SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA

DETERMINANTS OF MALNUTRITION IN CHILDREN UNDER FIVE AT
EFFUTU MUNICIPALITY

BY

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THE MASTER OF PUBLIC HEALTH DEGREE
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DECLARATION

I, Vivian Tackie, hereby declare that with the exception of references to other people's work which have been duly acknowledged, this work is the result of my own original research with guidance from my supervisor. I further affirm that this work has never been submitted to any other University, in part or whole for any Degree or other purpose.

.......................... ................................
VIVIAN TACKIE DATE
(STUDENT)

ACADEMIC SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of the project work was supervised in accordance with the guidelines on supervision of dissertation laid down by this University.

Signature: ................................................. .................................................
DR. ERNEST MAYA DATE
(SUPERVISOR)
DEDICATION

This work is dedicated to the Almighty God, children under five years and parents in the Effutu Municipality.

I also dedicate it to my able supervisor, Dr. Ernest Maya and his family for their commitment, guidance and support.

Not forgetting my dear husband Mr. Eric Essel, my children, Nhyria, Adom, and Ayeyi Essel and my brothers and sisters for their prayer support, counseling, and their ever ready support in my life.
ACKNOWLEDGEMENT

The end of everything is surely better than its beginning. I am highly indebted with thanks to a number of people, who have helped in making this project a possible. I thank the Almighty God for the strength He has given me, even until this final day. My profound gratitude goes to my supervisor, Dr. Ernest Maya, whose his love, guidance and unflinching support has made this project a reality. I am equally grateful to all Lecturers of the Population, Family and Reproductive Health Department of the School of Public Health for their contributions, corrections and suggestions during the preparation of this work.

Finally, special thanks goes to my lovely family, who supported me financially, emotionally and spiritually and to all colleagues and friends who also encouraged me through thick and thin.
ABSTRACT

Background-Malnutrition is an underlying factor in many diseases for both children and adults and is particularly prevalent in developing countries, where it affects one out of every three preschool-age children. Under nutrition (malnourished) a form of malnutrition has been a worldwide problem which is being tackled in various ways and is usually prevalent among children in developing economies. One of the appropriate measures to support the fight against malnutrition in general and undernutrition specifically is to know the nutritional status and conditions of the population so that appropriate measures can be taken to address them.

Objective- The study sought to find out the proportion of children under five years who were malnourished and examined what socio-economic, household practices, child health care seeking practices and cultural beliefs and practices are associated with the most prevalent form of undernutrition.

Methodology-A community based research was conducted to assess the nutritional status of children under five years in Effutu municipality for a total of 350 children. With the use of a structured questionnaire, data on children and care givers was collected. Data was entered into Microsoft Excel 2010. WHO Anthro software version 3.2.2.1 was used in determining the z-scores and SPSS software version 20 was used to perform univariate, bivariate and logistic regression analysis. A P<0.05 was deemed statistically significant.

Results-Out of the 350 children under five, the most prevalent undernutrition case is stunting (59%) and the least malnutrition case was wasting (19%). Stunting was most prevalent among children in the age group of 12-23 months (35.5%). Occupation of Mother and Household income were socio-economic factors that were found to be
significantly associated with stunting at 95% significant level. What is done when the child is sick was the only child health care seeking factor associated with stunting at 95% significant level. The number of times child feeds daily is the only house hold practice that is associated with stunting at 5% significant level. None of the cultural practices and believe system had any significant association with stunting. With regards to the socio-economic factors, Children whose parents who are self-employed are about twice likely to be stunted than those who are unemployed (OR=2.18; 95% CI, 1.14 - 3.246). Those who earn more than Ghc1000 are about two and half times more likely to be stunted than those who earn less than Ghc100 (OR=2.672; 95% CI, 2.198 - 47.145).

Those who consult traditionalist when their child is sick are less likely to stunted than those who visit the hospital when the child is sick by a multiplicative factor of 0.355 (OR= 0.355; 95% CI, 0.098 - 0.612).

Conclusion- The study showed that of the economic factors, mother’s occupation and household income was significantly associated with their child being stunted.

The findings of the study also showed of the house hold practices, the number of times a child feeds in a day was significantly associated with their child being stunted.

Child health care practices and stunting, also showed no significant relationship. Which was not the same as in the case of cultural beliefs and practices and stunting among children under five years.
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<th>Description</th>
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<tbody>
<tr>
<td>ANC</td>
<td>Ante Natal Clinic</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>DHS</td>
<td>Demographic Health Survey</td>
</tr>
<tr>
<td>ESPEN</td>
<td>European Society for Clinical Nutrition Metabolism</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agricultural Organization</td>
</tr>
<tr>
<td>GSS</td>
<td>Ghana Statistical Service</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Human Immune Virus/Acquire Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>IQ</td>
<td>Intelligent Quotient</td>
</tr>
<tr>
<td>NCHS</td>
<td>National Center for Health Statistics</td>
</tr>
<tr>
<td>PEM</td>
<td>Protein Energy Malnutrition</td>
</tr>
<tr>
<td>SES</td>
<td>Socioeconomic Status</td>
</tr>
<tr>
<td>SD</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations International Children Education Fund</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency International Development</td>
</tr>
<tr>
<td>WMHD</td>
<td>Winneba Municipal Health Directorate</td>
</tr>
<tr>
<td>WAZ</td>
<td>Weight for Age Z – score</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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## DEFINITION OF TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>Anthropometry</td>
<td>Measurement of body parts</td>
</tr>
<tr>
<td>Child welfare clinics</td>
<td>Integrated services that are provided to all children from birth to 5 years of age, with the purpose of monitoring their nutritional status</td>
</tr>
<tr>
<td>Child under 5 years</td>
<td>A child under the age of 5 years refers to a young human being whose age ranges from 6 to 59 months from his date of birth</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>Undernutrition and overnutrition.</td>
</tr>
<tr>
<td>Overnutrition</td>
<td>Overconsumption of nutrients and food to the point at which health is adversely affected developing into child.</td>
</tr>
<tr>
<td>Parent</td>
<td>Biological mother or the guardian of the under-five participant</td>
</tr>
<tr>
<td>Undernutrition</td>
<td>Stunting (low height for age), wasting (low weight for height), underweight (low weight for age)</td>
</tr>
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CHAPTER ONE

INTRODUCTION

1.1 Background

For a healthy early childhood, adequate nutrition is essential to ensure proper organ formation and function, healthy growth, neurological and cognitive development and a strong immune system. For a good human development and economic growth, well-nourished populations who can think critically, learn new skills and contribute to their communities. Child malnutrition has impact on cognitive functions and is a contributor to poverty by impeding individuals’ ability to lead productive lives (Hoseini, Moghadam, Saeidi, & Rezaei, 2013). Children’s full physical and mental potentials can be prevented by malnutrition; prolonged malnourishment in children is known to result in: lower intellectual quotient (IQ), delay in their physical growth and motor development, deficient social skills and greater behavioural problems (Food and Agriculture Organization (FAO), 2016; Black, Morris & Jennifer, 2003). Children less than five years worldwide are known to be vulnerable and susceptible in many respects, especially on matters on health (FAO, 2016).

Nutritional deficiencies and malnutrition generally affect children more than any other group (FAO, 2016). This trend is not unique to any particular nation; poor nutrition occurs in developing and developed nations, however, it is prevalent in some nations than others. As revealed in the WHO’s report, developing countries has, of all the children under five years of age, 27% being underweight and this accounted for approximately 3.4 million deaths in year 2000 (World Health Organization (WHO), 2002). Malnutrition in children alone accounts to about 60 percent of mortality of children under-five in Sub-Saharan
Africa (SSA) countries (Kandala, Emina, Nzita & Cappuccio, 2009). Unstable countries which have different kinds of conflicts, are fragile and vulnerable and have the highest numbers of malnutrition. (Kandala et al., 2009). Countries that are like that need more interventions and actions to reduce malnutrition. Continuous malnutrition causes stunting and is very destructive to a child and has an effect on the family largely. This is because severely malnourish children can have impaired learning and psychological problems, which to a can be a source of worry to their parents (Hoseini et al., 2013; Kandala et al., 2009). Malnutrition contributes to the weakening of a child’s health, ability to learn, and later on livelihood and ability to have healthy children (World Vision Finland, 2013.)

The Millennium Development Goal 1 (Target 2) aimed that between 1990 and 2015, the prevalence of underweight among children under five years, which is used as the measure of the proportion of people who suffer from hunger, is halved (Musa, Musa, Ali, & Musa, 2014). Despite various interventions, the burden of under-nutrition among under-five children has not changed much (Musa et al., 2014). Undernutrition of children is a significant global health problem that contributes to childhood morbidity; suboptimal adult work capacity, mortality, harmed intellectual development and the risk of adulthood diseases. Children between the ages of 6 and 24 months are the most vulnerable to undernutrition (Health across the life span, 2012.). According to Kandala et al. (2009) malnutrition has been the cause of death for hundreds of thousands of children over the past 12 years.

One key to meeting many other SDG targets is tackling malnutrition. Good nutrition is a signal the realization of people’s rights to food and health. The reflection of Inequalities in the world is narrowed by good nutrition. Without it, it becomes difficult for people to
achieve their full potential. An improvement in the nutrition of people helps generates broad-based economic growth, break the intergenerational cycle of poverty and leads to a host of benefits for countries, communities, families and individuals (Musa et al., 2014). The foundation of human development and scaffolding needed to ensure it reaches full potential is provided by good nutrition. In short, good nutrition, is an essential driver of sustainable development.

Malnutrition takes many forms in children: children who do not grow properly, those who suffer because of imbalanced diet, and those who are suffer from nutrition-related non-communicable diseases or are obese (Cederholm et al, 2015). Almost half of all countries encounter multiple serious burdens of malnutrition such as micronutrient deficiency, poor child growth, and adult overweight (Cederholm et al, 2015). In many cases, parents are not aware of the fact that the diet of their children should be changeable and that the importance of breast feeding should be fully understood (Cederholm et al, 2015). Mothers suffering from malnutrition give birth to malnourished children (UNICEF, 2012). The breast milk is the best way to ensure the proper intake of food during the first few months after birth; the child is protected with adequate body nutrients that help to strength the immunity of the child (WHO, 2009). About 1.5 million lives in a year can be saved by breastfeeding (FAO, 2016). It is important that a child has diverse diet after breastfeeding. In many cases the unawareness of parents about healthy diet is the reason for malnutrition in children and not scarcity of food (WHO, 2009).

Studies have shown that various factors account for malnutrition. According to FAO (2016) factors like extreme poverty, high mortality, high incidence of childhood diseases and poor infrastructure account for malnourished. Knowing specific determinant that account for
malnutrition, goes a long way in tackling the prevalence of malnutrition in Ghana, which is a major motivation for this study.

1.2 Problem Statement

Malnutrition has been a worldwide problem which has been addressed by various interventions but has not yielded much results. Malnutrition continues to be a killer for millions of children daily (FAO, 2016). Worldwide, approximately 165 million children under five years old are suffering from stunting, 52 million are experiencing wasting syndrome (hereafter referred to as wasting) and 101 million are underweight (Das, Salam, & Bhutta, 2016). One underlying factor in many diseases in children and adults such as hypertension and diabetes is malnutrition (Tette, Sifah, & Nartey, 2015) and in developing countries where it is particularly prevalent, it affects one out of every 3 preschool-age children. (UNICEF, 2011)

In Ghana, malnutrition remains a challenge among children under five. According to the Ghana Statistical Service (GSS) (2010) children, under five accounts for 15% of the population and Demographic and Health Survey (DHS) (2014) report indicates that 19% of children under five are stunted, 5% severely stunted, 11% underweight, indicating chronic malnutrition.

The central region where Efutu municipality is located has 34% of children under five stunted (DHS, 2014). Report available at the Winneba Municipal Health Directorate (WMHD) indicates that the municipality recorded 6000 cases of malnutrition in children under five between 2010 and 2015 (WMHD, 2016). This is relatively high for a fishing
community since FAO report indicates that where there is abundance of protein, nutrition is relatively low (FAO Fisheries and Aquaculture, 2014).

Several other factors may exist which contributes to malnourishment in such communities. There is however limited literature explaining this phenomenon. It has therefore become imperative to investigate the factors that might have accounted for this high prevalence of malnutrition in the municipality.

1.3 Conceptual Framework

![Conceptual Framework](http://ugspace.ug.edu.gh)

Adopted From UNICEF 1998

Figure 1: Conceptual Framework
The conceptual framework (figure 1) explains that malnutrition is influenced by several factors and a factor influences the other. Factors such as maternal socioeconomic status, maternal health seeking behaviour, cultural practices and household practices or determinants influence malnutrition. Socio-economic status, household size, parents knowledge on malnutrition, breastfeeding practices, number of meals taken by child per 24 hours, parent employment status, the marital status of parents and the number of children under five in a household. It is also influenced maternal and child health seeking practices (ANC attendance, child birth weight, HIV status of mother during pregnancy, immunization status, place of delivery of child and vitamin A supplementation), household practices (unsafe hygienic practices, poor sanitation, and inadequate access to quality water supply) may lead to unhealthy environment causing diseases. These diseases can lead to inadequate nutritional intake in the child causing malnutrition. Maternal socio economic status will also influence household food security which will determine dietary intake of the child causing malnutrition. On the other hand, cultural practices and beliefs (food taboos, customary systems of food sharing within the family, cultural attitudes towards various foods, food preparation methods and child rearing practices) may be influenced by maternal socio economic status and will influence the maternal health seeking behaviour causing malnutrition.

1.4 Justification

Globally, especially in the developing countries, government agencies and researchers are working extensively to improve nutritional status among human being with special attention on children under five. High child mortality has malnutrition as major contributor
which various countries and communities are trying hard to reduce in order to produce a healthy population and to achieve goal 3 of the Sustainable Development Goals (SDG).

Children are one of a country’s greatest assets, hence providing optimum health to children in terms of social, physical and intellectual development should therefore be a priority to everyone. There are several causes of malnutrition which are preventable in communities, hence results from research related to investigating the determinant of malnutrition can be very helpful in tackling malnutrition.

The Efutu municipality is a fishing area and hence there is abundance of proteins. It is believed that malnourished children usually suffer from poor diet particularly in vitamins and proteins. It is therefore worth investigating what other factors could be causing malnutrition amongst a fishing community with abundance of proteins. This would help identify other factors that affect malnourishment apart from the diet of children.

The work would help expose other important factors that affect under-five malnutrition apart from food the children consume. This could help public health experts to consider other areas of tackling under-five malnutrition in Ghana and give them a holistic approach in dealing with the issue of malnutrition.

The findings of the study would inform better planning, management and prevention of malnutrition (undernutrition) generally, and specifically to children less than five years to health experts and health policy advocators. It would unearth specific determinants of the high cases of under-five malnutrition in the municipality and enable the WMHD and health related Non-Governmental Organizations (NGOs) to develop interventions to reduce malnutrition in the Efutu Municipality.
The results of these findings would provide empirical evidence of how socio-economic factors, cultural factors, household practices and child healthcare seeking practices affect malnutrition of children under-five years. This can be used as literature for further research and filling some literature gaps in identifying causes of malnutrition of under-five especially in Ghana.

1.5 General Objectives

Malnutrition defines both overnutrition and undernutrition but the focus of the study will be to assess the prevalence of undernutrition and the factors that determine the most prevalent form of undernutrition in children under five years in the Effutu Municipality.

1.5.1 Specific objectives

1. To determine the association between socio-economic status and the most prevalent form of undernutrition in children under five years in the Effutu municipality.

2. To determine how household practices influence the most prevalent form of undernutrition in children less than five years in the Effutu municipality.

3. To determine how maternal and child healthcare practices influence the most prevalent form of undernutrition in children under five in the Effutu municipality.

4. To determine cultural beliefs and practices associated with the most prevalent form of undernutrition among children under five years in the Effutu municipality.
1.6 Research Questions

1. What is the relationship between socio-economic status and the most prevalent form of undernutrition in children under five years in the Effutu municipality?

2. How do household practices associate with the most prevalent form of undernutrition in children under five in the municipality?

3. How does maternal and child healthcare practices influence the most prevalent form of undernutrition in children under five in the municipality?

4. What cultural beliefs and practices are associated with the most prevalent form of undernutrition among children under five years in the municipality?
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The growth of children is recognized internationally as an essential public health indicator used to monitor health and nutritional status of populations (WHO, 2009). There is more frequent occurrences of severe diarrhea and prone to many infectious diseases like meningitis, pneumonia and malaria for children who suffer from growth retardation due to poor diet. (WHO, 2009). The prevalence of malnutrition, which includes the determinants of malnutrition is a major source of problem for most countries in sub Saharan Africa (USAID, 2007; WHO, 2009), of which Ghana is not excluded. This study seeks to discover specific determinants of malnutrition in the Effutu Municipality. This chapter includes the review of important concepts and literature.

2.2. Concept of Malnutrition

Literally, the term malnutrition refers to “bad nutrition” thus it integrates either ‘too much’ nutrition and under-nutrition. In relations to trends of malnutrition globally, developing countries including Ghana is more prevalent in the later.

Malnutrition is defined as excess, deficiencies or imbalances in intake of protein, energy and other nutrients. This is the effect of being unable to meet the nutritional needs continually over a period of time. Child malnutrition continues to be one of the most
dreaded health problems. Several studies have been conducted and are still being conducted, all in an attempt to solve the problem of malnutrition. Despite of all these efforts, each year, 4.6 million children under-five die due to malnutrition (WHO, 2009).

The European Society of Clinical Nutrition and Metabolism (ESPEN) (2015), which is an European nutritional organization, explains that malnutrition resulting from disease, ageing or extreme hunger can be defined as “a state resulting from lack of uptake or intake of nutrition leading to altered body composition (decreased fat-free mass) and body cell mass leading to diminished physical and mental function and impaired clinical outcome from disease”. According to the Swedish National Board of Health and Welfare, (2011) this particular nutrition deficiency as “a condition where a deficiency of energy, protein, and other nutrients causes measurable adverse effects on body composition, function or of a person’s clinical outcome”

The cognitive function of children is impacted by child malnutrition and contributes to poverty since it impedes individuals’ ability to lead productive lives. Estimates show that malnutrition causes death of one out of three of children less than five years. (Liu et al, 2012; Black et al, 2008). Nutrition has increasingly been regarded as a very important contributor to social and economic development. The reduction of young child and infant malnutrition is necessary in achieving the Sustainable Development Goals—especially those regarding good health and wellbeing (SDG 3). Considering the impact early childhood nutrition can have on cognitive development and health, putting measures in place or optimal nutrition would also go a long way to aid in achieving (SDG 1) that is related to no poverty and also promote empowerment of women and gender equality.
2.3 Prevalence of malnutrition

Over the years different rate of malnutrition rates have been recorded, showing variations even in countries in the same region.

In a study on children between 6 and 59 months old in Bam, Iran, prevalence of medium and acute underweight, medium and acute stunting; and medium and acute wasting were 15.2%, 8.9%, and 5.6% respectively (Yarparvar, Omidvar, Golestan, & Kalantari, 2006). According to the study carried out on under two-year old children in Golestan, Iran province prevalence of slight to acute underweight, slight to acute wasting and slight to acute stunting were 21.4%, 16.5%, and 31.4% respectively (Kabir, Keshtkar & Lashkar, 2006).

In a study on 25-36 months old children under the care of Kerman, Iran rural health houses prevalence of underweight, wasting, and shortness was worked out 16.1%, 7.2%, and 15.6% respectively (Alavi-naien, Keyghobadi, Djazayery & Djazayery, 2003).

Deshmukh, Dongre, Gupta and Garg (2007) carried out a study on 1497 children under six in the health-care center of Anganwadi in 2007 to investigate malnutrition on the basis of NCHS concluded that 53% of the children were underweight while 15% suffered from acute underweight. A similar study carried out in Aydin in Turkey, also had similar
conclusions. The study by Ergin, Okyay, Atasoylu and Beser, (2007) shows that the prevalence of underweight was 4.8%, wasting as 8.2%, and nutritive stunting was 10.9%.

In Bangladesh a study performed on malnutrition for children under-five revealed high numbers of underweight and delayed growth with 40% and 42% of under-five children being underweighted and stunted respectively (Siddiqi, Haque, & Goni, 2011). In another Asian country, Mongolia, a study conducted to investigate under-five children the nutritional status emphasised that, the numbers are no different, with underweight, wasting and emaciated children being 4.7%, 1.7%, and 15.6% respectively which is relatively lower than those of Bangladesh (Otgonjargal, Woodruff, Batjargal, Gereljargal, & Davaalkham, 2012). Another study carried out in south Asia, Belahara, and Dhankuta districts in Nepal on the prevalence of stunting, wasting and underweight also showed varying results, it concluded the prevalence of wasting, stunting and underweight were 11%, 37%, 27%, respectively (Gurung & Sapkota, 2010).

A study that was done in a rural area of Nigeria by Senbanjo, Adeodu and Adejuyigbe, (2007) found that prevalence of underweight was 23.1%, wasting 9%, and that of nutritional stunting 26.7%. A study which was carried out in osun state in Nigeria, particularly a rural area, on the effect socio-economic factors can have on nutritional status of children concluded that the prevalence rates of stunting wasting, and underweight were 9%, 26.7%, and 23.1% respectively. Also in a similar study also carried out in Nigeria, on determinants and prevalence of malnutrition among Farming Households in Kwara State, Nigeria focusing on children under five, shows that 22.0%, 14.2% and 23.6%, of the sample population were underweight, wasted and stunted respectively (Babatunde,
Olagunju, Fakayode, & Sola-Ojo, 2011). Another study in a different African country also showed varying prevalence rate. Bloss, Wainaina and Bailey (2010) carried out a study in Kenya on the predictors and prevalence of stunting, wasting and underweight among children who are 5 years and below. The study investigated the nutritional level, as it were, and health of children aged less than 5 years and below by assessing children in three villages in western Kenya District of Siaya. The study was cross-sectional, and focusing on 175 children and 121 adults in July 2002, the result showed the prevalence as 30 percent for underweight, 47 percent for stunted, and 7 percent were wasted. The study also showed there was a higher likelihood of being underweight for children who had early child introduction. Children who are two years were had a higher risk of being stunted and underweight. Those who were not living with their biological parents had a higher likelihood of becoming stunted whiles those who had had all their vaccinations were protected against becoming stunted in growth.

In the rural area of Kenya, a research that was conducted on pre-school children in western Kenya rural areas which showed that the number of underweight, wasting and stunting children were 20%, 4% and 30%, respectively (Kwena, et al, 2003). In Southern Sudan, another African country, the prevalence of acute malnutrition of children less than five showed that approximately of every five children, one of them (22%) suffers from severe or moderate acute malnutrition (wasting). A similar conclusion was also recorded in another parts of Sudan and also concluded with similar results, There was high prevalence of malnutrition among children under five. About 35% suffered from either mild or
moderate malnutrition and 27.5% were severely malnourished (USAID, 2007; Ola et al., 2011).

Mengistu, Alemu and Destaw (2013) carried a study with the aim of assessing the malnutrition prevalence and associated factors among under-five children. The scope was the Hidabu Abote district, North shewa, Oromia. A cross sectional community study was adopted by sampling 820 children aged 6-59 months in September, 2012. Anthropometric measurements and structured questionnaires were used. The result showed that 30.9%, 47.6% and 16.7% of children were underweight, stunted and wasted respectively. With stunting, the main associated factors discovered were child age, children who received butter as pre-lacteal feeding, family monthly income and family planning. Children who lived in households were found to be associated with Underweight. Wasting was associated with treatment of water in House Hold.

2.4 Type of malnutrition

According to the WHO (2006), wasting, stunting and underweight are the commonly used comprehensive types of malnutrition by weight of height, height of age and weight of age indexes respectively.

Growth retardation or chronic protein-energy malnutrition (PEM) which is also known as stunting is deficiency for protein and calories available to the tissues of the body. It is also the persistent and recurrent ill-health or inadequate intake of food over a long period of time. It should be noted that height-for-age index (stunting) has lower sensitivity to
temporary food shortages, hence stunting regarded as the most reliable indicator (UNDP, 2007). Stunting is as a result of poor nutritional history, and it can be as result of dietary habits, such as long term intake of insufficient protein and energy. It can also be due to recurrent infection, poor feeding practices and low income. (Bruce, 2001).

Wasting is also known as acute protein-energy malnutrition. It occurs when during the period immediately before a survey one fails to receive adequate nutrition as a result of recent episodes of diarrhoea or illness and acute food shortage. Wasting shows current or acute malnutrition which is as a result of inability of a person to gain weight or losing some of the gained weight. (Bruce, 2001). Being Underweight is part of Stunting and Wasting, hence it can either be due to sustained or acute malnutrition or even PEM. Stunting, wasting and underweight were defined as height-for-age, weight-for-height and weight-for-age of 2SD or more below respectively for the corresponding median of the reference population; while severe stunting and severe wasting was defined as 3SD or more below the same median, respectively.

2.5 Measuring malnutrition in children under five years

Assessment of nutritional status attempts to give an interpretation of what the body lacks, has in right amounts, or has in excess. It helps in the identification of people with nutritional deficiencies (malnourished or with malnutrition) and the type of deficiencies they have as well as obesity.

Nutrition status can be determined by either one of the following method analysed below or a combination of them. Every nutritional assessment requires one or more of these for better interpretations since no single method provides an adequate assessment of nutritional
status. They include anthropometry, biochemical analysis, clinical assessment, and dietary assessment (Maqbool et al., 2008). However, the best way to assess nutritional status is by combing all four methods; anthropometry, biochemical, clinical and dietary methods (Wasantwisut et al., 2007). These indicators help to measure long term nutritional imbalance and malnutrition.

2.5.1 Biochemical assessment

Biochemical assessment is used to measure the nutrients in the body. It involves collection of laboratory samples to assess nutritional status (various nutrients). Samples such as blood and urine are taken from the individual and the levels of biological markers in the body are assessed. These makers are used to determine levels of nutrients in the body (Maqbool et al., 2008).

2.5.2 Dietary assessment

Dietary assessment is used to measure dietary intake and feeding ability. It can be used to assess both nutrient and food intake. Methods use includes individual dietary assessments, food frequency questionnaires, household survey methods, and simple food list. It provides information about the amount, and quality of food consumed and also eating patterns and behaviours of the family (Maqbool et al., 2008).

2.5.3 Clinical assessment

This method uneartths the signs of malnutrition on the body of the individual. These signs can be seen by close observation of the individual. According to Maqbool et al. (2008), it
involves the close examination of the physical body such as skin, hair and teeth. It is used to identify evidence of specific nutritional deficiencies. Clinical assessments require little expertise.

2.5.4 Anthropometry

A very useful tool for monitoring nutritional assessment and growth is Anthropometry. It has been used for a long time to diagnose and grade malnutrition (Duggan, 2010). Duggan (2010) describes it as a simple tool for nutritional assessment of individuals because of its objectivity and relatively low technology required in its usage. Anthropometric measurements is well known and widely used indicators for nutritional status in a community. Anthropometric measurement involves taking body measurements such as height, weight, Mid-Upper Arm circumference and comparing them to the WHO growth standards (Duggan, 2010). These body measurements are used to formulate indicators that give some information on children nutritional status. There are three main anthropometric Indices used in children nutritional status assessment. They are weight-for-height, height-for age and weight-for-age.

Height-for-age: This malnutrition index gives an indication of linear growth retardation. A height-of-age index which is below minus two standard deviations (-2SD) from the median of the reference population, are regarded as being short for their age (stunted). If a child falls below three standard deviations (-3SD) from the reference population median, he/she are considered severely stunted. Factors such as inadequate nutrition over a long period of time or recurrent or chronic illness can cause stunting in children. It reflects chronic malnutrition (malnutrition over a long period of time) which is due to prolonged inadequate nutrient intake (GSS, 2011). Height-forage, therefore shows the outcome of
under nutrition over a sustained period, and does not really change with the season of data.

**Weight-for-age:** This assesses the weight of a child for his age and is a measure of long and short term malnutrition (Prentice et al., 2008). Children whose weight-for-height measures are below minus two standard deviations (-2SD) from the median of reference population are considered underweight for their age while those with measures below minus three standard deviation (-3SD) from the reference population are severely underweight (GSS, 2011).

**Weight-for-height:** This is a measure of body mass (weight) in relation to body length. Below minus two standard deviations (-2SD) from the median of the reference population, a child is considered too thin for their height (wasted). Those children with measures below minus three (-3SD) from the reference population are considered severely wasted which is a measure of acute malnutrition (malnutrition of a short period of time) that is recent nutritional deficiency (Prentice et al., 2008). This indicator highlights significant changes associated with the availability of food or disease prevalence (GSS, 2011).

### 2.6 Determinants of Malnutrition in under fives

Malnutrition in children is determined by multiple and interrelated factors. Food related factors are just one aspect of the multiple determinants of malnutrition (Iram & Butt, 2006). It is difficult to point to a particular causes of malnutrition, since there are various determinant, and most of them are intertwine with each other and are hierarchically related, however, the most common of these determinants are poor diet and disease which are also
influenced by other factors, like household food security, maternal/child caring practices and access to health services and healthy environment (Müller & Krawinkel, 2005). These factors in turn are also influenced by the basic socio-economic and political conditions (Müller & Krawinkel, 2005). Studies have shown that malnutrition is usually related to food security, care practices, and the health environment at the household level, which are also influenced by the socioeconomic and demographic situation of households, communities and public health policies (Moradi & Klasen, 2000; Caputo, Roraita, Klasen & Pigeot, 2003). Factors like acute deprivation of living facilities, recent droughts, poverty, and unfavourable nutrition of children have been discovered to be factors that account for the prevalence of malnutrition (Alavi-naien, Keyghobadi, Djazayery & Djazayery, 2003; Jafarinia, Faraz, Akhoundzadeh, & Gahgaei, 2003; Nojomi, Kafashi, & Najmabadi, 2003).

Over the years various studies have found, illiteracy and low education of parents having an influence on the malnutrition of children, and it is established that this leads to varying malnutrition prevalence (Jafarinia, Faraz, Akhoundzadeh & Gahgaei, 2003; Yarparvar, Omidvar, Golestan & Kalantari, 2006; Deshmukh, Dongre, Gupta & Garg, 2007; Senbanjo, Adeodu & Adejuyigbe, 2007; Al-Hashem, 2008). Higher knowledge of literate parents and higher income of families with higher education as compared to illiterate ones regarding children's nutrition accounts for varying rate of prevalence (Yarparvar et al., 2006; Deshmukh et al., 2007; Senbanjo et al., 2007; Al-Hashem, 2008). Higher income results in higher probability of accessing quality health care, education, and nutritional facilities which leads to lower malnutrition, basically knowledge with enough income can improve the nutritional status of a family (Jafarinia et al., 2003; Yarparvar et al., 2006; Deshmukh et al., 2007; Senbanjo et al., 2007; Al-Hashem, 2008).
According to (Ahmed, El Khalifa & Elnasikh, 2011), factors like poor sanitary conditions and inadequate food intake increases the prevalence of malnutrition. Ahmed et al. (2011), shows that Mother's education was found to be the strongest factor associated with malnutrition among the children under 5 years of age. A research carried out on malnutrition among under five children in Bangladesh revealed that household economic status, mother’s educational status, father’s educational status, mother’s antenatal visit (s), mother’s age at birth and mother’s BMI are the most significant factor/determinants of child’s malnutrition (Siddiqi., Haque & Goni, 2011).

A study focusing specifically on the influence of socio-economic factors on nutritional status, looked at rural children in a Osun state community in Nigeria, revealed that mothers whose education is below secondary had their children having one and half to two times the rate of prevalence of stunting. Those mothers who had post-secondary education had their children more often affected by wasting compared to those mothers who were less educated. Paternal education level did not have a consistent pattern or trend with wasting or stunting. High prevalence of wasting had associated low maternal income and overcrowding. The source of drinking water and or social class had no association with malnutrition (Gurung & Sapkota, 2010).

Malnutrition was significantly associated with education and body mass index of mother, gender, age of child, access to clean water, calorie intake of the households and presence of toilet in the households by a study that was conducted on the prevalence and
determinants of malnutrition among Under-five Children in Kwara State, Nigeria on Farming Households (Babatunde, Olagunju, Fakayode, & Sola-Ojo, 2011). In a similar study at Beta-Israel, it was revealed that under-five malnutrition was mainly contributed by factors such as child's age, sex of the child, diarrhoea episode, duration of breastfeeding, deprivation of colostrums, pre-lacteal feeds, age of introduction of complementary feeding and method of feeding, type of food, (Asres & Eidelman, 2011).

2.7 Socioeconomic Factors and Undernutrition

Globally, undernutrition in children is highly prevalent and remains a big challenge. According to estimates by the United Nations Food and Agriculture Organization (FAO), 11.11% of world populations were suffering from chronic undernourishment in 2012-2014 (FAO, 2014). Children are the most visible victims of undernutrition. United Nations Children’s Fund (UNICEF) reports that 25% and 8% of under-five year old children were estimated to be stunted and wasted respectively with an estimated 6·3 million live born children worldwide dying before age 5 years, in 2013 because of undernutrition (UNICEF et al., 2014b). This shows that almost half of all deaths in children under 5 can be attributable to under nutrition.

According to Ethiopian demographic and health survey (DHS) report, nationally 40%, 25% and 9% of children under age five were stunted, underweight and wasted respectively in 2014 (CSA, 2014) with the prevalence of overweight or obese children not being more than 3%. This high prevalence of under-nutrition of children exerts impacts economically and socially on the country.

Various studies in different or the same countries may come out with different results over the importance of the determinants behind children’s nutrition. Their estimates may differ
depending on various variables including the type of the data and the methodology. In Ethiopia, studies by Tesfaye (2009) and Alemu et al. (2011) found out that household wealth or income is an important determinant of child nutritional and health status.

A study conducted by Kamiya (2011) in Lao using multilevel mixed linear model to estimate a health production function showed that educational attainment of mothers do not exert any positive impact on childhood nutrition (height-for age, weight-for -age and weight-for height)

In a study by Mostafa (2011) in Bangladesh and employing data from the 2007 Bangladesh Demographic and Health Survey, a Cross-sectional and multinomial logistic regression analyses was done on moderate and severe stunting over normal among the children looking at how socio-demographic variables affect them. Findings showed of all the children used in the study, over two-fifths of the children were stunted, of which 15.1% were severely stunted and 26.3% were moderately stunted. Multivariate multinomial logistic regression analysis revealed that children of a thinner mother had significantly increased risk of severe stunting and moderate stunting over normal. Child's age region, father's education, birth order of children, toilet facilities and wealth index were also important determinants of children's nutritional status. Maternal age at birth has been associated with malnutrition among under-five year old children. It was found out in Bangladesh that children whose mothers were less than 20 years at the time of their birth were 1.22 times more likely to be stunted, wasted and underweight compared to children whose mothers were 20 years and above at birth their birth (Nure., Nuruzzaman and Goni, 2011).
2.8 Household practices and Undernutrition

A study was conducted by Babatunde, Olagunju, Fakayode, and Sola-Ojo,(2011) to examined the prevalence and determinants of malnutrition among under-five children in Kwara State, Nigeria. Results revealed from descriptive and regression analyses used to analyze anthropometrics that 23.6%, 22.0% and 14.2% of the sample children were stunted, underweight and wasted respectively. In addition, regression analysis showed that the significant determinants of malnutrition included gender and age of child, education and body mass index of mother, calorie intake of the households, access to clean water and presence of toilet facility in the households in addition to mother’s variables (education and nutrition. Again, the results showed that children from richer households were less malnourished than those from poorer households which underscores the importance of household income in child nutritional status.

Furthermore, a study conducted on malnutrition among under five children in Bangladesh revealed that household economic status, mother’s education, father’s education, mother’s antenatal visit, mother’s age at birth and mother’s BMI are the most significant factor/determinants of child’s malnutrition Siddiqi, Haque Goni (2011). Low maternal income and overcrowding were associated with higher prevalence of wasting. Low maternal income and overcrowding were associated with higher prevalence of wasting. However, no association was found between the source of drinking water or social class and malnutrition. Sapkota, Gurung (2008).
A study by Hussin,(2010) on the determinants of malnutrition among children in rural Kelantan in Malaysia, the results demonstrated that environmental construct comprising factors that included total household income, total expenditure, number of rooms in the house as well as socioeconomic status had a significant effect on malnutrition. Neither do biological or behavioural constructs had significant effects on malnutrition.

2.9 Maternal and Child Health Practices and Undernutrition

Antenatal care refers to the care rendered to a pregnant woman from conception to the beginning of labor. Ideally, the midwife provides an individualized care to the woman and her family by providing guidelines to the woman to enable her make choices about her care that are well-informed. (Fraser, Brockert & Ward, 2006). According to Tjukurpa (2008) antenatal care is also intended to improve the health of the pregnant woman and her baby, since it allows for continuous monitoring of the pregnancy so that any problems can be seen and corrected promptly. The primary objective of antenatal care is to interact with pregnant women, identify and manage known and potential risks and complications.

WHO (2014) proposed new essential ANC interventions (Focused Antenatal Care). This aims to provide at least over four visits of antenatal care at specified intervals, for healthy mothers with no underlying complications. This new model of the ANC was defined by WHO based on four goal-oriented visits. The maximum number of ANC visits for areas where there are limited resource depends on effectiveness, costs and other barriers to ANC availability. The focused antenatal care (FANC) was implemented to solve some of the barriers associated with the old system, such as ignorance, long waiting time, repetition of
topics in group counseling and clients seen by different providers. The benefits of FANC include: early recognition and correction of complications; promotion of health and reduce disease prevalence; detection of known medical problems of mothers; and also improving preparedness for birth and readiness for complications. (WHO, 2014).

This new sphere to ANC is more geared towards quality of care, not the quantity. With regards to women with normal pregnancies, the recommendation is four antenatal visits. The main aim of the FANC is to aid women go through pregnancy without problems through: identification of pre-existing health conditions; early recognition and correction of complications; promotion of health and lessen disease prevalence; early detection of known medical problems of mothers; and also improving preparedness for birth and readiness for complications (WHO, 2014).

The schedule of activities and visits of the FANC include the following:

First visit up to 16 weeks: confirmation of pregnancy and EDD, classify women for basic ANC, four visits or more. Screen for STIs, anemia, preventive measures, as well as treatment. Schedule a birth and emergency plan. Counseling on danger signs and how to promote health and prevent diseases.

Second visit 24-28 weeks: assess maternal and fetal health and exclude PIH and anemia. Give preventive measures such as TT, SP, iron, and folate. Review and modify birth and emergency schedule I needed.

Third visit 32 weeks: Assess maternal and fetal well-being; exclude PIH, anemia, and multiple pregnancies. Give preventive measures such as TT, SP, iron, and folate. Review and modify birth and emergency plan. Counsel the client on your findings.
Fourth visit 36-38 weeks: assessment of maternal and, fetal well-being, exclude PIH, anemia, multiple pregnancy and malpresentation. Give preventive measures. Review and modify birth and emergency plan with the client and relative where possible. Advice and counsel client on your findings (WHO, 2014).

How far antenatal care covers in a particular setting indicates the accessibility and utilization of care during pregnancy. It reveals the number or proportion of women who receive care at least once during pregnancy annually. ANC coverage has reduced smoothly from 98.2% in 2011 through 92.2% in 2012 to 90.8% in 2013 and 87% in 2014 (GSS, 2015). As the ANC coverage decrease there is likelihood that the health status of the pregnant women and their unborn babies will be reduce. This is due to the fact that the pregnant women who are not attending the ANC will not have information about their nutritional requirements and the drugs they need to take improve their nutritional status to support the growth of the fetus in their uterus. This could lead to increase in the prevalence of malnutrition among children under five in the country. In accordance with this, GHS (2015) reported that the prevalence of severe underweight among children between 0-11 months increased from 0.01 to 1.9 in 2010 and 2014 respectively.

Statistics on ANC coverage in 2014 showed that, although there have been sustained decrease over the last three years, pregnant women making at least four visits to the hospital spiked over the same period as shown in figures 1 and 3 respectively. This is important because it shows that more pregnant women’s concerns, at least the basic ones, were met; such as Intermittent Preventive Treatment of malaria in pregnancy, Prevention of Mother-to-Child Transmission of HIV and nutrition counseling among others (GSS, 2015).
The National Reproductive Health Policy stipulates that pregnant women who have no complications should make not less than four visits to the antenatal clinic. The ratio of pregnant women who actually made the required visits within the year (2015), increased from 72.7% in 2013 to 76%. Generally, most clients, are not able to make the four visits because of late registration; since this limits accessibility to all the needed antenatal interventions (GSS, 2015).

Starting antenatal care early as well as close monitoring of clients is important for early detection and correction of anaemia since it is known to increase the risk of pre-term labour, low birth weight and perinatal death. The overall prevalence of anaemia among pregnant women increased from 25.8% in 2010 to 31.8% in 2014 and anaemia at 36 weeks, 24.2% in 2010 to 26.8% in 2014 (GSS, 2015). Daily oral iron supplementation, at a 60 to 120 mg dosage is given to correct most of mild-to moderate anaemia.

During antenatal care service, pregnant women are counselled to eat nutritious diet and iron supplements are also given to improve their nutritional status and hemoglobin level. The level of mothers nutritional status have great influence on the health of the fetus in the uterus which also determine the growth pattern of the child after delivery (11,13,14). According to Brantuo et al. (2009), Ghana Health Service (2008) and Bryce, Coitinho, Darnton-Hill, Pelletier, and Pindstrup-Andersen (2008) nutritional counseling at health facilities is a major intervention to improve the health status of the mother and the child. Women who have inadequate antenatal and postnatal visits are more likely to have malnourished children (Tette, Sifah & Nartey, 2015).
2.10 Child Welfare Services and Malnutrition

Child welfare clinic (CWC) is a place where children under school going age are sent for examination and for their growth and development to be monitored and to be vaccinated. It is also a place where babies and malnourished children are given health care. Child welfare clinics focuses on all families with children in issues related to child health. These clinics enable the child grow and develop well and also maintain their health. A child welfare clinic helps families to understand that healthy ways of life are important for a child from the early years. A child welfare clinic also provides guidelines to families in making good health choices.

The activities that carried out at the CWC are registration, weighing, immunization, examination of children from head to toe, counseling of mothers, treatment of minor ailment, referrals, health education talks, distribution of nutrients, family planning and other reproductive health services, nutritional rehabilitation and report writing. These activities help in early identification of childhood conditions such as malnutrition and appropriate interventions given (GSS, 2015).

According to GSS (2015) trend in CWC has remained consistent over the years for all age ranges. Children 0-11 months continue to record the highest proportion of registrants, and this has been linked to the fact that the majority of vaccinations, immunizations and supplementations are given within this age range. However, the proportion of children registered at child welfare clinics reduced by almost 50% for the 12-23 months age range, and is lowest for children 24-59 months as shown in figure 50. These low proportions
result from drop outs in attending child welfare clinics after completing vaccinations (GSS, 2015).

Immunization is the strategy used to eliminate vaccine preventable diseases. In a study conducted by Samaru, Alamu, Atawodi and Edokpayi (2011) at Ahmadu Bello University revealed that rates of childhood immunization and vitamin supplementation were 92-97% and analysis of anthropometric data indicates that most of the infants have a moderate weight and height for their age. From the findings, the children were adequately immunized against many vaccine preventable diseases (92-97%). In the findings 95% of the infants have been given vitamin A and the care givers know the consequences of lack of vitamin A which mean there is adequate intake of micronutrient.

Anthropometric data is used for the assessment of nutritional status of children below five years. According to Samaru et al (2011) the anthropometric data shows that the male infant status has a normal weight of 52.10% and normal length 43.50%. The female nutritional status has a normal weight of 64.70% and normal length of 47.00%.

2.11 Cultural Practices and Undernutrition

Cultural practices are vital in communities and they influence dietary practices globally. This influence can be on men, women and children but children under five are the most vulnerable groups who suffer undernutrition among these people (Cohen 2009; Sucher & Kittler, 2007).

In a study by Johnson et al,(2011) it came out that there is a relationship between culture and dietary habits of people despite where they find themselves. These intend influences
what they consume and what they don’t consume. Various studies have also indicated that cultural beliefs be an indicator of people see as important diets, less important diets as well as bad diets that should not be eaten (Kittler, Sucher & Nelms, 2011) and people will consume what they consider as valuable or important. Another studies conducted by Lyana and Manimbulu (2014), and Trefry, Parkins and Cundill (2014), highlights the fact that diets adopted by individuals are influenced by culture and consequently the their household food security status. This can therefore have consequences on their health and nutritional status whether young or old.

Traditional practices usually impede seeking early treatment and are dangerous to health. It account for the great majority of mortality. Among the major reasons for the infants’ mortality rate and children being 10-15 times as high in the developed world is due to the lack of good medical care and malnutrition specifically undernutrition. Accordingly in Turkey, 17.6% children aged 0-5 groups are undernourished and 24% undernourished to the extent that they will need treatment in various health facilities and they are underweight. These reflect that there are several problems in the nutritional practices with regards infants in the country. The data indicates that 97% of infants are breastfed for just a while; 54% of them usually start to be breastfed within the first hour after birth while 16% of them are never breastfed in the first 24 hours. Unfortunately, mothers who don’t breastfeed, especially in rural areas, are regarded as evil mothers. (Gül E & Ergün, 2013).
CHAPTER THREE

METHODOLOGY

3.1 Study Design

The study was a cross-sectional study to assess the determinants of undernutrition in the Effutu Municipality.

3.2 Study Area

3.2.1 Geography/Background of the Area/Effutu Municipal Assembly

The Effutu Municipal Assembly is one of the 216 Administrative Districts in Ghana and one of the 20 districts in the Central Region. Currently, the Municipality has been divided into four sub-areas called sub-Municipalities with 17 Electoral areas; they are as shown in the table below;

The land area of the Municipality is 64 square kilometers. It is bounded on the North by Gomoa East, on the South by the Gulf of Guinea, on the East by Gomoa East and on the West by Gomoa West. Winneba with a population of 40,017 is the only urban settlement. Other big settlements in the Municipality are Sankor, Gyangyenadze, Nsuekyir, Ateitu, Osubonpanyin and Woarabeba. All the Sub- districts were used for the study.
### Table 3.1: Distribution of the 17 electoral areas in the Effutu Municipality

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<th>No.</th>
<th>Sub district</th>
<th>Electoral Areas</th>
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<td>Kojo Beedu North/Low Cost</td>
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<td>2. Low Cost</td>
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<td>3</td>
<td>Winneba East</td>
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<td>5. Osakam/Fetteh</td>
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<td>4</td>
<td>Winneba West</td>
<td>1. Abasraba South</td>
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<td>9. Ndaama</td>
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*Source: Effutu Municipal Assembly*
3.2.2 Geographical Features and Climate

The municipality is basically a low lying area drained by a few rivers and streams, notably Ayensu and Ntarkufa. A few lagoons are also found along the coast, the biggest being Muni lagoon, near Winneba and into which flows river Ntarkufa.

The area experiences 2 rainfall seasons. The main season occurs from April to July and the minor one from September to November. The periods from December to March and August to early September are always dry. Temperatures are generally mild, ranging between $24^\circ C$ and $28^\circ C$ the coastline is usually very windy. The vegetation is predominantly savannah.

3.2.3 Population

The Municipality has a total population of 82,470 for the year 2016. The population was projected from the 2010 population census with a growth rate is 3.2% per annum (GSS, 2010).

The Municipality has 12 Health institutions. These are two government hospitals, one health centre, four CHPS zones, two private hospitals, one Quasi-Government Clinic, one CHAG hospital and one private maternity home (Bethel Maternity Home). The Winneba municipal hospital serves as the referral center for all the other health facilities and surrounding health facilities.
3.2.4 Economic Activities

Agriculture
Economic activities in the area are dominated by agriculture, with farming falling slightly behind fishing. The main staple food crops cultivated are cassava, maize and vegetables. Winneba is the only marketing centre

Industries
A few small scale industries abound in the municipality. These include Ekem Art Pottery, Mbroh Ceramics, Winneba Oil Mills, Saw Mills, a salt Factory, Poultry Farms, Livestock rearing (cattle, pigs, sheep and goats) and a Chemical Factory.

3.2.5 Social Infrastructure

Water
Majority of the people living within the area have access to pipe borne water. Other sources of drinking water include bore holes, wells and rivers/stream.

3.2.5 Environmental Health and Sanitation Facilities

The mission of the Environmental Health sanitation unit of the municipality is to promote and protect public health by ensuring the provision of basic requirements for a healthy and pleasant physical environment in collaboration with other stakeholders.

3.3 Study Population

The study population for this study were children between the ages of 6-59 months and their caregivers in Effutu Municipality.
3.4 Sampling

3.4.1 Sample Size

Sample size estimation gotten was done from the target population. The formula for estimating the sample size is

\[ n = Z^2pq/d^2 \]  \quad (Charan & Biswas, 2013)

\[ n = \text{Sample size} \]

\[ Z = 1.96, \text{ that is the value of } Z \text{ corresponding to the } 95\% \text{ confidence level} \]

\[ p = 0.35 \text{ (35\%) malnutrition prevalence rate of children under 5 years of 35\%} \]

\[ q = 1-p \text{ (1-0.35=0.65)} \]

\[ d = 0.05 \text{ (5\% error margin)} \]

DHS (2014) report indicated that 19\% of children under five are stunted, 5\% severely stunted, 11\% underweight

The \( p \) is the estimate of malnutrition among the target population according to GDHS (2014) 19\% stunted, 5\% severely stunted, and 11\% underweight = 35\% 

\[ n = 1.96^2 \times 0.35 \times 0.65 / 0.05^2 \]

\[ n = 3.8416 \times 0.2275 = 0.873964/0.0025 \]

\[ n = 349.5856 \]

\[ n = 350 \]

The sample size for the study will be 350.
3.4.2 Sampling Method

Simple random sampling

The community is divided into four sub-districts namely Essuekyir, Gyahadze, Kojo-Beedu north-Low Cost, South East Winneba and south west Winneba respectively. A simple random sampling was used to select two communities from each sub-district. The data was collected from all the four sub-districts. The communities were numbered. The numbers were written on a piece of paper. Each paper was folded and put in a box. The researcher picked from the box. Any number that was picked, the community with that number was selected. Choosing the households was done by modified random walk. Respondents were chosen based on the population of the chosen communities.

3.4.3 Modified random walk

The communities do not have a proper housing list therefore, the modified random walk was used to select the households from housing units. According to Manu (2011), the modified random walk can be used in the absence of a proper housing list. In doing the modified random walk, key landmarks in the community such as churches, private and public schools, the mosque, the CHPS compound, the information centre and the community taxi rank were listed. One of the landmarks was randomly selected and the first house closest to the landmark was chosen as the first house from which subjects were selected.
Dwelling place units were used for identification of households. Dwelling place refer to a specific area occupied by a particular household and therefore need not necessarily be the same as a house (GSS, 2010). Children under-five years were identified by asking the residents of the chosen communities. All children aged 6-59 months from the different households who were eligible to be part of the study were used.

If in a household, where mothers have more than one child less than five years; one of the children was randomly selected to be part of the study.

3.5 Data Collection Technique/Method and Tools

3.5.1 Anthropometric Technique

Anthropometric measures (weight and height) were all taken and recorded on the questionnaires. All children were in only underwear or light clothing during measurements. The measurements were taken using WHO standard procedure. Each measurement was taken by a field skilled worker. The scales were checked for accuracy by before taken to the field.

Length measurement: Recumbent length was taken for children below 24 months. It was measured with the infantometer. The child was placed on the infantometer gently with his/her head against the head board. The child's head was positioned firmly in place by cupping the ears. It was ensured that the vertical line formed from the ear canal to the lower border of the eye socket the child was at right angle to the horizontal board. This is referred to as the Frankfort vertical plane. While another fieldworker ensured that the child's trunk was straight and flat on the board. The foot board was pushed gradually to the feet of the
child with the left hand whiles the right was used to hold the legs together in place. The length was recorded on the questionnaire.

Height was taken for children the rest of the children (above 24 months) with a stadiometer. The child was asked to stand on the footboard with the back of the head against the back board. This was to ensure that the back of their head, shoulder blade, back, buttocks calf and their heel touched the back board of the stadiometer. The head was positioned such that the horizontal line connecting the upper ear opening and lower edge socket of the eye ball run parallel to the base board. This is the formation of the Frankfort horizontal plane. The child’s tummy was pushed in gently to help the child to stand straight and the head board pressed firmly on the top of the head. The reading was then taken and recorded on the questionnaire. Standing height and length were recorded to the nearest 0.1cm.

Weight measurement: For children below 24 months, their mothers were made to stand on the scale without footwear and all heavy objects she was holding or adorned taken from her. The scale was then tarred and the child handed to the mother on the scale for the weight of the child to be taken. For children above 24 months, they stood by themselves on the scale and their feet positioned slightly apart. They were instructed to stand still and the reading taken and recorded on the questionnaire. Weight measurements were taken to the nearest 0.1kg.
3.5.2 Questionnaire

A questionnaire constructed by the researcher was used to collect the data from the respondents. The questionnaire consisted of a list of items related to the topic, research questions and the objectives of the study.

3.6 Quality Control

To ensure quality outcome of the study the following were done:

1. Research assistants with the adequate knowledge in data collection for nutrition surveys were recruited and trained for the study.
2. Data collection tools were critically analyzed with my supervisor and remove all errors and ambiguity.
3. The questionnaire was studied carefully with my supervisor to eliminate ambiguous items.
4. The data was collected and analyzed by the researcher, research assistant, trained data analyst and data entry personnel.
5. Data that was collected on daily basis was assessed to ensure that all information had been properly collected and the questionnaires properly filled.
6. Data cleaning and analysis was done with SPSS 20 software.
7. Each questionnaire after entry was separated and an indication made on it.
3.7 Variables

3.7.1 Dependent Variable

The dependent variable used in the study of undernutrition status of children between the ages of 6-59 months in the community was stunting.

3.7.2 Independent Variable

Economic Factors (Type of community, occupation of mother, occupation of father, household income and highest level of education for mother)

Maternal and Child health Practices (Number of antenatal care received during pregnancy, how often the child gets sick, frequent disease the child suffers from, what support is given to child when sick)

Household Practices (Duration for exclusive breastfeeding, number of times the child feeds in a day, main source of drinking water, How food is preferred to be served, how refuse is stored, toilet facility available)

Cultural practices (what types of foods the child is allowed to eat, what type of foods the child is not allowed to eat, why children are not allowed to eat some food and presence or absence of taboo foods).

3.8 Pre-Testing / Pilot Study

The structured questionnaire and anthropometric instruments were pretested at Apam, a town close to Winneba. The tools were fine-tuned before going to the field for final study.
3.9 Data management and analysis

Of all 350 sampled people, 350 was obtained. Data was then entered into SPSS 20 and cleaned by running frequencies of all the variables to check for incorrect entries. This was double checked with the raw data and the needed corrections done. Incomplete entries were traced back to the respondents for correction. Data was subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS) version 20 and WHO Anthro Software version 3.2.1. Data collected on demographic characteristics were presented in tables as frequencies and percentages. Percentages were calculated from the frequency of responses for the items and put into tables. For the anthropometric data obtained, the Height-for-age, (H/A), Weight-for-age (W/A) and Weight-for-Height (W/H) of the subjects was compared to the WHO child growth standards (WHO, 2006).

The general prevalence of malnutrition was assessed by the Z score so that those who fall below -2 Z score for height of age, weight of height and weight of age were classified as stunted, wasted and underweight. Those who fall above +2 Z-scores for weight of age were classified as overweight.

Association between undernutrition and selected characteristics was limited to the most prevalent undernutrition, specifically stunting using chi-square test at 95% significant level.

The study employed logistic regression to assess the statistical association between stunting of children under five years and those variables that were significant in the bivariate analysis at 95% significant levels. Crude and adjusted odds ratios, and p-values were obtained and statistical significance determined at 95% confidence intervals (CI).
3.10 Ethical Consideration/ Issues

Approval was obtained from Ghana Health Service (GHS) Ethical Review Committee. Initial consultations was done with the Municipal Director of Health Services, Municipal Chief Executive, community leaders and assembly men of the selected suburbs, and management at the hospital and letter followed up to confirm the study. Written informed consent was obtained from mothers or guardians of the children, and consent was sort from the mothers or guardians before the children were used for the study. Explanation of the study to the participants was done in a language they understand to gain their maximum cooperation. Purpose and objective of the study was explained to the participants. They will were also informed that there will be no financial or material reward for participating, except that their participation will generate knowledge for taking measures to prevent undernutrition in the municipality and the country at large. Again, they were told that participation is voluntary and as such they could withdraw at any time if they feel like and without any consequences to them. For anonymity, codes were given to participants instead of their names. During data collection, all materials related to the study was Locked up in a safe location.
CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter presents the analysis of the data obtained from the research and their interpretations.

Out of the total of 350 sample size, 350 responded to the questionnaire. Data from these 350 respondents were analysed and compared on measures relating to economic factors, child health seeking practices, household practices and cultural practices and believes of undernutrition of children under five years.

The work is organised into sections, the first section considered the demographic information of the sample used for the study. The second section considered the general prevalence of malnutrition of children under five years in Effutu municipality. The third section looks at relationship between socio-economic factors and the stunting status of children. The section that followed considered how household practices associate with stunting in children. The next section looked at how child health seeking practices associates stunting in children. The section that follows looks at how cultural beliefs and practices associate with stunting. The final section considered the extent to which those socio-economic factors, child health seeking practices, house hold practices and cultural practices that have significant association with stunting affects stunting.
### Table 4.1: Characteristics and socio-demographic information of Children under five years

<table>
<thead>
<tr>
<th>Options</th>
<th>Frequency (N=350)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of Child (Months)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>12</td>
<td>3.4</td>
</tr>
<tr>
<td>6-11</td>
<td>76</td>
<td>21.7</td>
</tr>
<tr>
<td>12-23</td>
<td>114</td>
<td>32.6</td>
</tr>
<tr>
<td>24-35</td>
<td>60</td>
<td>17.1</td>
</tr>
<tr>
<td>35-47</td>
<td>50</td>
<td>14.3</td>
</tr>
<tr>
<td>48-59</td>
<td>38</td>
<td>10.9</td>
</tr>
<tr>
<td><strong>Sex of Child</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>172</td>
<td>49.1</td>
</tr>
<tr>
<td>Male</td>
<td>178</td>
<td>50.9</td>
</tr>
<tr>
<td><strong>Age of Mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>less than 20 years</td>
<td>89</td>
<td>25.4</td>
</tr>
<tr>
<td>20-34</td>
<td>202</td>
<td>57.7</td>
</tr>
<tr>
<td>35-49Yrs</td>
<td>59</td>
<td>16.9</td>
</tr>
<tr>
<td><strong>Religion of Mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>237</td>
<td>67.7</td>
</tr>
<tr>
<td>Muslim</td>
<td>105</td>
<td>30</td>
</tr>
<tr>
<td>Traditionalist</td>
<td>8</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Marital Status of Mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>124</td>
<td>35.4</td>
</tr>
<tr>
<td>Married</td>
<td>121</td>
<td>34.6</td>
</tr>
<tr>
<td>Separated</td>
<td>19</td>
<td>5.4</td>
</tr>
<tr>
<td>Divorced</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Widowed</td>
<td>5</td>
<td>1.4</td>
</tr>
<tr>
<td>Cohabiting</td>
<td>79</td>
<td>22.6</td>
</tr>
<tr>
<td><strong>Number of Children by Mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Child</td>
<td>116</td>
<td>33.15</td>
</tr>
<tr>
<td>2 Children</td>
<td>87</td>
<td>24.9</td>
</tr>
<tr>
<td>3 Children</td>
<td>66</td>
<td>18.9</td>
</tr>
<tr>
<td>4 Children</td>
<td>69</td>
<td>19.7</td>
</tr>
<tr>
<td>More Than 4 Children</td>
<td>12</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Type of Community</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>110</td>
<td>31.4</td>
</tr>
<tr>
<td>Rural</td>
<td>240</td>
<td>76.7</td>
</tr>
</tbody>
</table>
Table 4.1 above shows the demographic characteristics of children used in the study. Majority (32.6%) of the children were within the ages of 12 to 23 months followed by those who were within the ages of 6 to 11 months. Majority of the children were males (50.9%). Majority (57.7%) of the mothers were within the age range of 20 to 34. The least (16.9%) were those in the ages within the ages of 35 to 49 years and 48 years. Majority of the respondents were Christians (67.7%) whiles 30% were Muslims.

With regards to the marital status of the parents of children used in the study, majority (35.4%) of them were Single followed by those who were married (34.6%).

With regards to the number of children that the mother of the children used in the study have, had about a third (33.2%) having only a child. The least (3.5%) were those who had more than four children.

Considering the geographic location of the parents as either living in a rural or urban area showed that most (67.7%) of the parents of the children examined lived in rural areas.

4.2 General malnutrition levels of children under five years

This sections looks at the various malnutrition status of the children used in the study.
4.2.1 Nutritional status of under-five according to weight-for-age

Figure 2: Nutritional status of under-five according to weight-for-age

The weight-for-age nutritional status had majority of the children used in the study being normal (64%). Those who were underweight formed 20%. 
4.2.2 Nutritional status of under-five according to height-for-age

Figure 3: Nutritional status of under-five according to height-for-age (Stunting)

The height-for-age nutritional status had majority of the children used in the study being stunted (59%).
4.2.3 Nutritional status of under-five according to weight-for-height

The weight-for-height nutritional status had majority of the children being normal (81%) and 19% of them being wasted.

Of all the undernutrition status, that is weight-for-height, height-for-age and weight-for-height, the one with the highest proportion of children being malnourished is stunting making it the most prevalent hence the study concentrated on stunting.
4.2.3 Stunting status of children under-five according to their age

Children who were between the age group of 12-23 months were most prevalent with stunting (35.5%). Followed by those who were within the ages of 6-11 months. The Least age group with stunting were those who were up to five months old.
4.3 Association of socio-economic factors with stunting

Table 4.1 Bivariate analysis of stunting status and children under-five in Effutu municipality: Socio-Economic factors

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Outcome (n=350)</th>
<th></th>
<th></th>
<th>Chi-Square</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stunted (%)</td>
<td>Normal (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Occupation of Mother</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>61(68.5)</td>
<td>28(31.5)</td>
<td>4.897</td>
<td>0.038*</td>
<td></td>
</tr>
<tr>
<td>Self Employed</td>
<td>144(56.3)</td>
<td>112(43.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil/Public Servant</td>
<td>2(40)</td>
<td>3(60)</td>
<td>1.122</td>
<td>0.571</td>
<td></td>
</tr>
<tr>
<td><strong>Occupation of Father</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>20(51.3)</td>
<td>19(48.7)</td>
<td>1.122</td>
<td>0.571</td>
<td></td>
</tr>
<tr>
<td>Self Employed</td>
<td>181(60.1)</td>
<td>120(39.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil/Public Servant</td>
<td>6(60)</td>
<td>4(40)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household Income per month</strong></td>
<td></td>
<td></td>
<td></td>
<td>12.619</td>
<td>0.013**</td>
</tr>
<tr>
<td>Less than 100</td>
<td>95(62.1)</td>
<td>58(37.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 to 200</td>
<td>59(59.6)</td>
<td>40(40.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>201 to 500</td>
<td>34(63)</td>
<td>20(37)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>501 to 1000</td>
<td>17(56.7)</td>
<td>13(43.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above 1000</td>
<td>2(14.3)</td>
<td>12(85.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Educational Levels</strong></td>
<td></td>
<td></td>
<td></td>
<td>6.263</td>
<td>0.18</td>
</tr>
<tr>
<td>Tertiary</td>
<td>8(40)</td>
<td>12(60)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>30(53.6)</td>
<td>26(46.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior High School</td>
<td>6(85.7)</td>
<td>1(14.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>112(60.5)</td>
<td>73(39.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Formal Education</td>
<td>51(62.2)</td>
<td>31(37.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P-value significant at 0.05, **P-value significant at 0.01

With regards to the socio-economic factors of undernutrition, unemployed mothers were found to have more (68.5%) stunted children than normal. Children of self-employed mothers were more stunted (56.3%) than normal. Children of mothers who were public or civil servants were more stunted than normal (60%). There is a significant difference between children who are stunted and normal with respect to the occupation of their mothers at P<0.05.
With regards to the occupation of the father, children of unemployed father were more (51.3%) stunted than normal. Those children whose fathers were self-employed were more (60.1%) stunted than normal. Those whose fathers were in the civil or public service had their children being more (60%) stunted than normal. There is no significant difference between children who are stunted and normal with respect to the occupation of their fathers.

Children who lived in households that earn less than Ghc100, between Ghc100 and Ghc200, between Ghc 201 and Ghc 500 and between Ghc 501 and Ghc 1000 were more stunted than normal with 62.1%, 59.6%, 63% and 56.7% respectively. Those children who lived in households that earn more than Ghc1000, were more normal than stunted (85.7%). There is a significant difference between children who were stunted and normal with respect to the income levels of the household they live in at P<0.05.

Children of mothers who had no formal education, primary, junior or secondary were more stunted than normal with 62.2%, 60.5%, 85.7% and 53.6% respectively. Those who had tertiary education however had more (60%) normal children than stunted. There is a no significant difference between children who were stunted and normal with respect to the level of education of the mother at P<0.05.

Of all the socio-economic factors of undernutrition, occupation of the mother and household incomes was found to be significantly associated with a child’s undernutrition status at P<0.05 and P<0.01 respectively.
4.4: Association of Child health seeking practices with stunting

Table 4.2: Bivariate analysis of stunting status and children under- five in Effutu municipality: Child health seeking practices

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Outcome (n=350)</th>
<th></th>
<th>Chi Square</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stunted (%)</td>
<td>Normal (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number Of ante natal cares visits during pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>2(66.7)</td>
<td>1(33.3)</td>
<td>8.735</td>
<td>0.068</td>
</tr>
<tr>
<td>Once</td>
<td>32(59.3)</td>
<td>22(40.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twice</td>
<td>73(64.6)</td>
<td>40(35.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrice</td>
<td>75(62)</td>
<td>46(38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four Times</td>
<td>25(42.4)</td>
<td>34(57.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How Often Child Gets Sick</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a week</td>
<td>2(18.2)</td>
<td>9(81.8)</td>
<td>11.073</td>
<td>0.026*</td>
</tr>
<tr>
<td>Twice a Week</td>
<td>27(52.9)</td>
<td>24(47.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a Month</td>
<td>104(59.4)</td>
<td>71(40.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a while</td>
<td>43(62.3)</td>
<td>26(37.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Fall Sick</td>
<td>31(70.5)</td>
<td>13(29.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition a child usually suffers from</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>45(60)</td>
<td>30(40)</td>
<td>1.699</td>
<td>0.791</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>41(56.2)</td>
<td>32(43.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td>67(57.3)</td>
<td>50(42.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anemia</td>
<td>31(55.4)</td>
<td>25(44.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory Tract Infection</td>
<td>23(67.6)</td>
<td>11(32.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is done when the child is Sick</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visit the Hospital</td>
<td>109(55.6)</td>
<td>87(44.4)</td>
<td>19.215</td>
<td>0.01**</td>
</tr>
<tr>
<td>Buy drugs from The Pharmacy</td>
<td>38(48.1)</td>
<td>41(51.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consult a traditionalist</td>
<td>33(84.6)</td>
<td>6(15.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do Home treatment</td>
<td>27(75)</td>
<td>9(25)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P-value significant at 0.05, **P-value significant at 0.01

With regards to the child health care seeking factors and stunting, the number of ante natal care visits during pregnancy was found to have mothers who never went for antenatal care,
those who went once, twice or thrice having their children being more stunted than normal with (66.7%), (59.3%), (64.6%) and (62%) respectively. and those who went for ante natal care four times during their pregnancy had more (57.6%) normal children than stunted. There is no significant difference between children who were stunted and normal with respect to number of ante natal cares visits during pregnancy at P<0.05.

With regards to how often a child gets sick and their stunting status, those who went once a week had more (81.8%) cases of normal children than stunted. There were more stunted cases than normal cases for those children who fall sick twice a week (52.9%), once a month (59.4%), once a while (62.3%) or never fallen sick (70.5%). There is a significant difference between children who were stunted and normal with respect to how often a child gets sick at P<0.05.

With regards to what disease condition a child usually suffers from, there were more cases of stunted than normal for fever (60%), diarrhea (56.2%), malaria (57.3%), anemia (55.4%) and respiratory tract infection (67.6%). There is no significant difference between children who were stunted and normal with respect to what disease condition a child usually suffers from at P<0.05.

What is done when a child is sick had majority of the children being stunted than normal for those who visit the hospital (55.6%), consult a traditionalist (84.6%) and those who treat them at home (75%). Those who buy drugs at the pharmacy however had more
(51.9%) normal cases than stunted cases. There is a significant difference between children who were stunted and normal with respect to what is done when a child is sick at P<0.05. On the whole, only what is done to a child when he or she gets sick was found to be significantly associated with a child’s stunting status at P<0.001.
4.5 Association of Household practices with stunting

Table 4.3: Bivariate analysis of stunting status and children under-five in Effutu municipality: household practices factors

<table>
<thead>
<tr>
<th>characteristics</th>
<th>Outcome (n=350)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stunted (%)</td>
<td>Normal (%)</td>
<td>Chi Square</td>
<td>P value</td>
<td></td>
</tr>
<tr>
<td>How long child was fed on breast milk only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>did do exclusive breastfeeding</td>
<td>3(42.9)</td>
<td>4(57.1)</td>
<td>2.644</td>
<td>0.619</td>
<td></td>
</tr>
<tr>
<td>3 Months</td>
<td>88(60.7)</td>
<td>57(39.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Months</td>
<td>87(62.1)</td>
<td>53(37.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Year</td>
<td>5(45.5)</td>
<td>6(54.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More Than A Year</td>
<td>24(54.5)</td>
<td>20(45.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many times child feeds in a day</td>
<td></td>
<td></td>
<td></td>
<td>8.269</td>
<td>0.041*</td>
</tr>
<tr>
<td>Once</td>
<td>3(75)</td>
<td>1(25)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twice</td>
<td>26(43.3)</td>
<td>34(56.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrice</td>
<td>117(62.9)</td>
<td>69(37.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As and when Necessary</td>
<td>61(62.9)</td>
<td>36(37.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Source of Drinking Water</td>
<td></td>
<td></td>
<td></td>
<td>3.603</td>
<td>0.462</td>
</tr>
<tr>
<td>Pipe Borne Water</td>
<td>148(61.4)</td>
<td>93(38.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dug Well</td>
<td>28(54.9)</td>
<td>23(45.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rain Water</td>
<td>1(100)</td>
<td>0(0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottled Water</td>
<td>14(66.7)</td>
<td>7(33.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sachet Water</td>
<td>16(48.5)</td>
<td>17(51.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How Household Prefer Food Served</td>
<td></td>
<td></td>
<td></td>
<td>1.088</td>
<td>0.58</td>
</tr>
<tr>
<td>Hot</td>
<td>139(60.4)</td>
<td>91(39.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold</td>
<td>55(60.4)</td>
<td>36(39.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>warm</td>
<td>13(50)</td>
<td>13(50)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How Refuse is Stored</td>
<td></td>
<td></td>
<td></td>
<td>1.535</td>
<td>0.674</td>
</tr>
<tr>
<td>Sanitary Dustbins</td>
<td>108(59.7)</td>
<td>73(40.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receptacles</td>
<td>36(56.3)</td>
<td>28(43.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Storages</td>
<td>1(33.3)</td>
<td>2(66.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without Storage Facility</td>
<td>62(62.6)</td>
<td>37(37.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toilet facility Available</td>
<td></td>
<td></td>
<td></td>
<td>3.534</td>
<td>0.316</td>
</tr>
<tr>
<td>Water Closet</td>
<td>22(56.4)</td>
<td>17(43.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KVIP</td>
<td>90(56.3)</td>
<td>70(43.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pit Latrine</td>
<td>84(62.7)</td>
<td>50(37.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indiscriminate Defecation</td>
<td>11(78.6)</td>
<td>3(21.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P-value significant at 0.05, **P-value significant at 0.01
Considering how long children are exclusively fed on breast milk, those who did not do exclusive breast feeding had more normal (57.1%) children than stunted also those who did exclusive breastfeeding for one year had more normal (54.5%) than stunted children. There were more stunted children than normal children for those who did exclusive breastfeeding for three months (60.7%), six months (62.1%) and more than a year (54.5%). There is no significant difference between children who were stunted and normal with respect to how long children are exclusively fed on breast milk at P<0.05.

With regards to how many times a child feeds in a day, more stunted than normal cases were recorded for those who feed once a day (75%), thrice (62.9%) a day or as and when necessary (62.9%). However, those who fed twice a day were more normal (56.7%) than stunted. There is a significant difference between children who were stunted and normal with respect to how many times a child feeds in a day at P<0.05.

With regards to the main source of drinking water for a household and their child being either stunted or normal, there were more stunted children than normal for those whose main source of drinking water is pipe borne water (61.4%), dug well (54.9%), rain water (100%) and bottled water (66.7%). Those whose main source of drinking is sachet water had more normal (51.5%) children than stunted. There is no significant difference between children who were stunted and normal with respect to the main source of drinking water for a household at P<0.05.

Majority of children were stunted than normal in households who preferred food served hot (60.4%) and cold (60.4%). Those households who preferred food served warm had an equal number of children being stunted and normal. There is no significant difference
between children who were stunted and normal with respect to how households prefer food served at P<0.05.

The way refuse are stored in a household had majority of the children being stunted than normal for sanitary dustbins (59.7%), receptacles (56.3%) and those without storage facilities (62.6%). Those who use other storage facilities had more normal (66.7%) children than stunted. There is no significant difference between children who were stunted and normal with respect to way refuse are stored in a household at P<0.05.

There were more stunted than normal cases for children who lived in households that used Water closet (56.4%), KVIP (56.3%), pit latrine (62.7%) or do indiscriminate defecation (78.6%). There is no significant difference between children who were stunted and normal with respect to toilet facility available to households at P<0.05.

On the whole, only the number of times a child feeds in a day is the only household practice that was significantly associated with stunting status at P<0.05.
4.6 Association of cultural practices and beliefs factors with stunting

Table 4.4: Bivariate analysis of stunting status and children under- five in Effutu municipality: cultural practices and beliefs factors

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Stunted (%)</th>
<th>Normal (%)</th>
<th>Chi Square</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foods that are Allowed (n=350)</strong></td>
<td></td>
<td></td>
<td>10.105</td>
<td>0.069</td>
</tr>
<tr>
<td>Porridge</td>
<td>44(72.1)</td>
<td>17(27.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mashed Kenkey</td>
<td>37(46.3)</td>
<td>43(53.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>54(62.1)</td>
<td>33(37.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>42(58.3)</td>
<td>30(41.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat</td>
<td>30(60)</td>
<td>20(40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Foods that are disallowed (n=145)</strong></td>
<td></td>
<td></td>
<td>0.923</td>
<td>0.921</td>
</tr>
<tr>
<td>Ice Kenkey</td>
<td>12(52.2)</td>
<td>11(47.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yam</td>
<td>21(55.3)</td>
<td>17(44.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>17(50)</td>
<td>17(50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat</td>
<td>18(60)</td>
<td>12(40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>12(60)</td>
<td>8(40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Why Children Are not Allowed to Such Foods (n=145)</strong></td>
<td></td>
<td></td>
<td>4.260</td>
<td>0.513</td>
</tr>
<tr>
<td>Child Does not Grow Healthy</td>
<td>20(66.7)</td>
<td>10(33.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Child Would become a thief</td>
<td>15(53.6)</td>
<td>13(46.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religious Reasons</td>
<td>19(57.6)</td>
<td>14(42.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial difficulties</td>
<td>17(68)</td>
<td>8(32)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child is too young</td>
<td>6(46.2)</td>
<td>7(53.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child gets sick</td>
<td>7(43.8)</td>
<td>9(56.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Presence of taboos foods (n=350)</strong></td>
<td></td>
<td></td>
<td>2.403</td>
<td>0.301</td>
</tr>
<tr>
<td>Yes</td>
<td>31(58.5)</td>
<td>22(41.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>144(57.4)</td>
<td>107(42.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cannot Tell</td>
<td>32(69.6)</td>
<td>14(30.4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P-value significant at 0.05, **P-value significant at 0.01

With regards to cultural practices and believe system, majority of the children were stunted than normal for children who were allowed to eat porridge (72.1%), eggs (62.1%), fish (58.3%) and meat (60%). Majority (53.8%) of the children who were allowed to eat mashed kenkey were more normal than stunted.

With regards to foods that were disallowed, majority of the children were stunted than normal for children who were not allowed to eat ice Kenkey (52.2%), Yam (55.3%), meat
(60%) and fish (60). Those were not allowed to eat eggs had equal percentage for stunted and normal.

Looking at why children are not allowed to eat some kinds of foods, more children were stunted than normal for those who do not grow healthy because of such foods (66.7%), the child becoming a thief in future (53.6%), religious reason (57.6%) and financial reasons (68%). On the other hand, there were more normal children than stunted for those children were not allowed to eat certain because their too young (53.8%) or because they get sick when they eat them (56.3%).

Whether or not there were foods which were considered taboo for children to eat had more stunted children than normal children for those who indicated that there are taboo foods (58.5%), those who indicated that there are no such taboo foods (57.4%) and those who cannot tell whether or not there are taboo foods (69.6%).

There is no significant difference between children who are stunted and normal with respect to all the cultural and belief practices at P<0.05.

None of the household practices was found to be significantly associated with child nutritional status.
4.7 Socio-Economic factors associated with stunting among children under five years:

Outcomes from the simple logistic regression modelling are presented together with their unadjusted and adjusted measures of association. Simple logistic regression was performed for socio-economic characteristics that had significant association at P<0.05.
Table 4.8: Associations between selected exposure variables and Stunting: Socio-economic factors

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>P Value</th>
<th>Crude OR</th>
<th>95% CI</th>
<th>Adjusted OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation of Mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>0.531</td>
<td></td>
<td></td>
<td>0.451</td>
<td></td>
</tr>
<tr>
<td>Self Employed</td>
<td>0.032</td>
<td>2.18</td>
<td>(1.114 - 3.246)</td>
<td>0.053</td>
<td>2.004</td>
</tr>
<tr>
<td>Civil/Public Servant</td>
<td>0.546</td>
<td>0.929</td>
<td>(0.599 - 1.258)</td>
<td>0.621</td>
<td>1.103</td>
</tr>
<tr>
<td>Household Income/Month</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 100</td>
<td>0.064</td>
<td></td>
<td></td>
<td>0.385</td>
<td></td>
</tr>
<tr>
<td>100 to 200</td>
<td>0.067</td>
<td>1.141</td>
<td>(0.581 - 1.701)</td>
<td>0.078</td>
<td>1.2065</td>
</tr>
<tr>
<td>201 to 500</td>
<td>0.241</td>
<td>1.156</td>
<td>(0.494 - 1.818)</td>
<td>0.578</td>
<td>1.153</td>
</tr>
<tr>
<td>501 to 1000</td>
<td>0.146</td>
<td>1.728</td>
<td>(0.586 - 2.87)</td>
<td>0.932</td>
<td>1.0075</td>
</tr>
<tr>
<td>Above 1000</td>
<td>0.004</td>
<td>2.672</td>
<td>(2.198 - 3.145)</td>
<td>0.0241</td>
<td>1.8415</td>
</tr>
</tbody>
</table>
Children of mothers who are self-employed are about twice likely to be stunted than those who are unemployed (OR=2.18; 95% CI, 1.14 - 3.246). Again those who earn more than Ghc1000 are more likely to be stunted than those who earn less than Ghc100 by a multiplicative factor of 2.672 (OR=2.672; 95% CI, 2.198 - 47.145).

4.8: Child health seeking factors associated with stunting among children under five years:

Outcomes from the simple logistic regression modelling are presented together with their unadjusted and adjusted measures of association. Simple logistic regression was performed for all selected maternal and health care factors that were significant at P<0.05.
Table 4.9: Associations between selected exposure variables and Stunting: Child health seeking practices

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>P Value</th>
<th>Crude OR</th>
<th>95% C.I.</th>
<th>P Value</th>
<th>Adjusted OR</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit the Hospital</td>
<td>0.742</td>
<td>0.521</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy drugs from The Pharmacy</td>
<td>0.129</td>
<td>1.542</td>
<td>(0.789 - 2.295)</td>
<td>0.312</td>
<td>1.758</td>
<td>(0.856 - 2.66)</td>
</tr>
<tr>
<td>Consult a traditionalist</td>
<td>0.032</td>
<td>0.355</td>
<td>(0.098 - 0.612)</td>
<td>0.172</td>
<td>0.371</td>
<td>(0.101 - 0.641)</td>
</tr>
<tr>
<td>Do Home treatment</td>
<td>0.312</td>
<td>0.6275</td>
<td>(0.207 - 1.048)</td>
<td>0.198</td>
<td>1.2015</td>
<td>(0.143 - 2.26)</td>
</tr>
</tbody>
</table>
Those who consult traditionalist when they child is sick are less likely to stunted than those who visit the hospital when the child is sick by a multiplicative factor of 0.355 (OR= 0.355; 95% CI, 0.098 - 0.612).

4.9: Household practices factors associated with stunting among children under five years:

Outcomes from the simple logistic regression modelling are presented together with their unadjusted and adjusted measures of association. Simple logistic regression was performed for all selected household practices factors that were significant at P<0.05.
Table 4: Associations between selected exposure variables and Stunting: household practices

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>P value</th>
<th>Crude OR</th>
<th>95% CI</th>
<th>P Value</th>
<th>Adjusted OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>How Many Times Child Feeds in a day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once</td>
<td>0.521</td>
<td>1.8295</td>
<td>(0.225 - 3.434)</td>
<td>0.621</td>
<td>2.1285</td>
<td>(0.258 - 3.999)</td>
</tr>
<tr>
<td>Twice</td>
<td>0.231</td>
<td>1.4855</td>
<td>(0.102 - 2.869)</td>
<td>0.312</td>
<td>2.042</td>
<td>(0.104 - 3.98)</td>
</tr>
<tr>
<td>Three</td>
<td>0.121</td>
<td>1.0545</td>
<td>(0.092 - 2.017)</td>
<td>0.112</td>
<td>1.3235</td>
<td>(0.08 - 2.545)</td>
</tr>
<tr>
<td>As and when Necessary</td>
<td>0.076</td>
<td></td>
<td></td>
<td>0.089</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the logistic regression model, the number of times a child feeds in a day does not have any significant effect on a child being stunted.
CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter discusses the findings of the study under in relations with its objectives. It looks at the general prevalence of undernutrition in the community under study, and the relationships existing between socio-economic factors, child health seeking factors, household practices and cultural and belief system and stunting status of the children used in the study.

5.2 Discussion of main findings

5.2.1 General outcome of malnutrition status of children under five

Globally, undernutrition in children remains a big challenge. According to estimates by the United Nations Food and Agriculture Organization (FAO), 11.11% of world populations were suffering from chronic undernourishment in 2012-2014 (FAO, 2014). Children are the most visible victims of undernutrition. United Nations Children’s Fund (UNICEF) reports that 25% and 8% of under-five year old children were estimated to be stunted and wasted respectively with an estimated 6.3 million live born children worldwide dying before age 5 years, in 2013 because of undernutrition (UNICEF et al., 2014b). This shows that almost 50% of all mortality in children under 5 can be attributable to under nutrition.

In this study, the indicators used in the assessment of general malnutrition were stunting, underweight, overweight and wasting. A total of 350 children were assessed. The findings
of the study show the prevalence of underweight, stunting, wasting and overweight were 20%, 59%, 19% and 16% respectively.

In investigating the undernutrition status in children under five years, it was discovered that in the three major types of undernutrition, Stunting was more prevalence, followed by underweight and wasting respectively. This finding is close in line with those by those carried out on under two-year old children in Golestan, Iran province by Kabir et al (2006) where it was discovered that the prevalence of slight to acute underweight, slight to acute wasting and slight to acute stunting were 21.4%, 16.5%, and 31.4% respectively. Also this is supported by the findings of Kwena, et al (2003), who conducted a study in a rural area of western Kenya using pre-school children and discovered that the prevalence of underweight, stunting, and wasting were 20%, 30%, and 4%, respectively. It is also in congruence with the study by Mengistu et al (2013) who carried a study with the aim of assessing the prevalence of undernutrition and associated factors among children aged 6-59 months at HidabuAbote district, North shewa, Oromia. The study adopted a community based cross sectional study by sampling 820 children aged 6-59 months from September 8-23, 2012 at HidabuAbote district. Anthropometric measurements and structured questionnaires were used. The result from this study showed that the prevalence of stunted, underweight and wasted were 47.6%, 30.9% and 16.7% respectively as calculated. It can be implied that the food feed on by the children in Ghana are different.

The finding is however against those by Alavi-naien et al (2003) who carried a study on 25-36 months old children under the care of Kerman, Iran rural health houses. It was concluded in that study the prevalence of underweight, wasting, and shortness were 16.1%,
7.2%, and 15.6% respectively as calculated. Also, the findings were higher that the globally figures. According to the United Nations Children’s Fund (UNICEF) reports that 25% and 8% of under-five year old children were estimated to be stunted and wasted respectively with an estimated 6.3 million live born children worldwide dying before age 5 years, in 2013 because of undernutrition (UNICEF et al., 2014b). The result from this study is close to that of another developing country thus Ethiopian which according to their 2014 report of demographic and health survey (DHS), nationally 40%, 25% and 9% of children under age five were stunted, underweight and wasted respectively with the prevalence of overweight or obese children not being more than 3%.

5.2.2 Socioeconomic Factors and Undernutrition

The study sought to examine whether socioeconomic factors has a role to play in the undernutrition of children. The study looked at four socioeconomic factors namely Occupation of mother, Occupation of father, Household Income and Education of mother on undernutrition. The result of the study showed that two of the socioeconomic factors considered namely occupation of the mother and household incomes were found to be significantly associated with a child’s undernutrition status. By implication since mother are more concern about the wellbeing of their child the occupation of the mother will influence her income hence they growth of her child in terms of provision of adequate nutritious food. It was found out that Civil/Public Servant had more normal growth than Self Employed and Unemployed since they had a much more steady inflow of income. With stunted growth children it was revealed that Unemployed mother had most, followed by Self Employed Civil/Public Servant. The income of the household generally influences
the ability to buy food. Children who lived in households in the low income brackets were more likely to have stunted growth than normal. But those children who lived in households that earn more than Ghc1000 were more normal than stunted.

Interestingly the occupation of fathers do not have important role to play with the level of nutrition of their children since mostly childcare is largely the preoccupation of the mothers. Also, the educational level of the mother generally did have a significant relationship with their children’s undernutrition status. However, the study revealed that mothers who had tertiary education had more normal children than stunted. It could be that because of their level of education, such mothers may be aware of nutritional needs of the children and hence provide them with more nutritious dishes.

This is consistent with a study done in Ethiopia by Tesfaye (2009) and Alemu et al. (2011) who found out that household wealth or income is an important determinant of child nutritional and health status. It further agrees with a study conducted by Kamiya (2011) in Lao using multilevel mixed linear model to estimate a health production function showed that educational attainment of mothers do not exert any positive impact on childhood nutrition (height-for age, weight-for -age and weight-for height). However, it is not in line with a study by Mostafa (2011) in Bangladesh, the Bangladesh Demographic and Health Survey data- 2007 was used with multinomial logistic regression and Cross-sectional analyses to assess the impact of the socio-demographic variables on severe and moderate stunting over normal among the children where it was discovered that that father’s education is an important determinant of children’s nutritional status. The study reveals that educational level of mother has no effect on nutritional status. This is in line with a study conducted by Kamiya (2011) in Lao using multilevel mixed linear model to estimate
a health production function showed that mothers’ educational attainment do not exert any positive impact on childhood nutrition (height-for age, weight-for age and weight-for height).

5.2.3 Household practices and Undernutrition

There are a number of household practices considered in this study such as exclusive breastfeeding duration, number of times a child is fed a day, main source of drinking water, how food is served, refuse storage and Toilet facilities. These were examined as to how they affect undernutrition of children. A similar study was conducted by Babatunde, Olagunju, Fakayode, and Sola-Ojo (2011) to examine the determinants and prevalence of malnutrition among children in Kwara State, Nigeria, who are under-five children. Results revealed from descriptive and regression analyses used to analyze anthropometrics that 22.0%, 23.6% and 14.2% of the sample children were underweight, stunted and wasted respectively. In addition, regression analysis showed that the significant determinants of malnutrition included calorie intake of the households, access to clean water and presence of toilet facility in the households.

With respect to this study, On the whole, only the number of times a child feeds in a day was significantly associated with undernutrition status. Mothers who feed their children once a day, thrice a day or as and when necessary have more stunted than normal children. However, those who fed twice a day were more normal than stunted. Maybe these results are reflective of the fact it is not the number of times a children feeds which matter but what exactly the child is being fed on based on the health and nutritional welling of their mothers.
The duration for exclusive breastfeeding did not have any significant effect on the undernutritional status of the child.

This is in congruence with a study by Sapkota & Gurung (2008) who found no association between social class and the source of drinking water on malnutrition. However, it not in support of a study conducted by Babatunde, Olagunju, Fakayode, and Sola-Ojo (2011) to investigate the determinants and prevalence of malnutrition among children in Kwara state, Nigeria who are under-five and found out that the presence of toilet facility and access to clean water in households affect a child nutritional status.

5.2.4 Child Healthcare Seeking Factors

Number of Antenatal care visits during pregnancy, How often a child gets sick, diseases a child usually suffers from, What is done when a child is sick are the Child Healthcare seeking practices investigated with regards to undernutrition of children.

From the study, ante natal care had no significant relationship children malnutrition status this not in line with the opinion that when antenatal care is commenced early and clients are closely monitored early diagnosis and treatment of anaemia can be done since it is associated with low birth weight and perinatal and higher risk of pre-term delivery, (GSS, 2015). Ante natal visits helps to check prevalence of anaemia which can cause malnourishment among children under five years. The overall prevalence of anaemia among pregnant women increased from 25.8% in 2010 to 31.8% in 2014 and anaemia at 36 weeks, 24.2% in 2010 to 26.8% in 2014 (GSS, 2015).

Again it is against views of Brantuo et al. (2009), Ghana Health Service (2008) and Bryce, Coitinho, Pelletier, Darnton-Hill, and Pinstrep-Andersen (2008) who claim that nutritional counseling at health facilities is a major intervention to improve the health status of the
mother and the child. Women who have inadequate antenatal and postnatal visits are more likely to have malnourished children (Tette, Sifah & Nartey, 2015).

It was revealed from the study that how often a child gets sick and what is done to a child when a child gets sick were significantly associated with a child’s undernutrition status. It is believed that ill health can affect children malnourishment and hence could explain why how often a child gets sick or seeks treatment is significantly associated with malnourishment.

With regards to how often a child gets sick and their stunting status, those who fell sick once a week had more cases of normal children than stunted. Generally, it is believed that a child who falls sick often are likely to have malnutrition problems but the study proved otherwise that they have no relationship. The study showed further that there were more stunted cases than normal cases for those children who fall sick twice a week, once a month, once a while and never fallen sick. In addition, for what is done when a child is sick had majority of the children being stunted than normal for those who visit the hospital, consult a traditionalist and those who treat them at home. Those who buy drugs at the pharmacy however have more normal cases than stunted cases. This could be because those who buy hospital drugs can give ready and immediate support to the wards. Hospital bills may a discouragement so that since there is ready support, by buying drugs at the pharmacy, children tend to get immediate treatment and hence be normal.

5.2.5 Cultural Practices and Undernutrition

Cultural activities and practices are vital in every community and they affect dietary practices globally. This influence can be on women, men and children but the most
vulnerable are children under five who suffer undernutrition among these people (Cohen 2009; Sucher & Kittler, 2007).

In a study by Johnson et al., (2011) it came out that there is a relationship between culture and dietary habits of people despite where they find themselves. These intend influences what they consume and what they don’t consume. Various studies have also indicated that cultural beliefs is what influences what people see as less important diets, important diets as well as bad diets that should not be eaten (Kittler, Sucher & Nelms, 2011) and people will consume what they consider as valuable or important. Another studies conducted by Trefry, Parkins and Cundill (2014) and Lyana and Manimbulu (2014), highlights the fact that diets adopted by individuals are influenced by culture and consequently their household food security status. This can therefore have consequences on their health and nutritional status whether young or old.

There are a number of cultural practices in Ghana but the ones examined in this study were foods that were allowed for children to eat, disallowed foods, reason for disallowing foods and whether or not there are taboo foods and the effect they have on undernutrition of children. According to this study none of these practices examined had a significant association to undernutrition among children. By implication although there are a number traditional and cultural influences inherited, they do not affect nutrition. Maybe in these modern times majority have stopped observing some of these cultural practices hence their disassociation to undernutrition. There is increased access to health facilities and health care, more people are becoming more educated and less adherent to traditional customs. This study is not in line with a study by Cohen (2009; Sucher & Kittler, 2007) who found out that cultural practices influences children but children under five are the most
vulnerable. Likewise it disagrees with a study by Johnson et al. (2011) which showed that culture and dietary habits of people despite have a relationship despite where they find themselves which affects nutritional status of children.
CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study set out to investigate undernutrition, specifically by targeting children under five years. The study also used modified random walk approach for collecting information from the Effutu Municipal Assembly. For the aim of the study to be achieved, four major objectives were set namely how socio-economic factors, household practices, child health care seeking factors and cultural practices influence undernutrition in Efutu municipality. The study employed a convenient and random sampling technique to gather data that represent the exact reality on the ground. The study used structured questionnaires to collect opinions of three hundred and fifty people in the Efutu municipality. Anthropometric measurement was done alongside filling of the questionnaire. Data was subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS) version 20 and WHO Anthro Software version 3.2.1. The anthropometric data obtained thus, the Height-for-age, (H/A), Weight-for-age (W/A) and Weight-for-Height (W/H) of the subjects was compared to the WHO child growth standards (WHO, 2006)

The analysis of the study came up with interesting findings with how certain indicators are associated with stunting. The weight-for-age nutritional status had majority of the children used in the study being normal (64%). Those who were underweight formed 20%. The height-for-age nutritional status had majority of the children used in the study being stunted (59%).
The weight-for-height nutritional status had majority of the children being normal (81%) and 19% of them being wasted. Children who were between the age group of 12-23 months were most prevalent with stunting (35.5%).

The study showed that the various socio-economic factors, occupations of fathers had no significant relationship with their children being stunted, however there was for mothers. For educational levels of parents there was no significant relationship with their children being stunted even though mothers who had tertiary education had more normal children than stunted.

With regards to household practices, the findings of the study showed that there is no significant difference among the various sources of drinking water with regards to stunting. The same was for how Household Prefer Food Served. The number of times a child feeds in a day however had significant relationship with stunted. There was no significant difference among the various Child health care practices with regards to stunting. Which was the same as in the case of cultural beliefs and practices and stunting among children under five years.

6.2 Recommendations

Based on the findings of the study some recommendations have been established

6.2.1 Policy Related Recommendations

The study revealed that those who earned more monthly income tended to have normal children and hence it is recommended that the municipal assembly should work at creating
more employment avenues for those in the municipality especially in food processing of
the fish the catch. The municipality has only Winneba as their main market center unlike
other coastal municipalities. More markets should be created by the municipal assembly as
well as a good transport network to get more buyers into the municipality. In this regard,
improving the income levels of parents would go a long way to reduce undernutrition
among children under five in the municipality.

In addition, the study revealed also that employed mothers tend to have normal children
unlike employed fathers. It is recommended that the municipal assembly should collaborate
with banks and other financial institutions to provide capital support to mothers to either
start their own business or expand existing ones.

The study revealed that majority of the children in the municipality were stunted. Based on
this, it is recommended that the municipal assembly of the Effutu municipality in
collaboration with the district and regional health directorate should put more monitoring
structures in place to provide early warning on the level of malnutrition in the municipality.
This can be done at the hospitals when children are brought for weighing. The instance of
high level of stunting could have been avoided if there is early detection. This would also
help them develop appropriate measures for intervention to prevent its adverse effects of
undernutrition among children under-five years.
6.2.2 Practice related recommendations

The Municipal assembly in collaboration with the district and regional hospitals should do more education on the adverse effect of undernutrition of children considering the high prevalence of undernutrition (stunting) for under-five children especially for those within ages 12 to 23 months. Unlike several communities in Ghana, the communities involved were predominantly fishing communities with abundance of protein from fish. This means more education emphasizing balanced diet for children needs to be done by the health care centers and during ante natal care visits.

6.2.3 Further Research recommendation

The study employed a sample size of three hundred and fifty, if the sample size and target population is increased, it would provide a wider opinion of under nutrition of children under five years.

Again, several household practices, cultural factors, and child health seeking factors exist which was not included in the questions used in the study due to limited time. It is recommended that future study should consider more of such factors.

The study looked at four main factors of malnourishment namely socio-economic, cultural and child health seeking practices and household practices. Several other factors could be considered in future research to reveal the impact of some others factors that causes under nutrition that has not been considered in this study.

Finally, the study focused on under nutrition. Over nutrition is also important area that could be considered in future research.
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APPENDIX A: Consent Form

INFORMED CONSENT

Title: Determinants of Malnutrition in Children under-five in Effutu Municipality.

Principal Investigator: Vivian Tackie

Introduction

School of Public Health, University of Ghana, is conducting a research in this community to assess Determinants of Malnutrition in children under-five years in this community. I would like you and your child to participate in the study. Kindly read the consent before deciding whether or not to be part of the study.

Description of Procedure

You are being invited to participate in the study because you have a child between the ages of 6 to 59 months.

You would willingly sign or thumbprint the consent form if you agree to participate. The study staff you ask you questions about your child and your household. The weight and height of your child would be taken and his/her physical body examined for signs of malnutrition.

Risks and Benefit

There is no risk associated with participating in this survey. There would be a slight discomfort when the field staff visit you at home and engage you in a short interview followed by child anthropometric measurements. But, well trained field assistants will carry out the procedure in order to minimize time spent or any other discomfort.

There is no direct benefit for participating. However, information obtained will be used to make some recommendations to reduce the incidence of malnutrition in your community and in Ghana as a whole.

Participant Rights

Your participation in this study is voluntary and you may opt to skip any of the questions you feel uncomfortable with or end your participation at any time. If you choose not to participate in the study, it would not affect you or your child in any way.

Confidentiality

Participants would be identified with unique codes which would be written on the questionnaires and used during data entry. Records identifying participants will be kept confidential to the extent permitted by laws and regulations and not made publicly available.
Subject’s permission

The informed consent has been read to me and I understand all the conditions of this study. All my questions have been answered to my satisfaction and I agree to take part in the study.

Name of Mother..........................................................................

Name of child..............................................................................

Signature/thumbprint..............................................

Signature of witness .................................................................

Date ...................................................

Researcher’s signature................. Date ..............................

Contacts for additional information

If you have any further questions regarding clarification of the study, you can contact Vivian Tackie on 024-2749540.
APPENDIX B: Questionnaire

UNIVERSITY OF GHANA, SCHOOL OF PUBLIC HEALTH

QUESTIONNAIRE FOR DETERMINANTS OF MALNUTRITION IN CHILDREN UNDER-FIVE

I am reading master of Public Health from the above school conducting a research into the determinants of malnutrition in children under-five in this Municipality. This questionnaire is to gather information on your demographics, socio-economic status, maternal and child healthcare practices, household practices, cultural beliefs and practices and the anthropometric measurements of your child. Any information collected would be treated as confidential and would not take much of your time.

<table>
<thead>
<tr>
<th>Question No</th>
<th>Responses</th>
<th>Code</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
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<td>0</td>
</tr>
<tr>
<td>2 Age of child</td>
<td></td>
<td></td>
</tr>
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<td></td>
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</tr>
<tr>
<td>2 months</td>
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<td>1</td>
</tr>
<tr>
<td>3 months</td>
<td></td>
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<tr>
<td>4 months</td>
<td></td>
<td>3</td>
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<tr>
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<tr>
<td>7 months</td>
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<td>6</td>
</tr>
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<td>Age</td>
<td>Count</td>
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<td>--------------</td>
<td>-------</td>
<td></td>
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<tr>
<td>8 months</td>
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<td></td>
</tr>
<tr>
<td>9 months</td>
<td>8</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>1 year</td>
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<td></td>
</tr>
<tr>
<td>2 years</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>3 years</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>4 years</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>5 years</td>
<td>17</td>
<td></td>
</tr>
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### 3 Religion

<table>
<thead>
<tr>
<th>Religion</th>
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</tr>
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<tbody>
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<td>Christian</td>
<td>0</td>
</tr>
<tr>
<td>Muslim</td>
<td>1</td>
</tr>
<tr>
<td>Traditionalist</td>
<td>2</td>
</tr>
<tr>
<td>none</td>
<td>3</td>
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</table>

### 4 Marital Status

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<thead>
<tr>
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<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Married</td>
<td>1</td>
</tr>
<tr>
<td>Separated</td>
<td>2</td>
</tr>
<tr>
<td>Divorced</td>
<td>3</td>
</tr>
<tr>
<td>Widowed</td>
<td>4</td>
</tr>
<tr>
<td>Cohabitating</td>
<td>5</td>
</tr>
</tbody>
</table>

### 5 How many children do you have

<table>
<thead>
<tr>
<th>Children</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 child</td>
<td>0</td>
</tr>
</tbody>
</table>
6 Community of residence

7 Type of community

8 Weight of child in kilograms

9 Height of child (cm)

Measurement

10 Occupation of Mother

11 Occupation of father

12 How much does your household make at the end of the month

13 What is your educational qualification

Maternal and child health practices

2 children 1
3 children 2
4 children 3
More than 4 children 4

Urban 0
Rural 1

Unemployed 0
Self-Employed 1
Civil/Public Servant 2

Unemployed 0
Self-Employed 1
Civil/Public Servant 2

Less Than Ghc 100 0
Between 100 to 200 1
Between 201 to 500 2
Between 501 to 1000 3
Above Ghc 1000 4

Tertiary 0
Secondary School 1
Junior high 2
Primary 3
14 How many ANC visits during pregnancy

<table>
<thead>
<tr>
<th>Visits</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td>Once</td>
<td>1</td>
</tr>
<tr>
<td>Twice</td>
<td>2</td>
</tr>
<tr>
<td>Thrice</td>
<td>3</td>
</tr>
<tr>
<td>Four Times</td>
<td>4</td>
</tr>
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</table>

15 How often do you take your child for medical check up

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Fallen Sick</td>
<td>0</td>
</tr>
<tr>
<td>Once a week</td>
<td>1</td>
</tr>
<tr>
<td>Twice a week</td>
<td>2</td>
</tr>
</tbody>
</table>

16 How often do the child gets sick

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Fall Sick</td>
<td>0</td>
</tr>
<tr>
<td>Once a week</td>
<td>1</td>
</tr>
<tr>
<td>Twice a week</td>
<td>2</td>
</tr>
<tr>
<td>Once a month</td>
<td>3</td>
</tr>
<tr>
<td>Once a while</td>
<td>4</td>
</tr>
</tbody>
</table>

17 What conditions does the child usually suffer from

18 What is done to the child when sick

<table>
<thead>
<tr>
<th>Action</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visited the hospital</td>
<td>0</td>
</tr>
<tr>
<td>Buy drugs at Pharmacy</td>
<td>1</td>
</tr>
<tr>
<td>Consult a traditionalis</td>
<td>2</td>
</tr>
<tr>
<td>Do Home treatment</td>
<td>3</td>
</tr>
</tbody>
</table>

Households practices

19 How long did you feed your child with only breast milk

<table>
<thead>
<tr>
<th>Duration</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
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<tr>
<td>3 Months</td>
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<td>6 Months</td>
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<tr>
<td>1 Year</td>
<td>3</td>
</tr>
<tr>
<td>More than a year</td>
<td>4</td>
</tr>
</tbody>
</table>
20 How do your household prefer their food served

Hot
Cold
Warm

21 How do you store refuse

Sanitary Dust Bins,
Receptacles ,
Others
Without Storage Facility

22 Toilet facility at home

W.C ,
KVIP,
KVIP,
Pit Latrine,
Indiscriminate
defecation.

Cultural Practices And Believes

23 What are some of the foods that children are allowed to eat in your household?

Porridge
Rice
Mash kenkey
Eggs
Fish
Meat

24 Which are the foods that children are not allowed to eat?

Ice kenkey
Mixed food
Yam,
Eggs
Meat
fish

25 Why children are not allowed to eat those types of foods?

Do you have any other taboos with regards to foods?

26

Yes
APPENDIX C: Assent form

Study Title: Determinants of Malnutrition In Children Under Five at Effutu Municipality

Assent Form

Statement of Person Obtaining Informed Consent

I have fully explained this study to the participant. I have discussed the study's purpose and procedures, the possible risks and benefits and that participation is completely voluntary.

I have invited the participant to ask questions and I have given complete responses to all of the participant's questions.

________________________________________
Signature of Person Obtaining Informed Consent        Date:
APPENDIX D: Ethical Clearance Form

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

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School of Public Health
Legon, Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

<table>
<thead>
<tr>
<th>GHS-ERC Number</th>
<th>Project Title</th>
<th>Approval Date</th>
<th>Expiry Date</th>
<th>GHS-ERC Decision</th>
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This approval requires the following from the Principal Investigator:

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol.

SIGNED ..................................................
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra