

UNIVERSITY OF EDUCATION, WINNEBA

**NUTRITIONAL KNOWLEDGE OF TEENAGE MOTHERS AND ITS
INFLUENCE ON NUTRITIONAL STATUS
OF THEIR CHILDREN AT ZENU**



FELICIA AKPENE DOGBE

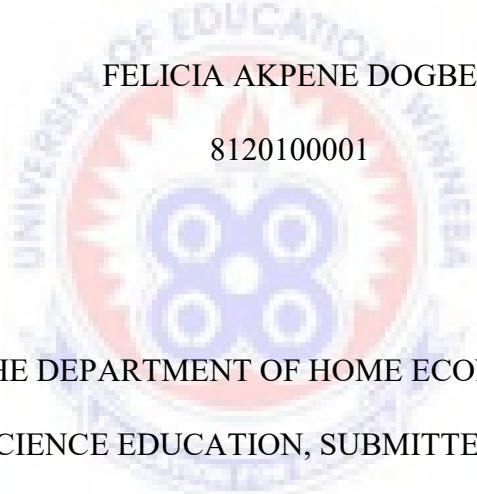
2018

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A THESIS IN THE DEPARTMENT OF HOME ECONOMICS EDUCATION,
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GRADUATE STUDIES, UNIVERSITY OF EDUCATION, WINNEBA IN
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OF PHILOSOPHY (HOME ECONOMICS EDUCATION) DEGREE

MARCH, 2018



DECLARATIONS

Candidate's Declaration

I, Felicia Akpene Dogbe, hereby declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and that it has not been submitted, either in part or whole, for another degree elsewhere.

Signature:

Date:.....

Supervisor's Declaration

I hereby declare that the preparation and presentation of this thesis was supervised by me, in accordance with the guidelines for supervision of dissertation laid down by the School of Research and Graduate Studies, University of Education, Winneba.

Name of Supervisor: Professor Matthew Caurie

Signature:

Date:

Co-Supervisor: Miss Comfort Kutum Maddah

Signature:

Date:

DEDICATION

To my four precious gifts Jeff, Janice, Jaden and Jeremy for always calming me down with their songs and rhymes when am stressed up during my study period.



ACKNOWLEDGEMENTS

The successful completion of this study is the result of corrections, suggestions and guidance of my supervisor Professor Matthew Caurie of the Department of Home Economics Education of the University of Education, Winneba. I am grateful to all the lecturers of the Department of Home Economics Education especially Miss Katumi Maddah, Professor Phillis Forster and Miss Lani Ashong for their immense contributions to this work. I am greatly indebted to Professor Kolawole Soyebó lecturer at Obafemi Awolowé University Ife-Ife, Nigeria for his time, comments, constructive criticisms and guidance that put this work in shape. To Professor Asiedu-Addo and Professor J. O. Ammah, your role is well appreciated.

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ABSTRACT

The study was conducted at Zenu community and its environs. It investigated the influence of nutritional knowledge of teenage mothers on the nutritional status of their children. The design for the study was a descriptive design. A total of 80 participants comprising 40 teenage mothers and 40 of their children aged 0 - 24 months were selected using purposive sampling techniques for the study. Questionnaire with Cronbach's alpha = 0.82 and observation checklist were used for data collection. The quantitative data were analyzed descriptively via Statistical Package for Social Sciences (SPSS), and presented in tables as frequency counts, percentages, means, and standard deviation, whereas correlational analysis was used for the inferential statistics. The study revealed that the nutritional knowledge, food habits and choices of teenage mothers had a significant influence on the nutritional status of their children ($p < .05$). Sadly, the practice of exclusive breastfeeding was very low among teenage mothers. The study concluded that child (infant) malnutrition remains prevalent in Zenu community and its environs, and this was attributed to poverty and low level of nutritional knowledge among the teenage mothers. The study recommended that the Ghana Health Service in conjunction with the Ghana Education Service should intensify nutrition education and counselling in schools as well as during antenatal clinics (ANC). Nurses and midwives in the Zenu community and its environs should also intensify education on exclusive breastfeeding to expectant and nursing mothers during antenatal and post-natal visits as well as during public health education outreach programmes.

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter comprises the background to the study, statement of the problem, purpose of the study, research objectives, research questions, hypothesis, significance of the study, delimitation and limitation, definition of terms and abbreviations, and organisation of the study.

1.1 Background to the Study

Nutrition is vital for good health and wellbeing of all human life across the entire life span. From the earliest stages of foetal development, at birth, through infancy, childhood, adolescence, and into adulthood and old age, proper nutrition is important for physical growth, mental development, performance and productivity and survival. Nutrition is an essential foundation of human and national development as stated by the World Health Organisation [WHO] (2000). From the perspective of Adigbo and Maddah (2011), nutrition is the scientific study of food and its use in the body. Again, the Council on Food and Nutrition of the American Medical Association (2015) defines nutrition as the science of food, the nutrients and the substances therein, their action, interaction and balance in relation to health and diseases and the process by which the organism ingests, digests, absorbs, transports, utilizes and excretes food substances.

Gutherie and Picciano (1996) are of the view that whatever is used to explain the science of nutrition, there is a clear agreement that it is concerned with the many ways food is

produced with the changes that occur to the food before it is eaten and with the way the body uses energy, builds body tissues or excretes. There is a positive relationship between good diet and good health (Anspaugh, Hamrick & Rosato, 2003).

Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safe pregnancy and childbirth, lower risk of non-communicable diseases (such as diabetes and cardiovascular disease), and longevity. Healthy children learn better, people with adequate nutrition are more productive and can create opportunities to gradually break the cycles of poverty and hunger (WHO, 2010).

Malnutrition, in every form, presents significant threats to human health. The development and progress of every nation is predominantly dependent on the health status of its citizens. Today the world faces a double burden of malnutrition that includes both under-nutrition and overweight. This problem is especially acute as well as chronic in the developing countries, especially among children. World-wide it is estimated that one in six children is born underweight as indicated by the United Nations Children's Fund [UNICEF] (2000). A study by UNICEF (2000) in India revealed that 20 percent of children under-five years of age suffer from wasting due to acute under-nutrition. More than one third of the world's children who are wasted live in India. Forty three per cent of Indian children under-five years are underweight and 48 percent (that is 61 million children) are stunted due to chronic under-nutrition: India accounts for more than 3 out of every 10 stunted children in the world.

Takyi (1999) conducted a study in Saboba in the Northern Region of Ghana where he looked at the nutrients intake of 518 pre-school children (aged 2-6 years). Generally, he found a poor nutritional status in children in this age bracket. Stunting was found to be 27%, wasting 4.4% and a combination of stunting and wasting to be 1.9% though most children (>90%) met their RDA for iron. A total of about 92% were found to be anaemic while only 26.5% of children met their total daily caloric intake. Intake of most of the other nutrients assessed was inadequate. The high anaemia rate was attributed to low vitamin C intake, low intake of animal source food, iron, malaria and worm infections. This study however did not cover the whole of Ghana, but may be representative of a typical poor Ghanaian setting. Although malaria is the primary cause of anaemia, malnutrition and micronutrient deficiencies also play a role.

The Ghana Demographic and Health Survey [GDHS] (2008) on nutrition also carried out a study to assess levels of malnutrition in the 10 regions of Ghana. The findings showed that 28% of children less than 5 years were stunted, 9% were wasted and 14% were overweight. According to Ayaya, Esamai, Rotich and Olwambula (2004), malnutrition is one of the leading causes of morbidity and mortality in the preschool age. Since the feeding practices and care of mothers or caregivers come into play as young children generally do not have the ability to choose a balanced nutritious diet. Thus, parents, caregivers and other adults are responsible for offering them a variety of nutritious and developmentally appropriate foods and emphasis must be placed on development of good eating and care practices.

Another group that is vulnerable to malnutrition is the adolescent and for that matter the teenage mother. Adolescence is a term derived from the Latin word 'adolescere';

meaning to grow or to mature, and has been described by WHO (2000) as the period of life from the ages 10–19 years; characterised by rapid physical growth, significant emotional, psychological, social and sexual changes involving personal relationships. This implies that adolescence is a phase in the course of life rather than a fixed time period in a person's life. It is a transitional period and stage of physical and mental development between childhood and adulthood. The phenomenal growth that occurs in adolescence creates increased demands for energy and other essential nutrients. Total nutrients requirements are higher during adolescence than any other time in the life cycle. Good nutrition is necessary during this period to help cope with the growth spurt and changes as well as help prevent ageing diet-related chronic diseases such as cardiovascular disease, cancer and osteoporosis (Story & Stang, 2005).

Pregnancy during adolescence is a phenomenon found all over the world. UNICEF (2008) describes teenage pregnancy as a teenage girl, usually within the ages of 13-19, becoming pregnant. The term, in everyday speech, usually refers to girls who have not reached legal adulthood, which varies across the world, who become pregnant. Thus, teenage pregnancies, encompassing conceptions by girls aged 19 or younger. The statistics are alarming in both developed, developing and under developed countries. According to UNICEF (2001) and the Alan Guttmacher Institute (2000), more than 15 million girls, aged 15 to 19 years old, give birth each year representing 11% of all births worldwide. There are 65 births for every 1000 females aged 15-19 years (worldwide average). More than 90 per cent of these births occur to women in developing countries. There are, however, wide regional variations.

Nutritional problems of a teenage mother escalate as the stage is characterised by a period of great psychological stress as she is nurturing a growing foetus in her body. Foetal development is accompanied by many psychological, biochemical and hormonal changes occurring in the maternal body which influences the needs for nutrients and the efficiency with which the body uses them. Additionally, teenage mothers need special attention as they have inadequate resources to cater for their children. These young girls become pregnant out of curiosity, ignorance, poverty, lack of care and support among others and this situation increases their nutritional requirements and needs. In addition, during pregnancy and delivery, these teenage mothers are liable to develop several medical complications simply because of immature development of their pelvis and other organs which support pregnancy and delivery. For this reason, it is essential for individuals to obtain some levels of nutritional knowledge in order to maintain optimum health as this would serve as a guide to healthy dietary behaviour.

Nutrition is a crucial worldwide concern for all. Hence, there is a global effort aimed at assessing the magnitude of nutrition problems against a background of a world that has the resources and technology to ensure adequate nutrition for all. These efforts give rise to conferences, meetings, round tables, exhibitions, and summits to work towards a common goal. The second International Conference on Nutrition (ICN2) held in Rome in 2014 was attended by over 2200 participants including more than 170 governments, 150 representatives from civil society and nearly 100 from the business community to delve deeper into specific nutrition issues, design strategies to strengthen worldwide commitment and take actions to prevent and alleviate malnutrition and its related problems. Also, nutritional goals were set by the Fourth United Nations Development

Decade and the 1990 World Summit on Children. This meeting re-affirmed the World's commitment to combat nutritional related problems in recognition of the fact that access to nutritionally adequate and safe food is a right of every individual.

Ghana is committed to ensure the health and wellbeing of all groups across the life span through conscious efforts by the government, non-governmental organizations, groups and few individuals to take action to prevent and alleviate malnutrition. In view of this, Ghana has constantly been participating in regional, inter-regional and international programmes in order to attain the goals entailed in these declarations and to attack all forms of malnutrition by addressing the underlying causes of inadequacies in food, health and care as well as the root causes of underdevelopment and poverty. All these have resulted in the formation of nutritional targets and new goals to eliminate famine and starvation.

Swift national programmes and initiatives are carved out of world's declarations and plan of action which is mandatory upon all to implement in their respective countries. A recent government policy document titled Ghana – Vision 2020 is one of such initiative aimed at improving nutritional status of all Ghanaians. This policy incorporated current and past efforts that specifically address the nutrition problems of the people: to make food available at reasonable prices to consumers, make the population adopt better nutrition practices, improved nutrition education and reduce malnutrition. In the agricultural sector policies to promote better nutrition are offered through initiatives such as Increased Food Production and Planting for All in the context of sustainable environment, price, incentives and enhanced access to inputs, improved storage systems and minimization of the constraints to marketing and distribution of food.

Other notable initiatives are the School Feeding Programme, Food and Nutrition Extension Programme. Efforts are made to increase the production of staple food crops such as root and tuber crops, cereals and grains. Household socio-economic characteristics also determine to a large extent the nutritional status of children, and a positive relationship between socio-economic status and the ability of mothers to provide adequate food and primary care has been observed. Over the past years nutrients intakes have shown changes, such as increased saturated fat, decreased total carbohydrate, and an increase in refined carbohydrate-rich foods with added sugar. Other changes observed are a decreased fibre intake and increased intake of total protein and animal protein foods (Moody, 2007). These dietary intake changes are typical of a western diet, which further exacerbates the globally accepted triple burden of diseases, specifically over- and under-nutrition. Malnutrition as seen earlier, has an effect on children's wellbeing and their ability to learn and play normally; therefore healthy food choices may improve a child's wellbeing and ability to learn and play normally. Research has shown that dietary habits in childhood impact directly on growth, development and the prevalence of diseases throughout the life cycle. To put this in perspective the following questions must be asked: Are the teenage mothers in Zenu and its environs aware of this importance of nutrition for their babies and themselves?

1.2 Statement of the Problem

Mothers are the foremost providers of primary care for their children. Their understanding of basic nutrition and health information strongly influences the care they provide. It is an emerging trend to find girls below nineteen years of age bringing forth and caring for their children and Zenu is no exception. Data collected from Reproductive

and Child Health Centers (RCHs) in Zenu reveals that children who are put on supplementary feeding are mostly children of teenage mothers. Again, mothers who go for counseling at post-natal session about undesirable growth patterns of their children are mostly teenage mothers. A report according to a medical practitioner at the Zenu Community Hospital also indicates that children are currently diagnosed with diseases such as obesity, high blood pressure, diabetes which were formerly considered as diseases of the rich and the elderly. It is clear that our food choices and habits are posing various degrees of health challenges to both young and the elderly. Malnourished children experienced develop-mental delays, weight-loss and illness as a result of inadequate intake of protein, calories and other nutrients because so much development occurs in the few years of life. Considering all these negative effects on the health of the individual, malnutrition can adversely affect the individual, family and the nation at large. Although, there are a lot of attempts to combat nutritional problems of teenage mothers, through education, the problem still persists in Zenu which affects the way children of teenage mothers are fed. It was against this background that the researcher undertook this study to come out with added knowledge in this area. The study was therefore designed to investigate the nutritional knowledge of teenage mothers with a view to determine the influence on the nutritional status of children between zero and twenty-four (0-24) months of age of teenage mothers.

1.3 Purpose of the Study

The main purpose of the study was to investigate the influence of nutritional knowledge of teenage mothers on the nutritional status of their children in Zenu community and its environs.

1.4 Research Objectives

The objectives of the study were to:

1. determine the nutritional knowledge of teenage mothers in Zenu and its environs.
2. investigate the basis for food choices and habits of teenage mothers.
3. examine infant feeding practices of teenage mothers.
4. examine nutritional knowledge of teenage mothers and its influence on the nutritional status of their children.

1.5 Research Questions

1. What nutrition knowledge do teenage mothers have?
2. What is the basis for their food choices and habits?
3. What infant feeding practices do teenage mothers practise?
4. What is the influence of teenage mothers' nutritional knowledge on the nutritional status of their children?

1.6 Hypothesis

To investigate the phenomenon in question, two hypotheses were formulated:

H₀: There is no significant relationship between teenage mothers' nutritional knowledge and nutritional status of their children.

H_a: There is a significant relationship between teenage mothers' nutritional knowledge and nutritional status of their children.

1.7 Significance of the Study

This study established the relationship between teenage mothers' nutritional knowledge and its influence on the nutritional status of their children between the ages of 0-24

months. This study has provided empirical nutritional information on the effect of nutritional knowledge of mothers on the nutritional status of their children in Zenu and its environs in the Kpone–Katamanso District of Greater Accra which the adolescent units may use to update nutritional intervention programmes such as nutrition education for adolescents, teenage mothers, caregivers and parents.

It would serve as a guide to heads and staff of Reproductive and Child Health Centres during pre and post- natal education of pregnant adolescent. The study is also relevant to the district information service department in designing health education programmes to promote healthy food choices and habits among the public.

Again, it has increased the researcher’s stock of knowledge on teenage mothers and the feeding practices of their children. Lastly, it would serve as a reference material for those who would conduct similar research in future.

1.8 Delimitation of the Study

The study is confined to Zenu and its environs (Lebanon and Atadeka) in the Kpone-Katamanso District. Also, the study only included teenage mothers between the ages of 12 and 19 in the community where nutritional knowledge and nutritional status is being considered as subject of the research. The rationale behind the choice of Zenu community as case is largely due to its position in relation to the high incidence of teenage pregnancy and malnutrition cases in the Greater Accra Region. Due to frequent changes in population dynamics, span of period for the study, the data covered June 2014 to December 2014.

1.9 Limitations to the Study

In conducting this study, it was impossible to identify and engage all the teenage mothers in the district because not all teenage mothers honour their post-natal visits as these were the only data collection centers. Teenage mothers are usually emotionally sensitive, shy and reluctant in releasing personal information about themselves and that of their children. A major challenge which confronted the researcher was the language barrier. Zenu is a new settlement and cosmopolitan in nature, languages spoken include *Ewe, Ada, Ga-Adangbe, Krobo, Ga* and *Twi*. To overcome this challenge, one of the Community Health Nurses was engaged as an interpreter. Additionally, the medical staff was initially suspicious and uncomfortable by my presence as I was with them throughout the data collection period. The researcher's inability to identify and use all teenage mothers in Zenu and its environs limited the study. Therefore, findings and conclusions from this study could not be generalised due to the percentage of respondents used in relation to the total number of teenage mothers in the study area (565 teenage mothers in Zenu, Ghana Health Report, 2013). Fortunately, these limitations did not significantly affect the outcome of the study since data gathered adequately supported achievement of the objectives of the study.

1.10 Definitions of Terms and Abbreviations

Nutrition: The study of food and nutrients and their relationship with living things.

Adolescent: a young girl between the ages of 13 and 19.

Teenage mother: adolescent girl between the ages of 13 and 19 who has a baby of her own.

Nutrition Knowledge (Maternal nutritional knowledge): Information available to a teenage mother or caregiver concerning nutrition and childcare practices. It consists of teenage mothers food habits and choices, infant feeding practices, personal and food hygiene, exercising, medications and food supplement.

Nutritional Status: current body state of an individual in respect to nutrient intake and nutrient requirement.

MNK: Maternal Nutritional Knowledge.

FHC: Food Habits and Choices.

IFP: Infant Feeding Practices

1.11 Organization of the Study

This study consists of six chapters. In Chapter One, the introduction to the study consists of background to the study, statement of the problem, purpose of the study, research objectives, research questions, hypotheses, significance of the study, delimitation of the study, limitations to the study, definitions of terms and organization of the study. Chapter Two dealt with literature review from books, periodicals, articles and unpublished materials organized under mini-headings including theoretical framework and conceptual framework. The methodology which covers research design, the study area, population, sample and sampling techniques, instrumentation, pilot testing, validity and reliability of instrument, data collection procedures, data analysis and ethical consideration employed in the study is presented in Chapter Three. Analysis and data presentation is done in Chapter Four. Chapter Five is devoted to the discussion of the results obtained from the

study. Chapter Six covers the final part of the study which involves summary of findings, conclusions and recommendations based on the findings whilst also identifying areas for future research, references, and appendices.



CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This chapter covers a review of literature relevant to the study and its purpose is to build context that has potential merit for the investigation. The literature was reviewed under the following sub-headings:

1. Theoretical Framework
2. Conceptual Framework
3. Maternal Nutritional Knowledge
4. Adolescent Nutrition; Food Habit, Choice and Dietary Patterns
5. Nutritional status of:
 - a) Ghanaian Children
 - b) Preschool children
 - c) Anthropometric(growth chart)
 - d) Clinical Signs of malnutrition in infants.
- 8 Infant feeding practices of teenage mothers.

2.1 Theoretical Framework

Several learning theories contribute to one's understanding of nutritional knowledge and its effect on nutritional status of individuals. This study employed the Bloom's taxonomy of educational objectives which is one of the most widely used ways of organizing levels

of expertise in education. Bloom (1956) identified six levels within the cognitive domain from the simple recall or recognition of facts as the lowest level, through increasingly more complex and abstract mental levels to the highest order which is classified as evaluation. Bloom's (1956) taxonomy is a convenient way to describe the degree to which we want individuals to understand and use concepts to demonstrate particular skills and to have their values, attitudes and interests affected. This will further give individuals an idea about people's level of achievement. Bloom presented the six levels of intellectual activity in the pyramid as follows:



Figure 1: Bloom's (1956) taxonomy of educational objectives

Knowledge as the main component of this study is defined by Bloom (1956) as remembering of previously learned material. This may involve the recall of a wide range of materials from specific facts to complete theories. To him the most important requirement is the bringing to mind the appropriate information when needed. Knowledge according to him represents the lowest level of learning outcomes in the cognitive domain. Bloom (1956) further outlined some verbs which can be used to

characterize knowledge; arrange, define, describe, identify, know, label, list, match, name, outline, recall, recognize, reproduce, state, select, memorize, relate, recall and duplicate. It is important to note that once a person is able to perform all of the above, the person is illegible to be pronounced knowledgeable on a concept, idea or subject matter. On the contrary, if one is not able to demonstrate these actions when needed, that individual can be said of having no or low knowledge level.

The second level as classified by Bloom is comprehension. He defined comprehension as the ability to grasp the meaning of learned material. The argument made is that comprehension may be shown by translating materials from one form to another (words to numbers), interpreting materials (explaining or summarizing) and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material as in knowledge. Verbs such as classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select and translate .In order for any student or individual to perform the above, it is imperative for that individual to think beyond mere knowledge.

Application is the third level in the pyramid of Bloom's (1956) theory. He opines that application is the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, law and theories. This is a higher level of understanding than those under comprehension. The ability of the teenager in this context to put whatever nutritional knowledge acquired in school, at home, on television, pre and post natal clinics in feeding herself and her child is paramount.

The fourth level in this theory is referred to as Analysis. The ability to breakdown material into its component parts so that its organizational structure may be understood is how Bloom sees analysis. This ability may include the identification of the parts, analysis of the relationships between parts and recognition of the principles involved. Learning outcomes here represents a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the concept. Here it is expected that the teenage mother is able to separate complex ideas into its constituent parts and have an understanding of organization and relationship between the different facts in the concepts. For example, she should be able to separate the idea of a balance diet into practically choosing foods from all the five food groups to feed her baby on daily basis.

Synthesis being the last but not the least level of Bloom's (1956) theory of learning talks about the ability of the learner to create mental construction of ideas and concepts from complex ideas into a new, integrated and meaningful pattern subject to given constraints. Key words given by Bloom (1956) to illustrate synthesis are categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates and summarizes. Here the teenage mother is expected to use the knowledge acquired to plan other nutritious recipes for her child.

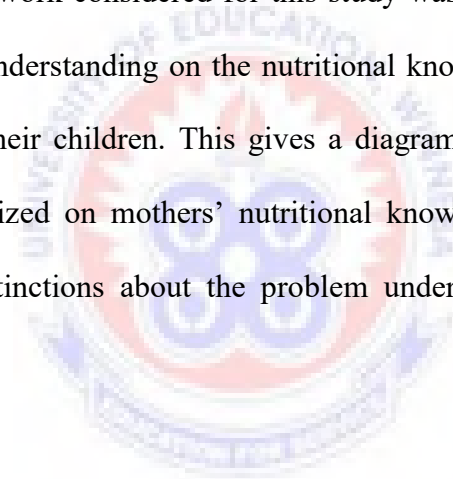
Evaluation is the highest and last level of learning outcomes according to Bloom. This level provides that a learner who has acquired some level of knowledge should be able to make judgment about the value of ideas or concepts. These key words have been suggested for use to differentiate the highest level and the lowest level in the hierarchy;

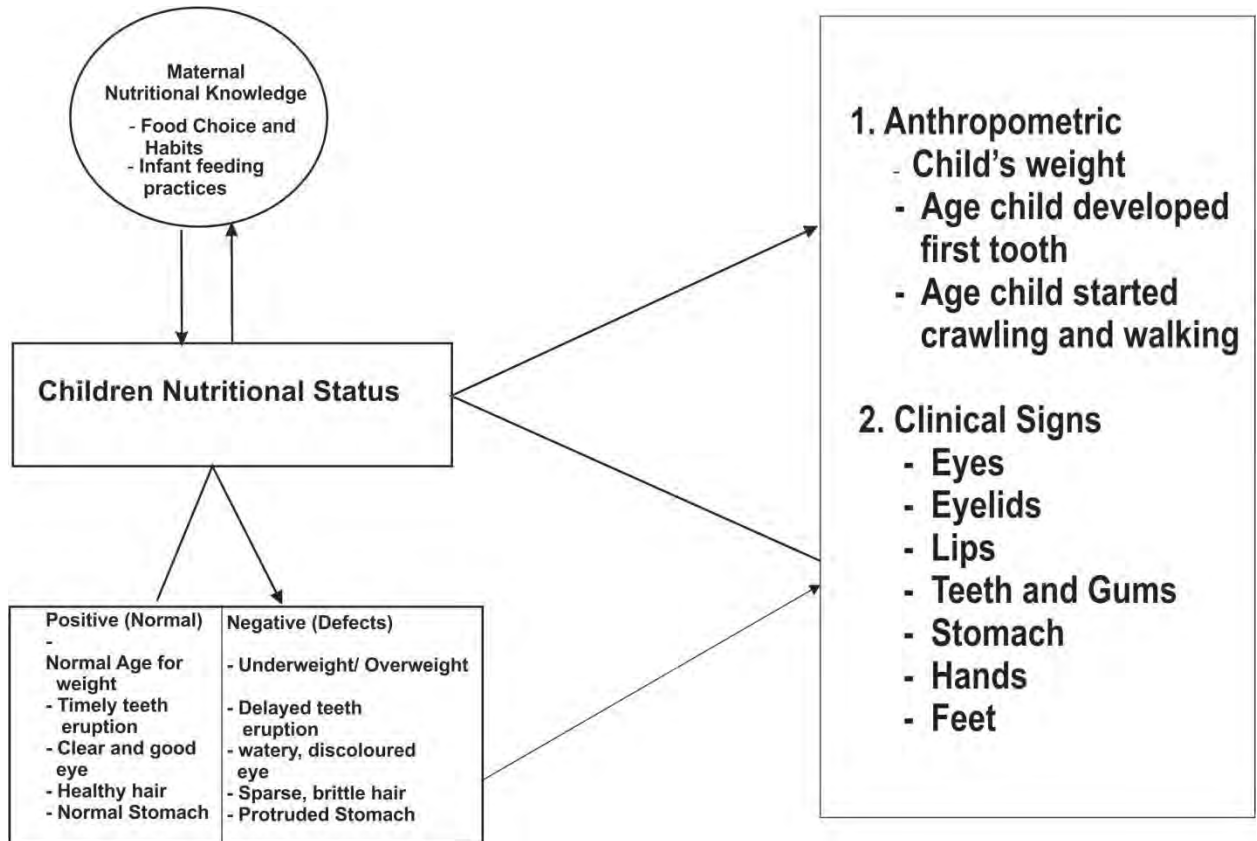
appraises, compares, concludes, contrasts, criticizes, critiques, defends, describes, discriminates, evaluates and justifies.

Juxtaposing Bloom's level of learning objectives with this study, it can be concluded that knowledge can be acquired but the teenage mother must be able to apply it in the feeding of her child before a positive nutritional status can be achieved inversely if the knowledge acquired is not practiced it will result in a negative nutritional status of the teenage child.

2.2. Conceptual Framework

The conceptual framework considered for this study was adopted by the researcher and discussed for better understanding on the nutritional knowledge of teenage mothers and nutritional status of their children. This gives a diagrammatic presentation of concepts that have been organized on mothers' nutritional knowledge and nutritional status of children to make distinctions about the problem under study in order to gain better understanding.





Source: Researcher's own Construct (2015)

Figure 2: Conceptual Framework on Nutritional Knowledge and Nutritional Status

Nutritional knowledge, according to the concise medical dictionary, is information and understanding about food and liquid requirement of human beings and animals for normal physiological function including energy need, maintenance, growth activity, reproduction and lactation. Maternal nutritional knowledge indicates the information available to a mother or caregiver concerning nutrition and childcare practices (Carter, 2002). His view is that the type and frequency of food and liquid intake, kinds of exercise etc a person indulges in a typical day is strongly connected to the depth of nutritional knowledge a person possesses.

A study conducted on mothers' nutritional knowledge and children's dietary intakes by Variyam, Blaylock, Lin, Ralston and Smallwood (1999), examined if children's diets are influenced by their mothers' stock of nutritional knowledge and diet health awareness. According to the study, relatively little was identified about the relationship between a child's diet and the nutritional literacy of the person responsible for meal planning and preparations, often the mother. This may be especially significant for preschoolers since their diets are largely dependent on foods supplied by parents and other adults and can have a negative effect on their nutritional status. Among the potential determinants of child's health, the mother's education has been a major component. The effect of maternal nutritional knowledge therefore is wide spread as studies show that good nutritional knowledge of a mother often translates them into appropriate good health for both the child and the family at large. This is because more educated mothers could have healthier behaviours and provide more sanitary and safe environments for themselves and their children.

A mother is the principal provider of the care that her child needs for the first six years of life. The African Nutrition Chart Books (2005) states that in urban Ghana children whose mothers had poor child care practices were up to three times more likely to be stunted (indicating malnutrition) compared to those whose mothers had good care practices. Optimal feeding practices during the first six months contribute to the prevention of growth default among young infants in Accra and the benefits may linger beyond the first year of life. According to this study education was found to be the factor most strongly associated with good childcare practices.

It is expected that when women are knowledgeable about nutrition. It will translate in better childcare practices. This knowledge can be acquired formally or informally. Formal education is classroom based provided by trained teachers. Informal education is normally unstructured and given outside the structured instructional hours.

An individual's food habits might be healthy (good positive) and either of these has implications on the physical development cognitive abilities, behaviour, attitude and health of the individual. Poor food habits might affect physical and cognitive growth based on a study carried out by Florence, Asbridge and Veugelers (2008) which demonstrated that nutrition affects students' thinking skills, behavior and health. These directly or indirectly influence the nutritional status of the child. Food habits or dietary practices are most often learned during childhood and practiced throughout adulthood. They may however change due to a lot of factors including location, and seasonal variations.

The fundamental knowledge about nutrition can make tremendous contribution to the level of wellness, as it will help make appropriate food choices that enhance the overall wellbeing and vitality. Good nutrition is vital to good health throughout life as it boosts our resistance to diseases and stress while promoting healthy cognitive development (Wadrlaw & Smith, 2009). Wardlaw and Kessel (2004) found out that there is greater association between parental knowledge on nutrition and its effects on children nutritional status.

Nutritional status of a person is the condition of the body in those respects influenced by the diet: the levels of nutrients in the body and the ability of those levels (Wardlaw &

Smith, 2009). Nutritional status is the current body status, of a person or a population group, related to their state of nourishment (the consumption and utilization of nutrients). Their book continue to state that nutritional status can be determined by a complex interaction between internal/constitutional factors and external environmental factors: Internal or constitutional factors like: age, sex, nutrition, behaviour, physical activity and diseases. External environmental factors like: food safety, cultural, social and economic circumstances. They propose that an ideal nutritional status occurs when the supply of nutrients conforms to the nutritional requirements or needs.

Also, nutritional status of children mostly depends on the level of control of the determinants of nutritional status. This includes maternal education, knowledge and beliefs, physical health and nutritional status, mental and self-confidence, socio-economic status, control of resources, workload and time availability, family and community social support but poor growth in children indicates malnutrition. Child malnutrition according to the International Institute for Population Sciences (2000) is generally caused by a combination of inadequate or inappropriate food intake, gastrointestinal parasites, improper care and household practices and other childhood related feeding practices or food habits.

In the diagram above, it shows the relationship between the nutritional knowledge of teenage mothers and nutritional status of their children. Nutritional knowledge of mothers also described as maternal nutritional knowledge consists of food habits and choice, infant feeding practices, personal and food hygiene, exercising, medications/food supplement and the like. This classification determines the nutritional knowledge of a mother. Wardlaw and Kessel (2004) found that there is a greater association between

parental knowledge on nutrition and its prevalence effects on children's nutritional status. Teenagers or adolescent girls who are yet to attain their full growth potential for pregnancy are often ignorant about pre-natal and post-natal practices hence, the teenage mother needs knowledge on maternal nutrition and nutritional status of children so as to identify, choose and apply the right methods when caring for the children.

The methods that can be adopted by the teenage mother have been identified as selecting food from all the six food groups; exercising regularly; moderate consumption of fat, sugar and salt; adopting good personal hygiene practices; taking right medication and food supplement, immunization of children, regular post-natal attendance. When all these are rightly done it is assumed to translate into better nutritional status indicators for both the mother and the child. However, the opposite of these will have a detrimental effect on the nutritional status of both mother and child. The effects could be viewed from the anthropometric indicators and clinical signs.

The nutritional status of an individual can only be known by carrying out a nutritional assessment. In assessing the nutritional status of children, indicators relating to weight, length, age of teeth eruption, age of crawling. Other related clinical signs indicators that need to be assessed include physical appearance of the eye, skin, abdomen, teeth, hair, etc. For instance, the weight of the child should correspond with the age of the child. If a child's nutritional needs is affected, the possible anthropometric indicators and clinical signs have been identified to include: uunderweight/overweight; stunted growth; delayed teeth eruption; watery and discoloured eyes; poor vision; loose, wrinkled and flaky skin; discoloured and decayed teeth, bleeding and swollen gums; protruded abdomen; sparse and brittle hair.

These effects may not be sudden but will gradually retard normal physical development of children, expose children to infections and deform children, emotional imbalances, mental defects, develop low self-esteem. According to Contento (1981), the health and wellbeing of a child is mostly regulated by nutrition. Poor nutrition can cause long-term detrimental consequences and poor academic performance (Mwangome, Prentice, Plugge & Nweneka, 2010).

Government will in the end spend more of national resources on meeting the health needs of the individuals in the family and more specifically on children. Individuals may not be strong and healthy to contribute meaningfully to national growth. If a nation's labour force is affected government will have to put up more health facilities, spend a greater proportion of revenue to educate the individual on their nutritional health and in the end affect production. Family may pay more on health insurance to cater for their health needs.

Public ignorance is a greater obstacle in discussing issues of this nature. These nutritional assessments raised justify the need for public education on nutrition. Awareness creation will have to be intensified by the Ministry of Health and Ministry of Education through the various Metropolitan, Municipal or District Assemblies.

2.3 Scenario on Adolescent Pregnancy

Bratati (2009) hold the idea that health, in addition to its biomedical determinants, is influenced by many social and cultural factors. This influence is often negative with a resultant increase in the number of social hazards which finally aggravate the already poor health status of the developing societies. One such social hazard of serious

consequences on the nation as a whole is pregnancy in an adolescent girl, who herself is yet to attain her full growth potential.

UNICEF (2008) opines teenage pregnancy, as a teenage girl, usually within the ages of 13-19, becoming pregnant. The term in everyday speech usually refers to girls who have not reached legal adulthood, which varies across the world, who become pregnant. Thus, teenage pregnancies, encompassing conceptions by girls aged 19 or younger, are a worldwide phenomenon.

According to UNICEF (2001) and the Alan Guttmacher Institute (2000), more than 15 million girls, aged 15 to 19 years old, give birth each year representing 11% of all births worldwide. There are 65 births for every 1000 females aged 15-19 years (worldwide average). More than 90 per cent of these births occur to women in developing countries. There are, however, wide regional variations.

According to Treffers (2003), the highest rate of teenage pregnancy in the world is 143 per 1000 in girls aged 15-19 in Sub-Saharan Africa. Women in Africa, in general, get married at much earlier ages than women elsewhere leading to earlier pregnancies. According to United Nations Populations Fund (UNFPA, 2003), the teenage birth rate in United States was 53 births per 1000 women aged 15-19 in 2002, the highest in the developed world. If all pregnancies including those that end in abortion or miscarriages are taken into account, the total rate in 2000 was 75.4 pregnancies per 1000 girls. Strasburger (2007) opines that over 80 per cent of teenage pregnancies in the U.S are unintended approximately one third end in abortion, one third end in spontaneous miscarriage and one third will continue their pregnancy and keep their baby.

WHO (2007) reported that 8-15 per cent of adolescent girls have had a child by the age of 15 in Bangladesh, Cameroon, Liberia, Malawi, Mali, Niger in Nigeria. More recent data show different levels of adolescents already pregnant or as mothers by the age of 15 like four per cent in Mali, 16 per cent in Bangladesh, 17 per cent in Liberia. In the Eastern Mediterranean region as in Bahrain, 18-20 per cent of mothers get pregnant between the ages of 11-15 years in Oman 16-18 per cent of women had their first pregnancy less than 15 years of age.

According to WHO (2003), in Kuwait, 40.5 per cent of all women giving birth in the hospital were less than 16 years old. The average age at first pregnancy in Saudi Arabia is estimated to be 16 years. Adolescents represent a resource for the future whose potential can either be wasted or nurtured in a positive manner. The Centre for Development and Population Activities (CEDPA, 2001), states that there are an estimated 105 million adolescent girls in the age group 10-19 years in India.

In India, early marriage for girls receives religion and social sanction. Despite laws raising the legal age of marriage to 18 for girls, there are strong cultural pressures on parents to marry their daughters early. Thus, there are over 10 million pregnant adolescents and adolescent mothers in India, with one in six girls age 13-19 beginning child bearing. Bratati (2009) stresses that in their country, teenage pregnancies after marriage, in contrast to unwed pregnancies in developed countries, have social approval but have an adverse impact on maternal mortality and perinatal morbidity.

2.4 Nutrition and Health

Gopalan (2003) states that nutrition is an integral component of health and wellbeing of an individual. Good nutrition enables one to lead a socially and economically active life and it improves the quality of life as evidenced through enhanced nutritional status of the population groups, better work efficiency rate, reduced mortality and morbidity rate by raising the standard of living.

Carroll and Karen (2001) opine that nutrition is the science of food and its relation to people. The science of nutrition is based on the chemical constituents of foods called nutrients, which function to provide fuel, support tissue growth and maintenance and regulate body processes.

Kathy (2008) calls attention to the fact that an individual's nutritional status reflects the degree to which physiologic needs for nutrients are being met. Thus, nutrient intake depends on actual food consumption which is influenced by factors such as economic situation, eating behaviour, emotional climate, cultural influences, effects of various diseases on appetite and the ability to consume and absorb adequate nutrients.

According to WHO (2006), adequate nutrition of any individual is determined by factors like the adequate availability of food in terms of quantity as well as quality and also on the ability to digest, absorb and utilize the food which can be hampered by infection and by metabolic disorders.

According to Kathleen and Sylvia (2008), when adequate nutrients are consumed to support the body's daily needs and any increased metabolic demands, the person moves

into an optimal nutritional status. This status promotes growth and development, maintains general health, protect them from or predispose them towards chronic disease.

As per Vijayalakshmi and Amirthaveni (2001), good nutrition is the fundamental requirement for positive health, functional efficiency and productivity. Nutrition science, thus, provides abundant evidence on the importance of nutrition, not only in promoting proper physical growth and development but also ensures adequate immune competence, cognitive development and work capacity.

The World Health Organization (2001) defines health as a “state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity”. The World Health Organization also states that the diets people eat, in all their cultural variety, define to a large extent people’s health, growth and development (WHO, 2001). As far as Staci (2005) is concerned, good nutrition is thus essential to good health throughout life, beginning with prenatal life and extending through old age. A lifetime of good nutrition is evidenced by a well-developed body, the ideal weight for body composition and height and good muscle development.

Bamji *et al.* (2003) opine that nutrition during early childhood is of paramount importance because it is a foundation of life time health, strength and intellectual vitality. Iyengar (2002), states that the nutritional requirements of the healthy child vary widely according to their age, sex, weight and rate of growth as well as environmental factors. Deficient intake of nutrients signals the start of nutrition related disorders in adulthood. So, Sri Lakshmi (2004) emphasizes that proper nutrition at the growing stages of life not only helps to promote health but also prevent the occurrence of deficiency diseases and

other health hazards. Ingesting too much or too little of a nutrient can interfere with health and wellbeing. Thus, malnutrition occurs when body cells receive too much or too little of one or more nutrients.

Nancy (2003) expresses malnutrition as a state in which, a prolonged lack of one or more nutrients retards physical development, or causes the appearance of specific clinical conditions. Thus, malnutrition includes under nutrition, which may be related to an individual's inability to obtain foods that contain essential nutrients, failure to consume essential nutrients, body's inability to use the nutrients, disease condition that increase the body's need for nutrients and a disease process that causes nutrients to be excreted too rapidly from the body.

Paul *et al.* (2004) emphasize that malnourished children grow at a slower rate than adequately nourished ones and they are prone to infections and are more likely to have mental and developmental problems. As per Donna (2004) malnutrition adversely affects lung structure, elasticity and function, respiratory muscle mass, strength and endurance, lung immune defense mechanisms and control of breathing. Sri Lakshmi (2009), states that the direct effects of under-nutrition are occurrence of frank and subclinical nutritional deficiency diseases. The indirect effects are a high morbidity and mortality among young children, retarded physical and mental growth, lowered vitality leading to lowered productivity and reduced life expectancy. Under-nutrition predisposes to infection and infection predisposes to under-nutrition. The high rate of maternal mortality, still births and low birth weight are all associated with under-nutrition.

Wahlqvist, Savige and Lukito (2003) underline the consequences of under nutrition which includes death, disability and stunted mental and physical growth. She further warns that poor nutrition often commences in utero and in many cases extends into adolescence and adult life. Females in particular are affected by lifelong poor nutrition. Evidence from epidemiological studies from both developing and industrialized countries suggests a casual relationship between foetal under nutrition and increased risks of impaired growth and various adult chronic diseases.

2.5 Maternal Nutritional Knowledge

Maternal nutritional knowledge, according to Carter (2002), refers to the information available to a mother or caregiver concerning nutrition and childcare practices. His view is that the type and frequency of food and liquid intake, kinds of exercise etc a person indulges in a typical day is strongly connected to the depth of nutritional knowledge a person possesses.

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knowledge therefore is wide spread as studies show that good nutritional knowledge of a mother often translates into appropriate good health for both the child and the family at large. This is because more educated mothers could have healthier behaviours and provide more sanitary and safe environments for themselves and their children.

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In another study by Christiaesen and Alderman (2000), which examined household data in Ethiopia over the period of two years, household resources, parental education, food prices and maternal nutritional knowledge were identified as key determinants of growth faltering. This study however suggested that to reduce child growth faltering in Ethiopia in a significant and timely manner, targeted child growth monitoring and maternal nutritional education programs will be needed to promote growth. Since dietary behaviours and life choices are developed while the child is with the mother, a mother's nutritional knowledge therefore, is a very important determinant of child's nutritional status at this young and crucial age (Carter, 2002).

Also, the Economic Research Service (ERS) research findings suggest that the more a mother knows about nutrition, the better the overall quality of her child's diet; this although was thought to be more applicable to preschoolers than to older children and implies that susceptible groups such as preschoolers would need more attention to their nutrition and therefore health. A cross-sectional study involving four hundred households to assess the nutritional status of children below the age of three was conducted by Mahgoub, Nyebi and Bandeke (2006). The study examined the effect of three indicators of malnutrition weight-for-age and weight-for-height on factors affecting the prevalence of malnutrition among children under three years of age in Botswana. Their results revealed that stunting (low weight-for-height) of the three indicators was more prevalent in the sampled areas in Botswana. The authors also found that a negative relationship exist between the number of under three children in the family, family income, maternal education and nutritional status (underweight) in this population. This study also examined the effect of single parented families on the nutritional status of children it came up that children from single parented homes had less protection as a result of poorer child care practices.

The relationship between maternal nutritional knowledge, maternal education and child nutritional status (weight-for-age) was also investigated in Ghana by Appoh and Krekling (2005). Data collection was on 55 well-nourished mother-child pairs in which nutrition knowledge scores on mother's responses to nutrition related factors were determined. Analysis of the collected data gave significant associations between child nutritional status and the maternal knowledge on colostrums, initiation of breastfeeding, age of introduction of complementary foods and mother's knowledge on kwashiorkor.

Responses showed relatively significant differences in their scores and the mothers of the malnourished children invariably had lesser scores. This goes to imply that the malnourished mother-child pairs thrived under lesser conditions to yield the observed lower scores compared to the well-nourished pairs and can be said to have lower maternal nutritional knowledge. Appoh and Krekling (2005) therefore concluded that, the results entailed that maternal practical knowledge about nutrition may be more important than formal maternal education for child's nutritional outcome.

According to the African Nutrition Chart Book (2005), maternal education significantly lowers childhood malnutrition and malnutrition was found to increase with increasing age among Ghanaian children. These also stated that in Ghana, 40% of all deaths that occur before age five are related to malnutrition (including severe and moderate malnutrition). Significant disparity in nutritional status also exists in terms of mothers' education and literacy. A number of studies and analyses have found a significant association between low maternal literacy and poor nutrition status of young children. In many developing countries, the low status of women is considered to be one of the primary determinants of under-nutrition across the life cycle. Women's low status can result in their own health outcomes being compromised, which in turn can lead to lower infant birth weight and may affect the quality of infant care and nutrition. A study in India showed that women with higher autonomy (indicated by access to money and freedom to choose to go to the market) were significantly less likely to have stunted children when compared with their peers who had less autonomy (Bircher & Loewenfeld, 2000).

A survey of adolescents found that those who were knowledgeable about recommended intake of calcium, calcium's bone health benefits and the importance of adolescence as a

critical time for bone mass consumed more calcium than those adolescents who were unaware of this information (Bircher & Loewenfeld, 2000). The association between greater parental nutrition knowledge and lower prevalence of overweight among children is another example of the importance of knowledge (Wardlaw & Kessel, 2004). However, (Wahl & Richard, 1999) were quick to acknowledge that knowledge alone does not necessarily translate into healthful eating behaviours. Knowledge may provide the information to implement a behaviour change, but it is the individual's attitude or belief that ultimately determines whether or not this knowledge will be translated into actual behaviour.

Renfrew, McCormick, Wade, Quinn and Dowswell (2012) indicated that in assessing caregivers' knowledge about nutrition, some answers must be sought from some key concerns in the following extract. According to them a caregiver must consent to at least more than one or two of these opinions under each category.

i. Benefits of early initiation of breastfeeding to both mother and child: preferably within the first hour after birth. Early initiation of breastfeeding contributes to reducing neonatal mortality; and ensures early skin-to-skin contact, which is important in preventing hypothermia and establishing the bond between the mother and her child. Early initiation of breastfeeding also reduces a mother's risk of post-partum haemorrhage, one of the leading causes of maternal mortality, colostrum, the milk produced by the mother just after delivery during the first post-partum days, provides protective antibodies and essential nutrients, acting as a first "natural" immunization for newborns, strengthening their immune system and reducing the chances of death in the neonatal period.

ii. Optimal complementary feeding: is the most effective intervention that can significantly reduce stunting during the first two years of life, A comprehensive programme approach to improving complementary feeding practices includes timely introduction of age-appropriate and hygienically prepared complementary foods, counselling for caregivers on feeding and care practices and on the optimal use of locally available foods, improving access to quality foods for poor families through social protection schemes and safety nets, and the provision of fortified foods and micronutrient supplements when needed.

Vitamin and mineral deficiencies: Anaemia in young children is a serious concern, because it can result in increased morbidity from infectious diseases and impaired:

i. cognitive performance, behavioural and motor development, coordination, language, development, and school achievement. Vitamin A is essential for a well-functioning immune system; its deficiency increases the risk of mortality significantly, Vitamin A supplementation twice yearly reduces the risk of blindness, infection, under nutrition and death associated with vitamin A deficiency, particularly among the most vulnerable children, Iodized salt consumed as table salt and/or as food-grade salt (used in food processing) improves brain development; prevents motor and hearing deficits. Zinc given as part of Oral Rehydration Therapy for the treatments for diarrhoea reduces duration and severity of diarrhoea and subsequent episodes.

ii. Basic sanitation Practices: Hand washing with soap by caregivers' and children prior to food preparation and eating, serving foods immediately after preparation, using clean utensils and avoiding feeding bottles helps reduce diarrhoea and associated under nutrition in the child.

2.6 Adolescent Nutrition: Food Habits, Choices and Dietary Patterns

More than 20% of the total growth in stature and 50% of adult bone mass is achieved during adolescent stage (Wang, 2003). Among girls the growth spurt or peak growth velocity occurs normally about 12-18 months before menarche (onset of menstruation) at between 10 to 14 years of age. Growth in stature continues for up to 7 years after menarche. Adult height in women may be attained as early as 16 years and late as 23 years particularly for populations with high rate of under nutrition (Graham, 2000).

Ahmed (2004) in his baseline survey on National Nutrition Programme states that female adolescent nutrition is particularly an important tool in combating the vicious cycle of intergenerational under-nutrition. If not well addressed adolescent under-nutrition perpetuates this cycle and brings about mothers producing low birth weight babies who grow into undernourished children and adolescent.

Defelice (1992) stated that the teenager's social pressures and personal tensions concern in figure control sometimes cause a girl to follow unwise, self-imposed crash diets for weight loss. Birher and Loewenfeld (2000) continued to state that in some cases, self-starvation regimens may result in complex and far-reaching eating disorders such as anorexia nervosa and bulimia nervosa. During adolescence there is a high incidence of nutritional deficiencies and poor eating habits and these in later years may lead to problems including osteoporosis, obesity, hyperlipidemia, sexual maturation delays and final adult height.

Barasi and Mottram (1987) are of the view that dietary patterns are those aspects of food habit which deal with a number of meal patterns like eating, who prepares the food, what

time of the day the food is eaten, and who eats with who. The food patterns of a country are moulded by the agricultural patterns.

Defelice (1992) stated that religion plays one of the most influential roles in the choices and subsequent selection of foods consumed in certain societies. For example, in the Hindu and Buddhist religions the consumption of both pork and beef is frowned upon. According to Whitney (2003), geographical factors such as where people live and the range of shops situated near may influence their choice of foods. For example, some low-income families may live far away from certain shops and may not be able to afford a car or to pay regularly for public transport to travel to where more shops are situated.

Adegoke (2003) stated that the age of the individual choosing the food may affect food choices. Children will usually choose to eat foods such as fish fingers, chicken nuggets and jelly, which are principally foods developed for younger people than older people. Anderson and Morrison (2003) said another factor affecting the choice and selection of foods is ethnicity. Taste preference for sweetness, which is inborn, is a significant determinant of food choices in the adolescent.

Numerous physiological and biological factors such as hunger, gender, age, disease states and treatments influence food choices and persons with lactose intolerance may exclude milk and other dairy foods from their diet, thereby compromising their calcium and nutrient intake (William, 1999). Parents, mothers in particular, play an important role in shaping young children's eating behaviours by their own dietary behaviours, their attitudes towards food and the availability of food in the home (Defelice, 1992). Eating behaviour and dietary quality are influenced by where food is consumed – at home,

school or away from home at restaurants and fast food establishments may negatively affect the nutritional quality of the diet because of the large portion sizes of foods served and the types of foods often selected (Anderson & Morrison, 2000). The media can positively impact food choices by promoting health education and awareness through “healthier” food choices. However, there is some concern that media exposure such as some television commercials may contribute to higher fat, higher energy food choices (Johnson & Anderson, 1999).

2.7 Effects of Nutrition on Teenage Mother and Child

Children and adolescents are, of course, among the most vulnerable members of any community and will disproportionately suffer the negative effects of nutrition. According to Wang (2003), many pregnant teenagers are subject to nutritional deficiencies from poor eating habits, dieting, skipping meals, food faddism, snacking and consumption of fast food which may have detrimental effect on both the child and the mother. Inadequate nutrition during pregnancy is an even more marked problem among teenagers in developing countries.

Adolescence is a period of profound physical and psychological development. Coupling pregnancy and parenthood with this stage of growth can put both the mother and the child at health of behavioural risk (Flanagan, McGrath, Meyer & Gracia-Coll, 1995). Due to the biological changes occurring during adolescence and pregnancy, nutritional requirements increases. Nutrition needs of adolescent are unique and demand special attention. These requirements are conditioned primarily by the building and maintenance of new body tissues, by the demand of a high order of physical act to some extent by

interrelated intrinsic and entire factors such as emotional changes as the growing child reacts to her maturation and pregnancy.

Teenage pregnancy poses special health problems for both the mother and child. Young women continue maturing into physical adulthood for 5 years after the onset of menstrual periods. Wardlaw (2003) indicated that since the average age for menarche is 13 years, a woman younger than 18 years is not as physically ready to be pregnant as she will be in the later years. The nutritional demand of pregnancy in adolescence is particularly critical since the growing youngster who becomes pregnant has the task of developing another human being before her body has completed its own growth. Due to this, they have greater nutritional requirements than adult women of equal size and pregnancy may compromise their growth potential and increase the risk in pregnancy. Unfortunately, pregnant teenagers turn to behave as normal and involve in bad dietary habits and patterns such as dieting, skipping meals, snacking consuming fast foods and performing other poor dietary habits (Gutierrez & King, 1993). Research has shown that some of the nutrients most needed during this period, for example; Energy, Vitamin C and iron are also the ones most lacking in adolescents diets (Sargent, Kemper & Schulken, 1994).

Additionally, when women initially become pregnant, they often think that they need to consume a significantly larger number of calories, to assure the growing of the fetus. “An adequate diet during pregnancy maintains the nutritional status of the mother at a level that conserves her own body tissues and contributes to the normal development and birth of a healthy, full-term baby” (Nti & Larweh, 2002). As many researches show, during the pregnancy women often become aware of nutrition, seek health advice and change their diets (Anderson, 2001). The healthy development of the baby and maintaining a good

body weight may be an incentive and motivator for positive dietary change at this time. It may also be a good time to target women with healthy food choices and give them advises for a healthy eating.

Many factors might affect the dietary choice of the pregnant woman. Intrapersonal factors are such individual's characteristics that influence the specific food choices a person makes, whereas interpersonal are such as income, relationships with family members, child and friends (Fowles, 2008). They have a collective impact and may interact with individual characteristics to influence healthy eating by pregnant women (Fowles, 2008).

A growing body of literature studies the healthiness of the food that children consume and the increasing role they play in the family during the buying decisions process (Nørgaard, Bruns, Pia & Muguel, 2007). Parents shape children's perceptions and strongly determine their early choices with food and eating, providing both genes and environments for children (Savage, Fisher & Birch, 2007). Parents select the foods of the family diet, serve as models of eating that children learn to emulate, and use feeding practices to encourage the development of culturally appropriate eating patterns and behaviors in children (Savage *et al.*, 2007). Thus, as providing healthy food for their children is being of a great importance for parents (Alderson & Ogden, 1999; Søndergaard & Edelenbos, 2007), they might be a large health-interested target group among consumers" (Aschemann-Witzel, 2010). They also might provide nutrition to their babies through the food they consume during pregnancy. Studying parents' eating habits and how they change in time might be of great importance for children's health management

Maternal underweight is a key risk factor in low birth weight this in turn is a risk factor for childhood stunting and underweight as well as for some types of chronic diseases during adulthood (Barker, 1993). Low birth weight, specifically due to intrauterine growth retardation (IUGR), is linked to under nutrition. The latest UNICEF (2004) estimates show that 30% of all babies born at term in South Asia have low birth weight to 14% in sub-Saharan Africa. 15% in the middle East and North Africa, 10% in Latin America and Caribbean, 8% in East Asia and the Pacific (UNICEF, 2004). In Ghana, 11% of infants are born to low birth weight (UNICEF, 2004). Poor maternal nutrition during pregnancy is thought to account for 14% of IUGR in developing countries, and maternal stunting may account for a further 18.5% (ACC/SCN, 2000).

Iron deficiency anemia among pregnant women is associated with an estimated 110,000 maternal deaths each year (Stoltzfus, 2003). Among adolescent pregnant females in Ghana, maternal haemoglobin status during the 3rd trimester of pregnancy influenced significantly in few hemoglobin status at 3 months of age (Grant & Lartey, 2005). This has implications for both maternal and infant morbidity and mortality.

Maternal zinc deficiency is increasingly recognized as widespread among women in developing countries. Maternal zinc supply has a beneficial effect on neonatal immune status and infant morbidity (Osendarp, West & Black, 2003). Folate deficiency is associated with an increase risk of pre-term delivery and low birth weight (Scholl & Johnson, 2004). It also contribute to anemia, especially in pregnant and lactating women (Dugdale, 2001), it may be indirectly associated with increased risk of maternal death and illness. Folate helps prevent malformations that affect the brain and spinal cord. Studies have shown that increasing folic acid intake before pregnancy prevents neural tube

defects (Bailey, Offer, Sarbens, Ayling & Ames, 2003). Maternal iodine deficiency increases the risk of stillbirths and miscarriages (Dillon & Milliez, 2000). It also has a detrimental effect on foetal brain development (Hetzel, Chavadej & Potter, 1988).

Maynard (1997) contended that children born to teenage mothers are also at risk of lower intellectual and academic achievement and social behavioural problems due to inadequate nutrition. The health of the mother (including nutritional status) during pregnancy can have an impact on the life and the nutritional status of the baby. This is explained by Garretson and Burton (2000) where they investigated the effects of mother's nutrition on the wellbeing of the child. Their indicated results were more interesting and are in the following lines: There are many kinds of potential harms, Viruses and bacteria that causes diseases in the mother that can cross the placental barrier to infect and damage the fetus, these include the human immunodeficiency virus (HIV) and the organisms that cause syphilis and other sexually transmitted infections. They also indicated that, German measles (rubella) in the mother in early pregnancy can cause severe defects in the fetus, such as blindness, deafness, heart problems, and brain damage.

Certain medicinal drugs, such as aspirin and antidepressants, may harm the fetus, and maternal use of psychoactive drugs like heroin, cocaine, and marijuana they say can cause long-term behavioral problems or learning disabilities in the child. Moderate or heavy consumption of alcoholic beverages during pregnancy can cause serious damage to the fetus, including fetal alcohol syndrome, and use of tobacco can impair fetal growth and lead to other complications. Interestingly, they discovered that the mothers' exposure to lead, mercury, polychlorinated biphenyls (PCBs), and other industrial chemicals through, for example, drinking contaminated water or eating fish from polluted waters

can harm prenatal growth and cause birth defects because these substances are absorbed by the fetus.

Every adolescent girl must be protected against under-nutrition and nutritional deficiencies like anaemia. Every pregnant woman must have access to sufficient quality and quantity of food and liquids during pregnancy and lactation. Pregnant women and breastfeeding mothers must take supplements if needed to improve pregnancy and lactation outcomes. In order to attain the MDG target of reducing maternal mortality by three-quarters from 1990-2015, there is the need to ensure optimal nutrition during adolescence especially for girls in order to ensure favorable pregnancy outcomes.

2.8 General Nutritional Status of Ghanaian Children

One of the major issues the world is facing today is malnutrition. This problem is especially acute as well as chronic in the developing countries, especially among children. World-wide it is estimated that one in six children are born underweight (UNICEF, 2000). Takyi (1999) conducted a study in Saboba in the Northern Region of Ghana where he looked at the nutrients intakes and number of 518 pre-school children (age 2-6 years). Generally he found a poor nutrients status in children in this age bracket. Stunting was found to be 27%, wasting 4.4% and a combination of stunting and wasting to be 1.9%. Though most children (> 90%) met their RDA for iron. A total of about 92% were found to be anaemic while only 26.5% of children met their total daily caloric intake. Intake of most of the other nutrients assessed was inadequate. The high anaemia rate was attributed to low vitamin C intake, low intake of animal source, food iron, malaria and worm infections. This study however did not cover the whole of Ghana but

may be representative of a typical poor Ghanaian setting. Although malaria is the primary cause of anaemia, malnutrition and micronutrient deficiencies also play a role.

The Ghana Demographic and Health Survey (GDHS) (2008) on nutrition also carried out a study to assess levels of malnutrition in the 10 regions of Ghana. The findings showed that 28% of children less than 5 years were stunted, 9% are wasted and 14% are overweight. According to Ayaya *et al.* (2004), malnutrition is one of the leading causes of morbidity and mortality in the preschool age. Since the feeding practices and care of mothers or caregivers come into play as young children generally do not have the ability to choose a balanced nutritious diet. Thus, parents, caregivers and other adults are responsible for offering them a variety of nutritious and developmentally appropriate foods and emphasis must be placed on development of good eating and care practices.

2.9 Nutritional Status of Preschool Children

According to Przyrembel (2008), the infants and pre-school children are most vulnerable to retardation in growth as a result of malnutrition particularly under-nutrition. The age range 1-12 years includes very different phases of development. With increasing motor skills, toddlers some of whom are still partly breastfed continue to be fed with an increasing variety of foods. Food preferences developed in the first year of life continue to persist but are modified under the influence of parents, siblings and playmates (Przyrembel, 2008).

According to Christiaensen and Alderman (2001), the nutritional status of children is a manifestation of a host of factors including household access to food and the distribution of this food within the household, availability and utilization of health services, and the

care provided to the child. Preschool children are children between the ages of 2-5 years and fall within the vulnerable group for malnutrition because of their increased growth demands within that age (Ayaya *et al.*, 2004) but according to Bardosono, Sastroamidjojo and Lukito (2007), the nutritional status of children less than 5 years can be used as a public health indicator and especially in developing countries like Ghana, it can be assessed by monitoring child growth through maternal care practices. Preschool children are very susceptible vulnerable to malnutrition as they are still in the developmental process and require adequate nutrients to fall into good nutritional status but according to Whitney and Rolfes (2005), nutritional status of an individual refers to the intake of a diet sufficient to meet or exceed the nutritional needs to keep the composition and function of the otherwise healthy individual within the normal range. High quality (nutrient dense) foods are crucial because of children's growth demands and the small size of their stomachs (Whitney & Rolfes, 2005). It is not just a matter of importance whether a family has food, but whether the family knows and is able to give the child foods of sufficient nutritional quality. This mostly rest on the mothers or caregivers. Under nutrition encompasses stunting, wasting, and deficiencies of essential minerals (collectively referred to as micronutrients) as one form of the condition known as malnutrition, with obesity or over-consumption of specific nutrients as another form (Whitney & Rolfes, 2005).

According to Contento (1981), the health and wellbeing of a child is mostly regulated by nutrition. Magboub *et al.* (2006), also posit that malnutrition is particularly prevalent in developing countries, where it affects one out of every three preschool-age child although it cannot be totally true to say that malnutrition always arises as a result of inadequate

food intake or poor maternal care as superstitions, beliefs taboos and poor maternal nutritional knowledge also come into play (Thomas, 1991). The most prevalent type of malnutrition worldwide is protein-energy malnutrition [PEM] (Wennberg, 1988). One out of every three children under five in developing countries is malnourished (Gulati, 2010). Malnutrition is one of the major killers of children in developing countries.

According to Mwangome *et al.* (2010), it has remained the most crucial risk factor for the burden of diseases in developing countries causing long term detrimental consequences and poor academic performances. Children most at risk are those aged less than 5 years living in developing countries. The determinants of children's nutritional status are numerous, complex and intimately interwoven. The family's economic resources, number of children in the household, access to education, the mothers health, status, frequency and severity of illness experienced and sanitation in and around the home are among many factors that influence child growth. About one-third of the population in Africa currently lives in urban areas. The population of Accra, the capital of Ghana, is increasing more quickly than anywhere else in the country. In six (6) years, the absolute number of poor households and undernourished children in urban areas of Ghana has increased and is accounting for a growing share of the overall burden of poverty and malnutrition in the country (Amar-Klemensu *et al.*, 2000).

It is widely believed that malnourished children are mainly found in sub-Saharan Africa. Data clearly shows that the worst affected region is not Africa but South Asia where 46% of children under five are moderately or severely underweight, whereas in sub-Saharan Africa it is 28% (Gulati, 2010).

Mwangome, Andrew, Plugge and Nweneka (2010) state that there has been a recent increase in the prevalence of malnutrition in Africa, which means the goal set to reduce the levels of under nutrition by 50% between 1990 and 2015 has not been met. The number of underweight children in Africa has increased from 26 million in 1990 to 32 million in 2000. Normal physical development in infancy requires a nutritionally adequate diet, immunizations to guard against infectious diseases, and protections from environmental hazards (such as lead-based paints) and from dangerous drugs.

Children grow more slowly and gradually during middle childhood. Even so, children who are well nourished gain about 6 cm (2.5 in) in height and 1.8 to 2.3 kg (4 to 5 lb) in weight each year. Children typically become slimmer as their body proportions change. Children vary in physical size, weight, and coordination. During middle childhood, these differences can affect social and personal adjustment as children compare their characteristics and capabilities to those of their peers. Childhood obesity, for example, can signal a broader problem if it arises from inactivity (such as watching too much television) or poor eating habits.

The nutritional status of an individual can only be known by carrying out a nutritional assessment. This was defined by Smolin and Grosvenor (2003) as the process of determining the nutritional status of an individual for the purpose of identifying nutritional needs and planning strategies to meet these needs. Nutritional status of children can be assessed by using both direct and indirect methods. The direct methods deal with the individual and measure objective criteria, while indirect methods use health indices that reflect nutritional influences. Direct methods of nutritional assessment are summarised as follows:

- a. Anthropometric methods
- b. Biochemical laboratory methods
- c. Clinical methods
- d. Dietary evaluation methods.

For the purpose of this research, the researcher made use of anthropometric measures (growth charts) and clinical methods to assess the nutritional status of teenage children

2.10 Anthropometry

Colhoun et al. (1996) in the context define anthropometric as literally meaning measuring man. They further explained that anthropometric indicators are basic measurements of the human body. By relating these to standards typical of the test population, any deviations indicate abnormal nutritional status. Measurements commonly used are height and weight; these can be used to calculate the body mass index (BMI). However, they were quick to indicate that in children, height and weight results can be compared with standard growth curves which indicate the rate of physical development of a child, particularly when a sequence of measurements is made.

Anthropometry is also viewed by Simko, Cowell and Gilbride (1995) as the measurement in the variations of physical dimensions and the gross composition of the human body. This is an indirect way of assessing body fat. However it has a number of advantages over other measurements of assessing body fat which includes the fact that it is non-invasive, simple to perform, require less expensive equipment and it is relatively fast (Kerr, Ackland & Schneider, 1995) Measurements of physical dimensions or body size

involving anthropometry include weight, height, mid upper arm circumference. Measurements of gross composition involves skin fold, hip measurement. Physical signs and symptoms of malnutrition can be valuable aids in detecting nutritional deficiencies. These may include delayed growth and development as determined by comparing an individual or a group with normal values on growth charts.

WHO (2004) documented “wasting” and “stunting” as two most important words to denote anthropometric measures as they are purely descriptive of what is observed. The document further gave other words which could fulfill the same function and which are more readily translated as thinness (for wasting) and shortness (for stunting). Terms such as “acute” malnutrition (for wasting), “chronic” malnutrition (for stunting) and “acute on-chronic” for the combination of wasting plus stunting, are not direct observations but deductions which may not always be correctly determined.

In the document, Wasting indicates a deficit in tissue and fat mass compared with the amount expected in a child of the same height or length, and may result either from failure to gain weight or from actual weight loss. Again, stunting signifies slowing in skeletal growth (WHO, 2004).

It may be precipitated by infection or some other household crisis and usually occurs in situations where the family food supply is limited and the food intake of children is low. The determinants will differ in different environments. Very often there are seasonal episodes of wasting, related to variations either in food supply or in disease prevalence. One of the main characteristics of wasting is that it can develop very rapidly, and under favorable conditions can be restored rapidly. The growth rate may be reduced from birth,

but a significant degree of stunting, representing the accumulated consequences of retarded growth, may not be evident for some years. Stunting is frequently found to be associated with poor overall economic conditions, especially mild to moderate, chronic or repeated infections, as well as inadequate nutrient intake.

Height for age (stunting) is used as the key outcome variable, which is an indicator of chronic nutritional status capable of reflecting long-term deprivation of food following the established practice of anthropometric measures of malnutrition. The measure is expressed in the form of z-scores standard deviation (SD) from the median of the 2006 WHO International Reference Population. There are several obvious biological differences between wasting and stunting. In the first place, one can fail to gain height but one cannot lose it. Secondly, linear growth is a slower process than growth in body mass. A child should double treble its weight in the first year, but only double its height; in consequence, a significant degree of stunting takes longer to be established. Thirdly, although catch-up in height undoubtedly can occur, as shown by the effects of treatment in severely stunted children with celiac disease, it takes a relatively long time even with a favourable environment.

The prevalence of wasting is greatest between 12 and 24 months of age, when dietary deficiencies are common and diarrhea diseases more frequent, and tends to decrease later on. By contrast, the prevalence of stunting increases over time up to the age of 24 or 36 months and then shows a tendency to level off. It follows from these age-related differences in prevalence that, as pointed out earlier, for the proper interpretation of surveys on children, the results should be analyzed separately according to age. Wasting at one point of time may be a reasonable indicator of the incidence of the process that is

causing weight deficit. However, this is certainly not the case for stunting. Thus, it is totally incorrect to suppose that because the prevalence of stunting in a population of children is greater at 4 years than at 2 years, more 4-year-old children are “malnourished”.

Children grow more slowly and gradually during middle childhood. Even so, children who are well nourished gain about 6 cm (2.5 in) in height and 1.8 to 2.3 kg (4 to 5 lb) in weight each year. Children typically become slimmer as their body proportions change. Children vary in physical size, weight, and coordination. During middle childhood, these differences can affect social and personal adjustment as children compare their characteristics and capabilities to those of their peers. Although many variations in physique are attributable to individual differences in rate of maturation and are not necessarily enduring, some can foreshadow potentially long-term difficulties for children. Childhood obesity, for example, can signal a broader problem if it arises from inactivity such as watching too much television or poor eating habits. Normal physical development in infancy requires a nutritionally adequate diet, immunizations to guard against infectious diseases, and protections from environmental hazards (such as lead-based paints) and from dangerous drugs.

2.11 Clinical Signs of Malnutrition in Infants

Malnutrition or malnourishment is a condition that results from eating a diet in which nutrients are not enough or are too much such that it causes health problems (Facts of life, 2010). This may include too much or too little: calories, protein, carbohydrates, vitamin or minerals (Facts of Life, 2010). It is often used specifically to refer to under-

nutrition where there are not enough calories, protein or micronutrients; however, it also includes over-nutrition (Young, 2012). If under-nutrition occurs during either pregnancy or before the age of two years of age it may result in permanent problems with physical and mental development (Facts of Life, 2010). Extreme undernourishment, known as starvation, may have symptoms that include: a short height, thin body, very poor energy levels, and swollen legs and abdomen (Facts of Life, 2010; Young, 2012). People also often get infections and are frequently cold. The symptoms of micronutrient deficiencies depend on the micronutrient that is lacking (Young, 2012).

Undernourishment is most often due to not enough having high quality food available to eat (Maternal, Newborn, Child and Adolescent Health, 2014). This is often related to high food prices and poverty (Facts of Life, 2010). A lack of breast feeding may contribute to a number of infectious diseases such as gastroenteritis, pneumonia, malaria and measles which increase nutrient requirements (Maternal, Newborn, Child and Adolescent Health, 2014). There are two main types of under-nutrition: protein-energy malnutrition and dietary deficiencies (Essentials of International Health, 2011). Protein-energy malnutrition has two severe forms: marasmus (a lack of protein and calories) and kwashiorkor [a lack of just protein] (Young, 2012). Common micronutrient deficiencies include: a lack of iron, iodine and vitamin A (Young, 2012).

During pregnancy, due to increased demand, deficiencies become more common (Konje & Justin, 2007). In some developing countries over-nutrition in the form of obesity is beginning to present within the same communities as under-nutrition (Progress for Children: A Report Card on Nutrition, UNICEF). Other causes of malnutrition include

anorexia nervosa and bariatric surgery, (Caballero et al., 2005; Stoelting's Anesthesia and Co-existing Disease, 2012).

Malnutrition increases the risk of infection and infectious diseases, moderate malnutrition weakens every part of the immune system (Stillwagon, 2008). For example, it is a major risk factor in the onset of active tuberculosis, (Schaible & Kaufmann, 2007). Protein and energy malnutrition and deficiencies of specific micronutrients (including iron, zinc, and vitamins) increase susceptibility to infection, (Stillwagon, 2008). Malnutrition affects HIV transmission by increasing the risk of transmission from mother to child and also increasing replication of the virus (Stillwagon, 2008). In communities or areas that lack access to safe drinking water, these additional health risks present a critical problem. Lower energy and impaired function of the brain also represent the downward spiral of malnutrition as victims are less able to perform the tasks they need to in order to acquire food, earn an income, or gain an education.

Vitamin-deficiency-related diseases (scurvy and rickets), hypoglycemia (low blood sugar) can result from a child not eating for 4 to 6 hours. Hypoglycemia should be considered if there is lethargy, limpness, convulsion, or loss of consciousness. Blood sugar can be measured immediately and quickly by performing a finger or heel stick test.

In those with malnutrition some of the signs of dehydration differ (WHO, 2005). Children; however, may still be interested in drinking, have decreased interactions with the world around them, have decreased urine output, and may be cool to touch (WHO, 2005).

Table 1: Clinical Signs in relation to Nutrition

Site	Sign
Face	Moon face (kwashiorkor), simian facies (marasmus)
Eye	Dry eyes, clear, pale conjunctiva, Bitot's spots (vitamin A)
Eyelids	Swollen, pale, normal
Lips	Pale, crack, angular, normal
Teeth	Cutting, discoloured, caries, normal
Gums	Bleeding, sore, swollen, healthy
Hair	Reddish, sparse, silky, healthy
Skin	Rashly, scaly, dry, greasy, smooth
Feet	Swollen, cracked sole, flat foot, normal
Hands	Cracked, pale palm, expanded, normal
Stomach	Protruded, hard, flat, normal

Source: Protein Energy Malnutrition (2009)

2.12 Infant Feeding Practices

Accurate monitoring of infant feeding practices is essential to ensure health service policy and plans reflect both state and national health priorities in relation to breast-feeding and the introduction of solids. Research based evidence is required to support area and local health priorities in relation to infant feeding practices, child and family clinical practice and to guide child and family clinical service decisions.

2.13 Breastfeeding Practices

The literature shows that any breastfeeding is beneficial but exclusive breastfeeding until six months, and a long duration of any breastfeeding protects infants against illnesses such as otitis media, non-specific gastroenteritis, atopic dermatitis, and respiratory infections (Kramer *et al.*, 2004; Oddy *et al.*, 2004). It also lowers their risk of being overweight, obese or developing diabetes in childhood and adulthood (Kramer *et al.*, 2004, Burke *et al.*, 2005). Breastfed infants also score higher on IQ tests (Oddy *et al.*, 2003, Julvez, *et al.*, 2007) and have better teeth and jaw development (Viggiano *et al.*, 2004). Many of the above conditions have been identified as health priority areas at international, national and state levels, due to the physical, psychological and economic impact on individuals, health systems and communities.

Early nutritional status has been shown to have an effect on child and adult health and development. Obtaining the necessary micronutrients and macronutrients essential for optimal health and development may depend on the method of feeding practice to which the infant is exposed (Wilson, Forsyth & Green, 1998, Agostini *et al.*, 2008). Infant feeding practices include breastfeeding, the use of expressed breast milk, infant formula feeding, the timing of introduction and type of complementary solid food and the giving of water, fruit juices and other liquids. The WHO breastfeeding, breast milk feeding and infant formula feeding definitions have been used in this survey however, the definition of complementary food is in line with the recommendation of the European Society for Pediatric Gastroenterology, Hepatology and Nutrition – ESPGHAN (Agostini *et al.*, 2008) and refers to the introduction of semi-solid and solid foods and the infant may still be receiving breastmilk and/or infant formula.

2.14 Introduction of Complementary Solid Foods

It can be difficult for parents to know when to start their infant on solids as the ‘starting age’ has changed several times since they themselves were infants. They may have been fed solids anywhere from six weeks to six months of age (Formon, 2001; Barker, 2005). Currently the WHO recommends that healthy infants born at term with normal birth weights and drinking breastmilk or infant formula will have all their nutritional needs met until complementary foods are introduced at six months of age. Delaying the introduction of complementary foods or solids until six months not only helps to influence the duration of exclusive breastfeeding but the timing of the introduction of complementary foods has been shown to have important health outcomes for infants. Although the six month timeframe created some controversy (Lanigan, Bishop, Kimber & Morgan, 2001), there is convincing evidence that early introduction of solids (under four months) is related to nutritional deficiencies and rapid weight gain in infancy which in turn has implications for childhood obesity (Crocetti, Dundas & Krugman, 2004; Sloan *et al.*, 2007).

Although, some researchers would prefer a more flexible timeframe, the WHO recommendation has been endorsed by health authorities in Ghana. Parental inability to read their infant’s cues in relation to sleep needs and temperament may also lead them to believe their infant is displaying hunger signs which can lead to extra milk feeds and the early introduction of complementary solid foods (Crocetti, Dundas & Krugman, 2004). The physiological cues that reflect an infant’s readiness for solids are displaying a keen interest in food and what others are eating, reaching for food off others plates, imitating eating behaviours, such as opening their mouth and moving their lips and jaw, the loss of

the tongue- extrusion reflex, willingly opening their mouths when food is offered or the spoon touches their lips, the ability to swallow not just suck, good control of the head and neck and being able to sit with support (FSANZ, 2004; Monti, 2005). Early introduction of complementary solid foods is more common with younger mothers and mothers of lower socioeconomic status.

2.15 Summary of Literature Reviewed

Pregnancy in adolescent girls has shown as a social hazard of serious consequences on nations especially in the developing countries where the incidence occurs most. Nutrition is an integral part of health and wellbeing of an individual and as such it leads to quality of life at every stage of human. Individual nutrition status has shown to reflect the degree to which physiologic needs for nutrients are being met. Good nutrition has proved to be the fundamental requirements for positive health, functional efficiency, and productivity. Moreover, the nutritional requirements of healthy children vary widely according to their age, sex, weight, and rate of growth as well as environmental factors.

Deficient intake of nutrients signals the start of nutritional related disorders in childhood. Again it reviewed that proper nutrition at the growing stages of life not only helps to promote health but also prevent the occurrence of deficiencies, diseases and other health hazards.

Nutritional knowledge is shown to be the information and understanding about food and liquid requirement of human beings or animals for normal physiologic function including energy need, maintenance, growth activity, reproduction and lactation. In this case, children's diets are influenced by their mothers stock of nutrition knowledge and diet

health awareness. Meaning, the more a mother knows about nutrition, the better the overall quality of her child's diets. Importantly, female adolescent nutrition knowledge is important tool in combating the vicious cycle of intergenerational under-nutrition.

Many pregnant teenagers are subject to nutritional deficiencies from poor eating habit, dietary, skipping meals, food faddism, snacking, and consumption of fast food which may have detrimental effect on both the child and the mother. Children born to teenage mothers are also at risk of lower intellectual, academic and social behavioural problem due to inadequate nutrition. Furthermore, it reviewed that health of the mother (including nutrition status) during pregnancy can have an impact on the life and the nutritional status of the baby. Malnutrition in the review has shown to be one of the leading causes of mobility and mortality in the preschool age.

In choosing food, it showed that many factors are considered and among them include religion, geographic location, income, ethnicity, sex and gender. It shows that breast-feeding is essential to protect infant against illnesses and as well improves IQs, and other health benefits. Delaying the introduction of complementary food or solids until six months not only helps to influence the duration of exclusive breastfeeding but also come with excellent health benefits to the infants and mothers as well. Malnutrition in infants is a serious health condition that occurs during either pregnancy or before the age of two years of age which may result in permanent problems of physical and mental development.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter discusses the methods that were employed in conducting the study. These are discussed under these sub-headings: research design, study area, population, sample and sampling techniques, instrument for data collection, validity and reliability of the instruments, data collection procedures, data analysis and ethical considerations.

3.1 Profile of the Study Area/Location

The study was conducted at Zenu community and its environs in the Kpone-Katamanso District of the Greater Accra Region of Ghana. Kpone is the administrative capital. The district lies in the coastal savannah zone of Ghana. It is located in the eastern part of the Greater Accra Region and stretches from the coast to the southern lower slopes of the Akuapim Mountains with its District capital as Kpone. It shares boundaries with Shai-Osudoku and Ningo-Prampram District Assemblies on the East, Adentan Municipal Assembly, La-Nkwantanang and Ashaiman Municipal Assembly, and Tema Metropolitan Assembly on the West, Gulf of Guinea on the south and Akuapim North Municipal Assembly on the North. The Kpone-Katamanso District is only 38 kilometers drive from Accra, the capital city of Ghana and falls on longitude 004°E and latitude 5° 40' 60N. The Precambrian rocks of the Dahomeyan formation underlie the district: metamorphic rocks mainly consisting of granite, gneiss and schist have been derived from sedimentary layers. The vegetation zones in the district comprise shrub and grassland. The grassland

is found in areas like Appolonia, Gbetsile, Santeo and Katamanso where livestock farming is practised.

Data from the 2010 Population and Housing Census (PHC) indicated that the district has a population of one hundred and nine thousand, eight hundred and sixty-four 109,864 representing 2.7 percent of the population of the Greater Accra Region. Males constitute 53, 376 (48.7%) and females represent 56, 488 (51.3%). The district has a total fertility rate (TFR) of 2.6. The general fertility rate is 81.9 births per 1000 women aged 15-49 years which is the sixth highest for the region. The crude birth rate (CBR) is 24.4 per 1000 people.

The district has both private and public health facilities. There are a number of primary health facilities in the district. Since the district is close to Tema West, most referral cases are sent to the Tema General Hospital. The public health facilities in the district have no resident doctors serving the people. However they offer outpatient, antenatal and prenatal care services. Table 2 gives a description and statistics of the types of health facilities in the district.

Table 2: Health Facilities in the Kpone-Akatamanso District

Health facility	Public	Private
Hospital	-	5
Clinic	2	6
Health Centre	2	-
CHPS	4	-
Quasi-Government	1	-
Corporate Facilities	-	2
Total	9	8

Source: Kpone-Katamanso District Health Directorate (2016)

Apart from the above seventeen (17) health facilities, there are chemical and pharmaceutical shops that complement these facilities. Since the District is close to Tema, some referral cases are sent to the Tema General Hospital and also some people are able to assess it as their first point of call anytime they are sick. Also, in existence are herbal practitioners such as Dua ma Aduro – Sebrepur, Adom Herbal-Sebrepur, Abotare Clinic – Bethlehem, New Crystal Clinic- Kakasunanka among others, whose services also complement the above mentioned facilities.

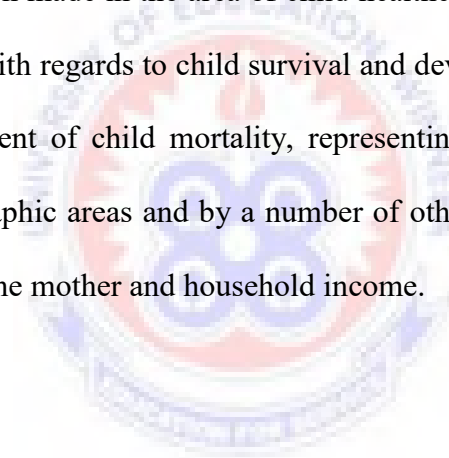
Tema Oil Refinery (TOR) has constructed a modern maternity block to take care of antenatal and postnatal services for Kpone, but the facility is yet to be commissioned and also lack the necessary equipment to complement it. There is an Adolescent Reproductive Health (ARH) Center funded by the Urban Poverty Reduction Project (UPRP) in the District that caters for Adolescent health. Other health facility under this project is a clinic at Katamanso that is furnished and is in operation. The Assembly has constructed a clinic at Zenu that is in use and two others at Gbetsile and Agbeshi Laryea that is under construction as well as a CHPS compound at Saduase that is near completion. All these facilities are expected to foster good health care delivery in the district.

Maternal and Child Healthcare

Maternal healthcare services include family planning; antenatal care; delivery and postnatal care; and prevention of mother to child transmission of HIV. Though maternal health care in Ghana has improved over the past 20 years, the pace has been slow in the district.

Programs such as the Maternal and Child Health and Nutrition Improvement Project (MCHNP), initiated by the World Bank, aims to improve the utilization of community-based health and nutrition services by women of reproductive age and children under the age of 2 years old. The District Health Directorate has also introduced a number of programs, and benefits, to reduce maternal mortality (MMR) such as free healthcare to pregnant women and the development of midwives to further enhance the safety of childbirth.

The district has no record of infant death because it does not have a hospital. Although some progress has been made in the area of child healthcare, there are several challenges still to be addressed with regards to child survival and development. New-born deaths are an important component of child mortality, representing 40% of all deaths. Mortality varies between geographic areas and by a number of other factors including the age and level of education of the mother and household income.



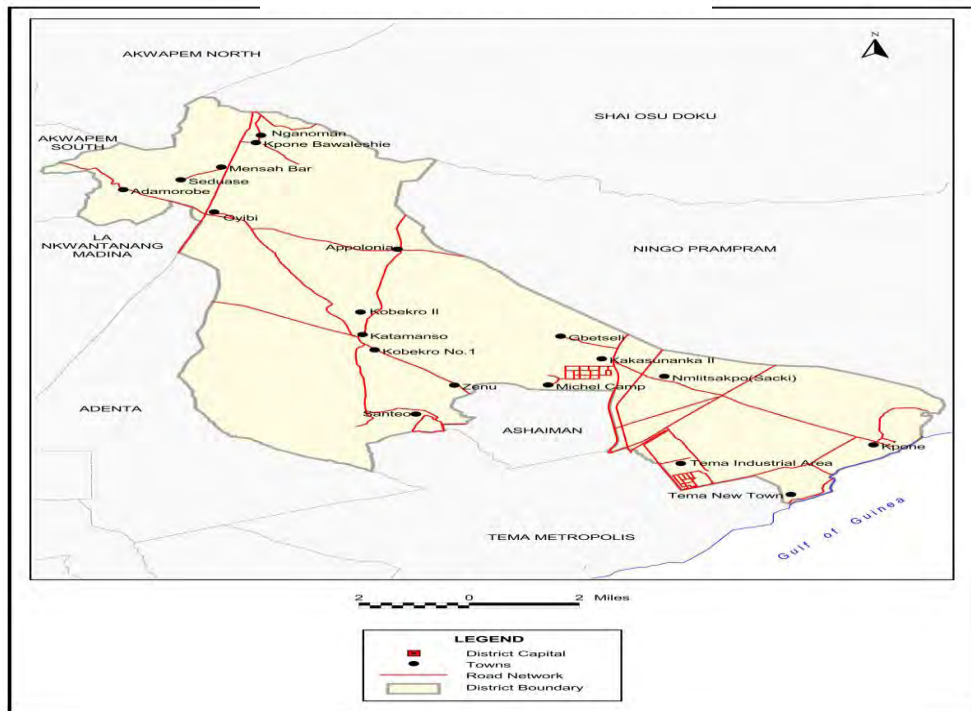


Figure 3: Map of Kpone-Katamanso District

Source: Ghana Statistical Service, GIS (2014)

3.2 Research Design

The study adopted a descriptive design and the focus was on the influence of teenage mother's nutritional knowledge on the nutrition status of their children. Descriptive studies are more formalized and typically attempt to describe a situation, problem, phenomenon, service or programme with stated hypothesis or investigated question (Kumar, 2011). For example, the living conditions of a community, or a description of attitudes towards an issue. Saunders, Lewis and Thornhill (2007) further stated that this could be an extension, a fore runner to, a piece of exploratory research or a piece of explanatory research. There is a necessity to have a clear picture of the phenomenon on which one wishes to collect data prior to the collection of the data (Saunders *et al.*, 2007).

According to Blumberg, Cooper and Schindler (2008), descriptive studies are often complex and require clever research skills to be designed and executed successfully.

Though descriptive design has a limitation of ensuring that the questions to be listed are clear and not misleading, it has an overwhelming advantage of getting respondents to answer questions thoughtfully and honestly with the potential to provide a lot of information from a large sample of subjects or participants which makes it suitable for this kind of study. This design helped in collecting information on the views and practices of teenage mothers on the nutrition of their children through observation and questionnaire.

3.3 Population of the Study

Population used in the study includes all teenage mothers with their infants aged 0 – 2 years in the Zenu community and its environs. Population is defined as a group of individuals or people with same characteristics and in whom the researcher is interested (Kusi, 2012).

Population of the study is approximately 565 thousand teenagers according to the Ghana Health Report (2013). The accessible population was made up of teenage mothers between aged 12 and 19 who were in charge of their children's feeding and reside in Zenu and its environs. The accessible population of the study is realistic which involves research participants who were available at the time the researcher was at the post natal care centers. The teenage mothers were chosen as participants for this study because they were adolescents with babies, plan and feed their infants and possess some nutritional

knowledge which the researcher sought to establish the relationship with the nutritional status of their children.

3.4 Sample and Sampling Techniques

The sample size consisted of 80 participants, and this represents 7% of the population. This comprised 40(7%) teenage mothers aged between 12 and 19 years and 40(7%) infants of those mothers. The choice of 7% of the population is based on Dornyei's (2007) assertion that between 1% and 10% of a study population gives an adequate sampling fraction. According to Dornyei (2007), there are unfortunately no hard and fast rules in setting the optimal sample size; the final answer to the 'how large or small?' question should be the discretion of the researcher considering several broad guidelines. He gave *rules of thumb* as example which he says in the survey research literature a range of between one percent and ten percent of the population is usually mentioned as the magic sampling fraction.

In order to arrive at this sample size, the researcher employed two sampling techniques namely: purposive and convenience sampling techniques. The teenage mothers and their infants (children) were sampled purposively during a post-natal care clinic attendance at the three Reproductive and Child Health (RCH) centers at Zenu, Lebanon and Atadeka. Only teenage mothers who had infants aged between 0-2 years were sampled. Once the mother was selected, the child automatically formed part of the sample. Ball (1990) explained that purposive sampling is used in order to access knowledgeable people thus those who have in-depth knowledge about particular issues may be by virtue of their professional role, power and access to network expertise or experience. These charac-

teristics identified earlier were useful in selecting samples for this study. Though, this technique may breed biases and may not lead to getting the right representation of the population, it was considered very useful since in-depth information was derived from those who were in the position to provide the required data.

Convenience sampling was also employed to select the actual sample for this study. Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher (Saunders, Lewis & Thornhill, 2012). This method relies on data collection from population members who are conveniently available to participate in the study. Convenience was considered because the teenage mothers who were available and could be accessed at the time the researcher was at the centers were included. It was convenient to reach the participants because of proximity to my residence. Only teenage mothers who were ready and willing to provide information about their knowledge of nutrition and child care practices participated. The researcher visited three posts namely; Adonai Maternity Home and Clinic (Lebanon), Dominion Assemblies of God (Zenu) and Passion for Souls Ministries (Atadeka). Attendance times differed from one center to the other. Weighing was attended every Thursday at Adonai Center, fortnightly at Dominion Center, and once every month (third Wednesday in the month) at Passion Center. Though convenience sampling is considered a weak form of sampling because of the inability to generalize findings to a larger population, data collection can be facilitated in short duration of time (Gravetter & Forzano, 2012).

Table 3: Sample of Teenage Mothers and Infants selected from Reproductive and Child Health (RCH) centers at Zenu, Lebanon and Atadeka

Weighing Centre	No. of Teenage Mothers	No. of Infants	Total	%
Adonai Maternity Home and Clinic	10	10	20	25.0
Dominion Assemblies of God, Zenu	17	17	34	42.5
Passion for Souls Ministries, Atadeka	13	13	26	32.5
Total	40	40	80	100

3.5 Data Collection Instruments

Instruments employed for the study were observation checklist and questionnaire. There were 42 items on the questionnaire which were sectioned under three parts. The first part of the questionnaire had 5 items on demographic information of the respondents (age, number of children, marital status, educational level, and occupational status). The second part comprised 28 questions which were used to assess the nutritional knowledge of the teenage mothers. The final part of the questionnaire had 9 items which were intended to take anthropometric measures. The options were formulated in a 5-point Likert scale and respondents were to indicate the extent to which they agreed or disagreed with each item. This scale contains several questions and their value loadings ranged from 4-0 for "strongly agree", "agree", "disagree", "strongly disagree" and "not sure" respectively.

The second instrument used in gathering data for this study was an observation checklist. The observation was done unobtrusively using indicators on the formulated observation checklist. Unobtrusive observation is a method of making observation without the

knowledge of those being observed (Trochim, 2006). This occurs naturally in a research context but enabling the researcher to collect the data without introducing any formal measurement procedure. He added that unobtrusive observation presumably reduces the biases that result from the intrusion of the researcher or measurement instrument. Though the researcher was physically present, there was no need to intrude in the research context since the researcher could observe all that need to be observed. The infants of the teenage mothers (respondents) were observed to ascertain their nutritional status using clinical sign indicators with specifics such as texture and colour of hair, colour of skin, eyes, teeth, gums and abdomen. Categorical data were collected using physical appearance indicators.

3.6 Validity and Reliability of the Instruments

Validity is concerned with the extent to which an instrument measures what it is intended to measure (Tavakol & Dennick, 2011). The research instruments were developed after a review of related literature in the subject area. As regards this study, content and face validity were considered.

Content-related evidence helps to determine if the instrument covers an appropriate or adequate sample of the domain it is supposed to represent or reflect (Fraenkel & Wallen, 2000). For both face and content validity, the research instruments were given to three colleagues of the researcher and senior lecturers from Home Economics, Psychology and Education Departments in the University of Education, Winneba. They read through and made necessary corrections before they were administered for subsequent analysis.

In the views of Eshun and Effrim (2007), reliability concerns itself with the consistency of results of the use of a particular instrument. That is the tendency to obtain the same results if the measure was to be repeated by using the same subjects under same conditions. To ensure reliability of the instruments, they were pre-tested.

Pilot study is a small scale preliminary study conducted in order to evaluate feasibility, time, cost, and improve upon the study design prior to performance of a full-scale study. According to Holloway and Wheeler (2002), pilot studies are used in quantitative studies to get used to the type of data collection. A pre-exercise was done to orientate the researcher to the research project and provide the researcher with insight into the phenomenon. A pilot study ensures that errors can be rectified at little cost. The pilot study was conducted on 12 respondents at Darbem Hospital during a weighing session. All 12 were residents of Ashiaman Community which is another municipality around the area of study. Pilot-test for the data collection instrument (questionnaire) was conducted to help ensure that the items and instructions were clear to participants. This enhanced the researcher's level of confidence and provided the opportunity to:

1. obtain relevant responses from respondents.
2. approach the respondents with sensitivity and open-mindedness.
3. analyse data, which was an opportunity to increase data analysis skills.
4. build in extra precautions to prevent errors in the questionnaire.

The responses from the pilot-test were analyzed to determine the internal consistency of responses to the test items. Due to the inconsistencies that emerged from the respondent's

responses, a few items were reframed for clearer interpretation in the actual study in order to bring out similar responses. These inconsistencies did not affect the reliability as Chronbach alpha reliability coefficient of 0.82 was obtained using the Statistical Package for Social Sciences (SPSS) version 21 software.

The last section of the questionnaire was devoted to measuring the children's physical development to ascertain the nutritional status. The options were labeled and respondents were to tick the option that is applicable. These items (1-9) could be found under section E of the questionnaire.

3.7 Data Collection Procedures

In conducting a study, Creswell (2005) advises researchers to seek and obtain permission from the authorities in charge of the site of the study because it involves a prolonged and extensive data collection. In line with this, an introductory letter was obtained from the Head of Department of Home Economics from the University of Education, Winneba. This was used to obtain permission from the Kpone-Katamanso District Health Directorate to conduct the study. The researcher sought the assistance of the community health nurses who were at the weighing centres to aid in identifying the teenage mothers. Before data collection began, respondents were briefed about the purpose of the study and given assurance about ethical principles such as their anonymity and confidentiality of the information they would provide. These gave the respondents a fair idea of what to expect from the questionnaire and increased the likelihood of them providing honest responses.

The questionnaires were hand-delivered by the researcher to the respondents who are literates to fill. For respondents who could not read and write, the researcher read and interpreted the questions to them using Akan and Ga-Adangbe as medium, and their responses were indicated on the questionnaire by the researcher. Questionnaire was completed within 25 to 30 minutes. Completed questionnaires were collected for analysis.

Data were gathered on demographic characteristics of respondents, maternal nutritional knowledge, food habit and choices, anthropometric measures of infants, infant feeding practices of teenage mothers and clinical signs of their children. Data on anthropometric measures were obtained from the weighing-cards of the infants whose mothers' nutritional knowledge data were sourced. For the data on clinical signs of the infants the researcher observed the infants using an observation checklist.

3.8 Data Analysis Procedures

Descriptive statistics were mainly used for the analysis. The data were put in frequencies and percentages in tables and charts. This aided the description, analysis and interpretation of data gathered pictorially clear. The nutritional knowledge, food habits and choices, infant feeding practices data were analysed using tables and percentages of respondents. The responses were manually scored and later fed into the SPSS version 21 software and analysed to generate frequencies and percentages which were put in tables and figures in the case of quantitative data. Mean scores were also obtained and interpreted accordingly.

The researcher also used the Spearman's correlation analysis to determine the relationships or correlation between the independent variable or predictor (nutritional knowledge; food habits and choices) and the dependent or outcome variable (nutritional status of children). This was done at a significance level of $p \leq .05$ using a confidence interval (C.I) of 95. The interpretation of the results made it possible to make appropriate inferences.

To test the hypothesis one (1), for instance, correlation analysis was done to establish the relationship between the independent variables and the dependent variable. The question is what is the direction and magnitude of the influence of the predictor (mother's nutritional knowledge, food habit and choice) on the dependent variable (nutritional status of child)? To find the degree of influence of the predictor on the dependent variable, correlation coefficients (r) were calculated for the relationship between dependent variable and the independent variables. Table 18 contains the correlation matrix. The following values of correlation interpretations suggested by Cohen, West, and Aiken (2003) were used as guidelines for the interpretation of the correlation results:

Correlation coefficient (r)	Interpretation
$r = .10$ to $.29$ or $r = -.10$ to $-.29$	Very Weak.
$r = .30$ to $.49$ or $r = -.30$ to $-.49$	Weak.
$r = .50$ to 1.0 or $r = -.50$ to -1.0	Strong.

3.9 Ethical Considerations

Babbie (2007) defined ethical issues as the general permission shared by researchers about what is proper and improper in the conduct of scientific inquiry. These include

seeking permission, voluntary participation, no harm to participants, informed consent, anonymity and confidentiality (Punch, 2009). As a way of dealing with ethical issues in this study, the teenage mothers were allowed to choose to participate or not in the research out of their own volition after receiving full information about the study.

Confidentiality was one of the obligations of the researcher; the teenage mothers were assured that any response they provided was strictly going to be used for academic purpose and not otherwise. Hence, they were asked not to indicate their names on any portion of the questionnaire. The researcher did not harm any of the respondents in any way for example, embarrassments.



CHAPTER FOUR

RESULTS

4.0 Overview

This study investigated the relationship between nutrition knowledge of teenage mothers and the nutritional status of their children in Zenu and its environs. The results were organized under six main sections overlying the two instruments used:

1. Demographic data of the teenage mothers
2. Maternal nutritional knowledge
3. Food choices and Habits
4. Infant feeding practices
5. Anthropometric measures
6. Clinical signs of the children.

4.1 Demographic Data of Respondents

Section A of the instrument asked respondents to provide information relating to their bio-data comprising age, educational level, occupational status, number of children.

Tables 4 – 8 present a summary of these responses

Table 4: Age of Respondents

Age (Yrs)	Frequency	Percentage (%)
12 – 14	3	7.5
15 – 17	9	22.5
18 – 19	28	70.0
Total	40	100

Table 4 shows that 7.5% of respondents were within 12-14 years, 22.5% were within ages 15-17 and 70% were within the ages of 18-19 years. It could be concluded from this result that the majority (92.5%) of the respondents were 15 years old and above.

Table 5: Number of Children of Respondents

Number of Children	Frequency	Percentage (%)
1	25	62.5
2	14	35.0
3	1	2/5
4	0	0
Total	40	100

Table 5 showed that 62.5% of respondents had only one child, 35% had two (2) children and only 2.5% of respondents had three (3) children. No teenage mother had four (4) children.

Table 6: Respondents' Marital Status

Marital Status	Frequency	Percentage (%)
Single	15	37.5
Married	25	62.5
Divorced	0	0
Total	40	100

Table 6 indicates that 37.5% of these respondents were single mothers, whereas the majority (62.5%) was married. None of the respondents was divorced.

Table 7: Education Level of Respondents

Educational Level	Frequency	Percentage (%)
No Education	1	2.5
Lower Primary	4	10.0
Upper Primary	4	10.0
Junior High	26	65.0
Senior High	2	5.0
Tertiary	3	7.5
Total	40	100

Table 7 illustrates that only 1 respondent had no education, 10% had lower primary education (from basic 1 to basic 3), 10% had upper primary education (from basic 4 to basic 6), 65% of respondents had junior high education, and only 12.5% had above Junior

High Education. It is evident from the result that the majority (65%) of the teenage mothers had junior high school education.

Table 8: Occupational Status of Respondents

Occupational Status	Frequency	Percentage (%)
Employed	16	40
Unemployed	24	60
Total	40	100

Table 8 indicates that 40% of the respondents had employment, while 60% had no employment.

4.2. Nutritional Knowledge of the Respondents

To stick to the real intent of the study, each of the objectives was carefully analysed for accurate interpretations and conclusion. This second section of the questionnaire was made up of 9 items which were used to assess the nutritional knowledge of the teenage mothers. The options were formulated in a 5-point Likert scale and respondents were to indicate the extent to which they agree or disagree with an item.

Tables 9: Mothers Nutritional Knowledge

Statement	n = (40)				
	A F(%)	D F(%)	M	SD	Interpre- tation
1. In food grouping, there are 6 different kinds of nutrient for every child.	6(15.0)	34(85.0)	.150	.362	Low
2. The right meal for a child in the morning should be any warm liquid meal.	5(12.5)	35(85.5)	.875	.335	Low
3. If my child skips breakfast, it will have an effect on its well-being.	24(60.0)	16(40.0)	.4000	.496	Low
4. A well balanced diet should consist of vitamins, fat and oils, carbohydrates, proteins and minerals	31(77.5)	9(22.5)	.225	.423	Low
5. The purpose of including protein in my child's meal is to build its muscles and body.	38(95.0)	2(5.0)	.050	.220	Low
6. The purpose of including vitamins and minerals in child's meal is to protect it against infections.	23(57.5)	17(42.5)	.425	.521	Low
7. The purpose of including carbohydrates in child's meal is to provide energy	31(77.5)	9(22.5)	.225	.423	Low
8. The purpose of including fruits and vegetables in child's diet is to provide nutrients	23(57.5)	17(42.5)	.425	.501	Low
9. The purpose of including fats and oil in child's diet is to build its muscles	6(15.0)	34(85.0)	.850	.362	Low
Total			3.525	.141	Moderate

Key: **A** –Agree = 1; **D** –Disagree = 0; F = Frequency; % = Percentage; M = Mean; SD = Standard Deviation

Note: The figures in parentheses are in percentage.

The following mean (M) values were used as guideline for the interpretation of the nutritional knowledge levels of the respondents:

$M \leq 2.90$	Low.
$M = 3.00$ to 3.50	Moderate.
$M \geq 3.60$	High.

Table 9 presents data on nutritional knowledge of respondents. The data (responses) were further collapsed into two categories: agree and disagree. This was done in order to facilitate the interpretation of the results. The result indicates an overall mean ($M= 3.525$) and a standard deviation ($SD= 1.413$). The detailed results of individual items which are compared with the overall mean are presented below.

More than half (85%) of the respondents asserted that there are six food groups, whereas 15% disagreed. This result means that the majority of them had a low level of knowledge of the actual number of food nutrients ($M= .150$; $SD= .362$). Arguably, there are five kinds of food nutrients even though there are six food groups as espoused by Adigbo and Maddah (2011).

Similarly, 85.5% of the respondents agreed while 12.5% disagreed with the statement that the right meal for a child in the morning should be warm. The majority of them had a low level of knowledge of the right temperature of meal for infants in the morning ($M= .875$; $SD= .335$). Majority (60%) of the respondents agreed, whereas 40% disagreed with the statement that when babies skip breakfast, it would have a negative effect on them ($M= .4000$; $SD= .496$). This result means that a significant number of the mothers had a low knowledge of the negative effect skipping breakfast.

With regards to a well-balanced diet, it should consist of vitamins, fat and oils, carbohydrates, proteins and minerals as admitted by 77.5% of the respondents. Conversely, 22.5% disagreed with the statement. This result signifies a low level of knowledge of the respondents on this issue ($M = .225$; $SD = .423$). Also, 95% of the respondents confirmed while 5% disagreed that the purpose of including protein in child's meal is to build its muscles and body ($M = .050$; $SD = .221$). This result signifies a low level of knowledge.

In terms of the purpose of including vitamins and minerals in child's meal is to protect it against infections, 57.5% consented but 42.5% disagreed with the statement ($M = .425$; $SD = .521$). This result is indicative of a low level of knowledge. Moreover, 77.5% of the respondents agreed while 22.5% disagreed with the statement that the purpose of including carbohydrates in food is to provide energy ($M = .225$; $SD = .423$). This result is indicative of a low level of knowledge.

A large number of the respondents (57.5%) consented to the item that the purpose of including fruits and vegetables in child's diet is to provide nutrient, whereas 42.5% disagreed ($M = .425$; $SD = .501$). This result is indicative of a low level of knowledge. Lastly, 15% agreed with the item that the purpose of including fats and oils in child's diet is to build its muscles, but 85% disagreed ($M = .425$; $SD = .501$). This result signifies a low level of knowledge. It could be concluded from the result of this study that most of the respondents had a low level of nutritional knowledge since individual mean scores were below the overall mean of 3.525.

4.3 Respondents' Food Habits and Choices

The object of these questions was to explore the respondents' food habit and choices. Items 1 – 10 in Section C of the questionnaire covered all. The respondents were to indicate the extent to which they agreed or disagreed with an item on a 5 – point Likert scale. Their responses are presented in Table 10.

Table 10: Respondents' Food Habits and Choices

Statement	n = (40)			
	A F(%)	D F(%)	M	SD
1. I feed my child more than thrice in a day.	32(80.0)	8(20.0)	3.275	.905
2. My child's breakfast is always my greatest priority among all her meals.	38(95.0)	2(5.0)	3.700	.723
3. Most of the meals taken by my child is prepared at home.	26(65.0)	14(35.0)	2.800	.106
4. Apart from the regular food prepared at home, my child is given additional supplements.	17(42.5)	23(57.5)	2.625	.140
5. The kind of foods my child takes are usually based on my financial strength rather than nutritional values.	34(85.0)	6(15.0)	1.425	.873
6. Personally, I do not think that the choices of nutrients play a significant role in child's growth and development	8(20.0)	32(80.0)	1.650	.149
7. Sweets such as candies and chocolates form part of my child's dietary planning.	38(95.0)	2(5.0)	3.000	.110
8. I do not think that snacking is important.	26 (65.0)	14(35.0)	2.025	.999
9. The only time I give fruits to my child is during sickness.	18(45.0)	22(55.0)	.275	1.235
10. I ensure that my child drinks a lot of well treated water	38(95.0)	2(5.0)	3.375	.925

Key: A –Agree = 1; D –Disagree = 0; F = Frequency; % = Percentage; M = Mean;

SD = Standard Deviation

Note: The figures in parentheses are in percentage.

The data in Table 10 gives information on the food habits and choices of the respondents. Most (80%) of respondents fed their children more than thrice in a day, 20% either fed less or more times ($M = .80$; $SD = .405$). About breakfast being the greatest priority meals for the respondents, 95% admitted and only 5% disagreed ($M = .95$; $SD = .221$). Majority (65%) of them prepared their children meals at home whereas 35% of them obtained from food vendors ($M = .65$; $SD = .483$).

Similarly, 42.5% of respondents agreed giving additional food supplements to their children, but 57.5% disagreed ($M = .42$; $SD = .501$). As to whether the foods respondents give their children are dependent on their financial strength or nutritive values, 85% accepted on financial strength while 15% disagreed ($M = .85$; $SD = .362$). Also, 20% of the respondents did not think that nutrients play a significant role in child's growth and development, but 80% disagreed with that assertion ($M = .20$; $SD = .405$).

Almost all respondents (95%) accepted they include candies and chocolates when planning their children meals, but 5% disagreed ($M = .95$; $SD = .221$). Furthermore, 65% did not think snacking is important whereas 35% gives snacks to their children ($M = .65$; $SD = .483$). Respondents who gave fruits to their children only when they are sick were 45%, and those who gave always irrespective of the health condition was 55% ($M = .45$; $SD = .504$). Lastly, 95% of respondents ensured drinking of well treated water, and 5% disagreed with the practice ($M = .92$; $SD = .267$).

4.4: Infant Feeding Practices of Respondents

The fourth part of the questionnaire had 9 items which sought to investigate the infants feeding practices of respondents in the area to establish whether teenage mothers have best practices when it comes to feeding their infants. Table 11 presents a summary of these responses.

Table 11: Infant Feeding Practices of Respondents

Statement	n = (40)			
	A F(%)	D F(%)	M	SD
Exclusive breastfeeding	17(42.5)	23(57.5)	2.250	1.480
Breastfeeding immediately after birth	31(77.5)	9(22.5)	3.025	1.310
Give thick yellowish breast milk	18(45.0)	22(55.0)	2.500	1.552
Use proper breastfeeding position	26(65.0)	14(35.0)	2.150	0.863
Give complementary foods	33(82.5)	7(17.5)	3.200	1.245
Give solid diet earlier	26(65.0)	14(35.0)	2.300	1.453
Never gave red meat	21(52.5)	19(47.5)	2.500	1.395
Include poultry products in diet	26(65.0)	14(35.0)	2.500	1.320
Child fed only when he/she cries	9(22.5)	31(77.5)	3.075	1.163

Key: A –Agree = 1; D –Disagree = 0; F = Frequency; % = Percentage; M = Mean; SD = Standard Deviation

Note: The figures in parentheses are in percentage.

The information from the Table 11 shows that, 42.5% of respondents practiced exclusive breastfeeding for the first six (6) month of their child's life, but 57.5% did not (M= 2.250; SD= 1.480). Respondents who put their babies to breast immediately after birth were 77.5%, but 22.5% did not (M= 3.025; SD= 1.310). Some (45%) of them admitted they did not give colostrum to their babies, but 55% did it (M= 2.500; SD= 1.552).

Also, 65% of respondents did not place themselves in any position when breastfeeding, but 35% did it (M= 2.150; SD= 0.863). With respect to the usage of complementary foods alongside breastfeeding, 82.5% asserted, and 17.5% disagreed with the statement (M= 3.200; SD= 1.244). Similarly, 65% of respondents started giving solid food earlier than was advised whereas 35% did it after 6 months (M= 2.300; SD= 1.453).

Teenage mothers who did not include red meat in the diet of their children were 52.5%, but 47.5% did it (M= 2.500; SD= 1.395). Furthermore, respondents were asked to indicate whether or not they gave poultry products to their babies, 65% of respondents confirmed, while 35% disagreed (M= 2.500; SD= 1.320). Regarding when a child is fed, 22.5% indicated that their babies are only fed when they begin to cry, 77.5 % suggested they do not wait for baby cry before feeding (M= 3.075; SD= 1.163).

4.5 Anthropometric Measurement of the Children

Table 12 gives a summary of the nutritional status of the children. The following z-score values, based the WHO (2016) standard of assessing the nutritional status of children under five (5) years, were used as guideline for the interpretation of the nutritional status of the children:

z-score = 0	Normal.
z-score \geq -1	underweight, wasting, stunting
z-score \geq 1.	Overweight, obese

Table 12: Nutritional Status of the Children

Indicator	Frequency	Percent	n = (40)	
			M	SD
1. Weight for Age z-score				
Normal	15	37.5	1.00	.000
Mild underweight	14	35.0	.36	.497
Moderate underweight	6	15.0	.00	.000
Severe underweight	5	12.5	.00	.000
2. Height for Age z-score				
Normal	8	20.0	1.00	.000
Mild stunting	6	15.0	1.00	.000
Moderate stunting	5	12.5	1.00	.000
Severe stunting	21	52.5	.05	.218
3. Weight for Height z-score				
Normal	30	75.0	.67	.497
Mild wasting	3	7.5	.00	.000
Moderate wasting	2	5.0	.00	.000
Severe wasting	5	12.5	.00	.000
Total			.50	.506

Key: M = Mean; SD = Standard Deviation

Table 12 presents the nutritional status of infants of the respondents. Anthropometric measurements were done to obtain the following indicators: weight-for-height, height-for-age and weight-for-height. These were categorized into z-score values based on the WHO (2016) standard of assessing the nutritional status of children under five (5) years.

With regard to the weight-for-age indicator; 15 (37.5%) children were classified as normal, 14 (35.0%) children were mildly or slightly underweight, 6 (15.0%) were moderately weight and 5 (12.5%) were severely underweight. It could be concluded from the result that the majority (62.5%) of children of the respondents were underweight. The z-score distribution for height-for-age indicator reveals that 8 (20.0%) children were normal, 6 (15.0%) children were slightly stunted, 5 (12.5%) were moderately stunted and 21 (52.5%) were severely stunted. The result shows that the majority (80%) of children of the respondents were stunted. It could also be concluded from this result that all the children fell below the standard z-score length or height for infants from birth to two years, which ranges from 45 to 95cm as noted by the World Health Organisation (2011).

The z-score distribution for weight-for-height indicator shows that 30 (75.0%) children were normal, 3 (7.5%) children were classified into mild wasting, 2 (5.0%) were moderately wasting and 5 (12.5%) were severely wasting. The result means that only a few (25%) of children of the respondents experienced wasting. It could be concluded from the results that all the children fell within the standard z-score weight for infants from birth to two years, which ranges from 2 to 17kg as noted by the World Health Organisation (2011).

Table 13: Respondents' Response on Cutting of First Teeth by Child

Variable	(n = 40)	
	F	%
Age (months) of cutting first teeth		
1-3	7	17.5
4-6	15	37.5
7-9	6	15.0
10-12	4	10.0
I can't remember	8	20.0
Number of teeth		
1-2	7	17.5
3-4	10	25.0
5-6	4	10.0
7-8	1	2.5
9-10	3	7.5
11 & above	5	12.5
No teeth	10	25.0

Key: F = Frequency; % = Percentage

Table 13 shows response on development of teeth by the children. Seven (17.5%) children developed their first tooth when they were 1-3 months old. Also, 15 (37.5%) developed their first tooth when they were 4-6 months old. Six (15%) children had their first tooth when they were 7-9 months old, whereas 4(10%) of them developed their first tooth when they were 10-12 months old. Eight (20%) mothers could not recall the age in month when their children developed their first tooth.

As regards the number of teeth developed by the children, 7 (17.5%) had 1-2 teeth and 10 (25%) had 3-4 teeth. Also, 4 (10%) children had developed 5-6 teeth, whereas 1 (2.5%) had 7-8 teeth. Three (7.5%) children had between 9 and 10 teeth, while 5 (12.5%) had 11 or more teeth. Ten (25%) children had not yet developed any teeth.

Table 14: Respondents' Response on Age of Crawling and Walking by Child

Variable	F	(n = 40)
		%
Age (months) at which child started crawling		
4-5	11	27.5
6-7	10	25
8-9	5	12.5
10-11	1	2.5
12-13	4	10
Not yet	9	22.5
Age (months) at which child started walking		
7-8	2	5
9-10	4	10
11-12	4	10
13-14	0	0
15-16	1	2.5
17-18	0	0
19-20	29	72.5

Key: F = Frequency; % = Percentage

Table 14 presents results of the age which the children started to crawl and walk. Eleven (27.5%) children started crawling at age 4-5 months, and 10 (25%) crawled when they were 6-7 months old. Also, 5 (12.5%) crawled when they were 8-9 months old, and 1 (2.5%) child crawled at age 10 months. Four (10%) children crawled when they were 12-13 months old, whereas 9 (22.5%) were yet to start crawling.

As regards the age at which the children started to walk, 2 (5%) started walking at age 7-8 months, 4 (10%) walked when they were 9-10 months old and 4 (10%) walked at age 11-12 months. Only 1 (2.5%) child started walking when he/she was 15-16 months old. The majority (29) which represents 72.5% of the children started walking when they were 19-20 months old.

Table 15: Mother's Knowledge of the Chart in a Child's Weighing Card and its Indicators

Indicator	Frequency	Percent (%)
Charts shows baby's growth	12	30
Chart means nothing	4	10
Chart shows mother's attendance	24	60
Total	40	100

Table 15 gives responses on mother's knowledge of the chart and its indicators in their children's weighing card. A small number (12) which represents 30% of the mothers were aware that the chart indicates the growth pattern of their children. The chart meant nothing to 4 (10%) mothers. A large number (24) which represents 60% of the mothers had the knowledge that the chart shows mother's attendance. It could be concluded from this result that majority (70%) of the mothers had inadequate knowledge of the chart in their children's weighing card.

4.6. Clinical Signs of Children

The following tables elaborate more on the outcome of the observation made on the infants of the teenage mothers by the researcher.

Table 16: Clinical Signs of the Children of Respondents

			(n = 40)
Physical indicator	Variable category (clinical sign)	Frequency	%
Eyes	Bitot spot	0	0.0
	Discolouration	3	7.5
	Clear	37	92.5
Eyelids	Swollen	2	5
	Pale	7	17.5
	Normal	31	77.5
Lips	Pale	2	5
	Crack	0	0
	Angular	1	2.5
	Normal	37	92.5
Gums	Bleeding	0	0
	Sore	0	0
	Swollen	1	2.5
	Healthy	39	92.5
Teeth	Cutting	3	7.5
	Discoloured	1	2.5
	Caries	1	2.5
	Normal	35	87.5
Hair	Reddish/silky	2	5
	Sparse	9	22.5
	Silky	9	22.5
	Healthy	20	50
Skin	Rashly	11	27.5
	Scaly	1	2.5
	Dry	5	12.5
	Greasy	5	12.5
	Smooth	18	45.0
Feet	Swollen	0	0
	Cracked sole	0	0
	Flat foot	0	0
	Normal	40	100
Hands	Cracked	0	0
	Pale palm	0	0
	Expanded	0	0
	Normal	40	100
Stomach	Protruded	0	0
	Hard	0	0
	Flat	0	0
	Normal	40	100

Key: **F** = Frequency; **%** = Percentage

Table 16 presents observational data on the clinical signs of the children. The data covered observation of the following parts of the body: eyes, eyelids, lips, gums, teeth, hair, skin, feet, hands and stomach. None (0%) of the children had bitot spot on their eyes, 3 (7.5%) had discoloured eyes and the majority (37) which represents 92.5% of the children had clear eyes. Two (5%) children had swollen eyelids, 7 (17.5%) had pale eyelids and 31 (77.5%) of them had healthy or normal eyelids.

Two (5%) children had pale lips, none (0%) had a cracked lips, 1 (2.5%) had angular lips, and 37 (92.5%) had healthy or normal lips. None (0%) of the children had either a bleeding or sore gum, 1 (2.5%) had swollen gum, whereas 39 (92.5%) had healthy gum. Three (7.5%) children had cutting teeth, 1 (2.5%) had discoloured teeth, 1 (2.5%) dental caries and 35 (87.5%) had healthy teeth. It was also observed that 2 (5%) children had reddish hair, 9 (22.5%) had sparse hair, 9 (22.5%) had silky hair and 20 (50%) had healthy hair. Also, 11 (27.5%) children had rashes on their skin, 1 (2.5%) scaly skin, 5 (12.5%) had dry skin, 5 (12.5%) had greasy skin and 18 (45%) has smooth skin. The observation data revealed that all the children had healthy feet, hands and stomach. It could be concluded from the anthropometry data that over 50% of the infants were healthy. They had healthy eyes, skin, lips, gums, teeth and hair.

4.7 Hypothesis Testing

H₀₁: There is no significant relationship between mothers' nutritional knowledge and nutritional status of children

Table 17: Relationship between Nutrition Knowledge of Respondents and Nutritional Status of Children

		Value	Asymp. Std. Error	Approx. T	Sig.
Interval by Interval	Pearson's R	-0.216	0.178	-1.366	0.180 ^c
N of Valid Cases		40			

* Correlation is significant at the .05 level; $p \leq 0.05$ (2-tailed).

MKN - Mother's Nutritional Knowledge

The relationship between 'mothers nutritional knowledge' and 'nutritional status of child' was [$r = -0.216$, p (two-tailed) = 0.180^c] at 95 % confidence interval (CI). This result shows a non-significant and negative relationship between MKN and the nutritional status of children. Since $p > .05$, the null hypothesis is accepted. It is obvious that there is a non-significant correlation between the independent and the dependent variable. Logically, the significant but negative relationship might be due to the fact that the respondents had poor or low level of nutritional knowledge, and they also lacked economic resource or finance to decide on appropriate diet to buy and eat and feed their children. The nutritional knowledge of the teenage mothers was scored as either correct or incorrect. Each correct response to the statement was given a score of 1 and the total scores were computed. The mean and standard deviation (SD) of the scores were determined and was used to categorize into; good, fair and poor knowledge using the formula; Mean \pm SD. Where Mean + SD = good knowledge and Mean - SD = poor

knowledge. The scores between the good and poor knowledge were regarded as fair knowledge (Fadeyi et. al, 2015).



CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Overview

The study investigated the influence of nutritional knowledge of teenage mothers on the nutritional status of their children. This chapter is devoted to the discussion of the findings of the study. The discussion covers the following thematic areas: demographic data of the teenage mothers, nutritional knowledge of the teenage mothers, food habits and choice of the teenage mothers, infant feeding practices of the teenage mothers and anthropometric measurement of the children.

5.1 Demographic Data of the Respondents and their Infants in Zenu Community and its Environs

The demographic attributes of the respondents included the following: age, level of education, occupational status, marital status and number of children. It emerged from the findings that the majority (92.5%) of the teenage mothers were 15 years and above. This suggests that the rate of teenage pregnancy is high among teenagers who are 15 years and over. This means that they were within the reproductive age group of 15 to 19 years. This findings is in line with the views of Treffers (2003) who posited that the highest rate of teenage pregnancy in the world is in girls aged 15-19 years in Sub-saharan Africa. The high percentage of married teenagers underscores the practice where pregnant teenage girls are forced by their parents to move in with the boys or men who eventually impregnate them.

It also unfolds that from this study that majority (65%) of the respondents ended their education at the junior high school level due to incidental pregnancy and childbirth. This implies most teenagers had a low level of education. It is likely that they also lacked knowledge of the appropriate diets to consume because they would be unable to make appropriate food choices. This could have negative implications on their health and the health of their infant children. This observation supports Caulfield's (2005) assertion that barriers based on knowledge, beliefs, attitudes, lifestyles, pregnancy unplanned or when viewed negatively or both, unmarried, and less-than-high-school education affects women's food choices when they become pregnant. If the majority of the teenage mothers had a low level of education then the implication is that they would be unable to make appropriate food choices for their children. It is also evident from the findings that 60% of the teenage mothers were unemployed. This suggests a high percentage of unemployment. A high level of unemployment level among the teenage mothers could be attributed to the fact that junior high students have little or no employable skills. This observation is parallel to a report which buttresses the high youth unemployment rate which is currently at 48% in Ghana (World Bank report, 2016). The findings also indicate that although all the children were infants aged 0-24 months or 0-2years, a few were toddlers aged 12 and 25 months.

5.2 Nutritional Knowledge of the Respondents in Zenu Community and its

Environ

The first research question sought to gather data on the nutritional knowledge of teenage mothers. The purpose was to determine whether or not teenage mothers have adequate knowledge about basic nutrition. In this regard, a number of indicators were used to

assess the nutritional knowledge of the teenage mothers. Generally, the nutritional knowledge of the mothers was varied across various indicators used in assessing their nutritional knowledge. It was high, moderate and low on the indicators and these are discussed as follows.

Respondents' knowledge of food nutrients was low (F = 15%; M =.150). Knowledge of the right meal for a child in the morning was also low (F = 12.5%; M =.875). Knowledge of the effects of babies skipping breakfast was also low among respondents (F = 60%; M =.4000). Knowledge of the composition of a well-balanced diet was very low among the respondents (F = 77.5%; M =.225). Knowledge of the reason for including protein in children's meal to build muscles and body was very low (F = 95%; M =.050). Knowledge of the reason for including vitamins and minerals in children's meal to protect them against infections was low (F = 57.5%; M =.425). Their knowledge of the reason for including carbohydrates in food to provide energy for the children was low (F = 77.5%; M =.225). Knowledge of the reason for including fruits and vegetables in children's diet to provide nutrient was found to be the low; this recorded a percentage and mean scores of (F = 57.5%; M =.425). The score for the reason for including fats and oils in children's diet to build muscles was quite low (F = 15.0%; M =.850).

It becomes clear from the findings that most of the respondents had a low level of nutritional knowledge of some aspects of basic nutrition. This could have negative implications on what they eat. This is because knowledge of what to eat is likely to influence food purchasing and consumption behaviours. This finding is parallel to the views of Fowles (2008) who found that most women, including mothers have inadequate general nutritional knowledge. In the views of Bennion (1995), information about

nutrition and health concerns of various diets on health might encourage those responsible for food purchasing and preparation to adjust food patterns in accordance with public health suggestions on diet. The result of this study however contradicts the findings of Graves (2011) who found that majority of women, including pregnant women have a fair knowledge on the appropriate diet to eat in order to stay healthy, and those who visit ante-natal clinics are given more advice on healthy food choices. This inadequate nutrition knowledge on some indicators could be linked to one key determinant, that is, inadequate education. Education of mothers is been proven as a key determinant influencing mothers' nutritional knowledge. One of such study on child nutritional status is by Gulati (2010), who found out that an educated mother not only could take better care of the child's nutrition but also help prevent infant morbidity and mortality to a large extent. In fact, maternal education emerged as the single most significant determinant of child mortality.

It becomes clear that the nutritional knowledge of teenage mothers in Zenu community and its environs is statistically not significant ($p > .05$). The findings of this study showed that the nutritional knowledge of the teenage mothers had no significant influence on the nutritional status of their children ($p = 0.180$). As a result, the anthropometric measurements of the children in relation to mothers' nutritional knowledge significantly differed.

The finding that there is no statistically significant relationship between nutritional knowledge of mother and nutritional status of a child is contrary to the findings of Wardlaw and Kessel (2004) who found a greater association between mother's knowledge of nutrition and children's nutritional status. The outcome of this relationship

could be viewed from the anthropometric indicators and clinical signs of the children who formed part of this study.

A high or moderate level of nutritional knowledge of a mother or caregiver can make her adopt actions such as selecting food from all the six food groups; exercising regularly; moderate consumption of fat, sugar and salt, practicing good personal hygiene, taking right medications and food supplement, immunization of children, regular post-natal attendance. When all these are rightly done, it is possible to translate into better nutritional status for both caregivers and their children. However, the opposite of these will have a detrimental effect on the nutritional status of both mother and child. This also implies that fundamental knowledge about nutrition can make tremendous contribution to the level of wellness, as it will help mothers make appropriate food choices that enhance the overall wellbeing and vitality of their children and themselves. Good nutrition is vital to good health throughout life as it boosts our resistance to diseases and stress while promoting healthy cognitive development as indicated by Wardlaw and Smith (2009).

On the other hand, a low level and/or lack of mother's nutritional knowledge have far reaching implication on children according to Paul *et al.* (2004) who explained that lack of nutritional knowledge leads to malnourishment and malnourished children grow at a slower rate than adequately nourished ones, prone to infections and they are more likely to have mental and developmental problems. In the views of Donna (2004), malnutrition adversely affects lung structure, elasticity and function, respiratory muscle mass, strength and endurance, lung immune defense mechanisms and control of breathing. According to Kathleen and Sylvia (2008), when adequate nutrients are consumed to support the body's daily needs and any increased metabolic demands, the person moves into an optimal

nutritional status. This status promotes growth and development, maintains general health, protect them from chronic disease.

5.3 Food Habits and Choices of the Respondents in Zenu Community and its Environs

This theme was intended to find out the food habits and choices of the teenage mothers, and the factors influencing it. Overall, the result signifies that some teenage mothers had positive food habits and choices concerning the kinds of diets diet given to their children. The findings reveal that most of the meals given to the children were prepared at home by the majority of the teenage mothers (F = 65%; M =2.80). Also, feeding the children with breakfast meals (F = 95%; M =3.70) and snack (F = 65%; M =2.02) were priority areas to the teenage mothers. An average number of the teenage mothers fed their children with fruits irrespective of their health condition (F = 52%; M =.275). Similarly, most of them had a positive and healthy habit of giving well-treated drinking water to their children (F = 95%; M =3.37). Feeding children more than thrice in a day was also a priority to the mothers (F = 80%; M =3.27). The children were also given additional food supplements (F = 42.5%; M =2.62). The teenage mothers made these food choices because they had the perception that nutrients play a significant role in a child's growth and development (F = 80%; M =1.65). The children were given based on the financial strength rather nutritional value (F = 85.5%; M =1.42). The children were given sweets such as candies and chocolate as part of respondents' dietary plan (F = 38.0%; M =3.00).

This implies that the teenage mothers considered it necessary to give a variety of foods or meals to their infants so as to maintain optimal growth and development. This observation corroborates the finding of the American Dietetic Association (2002) which

established that, for a pregnant woman, maintaining optimal nutrition through healthful food choices such as fruits, vegetables, dairy products, whole grains and lean protein is ideal. Regrettably, the kinds of diets given to the children were usually based on the financial strength of the mothers rather than nutritional value of the food. Again, the only time fruits were given to the children was when they were sick.

The basis for food choices and habits are mainly depended on economic resources of the mothers as most of them were single mothers and unemployed. Though most of the mothers fed their children regularly based on their culture orientations, the issue remains with whether the children were fed with the required nutrients in their diets. Per the outcome of the analysis, most of the teenage mothers were unemployed and single, and for that matter the choice of food for the children largely depends on the availability of the mothers' economic resources and sole efforts. It emerged from the results that a positive but significant and marginal relationship exists between food habits and choices of mothers and the nutritional status of their children ($p = .000$). This observation is consistent with that of Kathy (2008) who stated that nutrient intake depends on actual food consumption which is influenced by factors such as economic situation, eating behaviour, emotional climate, cultural influences, effects of various diseases on appetite and the ability to consume and absorb adequate nutrients.

5.4 Infant Feeding Practices of the Respondents in Zenu Community and its

Environs

The findings of this study indicate that the practice of exclusive breastfeeding for the first six (6) month was very low among the teenage mothers ($F = 42.5\%$; $M = 2.250$); putting

babies to breast immediately after birth (F = 77.5%; M =2.300); and giving colostrum to babies at birth (F = 50%; M =2.500). It was found that the practice of assuming a good posture when breast feeding, that is, breastfeeding position was also poor among the teenage mothers (F = 35%; M =2.2500).

Notwithstanding these poor infant feeding practices, it emerged from the results that most of the teenage mothers breast fed the children alongside complementary feeding. The frequency and mean distribution of giving complementary foods alongside breastfeeding was (F = 82.5%; M =2.150). Some of the teenage mothers gave solid foods to their children earlier than was advised (F = 65%; M =3.025); inclusion of red meat in the diet of children (F = 47.5%; M =2.500); inclusion of poultry products in the diet of children (F = 65%; M =2.5); and children were fed only when they cried (F = 9%; M =3.075).

The finding of this study is an indication that the teenage mothers feed their children with a variety of foods at any time. This feeding pattern by the teenage mothers could promote the health of their children positively. This result is consistent with the claim by Oniang'o (2003) also indicated that children who consume a variety of foods foster better health.

5.5 Anthropometric Measurement of the Respondents' Children in Zenu

Community and its Environs

Generally, over 60% of children of the respondents were underweight and stunted. This implies that they had poor nutritional status. This could be linked to poor nutritional knowledge, food habits and choices as well as feeding practices of the respondents. The result of this study further shows that 62.5% of the infants were underweight, whereas 80% of them were stunted. This is an indication that they were either undernourished.

However, the majority (80%) of the children fell within the standard z-score weight for infants from birth to two years, which ranges from 2 to 17kg as noted by the World Health Organisation (2011). It was also evident from the result that 57% of the children had showed signs of a good or healthy physical growth status. It could be concluded from the clinical features of the children that they had healthy eyes, eyelids, skin, hair, lips, gums, teeth, gum, eye, eyelids, feet and hands.

Stunting and overweight are the common malnutrition problems among the children. This finding is in line with Burbano *et al.* (2009) who found that stunting and wasting are widespread among children in developing countries. This suggests that they lacked or were deficient of some food nutrients. The children who exhibit signs of a poor physical growth is indicative of stunting and wasting which might be due to undernourishment or overnourishment. There is ample evidence that malnourished children are shorter and lighter than they should be for their age as noted by UNICEF (2001). Other studies by Gillespie and Kadiyata (2004) indicated that children who are stunted are likely to have been exposed to poor nutrition. This result also confirms the observation by UNICEF (2008) that more than a quarter of children younger than five years in developing countries were moderately or severely underweight or stunted. This further supports Nokuthula's (2009) view that there are 226 million children under the age of five in developing countries who suffer from moderate or severe stunting.

CHAPTER SIX

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

6.0 Overview

The purpose of the study was to investigate the nutritional knowledge of teenage mothers and the nutritional status of their children to find out if mothers' nutritional knowledge has any influence on the nutritional status of their children. To arrive at the objectives of this study, 40 teenage mothers were purposively and conveniently sampled for the study. The design adopted for this study was descriptive survey design. Basically, the main instruments used were questionnaire (Cronbach's $\alpha = 0.82$), and observation checklist. Data collected was analyzed using frequency and percentage and these were presented in tables. This chapter presents a summary of the major procedures employed in conducting the study, the findings, conclusions and recommendations based on the findings.

6.1 Summary of Findings

Findings of this study were the following:

The first research question sought to find out the nutritional knowledge of teenage mothers, and its influence on the nutritional status of their children. The findings showed that the nutritional knowledge of the mothers was varied across the various indicators used in assessing their nutritional knowledge. Some of the teenage mothers had a low level of knowledge of some aspects of basic nutrition. It becomes clear that the

nutritional knowledge of teenage mothers in Zenu community and its environs is statistically insignificant. The findings showed that the nutritional knowledge of the teenage mothers had a significant influence on the nutritional status of their children ($p = .039$).

The second research question looked at the food habits and choices of the teenage mothers and its influence on the nutritional status of their children. The study found that some teenage mothers had positive food habits and choices concerning the kinds of diets given to their children. The nutritional status of the children was statistically linked to mothers' food habits and choices ($p = .000$). The basis of their food choices and habits were mainly depended on economic resources as most of them were single mothers and unemployed.

The third research question sought to explore infant feeding practices of the teenage mothers. The findings reveal the practice of exclusive breastfeeding for the first six (6) months was very low among the teenage mothers. It also emerged from the results that most of the teenage mothers breast fed the children alongside complementary feeding.

The fourth research question assessed the nutritional status of children of the teenage mothers. The findings show that over 57% of the children had showed signs of a good or healthy physical growth status. It unfolds from the anthropometric data that the children had healthy weight, eyes, eyelids, skin, hair, lips, gums, teeth, gum, eye, eyelids, feet and hands.

6.2 Conclusions

The following conclusions were drawn based on the findings of this study:

The prevalence of child malnutrition, particularly among infants in the Zenu community and its environs remains unacceptable. The high prevalence of infant malnutrition in the community could be attributed to poverty and low level of nutritional knowledge among the teenage mothers. It is essential for mothers of children to take good care of the diets of the infants by feeding them well on a balanced diet. The study concluded that parents should have adequate knowledge of appropriate diets to give to infants and have appropriate food habits as well as choices.

6.3 Recommendations

The Millennium Development Goal four (MDG 4) seeks to reduce child mortality. Therefore, conscious efforts must be made by all stakeholders to achieve this. As most of the teenage mothers are single parents, without employment and having low education the following suggestive recommendations are prescribed in helping them to improve their nutritional knowledge and dietary practices of the teenage mother. In the light of the findings and the conclusions drawn, the following recommendations are put forward:

- a. It emerged from this study that most of the respondents had a low level of knowledge of some aspects of basic nutrition, while others had a moderate level of nutritional knowledge. Consequently, the nutritional knowledge of the teenage mothers had a significant influence on the nutritional status of their children. Therefore, education on healthy eating at antenatal clinics (ANC) in the community should be well inten-

sified and nursing mothers should be assisted on how to plan a well-balanced diet, including iron-rich foods using the local food ingredients available to them.

- b. Nurses and midwives in the Zenu community and its environs should educate nursing mothers to eat healthy and nutritious food as well as feed their children with balanced diets.
- c. They should encourage them to eat as well as feed their children with foods which contain vitamins and minerals such as fruits examples are, banana, oranges, pineapples and monkey apples (*alasa*) and vegetables with examples as, *kantomire* stew and soup, *ayoyo* soup, and garden egg stew.
- d. A suggested nutritional guide should be developed and presented to the hospital staff.
- e. The community health nurses in the community should give pregnant and nursing mothers lessons on nutrition from time to time, and if possible visit from door to door to educate the people on nutrition so as to reach those who do not attend ANC.
- f. It also came to light from the findings of this study that food habits and choices of the teenage mothers had significant influence on the nutritional status of their children. It also unfolds that most of the teenage mothers could not adopt appropriate dietary habits and practices because of economic constraints and low level of education. In this regard, teenage mothers in the Zenu community and its environs should endeavor to undertake some economic activities to improve on their lives, and feeding practices of their children.

- g. Again, teenage mothers in the Zenu community and its environs must be encouraged to further their education after delivery beyond JHS so that the state of idleness does not entice them into pre-marital sex.
- h. Teenage mothers in the Zenu community and its environs should not be allowed to single handedly take care of their children since this task is an enormous one which negatively affect the larger community in the long run.
- i. The findings of the study reveal the poor practice of exclusive breastfeeding among the teenage mothers. Nurses and midwives in the Zenu community and its environs should intensify education on exclusive breastfeeding to expectant and nursing mothers during antenatal and post-natal clinics as well as during public health education outreach programmes.
- j. Nurses and midwives in the Zenu community and its environs should regularly conduct nutritional surveys, identify nutritional problems of pregnant and nursing mothers, and undertake special nutritional programmes.
- k. Mothers of infants in the Zenu community and its environs should be made aware to eat healthy diets before, during and after conception since it is essential for child growth.
- l. Nurses and midwives in the Zenu community and its environs in conjunction with the Ghana Education Service and school authorities should intensify nutrition education in schools. They should also scale-up nutrition education and counselling during antenatal clinics (ANC) and postnatal clinics.
- m. The findings show that over 57% of the children had showed signs of a good or healthy physical growth status. Nurses and midwives in the Zenu community and

its environs should in conjunction with the Ghana Education Service and school authorities should intensify health intervention programmes such as monthly weighing, deworming, child immunization, fortification of food with iodized salt and vitamin A supplementation which are targeted at children.

6.4 Suggestions for further Study

The objective of the study was the nutritional knowledge of teenage mothers and the nutritional status of their children in Zenu and its environs. Children and teenage mothers are among the vulnerable groups in our societies. A further study should be conducted on the impact of nutritional status of children of teenage mothers in the Zenu community and its environs.

A study can be undertaken with a large sample to generalize the findings. This study should be replicated by other researchers in order to strengthen the foundation for interpreting results. A replication of the study with samples drawn from all the health facilities in the Zenu community and its environs would provide additional insights into issues pertaining to the nutritional practices of pregnant and nursing mothers.

Researchers investigating the feeding practices of pregnant and nursing mothers should conduct such studies among expectant mothers who do not attend any antenatal clinic or hospital. This would limit the level of bias that the research environment could have on the data being generated. Also such studies must cover husbands'/ fathers' roles, recognition and support for pregnant spouses regarding nutritional practices. A comparative study could be done to assess the knowledge and practices of rural and urban teenage mothers.

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APPENDICES

APPENDIX A: INTRODUCTORY LETTER

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HED/A13/VOL.3/58

27th August, 2013

TO WHOM IT MAY CONCERN

MS. FELICIA AKPENE DOGBE

We write to introduce, Ms. Felicia Akpene Dogbe, an M.Phil student with index number (8120100001) of the Department of Home Economics Education, University of Education, Winneba, who is conducting a research titled: **“Nutritional Knowledge of Teenage Mothers and the Nutritional Status of their Children in Zenu and its Environs”**.

We would be very grateful if you could give her the assistance required.

Thank you.

Yours faithfully,

DEPT. OF HOME ECONOMICS EDUCATION
UNIVERSITY OF EDUCATION
MS. OPHELIA QUARTEY
AG. HEAD OF DEPARTMENT

For (13-27-08-2013)

APPENDIX B: QUESTIONNAIRE FOR PARTICIPANTS

Introduction

This research is conducted to assess the influence of nutritional knowledge of teenage mothers on the nutritional status of their children in Zenu and its environs in the Kpone-Katamanso District. I would be very grateful if you could kindly share your time, thoughts and experiences earnestly to contribute to the success of the study. Rest assured that all information given will be treated with utmost confidentiality.

Instruction: Please fill in the needed information by ticking like this (✓) in the appropriate box [] or write down your answer as appropriate to each item as the question or statement may require. Indicate the extent to which you agree or disagree with a statement.

SECTION A: Respondents Demography

1. Age of mother (in years):

- a) 9 -11 [] b) 12 -14 [] c) 15 -17 [] d) 18 - 19 []

2. Number of children:

- a) 1 [] b) 2 [] c) 3 [] d) 4 []

3. Marital status:

- a) Single [] b) Married [] c) Divorced []

4. Educational Background:

- a) Lower Primary [] b) Upper Primary []
c) Junior High [] d) Senior High [] e) Tertiary []

5. Occupation Status:

- a) Employed [] b) Unemployed []

SECTION B: Maternal Nutritional knowledge (MNK)

MNK01 In food grouping, there are 6 different kinds of nutrient for every child.

05 Strongly agree [] 04 Agree [] 03 Not Sure []

02 Disagree [] 01 Strongly Disagree []

MNK02 The right nutrient for a child in the morning should be any warm liquid meal.

05 Strongly agree [] 04 Agree [] 03 Not Sure []

02 Disagree [] 01 Strongly Disagree []

MNK03 If my child skips morning break-fast it will have an effects on it well being.

05 Strongly agree [] 04 Agree [] 03 Not Sure []

02 Disagree [] 01 Strongly Disagree []

MNK04 A well balanced diet should consists of vitamins, mineral, carbohydrates, proteins, fats and oils.

05 Strongly agree [] 04 Agree [] 03 Not Sure []

02 Disagree [] 01 Strongly Disagree []

MNK05. The purpose of including protein in my child's meal is to build its muscles and body.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

MNK06. The purpose of including vitamins and minerals in child's meal is to protect it against infections.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

MNK07 The purpose of including carbohydrates in child's meal is to provide it energy.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

MNK08 The purpose of including fruits and vegetables in child's diet is to provide nutrients vital for health and maintenance of it body.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

MNK09 The purpose of including fats and oil in child's diet is to builds its muscles.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

SECTION C: Food Habit and Choices (FHC)

FHC01 I feed my child more than thrice in a day

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC02 My child's breakfast is always my greatest priority among all other meals.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC03 Most of the meals taken by my child is prepared at home.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC04 Apart from the regular food prepared from home, my child is given additional nutritional supplement.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC05 The kind of diets my child take are usually based on my financial strength rather than nutritional values.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC06 Personally, I do not think that the choices of nutrient play a significant role in child's growth and development.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC07 Sweets such as candice, chocolates and the like do not form part of my child's dietary planning.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC08 I do not think that snacking is too important in the dietary planning for my child.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC09 The only time I give any fruits to my child is when he/she is sick.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

FHC10 I ensure that my child drinks a lot of well treated water in day.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

SECTION D: Infant Feeding Practices (IFP)

IFS01 I practiced exclusive breastfeeding for the first six months for my child's feeding.

05Strongly agree [] 04Agree [] 03Not Sure []
02Disagree [] 01Strongly Disagree []

IFS02 I started breastfeeding my child immediately after birth.

05Strongly agree [] 04Agree [] 03Not Sure []
02Disagree [] 01Strongly Disagree []

IFS03 I did not give the first thick yellowish breast milk (colostrums) to my child.

05Strongly agree [] 04Agree [] 03Not Sure []
02Disagree [] 01Strongly Disagree []

IFS04 Personally, I do not place myself in any particular position when feeding my child.

05Strongly agree [] 04Agree [] 03Not Sure []
02Disagree [] 01Strongly Disagree []

IFS05 I always ensure that complementary foods are use alongside the breastfeeding in my child's dietary plan.

05Strongly agree [] 04Agree [] 03Not Sure []
02Disagree [] 01Strongly Disagree []

IFP06 I started my child with solid diet earlier than what was advised.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

IFP07 In the dietary of my child, I never give red meat such as goat, pork, and beef.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

IFS08 I ensure that my child's diets always contain poultry products such as eggs or chicken.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

IFS09 My child is only fed when it begins to cry.

05 Strongly agree [] 04 Agree [] 03 Not Sure []
02 Disagree [] 01 Strongly Disagree []

SECTION E: Anthropometric Measures (APM)

APM01 Age of your child (in months)...

- a) Less than 1 [] b) 1 - 5 [] c) 6 - 10 []
b) d) 11 - 15 [] e) 16 - 20 [] f) 21 - 25 []

APM02 Sex of the child

- a) Male b) Female

APM03 Weight of the child, between...

- a) 2 – 4 kg b) 5 – 7 kg c) 8 – 10 kg d) 11 – 13 kg
e) 14 – 16 kg f) 17 – 19 kg g) 20 -22 kg i) + 22 kg

APM04 Length of the child (in cm)

- a) 30 – 40 b) 41 – 51 c) 52 – 62 d) 63 – 73

APM 05 Age your child developed the first tooth (in months)...

- a) 1 – 3 b) 4 – 6 c) 7 – 9 d) 10 – 12 e) None

APM06 If any teeth, how many in your child's mouth

- a) 1 - 2 b) 3 - 4 c) 5 - 6 d) 7 - 8 e) 9 - 10 f) 11 and above

APM07 Age your child started crawling (in months)...

- 4- 5 b) 6-7 c) 8 - 9 d) 10- 11 e) 12 – 13 f) Not yet

APM08 Age your child begun to walk (in months)...

- a) 7-8 b) 9 – 10 c) 11 – 12 d) 13 – 14
e) 15 – 16 f) 17 – 18 g) 19 – 20 h) Not yet

APM09 The chart in my child's weighing card tells me...

- a) My baby's growth b) Nothing c) Mother's attendance

APPENDIX C

OBSERVATIONAL CHECKLIST

Instruction: *Tick where applicable*

CLINICAL SIGNS

01. Eyes

- a) Bitot spots [] b) Clear [] c) Discolouration [] d) Others.....

02. Eyelids

- a) Normal [] b) Swollen [] c) Pale []

03. Lips

- a) Angular [] b) Crack [] c) Pale [] d) Normal []

04. Gums

- a) Swollen [] b) Bleeding [] c) Sore [] d) Healthy []

05. Teeth

- a) Carries [] b) Discoloured [] c) Cutting [] d) Normal []

06. Hair

- a) Silky [] b) Reddish [] c) Healthy [] d) Sparse []

07. Skin

- a) Dry [] b) Scaly [] c) Smooth [] d) Rashy [] e) Greasy []

08. Feet

- a) Cracked sole [] b) Flat foot [] c) Swollen [] d) Normal []

09. Hands

- a) Expanded [] b) Pale palm [] c) Normal [] d) Cracked []

10. Stomach

- a) Protruded []