemia), vitamin A (xerophthalmia, blindness), and iodine (goiter and cretinism). Others, such as vitamin C (scurvy), niacin (pellagra), and thiamin or vitamin B1 (beriberi), also can occur during acute or prolonged emergencies when populations are dependent on a limited, unvaried food source.

2.2 Measuring nutritional status of children less than 5 years

Anthropometric measurements provide one of the most important indicators of a child's nutritional status. In combining the infant's spine length, weight and age data, three indices of physical growth used in describing children's nutritional status are height-for-age, weight-for-age and weight-for-height.

Height-for-age: This index provides an indicator of linear growth retardation. Children with height-for-age below minus two standard deviations (-2SD) from the median of the reference population, are considered short for their age, or stunted.

Children who are below minus three standard deviations (-3SD) from the reference population median are severely stunted. Stunting in children, may be the result of inadequate nutrition over a long period of time or the effects of recurrent or chronic illness. Height-for-age, therefore, represents a measure of the outcome of under nutrition in a population over a long period, and does not vary appreciably with the season of data.

Weight-for-age: This is a composite index of height-for-age. Children whose weight-for-height measures are below minus two standard deviations (-2SD) from the median of reference population are considered under weight for their age while those with measures below minus three standard deviation (-3SD) from the reference population are severely underweight. Being underweight for one's age, could mean that a child is stunted, or wasted, or stunted and wasted (GSS, 2003)

Weight-for-height: This measure body mass in relation to body length. Children whose weight-for-height measures are below minus two standard deviations (-2SD) from the median of the reference population, are too thin for their height or wasted, while those with measures below minus three (-3SD) from the reference population are severely wasted.

2.3 Influence of socio-economic characteristics on children nutritional status

Findings from studies which have investigated the association between nutritional knowledge and child nutritional status are inconsistent. Whereas some studies (e.g. Ruel and others., 1992; Glewwe, 1999; Webb & Block, 2003) found significant association between maternal nutrition knowledge and child nutritional status, social characteristics of parents, especially mothers have been identified by some scientist (Ojeifeitimi *and others*, 2003; Agnarsson, *and others*., 2005) as related to the nutritional status of children. A study on the socio-cultural influences on infant feeding decisions among women in Kwa-Zulu Natal showed that mothers' age has a greater influence on the food practices and choices for children less than five years. Mothers of older age intended to be independent as to the choice of food they gave to their children than those younger (Thairu, *and others*., 2005). Mothers socio-demographic and economic characteristics, plays a major role in determining the nutritional status of children less than five years. According to McKeever and Miller (2004), a child nutritional status is enhanced by the mothers' background characteristics, including age, employment status and educational status.

In a study of 300 women in rural Nigeria, Ojeifeitimi *and others*, in assessing determinants of nutrition status among children less than five years, found that there was a strong association between age of the mother, occupational status and employment and the risk of under nutrition among the children. He elaborated that the extent of women independence from the partners has a resultant effect on the nutritional status of the children (Ojeifeitimi and others., 2003).

In a study in Volta Region, Ghana, Appoh and Krekling, 2005, showed evidenced that maternal nutritional knowledge and socio-economic status influences the nutritional status of their children. The study which enrolled a sample of 110 mothers, showed that there was a strong association between the marital status of mothers and the nutritional status of their children. In addition, maternal knowledge and practices on breastfeeding was a significant indicator for the nutritional status of the child (Appoh and Krekling, 2005). Specifically, marital status, educational status, and socio-economic status had a significant association with the nutritional status of the child.

As far as household food security is concerned, there has been an average increase of over 75% in hectares of land under cultivation resulting in increases in production above 50% for all the crops (MOH Nutrition Unit, 2002). During periods of bumper harvest of foods such as vegetables, fruits, roots crops and plantain, the inadequate preservation and storage facilities lead to waste, lowered prices and extended periods of scarcity (MOH Nutrition Unit, 2002).

2.4 Maternal health care and child morbidity relationship with malnutrition

Having malaria was the only independent predictor associated with stunting, anaemia, and iron-deficiency. There is an urgent need to improve traditional complementary foods in the studied communities in terms of energy density, amount of fat in the diet, and bioavailability of macro and micronutrient. (Mark, and others. 2006). The GHS reports that incidence of malaria, diarrhoea and measles are factors contributing to child mortality and malnutrition (GHS, 2007).

2.5 Feeding practices, water and sanitation and malnutrition

Feeding practices have a lot of implication for the nutritional status of the child. Mothers' knowledge about nutritious meals for the children influences how the child is fed. According to Adigrata, 2000, 31% of mothers with babies 0 – 2 years consider cow's milk as best for growth of children. Some mothers consider breast milk as harmful when mothers get pregnant. (Wolde and others., 2002). Knowledge of exclusive breastfeeding by mothers often leads to an improvement in complementary feeding practices ((Lisa, and others., 2000). In India an interventional study where nutritional education was given to mothers to improve awareness about infant feeding in the variety, quantity, quality and consistency of complementary feeding showed that, 80% initiate breast feeding after 3 days of birth, 54.3% absence of exclusive breastfeeding 86% delayed complementary feeding practices which were inadequate in quality, quantity, frequency and consistency (Sethi *and others.*, 2002). In a similar study in south India, mothers were counseled about the choice of appropriate complementary foods and feeding frequency. The intervention group had improved feeding practices such as avoiding of feeding bottle and increased various type of complementary food improvement (Hague *and others.*, 2002). Time of introduction and type of complementary food given to an infant are very important for the child's nutritional status.

According to current recommendations (WHO 1995, 1998; Agnerson and others., 2005), complementary feeding should be introduced into child's diet starting around the age of 6 months. Castle and others, 2001 observed, a strong association was found between age of introduction of complementary feeding and child nutritional status. Significantly more mothers of malnourished children (34%) introduced complementary feeding before 6 months of age than mothers of well nourished children (5%). A scientific review on complementary feeding has revealed that porridge, (koko), and other forms of food given to children less than five are inadequate (Brown, 1998)

The world through the MDG framework, have consented to the objective of halving the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015. In Ghana, the Government of Ghana has passed the Millennium Development Act, ACT 702 that sets out the framework and also provides the political commitment for ensuring the achievement of the MDGs including issues relating to access to water and improved sanitation. The Ministry of Works and Housing in collaboration with the Ministry of Local Government is implementing a rural water and sanitation policy to ensure that people in rural settings achieve this feat by 2015 (UN, 2006). As at 2006, and estimated 50 – 75% of people in rural settings in developing nations including Ghana were using improved drinking water sources (UN, 2006). Investments in sanitation and other social sectors especially with an emphasis on access to women and girls to these services and resources are among the most important policy tools for improving nutrition. Evidence comes from Zimbabwe, where explicit policies were followed to redress the lack of access of many communities to basic services after independence in 1980. (World Bank, 2006)

2.6 Malnutrition rates among children less than 5 years.

GHS has reported an increasing trend of malnutrition over the past five years. According to the agency's annual report, 2006, the malnutrition trends in the children 0-11, 12 – 23 and 24 – 59 months have showed an increase over the period 2003 - 2006. The trend is high in mostly the three northern regions of Ghana. Ashanti region, recorded a low malnutrition among the 0-11 and 24 – 59 months groups. These were 1.8% and 2.3% respectively. Among the 12 – 23 months group that of the region was above 3.3%.

CHAPTER THREE

METHODOLOGY

3.0 Study Design

The study was a descriptive study with an analytical cross-sectional design conducted to access the determinants of malnutrition in the Bosomtwe district. Data was collected during August 2008, the harvest season. The crop this year was good in comparison with that of 2006 and 2007, There were occasional outbreaks of malaria before and during the data collection period. For women, who are the main caretakers, the harvest season is one of the busiest periods of the year. Although the food security situation is usually good during harvesting, child care tends to suffer. Data was collected randomly on a section of the population. The already existing data at the health facility was also reviewed

3.1 Study Area

Bosomtwe is one of the districts in Ashanti Region of Ghana. It is located at the south-western section of the Regional capital, Kumasi. Kuntanasi, the district capital is about 28km from Kumasi. The district shares common borders with Atwima, Ejisu-Juaben and Kumasi Metropolis to the north, Asante-Akim North on the east, and Atwima-Kwanwoma, in the west and Amansie in the south-west. The district covers an area of approximately 681.7995sq km. which represents about 2.8% of the total area of Ashanti Region.

The district has an estimated 2007 population of 172,599. The main economic activity of the people is farming. However, the inhabitants around the Lake do fishing in Lake Bosomtwe. The district has three Senior Secondary Schools namely Jachie/Pramso, Cardinal Tonko and Beposo Secondary Schools. There are also three Vocational Schools. These are St. Michael, St. George and Opoku Ware Girls Vocational/Commercial Schools at Pramso, Kuntanase and Esreso respectively.

The distribution of communities by sub-districts is as below:

Table 3.1: Population Distribution by Sub-districts and the number of communities in the Bosomtwe district

Sub-District	Population	% of Total Population	No. of Communities
Foase (AK)	43,150	25.00	24
Kuntanase	29,342	17.00	22
Jachie-Pramso	41,424	24.00	30
Amakom	13,808	8.00	11
Trede (AK)	44,875	26.00	33
District Total	172,599	100	120

DHA, 2007

Health Parameter

The health delivery system in the district is carried out by staff working in twenty (20) public and private health institutions with human resource stand at two hundred and one health personnel, most of whom are concentrated in the St. Michael's Hospital, Pramso.

These institutions are nine (9) government, seven (8) CHAG or Mission and four (3) private facilities. The distribution of these facilities is shown in Table 3.2 below.

Table 3.2: Distribution of Health Facilities in the district 2007

Hospitals	Health Centres	Clinics	Maternity Homes
Kuntanase Hospital (G)	Jachie H/C (G)	Nyameani Methodist Clinic (M)	Sophia Maternity Clinic-Esreso (P)
St. Michael's Hospital (M)	TetrefuH/C (G)	Brodekwan Methodist Clinic (M)	Emmanuel Maternity Clinic -Aputuogya (P)
	Foase H/C (G)	Amakom Methodist Clinic (M)	Eye Adom Maternity Clinic Brofoyedru (P)
	Trabuom H/C (G)	Aburaso Methodist Clinic (M)	
	Trede H/C (G)	SDA Clinic – Konkoma (M)	
	Kwanwoma H/C (G)	ST. Mary's Clinic - Apinkra (M)	
	Ahenema Kokoben H/C (G)	Methodist Clinic – Bebu (M)	
	Piase H/C (G)		

**** G – Government Institutions, M – Mission, P - Private**

3.2 Study Population

The study included all households within the communities with children less than five years. The eligibility criteria included: mothers with children less than five year and who have lived in the community for at least 6 months.

3.3 Study Variables

Table 3.3 Operational definition of Study Variables

VARIABLES	OPERATIONAL DEFINITION	SCALE OF MEASUREMENT
Socio-demographic characteristics	Responses to specific questions	
- age of mother	- age at last birth day	Discrete
- religion	- religious affiliation	Nominal (Christian, Moslem, traditional)
- Educational level	- level of formal education completed	Nominal (None, Basic, SHS etc)
- Number of children	- total number of children delivered	Discrete (eg. 1,2,3,)
- Number of dependant	- total number dependant in household	Discrete (e.g. 1,2,3,)
- Marital status	- Marriage rights performed	Nominal (single, married, divorced etc)
Adequate food supply at household level	Ability to provide food for the household throughout the year	Ordinal scale (e.g. always available, available, scarce)
Adequate maternal and child care practices		
- use of ANC services	- Mother attended ANC in last pregnancy	Nominal (attended, not attended)
- length of time child is breast fed	- Number of months child is breast fed	Discrete (2months,3months,)

- child falling ill	- Child falling ill in the last 6 months	Nominal (fell ill, healthy)
- complementary feeding	- introduction of food and water	Nominal (gives tea, gives water, gives kenkey)
Adequate sanitation and water supply	Availability of good drinking water, toilet facility, good drainage system, clean environment	Nominal scale (e.g. water available, water not available) Pipe-borne water= satisfactory KVIP=satisfactory
Feeding practices	Number of times food is given to children	Ordinal scale 4times a day= satisfactory 3times a day=satisfactory 2times a day= unsatisfactory
Support for women	Those who give assistance to expectant and lactating mothers in her absence	Nominal scale (e.g. husband, mother, household)

Source: Author's 2008.

3.4 Sample Size

With a population of 172, 599 and an estimated 20% of the population which is 3,460 children less than five years, 200 sample size was determined using EPI STAT CALC version 4.0.3 software. A malnutrition prevalence rate of 23% and a margin of 5% error and a power of 95% confidence interval.

3.5 Sample Technique

A simple random sampling was made. The data was collected from all the four sub-districts. In each sub-district, 50 households were chosen; making the total number two hundred (200) two communities from each were chosen. The communities were listed according to numbers. The numbers were written on a piece of paper. Each paper was folded and was put in a box and some selected people were asked to pick from the box. Any number that was

picked, the community with that number was selected. Choosing the households was done by counting the houses from the chief's palace, each third house was chosen but if a house is chosen and there is no pre-school child then the next house will be selected.

3.6 Data Collection Techniques and Tools

3.6.1 Pre-testing of Tools

Three National service participants were used as field assistants. They were trained in basic interviewing techniques and in taking weight and height measurements. Translations of questions into Ghanaian language "Twi", the local language were agreed upon to ensure consistency.

The tools for this study were pre-tested at Amansie East District and to be precise Bekwai Ashanti Region on fifty (50) mothers and children, on the 4th to 7th August 2008. The necessary modifications were made. Pre-testing was done at the district because it has the same characteristics of Bosomtwe district.

3.6.2 Structured Interviews

Structured interviews were conducted using pre-tested questionnaires administered to mothers with children less than five years. Information was collected on the demographic characteristics of household members and socio-economic factors. Child-related data, such as age, gender, breastfeeding, child feeding, nutritional status and occurrence of illness were collected. Sanitary conditions such as source of water, presence of latrine and waste disposal were also gathered.

3.6.3 Anthropometric Technique

Anthropometric measurements such as weight and standing height were taken of each child using the standard techniques by W.H.O (WHO, 2005). For children who were less than two years old, recumbent length was measured instead of standing height.

Weight Measurements were taken from all children below the age of five years using the Salter hanging scale. Weight measurements were taken to the nearest 0.1kg.

Standing Height was measured using a “microtoise” attached to a smooth straight wall. The subject was made to stand without shoes, with feet at right angle, his back flat against the wall, and his eyes looking straight ahead. The subject was requested to stand as erect as possible, with heels on the ground. The headpiece of the “microtoise” was then gently lowered, crushing the hair and making contact with top of the head. Height was recorded to the nearest 0.1cm.

Recumbent Length was taken among subjects less than 2years of age, using an infantometer or wooden length board. The child was laid on the board, which is a flat surface. The head was positioned firmly against the fixed head board with eyes looking vertically. The knees were extended by firm pressure and the feet were fixed at right angles to the lower legs. Similar to standing height, length was recorded to the nearest 0.1cm

3.6.4 Key Informant Interview

Key Informants such as the District Nutrition Officer, Officer in charge of rehabilitation centre, nutrition unit, the deputy director of nursing services who is also in charge of maternal and child health, Focal person for community child growth promotion and also personnel at kids ward at the district hospital were interviewed about policies and programmes they have put in place to help children in the district concerning their nutritional status and also resources available in the communities to improve nutritional status of children.

3.7 Data Analysis

Data collected were cleaned and analysed using Statistical Package for Social Sciences (SPSS) version 15.0.3. A template was designed and data entered. Entered data was run in frequencies and variables cross tabulated for purpose estimating descriptive and inferential trends. For the later, Chi square or Fisher’s Exact test were used and also p-values estimated was appropriate. A probability value (p-value) of less than 0.05 was considered to be statistically significant at 95% confidence interval.

3.8 Ethical Consideration

Permission was sought from the Department of Community Health, Kwame Nkrumah University of Science and Technology (KNUST) to carry out this study. Permission was also sought from the Bosomtwe District Health Directorate as well as the management of the health institutions to be surveyed. Informed consent was obtained from all the respondents of the survey and participants of the focused group discussions. The purpose, the methods and eventual use of the study findings was also explained to the respondents. They were assured of the confidentiality of their responses and the right to refuse to partake was made known to them. They were also assured that their responses would not be associated with them now or in the future and that it would also not affect their association with any institution in or outside the district now or in the future. They were to volunteer to participate.

3.9 Study assumptions

The following assumptions were made:

1. Respondents were objective with their answers.
2. That the sample size is a true representation of the study population.
3. That responses from the participants represented the true situation in the district.
4. All selected participants fully participated for a correct assessment to be made.
5. That few communities in the Atwima Kwanwoma District would be part of the project as they were all under the Bosomtwe-Atwima Kwanwoma District until recently when the District was divided.

3.10 Limitations

An attempt was made to present the real picture of the state of malnutrition in Bosomtwe, despite the limitations.

CHAPTER FOUR

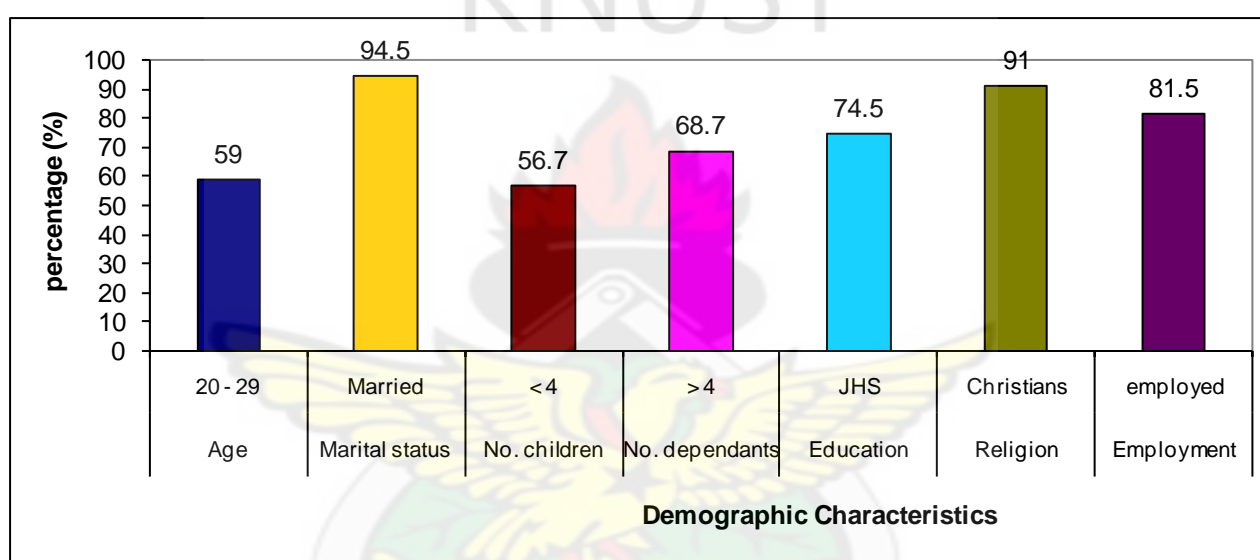
RESULTS

4.0 Introduction

This section of the study covers the findings. The findings are shown based on the pre-determined objectives as indicated in chapter one. They are presented in tables and graphs.

4.1 Socio-demographic characteristics

Figure 4.1 Summary of background characteristics of respondents (N=200)



Source: Author's field data, 2008

Over fifty percent (59.0%) of the respondent had age ranges of 20 – 29 years and a mean age of 27.53, with a \pm standard deviation of 2.63. Ninety four percent (94.5%) of them were married with 56.7% having less than four children. The average number of children for the respondent was 2.85 ± 1.50 standard deviation. More than sixty percent (68.7%) of the household had more than four dependants. As far as educational level is concerned, 4.0% had had no formal education, 19.5% primary education and 74.5% Junior Higher School. Out of the 200 respondents, 163 representing 81.5% were employed. Farming, trading and tradesman ship were the incoming earning employment engaged by the respondent forming, 68.1%, 30.7% and 1.2% respectively. Over half (53.5%) of their partners were engaged in

farming and in their view, the jobs earned them (94.5%) enough to meet their food and other needs.

Table 4.1: Background characteristics of respondents

Variable	Frequency (N = 200)	Percentage (%)
Age		
< 20 years	13	6.5
20 – 24 years	56	28.0
25 – 29 years	62	31.0
30 – 34 years	30	15.0
35 years and above	39	19.5
<i>Mean = 27.53 ± 2.67; Min = 16; Max = 39</i>		
Marital status		
Single	11	5.5
Married	189	94.5
Number children		
< 4	85	56.7
4 or more	65	43.3
<i>Mean = 2.85 ± 1.2</i>		
Number dependants		
< 4	43	31.3
4 or more	107	68.7
<i>Mean = 6.59 ± 2.99</i>		
Education level		
None	8	4.0
Primary	39	19.5
Junior High	149	74.5
Senior High	2	1.0
Tertiary	2	1.0
Religion		
Christianity	182	91.0
Islam	18	9.0
Employment status		
Employed	163	81.5
Not employed	37	18.5

Type of employment	(n=163)	
Farming	111	68.1
Trading	50	30.7
Tradesman	2	1.2
Partners occupation		
Farming	107	53.5
Trading	54	27.0
Tradesman	26	13.0
Public/Civil servant	13	6.5
Earning meet food and other needs		
Earn enough	189	94.5
Don't earn enough	11	5.5

Source: Author's field data, 2008

4.2 Influence of socio-economic characteristics on malnutrition

As detailed in Table 4.2 below, marital status ($p=0.31$), educational level ($p=0.13$), religion ($p=0.60$) and earning enough to meet food and other needs ($p=0.75$) did not have any significant relationship with the malnutrition status of children. However, the number of children ($p=0.02$), number of dependants ($p=0.01$), employment status ($p = 0.05$), age of mother ($p=0.00$), had significant relationships with the nutritional status of the child. As indicated by the District Nutrition officer “...large family size, poverty and teenage pregnancy are the causes of malnutrition here”. On the distribution of age of mothers, there was a fair distribution of malnutrition across the age groups. Out of the 64 children identified as malnourished, 58 representing 90.6% were from households with 4 or more dependants.

The distribution of adequately nourished children in relation to educational level, depicted that, all (2) the mothers who had obtained secondary education had none of their children being well nourished. It is noteworthy, that over seventy percent of children malnourished (79.7%) and those well nourished (72.1%) had mothers who had obtained Junior High School level of education. In addition, 37.5% (3/8) of the mothers with no formal education had their children being malnourished. Even though religion did not show a significant relationship

with the weight of the child, 50.0% children of Muslim mothers were malnourished. It was also observed that out of the 64 malnourished children, 89.1% had mothers who claimed they were employed and 77.9% of adequately nourished children, said that they met the food needs of their children. Out of the 11 mothers who indicated that they did not earn enough to meet the food and other needs of their children, 4 representing 36.4% had their children being underweight and the rest, 63.6% had children with normal body weight as shown in Table 4.2 below.

Table 4.2: Relationship between socio-economic factors and malnutrition

Variable	Malnourished (n = 64)	Adequately nourished (n=136)	Chi square or Fisher's Exact; p-value
Age			
< 20 years	3 (4.7%)	10 (7.4%)	10.45 (0.00)
20 – 24 years	17 (26.6%)	39 (28.7%)	
25 – 29 years	15 (23.4%)	47 (34.6%)	
30 – 34 years	8 (12.5%)	22 (16.2%)	
35 years and above	21 (32.8%)	18 (13.2%)	
Marital status			
Single	2 (3.1%)	9 (6.6%)	1.02 (0.31)
Married	62 (96.9%)	127 (93.4%)	
Number of children			
< 4	26 (40.6%)	80 (58.8%)	5.79 (0.02)
4 or more	38 (59.4%)	56 (41.2%)	
Dependants			
< 4	6 (9.4%)	32 (23.5%)	6.26 (0.01)
4 or more	58 (90.6%)	104 (76.5%)	
Educational status			
No education	3 (4.7%)	5 (3.7%)	7.00 (0.13)
Primary	8 (12.5%)	31 (22.8%)	
JHS	51 (79.7%)	98 (72.1%)	

SHS	2 (3.1%)	0 (0.0%)	
Tertiary	0 (0.0%)	2 (1.5%)	
Religion			
Christianity	63 (98.4%)	135 (99.3%)	0.60 (0.73)
Islam	1 (1.6%)	1 (0.7%)	
Employment status			
Employed	57 (89.1%)	106 (77.9%)	3.55 (0.05)
Not employed	7 (10.9%)	30 (22.1%)	
Earning meet food and other need			
Earn enough	60 (93.8%)	129 (94.9%)	0.10 (0.75)
Don't earn enough	4 (6.3%)	7 (5.1%)	

Source: Author's field data, 2008

4.3 Influence of Maternal health seeking behaviour and child morbidity on nutritional status of children less than five years

Morbidity rate within the past 6 months among the children as indicated by the respondents was 70.5% compared to and the rest, 29.5% who had not been sick in the same period. Child morbidity in the household had an association ($p=0.05$) with the nutrition status of the child. This was noted by the pediatrician that “...*illness example HIV...*” accounted for the malnourished state of some of the children. All malnourished children were from mothers who had attended ANC. Those who did not use ANC services had their children well nourished.

Accessing ANC during pregnancy did not have a relationship ($p=0.35$) with the nutritional status of the children. One hundred and forty six (146) out of the 198 respondents, who used ANC services, used it in the first trimester. This represents 73.7%. The women do not attend ANC regularly because “...*when the centre [referring to the rehabilitation centre] used to provide food, they came but now, the number has reduced because the food is finished*”[Nutrition Officer]. As far as provision of funds to the health facility was concerned, none of them used their own funds. Majority, 97.9% (194/198) said funds for accessing ANC

services were provided by husbands. The source of funding however, did not have any association ($p = 1.00$) with the nutritional status of the child.

On being overruled to attend ANC, out of the 198 respondents who used ANC, 188 forming 94.9% said they were not overruled when they decided to use the service. Interestingly their independent decision did not influence ($p=0.39$) the nutritional status of the children. In fact, 96.9% of malnourished children were of mothers whose decision to use ANC was not overruled. On the other hand, out of the 10 respondents who said their decision was overruled, 8 had their babies having a well nourished status.

The practice of breast feeding was also assessed with more attention to time period of breastfeeding children. Whereas 37.0% of the respondents stopped breast feeding in less than 24 months, 63.0% continued breast feeding for 24 months or more. Despite this, 57.8% of the children malnourished were breastfed for 24 months or more. Length of time of breast feeding therefore did not have any association with the nutritional status of the child ($p=0.35$) as detailed in Table 4.3 below. Out of the 200 respondents, 37.0% gave water and food to their children before 6 months.

There was a significant ($p=0.03$) relationship between early introduction of water and food before 6 months and the nutritional status of the child. Over 60% of the children malnourished were given water and food after 6 months, as against 43.9% of the children well nourished. Partners (48.0%), in-laws/parents (42.0%) and other relatives (10.0%) were those who took care of the children when the mother is away. The type of person who took care of the child does affect ($p=0.00$) the nutritional status of the child.

Table 4.3: Influence of Maternal health seeking behaviour and child morbidity on nutritional status of the child

Variable	Malnourished (n = 64)	Adequately nourished (n=136)	Chi square or Fisher's Exact; p-value
Child morbid within last 6 months			
Child has been sick	51 (79.7%)	90 (66.2%)	3.80 (0.05)
No child has been sick	13 (20.3%)	46 (33.8%)	

Attending ANC			
Attend ANC	64 (100)	134 (98.5%)	0.21
Don't attend ANC	0 (0.0%)	2 (1.5%)	
Time of first ANC visit			
1 st trimester	55 (85.9%)	91 (67.9%)	7.85 (0.00)
2 nd and above trimester	9 (14.1%)	43 (32.1%)	
Provider of funds for ANC			
Self	0(0)	0(0)	0.67 (1.00)
Husband/partner	63 (98.4%)	131 (97.8%)	
Parent	1 (1.6%)	2 (1.5%)	
Mother-in-law	0 (0.0%)	1 (0.7%)	
Decision to attend ANC overruled			
Decision overruled	2 (3.1%)	8 (6.0%)	0.73 (0.39)
Decision not overruled	62 (96.9%)	126 (94.0%)	
Length of time of breast feeding			
< 24 months	27 (42.2%)	47 (34.6%)	1.09 (0.35)
24 months and above	37 (57.8%)	89 (65.4%)	
Give water and food within 6 months			
Give water and food	25 (39.1%)	74 (56.1%)	4.98 (0.03)
Don't give water and food	39 (60.9%)	58 (43.9%)	
Care giver when mother is away			
Partner	19 (29.7%)	77 (56.6%)	14.65 (0.00)
In-law/parent	39 (60.9%)	45 (33.1%)	
Other relatives	6 (9.4%)	14 (10.3%)	

Source: Author's field data, 2008

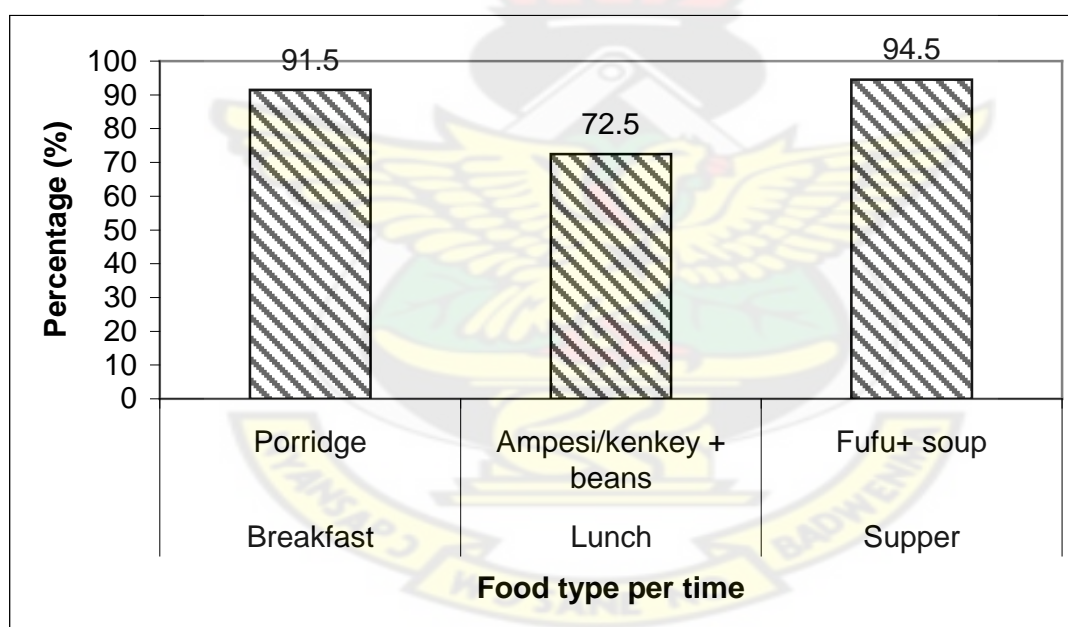
4.4 Influence of feeding practices, water source and sanitation on child malnutrition

As shown in Figure 4.2 below, 91.5% of the women gave porridge to the children as for breakfast, ampesi/kenkey with beans (72.5%) as lunch, and fufu and soup (94.5%) for supper. About four percent (4.5%) of the respondents said that they fed their children once a day. The

rest, 85.5% and 7.0% fed the children twice and thrice respectively. The number of times a child was fed did not have any association ($p=0.11$) with the nutritional status of the child. The practise of children eating together from the same bowl/plate also did not have any relationship ($p=0.19$) with their malnutrition status. It is worthy of note that 79.4% and 87.3% of children malnourished and well nourished respectively, did not eat from the same bowl/plate together.

Pipe borne (20.0%), Boreholes (66.0%), Hand dug wells (13.5%) and streams (0.5%) were the source of water used by the respondents. The source of water for the children have a significant association ($p=0.00$) with their nutritional status. The type of toilet facility used per household also did have an association ($p=0.00$) with the nutritional status of the child as detailed in table 4.4 below. All the respondents disposed off refuse by crude dumping.

Figure 4.2: Major meals given to children per feeding time



Source: Author's field data, 2008

Table 4.4: Influence of feeding practices, water source and sanitation on child malnutrition

Variable	Malnourished (n = 64)	Adequately nourished (n=136)	Chi square or Fisher's Exact; p-value
Number of times fed per day			
Once	1 (1.6%)	8 (6.2%)	4.34 (0.11)
Twice	61 (95.3%)	110 (84.6%)	
Thrice	2 (3.1%)	12 (9.2%)	
Eating together			
Children eat together	13 (20.6%)	16 (12.7%)	2.04 (0.19)
Children don't eat together	50 (79.4%)	110 (87.3%)	
Source of water used			
Stream/pond	0 (0)	1 (0.7%)	30.97 (0.00)
Hand dug wells	20 (31.3%)	7 (5.1%)	
Borehole	27 (42.2%)	105 (77.2%)	
Pipe-borne	17 (26.6%)	23 (16.9%)	
Toilet facility used			
Pit latrine	58 (90.6%)	100 (73.5%)	10.43 (0.00)
KVIP	4 (6.3%)	33 (24.3%)	
Water closet	2 (3.1%)	3 (2.2%)	
Disposal of refuse			
Crude dumping	64 (100.0%)	136 (100.0)	-

Source: Author's field data, 2008

4.5 Malnutrition estimate among children in the district

The mean age of the children was 10 months, an average height of 66.24 cm and a weight of 7.89 kg as shown in Table 4.5 below. About 36% of the children were females. Severe malnutrition was identified in 23% of the children, 9% malnourished and rest (68%) adequately nourished. Fig 4.3 There was no relationship ($p=0.82$) between the sex of the children and malnutrition status however, the age of the children had an association ($p=0.00$) with its nutritional status as shown in table 4.6 below. According to the key informants the

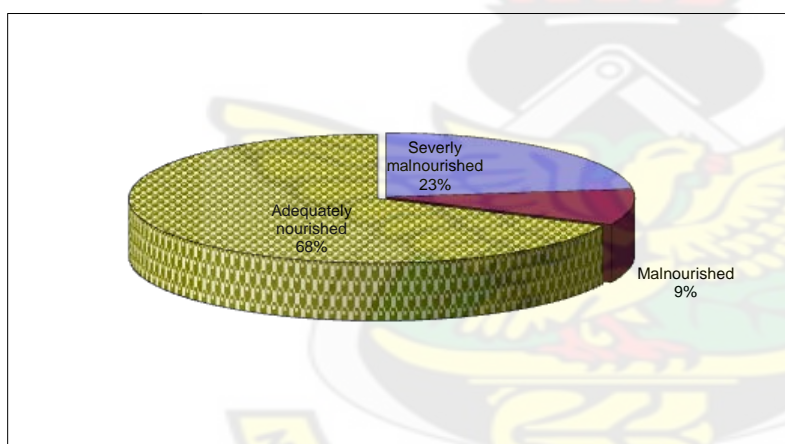
trend of malnutrition in the district is decreasing because of the rehabilitation interventions sited at Pramso and food supplements supports from the Catholic Relief Services (CRS).

Table 4.5: Descriptive statistics of background characteristics of respondents

Variable	Mean	SD	95 % C.I.
Age	10.00 months	10.79	[10.51, 13.52]
Height	66.24 cm	24.26	[65.23, 71.98]
Weight	7.89 kg	3.33	[7.43, 8.36]

Source: Author's field data, 2008

Figure 4.3: Distribution of malnutrition of children

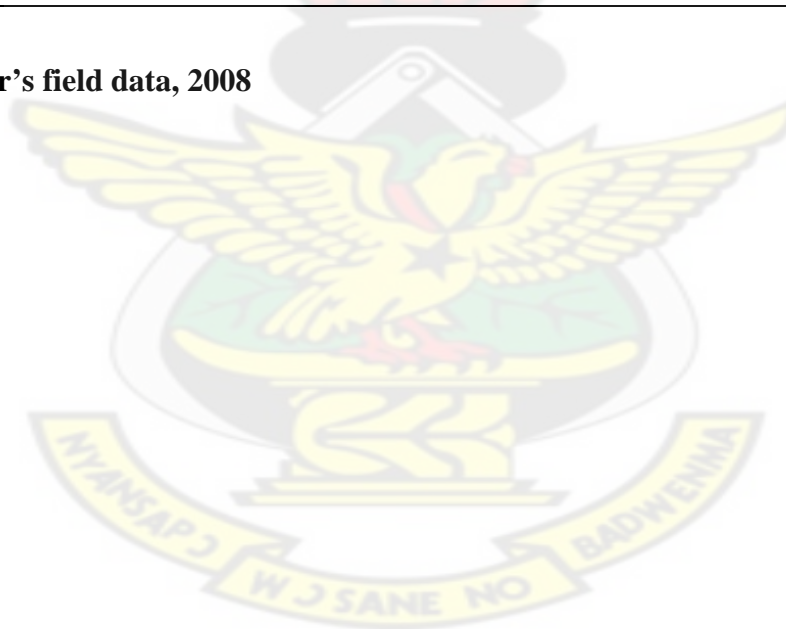


Source: Author's field data, 2008

Table 4.6 Influence of characteristics on the malnutrition

Variable	Severely malnourished	Moderately malnourished	Adequately nourished	Chi square or Fishers exact, p-value
Sex				
Female	18 (39.1%)	7 (38.9%)	48 (35.3%)	0.34 (0.82)
Male	28 (60.9%)	11 (61.1%)	88 (64.7%)	
Age of child (months)				
< 12 months	26 (56.5%)	11 (61.1%)	81 (59.6%)	14.53 (0.00)
12 – 24 months	14 (30.4%)	3 (16.7%)	42 (30.9%)	
25 - 36 months	6 (13.0%)	1 (5.6%)	13 (9.6%)	
37 months – 59 mths	0 (0)	3 (16.7%)	0 (0)	

Source: Author's field data, 2008



CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter elaborates on the relevance of the observations made from the study and the consequence on the malnutrition status of children less than five years. The findings are discussed in relation to available literature on the subject coupled with the current policy guidelines. It also elaborates on the social and economic implication to the children at Bosomtwe and similar settings.

5.1 Background characteristics

Mothers with children less than 5 years in the Bosomtwe district are relatively young, educated and energetic and engaged in farming and trading. The independence of women contributes significantly and is a good indicator for the quality of care provided their children. Having had basic education presupposes that they were exposed to basic skills of improving life style through better nutritional and sanitation care.

The Millennium Development Goal Report, in assessing its fourth objective of reducing child mortality recognised the relevance of maternal education and income levels doubles children survival (UN, 2006), since such parent can perform the protective role to children less than five years. Engaging in farming also could reflect the level of food security at home and therefore implication for the quality of food to the children. These strong characteristics could be stymied by the level of dependents in the household. About half, 43.3% had had more than four deliveries and were staying with other relatives increasing the household dependents to more than four inhabitants. This is reflected in about 70% of the households. The increased number of dependants, coupled with the high dependency could affect the quality and quantity of food shared. In fact, in most setting as described above, the children suffer (Ojeifeitimi *and others.*, 2003). Little food is given to them and most of the shared protein is taking by the adults such as observed elsewhere (Brown 1998; and Benson, and others., 2004). Usually, they don't have their served plates but are fed when the adults are eating together in the same bowl. A similar observation was made by Sethi *and others.* 2002 in India. Caring for the children could be influenced by having a permanent partner who is

employed and also educated. Since only 6% of the women were unmarried, partners of the women could provide additional support to ensure food and financial security required to improve the nutritional status of the children. Evidence from the study suggest that, the collaborative efforts of both parents of children less than five years is yielding results and in most respect providing adequate food security for the household which is also observed (Mark, and others. 2006). The parents are able to earn enough income to meet other needs for the household.

5.2 Influence of socio-economic characteristics on nutritional status of the child

It was evident from the findings that the age of the mother had a strong relationship with the nutritional status of the child. Teenage pregnancy, mothers below age 18 years, might have been in the plight as a result of role identification crisis. This results from peer influences and wanting to be seen to be also capable of behaving like adult (Appoh and Krekling, 2005).

This psychological attitude exposes them to early sex. This is not to suggest that they are not biologically prepared to conceive (Mamiro, and others. 2005), rather, that they are socially and economically incapable of controlling and managing the demands of child rearing. Such young women may not have been married and therefore would gain little or no social and financial support from their partners. In addition to this social dynamics is the issue of the risk of given birth to an underweight child at that age if the necessary nutritional requirements during pregnancy are not met?

This is more reflective of such circumstance considering the low economic standing of most of these young women in a relatively rural setting in Ghana. Worthy of note is that majority of the women who had children malnourished were 35 years and above, page 28. In fact, 53.8% of women in this age group had malnourished children. This is also a risk group not only for outcomes of pregnancies but related complications to the mother.

In the context of this study, children delivered by women of this age could be underweight, a risk factor for malnutrition. The tendency to give birth at this old age may be attributed to several factors among which are social perspectives of the number of children that a woman should have. This is corroborated by the fact that the number of children the women had also had a significant ($p=0.01$) effect on their nutritional status. The number of children the women had could affect the quality and quantity of food served the children thereby affecting

their nutritional status (Brown, 1998; and WFP 2005). Majority (59.4%) of the children malnourished were of mothers who had more than four children. This may be because they had little to spend on the nutritional needs of their children.

In addition, the lack of care could expose the children to many risk factors including diseases. Worsening the situation is the extended family systems that is more strengthened in such largely rural setting (Lisa, and others., 2000; and Appoh and Krekling, 2005)., such as pertain in the Bosomtwe district. Couples are required to reciprocate the benefits they had from the external family, fending for members when they are of age and or have married.

Even though this provides the needed support relating to fending for the children thereby relieving the parents of certain stress, it has implication for the economic and nutritional demands. Its replica effect on the nutritional status of the children is reflected in this study as the number of dependants in a household also had significant ($p=0.02$) relationship with the nutritional status of the child.

It is evident that the occupation engaged by the respondent had an association ($p=0.05$) with the nutritional status of the child. Even though this suggests that their earning patterns may affect the nutritional status of the child, it could not explain the phenomenon since it did not influence the nutritional status of the child. It could be that, at the relative youthful age, the mothers gets to engaged in work to be seen as responsible, unfortunately their earnings are not enough to reflect on the nutritional status of the children even though from their perspective the job is giving them adequate earnings.

Educational status, religious affiliation also did not relate to the nutritional status of the children. The level of enlightenment of the educated had not been applied to meeting the nutritional need of their children so as to differentiate them from those who had not had formal education. The manifestation of this observation might have evolved from the socialisation concept of infant feeding. In many cultures, feeding practices and habits are informed by the indigenous practices which usually are enculturated irrespective of one's educational level. The low levels of formal education of majority of the mothers may influence to large extent, their inability to reappraise these practises to the benefits of the children but only to be engulfed by what pertains. This is not to suggest that the feeding culture of children is poor but, just to highlight the uniformity and no difference of the nutritional status of children less than five years among educated and non-educated mothers.

It is also worth noting, that the efforts of the district health administration, in educating and promoting proper food habits does not seem to influence differently, the practises of both educated and non-educated mothers in the district.

5.3 Influence of Maternal health seeking behaviour and child morbidity on nutritional status of the child

The health status of the child is an important indicator for its nutritional status. The incidence of malaria and diarrhoea has been well documented to contribute to the loss of appetite with consequential loss of weight among children. In tropical and rural setting such as Bosomtwe district, these diseases are endemic and children less than five years are most susceptible. Out of the 200 children assessed, 141 had fallen ill within the last 6 months. Obviously, this might have affected their growth and therefore the cumulative weight. Malnutrition among children less than five years in the district is associated with the incidence of child morbidity. In fact children who had fallen sick were 2.01 times more likely to be malnourished than children who had not been sick in the same period.

ANC services utilisation is presumed to influence outcome of delivery and secondarily affect the manner in which attendant implement the nutritional education and advice given. The fact that all the children malnourished were of former ANC attendants is a major concern. The lack of consistency in attending to ANC could have accounted for this. These mothers even though used the health facility in the first trimester, they may not have continued as also observed in GHS Annual report, 2007. Mothers' ability to assimilate and implement the content of nutritional information provided at the health facilities could be impeded by many factors among which is lack of available resources including food ingredients and income. Interestingly, only 4 out of the 64 women indicated their earnings were not enough to feed and meet other family needs. Obviously the tangibility of this evidence cannot explain the influences but could be suggested that there may be poor adherence to the use of the health messages on nutrition.

Time of attending ANC also affected the nutritional status of the children significantly ($p=0.00$). The late attendance to ANC poses a risk for the manifestation of preventable pregnancy complications that could have affected the growth of the foetus and consequently the outcome of delivery. Surprisingly, majority, 85.9% of mothers who had attended ANC,

had malnourished children, raising an issue of adherence. This is presumed from the evidence that early visitors of ANC as per GHS protocol are educated early about risk behaviour including exposure to infection, such as malaria and parasitic infections that has a negative toll on foetus weight and total growth. The assumption is that the adherence to this protocol would reduced delivery of underweight babies and hence improves the nutritional status. In addition the lack of adherence to breastfeeding and complementing practises after the baby has been delivered could be a contributory factor since the length of breastfeeding in particular did not influence the ($p=0.35$) nutritional status of the child. Thus, if the requisite nutritional practices are not continued from pregnancy throughout the total childhood period of the baby, its nutritional status may be compromised.

Water sources of rural areas are usually unwholesome. The use of streams, hand dug wells and boreholes are predominant in the Bosomtwe district. These water sources are exposed to contamination from varied sources but are the major domestic sources which includes the preparation of food for infants and children less than five years. Giving water and food within 6 months had a significant association ($p=0.03$) with the malnutrition trend among the children in the district.

The MOH through its service agencies is promoting the use of exclusive breastfeeding. This is in line with the WHO recommendation which is aimed at reducing infections usually diarrhoea among children less than five years. The promotion exercise is usually confronted with many social influences on the new mothers. Which influence results from not only practices in society but largely implemented by relatives who are suppose to provide support for caring for the baby in the absence of the mother. Mother in-law parents as evidenced in this study, contribute significantly to this practice. In the absence of the mother water and other food sources are provided because, she would not be around to breast feed the baby.

5.4 Influence of feeding practices, water source and sanitation on child malnutrition

Feeding practices as has been alluded above contributes significantly to exposure to infection by children less than five years. This coupled with poor water sources and sanitation only increases the susceptibility levels of the child to malnutrition. In the Bosomtwe district, porridge, ampesi/kenkey plus beans, and fufu and soup, are the predominant food given to children understudied. Plantain, Maize and cassava are the main farm crops in the districts.

These crops provide a readily available food for the family and the child less than five years. They are highly of carbohydrate content and in most rural settings little protein is added to complement for a nutritionally adequate diet. The number of times and the form with which the food ate, together or not, does not significantly affect the nutritional status of children less than five years.

The sources of water and toilet facility however, have a significant indication for nutrition status of the child. The MDG report in 2006, estimated that about 25% of people in Ghana do not have access to quality waters. The trend observed in this study suggest that the use of wells and pipe borne is similar to the estimated percentage of 50-75% as indicated in the MDG report (UN, 2006). Even though, stream is less used, hand dug wells and boreholes could constitute source of contamination and subsequently infections leading to malnutrition's. Waters from these sources are wrongfully presumed to be wholesome by the mothers because its colourless nature hence not boiled before used for the complementary feeding. This exposes the children to infection, as explained above and consequently malnutrition. Faeco-oral transmission of organisms to children is a contributory factor to the manifestation of malnutrition among them. Poor toileting practices, where children are not well cleaned after toileting and hands washed thoroughly exposes them to infection. At the younger age of less than five, the oro-anal development results in putting hands in mouth to and from part of the body and from outside environment.

Crude dumping is the order of the day in the Bosomtwe district. The practice could account for the possible exposure of water sources to contamination. Contamination from faeces and other sources are possible could consequently results in the spread of diseases among the vulnerable, mostly children less than five years. A proper waste disposal and total management of the district waste could prevent the incidence of contamination of water sources and hence illness including diarrhoea among children less than five years.

5.5 Malnutrition estimate among children in the district

About a quarter of the children less than five years in the district were malnourished which is about twice that of the national average and regional average (GHS, 2007). Twenty three percent were severely malnourished and 9% moderately malnourished. This implies that one out of every five children less than five years old was malnourished which is extremely high.

The high malnutrition rate has implication for the quality of social services generally including health and agriculture. It also reflects the state of economic standing of households in the districts. Poverty is conceived as one of the predominant determinant of malnutrition which contributes to a cycle of malnutrition for generations. Even though the sex distribution of the children did not influence their nutritional status, their age did significantly ($p=0.00$). Most of the children were infants, and over 56% of them constituted those severely malnourished, and 61.1% among those moderately malnourished. The lack of attention for these children could result in retarded growth debilitating to the social and economic growth.



CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Conclusion

6.1.1 Influence of socio-economic characteristics on nutritional status of the child

- a. Maternal age is a significant indicator for determining the nutritional status of a child.
- b. The number of children and dependants in a household has a corresponding effect on the nutritional status of children less than five years in the district.
- c. Employment status even though has an implication of determination of the nutritional status does not result in earnings that actually determines the distribution of nutritional status among children less than five years in the district.

6.1.2 Influence of Maternal and Child health seeking behaviour on nutritional status of the child

- a. The morbidity of children less than five years in the Bosomtwe district, affect their nutritional status and could explain the high malnutrition observed in this study.
- b. The time of ANC attendance does have a relationship with incidence of malnutrition in among children less than five years in the district even though majority of those malnourished were of mothers who attended the ANC in the first trimester.
- c. Introduction of water and food before 6 months as a strong indicator of the nutritional status of children less than five years in the district. Water and food sources used may be contaminated and account for morbidity among this group.

6.1.3 Influence of feeding practices, water source and sanitation on child malnutrition

- a. Porridge and fufu with soup is the predominant food given to children less than five years. Most of the children are fed twice or more, the quality and quantity of these food sources is a factor for accounting for the malnutrition levels among this group of children in the district.

- b. Source of domestic water and toilet facilities in the household determines the nutritional status of the child. Crude dumping in the district is a factor to the sanitation situation predisposes children to infection and hence malnutrition.

6.1.4 Malnutrition estimate among children in the district

- a. The malnutrition level among children less than five years in the district is very high. It is significantly related to the age of the children rather than their sex group. The younger the child the more likely they are susceptible to malnutrition.

6.2 Recommendation

6.2.1 Community and Opinion Leaders should:

- a. Educate and reinforce social services interventions and promotions on feeding children less than five years with adequately nutritious diets.
- b. Should encourage parents to farm and use protein sources in addition with the readily available carbohydrate sources to complement the food given to children less than five years in the district.
- c. Initiate a community action in the management of water sources so as to ensure that water used for domestic purposes particular for children less than five years are safe.
- d. Create awareness and use community labour to ensure safe disposal of waste including faecal matter so as to prevent contamination of water sources.

6.2.2 District Health Administration should:

- a. Intensify education on proper nutritional practices especially during ANC services in health facilities and at outreach sites.
- b. Give refresher training to public health nurses on the predictors of malnutrition among children less than five years. This should highlight risk of maternal age, employment status and dependants per household.
- c. Encourage mothers who attend ANC, to observe cleanliness during the preparation and feeding of children less than five years.

6.2.3 District Assembly should:

- a. Provide social infrastructure including wholesome water and toilet services in each household in addition proper waste management service.
- b. Build and integrate community support for the prevention of diseases affecting children less than five years.

6.2.4 Parents should:

- a. Control the number of children they have as an increased number of children does not only pose a health risk to especially the mother, but more important, affect children less than five years in the household.
- b. Observe proper hygiene especially in the use of toilet facilities and water used for children less than five years
- c. Ensure that the use of preventive tools including Insecticide Treated Nets (ITN), Measles immunisation and malaria prophylaxis to prevent the incidence of illness that is a significant factor accounting for the malnutrition in the district.
- d. Inform relatives who take care of their children in their absence not to give the child food and water which is a predictor for malnutrition among the children less than five years in the district.

6.3 CONCLUDING REMARKS

This study has shown that the social and economic characteristics of household play a role in the provision of the nutritional needs for children less than five years. There is therefore the need for more integrative efforts of parents, communities, health managers and political administrators to improve the nutritional status of children less than five years.

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APPENDIX A

STRUCTURED INTERVIEW GUIDE FOR HOUSEHOLDS ESPECIALLY MOTHERS AND CARE GIVERS

Determinants of malnutrition status in children less than five years in B .A .K. District.

INTRODUCTION

My name is Lily-versta Nyarko, a postgraduate student of the school of Medical Sciences, KNUST pursuing MSC Health services planning and management. I am carrying out this research as part of academic work. Could you please spare me few minutes of your time and respond to the items below as honestly as possible. Information provided will be treated as private and confidential.

A. SOCIO DEMOGRAPHIC DATA

1. Age.....
2. Sex.....
3. Marital status.....
 - a. Single b. Married c. Widowed/Separate/Divorce
4. Place of residence.....
5. Highest education level
 - a. No education ()
 - b. Non-Formal education ()
 - c. Primary education ()
 - d. junior high school ()
 - e. senior high school ()
 - f. Tertiary education ()
6. Ethnicity (Tribe)
 - a. Akan () b. Ewe () c. Others (specify).....

7. Religious Denomination

a. Christianity () b. Animist () c. Moslem () d. Traditionalist ()

Others (specify).....

B. SOCIO-ECONOMIC DATA

8. Occupation

Are you employed? Yes () No ()

9. If yes, what type of job do you do?

Farming () Trading () Tradesman () Public/ Civil Servant ()

Others (specify).....

10. If Farmer, state

Subsistent () Semi-Commercial () Commercial ()

11. If Trader/ Tradesman/Public/Civil Servant, do you have a regular cash income/ are you a salaried worker ?

a. Yes, professional – teacher, nurse, accountant, administrator

b. Yes, clerical/ secretarial

c. Yes, seamstress, hairdresser etc.

d. Yes, trader/food seller

e. Yes, labourer/ domestic worker

f. Others (specify).....

g. No ()

12. Do you receive any form of financial subvention?

Yes () No ()

13. If yes, in what form?

a. Regular b. Casual

14. What is the Occupation of the father?

Farmer () Trader () Tradesman () Public/Civil Servant ()

Others(specify.....

15. Does he earn enough to buy food and essentials for all the family?

Yes () No ()

C. ADEQUATE FOOD SECURITY AND FOOD INTAKE

16. Do you have any land on which you grow food?

Yes ()

No ()

17. Are you able to provide food for the family throughout the year?

Yes () No ()

18. How many people do you feed in your household?

D. INCIDENCE OF DISEASE

19. How many children do you have?

a. 1 b. 2 c. 3 d. Others (specify)

20. If more than one, what are the intervals between their births?

21. Has your child been falling sick? Yes () No ()

22. If yes, what type of sickness?

23. Have you lost a child before? Yes () No ()

24. If yes, what killed him or her?

E. MATERNAL AND CHILD CARE

25. Do you attend ANC when you are pregnant? Yes () No ()

26. When do you start anti- natal clinic when you are pregnant?
27. Who usually decides on your going to ANC ?
- Self () Husband/ Partner () Parent () Mother- in- law ()
- Others (specify).....
28. Who provides the money for your expenses during ANC ?
- Self () Husband/ Partner () Parent () Mother- in- law ()
- Others (specify).....
29. Is there any one who can overrule the decision to go to ANC ?
- Yes () No ()
30. Do you give breast milk to your child as soon as you deliver? Yes () No ()
31. How long do you breastfeed your children?
-
32. Do you give water and complementary food to your children the first six month?
- Yes () No ()
33. Who takes care of your children when you are away?
-

F. FEEDING PRACTICE

34. How many times do you feed your family a day, especially the children?
- a.4 times () b.3 times () c. 2 times () d. once ()
35. What type of food do you give to your children?
- Morning:.....
- Afternoon:.....
- Evening:.....
36. Do the children eat together?

Yes ()

No ()

G.WATER AND SANITATION

37. Source of water

Stream/ Pond () Hand dug well () Bore – Hole () Pipe- borne ()

TOILET FACILITY

38. What type of toilet facility?

Pit Latrine ()

Bucket latrine ()

KVIP ()

Water closet ()

Free range ()

39. How do you dispose off your refuse?

APPENDIX B

INTERVIEW GUIDE FOR KEY INFORMANT

All interviewees will be personnel in the area of caring of the health of children.

Date of interview

Time started

Time ended

Interview number

1. Profession
2. Age
3. Sex
4. Duration of service
5. What policies and programmes have been put in place in your District concerning nutritional care of children under five years of age?

.....
.....
.....

6. (a) How are these policies and programmes benefiting the children and society as a whole?

.....
.....
.....

- (b) Do the parents utilize the available services ?

.....

7. (a) Are there malnourish children in the District?

.....

.....

(b) If yes, what are the causes of malnutrition?

.....

.....

8. What factors have you put in place to curb the situation?

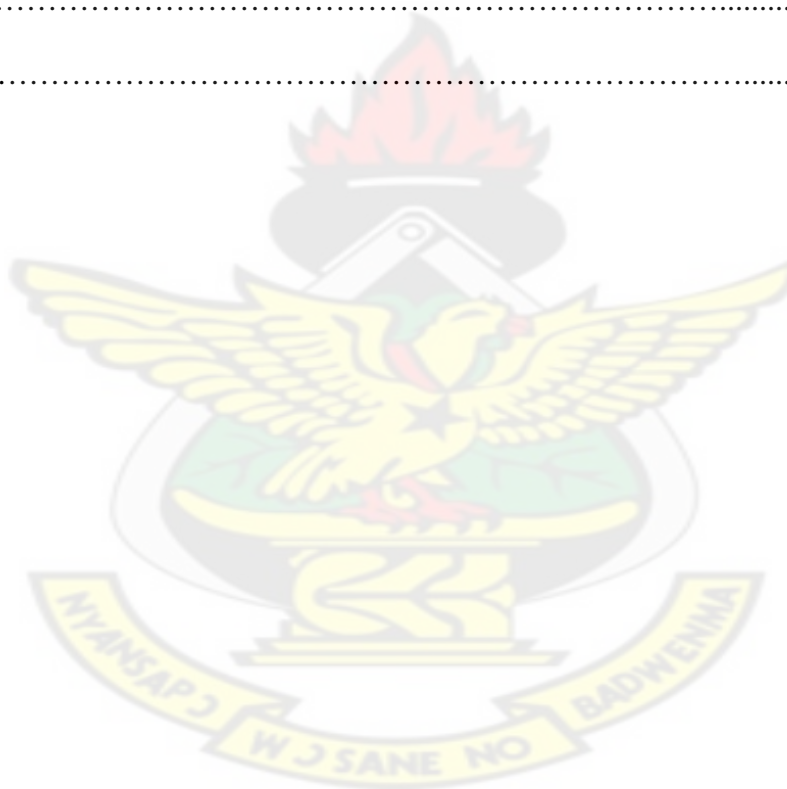
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.....

9. Has there been any improvement?

.....

.....



APPENDIX C

ANTHROPOMETRIC MEASUREMENT

1. Age of Child:

2. Sex: M () F ()

3. Weight for Age:

4. Height for Age:

5. Weight for height

