

UNIVERSITY OF EDUCATION, WINNEBA
COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

**COMPLEMENTARY FEEDING PRACTICES AMONG MOTHERS OF
CHILDREN AGED 6 - 24 MONTHS: A CASE STUDY OF ATWIMA
KWANWOMA DISTRICT IN THE ASHANTI REGION OF GHANA.**



GIFTY SARPONG

FEBRUARY, 2022

UNIVERSITY OF EDUCATION, WINNEBA
COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

**COMPLEMENTARY FEEDING PRACTICES AMONG MOTHERS OF
CHILDREN AGED 6 - 24 MONTHS: A CASE STUDY OF ATWIMA
KWANWOMA DISTRICT IN THE ASHANTI REGION OF GHANA.**



A Dissertation in the Department of HOSPITALITY AND TOURISM EDUCATION
Faculty of VOCATIONAL AND TECHNICAL EDUCATION, submitted to the
School of Graduate Studies, University of Education, Winneba in partial fulfillment of
the requirement for the award of the Master of Technology Education (Catering and
Hospitality Education) degree.

FEBRUARY, 2022

DECLARATION

STUDENT'S DECLARATION

I, GIFTY SARPONG, declare that this Dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledge, is entirely my original work, and that to the best of my knowledge it does not contain any material which is formerly published or written by any other persons except where due reference is written.

SIGNATURE:.....

DATE:.....



SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of Dissertation as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: DR. GILBERT OWIAH SAMPSON

SIGNATURE:.....

DATE:.....

ACKNOWLEDGEMENT

I give thanks to the Almighty God for his guidance and the ability He gave me to carry out this programme. My sincere gratitude goes to my supervisor; Dr. Gilbert Owiah Sampson who in his busy schedules patiently supervise my work. I also thank my family and all the lecturers at the department for their massive support.

My appreciation also goes to my roommates and also to the mothers that visits health center in the Atwima Kwanwoma District in the Ashanti Region of Ghana for their wonderful encouragement and co-operation. May the good God richly bless and replenish you all. Amen.



DEDICATION

I dedicate this work to my husband, Mr. Godlove Oduro Appiagyei



TABLE OF CONTENTS

Content	Page
DECLARATION	ii
ACKNOWLEDGEMENT	iii
DEDICATION	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES.....	ix
ABSTRACT	x
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background to the Study	1
1.2 Statement of the Problem	4
1.3 Main objective	5
1.3.1 Specific Objective	5
1.4 Research Questions.....	6
1.5 Significance of the Study.....	6
1.6 Scope of the study.....	7
1.7 Organization of the study	7
CHAPTER TWO.....	9
LITERATURE REVIEW.....	9
2.1 Complementary Feeding.....	9
2.1.1 Duration of exclusive breastfeeding and age of introduction of complementary foods.....	11
2.1.2 Timely introduction of complementary foods.....	14
2.1.3 Maintenance of breastfeeding	15

2.1.4	Responsive feeding	17
2.1.5	Safe preparation and storage of complementary foods	18
2.1.6	Amount of complementary food needed	19
2.1.7	Consequence of poor complementary feeding practices.....	20
2.1.8	Minimum meal frequency and energy density	21
2.1.9	Dietary Diversity and nutritional content of complementary foods.....	23
2.1.10	Minimum Acceptable diet	28
2.2	Complementary feeding practices among mothers of children	29
2.3	Factors influencing complementary feeding practices	33
2.3.1	Socio-demographic factors of mothers.....	36
2.3.2	Child characteristics	37
2.3.3	Maternal obstetric related factors	37
2.3.4	Household characteristics.....	38
CHAPTER THREE.....		40
METHODOLOGY		40
3.1	Study Area	40
3.2	Research Design	41
3.3	Target Population	42
3.4	Sample Size and Sampling Technique	42
3.5	Data Collection Instruments	44
3.6	Validity of the Instrument.....	45
3.7	Reliability of the Instruments	45
3.8	Pilot Study	46
3.9	Data collection procedure	46
3.10	Data analysis.....	46

CHAPTER FOUR.....	47
RESULTS AND DISCUSSION	47
4.1 Response Rate	47
4.2 Background Information of Respondents	48
4.3 Complementary feeding practice among mothers of children.....	55
4.4.1 Socioeconomic status of mothers.....	60
4.4.2 Knowledge level of mothers	61
4.4.3 Influence of postnatal care and the social network	62
4.4.4 Cultural beliefs	63
4.5 Determinants for early introduction of complementary feeding	64
CHAPTER FIVE.....	69
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	69
5.1 Findings of the Study.....	69
5.1.1 Complementary feeding practice among mothers of children	69
5.1.2 Factors influencing optimal complementary feeding practices.....	69
5.1.2 Determinants for early introduction of complementary feeding	70
5.2 Conclusions	70
5.3 Recommendations	71
5.5 Recommendations for Further Studies	72
REFERENCES.....	73

LIST OF TABLES

Table	Page
Table 4. 1: Age category of Respondents	48
Table 4. 2: Educational level of Respondents	49
Table 4. 3: Primary Occupation of Respondents.....	49
Table 4. 4: Responses on complementary feeding practice	55
Table 4. 5: Factors influencing optimal complementary feeding practices	59
Table 4. 6: Intended duration of Respondents.....	64
Table 4. 7: Responses on determinants of complementary feeding.....	66



LIST OF FIGURES

Figure	Page
Figure 4. 1: ANC of Respondents Current Child Pregnancy	50
Figure 4. 2: PNC of Respondents after Delivery of Current Child	51
Figure 4. 3: Complementary feeding age of Respondents child	52
Figure 4. 4: Number of times child is feed on Complementary food per day	53
Figure 4. 5: Type of Complementary Food given to Child	54



ABSTRACT

Malnutrition and poor complementary feeding are more predominant in many Ghanaian communities. Complementary feeding if not practiced appropriately at this age can make the child more prone to infections, reduce their illness recovery rates and as well cause high mortality in children. Hence, this study was aimed at assessing the complementary feeding practices among mothers of children aged 6 - 24 months at Atwima Kwanwoma District in the Ashanti Region of Ghana. Descriptive survey was adopted for this study. The study population consisted of all mothers who had children between the ages of 6-24 months and visited the district health center in the Atwima Kwanwoma District. Purposive sampling was used in selecting 280 mothers of children aged 6 - 24 months for the study. The study showed good complementary feeding practices among the mothers that visits health center in the Atwima Kwanwoma District in timely introducing solid, semi-solid or soft foods, using appropriate method of feeding during illness, adequacy of energy in complementary feeds. According to the showed that socioeconomic factors, mothers knowledge level, postnatal care and the social network, and cultural practices influences mothers complementary feeding practice. It was evident that enriching or making the child's food with more energy, improving the intelligence of the child, provision of essential nutrients for continued growth and development, and eliminating the risk causing deficiencies and malnutrition of the child are the key determinants of early introduction of complementary feeding. It was concluded that mothers of children aged 6 - 24 months practice good complementary feeding. It was recommended that government and nongovernment organizations should increase the various health-related activities to grow mothers' awareness and practice regarding complementary feeding.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potentials. It is well recognized that the period birth to two years of age is a "critical window" for the promotion of optimal growth, health and behavioral development. Longitudinal studies have consistently shown that this is the peak age for growth faltering, deficiencies of certain micronutrients and common childhood illnesses such as diarrhea. After a child reaches 2 years of age, it is very difficult to reverse stunting that has occurred earlier (Martorell et al., 1994).

Malnutrition can be defined as insufficient, excessive or imbalanced consumption of nutrients like protein, carbohydrates and vitamins (WHO, 2008). Malnutrition is the gravest single threat to global public health. The effects of poor nutrition are mostly observed in infants and young children who bear the brunt of the onset of malnutrition and suffer the highest risk of disability and death associated with it. In 2001, 50-70% of the burden of diarrhea diseases, measles, malaria and lower respiratory tract infections was attributed to under nutrition and due to lack of proper practice of complementary feeding (WHO, 2002). When breast milk is no longer enough to meet the nutritional needs of the infant, complementary foods should be added to the diet of the child. The transition from exclusive breastfeeding to family foods is referred to as complementary feeding. If appropriate feeding is not conducted at the early life, can lead to poor child growth and some of the effects if acquired at this age are irreversible to change. An effect such as stunting if acquired at this age is irreversible by compensatory feeding at later

date. WHO estimates that, two out of five children are stunted in low-income countries (WHO, 2012).

At 4 – 6 months of age, the nerves and muscles in the mouth develop so that the infant can bite and chew. Hence, mothers can initiate feeding of fruit and vegetable purees, porridges, and mashed foods which are easier for infants to take it through the tongue. They start to make up and down munching movements, the teething process begins and they also like to put things in their mouth. At this age, the infants are interested in new and different tastes. This also indicates that the infant's digestive system is also mature enough to introduce different foods which can be digested easily. The signs that indicate when an infant is ready and mature enough to begin complementary foods with a spoon are, Staying in a sitting position, alone or with support, Holding the head steady and straight; Coordinating eyes, hands, and mouth to look at the food; Being able to swallow solid foods (Neha Saini, 2018). Complementary feeding should be timely such as, start receiving foods in addition to breast milk from 6 months onwards. It should be adequate such as, the complementary foods should be given in amounts as well as frequency and using a variety of foods to cover the nutritional needs of the growing child while maintaining breastfeeding (WHO, 2010).

Foods should be prepared and given in a safe manner, meaning that measures should be taken to minimize the risk of contamination with pathogens. The food should also be given in a way that is appropriate, meaning that foods are of appropriate texture for the age of the child and applying responsive feeding following the principles of psychosocial care. Adequacy of complementary feeding not only depends on the availability of a variety of foods in the household, but also on the feeding practices of caregivers (Pan American Health Organization, 2001). It has been recommended that, infants receiving complementary foods at six months of age in addition to breast milk,

initially two to three times a day between six to eight months should increase to three or four times daily between 9-11 months and 12-24 months with additional nutritious snacks offered one to two times per day, as desired (WHO, 2000).

Complementary foods if not given at the age of 6 months or if not appropriately given to an infant may however cause the infant's growth to falter (WHO, 2017). Infant and young child feeding (IYCF) is a significant area to improve the survival of children and to improve their development. Optimal nutrition in the first two years of a child's life is very important as it reduces the risk of childhood illness and death and promotes child development (WHO, 2017). Though the Convention on the Rights of the Child indicted that all children are entitled to good health and health services which includes good nutrition, too few children receive diets that meets their minimum requirement for their growth and development in many developing countries (Bégin, 2017). Forty five percent of all childhood deaths yearly are estimated to be related to under nutrition (Black et al., 2011). Although there has been a decline in under nutrition per global estimates, Africa still experiences a surge in child under nutrition in over the past decade (Black et al., 2011). Inadequate amounts and quality of complementary foods, poor feeding practices and increased rates of infection during the first two years of life are direct risk factors for stunting (Bhutta et al., 2013; Danaei et al., 2016).

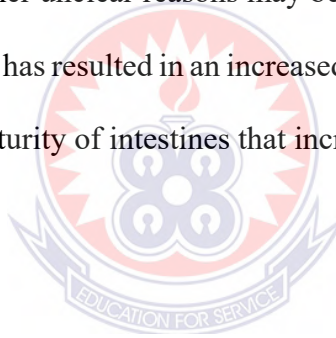
Globally, 155 million children under 5 are estimated to be stunted (too short for age), 52 million are estimated to be wasted (too thin for height), and 41 million are overweight or obese (WHO, 2017). According to WHO/UNICEF/WORLD BANK GROUP, (2017) child malnutrition estimates, about 32 percent of children in Africa are stunted whilst 8 percent are wasting. The South Asia Infant Feeding Research Network (SAIFRN) published a report after analyzing the complementary feeding practices of five South Asian countries: Bangladesh, India, Sri Lanka, Pakistan, and Nepal. The report

stated that approximately half of the world's malnourished children live in South Asia where 41% children are stunted (impaired growth and development), 16% are wasted, and 33% are underweight. Moreover, among the South Asian countries, India has the highest number of stunted children (UNICEF, 2012). The SAIFRN report suggested implementing necessary interventions to improve the complementary feeding practices in this region to reduce the burden of malnutrition (Senerath & Dibley, 2010). In India only 21% children aged between 6 to 24 months receive appropriate complementary feeding (UNICEF, 2016); this contributes to high numbers of stunted children. According to GSS et al., (2015), infant mortality rate in Ghana is 41 deaths per 1,000 live births whilst 19% of children in Ghana are too short for their ages (stunted), 5% have low weights for their heights (wasted), and 11% are underweight. However, too few children receive optimal complementary foods as less than 2 in 10 mothers practice optimal complementary feeding in Ghana. It is therefore very imperative to maintain appropriate complementary feeding practices to help decrease malnutrition, infant mortality and morbidity and increase optimal growth in developing countries like Ghana.

1.2 Statement of the Problem

It is well known that the first two years are very critical in the lives of children since they are predisposed to all forms of malnutrition at this age. Complementary feeding if not practiced appropriately at this age can make the child more prone to infections, reduce their illness recovery rates and as well cause high mortality in children. These practices include timely introduction of complementary foods as well provision of frequent and consistent nutrition dense foods to children. Malnutrition increases sharply especially from 6 months in infants, and this is the period when complementary foods are introduced (Davis,2001). Nutrition deficits acquired during this period is difficult to

make up for later in childhood, leading to poor academic performance, decreased productivity and impaired academic and social development (Bhutta et al., 2013). According to CPS/DC/HC (1998), giving complementary foods too early could lead to malnutrition and other problems. If given too early, the infant may not be ready to digest food properly and may reduce the intake of breast milk thereby losing out an appropriate intake for its growth. Complementary feeding for infants is a common practice in Atwima Kwanwoma District which has led to several health problems related to new born babies. Most mothers claim to introduce complementary feeding early for no tangible reasons, while some mothers claim alleviation of colic pains, some also claim they are not aware of the benefits of breastfeeding or the fact that breast milk is critically required during the first six (6) months. Other unclear reasons may be the work load of the mothers and their nutritional status. This has resulted in an increased risk of diarrhea and food allergies in the area due to the immaturity of intestines that increases the risk of malnutrition.



1.3 Main objective

The main objective of the study was to assess the complementary feeding practices among mothers of children aged 6 - 24 months at Atwima Kwanwoma District in the Ashanti Region of Ghana

1.3.1 Specific Objective

- To assess the complementary feeding practices among mothers of children age 6-24 months
- To identify the factors influencing optimal complementary feeding practices among mothers of children aged 6-24 months.
- To assess the determinants for early introduction of complementary feeding among mothers of children aged 6-24 months

1.4 Research Questions

The following research questions were developed to the study

- What are the complementary feeding practices among mothers of children age 6-24 months?
- What are the factors influencing optimal complementary feeding practices among mothers of children aged 6-24 months?
- What are the determinants for early introduction of complementary feeding among mothers of children aged 6-24 months?

1.5 Significance of the Study

This study will help provide current information about complementary feeding practices and the factors that influences compliance to the WHO/UNICEF guidelines on complementary feeding practices among mothers of children aged 6-24 months in the Atwima Kwanwoma District. The findings from this study may also be useful to the Ministry of Health, Non-Governmental Organizations and Community-Based Organizations in improving complementary feeding practices and therefore child health and survival. The findings will contribute to the field of knowledge on infant and young child nutrition and act as a basis for future research on complementary feeding. The finding of the study will also contribute to efforts being made to increase the proportion of mothers who exclusively breastfeed for the first – 6 months in Atwima Kwanwoma District before they start complementary feeding.

1.6 Scope of the study

The study is limited to mothers of children aged 6 - 24 that visits health center in the Atwima Kwanwoma District in the Ashanti Region of Ghana. It focuses on the complementary feeding practices among mothers, factors influencing optimal complementary feeding practices among mothers, and the determinants for early introduction of complementary feeding among mothers of children aged 6-24 months.

1.7 Organization of the study

The study is organized into five major chapters and specific issues are discussed in each of the chapters. The chapters include Introduction, Literature Review, Methodology, Results and Discussion of the Study, Summary of Findings, Conclusion and Recommendation. The summary of each chapter is provided below;

Chapter One - Introduction: The highlights of the chapter are the background of curriculum implementation, statement of the problem, purpose of the study, objective of the study, research questions, significant of the study, scope of the study and organization of the study.

Chapter Two - Literature Review: The researcher reviews the available literature on complementary feeding practice among mothers.

Chapter Three - Methodology: The chapter covers the discussion of all the research methods and techniques. The highlights of the chapter is research design, the population, the sample and the sampling techniques, the research instruments, administration of instruments and the data analysis.

Chapter Four – Results and Discussion of the Study: The data obtained through the administration of the research instruments are presented and discussed in this chapter.

The presentation was in the form of mean and standard deviation which was captured in tables.

Chapter Five – Summary of Findings, Conclusion and Recommendation: This is the last chapter of the study and it records the summary, the conclusions made based on the presentations, analysis and the recommendations.



CHAPTER TWO

LITERATURE REVIEW

2.1 Complementary Feeding

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. It is well recognized that the period from birth to two years of age is a "critical window" for the promotion of optimal growth, health and behavioral development. Longitudinal studies have consistently shown that this is the peak age for growth faltering, deficiencies of certain micronutrients, and common childhood illnesses such as diarrhea. After a child reaches 2 years of age, it is very difficult to reverse stunting that has occurred earlier (Martorell et al., 1994). The immediate consequences of poor nutrition during these formative years include significant morbidity and mortality and delayed mental and motor development. In the long-term, early nutritional deficits are linked to impairments in intellectual performance, work capacity, reproductive outcomes and overall health during adolescence and adulthood. Thus, the cycle of malnutrition continues, as the malnourished girl child faces greater odds of giving birth to a malnourished, low birth weight infant when she grows up. Poor breastfeeding and complementary feeding practices, coupled with high rates of infectious diseases, are the principal proximate causes of malnutrition during the first two years of life. For this reason, it is essential to ensure that caregivers are provided with appropriate guidance regarding optimal feeding of infants and young children.

Complementary feeding is the timely introduction of nutritious and safe solid, semi-solids or soft foods to infants when breast milk is no more sufficient for them with continuous breastfeeding till the child is two years or beyond (WHO & UNICEF, 2003). Appropriate complementary feeding should start at 6 months till the child can consume

same food as the rest of the family, usually between 18-24 months. Kramer & Kakuma, 2002, also define complementary feeding as any food which complements breast milk and ensures that the child continues to have enough energy, protein and other nutrients to grow normally. After six months of age, breast milk alone is not enough to make an infant grow well. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend exclusive breastfeeding for six months, i.e. 180 days and addition of complementary foods at six months of age with continued breastfeeding till at least two years.

If complementary foods are not introduced or are given inappropriately at this age, the growth of infants may falter. Insufficient quality of complementary foods, poor child feeding practices, and high rates of infection have a detrimental impact on health and growth during these important years. During the period of complementary feeding, the young child gradually becomes habituated to eating family foods. Complementary foods bridge the gap in energy, vitamin A, and iron intake, which occurs in breast-fed infants at six months of age. Too early or too late introduction of complementary food may lead to nutritional deficiencies of iron, zinc, calcium, and vitamins (Pan American Health Organization, 2002). Therefore, complementary feeding needs to be nutritionally adequate and safe and appropriately fed to meet the energy and nutrient needs of the young child. Proper breast feeding, and complementary feeding practices can prevent under five mortality by 19%. Appropriate complementary feeding depends on accurate information and skilled support from the family, community and healthcare system.

Inadequate knowledge about appropriate food and feeding practices is often a greater determinant of malnutrition than the lack of food. Knowledge of mothers about these factors will be of help in planning interventions to improve feeding practices. The nutritional status of young children is noted to be influenced by their dietary intake which

in turn is determined by the knowledge, attitudes, and practices of breastfeeding and complementary feeding by mothers. Around complementary feeding period infants are susceptible to infections and malnutrition. However, complementary feeding among other factors has been shown to be most effective in improving child growth and also contribute to stunting in children (UNICEF, 2011). It is therefore important for caregivers to adhere to the recommended complementary feeding practices. There are indicators by WHO & UNICEF (2003) which are used to measure complementary feeding practices. The four core indicators which are closely related to complementary feeding practices are; timely introduction of semi solids, solids or soft diet, minimum meal frequency (MMF), minimum dietary diversity (MDD) and minimum adequate diet (MAD).

2.1.1 Duration of exclusive breastfeeding and age of introduction of complementary foods

In May, 2001 the 54th World Health Assembly urged Member States to promote exclusive breastfeeding for six months as a global public health recommendation (World Health Assembly, 2001). This recommendation followed a report by a WHO Expert Consultation on the Optimal Duration of Exclusive Breastfeeding (WHO, 2001), which considered the results of a systematic review of the evidence (Kramer and Kakuma, 2002) and concluded that exclusive breastfeeding for six months confers several benefits on the infant and the mother. Chief among these is the protective effect against infant gastrointestinal infections, which is observed not only in developing country settings but also in industrialized countries (Kramer et al., 2001). There is some evidence that motor development is enhanced by exclusive breastfeeding for six months (Dewey et al., 2001), but more research is needed to confirm this. For the mother, exclusive breastfeeding for six months prolongs the duration of lactational amenorrhea and accelerates weight loss

(Dewey et al., 2001). A longer duration of amenorrhea is generally considered an advantage, and for overweight women, weight loss is also beneficial. Weight loss may be a disadvantage for underweight women, but could be avoided by ensuring that such women have access to an adequate diet.

The Expert Consultation observed that, on a population basis, there is no adverse effect of exclusive breastfeeding for six months on infant growth. The nutrient needs of full-term, normal birth weight infants typically can be met by human milk alone for the first 6 months if the mother is well nourished (WHO/UNICEF, 1998). However, in certain circumstances, some of the micronutrients may become limiting before 6 months. In the case of iron, the infant's reserves at birth play a major role in determining the risk for anemia during infancy because the iron concentration of human milk is low. Normal birth weight infants whose mothers had good prenatal iron status usually have adequate liver iron reserves, and thus the risk of iron deficiency before six months is low. Low birth weight infants are at much greater risk for iron deficiency, and for that reason it is advised that they receive medicinal iron drops beginning at 2 or 3 months of age (UNICEF/UNU/WHO/MI Technical Workshop, 1999).

Infants of mothers with prenatal iron deficiency may also be at risk, even if their birth weight is normal. For prevention of iron deficiency among infants at risk prior to six months, complementary foods are not likely to be as effective as medicinal iron drops (Dewey et al., 1998; Domellof et al., 2001). Other nutrients that may become limiting before 6 months include zinc and certain vitamins. The zinc concentration of human milk is relatively low, although its bioavailability is high. Low liver reserves of zinc at birth may predispose some infants to zinc deficiency (Zlotkin et al., 1988), similar to the situation for iron. To date there is little evidence that zinc deficiency limits growth of exclusively breastfed infants prior to 6 months of age (though it may do so after 6 one 10

Food and Nutrition months; Brown et al 2002), but recent findings of reduced infectious disease mortality among term, small-for-gestational infants in India given zinc supplements from 1 to 9 months of age (Sazawal et al., 2001) suggest that zinc nutrition in early infancy may be inadequate under certain conditions. As mentioned above for iron, however, medicinal zinc supplements may be more effective than complementary foods at preventing zinc deficiency in young infants.

Vitamin deficiencies are generally rare in exclusively breastfed infants, but when the mothers' diets are deficient, their infants may have low intakes of certain vitamins (such as vitamin A, riboflavin, vitamin B6, and vitamin B12). In these situations, improving the mother's diet or giving her supplements is the recommended treatment, rather than providing complementary foods to the infant. Vitamin D deficiency may occur among infants who do not receive much exposure to sunlight, but giving vitamin D drops directly to the infant generally prevents this. Given that growth is generally not improved by complementary feeding before six months even under optimal conditions (i.e., nutritious, microbiologically safe foods) and that complementary foods introduced before six months tend to displace breast milk (Cohen et al., 1994; Dewey et al., 1999), the Expert Consultation concluded that the potential health benefits of waiting until six months to introduce other foods outweigh any potential risks.

After six months of age, however, it becomes increasingly difficult for breastfed infants to meet their nutrient needs from human milk alone (WHO/UNICEF, 1998). Furthermore, most infants are developmentally ready for other foods at about six months (Naylor and Morrow, 2001). In environments where environmental sanitation is very poor, waiting until even later than 6 months to introduce complementary foods might reduce exposure to food-borne pathogens. However, because infants are beginning to actively explore their environment at this age, they will be exposed to microbial

contaminants through soil, etc. even if they are not given complementary foods. Thus, the consensus is that six months is the appropriate age at which to introduce complementary foods.

2.1.2 Timely introduction of complementary foods

According to White et al., (2017), about one third of children aged 6-8 months have not been introduced to complementary food yet globally. Thus, children between the ages of 6-8 months who were not fed with solids or soft diets 24 hours preceding the survey. However, studies at regional levels have shown a larger proportion of children within 6-8 months receiving complementary foods. Thus 84.5, 88.5 and 86.1 for Nigeria, Madagascar and Ethiopia respectively (Udoh & Amodu, 2016, Rakotomanana et al., 2017 and Berra, 2017). It is however recommended that children are fed with only breast milk for their first 6 months in life and other foods are given at the age of 6 months. Timing of children's first foods at 6 months is very important since it is vital for the nutritional status of children (WHO, 2008). When foods are introduced to children early, it increases childhood morbidity and mortality in and when foods are introduced late, it causes growth delay in children and makes children prone to malnutrition (WHO & UNICEF, 2003). In most cases, mothers practice early complementary feeding (GSS et al., (2015), Udoh & Amodu, 2016). According to GSS et al., (2015), 10% of children between the ages of 2-3 months and 30% of children between the ages of 4-5 months are introduced to complementary foods.

A study in Nigeria found that 78% of children less than 6 months were introduced to complementary foods whilst 1.5% of children above 6 months were not receiving complementary foods yet (Udoh & Amodu, 2016). Another research in Nigeria also found that only 47.9% of mothers practice appropriate age introduction of

complementary foods (Olatona & Adenihun, 2017). A study in Benin found that about 80% of children were not introduced to complementary foods timely. Thus, complementary foods were initiated either early or late. In Benin, the average age for introducing foods to children was found to be between 4.9 ± 2.3 months (Mitchodigni et al., 2017) indicating an early introduction of complementary foods. Sethi et al., (2017) assessed the knowledge, attitude and practices of complementary feeding practices of mothers in India and findings from his study showed that only 42% of mothers introduced complementary foods to their children at 6 months, 5.8% of mothers introduced complementary foods to their children before 6 months whilst 52.2% introduced complementary foods to their children after 6 months. Perception of mothers that only breast milk was insufficient for children was one of the core reasons for early initiation of complementary foods to children whilst child vomiting food and the believe that foods are supposed to be introduced only when the child is able to feed him/herself were some of the reasons for delay in initiation of complementary foods. However, 77.5% of mothers in India practiced appropriate age initiation of complementary foods (Rao, Swathi, Unnikrishnan, & Hegde, 2011).

2.1.3 Maintenance of breastfeeding

Breastfeeding continues to make an important nutritional contribution well beyond the first year of life. Breastfed children at 12-23 months of age whose intake is similar to the “average” amount of breast milk consumed at that age (about 550 g/d in developing countries; WHO/UNICEF, 1998) receive 35-40% of total energy needs from breast milk (Dewey and Brown, 2002). Because it has a relatively high fat content compared to most complementary foods, breast milk is a key source of energy and essential fatty acids. Its fat content may be critical for utilization of pro-vitamin A

carotenoids in predominantly plant-based diets. Breast milk provides substantial amounts of certain micronutrients. In the Gambia, it is estimated that breast milk provides 70% of vitamin A, 40% of calcium and 37% of riboflavin intake at 15-18 months of age (Prentice and Paul, 1990). The nutritional impact of breastfeeding is most evident during periods of illness, when the child's appetite for other foods decreases but breast milk intake is maintained (Brown et al., 1990). It thus plays a key role in preventing dehydration and providing the nutrients required for recovery from infections. Continued, frequent breastfeeding also protects child health by delaying maternal fertility postpartum (thereby increasing birth intervals in populations that do not regularly use other forms of contraception) and reducing the child's risk of morbidity and mortality in disadvantaged populations (Molbak et al., 1994; WHO Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality, 2000).

Although the impact of breastfeeding past the first year of life on infant appetite and growth has been controversial (Caulfield et al., 1996; Habicht, 2000), recent longitudinal studies demonstrate that in developing countries, a longer duration of breastfeeding is associated with greater linear growth when the data are analyzed appropriately to eliminate the influence of confounding variables and reverse causation (Onyango et al., 1999; Simondon et al, 2001). A longer duration of breastfeeding has been linked to reduced risk of childhood chronic illnesses (Davis, 2001) and obesity (Butte, 2001), and to improved cognitive outcomes (Reynolds, 2001), although the causal relationships underlying these associations remain controversial. Most of these studies have not specifically examined the effect of breastfeeding beyond 12 months on these outcomes.

2.1.4 Responsive feeding

Practice responsive feeding, applying the principles of psycho-social care (Engle et al., 2000; Pelto et al., 2002). Specifically: a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; b) feed slowly and patiently, and encourage children to eat, but do not force them; c) if children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement; d) minimize distractions during meals if the child loses interest easily; e) remember that feeding times are periods of learning and love - talk to children during feeding, with eye to eye contact.

There is increasing recognition that optimal complementary feeding depends not only on what is fed, but also on how, when, where, and by whom the child is fed (Pelto et al., 2002). Behavioral studies have revealed that a “laissez-faire” style of feeding predominates in some populations (Engle and Zeitlin, 1996; Bentley et al., 1991; Bentley et al, 1992), with encouragement to eat rarely observed, or observed only when children refused food or were ill. It has been hypothesized that a more active style of feeding may improve dietary intake. The evidence to date on the impact of feeding behaviors on dietary intake and child health is sparse, however.

In an urban population in Ghana, Ruel et al. (1999) found that a “care practices” scale (which included breastfeeding patterns, timing of complementary feeding, food quality, and two “active feeding” behaviors) was positively associated with child anthropometric status among mothers with little or no schooling. Several intervention studies that included feeding behaviors as part of the recommended practices have reported positive effects on child growth (Sternin et al., 1997; Creed de Kanashiro et al., 2002), but it is not possible to separate the influence of responsive feeding from that of the other changes that occurred in breastfeeding practices and the types of

complementary foods offered. When more data are available from controlled research trials, it may be possible to pinpoint the types of feeding behaviors that make the most difference to child health and behavioral development. In the meantime, the recommendations above represent the current consensus on optimal practices among experts in the field.

2.1.5 Safe preparation and storage of complementary foods

Practice good hygiene and proper food handling by a) washing caregivers' and children's hands before food preparation and eating, b) storing foods safely and serving foods immediately after preparation, c) using clean utensils to prepare and serve food, d) using clean cups and bowls when feeding children, and e) avoiding the use of feeding bottles, which are difficult to keep clean (see WHO Complementary Feeding: Family foods for breastfed children, 2000 for additional details). Attention to hygienic practices during food preparation and feeding is critical for prevention of gastrointestinal illness. The peak incidence of diarrheal disease is during the second half year of infancy, as the intake of complementary foods increases (Martinez et al., 1992). Microbial contamination of foods is a major cause of childhood diarrhea, and can be prevented by the practices described above. Because they are difficult to keep clean, feeding bottles are a particularly important route of transmission of pathogens. In peri-urban Peru, 35% of bottle nipples tested positive for *E. coli*, an indicator of fecal contamination, and 31% of teas served in baby bottles were contaminated with *E. coli* compared with only 2% of teas served in cups (Black et al., 1989).

Although there are significant barriers to compliance with the above recommendations in many settings (including lack of safe water and facilities for safe preparation and storage of food, and time constraints for the caregivers), carefully

planned educational interventions can result in substantial improvement (Monte et al., 1997). In addition, use of fermented foods can reduce the risk of microbial contamination (Kimmons et al., 1999) and has the added advantage of improving nutrient content (WHO, 1998).

2.1.6 Amount of complementary food needed

Start at six months of age with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding. The energy needs from complementary foods for infants with “average” breast milk intake in developing countries (WHO/UNICEF, 1998) are approximately 200 kcal per day at 6-8 months of age, 300 kcal per day at 9-11 months of age, and 550 kcal per day at 12-23 months of age. In industrialized countries these estimates differ somewhat (130, 310 and 580 kcal/d at 6-8, 9-11 and 12-23 months, respectively) because of differences in average breast milk intake. The total energy requirements of healthy, breastfed infants are approximately 615 kcal/d at 6-8 months, 686 kcal/d at 9-11 months, and 894 kcal/d at 12-23 months of age (Dewey and Brown, 2002). Energy needs from complementary foods are estimated by subtracting average breast milk energy intake from total energy requirements at each age. Among breastfed children in developing countries, average breast milk energy intake is 413, 379 and 346 kcal/d at 6-8, 9-11 and 12-23 months, respectively (WHO/UNICEF, 1998). The equivalent values for industrialized countries (for breastfed children only) are 486, 375 and 313 kcal/d, respectively. The above guideline is based on children receiving average amounts of breast milk at each age. If an infant is consuming more or less breast milk than the average, the amount needed from complementary foods will differ accordingly. In practice, caregivers will not know the precise amount of breast milk consumed, nor will they be measuring the

energy content of complementary foods to be offered. Thus, the amount of food to be offered should be based on the principles of responsive feeding, while assuring that energy density and meal frequency are adequate to meet the child's needs. With the sample diets shown in the document Complementary feeding: family foods for breastfed children (WHO, 2000), which have a composite energy density ranging from 1.07 to 1.46 kcal/g, the approximate quantity of complementary foods that would meet the energy needs described above is 137-187 g/d at 6-8 months, 206-281 g/d at 9-11 months, and 378-515 g/d at 12-23 months.

It should be noted, however, that these diets will not always satisfy micronutrient requirements. Recommended intakes of iron, and to a lesser extent zinc, are unlikely to be provided by these diets. It is important not to be overly prescriptive about the amount of complementary foods to be consumed, recognizing that each child's needs will vary due to differences in breast milk intake and variability in growth rate. Furthermore, children recovering from illness or living in environments where energy expenditure is high may require more energy than the average quantities listed here.

2.1.7 Consequence of poor complementary feeding practices

Feeding practices of children are important contributing factors of children's nutritional status (WHO; 2010). Poor breastfeeding and inappropriate complementary feeding practices are the major causes of malnutrition during infancy (Sethi, Padhy, & Raju, 2017). A study in Nigeria found non-compliance to timely introduction of solids and meal frequency to be significantly associated with stunting in children (Udoh & Amodu, 2016). Banapurmath, (2014) also found that children who were introduced to complementary foods earlier were more likely to be stunted compared to children who were introduced to complementary foods at six months. Also, timely introduction of

semi- solids, solids and soft foods resulted in reduced odds of stunting in Bangladesh (Jones et al., 2014). Inadequate dietary diversity was also found to be positively associated with stunting in children aged 6-23 months in Kenya (Kimiye & Chege, 2015).

2.1.8 Minimum meal frequency and energy density

Increase the number of times that the child is fed complementary foods as he/she gets older. The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding (Dewey & Brown, 2002). For the average healthy breastfed infant, meals of complementary foods should be provided 2-3 times per day at 6-8 months of age and 3-4 times per day at 9-11 and 12-24 months of age, with additional nutritious snacks (such as a piece of fruit or bread or chapatti with nut paste) offered 1-2 times per day, as desired (Dewey & Brown, 2002). Snacks are defined as foods eaten between meals-usually self-fed, convenient and easy to prepare. If energy density or amount of food per meal is low, or the child is no longer breastfed, more frequent meals may be required.

The above guideline is based on theoretical estimates of the number of feedings required, calculated from the energy needs from complementary foods, and assuming a gastric capacity of 30 g/kg body weight/d and a minimum energy density of complementary foods of 0.8 kcal/g (Dewey & Brown, 2002). To calculate the minimum meal frequencies shown above (2 at 6-8 months and 3 thereafter), the energy needs from complementary foods were based on age-specific total daily energy requirements plus 2 SD (to meet the needs of almost all children) minus the average intake of energy from breast milk by children in developing countries. Infants with low intakes of breast milk would require the higher meal frequencies shown above (3 at 6-8 months and 4

thereafter) When energy density of the usual complementary foods is less than 0.8 kcal/g, or infants typically consume amounts that are less than the assumed gastric capacity at each meal, meal frequency would need to be higher than the values shown above.

A meal frequency that is greater than necessary may lead to excessive displacement of breast milk. In Guatemala, a social marketing campaign to promote feeding complementary foods five times per day had the unintended consequence of reducing breastfeeding frequency in children 19-24 months of age (from an average of 6.9 daytime feedings prior to the intervention, to 3.7 daytime feedings after the intervention, $p=0.01$; Rivera et al., 1998). In addition, preparing and feeding five meals per day requires a considerable amount of time and effort by caregivers, which may prompt them to hold prepared food over from one meal to the next, thereby potentially increasing the risk of microbial contamination. These considerations should be borne in mind when developing messages regarding meal frequency. The use of 1 to 2 nutritious snacks per day, such as a piece of fruit or a piece of bread or chapatti with nut paste, will not require time for preparation and may also be less likely to displace breast milk.

According to WHO, (2008) in order to achieve the minimum meal frequency (MMF), children who are breastfeeding and are between the ages of 6-8 months are supposed to receive at least two meals per day, those between the ages of 9-23 months are supposed to receive at least three meals a day and all children aged 6-23 months who are not breastfeeding should receive at least four meals per day. Globally, only 52% of children between the ages of 6–23 months meet the MMF (Bégin, 2017). Current studies have also reported the minimum feeding frequency of children in Ghana to be 57.3 % (Saaka et al., 2016; Yawson et al., 2017) and 50.6% (Saaka et al., 2016; Yawson et al., 2017). Furthermore, studies have found higher proportion of children receiving the recommended number of meals compared to the global prevalence. Kassa, Meshesha,

Haji, & Ebrahim, (2016) found that 67.3 % of children in Benin had received appropriate meal frequency. A study in Ethiopia to investigate the meal frequency and diversity among children 6-23 months revealed that 68.9% of children met the minimum meal frequency. Vitta et al., (2016) also established that 70.3% of children between the ages of 6–23months achieved minimum meal frequency in Tanzania which is higher than most studies.

However, some studies in Ghana have found lower proportions of children receiving the recommended frequency of foods compared to the global prevalence. That is 29% for Ga West Municipality and 40% for Tema Municipality (Agbozo et al., 2015; Bentil et al., 2016).

2.1.9 Dietary Diversity and nutritional content of complementary foods

Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish or eggs should be eaten daily, or as often as possible. Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used. Vitamin A-rich fruits and vegetables should be eaten daily, provide diets with adequate fat content, avoid giving drinks with low nutrient value, such as tea, coffee and sugary drinks such as soda, limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.

In Scientific rationale, nutritional content of complementary food can be discussed under different context; i.e. Micronutrient content, fat, and beverages with low nutrients. Because of the rapid rate of growth and development during the first two years of life, nutrient needs per unit body weight of infants and young children are very high. Breast milk can make a substantial contribution to the total nutrient intake of children between 6 and 24 months of age, particularly for protein and many of the vitamins.

However, breast milk is relatively low in several minerals such as iron and zinc, even after accounting for bioavailability. At 9-11 months of age, for example, the proportion of the Recommended Nutrient Intake that needs to be supplied by complementary foods is 97% for iron, 86% for zinc, 81% for phosphorus, 76% for magnesium, 73% for sodium and 72% for calcium (Dewey, 2001). Given the relatively small amounts of complementary foods that are consumed at 6-24 months (see #5 above), the nutrient density (amount of each nutrient per 100 kcal of food) of complementary foods needs to be very high. Calculations of the desired nutrient densities at various ages (6-8, 9-11 and 12-23 months) are published elsewhere (WHO/UNICEF, 1998; Dewey and Brown, 2002). When these were compared with the actual nutrient densities of the typical complementary food diets consumed in various populations, several “problem nutrients” were identified. In most developing countries, complementary foods do not provide sufficient iron, zinc and vitamin B6. Even in the U.S., iron and zinc were identified as problem nutrients in the first year of life, despite the availability of iron-fortified products. Certain nutrients are in short supply in some populations, but not in all, depending on the local mix of complementary foods.

These include riboflavin, niacin, thiamin, folate, calcium, vitamin A and vitamin C. Others, such as vitamin E, iodine and selenium, may also be problem nutrients in certain settings, but there is insufficient information to make this judgment. Because there is so much variability in complementary food diets in different parts of the world, it is not feasible to provide global dietary “prescriptions” that would guarantee adequate intake of all essential nutrients. It is preferable to develop population-specific dietary guidelines for complementary foods based on the food composition of locally available foods. However, it is clear from analyses done previously (WHO/UNICEF, 1998; Gibson et al., 1998; Dewey and Brown, 2002) that plant-based complementary foods by them22

Food and Nutrition eight selves are insufficient to meet the needs for certain micronutrients. Therefore, it is advisable to include meat, poultry, fish or eggs in complementary food diets as often as possible. Dairy products are a good source of some nutrients, such as calcium, but do not provide sufficient iron unless they are fortified. In environments with poor sanitation, promotion of liquid milk products is risky because they are easily contaminated, especially when fed by bottle. Fresh, unheated cow's milk consumed prior to 12 months of age is also associated with fecal blood loss and lower iron status (Ziegler et al., 1990; Griffin and Abrams, 2001).

For these reasons it may be more appropriate during the first year of life to choose dairy products such as cheese, yogurt and dried milk (mixed with other foods, e.g. in a cooked porridge). Potential allergic reactions related to consumption of certain high-protein foods during infancy have been a concern in some industrialized countries (food allergies appear to be less common in developing countries). For example, the American Academy of Pediatrics recommends that infants with a family history of allergies or food sensitivities should not receive cow's milk until 1 year of age, eggs until 2 years, and peanuts, nuts and fish until 3 years of age (AAP, 1998). It is thought that avoidance of foods with documented allergenic potential may delay or prevent some food allergy and atopic dermatitis in high-risk infants. However, controlled studies demonstrating that restrictive diets after 6 months of age have an allergy-preventing effect have not been published (Halcken and Host, 2001), and for this reason no such restrictions were advised by an international group of experts (WHO/IAACI, 2000). The advice to provide vitamin A-rich fruits and vegetables daily is based on the clear health benefits associated with preventing vitamin A deficiency (Allen and Gillespie, 2001), and the likelihood that consumption of such foods will also help meet the needs for many of the other vitamins. More precise guidelines regarding the recommended amount and

frequency of consumption of such foods can be developed using local food composition data.

Fat is important in the diets of infants and young children because it provides essential fatty acids, facilitates absorption of fat soluble vitamins, and enhances dietary energy density and sensory qualities. Breast milk is generally a more abundant source of fat than most complementary foods. Thus, total fat intake usually decreases with age as the contribution of breast milk to total dietary energy declines. Although there is debate about the optimal amount of fat in the diets of infants and young children, the range of 30-45% of total energy has been suggested (Dewey and Brown, 2002; Bier et al., 1999) as a reasonable compromise between the risks of too little intake (such as inadequate essential fatty acids and low energy density) and excessive intake (thought to potentially increase the likelihood of childhood obesity and future cardiovascular disease, although the evidence on this point is limited [Milner and Allison, 1999]). The percentage of energy from fat in complementary foods that would be needed to achieve a level of 30-45% of energy from fat in the total diet depends on the level of breast milk intake and the fat content of the breast milk (Dewey and Brown, 2002). For infants in developing countries consuming an average amount of breast milk with a normal fat concentration (38 g/L), for example, the needed percentage of energy from fat in complementary foods is 0-34% at 6-8 months, 5-38% at 9-11 months, and 17-42% at 12-23 months.

When developing dietary guidelines to provide adequate fat in complementary foods, it is important to take into account the potential effect of added fat (such as oil mixed with porridge) on the overall nutrient density of the diet. For example, the addition of one teaspoon of vegetable oil to 100 g of a typical maize pap used in West Africa would increase the energy density from 0.28 to 0.73 kcal/g, but would reduce protein

density from 8.9% to 3.3% of energy, and iron density from 0.5 to 0.2 mg/100 kcal (WHO/UNICEF, 1998). These effects could exacerbate micronutrient malnutrition in vulnerable populations unless other measures (such as fortification) are taken to ensure adequate micronutrient intake.

Tea and coffee contain compounds that can interfere with iron absorption (Allen & Ahluwalia, 1997), and thus are not recommended for young children. Sugary drinks, such as soda, should be avoided because they contribute little other than energy, and thereby decrease the child's appetite for more nutritious foods. Excessive juice consumption can also decrease the child's appetite for other foods, and may cause loose stools. For this reason, the American Academy of Pediatrics (1998) recommends no more than 240 ml of fruit juice per day. Studies in the U.S. have linked excess fruit juice consumption to failure to thrive (Smith and Lifshitz, 1994) and to short stature and obesity (Dennison et al., 1997), although such outcomes have not been consistently observed (Skinner et al., 1999).

It is recommended by WHO, (2008) that all children between the ages of 6-23 months are fed with diets that contains at least four food groups per day out of seven food groups. The seven food groups that serves as a measure of this indicator are grains, roots and tubers; legumes and nuts; dairy products; flesh foods, eggs, vitamin-A rich fruits and vegetables and any other fruit or vegetable. Only 29% of infants globally meet the minimum dietary diversity of complementary feeding practices (Bégin, 2017). According to a research by Lutter et al., (2017) on the global burden of malnutrition and highlight of data on child feeding practices, less than 30% of children aged 6- to 23 months achieved the minimum dietary diversity. A study by Kassa et. al., (2016) showed that only 18.8% of infants in Benin met the minimum dietary diversity criteria. The proportion of children who met the requirement of minimum dietary diversity in a study

by Mekonnen et. al (2017) in Benin was 27.3% with most children consuming grains (84.6%) whilst just a few consumed fish (9.7%) and 1.1% consumed iron rich foods (liver). A study by Ayana, Tariku, Feleke, & Woldie, (2017) in Ethiopia found that only 23.7% of children were fed with diets that met minimum dietary diversity. However, most of the children were likely to consume foods from staples and dairy products than any other food group (35.2% and 35.2%) whilst only 15% consumed meat.

This is similar to a study in selected slum areas in Ethiopia by Demilew, Tafere, & Abitew, (2017) which established that children consumed starchy staples and dairy products as compared to fleshy foods (88%, 33% and 8%). Other studies have also established that children were more likely to consume staples than any other food group (Khanal et al., 2013; Saaka et al., 2016, Manikam et al., 2017 and Dangura & Gebremedhin, 2017) in Ethiopia, Ghana and Nigeria and this is comparable to the global findings (White et al., 2017). According to MOH/GHS National Nutrition Policy for Ghana, (2013) poor sanitation and feeding practices such as lack of diversified foods among other factors are the major determinants of malnutrition in Ghana. However, dietary diversification still remains a challenge among most Ghanaian mothers and caregivers. Only 35.3 % of children between the ages of 6-23 month in Northern Ghana were fed with diversified foods in a study by Saaka et al., (2016) whilst less than 50.0% of children in a study by Ali et. al. (2017) in Northern Ghana met the minimum dietary diversity

2.1.10 Minimum Acceptable diet

Minimum acceptable diet is a composite of at least the minimum meal frequency and the minimum dietary diversity indicators (WHO, 2008). Almost all studies have shown that too few children are able to meet both criteria and therefore do not achieve

the minimum acceptable diet and optimal complementary feeding with a global prevalence of minimum acceptable diet representing only 15.9% (White et al., 2017). Lower prevalence have also been recorded in some African countries 12.3%, 7.3% and 21.1%, for Benin, Nigeria and Ethiopia (Kassa et al., 2016; Udoh & Amodu, 2016; Mekonnen et al., 2017). A systematic review in Ghana by Issaka et al., (2014) found the proportion of children aged 6-23 months who met the minimum acceptable diet to be 29.9%. Also 28% and 38% compliance for minimum dietary diversity was recorded for mothers having singletons and twins in Ghana (Bentil et al., 2016). Since minimum acceptable diet is directly associated with optimal complementary feeding, the findings above show that complementary feeding is a challenge for most households in the world and most countries across regions are far from reaching the standard for optimal complementary feeding.

2.2 Complementary feeding practices among mothers of children

Evidence has shown numerous benefits of breastfeeding to both infants and mothers. Promotion of breastfeeding remains one of the vital strategies which can be used in reducing infant mortality (Binns & Lee, 2016). Compared to non-breastfed children or children who had a short duration of breastfeeding, children who are breastfed for two years and beyond have lower infectious morbidity and mortality, less abnormal dentition, higher intelligence (Victora et al., 2016). Spacing of birth, prevention of breast and ovarian cancer as well as diabetes are some of the benefits of breastfeeding to mothers as well (Victora et al., 2016). Studies have shown that breastfeeding of children decreases as the child ages leading to an early cessation in breastfeeding before two years. Eighty four percent of children were still breastfeeding at the age of 1 year according to a study by Kimani-murage et al., (2011) in Kenya. In contrast, Rakotomanana, Gates,

Hildebrand, & Stoecker, (2017) found that 99.6% of children in Madagascar were still breastfeeding at the age of 1 year. The average duration of breastfeeding was found to be 8.6 months in a study by Radwan, (2013) in the United Arab Emirates. Also, only 84.7% and 63.1% of all children below the age of two years were still breastfeeding in Ethiopia and Mexico (Ayana, Tariku, Feleke, & Woldie, 2017; Zaragoza-cortes, Trejo-osti, Ocampotorres, Maldonado-, & Ortiz-gress, 2017). According to GSS et al., (2015), only half of the total population of children between the 20-23 months were still receiving breast milk.

A research conducted at Department of Pediatrics, Government Medical college, Haldwani, Uttarakhand enrolled 200 mothers of children aged between 6 to 24 months attending immunization center and pediatric OPD of above tertiary care center from December 2017 to May 2018. The study found that the frequencies recorded for complementary food were 126(63%) twice a day and 74(37%) thrice a day. The understanding and basic knowledge about preparation of complementary foods from home made and commercially availability were 124 (62%) and 76 (38%) respectively. The main source of knowledge regarding complementary foods items were family 104 (52%) followed by healthcare professional, electronic media and relatives respectively. 48 (24%) mothers knew about the use of iron rich food, 114 (57%) use of iodized salt and 152 (76%) and 86 (43%) had no idea respectively. 91% (182) mothers had no idea that how to increase calorie of food and only 88 (44%) mother had knowledge of continuation of breastfeed after 6 months.

The researcher revealed mother's attitude about the complementary feeding practices. 136 (78%) mothers reported that the different food groups should be selected for complementary feeding for maintaining dietary diversity and variety of food for balanced food. Mother's attitude about feeding during illness was also recorded, 48%

(96) mothers reported the quantity and frequency should be decreased during illness. 14% (28) withheld the quantity and frequency, 27% (54) maintain same quantity and amount and only 11% (22) reported to increase the amount and frequency during child illnesses. In the study the mother's believes about cultural and social food taboos were also inquired. 110 (55%) mothers believes on food taboos and are related to children illnesses if included in complementary foods, out of which 76 (38%) believes that Banana, yogurt and rice are cold in nature that can cause chest infection or cough if introduced in complementary feeding and 68 (34%) reported that meat, pulses, nuts and egg are hot and hard in nature to digest that can cause diarrhea or lose motion in children if included in the complementary feeding of children. The mother's attitude about feeding during illness was also recorded. 48% (96) mothers reported the quantity and frequency should be decreased during illness. 14% (28) withheld the quantity and frequency, 27% (54) maintain same quantity and amount and only 11% (22) reported to increase the amount and frequency during child illnesses.

In the study the mother's believes about cultural and social food taboos were also inquired. 110 (55%) mothers believes on food taboos and are related to children illnesses if included in complementary foods, out of which 76 (38%) believes that Banana, yogurt and rice are cold in nature that can cause chest infection or cough if introduced in complementary feeding and 68 (34%) reported that meat, pulses, nuts and egg are hot and hard in nature to digest that can cause diarrhea or lose motion in children if included in the complementary feeding of children. Mother's food preferences and preparation were also recorded, 98 (49%) and 52 (26%) preferred homemade and commercially available complementary foods respectively while 50 (25%) preferred both homemade as well as commercially available complementary foods to feed the children, 62 (31%) mothers preferred that separate complementary food should be prepared while 138 (79%)

mothers preferred that the routine food prepared for the rest of the family is fed to children as well as a complementary food and no separate food is prepared.

For successful lactation, timely initiation of breastfeeding i.e. within $\frac{1}{2}$ hour of normal delivery and within four hours of caesarean delivery is essential. In present study 61% of the total mothers knew about this fact. Likewise, 47% mothers knew about correct period of exclusive breastfeeding. This dismal picture about breastfeeding is reflected in other studies also. Karnawat et al (1988), did a study on knowledge and attitude of hospital employees of Jodhpur (Rajasthan) regarding infant feeding practices which revealed that nearly 66% doctors favored to initiate breastfeeding on first day while 60% paramedical and 96% class IV wished to start it on 2nd or 3rd day whereas in present study all mothers-initiated breastfeeding on first day. Taneja et al (2003), conducted a study on rural health centre in Delhi and found that most of the infants (90.6%) were breastfed up to 6 months of age but exclusive breastfeeding was uncommon (26.4%) whereas in present study it was 47%. This study revealed that introduction of complementary feeding beyond eight months of age was found in 32 % of mothers only. These findings are nearly similar to the studies done by Vaahtera et al. (2001).

Current study revealed that 52% of total mothers were knowledgeable about correct age (i.e. six months) of start of complementary feeding. Taneja et al in their study found that 40.6% infant's top milk or semisolids were started before 4 months of age in addition to breast milk whereas in present study only 23% started complementary feeds by 6 months of age. They also reported that semisolid foods were started in only half the children at 6 month of age and even at 9 months of age, one-fourth of the infants were not receiving appropriate semisolid feed. Yadav et al in their study found that only 55%

mothers introduced supplements to their infants between 6-12 months. In present study complementary feed (CF) was given thrice a day in 37%.

Agrawal et al. (200) study highlights more frequent use (64%) of janam ghutti and animal milk dilution (79%) by mothers. Similarly, Karnawat et al reported in their study that 79% of class IV employees gave janam ghutti and jaggery as prelacteal feed (Karnawat & singh, 19987). Ideally, we should discourage the use of janam ghutti, gripe water or any other prelacteal feeds because evidently they affect successful lactation and are potential source of infection. Corroborating with our findings on dilution of cow milk, Taneja et al reported that the practice of diluting milk was nearly universal (95.3%). Most of the mother's resort to dilution of animal milk thinking that it will make milk easily digestible. Ideally mothers should not follow the practice of diluting animal milk because it will decrease the nutritional value of milk as well as increase the chances of infection.

2.3 Factors influencing complementary feeding practices

Many worldwide studies show that a remarkable number of families worldwide do not adhere to the World Health Organization (WHO) exclusive breastfeeding recommendations (Wright, Parkinson & Drewett 2004). For example; in a large survey conducted by (Schiess et al., 2010) in five (5) European countries which included a sample of 1,678 healthy term infants, agreed that almost half of the infants received solid food at the age of four (4) completed months. These are incongruent with the study findings of (Wright et al., 2004) in Glasgow, which agreed that a significant number of infants weaned from exclusive breast milk at the age of three and a half (3.5) months, with 21% commencing before three (3) months and only 6% after four (4) months of age. Similarly, Arabian Gulf countries reported having a considerable percentage of reluctance to adhere to the feeding advice.

This reluctance to adhere to BFHI policy illustrated in Radwan (Radwan H. Patterns 2013). Radwan evaluated breastfeeding and complementary feeding practices of the mothers in the United Arab Emirates (UAE) and compared it with guidelines and recommendations of the World Health Organization. The outcome was, despite the efforts of the UAE National Health Education Programs, 593 mothers who participated in the study introduced complimentary food before six (6) months of age. Accordingly, this was due to poor adherence to birth spacing. Another factor noted was market pooling with substitute milk products. Generally, amongst the reviewed literature, the factors which influence parents' decision to start feeding are similar to those reported in UAE (Radwan H. 2013).

The commonly identified factors that could affect the initiation of complementary feeding included; perceptions of inadequate lactation (Wright et al., 2004); parents' socio-economic and educational level, access to commercial baby foods, inadequate breastfeeding knowledge, lack of guidance and encouragement from health care professionals (Alder, Williams, Anderson, et al. 2004). Likewise, in a survey conducted by Wright et al., 2004 parents' perception that their baby was hungry and on feeding mode was considered to be one of the predictors for early weaning. Indeed, these factors, in turn, may promote the early introduction of complementary feeding. A cross-sectional study conducted in Nepal to explore factors influencing complementary feeding practice revealed that illiteracy and poor awareness regarding appropriate feeding practices were contributing factors to early initiation of complementary foods (Nepal, 2013).

In Scotland, Alder et al. 2004) conducted a prospective cohort study of 338 primiparous women using triangulated data collection strategies to study the factors

which interfere with the decision to start weaning diet early. The factors identified were grandmother's advices, friend's encouragements and free samples of manufactured milk from companies. In addition, Alder et al., 2004 claim that exclusive breastfeeding for the first six months of life could give protection against gastro-enteritis and respiratory infection. They added that the early introduction of complementary feeding could increase the risk of cardiovascular problem due to the increase of body fat and body mass index (BMI). (Kramer & Kakuma 2012) agreed with this argument stating in the findings of a systematic review that infants who continue exclusive breastfeeding for six months or more appear to have a significantly reduced risk of gastrointestinal and respiratory infection. (Wright et al. 2004) mentioned in a comparative study done in the United Kingdom that diarrhoea is a common risk of early weaning.

These findings support the argument that starting solids before age four (4) months has been associated with a higher risk of developing respiratory and gastrointestinal diseases. In Oman, it has been noticed that the main two leading causes of infant morbidity as per Ministry of Health 2012 statistical report are respiratory problems (21.8%) and gastrointestinal (15%) of the total hospitalized male infant. Similarly, female infants have almost close percentage where in 19.3% accounts for respiratory problem and 17% of gastrointestinal problem (Ministry of Health Statistical Report 2013). There are some international studies conducted with a similar purpose which has shown that many families introduced complementary feeding for their infants before six months due to social and educational factors. So far, no similar study done in Oman, especially it has a unique social and cultural context which could be an influencer in the mother's decision in starting early complementary feeding. However, factors affecting adherence to the international recommendation of exclusive breastfeeding up to six months is not studied thus far in Ghana. The relationship between common

childhood sickness (gastrointestinal and respiratory problems) and early initiation of solid foods to infants had few attention from researchers during the last two decades. Some few factors are explained into detailed as followed.

2.3.1 Socio-demographic factors of mothers

Higher educational attainment is seen as a potential intervention for improving child nutritional outcomes (Mallard et al., 2014). Maternal education is a factor for good care practices in relation to child health and nutrition (Black et al., 2011). A study in Ghana found that compared to mothers who had no education, mothers who had Junior high school education or higher were more likely to feed their children with diversified foods (Boadi & Kobina, 2017). This was similar to a study in Ethiopia which also found that mothers with no education were more likely to feed their children with diversified foods compared to mothers with higher education (Ayana et al., 2017). A study by Kassa et al., (2016) showed that being an educated mother was a significant factor for achieving minimum adequate diet. Other studies have also found maternal education as a protective factor for achieving minimum meal frequency (Senarath et al., 2012; Issaka et al., 2015; Kassa et al., 2016; Manikam et al., 2017). Studies have also established poor maternal education to be significantly associated with inadequate dietary diversity (Joshi et al., 2012; Issaka et al., 2015 and Tegegne et al., 2017) for Ethiopia, Nigeria and Sierra Leon.

A study by Mekonnen et al (2017) found employment status of mothers to be significantly associated with achieving minimum dietary diversity. Mothers who were employed were more likely to feed their children with diversified foods compared to mothers who were not. A similar finding was reported in Sri Lanka (Senarath et al., 2012).

A study by Issaka et al (2014) found religion as a predictor of timely initiation of complementary foods. Non-Christian mothers were likely not to introduce complementary foods to their children timely compared to Christian mothers. In contrast, Saaka et al. (2016) also found that being a Christian mother was associated with achieving appropriate complementary feeding practices compared to being a non-Christian in Northern Ghana.

2.3.2 Child characteristics

Child characteristics such as age, sex, position in the family status can influence complementary feeding practices. According to White et al., (2017), children between the 12-17 months age brackets were found to consume more diversified foods compared to children in the 6-11 months bracket globally with consumption of diversified foods nearly doubling in the 12 – 17 months compared to the 6-11 months age category. This was similar to findings by Kassa et al. (2016), Fein et al. (2017) and Mekonnen et al. (2017) that dietary diversity as well as appropriate complementary feeding practices increases with increasing child age. However, minimum meal frequency decreased with increasing age in the study by Mekonnen et al., (2017). Issaka et al., (2015) also found that children within the 12-18 months were more likely to meet the minimum acceptable diet compared to children in the 6-11 month category. A study by Beyene, Worku, & Wassie, (2015) found children who were the first of their parents to have poor minimum meal frequency compared to children who were the second born or above.

2.3.3 Maternal obstetric related factors

Studies have shown associations between obstetric related factors such as antenatal care attendance, post-natal visits and giving birth in the hospital and the practice

of appropriate complementary feeding (Na, Jennings, Talegawkar, & Ahmed, 2015; Ayana et al., 2017; Demilew et al., 2017).

Na et al., (2015) in Pakistan found that the majority of women who attended ANC and PNC received information on infant and young child feeding practices from health practitioners. He also established an association between the frequencies of ANC as well as PNC visits with appropriate complementary feeding practices. Ayana et al. (2017) also established similar findings in Ethiopia. He established that the majority of mothers who had postnatal visits were educated on complementary feeding practices and there was a significant association between PNC visits and timely introduction of solids.

According to a study by Demilew, Tafere and Abitew (2017), mothers of selected slums in Ethiopia who had PNC were more likely to achieve the minimum adequate diet compared to mothers who had no PNC visits. Delivering at the hospital was found to be significantly associated with achieving minimum adequate diet in this same study. Tegegne et al., (2017) found the parity of mothers to be associated with meal frequency in Ethiopia. This is comparable to a study by Manikam et al., (2017) in Bangladesh.

2.3.4 Household characteristics

Studies have shown significant associations between complementary feeding practices and household characteristics such as family size and socio-economic status. It was difficult for mothers in a study in Nigeria to feed their children with diversified diets and the required meal frequency because they lived in poor communities and they also had limited resources which limited their purchasing power for diversified foods (Udoh & Amodu, 2016). Findings from this study is comparable to that of Issaka et al., (2015) and Wang et al., (2017) who found poor dietary diversity to be associated with low socio-economic status in Ghana and China respectively. Manikam et al., (2017) also found high

socio-economic status of mothers as a good predictor for meeting the recommended number of meals. A study by Kassa et al (2016) found smaller household size of mothers to be significantly associated with achieving minimum adequate diet compared to mothers with larger family size.



CHAPTER THREE

METHODOLOGY

3.1 Study Area

The study was conducted in the Atwima Kwanwoma District. Atwima-Kwanwoma District Assembly is one of the newly created districts in Ashanti Region with Foase being its capital. According to the Ghana statistical service, the District is located on latitude 6 24"N and 6 43' North and longitude 1 15' and 1 46" West. The district is located in the central portion of the Ashanti region, bounded in the North by Kumasi Metropolitan Assembly, South by Amensie west, East by Bosomtwi District and west by Atwima Nwabiagya district. The district has a total land size of 340.9km constituting 1.4% of the total land area of Ashanti Region. The district capital, Foase is approximately 20 kilometers from Kumasi. Other major settlements include Ahenema Kokoben, Trede, Twedie Trabuom, Nweneso 1 and Kromoasi. The district is divided into two (2) Area Councils and subdivided into 21 electoral Areas. The population of Atwima Kwanwoma District, according to the 2010 Population and Housing Census, is 90,634 representing 1.9 percent of the region's total population. Males constitute 48.3 percent and females represent 51 percent.

The district has a sex ratio of 93.5. The population of the district is youthful depicting a broad base population pyramid which tapers off with a small number of elderly persons. The total age dependency ratio for the District is 82.6, the age dependency ratio for males is higher (83.4) than that of females (78.4). The district has a household population of 89,249 with a total number of 20,734 households. The average household size in the district is 4.3 persons per household. Children constitute the largest proportion of the household members accounting for 43.7 percent. Spouses form about 11 percent. Nuclear households (head, spouse(s) and children) constitute 31.4 percent of

the total number of households in the district. More than one third (38%) of the population aged 12 years and older are married, 40.5 percent have never married, 10.7 percent are in consensual unions, 4.3 percent are widowed, percent are divorced and 2.2 percent are separated. . Among the married, 40 percent have no education while about 9.5 percent of the unmarried have never been to school. More than half of the married population (57.5 %) are employed, 3.8 percent are unemployed and 38.7 percent are economically not active. A greater proportion of those who have never married (66.9%) are economically not active.

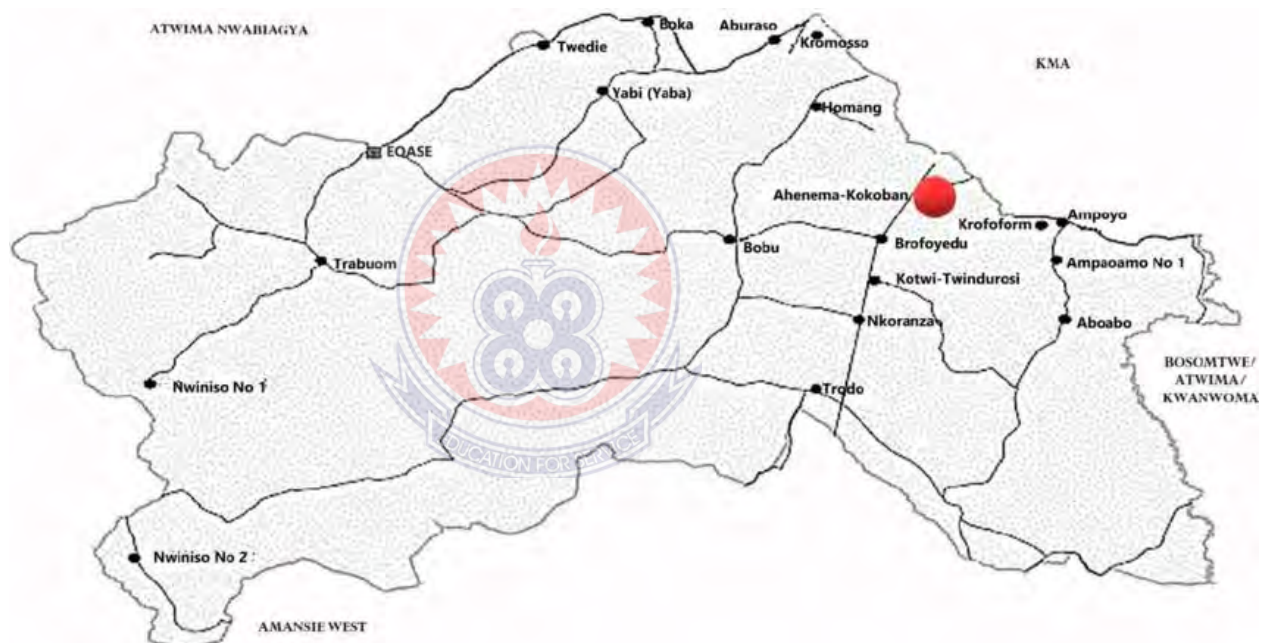


Figure 3.1: Atwima Kwanwoma District
Source : PHC 2010

3.2 Research Design

The study aimed to resolve the research question by using a descriptive survey research design which attempts to show the status quo of study items (Cooper & schidler, 2006). It is primarily concerned with finding out "what is," in research. It is appropriate when studying relationships and effect of variables on other variables. It studies existing

relationships as compared to exploratory research which looks at entirely new relationships.

Descriptive survey was adopted because it involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection. Because the human mind cannot extract the full import of a large mass of raw data, descriptive statistics are very important in reducing the data to manageable form. When in-depth, narrative descriptions of small numbers of cases are involved, the research uses description as a tool to organize data into patterns that emerge during analysis.

3.3 Target Population

Population is a collection of all possible individuals, objects or measurement that have one or more characteristics in common that are of interest to the researcher (Arthur, 2012). The study population consisted of all mothers who had children between the ages of 6-24 months and visited the district health center in the Atwima Kwanwoma District in the Ashanti Region of Ghana. The estimated population of the study includes 68,356 women in the Kwanwoma District (PHC, 2010). Mothers who met the inclusion criteria were randomly recruited daily into the study for a period of one week until the sample size was obtained. The study estimated 350 mothers who have children between the 6-24 months and 50 health workers at the district health center.

3.4 Sample Size and Sampling Technique

Sample is a smaller, manageable version of a larger group. Samples are used in statistical testing when population are too large for the test to include all possible members or observations. A sample should represent the whole population and not reflect bias toward a specific attribute. It has been indicated that the size of the sample and the

way in which it is selected definitely have implication for the confidence you can have in your data and the extent to which you can generalize (Saunders, 2007).

According to Kothari (2004), sample size is the number of items to be selected from the population to constitute the sample. Sample size for the study was calculated using Cochran's formulae for cross-sectional study:

$$n = \frac{Z^2 \alpha / 2^2 P (1-P)}{d^2}$$

Where:

n = sample size

p = prevalence of optimal complementary feeding practices in the Atwima Kwanwoma District,

$p=21\%$. (Agbozo et al 2015)

$Z_{\alpha/2} = 1.96$ at a confidence interval of 95%

d = margin of error, 5%

Substituting the figures above into the formula, the sample size calculated was;

$$n = \frac{(1.96)^2 0.21 (1-0.21)}{(0.05)^2}$$

$$n = 254.9$$

Using an error margin and non-response to some specific questions of 10%, the final sample size was

$$= 254.9 \times 0.1 = 25.45$$

$$255 + 25.5 = 280.39 \approx 280$$

Therefore, the minimum sample size that was used in this study was 280 mothers with Children aged 6-24 months in the Atwima Kwanwoma District.

A non-probability sampling method known as purposive sampling was employed in selecting 280 mothers with Children aged 6-24 months the study because of the characteristics they possess. This technique was adopted based on the researcher's

judgment in respect of the respondents' competency to provide detail and appropriate responses to the research instruments.

3.5 Data Collection Instruments

To ensure that data collected address the study objectives, the data collection instruments must be selected appropriately to avoid collecting irrelevant information, Odongo (2013). In this study, questionnaire was prepared for purposes of obtaining data from the respondents. The questionnaire items comprised closed - ended items that offered to give the advantage of collecting quantitative information. The questionnaires was adopted and modified from the WHO and UNICEF's guidelines on Infant and Young Child Feeding Practices (IYCF).

The researcher used the main primary data collection method that is structured questionnaire in soliciting data from the selected participants for the study. The questionnaire was made up of two sections; section one was made up of mother's socio-demographic characteristics (age, marital status, highest educational level attained, occupation and religion), mother's obstetric characteristics (parity, ANC attendance, PNC attendance and place of delivery), child characteristics (age, sex and birth order) and household characteristics (family size and socio-economic status) whilst section two contained mother's complementary feeding practices. A 24-hour dietary recall was used in this to assess complementary feeding practices of mothers (Timely introduction of complementary foods, Minimum meal frequency, Dietary diversity and Minimum acceptable diet). It took between 15-30 minutes on an average to complete an interview.

3.6 Validity of the Instrument

Validity is a measure of the degree to which differences found with a measuring instrument depict true differences among the items being measured (Kothari, 2014). In the perspective of Mugenda and Mugenda (2013), an instrument is validated by providing that its items are representative of the skills and characteristics to be measured. Validity of the research instruments was reinforced by ensuring that the questionnaire items sufficiently covered the research objectives. Measures put in place to address issues of instrument validity took the form of exposing the questionnaire to the experts and peers for judgement and review, respectively.

3.7 Reliability of the Instruments

According to Mugenda and Mugenda (2013), reliability is a measure of the degree to which a measuring instrument yields consistent results or data after repeated trials. In Kothari (2015), reliability of a test instrument is a measure of the consistency with which a test instrument produces the same results when administered to the group over time intervals.

Test was conducted in the piloting area in a span of two weeks, a correlation coefficient was computed using the Pearson product correlation coefficient which was generated using the statistical package for social scientist (SPSS) software to determine reliability. According to Nachmias and Nachmias (2009) positive coefficient of over 0.7 is considered to be reliable, and the higher the coefficient the more reliable the instruments. The computation showed the correlation coefficient (r) of 0.87 for the questionnaire.

3.8 Pilot Study

Prior to the major survey, a pilot study was carried out. The pilot study is a trial run that can help the researcher to modify the survey instrument to ensure that the respondents in the main survey did not have many problems in completing the questionnaire (Kothari, 2004). The importance of the pilot study was to test the wording of the questionnaire, identify ambiguous questions, test the intended technique for data collection and measure the usefulness of the potential responses. The research instruments were pilot tested at Atwima Tekyiman in the Kwadaso municipality using a sample size of 30 randomly selected breast feeding mothers. The pilot questionnaires were administered to the mothers and collected by hand in order to help increase the response rate. Covering letters explaining the purpose of the pilot study were attached to the questionnaires.

3.9 Data collection procedure

Permission to conduct the study was sought from the households and the women wishing to participate in the study were invited to attend the study on a pre-arranged date. All the adult women included in the study were given an identification number. In addition, the questionnaire items were explained to the women in the language they understand better and time is given to them to reflect on the responses before giving their options.

3.10 Data analysis

The data obtained from the field were edited, coded for its consistency and then entered in a computer using the statistical package for social scientists (SPSS) programmer version 23.0 to perform descriptive statistics. The frequency of

complementary feeding practices among mothers of children age 6-24 months and the age of introduction of complementary feeding was scored in terms of mean (\bar{x}) and standard deviation (SD). Also, Chi-square test was performed to determine whether the mean complementary feeding among mothers differ among their educational level and age.



CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Response Rate

A total of 280 questionnaires were sent out to collect data from respondents. However, after the data collection exercise, it was realized that 263 out of the 280 questionnaires sent out were significant to be included in the analysis. Whilst some of the questionnaires were not returned, key variables in the questionnaire that were critical in meeting the study objectives were not answered in some of the returned questions. In spite of this, 263 questionnaires were deemed good to be used since it gives a response

rate of 93.9%. According to Bowling (2011), a response rate of 75.0% is significant in social science research and admits that the higher the response rate, the better the analysis.

4.2 Background Information of Respondents

Issues covered under the background of respondents include the age, educational level and primary occupation of respondents, current child age of respondents in months, ANC & PNC of Respondents current child pregnancy, complementary feeding age of child of respondents, type of complementary food given to child. Knowing the background characteristics of respondents was very necessary as that could help in determining the authenticity of the responses.

Table 4. 1: Age category of Respondents

Age (Yrs)	Frequency (N)	Percentage (%)
20-29	80	30.4
30-39	105	39.9
40-49	52	19.8
50 and Above	26	9.9
Total	263	100.0

Source: Researcher Field Work, 2022

The responses with regard to the age category of the respondents are presented in Table 4.1. Statistically, 80 respondents constituting 30.4% were between the age bracket of 20-29 years, 105 respondents forming 39.9% were in the age bracket of 30-39 years, while 52 respondents representing 19.8% were in the age group of 40-49 years, The remaining 26 respondents constituting 9.9% of the respondents were 50 years and above. From the illustration, most mothers of children 6 – 24 months are within the age bracket of 30-39 years followed by the age bracket of 20-29 years. The finding was similar to

other study by Shumey et al. (2013) in Northern Ethiopia who revealed that the mean age of mothers was 36.34 year.

Table 4. 2: Educational level of Respondents

Education	Frequency (N)	Percentage (%)
No formal education	129	49.0
JHS/SHS	73	27.8
Technical/Vocational education	12	4.6
Diploma	34	12.9
First/Masters degree	15	5.7
Total	263	100.0

Source: Researcher Field Work, 2022

Table 4.2 gives detailed information about the educational level of mother. The results obtained indicate that most (n=129) of the respondents representing 49.0% were mothers with no formal education, following 73 respondents representing 27.8% were JHS/SHS holders. In addition, 34 respondents representing 12.9% of the were Higher National Diploma (HND) holders, 15 respondents representing 5.7% were First/Masters degree holders. The remaining 12 respondents constituting 4.6% were holding technical and vocational education. This implies that most of the mothers included in the study had low level of education. A study conducted in Ethiopia and it found that only five mothers had higher level of education (Berhane et al., 2018). A study conducted by Sandhya and Radha (2018) in India also found that there were 143 (35.1%) women had low level of education with only 21 (5.1%) having higher educational level.

Table 4. 3: Primary Occupation of Respondents

Occupation	Frequency (N)	Percentage (%)
Civil servant	48	18.2
Farmers	32	12.2
Petty traders	157	59.7

Unemployed	26	9.9
Total	263	100.0

Source: Researcher Field Work, 2022

The responses with regards to the occupation of the respondents is presented in Table 4.3. The result showed that 48 respondents constituting 18.2% are civil servant, 32 of them representing 12.2% are farmers. However, 157 of the respondents constituting 59.7% are petty traders, and 26 respondents forming 9.9% are unemployed. The finding showed that most of the mothers are workers and this help them in making money and thereby accessing a number of essential and non-essential goods, services and activities and daily routines for improving the nutritional health of their children aged 6-24 months.

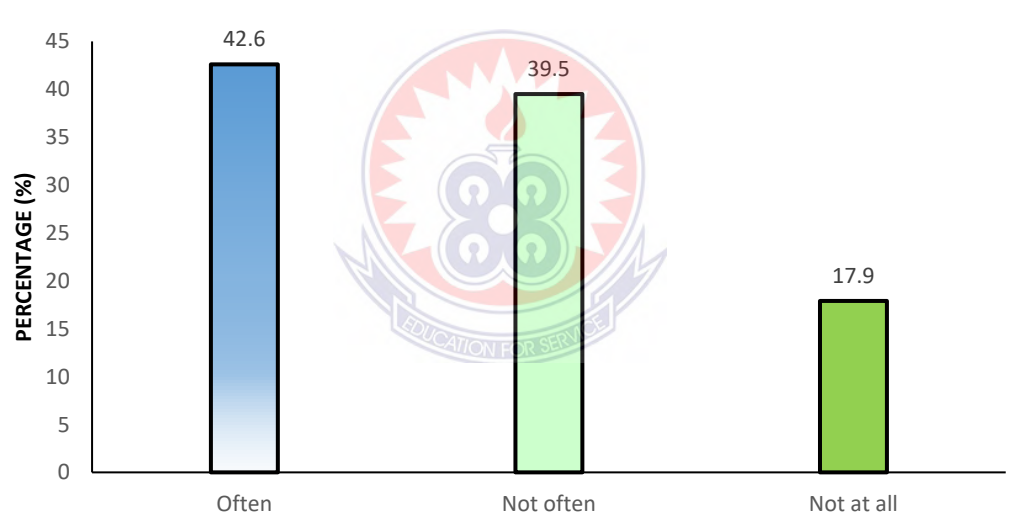


Figure 4. 1: ANC of Respondents Current Child Pregnancy

Source: Researcher Field Work, 2022

Figure 4.2 presents the antenatal care of respondent, which is very vital during child pregnancy. The finding showed that 112 respondents representing 42.6% often attend antenatal care, while 104 respondents forming 39.5% do not often attend antenatal care. However, 47 respondents constituting 17.9% do not attend antenatal at all. This affirmed that majority of the mothers visits ANC and this helped in screening, diagnosing and managing or controlling the risk factors that might adversely affect the

pregnant woman and/or the pregnancy outcome, and thereby advising the mothers when to start the complementary practice.

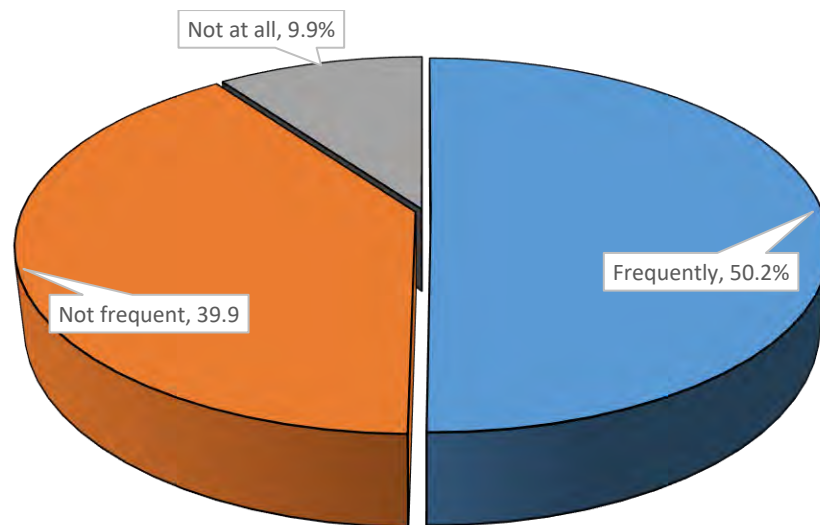


Figure 4. 2: PNC of Respondents after Delivery of Current Child

Source: Researcher Field Work, 2022

The data presented in Figure 4.2 showed the Postnatal care of the mothers. The finding revealed that mothers who still attend PNC after delivery of current child represent 132(50.2%) of the total respondent, interestingly 105(39.9%) of the total respondent were not frequently attending postnatal care after the delivery of current child, and the remaining 26(9.9%) indicates not at all. The finding showed that majority of the mothers after delivery of current child does not put any effort in attending PNC. The implication is that majority of the mothers failed to receive the care given to them and their newborn baby immediately after birth for the first six weeks of life. On the other hand, it is very difficult for the health practitioners in recognising any deviation from expected recovery after birth, and evaluating and intervening appropriately in a timely fashion. The finding agrees with the study by Sandhya and Radha (2018) in Ethiopia who mentioned that majority of women not more than 10% receive any postnatal care within two days of delivery.

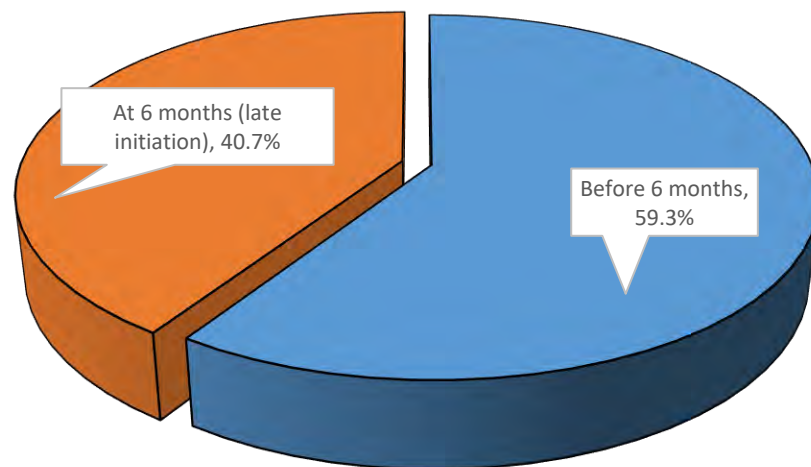


Figure 4. 3: Complementary feeding age of Respondents child

Source: Researcher Field Work, 2022

As depicted in Figure 4.3, the researcher was interested in the age at which the respondents introduce complementary food to her current child. The study revealed that 156 respondents constituting 59.3% introduce complementary feeding before 6 month. However, 107 respondents representing 40.7% of the total respondents indicates late initiation of complementary feeding. This depicted that majority of the respondents introduce complementary food before 6 month. The result agrees with WHO (2008) who however recommended that children are fed with only breast milk for their first 6 months in life and other foods are given at the age of 6 months. Timing of children's first foods at 6 months is very important since it is vital for the nutritional status of children (WHO, 2008). A study in Nigeria found that 78% of children less than 6 months were introduced to complementary foods whilst 1.5% of children above 6 months were not receiving complementary foods yet (Udoh & Amodu, 2016).

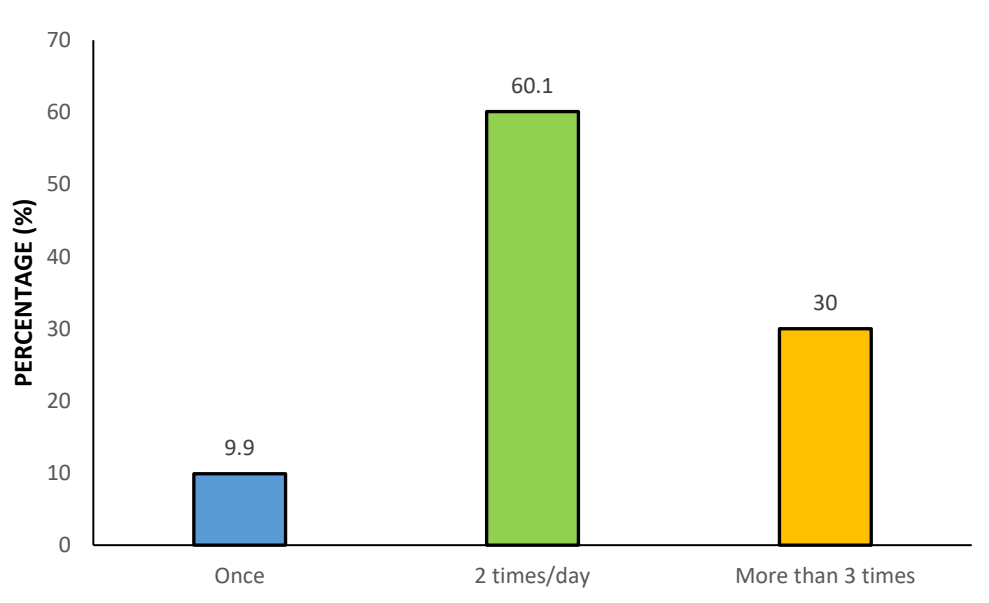


Figure 4. 4: Number of times child is feed on Complementary food per day
Source: Researcher Field Work, 2022

From Figure 4.4, the respondents were asked about the number of times they feed their child with complementary food per day. The results showed that 26 respondents representing 9.9% of the total respondents feed their child per day, meanwhile 158 respondents constituting 60.1% attest to the fact of feeding the child with complementary food twice per day. Conversely, 79 respondents constituting 30.0% also admit feeding the child more than 3 times with complementary food. The finding showed that majority of the mothers feed their children 2times/day. According to WHO, (2008) in order to achieve the minimum meal frequency (MMF), children who are breastfeeding and are between the ages of 6-8 months are supposed to receive at least two meals per day, those between the ages of 9-23 months are supposed to receive at least three meals a day and all children aged 6-23 months who are not breastfeeding should receive at least four meals per day. The finding also concurs with Dewey and Brown (2002) that the appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. For the average healthy breastfed infant, meals of complementary foods should be provided 2-3 times per day at 6-8 months of age and

3-4 times per day at 9-11 and 12-24 months of age, with additional nutritious snacks (such as a piece of fruit or bread or chapatti with nut paste) offered 1-2 times per day, as desired.

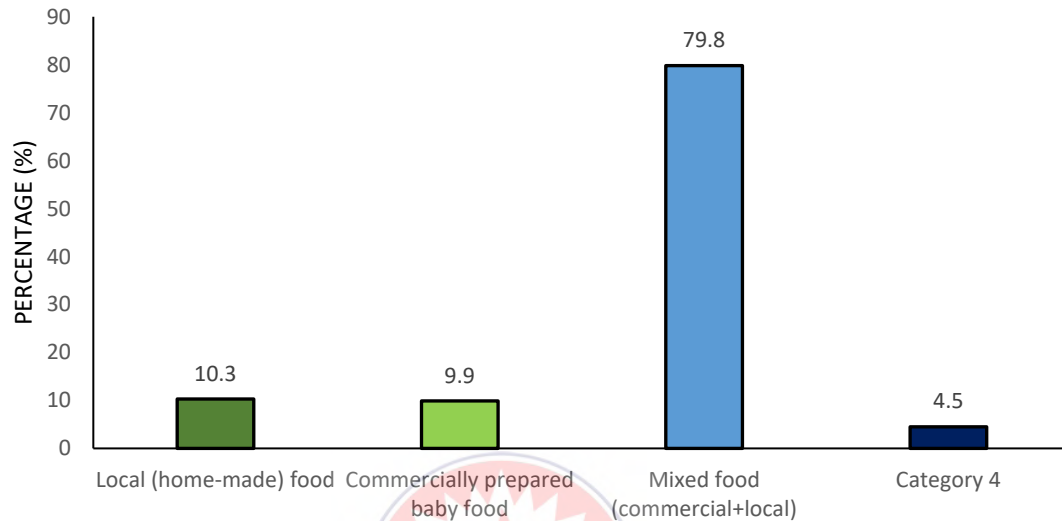


Figure 4. 5: Type of Complementary Food given to Child

Source: Researcher Field Work, 2022

With regards to the type of complementary food given to children between 6-12 months, Figure 4.5 clearly shows that 27 respondents constituting 10.3% depend on Local (home-made) food as complementary feed to infants, it was also revealed that 26 respondents representing 9.9% also depends on commercially prepared baby food as complementary food for children. Conversely, 210 respondents constituting 79.8% affirmed that they depend on mixed food (commercial + local) food as complementary food. The data clearly showed that majority of mothers choose mixed food as complementary food over the other types of food. WHO/UNICEF (2017) advocated that mothers should be encouraged to feed their infants with locally available home prepared foods which contain calories, proteins, minerals and vitamins. These nursing mothers had preference for commercial weaning foods because they felt that they save time, convenient and taste better.

4.3 Complementary feeding practice among mothers of children

This section addresses the complementary feeding practices among mothers of children age 6-24 months. The respondents were asked to indicate the extent to which they agree with each statement. The study used a 5-point Likert type scale ranging from “Strongly disagree” to “Strongly agree”, in descending order. In addition, the Mean (X), and standard deviation (SD) were computed. Table 4.4 shows the complementary feeding practices among mothers. The computed means were compared with the predetermined mean of 3.0.

Table 4. 4: Responses on complementary feeding practice

Complementary feeding practice	N	Mean	Std. Dev.	Rate	Remark
Timely introduction of solid, semi-solid or soft foods	263	4.50	0.501	1 st	Agreed
Use appropriate method of feeding during illness	263	4.30	0.645	2 nd	Agreed
Adequacy of energy in complementary feeds	263	4.25	1.033	3 rd	Agreed
Always wash hands before feeding	263	4.13	1.082	4 th	Agreed
Always wash and sterilize feeding utensils after feeding	263	4.00	0.839	5 th	Agreed
Correct frequency of introducing new foods per week	263	3.92	0.944	6 th	Agreed
Feed the child on complementary food each day	263	3.49	1.030	7 th	Agreed
Continued breastfeeding at one year	263	2.79	1.114	8 th	Disagreed
Feed child with cup/plate and spoon	263	2.60	0.920	9 th	Disagreed
Feed whenever child gave a cry	263	2.49	0.977	10 th	Disagreed
Feed child by myself	263	2.20	1.082	11 th	Disagreed
Aggregate mean	263	3.514	0.924		Agreed

Source: Field Work, 2022

$\bar{x} \geq 3.0 = \text{agreed}$

As depicted in Table 4.9, the respondents were made to examine complementary feeding practices of mothers of child age 6-24 months. The respondents ranked timely introduction of solid, semi-solid or soft foods as the first (1st) complementary feeding practices with the mean rating of 4.50 and standard deviation of 0.501. The finding revealed that the mothers timely introduce solid, semi-solid or soft foods for their

children aged 6-24 months. The finding is line with Madhu and Harish (2018) that mothers in Bengaluru, India start complementary feeds at appropriate time in 64.5% of the cases. The feeds were adequate in amount and frequency in 34.5% of the children.

Again, the respondents agreed that using appropriate method of feeding during illness is one of the major complementary feeding practices. This statement was second ranked (2nd) complementary feeding practices with a mean score of 4.30 and a standard deviation of 0.645. The average mean score affirmed that the mothers employ suitable method of feeding children during illness. The finding concurs with Forsido et al.'s (2019) study in Ethiopia that almost all (91.6%) of the mothers use appropriate method of feeding and prepare nutritional food to their children during sickness or recovery from disease. The study also signified that 96.7% of the mothers feed their children 3–4 times a day.

On the other hand, the third (3rd) complementary feeding practices was adequacy of energy in complementary feeds with the mean score of 4.25 and standard deviation of 1.033. The mean attained showed that the complementary feed prepared or purchased for the children adequate of energy. The result buttresses with WHO (2009) who recommended adequate energy in complementary feed. According to WHO minimum energy density in complementary foods is 0.8 kcal/g higher compared to that of breast milk. In reality, the energy density in complementary foods usually is between 0.6 and 1.0 kcal/g and may even drop to as low as 0.3 kcal/g in watery and dilute foods. Consequently, the amount of complementary food required to cover the energy gap corresponds to the level of energy density in the diets served.

Moreover, the respondents agreed on washing hands always before feeding. This statement was fourth (4th) in rank with mean rating of 4.13 and standard deviation of 1.082 among the numerous complementary feeding practices. The finding further

indicates that always wash and sterilize feeding utensils after feeding is one of the key complementary feeding practices. This statement had a mean score of 4.0 and a standard deviation of 0.839, showing 5th in the ranking order. The finding of the study calls for maximum attention pedagogical practices. The finding is in line with the study by Madhu and Harish (2018) on the hygiene practices of the mothers in food preparation and during feeding. The study showed that 4% of the mothers did not routinely wash their hands and utensils before feeding. Only 66% of mothers washed the child's hands before feeding. Bottle feeding was practiced by 33% of the mothers (Madhu & Harish, 2018).

On the practices of correct frequency of introducing new foods per week, the mean score 3.92 and standard deviation of 0.944 was attained. This statement was rated 6th in the ranking order. The finding showed that the mothers correctly introduce new food per week frequently. The result concurs with the study by Madhu and Harish (2018) who showed variety of complementary feeds introduced by mothers to children in different age groups. Most of the mothers had started cereals and pulses (home-made/commercial) before 12 months age. In a similar study in Nigeria, 49.7 and 51.2% of the mothers frequently introduce new complementary food for their children at age 6-8, and 9-11 months respectively (Adeniyi, 2017). The results of the present study is comparable to a study from Allahabad where 38.7% of children received new complementary feeding (Kumar et al., 2006).

On the statement that the mothers feed the child on complementary food each day, a mean score of 3.49 and a standard deviation of 1.030 was attained. This statement was rated 7th in the ranking order. The finding showed that the mothers feed the child on complementary food each day. A study conducted among children in Northern Uganda similarly reported that majority of the respondents were given complementary feed in every 24 hours (Mokori & Orikushaba, 2012). Conversely, the respondents disagreed

that Continued breastfeeding at one year ($X=2.79$, $SD=1.114$), feed child by myself ($x=2.60$, $SD=0.920$), feed child with cup/plate and spoon ($x=2.35$, $SD=0.977$), feed whenever child gave a cry ($x=2.20$, $SD=1.082$), these statements were rated 8th, 9th, 10th, 11th, 12th respectively in the ranking order.

The study showed good complementary feeding practices among the mothers that visits health center in the Atwima Kwanwoma District in timely introducing solid, semi-solid or soft foods, using appropriate method of feeding during illness, adequacy of energy in complementary feeds, always washing hands before feeding, always washing and sterilizing feeding utensils after feeding, and correct frequency of introducing new foods per week. Studies have shown that breastfeeding of children decreases as the child ages leading to an early cessation in breastfeeding before two years. This finding is almost comparable with the study done in Gondar by Dachew and Biftu (2014). According to the study, more than half of mother or caregiver accurately practiced complementary feeding. In addition, Tamiru et al. (2013) a study done in Jimma observed better introduction of complementary food. This result is also supported by the study done in Harar by Semahegn et al. (2014), which indicated that half percentage of caregivers or mother better practiced complementary feeding.

The finding disagrees with Sandhya and Radha (2018) how found poor complementary feeding practices among mothers both in rural and urban areas in age at initiation of complementary feeds, preference of readymade/ commercial food, feeding frequency and bottle feeds. The study by Olatona et al. (2017) discovered that complementary feeding practice was low. Complementary feeding practices, minimum dietary diversity and acceptable diet were not at the optimal level when compared with the recommendations of the WHO.

4.4 Factors influencing optimal complementary feeding practices

This section addresses factors influencing optimal complementary feeding practices. The factors were grouped under socioeconomic status of mothers, knowledge level of mothers, influences of postnatal care and the social network and cultural beliefs. The study used a 5-point Likert type scale ranging from “Strongly disagree” to “Strongly agree”, in descending order. In addition, the Mean (X), and standard deviation (SD) were computed. Table 4.5 presents the results, and the computed means were compared with the predetermined mean of 3.0.

Table 4. 5: Factors influencing optimal complementary feeding practices

S/N	Statement	Mean	Std. dev.	Decision
Socioeconomic status of mothers				
1.	My income encourages in the implementation of complementary feeding practice	3.89	0.707	Agreed
2.	My occupation influences the adoption of complementary feeding practices	3.67	1.619	Agreed
3.	My level of education encourages the acceptance of complementary feeding practices	3.50	1.378	Agreed
4.	My place of residence influences the practice of complementary feeding	3.0	1.022	Agreed
5.	My social status affect the acceptance of complementary feeding practice	2.78	1.251	Disagreed
Knowledge level of mothers				
1.	Knowledge on the implication of starting complementary feeding late	3.81	0.643	Agreed
2.	Knowledge on the most appropriate diet for normal healthy infant	3.75	0.898	Agreed
3.	Knowledge on the benefits of complementary feeding practice	3.69	0.648	Agreed
4.	Knowledge on complementary feeding guidelines	3.48	0.876	Agreed
Influence of postnatal care and the social network				
1.	Health professional (doctor/nurse/dietician) influence the complementary feeding method	3.60	1.025	Agreed
2.	My relatives influence the complementary feeding method	3.30	1.013	Agreed
3.	Female friends influence the complementary feeding method	3.01	1.345	Agreed
4.	Mass media (social media/radio/television) influence the complementary feeding method	2.90	1.021	Disagreed

5.	Traditional healer influences the complementary feeding method	2.79	1.079	Disagreed
Cultural beliefs				
1.	Acceptable maternal roles influence complementary feeding practice	3.89	.949	Agreed
2.	Dietary practices influence complementary feeding practice	3.29	1.106	Agreed
4.	Community customs influence complementary feeding practice	2.87	1.122	Disagreed
5.	Religious observances affect the implementation of complementary feeding practice	2.69	.830	Disagreed

Note: High: > 3.0, Low: < 3.0

4.4.1 Socioeconomic status of mothers

It can be observed from Table 4.5 that the respondents agreed to the fact that their income encourage in the implementation of complementary feeding practice had a mean of 3.89 and a standard deviation of 0.707. This implies that the respondents income plays a major role when it comes with complementary feeding practices. On the other hand, the respondent also agreed that occupation influence the adoption of complementary feeding practices with a mean of 3.67 and a standard deviation of 1.619. A study by Mekonnen et al (2017) found employment status of mothers to be significantly associated with achieving minimum dietary diversity. Mothers who were employed were more likely to feed their children with diversified foods compared to mothers who were not. A similar finding was reported in Sri Lanka (Senarath et al., 2012).

The statement that the level of education encourages the acceptance of complementary feeding practices had a mean score of 3.50 and a standard deviation of 1.378. The mean score attained showed that level of education encourages the acceptance of complementary feeding practices. The finding is in line with Boadi and Kobina (2017) who mentioned that mothers who had Junior high school education or higher were more likely to feed their children with diversified foods. This was similar to a study in Ethiopia which also found that mothers with no education were more likely to feed their children

with diversified foods compared to mothers with higher education (Ayana et al., 2017). A study by Kassa et al., (2016) showed that being an educated mother was a significant factor for achieving minimum adequate diet.

Again, place of residence influences the practice of complementary feeding ranked another high remark with a means and standard deviation 3.0 and 1.022 respectively. Studies have also established that the place of residence of a mother significantly associated with inadequate dietary diversity (Issaka et al., 2015 and Tegegne et al., 2017) for Nigeria and Sierra Leon. Finally, under the socioeconomic status of respondent, social status affects the acceptance of complementary feeding practice ranked low with a mean of 2.78 and standard deviation of 1.528.

4.4.2 Knowledge level of mothers

Table 4.5 shows the influence of mother's knowledge level on optimal complementary feeding. With a mean of 3.81 and a standard deviation of 0.643 the respondents emphasized that knowledge on the implication of starting complementary feeding late influence the practice of complementary feeding. Moreover, the respondents indicated that mother's knowledge on the most appropriate diet for normal healthy infant influence optimal complementary feeding. This statement reflected a mean of 3.75 and a standard deviation of 0.898. Furthermore, the respondents indicated that knowledge on the benefits of complementary feeding influence its practice. This statement had a mean of 3.69 and a standard deviation of 0.648. On the same issue, the respondents affirmed that knowledge on complementary feeding guidelines influence its practice. This statement attained a mean of 3.48 and a standard deviation of 0.876.

The finding showed that knowledge on the implication of starting complementary feeding, most appropriate diet for normal healthy infant, benefits of complementary

feeding, and complementary feeding guidelines influences mothers optimal complementary feeding. This implies that knowledge of mothers about these factors will be of help in planning interventions to improve feeding practices. Complementary feeding information from health care workers may help to influence infant feeding pattern (Piwoz *et al.*, 2007). When this information is provided before birth or in the maternity ward it can lead to a longer duration of exclusive breastfeeding (Ludvigsson, 2003). Mothers knowledgeable about aspects concerning exclusive breastfeeding will help the usage of correct practices when it comes to exclusive breastfeeding (Owoajeefa, 2002).

4.4.3 Influence of postnatal care and the social network

Statement under the influence of postnatal care and the social network as a factor of optimal complementary feeding were considered. From the above Table 4.5, the influence of health professional (doctor/nurse/dietician) having influence on complementary feeding method obtained a mean of 3.60 and a standard deviation of 1.025. However, relatives influence the complementary feeding method of the respondent also attained a mean of 3.30 and a standard deviation 1.003. This means that most optimal complementary feeding practices of respondent are dependent on the relatives. Again, female friends influence the complementary feeding method also gain a mean of 3.01 and standard deviation of 1.345.

Conversely, the respondents disagreed to mass media (social media/radio/television) influence the complementary feeding method ($M=2.86$, $SD=1.021$), Traditional healer influence the complementary feeding method ($M=2.54$, $SD=1.043$) as influence of postnatal care and social network. These statements failed to meet the predetermined cut-off point of 3.0. The results showed that mass media and

traditional healers has no significant influence on the factors influencing optimal complementary feeding practices.

The finding revealed that health professional advices, relatives, and female friends influence mothers complementary feeding method. The finding buttresses with Piwoz *et al.*, (2007) study that there are variety of factors influencing woman's decision, including information and advice from health personnel, family and friends and also reading material. It has been found that women would rather discuss their infant feeding methods with their family than the health care workers. This means that key individuals should be included when giving information on infant feeding methods. This will help pregnant women with regards to their decision by also getting accurate information from their family and friends (Chezem *et al.*, 2001).

4.4.4 Cultural beliefs

From the data presented, statement of cultural beliefs which influence the optimal complementary feeding practices were listed. Respondents agreed to the statement; acceptable maternal roles influence complementary feeding practice with a mean 3.89 and a standard deviation of 0.949. In addition, dietary practices influence complementary feeding were high with a mean of 3.39 and standard deviation of 1.106. The finding in in line with Manikam *et al.*, (2017) who found that dietary practice of mothers is a predictor for meeting the recommended number of meals. A study by Kassa *et al* (2016) found smaller dietary practices of mothers are significantly associated with achieving minimum adequate diet.

Meanwhile the respondent disagreed to community customs influence complementary feeding practice with a mean 2.87 and standard deviation 1.122. In addition, influence of religious observances on implementation of complementary

feeding practice obtained a means of 2.69 and standard deviation of 0.830. All these mean scores failed to obtain the predetermined cut-off point of 3.0.

The study showed that mother's acceptance of maternal roles, and dietary practices are cultural practices that influence complementary feeding practice. The finding is in agreement with Ayana et al. (2017) who also established similar findings in Ethiopia. He established that the majority of mothers practice of complementary feeding is significantly influenced by the cultural values. Findings from this study are comparable to that of Issaka et al., (2015) and Wang et al., (2017) who found dietary diversity to be associated with effective complementary feeding practices in Ghana and China respectively.

4.5 Determinants for early introduction of complementary feeding

In ascertaining the determinants for early introduction of complementary feeding among mothers of children aged 6-24 months. The respondents were asked to identify the intended duration of choosing complementary feeding. Table 4.6 presents the results

Table 4. 6: Intended duration of Respondents

Duration	Frequency (N)	Percentage (%)
0-6 months	105	39.9
7 – 12 months	79	30.0
13 – 18 months	53	20.2
19 – 24 months	26	9.9
Total	263	100.0

Source: Researcher Field Work, 2022

As depicted in Table 4.6, 105 respondents representing 39.9% intended choosing complementary feeding during age 0- 6 month, 79 respondents constituting 30.0% of the total respondents also agreed to 7-12 months as an intended duration for complementary

feeding. Meanwhile 53 respondents representing 20.2% of the total respondent's indicates their intended duration of complementary feeding between 13-18 months. The remaining 26 respondents representing 9.9% also chose 19-24 months as the intended duration of complementary feed. The data revealed that most of the respondents intended duration of complementary feeding slated 0-6 months. Australian mothers have been recommended to introduce solids to their infants at around 6 months of age (National Health and Medical Research Council, 2012). This ongoing cohort study commenced in late 2009, when this recommendation had been in place for approximately 6 years. However, a recent consensus from the Australian Infant Feeding Summit emphasized that "When your infant is ready, at around six months, but not before four months, start to introduce a variety of solids, starting with iron rich foods, while continuing breastfeeding" (Netting et al., 2017). Similarly, (Agostoni et al., 2008) and European Food Safety Authority (2009) recommend that complementary foods should be introduced "no earlier than 17 weeks and no later than 26 weeks".

Respondent's view was also ascertained on the determinants for early introduction of complementary feeding among mothers of children aged 6-24 months. The respondents were asked to indicate the extent to which they agree with each statement. The study used a 5-point Likert type scale ranging from "Strongly disagree" to "Strongly agree", in descending order. In addition, the Mean (\bar{X}), and standard deviation (SD) were computed. Table 4.7 shows the complementary feeding practices among mothers. The computed means were compared with the predetermined mean of 3.0.

Table 4. 7: Responses on determinants of complementary feeding

Reasons for early Complementary feeding.	N	Mean	Std. Dev.	Rate	Remark
To enrich or make the child's food with more energy	263	4.10	0.537	1 st	Agreed
To improve the intelligence of the child	263	4.00	1.265	2 nd	Agreed
To provide essential nutrients for continued growth and development	263	3.90	0.636	3 rd	Agreed
To eliminate the risk causing deficiencies and malnutrition of the child	263	3.79	0.877	4 th	Agreed
To help set healthy eating patterns for the child	263	3.60	0.668	5 th	Agreed
To improve the feeding skills of the child at developmental age	263	2.96	1.006	6 th	Disagreed
To take the place of breast milk	263	2.88	0.947	7 th	Disagreed
To increase the chance of getting pregnant again	263	2.60	1.355	8 th	Disagreed

Source: Field Work, 2022

$\bar{x} \geq 3.0 = \text{agreed}$

As indicated in the Table 4.7, eight (8) determinants or reason were identified from literatures to be associated with the determinants for early introduction of complementary feeding and they were left to the respondents to indicate how significant these factors were. Statistically, the respondents agreed that enriching or making child's food with more energy is the key determinants for early introduction of complementary feeding. This statement was ranked 1st with a mean of 4.10 and standard deviation of 0.537.

Moreover, the respondents mentioned that improving the intelligence of the child is a determinant for early introduction of complementary feeding. This statement was ranked 2nd with a mean of 4.00 and a standard deviation of 1.265. On the other hand, with a mean score of 3.90 and a standard deviation of 0.636, the respondents emphasized that provision of essential nutrients for continued growth and development is a determinant for early introduction of complementary feeding. This statement was ranked 3rd in the ranking order.

Moreover, to eliminate the risk causing deficiencies and malnutrition of the child came the 4th highest with a mean of 3.79 and standard deviation of 0.877. This showed that eliminating the risk causing deficiencies and malnutrition of the child is a determinant for early introduction of complementary feeding. Nevertheless, helping to set healthy eating patterns for the child also obtained 3.60 as mean and 0.668 as standard deviation and was rated 5th in the ranking order. The mean score implies that helping to set healthy eating patterns for the child is a determinant for early introduction of complementary feeding.

An indication from Table 4.7 showed that the respondents disagreed to improving the feeding skills of the child at developmental age ($x=2.96$, $SD=1.006$), taking the place of breast milk ($x=2.88$, $SD=0.947$), increasing the chance of getting pregnant again ($x=2.60$, $SD=1.355$) as determinants of early introduction of complementary feeding. These statements failed to meet the predetermined cut-off point of 3.0.

The finding revealed that enriching or making the child's food with more energy, improving the intelligence of the child, provision of essential nutrients for continued growth and development, eliminating the risk causing deficiencies and malnutrition of the child, and helping set healthy eating patterns for the child are the key determinants of early introduction of complementary feeding by the mothers. Enriching or making the child's food with more energy, and malnutrition of the child, and helping set healthy eating patterns, because it is more predictive of mother's early introduction of complementary feeding (Kloebler-Tarver *et al.*, 2002; Shaker *et al.*, 2004). However, provision of essential nutrients is also important in the introduction of early complementary feeding (Kloebler-Tarver *et al.*, 2002). Eliminating the risk causing deficiencies and malnutrition is also an influential predictor of early introduction of complementary feeding (Kloebler-Tarver *et al.*, 2002). The finding further agrees with

Shaker *et al.* (2004) study that setting healthy eating patterns for the child, and providing essential nutrients for the child play an important role in introducing early complementary feeding.



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Findings of the Study

The presentation of the main findings of the study was presented according to the specific objectives set out in Chapter One of this work.

5.1.1 Complementary feeding practice among mothers of children

- The study showed good complementary feeding practices among the mothers that visits health center in the Atwima Kwanwoma District in timely introducing solid, semi-solid or soft foods, using appropriate method of feeding during illness, adequacy of energy in complementary feeds,
- The study further showed that the mothers practice complementary feeding by washing hands before feeding, washing and sterilizing feeding utensils after feeding, and frequently introduce new foods per week.

5.1.2 Factors influencing optimal complementary feeding practices

- The study showed that income, occupation level of education encourages the acceptance of complementary feeding practices, place of residence socioeconomic factors that influences mothers practice of complementary feeding.
- The finding showed that knowledge on the implication of starting complementary feeding, appropriate diet for normal healthy infant, benefits of complementary feeding, and complementary feeding guidelines influences mothers optimal complementary feeding practices.

- It appeared from the study that health professional (doctor/nurse/dietician), relatives, and friends are postnatal care and the social network factors that influence mothers practice of complementary feeding.
- The study showed that mother's acceptance of maternal roles, and dietary practices are cultural practices that influence complementary feeding practice

5.1.2 Determinants for early introduction of complementary feeding

- The finding revealed that most of the respondents intended duration of complementary feeding slated 0-6 months
- It was evident that enriching or making the child's food with more energy, improving the intelligence of the child, provision of essential nutrients for continued growth and development, eliminating the risk causing deficiencies and malnutrition of the child, and helping set healthy eating patterns for the child are the key determinants of early introduction of complementary feeding.

5.2 Conclusions

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. Complementary feeding if not practiced appropriately can make the child more prone to infections, reduce their illness recovery rates and as well cause high mortality in children. A good complementary feeding practices was observed among the mothers that visits health center in the Atwima Kwanwoma District in timely introducing solid, semi-solid or soft foods, using appropriate method of feeding during illness, and adequacy of energy in complementary feeds.

According to the showed that socioeconomic factors, mothers knowledge level, postnatal care and the social network, and cultural practices influences mothers complementary feeding practice. The study discovered that most of the mothers intended duration of complementary feeding slated 0-6 months. It was evident that enriching or making the child's food with more energy, improving the intelligence of the child, provision of essential nutrients for continued growth and development, eliminating the risk causing deficiencies and malnutrition of the child, and helping set healthy eating patterns for the child are the key determinants of early introduction of complementary feeding.

5.3 Recommendations

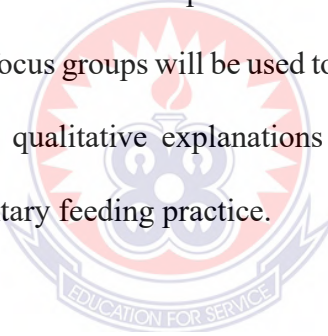
With the key findings emanating from this study and the conclusions drawn as the bases, the following recommendations are made.

- Government and nongovernment organizations should increase the various health-related activities to grow mothers' awareness and practice regarding complementary feeding.
- Family support is to be strengthened by improving education to family members, especially of mother-in-law and husband in order to improve mothers practice of complementary feeding.
- Nutrition education should be intensified to improve the knowledge, perception, and practices of mothers of children aged 6-24 months on complementary feeding.

5.5 Recommendations for Further Studies

In a study like this, recommendations for future research would address the issues generated from this study. Based on these findings, future research may start from a relatively higher level of knowledge. First, a replication of this study would be helpful in reexamining the validity of its findings for which the researcher was not able to investigate. Further empirical studies using larger sample sizes, and greater geographical diversity would be helpful in validating specific parts in this study. It is suggested that the range of respondents should be expanded to include other district in Ashanti Region to ensure adequate representation for effective overview of the results as the study was conducted in the Atwima Kwanwoma District in the Ashanti Region of Ghana.

Finally, in order to cover wide scope and to also enhance understanding, future study could be done so that focus groups will be used to discuss the findings of the survey. This may help to generate qualitative explanations from the mothers point of view regarding to the complementary feeding practice.



REFERENCES

- Agbozo, F., Colecraft, E., & Ellahi, B. (2015). *Impact of type of child growth intervention program on caregivers' child feeding knowledge and practices*
- Aggarwal A, Verma S, Faridi MMA, Dayachand. Complementary feeding- reasons for inappropriateness in timing, quantity and consistency. *Indian J Pediatr.* 2008;75:49-53.
- Agostoni, C., Decsi, T., Fewtrell, M., Goulet O, Kolacek, S. & Koletzko, B. (2008). Complementary feeding: a commentary by the ESPGHAN committee on nutrition. *Journal Pediatric Gastroenterol Nutrition*, 46:99–110.
- Alder EM, Williams FL, Anderson AS, et al. What influences the timing of the introduction of solid food to infants? *British J Nutri.* 2004;92(3):527-31.
- Ali, Z., Saaka, M., Adams, A., Kamwininaang, S. K., & Abizari, A. (2017). The effect of maternal and child factors on stunting, wasting and underweight among preschool children.
- Allen L. H. & Ahluwalia N. (1997). Improving iron status through diet. John Snow, Inc./OMNI Project.
- Academy for Educational Development (1997). *Facts for Feeding: guidelines for appropriate complementary feeding of breastfed children 6-24 months of age.* Washington, DC.
- American Academy of Pediatrics (1998). *Pediatric Nutrition Handbook.* Elk Grove Village, Illinois: American Academy of Pediatrics, 1998.
- Ayana, D., Tariku, A., Feleke, A., & Woldie, H. (2017). Complementary feeding practices among children in Benishangul Gumuz Region. *BMC Research Notes*, 10(335), 1–8.
- Bégin, F. (2017). First foods : Why improving young children's diets matter. *13(July)*, 1–9.

- Bentley M, Caulfield L, Torun B, Schroeder D, Hurtado E. Maternal feeding behavior and child appetite during acute diarrhea and subsequent health in Guatemala. *FASEB J* 1992;6:A436.
- Bentley M, Stallings R, Fukumoto, M. & Elder J. (1991). Maternal feeding behavior and child acceptance of food during diarrhea episodes, convalescence, health in the Central Northern Sierra of Peru. *Am J Pub Health*, ;83:1-5.
- Berra, W. G. (2017). Determinants of Suboptimal Complementary Feeding Practices among Children Aged 6-23 Months Selected Urban Slums of Oromia Zones, (January).
- Beyene, M., Worku, A. G., & Wassie, M. M. (2015). Dietary diversity, meal frequency and associated factors among infant and young children in Northwest Ethiopia: *a cross-sectional study*. *BMC Public Health*, 15(1), 1007.
- Bhutta, Z. A., Das, J. K., Rizvi, A., Gaff, M. F., Walker, N., Horton, S., Black, R. E. (2013). Maternal and Child Nutrition: *what can be done and at what cost?*, 382.
- Binns, C., & Lee, M. (2016). The Long-Term Public Health Benefits of Breastfeeding. *Asia-Pacific Journal of Public Health*, 28(1), 7–14.
- Black RE, Lopez de Romana G, Brown KH, Bravo N, Grados Bazalar O, Creed Kanashiro H. (1989) Incidence and etiology of infantile diarrhea and major routes of transmission in Huascar, Peru. *Am J Epidemiol*;129:785-99.
- Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., Onis, M. De, & Ezzati, M. (2011). *Maternal and Child Nutrition*. *Lancet*, 382.
- Brown, K. H. (1990). Effects of common illnesses on infants' energy intakes from breast milk and other foods during longitudinal community-based studies in Huascar (Lima), Peru. *Am J Clin Nutr*. 52:1005-13.
- Brown KH, Peerson JM, Rivera J. & Allen LH. (2002). Effect of supplemental zinc on the growth and serum zinc concentrations of pre-pubertal children: a meta-analysis of randomized, controlled trials. *Am J Clin Nutrition*, 75:1062-71.

- Brown K. H. (2001). A rational approach to feeding infants and young children with acute diarrhea. In: Lifschitz CH, ed., *Pediatric Gastroenterology and Nutrition in Clinical Practice*. New York: Marcel Dekker, Inc.
- Butte N. F. (2001). The role of breastfeeding in obesity. *Ped Clin N American*, 48:189-98.
- Caulfield, L. E, Bentley M. E. & Ahmed S. (1996). Is prolonged breastfeeding associated with malnutrition? Evidence from nineteen demographic and health surveys. *Int J Epidemiol*. 1996 25:693-703.
- Chapagain RH. (2013). Factors affecting complementary feeding practices of Nepali mothers for 6 months to 24 months children. *J Nepal Health Res Counc*, 2-13.
- Chezem, J., Friesen, C. & Clark, H. (2001). Sources of infant feeding information used by pregnant women. *The journal of perinatal education*, 10(3):20-26.
- Cohen R. J. (1994). Effects of age of introduction of complementary foods on infant breast milk intake, total energy intake, and growth: a randomized intervention study in Honduras. *Lancet*, 344:288-93.
- Cohen, L., Manion, L. & Morrison, K. (2005). *Research Methods in Education* (5th ed.). Madison: University of Wisconsin
- Davis MK. (2001) Breastfeeding and chronic disease in childhood and adolescence. *Ped Clin N Amer*;48:125-42.
- Dennison BA, Rockwell H. L. & Baker SL. (1997). Excess fruit juice consumption by preschool-aged children is associated with short stature and obesity. *Pediatrics*, 99:15-22.
- Dewey K. G. (1999). Age of introduction of complementary food and growth of term, low birth weight breastfed infants: a randomized intervention study in Honduras. *Am J Clin Nutrition*, 69: 679-86.
- Dewey, K. G. (2001). Nutrition, growth and complementary feeding of the breastfed infant. *Ped Clin N American*, 48:87-104.
- Engle PL, Bentley M, Pelto G. (2000). The role of care in nutrition programmes: current research and a research agenda. *Proc Nutr Sociation*,59:25-35.

- Engle, P. L. & Zeitlin M. (1996). Active feeding behavior compensates for low interest in food among young Nicaraguan children. *J Nutrition*, 126:1808-16.
- Fewtrell, M, Bronsky, J, Campoy C, Domellöf M, Embleton N. & Mis, N. F. (2017). Complementary feeding: a position paper by the European Society for Paediatric Gastroenterology, Hepatology, and nutrition (ESPGHAN) committee on nutrition. *Journal of Pediatric Gastroenterol Nutrition*, 64:119–32.
- Pelto G, Levitt E. & Thairu L. (2000). Improving feeding practices: current patterns, common constraints, and the design of interventions. Prentice AM, Paul AA. Fat and energy needs of children in developing countries. *Am J Clin Nutrition*, 72:1253S-65S.
- Habicht J. P. (2000). The association between prolonged breastfeeding and poor growth. In: Koletzko B, Michaelsen KF, Hernell O, eds., *Short and LongTerm Effects of Breast Feeding on Child Health*. New York: Kluwer Academic/Plenum Publishers, pp. 193-200.
- Halken S & Host A. (2001). Food allergy: prevention. *Current Opinion in Allergy and Clinical Immunology*, 1:229-236.
- Hamilton K, Daniels, L. & White K. M. (2011). Predicting mothers' decisions to introduce complementary feeding at 6 months. An investigation using an extended theory of planned behaviour. *Appetite*. 2011;56(3):674-81.
- Huffman SL, Baker, J., Shumann, J. & Zehner E. R. (1998). The case for promoting multiple vitamin/mineral supplements for women of reproductive age in developing countries. LINKAGES Project, Academy for Educational Development, Washington DC, 19-98.
- Jones, G., Stekette, R. W., Black RE, Bhutta ZA, Morris, S. S. (2003). How many child deaths can we prevent this year? *Lancet*, 362:65-71.
- Karnawat B. S, Singh R. N., Gupta B. D. & Chaudhary, S. P. (1987). Knowledge and attitudes of hospital employees regarding infant feeding practices. *Indian Pediatrics*, 24,939-48.

- Kimmons JE, et al. (1999) The effects of fermentation and/or vacuum flask storage on the presence of coliforms in complementary foods prepared for Ghanaian children. *Intl J Food Sci Nutr*;50:195-201.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Delhi, India: New Age International (P) Limited
- Kramer MS, Chalmers B, Hodnett E, Sevkovskaya Z, Dzikovich I, Shapiro S, et al. (2001) Promotion of breastfeeding intervention trial (PROBIT): A randomized trial in the Republic of Belarus. *JAMA*;285:413-420.
- Kramer MS, Kakuma R (2002). Optimal duration of exclusive breastfeeding (Cochrane Review). *Cochrane Database Syst Rev*; 1:CD003517.
- Kramer MS, Kakuma R. (2012.) Optimal duration of exclusive breastfeeding. *Cochrane database of systematic reviews*.
- Kramer MS, Kakuma R. (2002) Optimal duration of exclusive breastfeeding. *Cochr Database Syst Rev*.;1(1).
- Kreitner, J..E. (1986.). *Multivariate data analysis* (5th ed.). New Jersey: Prentice-Hall.
- Krejcie, R.V. & Morgan, D.W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, Vol. 30, 607-610.
- Kumepkor, T. K. B. (2002). *Research Methods and Techniques of Social Research*, New York: SonLife Printing Press.
- Landa Rivera L, Lonnerdal B. (2001) Iron supplementation of Honduras and Swedish breastfed infants from 4 to 9 months of age: effects on hemoglobin and other indices of iron status. *J Pediatr*;138:679-87.
- Latham, G. (2007). *Work Motivation: History, Theory, Research, and Practice*. USA. Sage Publications, Inc.
- Ludvigsson, J.F. (2003). Breastfeeding in Bolivia - information and attitudes. *BioMed Central Pediatrics*, 3(4):1-12.

- Lutter CK. (2003) Macro-level approaches to improve the availability of complementary foods. Food Nutr Bull, in press.
- Lutter CK. (2000) Processed complementary foods: summary of nutritional characteristics, methods of production and distribution, and costs. Food Nutr Bull;21:95-100.
- Martinez BC, de Zoysa I, Glass RI. (1992) The magnitude of the global problem of diarrhoeal disease: a ten-year update. Bull WHO;70:705-14.
- Martorell R, Kettel Khan L, Schroeder DG. (1994) Reversibility of stunting: epidemiological findings in children from developing countries. Eur J Clin Nutr;S45-S57.
- Matthew AK, Amodu AD, Sani I, Solomon SD. (2009) Infant feeding practices and nutritional status of children in North Western Nigeria. Asian J Clin Nutr. 1:1222.
- Milner JA, Allison RG. (1999) The role of dietary fat in child nutrition and development: summary of an ASNS workshop. J Nutr;129:2094-105.
- Molbak K, Gottschau A, Aaby P, Hojlyng N, Ingholt L, da Silva AP. (1994) Prolonged breast feeding, diarrhoeal disease, and survival of children in Guinea-Bissau. BMJ;308:1403-06.
- Monte CMG et al. (1997) Designing educational messages to improve weaning food hygiene practices of families living in poverty. Soc Sci Med;44:1453-64.
- Mugenda O.M and Mugenda A.G (2003). *Research Methods, Quantitative and Qualitative Approaches*. ACTS: NAIROBI.
- Mugenda, O. M., & Mugenda, A. G. (2003). *Reliability of research instruments*.
- National family health survey (NFHS-3), 2005-06 report india. Available at: rchiips.org/nfhs/nfhs3.shtml
- National Health and Medical Research Council (2012). Infant Feeding Guidelines. Canberra: National Health and Medical Research Council.
- Naylor AJ, Morrow AL. (2001) Developmental readiness of normal full term infants to progress from exclusive breastfeeding to the introduction of complementary foods. Linkages/Wellstart International.

- Netting, M. J., Campbell, D. E., Koplin, J. J., Beck, K. M. McWilliam, V. & Dharmage, S. C. (2017). An Australian consensus on infant feeding guidelines to prevent food allergy: outcomes from the Australian infant feeding summit. *Journal of Allergy Clinical Immunol Practice*, 5:1617–24.
- Neuman, W. L. (2007). *Basics of social research methods qualitative and quantitative approaches*. Boston: Allyn and Bacon
- Northstone K, Emmett P, Nethersole F, and the ALSPAC Study Team. (2001) The effect of age of introduction to lumpy solids on foods eaten and feeding difficulties at 6 and 15 months. *J Hum Nutr Dietet*;14:43-54.
- Onyango AW, Esrey SA, Kramer MS. Continued breastfeeding and child growth in the second year of life: a prospective cohort study in western Kenya. *Lancet* 1999;354:2041-45.
- Owens, L.K (2002). *Introduction to Survey Research Design*. SRL Fall 2002 Seminar Series
- Owens, L.K (2002). *Introduction to Survey Research Design*. SRL Fall 2002 Seminar Series. Retrieved from <http://www.srl.uic.edu/seminars/Intro/introsrm.pdf>
- Owoaje, E.T., Oyemade, A. & Kolude, O.O, (2002). Previous BFHI training and nurses' knowledge, attitudes and practices regarding exclusive breastfeeding. *African journal of medical science*, 31(2):137-140.
- Pan American Health Organization. (2002) *Guiding principles for complementary feeding of the breastfed child*. Washington, DC: Pan American Health Organization;37 .
- Piwoz, E.G., Humphrey, J.H., Tavengwa, N.V., Iliff, P.J., Marinda, E.T., Zunguza, CD., Nathoo, K. J., Mutasa, K., Moulton, L. H. & Ward, B. (2007). The impact of safer breastfeeding practices on Postnatal HIV-1 transmission in Zimbabwe. *American journal of public health*, 97(7):1249-1254.
- Punch, K. (2008). *Introduction to social research: Qualitative and quantitative approach* (3rd ed.). London: Sage Publications.

- R, Caulfield L, Black R. (2001) Improving infant nutrition through an educational intervention in the health services and the community. Presentation at the WHO Global Consultation on Complementary Feeding, Geneva.
- Radwan H. (2013) Patterns and determinants of breastfeeding and complementary feeding practices of Emirati Mothers in the United Arab Emirates. *BMC Public Health*;13(1):1-1.
- Radwan H. (2013) Patterns and determinants of breastfeeding and complementary feeding practices of Emirati Mothers in the United Arab Emirates. *BMC Public Health*;13(1):1-1. 9.
- Reynolds A. (2001) Breastfeeding and brain development. *Ped Clin N Amer*;48:159-72.
- Rivera J, Santizo MC, Hurtado E. Diseño y evaluación de un programa educativo para mejorar las prácticas de alimentación en niños de 6 a 24 de edad en comunidades rurales de
- Ruel MT, Levin CE, Armar-Klemesu M, Maxwell DG, Morris SS. (1999) Good care practices mitigate the negative effects of poverty and low maternal schooling on children's nutritional status: evidence from Accra. *World Development*;27:1993-2009.
- Sazawal S, Black RE, Menon V, Dinghra P, Caulfield LE, Dhingra U, Bagati A. (2001) Zinc supplementation in infants born small for gestational age reduces mortality: a prospective, randomized, controlled trial. *Pediatrics*;108:1280-86.
- Schiess S, Grote V. & Scaglioni S. (2010). Introduction of complementary feeding in 5 European countries. *J Pediatr Gastroenterol Nutr*;50(1):92-8.
- Simondon KB, Simondon F, Costes R, Delaunay V, Diallo A. (2001) Breast-feeding is associated with improved growth in length, but not weight, in rural Senegalese toddlers. *Am J Clin Nutr*;73:959-67.
- Skinner JD, Carruth BR, Moran J, Houck K, Coletta F. (1999) Fruit juice intake is not related to children's growth. *Pediatrics*;103:58-64.
- Smith MM, Lifshitz F. (1994) Excess fruit juice consumption as a contributing factor in nonorganic failure to thrive. *Pediatrics*;93:438-43.

- Sternin M, Sternin J, Marsh DL. (1997) Rapid, sustained childhood malnutrition alleviation through a positive-deviance approach in rural Vietnam: preliminary findings. In: Wollinka O, et al., eds. *Hearth nutrition model: applications in Haiti, Viet Nam and Bangladesh*. Arlington, VA: BASICS, 49-61.
- Taneja DK, Saha R, Dabas P, Gautam VP, Tripathy Y, Mehra M. (2003) Study of infant feeding practices and the underlying factors in a rural area of Delhi. *Indian J Community Med.*;28:107-11.
- UNICEF/UNU/WHO/MI Technical Workshop. (1999) Preventing iron deficiency in women and children: technical consensus on key issues. Boston, MA: International Nutrition Foundation.
- Vaahetra M, Kulmala T, Hietanan A, Natekha M, Cullinana T, Salin ML, et al. (2001) Breast feeding and complementary feeding practices in rural Malawi. *Acta Paediatr.*;90:328-32.
- WHO Collaborative Study Team. (2000) Role of Breastfeeding on the Prevention of Infant Mortality. Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. *Lancet*;355:451-55.
- WHO Complementary feeding: (2000) Family foods for breastfed children. Geneva: World Health Organization. WHO/NHD/00.1; WHO/FCH/CAH/00.6.
- WHO. (2002) Global strategy for infant and young child feeding. *WHA55/REC/1, Annex 2*.
- WHO. (2000) Management of the child with a serious infection or severe malnutrition. Geneva: World Health Organization. WHO/FCH/CAH/00.1.
- WHO. (2001) The optimal duration of exclusive breastfeeding: a systematic review. Geneva: World Health Organization. WHO/NHD/01.08; WHO FCH/CAH/01.23.
- WHO/IAACI (2000) Primary Prevention of Allergy and Asthma. *Allergy: preventive measures (Chapter 4)*. *Eur J Allergy Clin Immunol*;55:1080-1083.
- WHO/UNICEF. (1998) Complementary feeding of young children in developing countries: a review of current scientific knowledge. Geneva: World Health Organization, WHO/NUT/98.1.

- WHO/UNICEF. (2000) HIV and Infant Feeding Counseling: A Training Course. Geneva: World Health Organization , WHO/FCH/CAH/00.2-6.
- World Health Assembly Resolution. (2001) Infant and young child nutrition. WHA 54.2.
- World Health Organization. (2001) Complementary feeding - Report of the global consultation Summary of Guiding principles Geneva.
- Wright CM, Parkinson KN, Drewett RF. (2004) Why are babies weaned early? Data from a prospective population based cohort study. *Arch Dis Child*;89(9):813-6.
- Yadav RJ, Singh P. (2004) Knowledge attitude and practices of mothers about breast feeding in Bihar. *Indian J Community Med.*;29(3):130-1.
- Ziegler EE, Fomon SJ, Nelson SE, et al. (1990) Cow milk feeding in infancy: further observations on blood loss from the gastrointestinal tract. *J Pediatr*;116:11-8.
- Zlotkin SH, Cherian MG. (1988) Hepatic metallothionein as a source of zinc and cysteine during the first year of life. *Pediatr Res*;24:326-329.



APPENDIX

UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

QUESTIONNAIRE FOR MOTHERS OF CHILDREN AGED 6 - 24 MONTHS

Preamble: The questionnaire is designed to collect data on the topic “complementary feeding practices among mothers of children aged 6 - 24 months. A case study of Atwima Kwanwoma District in the Ashanti Region of Ghana. Please read the statement carefully and tick (✓) the option(s) which you think are applicable or provide your opinion which best answers the question. All responses will be confidential and will not be connected in any way to you or your organization, this is purely for academic purposes.

Section A: Background Information

1. Please select your age group from the following age brackets
 - a) 20 – 29 years
 - b) 30 – 39 years
 - c) 40 – 49 years
 - d) Above 50 years

2. Educational Level of Respondents
 - a) No formal education
 - b) JHS / S.H School
 - c) Technical/Vocational Education
 - d) Diploma / Higher National Diploma
 - e) First / Master’s Degree

3. What is your marital status?
 - a) single
 - b) Married
 - c) Divorce
 - d) widowed
 - e) Others, Please specify.

4. What is your primary occupation?
 - a) Civil Servant
 - b) Farmer
 - c) Petty trader
 - d) Unemployed
 - e) Others, Please specify.

5. How many children do you have?
 - a) 1 -2
 - b) 3 - 4
 - c) 5 and above

6. What is your current child age in months?
a) 1-3 months b) 4 – 6 months c) 7 – 9 months
d) 10 – 12 months e) 13-15 months f) 16 months and above
7. Place of delivery (current child)
a) Health Facility b) Home
8. How often did you attend antenatal care (ANC) during your current child pregnancy?
a) Very often b) Often c) Not Often d) Not at all
9. How frequent do you attend PNC after delivery of your current child.
a) very frequent b) frequent c) not frequent d) not at all
10. What is your religion?
a) Christianity b) Muslim c) Traditionalist
d) Others, Please specify.

Section B: Complementary feeding practices among mothers of children age 6-24 months

11. Are you aware of appropriate complementary feeding practice?
a) Yes b) No
12. Do you practice complementary feeding?
a) Yes b) No
13. At what age did you start the complementary feeding?
a) Before 6 months b) At 6 months (Late initiation)
14. How many times do you feed your child on complementary food each day?
a) once/day b) 2 times/day c) >3 times/day
15. What kind of complementary feed do you give to your child?
a) Local (home-made) food b) Commercially prepared baby food
c) Mixed food (commercial + local)

16. If “Yes” to question 10 & 11 above, what are some of the complementary feeding practices you know? The following listed complementary feeding practise should be rated on a scale from 1-5, (where 1 indicates strongly disagree, 2 represents disagree, 3 represents uncertain, 4 represents agree and 5 indicates strongly agree). Please select any option by ticking [] in the right box.

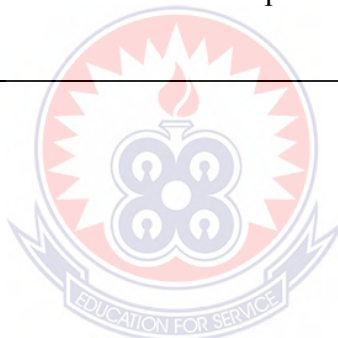
S/N	Complementary feeding practices	Scale				
		1	2	3	4	5
1.	Continued breastfeeding at one year					
2.	Timely introduction of solid, semi-solid or soft foods					
3.	Correct frequency of introducing new foods per week					
4.	Adequacy of energy in complementary feeds					
5.	Feed the child on complementary food each day					
6.	Feed child by myself					
7.	Feed whenever child gave a cue					
9.	Feed child with cup/plate and spoon					
9.	Always wash and sterilize feeding utensils after feeding					
10.	Always wash hands before feeding					
11.	Use appropriate method of feeding during illness					

Section C: Factors influencing optimal complementary feeding practices among mothers of children aged 6-24 months.

17. To what extent do you agree or disagree with the following factors influencing optimal complementary feeding practices among mothers of children aged 6-24 months. Please rate your responses using a scale of 1 to 5: Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), and strongly agree (5). **Please tick the box which best reflect your view and state briefly where necessary.**

S/N	Factors influencing optimal complementary feeding practices	SCORE				
		1	2	3	4	5
	Socioeconomic status of mothers					
1.	My place of residence influence the practice of complementary feeding					
2.	My occupation influence the adoption of complementary feeding practices					
3.	My level of education encourage the acceptance of complementary feeding practices					
4.	My income encourage in the implementation of complementary feeding practice					
5.	My social status affect the acceptance of complementary feeding practice					
	Knowledge level of mothers					
6.	Knowledge on the benefits of complementary feeding practice					
7.	Knowledge on complementary feeding guidelines					
8.	Knowledge on the most appropriate diet for normal healthy infant					
9.	Knowledge on the implication of starting complementary feeding late					
	Influence of postnatal care and the social network					
10.	My relatives influence the complementary feeding method					
11.	Female friends influence the complementary feeding method					

12.	Health professional (doctor/nurse/dietician) influence the complementary feeding method					
13.	Traditional healer influence the complementary feeding method					
14.	Mass media (social media/radio/television) influence the complementary feeding method					
	Cultural beliefs					
15.	Community customs influence complementary feeding practice					
16.	Religious observances affect the implementation of complementary feeding practice					
17.	Acceptable maternal roles influence complementary feeding practice					
19.	Dietary practices influence complementary feeding practice					



Section D: Determinants for early introduction of complementary feeding

18. By choosing complementary feeding, what is your intended duration of the feeding?

a) 0-6 months b) 7-12 months c) 13-18 months d) 19-24 months

19. What / who influenced your infant feeding choice the most?

.....
 .

20. To what extent do you agree or disagree with the following the reasons for early introduction of complementary feeding among mothers of children aged 6-24 months. Please rate your responses using a scale of 1 to 5: Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), and strongly agree (5). **Please tick the box which best reflect your view and state briefly where necessary.**

S/N	Reasons for early introduction of complementary feeding	SCORE				
		1	2	3	4	5
1.	To provide essential nutrients for continued growth and development					
2.	To enrich or make the child's food with more energy					
3.	To help set healthy eating patterns for the child					
4.	To improve the feeding skills of the child at developmental age					
5.	To increase the chance of getting pregnant again					
6.	To eliminate the risk causing deficiencies and malnutrition of the child					
7.	To take the place of breast milk					
8.	To improve the intelligence of the child					