

Factors that Influence Ghanaian Mothers' Complementary Feeding Practices and the Perceived Implications on Children's Growth, Health, and Development

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Authorization to Submit Thesis

This thesis of Bridget Egyir, submitted for the degree of Master of Science with a major in Family and Consumer Sciences and titled “Factors that Influence Ghanaian Mothers’ Complementary Feeding Practices and the Perceived Implications on Children’s Growth, Health, and Development,” has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies to the College of Graduate Studies for approval.

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Abstract

Appropriate complementary feeding practices are fundamental to a child's development. This study aimed to understand 1) Ghanaian mother's complementary feeding practices, and 2) their perceived impacts of complementary feeding. Ghanaian mothers with children from four to twenty four months of age were recruited from the Komenda Edina Eguafo Abrem district in the Central Region of Ghana (n=99). Eleven focus group interviews were conducted, audio recorded, and transcribed. The audio transcriptions were coded and analyzed into pertinent themes, meta-themes, and theoretical concepts. Over 80% (85) of mothers reported some knowledge about the effects of complementary feeding on their children. Four overarching themes were identified: 1) mothers' background knowledge about food, child health, and growth outcomes; 2) mothers' motivation in feeding their children; 3) barriers to feeding; 4) and, foods mothers offered their children. Ghanaian mothers identified challenges and misconceptions in complementary feeding indicating the need for nutrition education.

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Dedication

I am very much grateful to God Almighty for sustaining me throughout the thesis process.

To my husband Isaiah, I am thankful for all the encouragement, love, and support you showed in various forms throughout the period of this work. To my family; Thomas, Comfort, Edith, Benedicta, Ignatius, and Alfred, I really appreciate your love, prayers, and support. Your words of encouragement always carried me through this work. Lastly, I would also thank my friends; Jonathan, Lauren, and Ellison for being part of the data collection process. I could not have completed this work without you.

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List of Abbreviations

BMI	Body Mass Index
CDC	Centers for Disease Control
CF	Complementary Feeding
CFs	Complementary Foods
CSFP	Commodity Supplemental Food Program
FAO	Food and Agriculture Organization
GDHS	Ghana Demographic and Health Survey
GHS	Ghana Health Service
IYCF	Infant and Young Child Feeding
NCHS	National Center for Health Statistics
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WIC	Women, Infant and Children

CHAPTER 1: Introduction

Appropriate complementary feeding practice has been reported to promote growth and overall health of young children in Ghana (Ghana Demographic & Health Survey, 2008). Ghana is a developing country in West Africa. The country is divided into 10 major regions with various traditional and cultural differences that dictate life practices (Forkuoh, Appienti & Osei, 2012). Apart from the cultural and traditional differences various economic challenges dictate life practices (Forkuoh, Appienti & Osei, 2012), hence, mothers' complementary feeding practices may be affected in a way that may hinder the overall health of young children. The purpose of this study was to investigate Ghanaian mother's complementary feeding practices, and their perceived impacts of complementary feeding on their children. This chapter provides an overview of the prevalence of under nutrition in Ghana as a result of inadequate complementary feeding practices, and the associated interventions and guidelines that have been suggested to improve these practices.

Several cases of child malnutrition, including child mortality, have been reported in Ghana (Saaka, 2014; FAO, 2009). Malnutrition among young children is associated with improper child feeding practices, which can be due to a lack of education and or financial conditions (Saaka, 2014; Prado & Dewey, 2012). In the past decade, the Ministry of Health, through the Ghana Health Service has adopted the World Health Organization's infant and young child feeding guidelines and implemented programs to improve feeding and nutrition practices among young children (Ghana Demographic & Health Survey, 2008). Appropriate infant feeding practices are designed to improve the quality and quantity of food, as well as the behaviors of caregivers (Imdad, Yakoob, & Bhutta, 2011; Gretel & Armar-Klemesu,

2011). Included in these guidelines are exclusive breast-feeding for the first six months, timely introduction of complementary foods, the appropriate amount and consistency of complementary foods, appropriate food storage and handling, and appropriate caregiver behavior such as responsive feeding (Wu et al., 2014). These form an essential component to appropriate complementary feeding (Wu et al., 2014).

Poor feeding practices and its effects on children may be an indication that guidelines have not been put into practice (Wu et al., 2014). Noncompliance to appropriate feeding practices may be due to many factors. Mothers may be faced with difficulties that influence choices in food, introduction of solid foods feeding practices, and feeding patterns that could have adverse effects on their children (FAO, 2009). In consideration of the influence of factors on maternal feeding practices, research is needed to understand the phenomena of complementary feeding choices of Ghanaian mothers. Information from this research can be used to address the prevalence of child malnutrition in Ghanaian children and provide guidance for appropriate action to solve these problems. The significance of this study is the possibility to use the knowledge regarding the factors influencing Ghanaian mothers' feeding practices to support Ghanaian health professionals, and adjust current education practices to address those factors. Using the results from the study, strategies were developed to improve mothers' understanding on complementary feeding and feeding behaviors.

Statement of Purpose

The purpose of this study was to investigate Ghanaian mother's complementary feeding practices, and their perceived impacts of complementary feeding on their children.

The research will address two main areas:

1. The rationale for the choice of complementary foods and;
2. Mothers' perceived and observed impacts of complementary feeding on the children's growth, health, and development.

Research Objectives

The purpose of this study was to investigate Ghanaian mother's complementary feeding practices, and their perceived impacts of complementary feeding on their children.

The research objectives for this study are as follows:

1. What is the typical age of children when Ghanaian mothers introduce solid foods to their children?
2. What complementary foods do Ghanaian mothers offer?
3. What foods do mothers give their young children when they are still breastfeeding?
4. What informs the choice of foods mothers give their children?
5. What signs do mothers recognize that indicate children are ready for solid foods in addition to breast milk?
6. What are mothers' perceptions concerning the health implications of their feeding practices, and foods offered to their children?

Limitations

This study was not without limitations. Some mothers were not comfortable sharing their experiences and opinions in a focus group setting. A few mothers were shy and were not willing to respond to questions. However, mothers were encouraged by the community volunteers to share their opinions and the moderator was trained to elicit participant responses. Mothers were recruited from one district in Ghana; thus, the results cannot be generalized to all mothers in Ghana. Since focus group sessions were conducted in the local dialect (Akan), the research instrument had to be translated. All the information was transcribed and translated into English by a trained translator for analysis. Transcription errors were controlled for by the translator through listening to audio tapes multiple times, and proof reading transcripts.

Chapter one includes an introduction to the prevalence of under nutrition in Ghana as a result of inadequate infant and young child feeding practices. The purpose of this study was to investigate Ghanaian mother's complementary feeding practices, and their perceived impacts of complementary feeding on their children. The significance of this study is the possibility to use the knowledge regarding the factors influencing Ghanaian mothers' feeding practices to support Ghanaian health professionals, and adjust current education practices to address those factors. Limitations of this study were documented. Chapter two presents the review of literature, which describes complementary feeding practices, effects of complementary food on children's overall health, and the factors that affect complementary food choices. Chapter three is written as a journal article, and chapter four is a report intended for the district health directorate of Komenda Edina Eguafo Abrem (KEEA) district.

Definition of Terms

Complementary Feeding

Complementary feeding is the process of giving nutrient containing solid or semi-solid foods in addition to breast milk. This normally begins from 6 months through two years of age and beyond (Hetherington et al., 2011; Hamilton, et al., 2011).

Weaning

The complete cessation of breast milk. It is the replacement of breast milk by solid foods as the main source of nutrition (Foote & Marriott, 2003)

Malnutrition

Malnutrition is a health condition that result from inadequate or excessive nutrient intake. Inadequate nutrient intake, which normally results in under nutrition, is a common problem in developing countries. However, both under and over nutrition may occur (Buford, L. N. 2014; Brown, 2011).

Under nutrition

Under nutrition is defined by an insufficient provision of energy and nutrients, such as good quality protein with an adequate balance of essential amino acids, vitamins and minerals, and an inability to meet the requirements of the body to ensure growth, maintenance, and specific functions (Martins et al., 2011).

Over nutrition

Over nutrition is a form of malnutrition in which nutrients are over supplied relative to the amounts required for normal growth, development, and metabolism (Dyer & Rosenfeld, 2011).

Exclusive Breastfeeding

Exclusive breastfeeding can be defined as the process whereby the infant receives only breast milk. The infant does not receive any other liquid or solids; not even water. This occurs from birth to 6 months (WHO, 2009).

Researcher Perspective and Bias

My name is Bridget Egyir and I am studying for a Master of Science degree in Family and Consumer Sciences at the University of Idaho. I specialize in child nutrition, specifically feeding practices, nutrient intake, and overall health, and development among children zero to twenty four months of age. While completing my academic course work, I have been involved in various research activities and taken classes that have helped shape my interest in child feeding. In accordance with my interest in child nutrition, I studied complementary feeding practices among Ghanaian mothers for my masters' thesis. I have been involved in other nutrition research activities, such as the study of maternal development of feeding practices and an intervention on adult communication at mealtimes with young children.

I was born and raised in Ghana and obtained my bachelor's degree in food and nutrition from the University of Cape Coast, Ghana. After obtaining my degree in 2010, I took a position as an assistant nutrition officer at the Komenda Edina Eguafo Abrem (KEEA) municipal health directorate under the Ghana Health Service (GHS). I was mostly involved in nutrition activities such as organizing nutrition counseling and education for mothers and caregivers on appropriate care and feeding practices for their children. After one year, I took a more challenging position as a nutrition officer at a refugee camp, where I

established and supervised nutrition care in partnership with the National Catholic Secretariat and the United Nations High Commissioner for Refugees (UNHCR). This camp was home to about 1,500 Ivorian refugees and my role involved conducting nutrition screenings, organizing cooking demonstrations, and providing educational talks and seminars for pregnant women and mothers on nutrition issues. In addition, I have worked as a nutrition volunteer for a nongovernmental organization in Ghana.

In consideration of my work and research experiences, I am very passionate about healthy eating, and sharing my knowledge with other people. I love food, and I believe sound nutrition is the basis for good health. I also love helping vulnerable populations which include children, lactating mothers, and pregnant women. Helping others improve and regain their health through healthy food/feeding lifestyles is rewarding. The best part is interacting with mothers and seeing young children grow healthfully.

My background as a Ghanaian and my interest in child nutrition has motivated me to gain knowledge about Ghanaian mothers' feeding practices and its impact on young children. This passion influenced the development the interview questionnaire, data collection, and analysis. The reason for choosing the KEEA district for this study was due to my previous contact with Jonathan Prabeng (a disease control officer and child growth promoter of Kissi Health Center), who offered to assist me in the study. The focus group interviews were fascinating and indeed an eye opener to mothers' experiences and opinions about their feeding practices. Focus group interviews were organized to minimize bias on responses.

Summary

Chapter one includes an introduction, which describes documented studies related to the prevalence of under nutrition in Ghana as a result of inadequate infant and young child feeding practices. The purpose of the study was to investigate the factors that influence Ghanaian mothers' choices in the introduction and variety of complementary foods offered to their children, and to understand their perceived implications of complementary foods on children's growth, health, and development. The significance of this study is the possibility to use the knowledge regarding the factors influencing Ghanaian mothers' feeding practices to support Ghanaian health professionals, and adjust current education practices to address those factors. Limitations of this study were documented. Chapter two presents the review of literature, which describes complementary feeding practices, effects of complementary food on children's overall health, and the factors that affect complementary food choices. Chapter three is written as a journal article, and chapter four is a report intended for the district health directorate of Komenda Edina Eguafo Abrem district.

CHAPTER 2: Review of Literature

Maternal feeding practices impact the health of young children (Wu et al., 2014). The period from birth to 2 years of age is a critical time for children because malnutrition may occur if adequate nutrient dense foods are not offered (Elizabeth & Choudhury, 2011). Under nutrition in most African countries has been high (Kinney et al., 2010). Improving infant and young child feeding practices have been effective to reduce childhood malnutrition (Wu et al., 2014). In most developing countries, complementary foods are often of lesser nutritional quality than breast milk and they are often given in insufficient amounts (Food and Agriculture Organization, 2009). Thus, if given too early or too frequently, they displace breast milk (United States Agency for International Development, 2011; Sika-Bright, 2010). In addition, the FAO (2009) reported that most children 6 to 9 months were fed complementary foods once a day, and children 10 to 24 months were fed twice a day when the recommendation is 3 to 5 times a day. The 2010 Ghana statistics data shows mortality of children under five years of age increased from 80 per 1000 live births in 2008 to 83 per 1000 live births in 2010 (Ghana Statistical Service, 2010). The increase in infant mortality is an indication that malnutrition is still a concern in Ghana. Therefore, the purpose of this study was to investigate the factors that influence Ghanaian mothers' choices in the introduction and variety of complementary foods offered to their children, and to understand their perception of the implications of complementary foods on children's growth, health, and development.

Best practice of infant and young child feeding is well documented. This literature review begins by discussing the overview of complementary feeding and developmental

readiness in infants. The next section explains appropriate introduction of complementary foods, followed by types of complementary foods that should be offered to young children, the amount, frequency, and consistency of the foods offered. This review further describes the safe preparation and storage of complementary foods, how adult should offer them, and the period children transition from complementary foods to adult foods. The caregivers' behavior and role during feeding will also be reviewed. The final topic discusses the factors that influence mother's food choices. This chapter ends with a summary of complementary feeding on young children's health.

Overview of Complementary Feeding

Complementary feeding is the process of giving solid or semi-solid foods in addition to breast milk (Hetherington et al., 2011; Hamilton, et al., 2011). Complementary feeding is needed to provide energy and essential nutrients required for continued growth and development (Kinney, 2010). Therefore, complementary feeding is a critical time for establishing variety and appropriate feeding practices. The nutrients in complementary foods supplement those in breast milk (Hamilton, et al., 2011). Feeding practices during this time should ensure that the child receives all the necessary nutrients.

In most developing countries, complementary feeding has been reported to be below standard (WHO, 2009) and children are often fed in ways that can put them at risk of becoming unhealthy. A considerable amount of research and recommendations are available on complementary feeding practices (WHO, 2009). The World Health Organization recommends that infants should be exclusively breastfed for the first six months of life, and thereafter should receive appropriate complementary foods with continued breastfeeding up

to two years of age or beyond (Wu et al., 2014; Rasheed, et al. 2011; Kuriyan & Kurpad 2012). Breastfeeding is important because it provides about one half of the infant's energy needs between 6 to 12 months of age, and up to a third of required energy needs during the second year of life (USAID, 2011). Establishing complementary feeding at six months is recommended because breast milk alone is no longer sufficient to meet the nutritional and developmental needs of the child (Elizabeth & Choudhury, 2011). Children should be offered adequate, hygienic and nutritious complementary foods to support growth and development, and the amount and variety of food should increase with age (Elizabeth & Choudhury, 2011). Infants and children go through both internal and external biological processes, which is important in infant feeding (Infant Nutrition and feeding; Women, Infants, and Children & Commodity Supplemental Food Program, 2009).

Developmental Readiness

Developmental readiness of full term infants indicates that they are ready to advance from exclusive breastfeeding to the introduction of complementary foods (Infant Nutrition; WIC & CSF, 2009). Infants learn to consume a variety of foods with different tastes and textures. In full term infants, developmental readiness becomes visible through physical growth, the gastrointestinal tract, and the kidney (Brown, 2011). The development of the digestive system, intestinal tract, and kidney indicate that the child is able to digest and absorb different sources of fats, proteins, and carbohydrates as well as excrete waste efficiently (Brown, 2011). Most children reach developmental readiness for complementary foods between 4 to 6 months of age (Infant Nutrition; WIC & CSF, 2009). At that time, the structure of the infant's mouth is better developed to make chewing and grinding

movements, and the tongue has progressed in development to use a rotary movement. Hand and body gestures also are cues for starting complementary foods (Monterrosa et al., 2012). In addition, as infants grow and develop, they show a desire for food through various cues such as drooling, opening their mouth, and leaning forward when they see adults eating (Brown, 2011). They show fullness by leaning back, pushing food away or closing their mouth (Brown, 2011). By 6 months of age, most infants like to put things in their mouths, and are interested in new tastes (Infant Nutrition; WIC & CSF, 2009). These cues serve as a guide for introducing complementary foods.

Complementary Foods to be Offered

Young children need appropriate nutrient dense foods for their age. Foods typically contain different essential and non-essential nutrients (Brown, 2011), and thus a variety of foods eventually should be offered to a child. A variety of foods rich in micronutrients will support catch up growth or growth spurts in children (Ghana Baseline Report, 2011). Food promotes growth, provides energy, and protects the body from diseases and infections (Brown, 2011). Infants have to be fed adequate complementary foods at the right time so that they can grow up healthfully (WHO, 2009). Foods offered to young children should be introduced one at a time to allow the child to get use to different textures and help the caregiver to identify a possible allergic reaction (Elizabeth & Choudhury, 2011).

Complementary foods could be home or commercially prepared infant foods (Infant Nutrition and feeding; WIC & CSF, 2009). Regardless of the food offered it must be free of contamination, devoid of salt or spices, easy to prepare from family foods, easy to eat, and easily accepted by the infant (Elizabeth & Choudhury, 2011; WHO, 2009). In a situation where these foods are not available, the World Health Organization recommends the use of

fortified complementary foods and vitamin mineral supplements to ensure adequacy of particular nutrient intakes (Palmer, 2009).

In most developing countries, staples (such as millet, sorghum, yam, maize, cassava, rice and cocoyam) are the most common food supply, but they are limited in protein and other nutrients; thus they cannot provide all the nutrients infants need on their own (FAO, 2009). Most children are offered porridges made from these staples until they are old enough to eat family foods (Elizabeth & Choudhury, 2011). Some caregivers rarely add more nutritious ingredients such as eggs, fish, soybeans powder, peanuts, oils, vegetables and fruits, and they rarely diversify the foods given (World Health Organization & United Nations Children's Fund, 2006).

Offering a variety of foods to children is necessary since one particular food cannot meet their nutritional needs (Ghana Baseline Report, 2011). Different food sources must be combined when feeding young children because only a diversified diet can provide infants with adequate nutrition (Elizabeth & Choudhury, 2011).

Amount and Frequency of Complementary Foods

When identifying the type of foods to offer young children, the amount and frequency should be considered. The amount of complementary food should be increased with age (Elizabeth & Choudhury, 2011). The WHO (2009) suggests that energy needs for infants 6 to 8 months of age should be approximately 600 kcal/day, 700 kcal/day for infants 9 to 11 months of age, and 900 kcal/day for children 12 to 24 months of age. While guidelines are available for the estimated kcal for infant growth, the amount of food to be offered should be based on the principles of responsive feeding (Briend, 2009). Caregivers

should follow the hunger and satiety cues of children in assuring quality frequency and amount of complementary foods (Satter, 2013). The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding by the child (Briend, 2009). For the average healthy infant, meals should be provided 4-5 times per day, with additional nutritious snacks offered at 1 to 2 times a day (Briend, 2009; WHO, 2009). Complementary foods should not replace breast milk, rather, the two should be offered together, in that breast milk and complementary foods should be offered intermittently throughout the day (Ghana Baseline Report, 2011).

Consistency and Texture of Complementary Foods

The appropriateness of complementary foods for young children also include its consistency and texture. Complementary foods may begin with a thinner texture or consistency in the first few weeks, however, the texture should get progressively thicker. This ensures a more nutrient dense feeding. At six months, infant can eat pureed, mashed, semi-solid foods, and by 8 to 12 months they are able to eat finger foods (snacks) such as koose, pieces of soft cooked vegetables and fruits, cooked fish, meat, poultry, and breads (Peter & Hilmi, 2011; Elizabeth & Choudhury, 2011). In addition, by age 12 months the child should be able to eat solid foods that are consumed by the family (Lindsay, 2012). Both finger and family foods should be given in smaller pieces to avoid choking and aspiration (Brown, 2011; WHO, 2009). Porridges should be nutrient dense and thick or pasty in order to meet infants' needs (Elizabeth & Choudhury, 2011; WHO, 2009). In a study by Nti & Lartey (2007), 65% of mothers offered porridges to their infant, indicating that porridges are the most common food for young children in Ghana. Unfortunately, the energy and nutrient content in porridge is often too low (Nti & Lartey, 2007) due to the high

starch content of staple foods, such as cereals (rice, wheat, maize, millet), roots (cassava, yam and potatoes) and starchy fruits (plantain) etc. (WHO, 2009).

How to Offer Complementary Foods

Infants and toddlers are able to use a spoon and are able to manage the use of cups (Brown, 2011). Therefore, offering complementary foods with eating utensils is not a problem (Brown, 2011), as long as the adult recognizes infant development of self-feeding skills. The WHO (2009) recommends that complementary foods be offered with a spoon and a cup. The use of feeding bottles is not recommended in developing countries since it is a source of infection because bottles are difficult to clean increasing the risk for illness (WHO, 2009; Giugliani & Cesar, 2000). Feeding bottles also reduce breast suckling time, which interferes with breast feeding and displaces breast milk (Kuriyan & Kurpad, 2012). Spoon-feeding complementary foods from a cup or bowl is the best way to feed infants in developing countries to avoid infection (Elizabeth & Choudhury, 2011).

Safe Preparation and Storage of Complementary Foods

Safe preparation of complementary foods is essential in infant feeding practices because it reduces contamination and infection in young children. Contamination of complementary foods is very common in developing countries due to contaminated water, flies and insects, poor personal hygiene of the care giver or individual preparing the food, and inadequate cleaning of eating utensils, feeding bottles, and nipples (Burgess & Danga, 2008). Inadequate storage of foods after preparation is common in developing countries (Giugliani & Cesar, 2000) as well. Diarrhea was associated with complementary feeding practices (Giugliani & Cesar, 2000; WHO, 2009), and can be life threatening to the child.

Good hygiene, and proper food handling reduces food poisoning (Benjamin, 2012) which is particularly important for children under five years who are very vulnerable to infections (Elizabeth & Choudhury, 2011). Infections increase the risk of under nutrition, because sick children may eat less, absorb fewer nutrients, and lose nutrients through diarrhea infection (Burgess & Danga, 2008). Caregivers must practice good hygiene, proper handling of food, and avoid feeding bottles which may be difficult to keep clean (WHO, 2009). Caregivers should ensure appropriate means of offering complementary food to ensure nutrient intake by children.

Transition from Complementary Foods to Adult Foods

The period of complementary feeding is the time the baby gradually becomes accustomed to eating family foods (Ghana Baseline Report, 2011). At the end of this period, usually around 23 months of age, breast milk is replaced by family or adult foods that are modified to prevent choking; although a child may still sometimes suckle for comfort (Chandrani Liyanage, 2010). The age during which transitional foods are introduced is a particularly sensitive time in the developmental cycle of a child (WHO, 2009). The child's diet changes from a single food, mother's milk or formula, to a variety of foods required to fulfill different nutritional needs (Infant Nutrition and feeding, 2009; WIC & CSF, 2009). Not only is the transition associated with increasing and changing nutrient requirements, but it also is associated with infant growth spurts (WHO, 2009). Some feeding behaviors at this time include taking food from a spoon, self-feeding with fingers or a spoon, and independent drinking from a cup (Chandrani Liyanage, 2010; Brown, 2011). After about 2 years of age, breast milk is replaced entirely by family foods (WHO, 2009). During the complementary

feeding period, caregivers need to adopt an appropriate feeding style that promotes adequate food intake by young children.

Responsive Feeding and Child Hunger Cues

Appropriate feeding behaviors of caregivers are essential in determining the wellbeing of young children (Satter, 2013). This section describes responsive feeding and children's hunger cues.

Responsive feeding is the evidence-based approach to feeding children in an appropriate manner (WHO, 2009). It employs the principle of psychosocial care: respect for the physical mechanism that self-regulates the appetite in infants, and helping children until they feel satiated (Satter, 2013). Mothers sometimes use inappropriate feeding practices with their children (Ghana Baseline Report, 2011). This may be attributed to the increase in the number of women in the labor force (Mywage.org/Ghana, 2015), where mothers work outside the home and dedicate child care to non-working family relatives who may not have adequate knowledge about child feeding. Caregivers' must practice responsive feeding actions, especially during illness, so that children can recover quickly and attain the needed catch-up growth (United States Agency for International Development, 2011). Infant feeding requires attention to foods as well as feeding behaviors of caregivers (Elizabeth & Choudhury, 2011). Infants and young children need assistance that is appropriate for their age and developmental needs to ensure that they consume adequate amounts of complementary foods (WHO, 2009). Caregivers should feed their infant directly, slowly, patiently, and offer different foods to support taste and texture preference development (WHO, 2009). Caregivers also should respond early and appropriately to their children's

hunger cues (Creed-Kanashiro & Bartolini, 2009). Caregivers are to feed their children with love, keep eye to eye contact, and ensure that children are seated in a supportive and comfortable position (Black & Aboud, 2011). Thus, responsive feeding is a feeding style that ensures that the caregiver feeds her child in response to the child's hunger and satiety cues.

On Demand Feeding: Developing a positive feeding relationship is important to an infant's growth and development (Infant nutrition and feeding, WIC & CSF, 2009). When this bond falters, the child can either be underfed or overfed (Black & Aboud, 2011). Complementary food must be offered on demand and the adult should always respect the child's appetite (Elizabeth & Choudhury, 2011), thus pressuring children to eat should be avoided. Infants show signs indicating their hunger or fullness in various ways: cry or fuss, suck on fist, wake and toss, showing irritation if feeding is too slow, tight fist reaching for spoon, slowing the pace of eating, rejecting or playing with food, and spitting out food (Brown, 2011; Infant nutrition and feeding, WIC & CSF, 2009). Caregivers need to learn and pay attention to these signs of hunger and satiety (Black & Aboud, 2011).

Complementary Feeding Practices in Ghana

Poor nutrition outcomes in most developing countries are usually associated with suboptimal feeding practices and a lack of awareness on the part of caregivers (Wu et al., 2014). Even though the WHO (2009) has recommended exclusive breastfeeding for six months, and the introduction of adequate complementary foods through two years of age and beyond to boost the nutritional status of infants (Wu et al., 2014), only half of infants under 6 months of age are exclusively breastfed in Ghana (FAO, 2009). In addition,

complementary feeding practices are inadequate, and are the leading cause of malnutrition and infant mortality (Saaka, 2014; Food and Agriculture Organization, 2009; United States Agency for International Development [USAID], 2011). For example, less than one third of children aged 6 to 11 months are given fruits or vegetables, and only one quarter receive foods from animal sources (FAO, 2009). Therefore, most children receive insufficient nutrients. Furthermore, parents and child caregivers are faced with a variety of difficulties that bring about challenges in food choice, feeding practices, and feeding patterns that can have adverse effects on children (Paula Davis, Eva Tagoe-Darko & Altrena Mukuria, 2006; Sika Bright, 2010).

In Ghana, the most common complementary foods introduced are carbohydrate based staples such as rice, cassava, potatoes, millet, maize, and other roots and tubers (Schwartz, 2008). Sika Bright (2010) reported that some Ghanaian mothers introduce complementary foods as early as one month of age such as water and fermented maize porridge. Early introduction of complementary foods displace breast milk and may result in under nutrition (WHO, 2009). Under nutrition affects children across Ghana, but children living in rural areas suffer from under nutrition more often than their urban counterpart, 32% and 21% respectively (Ghana Demographic and Health Survey, 2008).

Factors Influencing Mothers' Choices of Foods

A number of factors influence mothers' choices of foods offered to their children (Gretel & Armar-Klemesu, 2011): cultural beliefs, maternal illiteracy, financial resources/economic status, food availability and accessibility, advice from other family members/friends, and child's preference. Each of the factors are described.

Cultural Beliefs

Culture provides the strongest determinant of food choice (Betsy, Calabrese & Maillet, 2009). The values people develop around food contribute to food choices and this has great importance for child health (Bowen & Devine, 2011). Family and culture determine what foods are appropriate and what foods are not (Bowen & Devine, 2011). In most cases, individuals and families select foods based on how familiar they are to that food (Betsy, Calabrese & Maillet, 2009). The effects of culture reflect different dietary histories, which also may determine whether the foods are acceptable to the individual (Prescott et al., 2012).

Family's choice of food may eventually impact the child's growth (Bowen & Devine, 2011). Cultural beliefs affect nutritional status of children in Ghana (Paula Davis Eva Tagoe-Darko Altrena Mukuria, 2006). For example, some mothers consider colostrum harmful to newborn babies, and it is believed to cause diseases in children (Maaike et al., 2011). Prelacteal feeds (i.e. foods or liquids given to new-borns before breastfeeding is established) are incorrectly believed to complement breast milk. In Ghana, prelacteal feeds are offered in the first few days to cleanse the digestive system (USAID, 2011) and early initiation of complementary feeding is often considered appropriate for children because mothers believe that breast milk is not sufficient to satisfy a child's hunger. In addition, some Ghanaian mothers believe porridge is an appropriate food that should complement breast milk, and so children are given this nutrient deficient, and energy deficient food before 6 months of age (Gretel & Armar-Klemesu, 2011).

Maternal Illiteracy

The education level of a mother will influence the feeding practices she uses with her child (Saaka, 2014; Johnson et al., 2011; Liaqat et al., 2007).

Infants may be fed inappropriate complementary foods because caregivers are not aware of appropriate feeding practices (Kuhnlein & Receveur, 1996; Krebs & Hambidge, 2007).

Caregivers' level of education may hinder or help in the selection of foods that support a child's growth and development (Johnson et al., 2011). Inadequate knowledge about appropriate foods and feeding practices is often a greater determinant of malnutrition in developing countries (Saaka, 2014; Gyampoh et al., 2014). In Ghana, children of mothers with no education or less than secondary education are likely to have stunted children (Ghana Demographic & Health Survey, 2008).

Financial Resources and Economic Status

The economic status of caregivers is directly related to feeding practices in Ghana (Gretel & Armar-Klimesu, 2011). Cost consideration is a factor when making a choice of food (Monterrosa et al., 2012). In Ghana, the cost of complementary food is a major concern for caregivers (Pelto & Armar-Klimesu, 2011). Economic constraint of caregivers may result in the selection of cheaper items or lower quality staples (Gretel & Armar-Klimesu, 2011). Household finances determine the frequency with which meat, vegetables, and dairy products are purchased (Monterrosa et al., 2012). The presence of financial constraints results in young children who are less likely to receive iron-rich foods and other micronutrients, hence resulting in micronutrient deficiencies and stunting (Monterrosa et al., 2012). Some households turn to street foods, which may be relatively cheaper and of low nutritive value (Ruel et al., 2010). In families where women have taken employment outside

the home as a result of economic hardships, they tend to feed their children and family with street foods (Ruel et al., 2010).

Food Availability and Accessibility

Children can be fed adequately with family foods, but food availability and accessibility are crucial for this to happen (Palmer, 2009). Little access to quality foods affect food choices (United Nations Information Center-GHANA, 2013). In most cases, poverty is associated with lack of sufficient and quality food in developing countries (Palmer, 2009). Food availability and accessibility are positively related to infant feeding practices, and it is seen as a factor beyond caregivers' immediate control (Schwartz, 2008). In most developing countries food availability is high, but people cannot afford to purchase the food, limiting availability (Palmer, 2009). The quantity of food available in households depends on family resources, which may lead to dietary intake problems (Bhattacharya, Currie & Haider, 2004). Some caregivers mistakenly view inexpensive local foods as inferior to processed foods, which may be relatively expensive, therefore depriving their children of access to more nutrient rich foods (Palmer, 2009).

Advice from Other Family Members and Friends

Significant others as well as friends whom mothers or caregivers interact are capable of influencing complementary food choices (Sika-Bright, 2010; Maaïke, 2011). Based on their beliefs, family members encourage caregivers to feed infants complementary food to respond to signals of hunger, reduce crying, and sleep through the night despite the recommendation to wait until the infant is 4 to 6 months of age (Sika-Bright, 2010). Immediate family members are known to be the most influential people that affect infant feeding (Gretel & Armar-Klemesu, 2011).

Child's Food Preference

Food preference has both genetic and environmental origins (Birch & Martin, 1988). Children are predisposed to like foods that are sweet and salty and reject those that are sour and bitter (Birch & Martin, 1988). The food a child likes or does not like guides the complementary foods the mother offers and how those foods are prepared (Monterrosa et al., 2012). Children prefer foods they are normally exposed to and reject new foods (Birch & Martin 1988). Appearance and texture are the first sensation to arouse the interest in a given food (Birch & Martin, 1988). According to Brown (2011), breastfed infants accept new foods more easily than non-breastfed infants because they are exposed to different kinds of flavor and smell through the breast milk. The foods mothers consume while breast-feeding affect the taste and smell of the breast milk, thus breastfed infants may take to solid foods easier, because they already recognize some flavors of food via mother's breast milk (Brown, 2011).

Caregivers are influenced by some factors in their choice of complementary foods. Among these factors are cultural beliefs, maternal illiteracy, financial resources/ economic status, food availability and accessibility, advice from other family members/friends, and child's preference. These factors have been proven to affect the nutritional status in young children (FAO, 2009)

Long Term Effects of Complementary Feeding Practices on a Child

The period from gestation through infancy is the critical period of rapid brain development (Prado & Dewey, 2012). Children who do not receive proper nutrition during the early years of life are at a greater risk of compromised physical and cognitive

development (Lutter et al. 2011). Under nutrition may affect brain development, and is seen through the child's behaviors and performance at school (Prado & Dewey, 2012). Specific effects of complementary feeding on growth, cognitive development, and health of the child are discussed below.

Growth

Physical growth occurs when there is an increase in height, weight, and body mass as the infant matures (Lutter et al., 2011). Growth and development is marked during the first year of life, and is ascertained with adequate feeding (Luther et al., 2011).

Malnourished women may deliver premature babies or small babies who are more likely to die or suffer suboptimal growth (Caulfield et al., 2006). Adequate nutrient intake during childhood is essential for growth and development (Allen, Peerson & Olney, 2009). Under nutrition can result in stunting typically caused by insufficient nutrient intake over a period of time (Luther et al., 2011). In 2006, an estimated 32% of children less than five years of age in developing countries were stunted, and 10% were wasted, which reflects inadequate nutrient intake (WHO, 2009).

Cognitive Development

Good nutrition during infancy is needed for cognitive development, as sufficient nutrients supplies the building blocks for neural formation and brain development (Mohd et al., 2012). Children who do not receive proper nutrition during the early years of life are at greater risk of compromised cognitive development (Lutter et al. 2011). The effect of under nutrition on brain development is seen through the child's experiences and behaviors (Prado & Dewey, 2012). Inadequate intake of required nutrients may result in compromised

cognitive function in the child's future (Monterrosa et al., 2012) including impaired intellectual performance and work capacity (Mohd et al., 2012).

Impaired intellectual capacity may extend into adult years, and decrease the adult's intellectual ability and work capacity as well (Caulfield et al., 2006).

Health

Improving the quality of complementary foods has shown to promote health, and reduce morbidity and mortality in children (Wu et al., 2014). Hence, sufficient complementary foods may prevent some chronic illnesses in childhood and the later years (Anigo et al., 2009). Infants who are deprived of adequate amounts of nutrient rich foods for a longer period of time may develop kwashiorkor, that is a protein deficiency and marasmus-kwashiorkor, a deficiency of calories and protein (Infant nutrition and feeding, WIC & CSFP, 2009). Adequate complementary feeding promote the overall health and development of young children.

Summary

This chapter presented the overview of complementary feeding, developmental readiness in infants, and appropriate introduction of complementary foods, followed by types of complementary foods offered to young child. The amount, frequency, and consistency of complementary foods that should be offered were also presented. This chapter further reviewed the safe preparation and storage of complementary foods, and how caregivers should offer them. The caregivers' behavior and role during feeding were also discussed as well as factors that influence mother's complementary food choices.

Child under nutrition exists in most developing countries, which Ghana is not exempt (Gyampoh et al., 2014). Reported infant feeding practices are below standard and are the major causes of malnutrition among young children (Wu et al., 2014). Under nutrition affects growth and development of young children as well as decreases intellectual and work capacity (Mohd et al., 2012). Guidelines are available to support breastfeeding and appropriate complementary feeding practices to ensure adequate nutrient intake of children, but these guidelines are often not adhered to (Gyampoh et al., 2014). Caregivers are often faced with problems that affect their food choices and feeding practices (Pelto & Armar-Klimesu, 2011), which affect the growth and development of their children. While guidelines of complementary feeding practices in developing countries and prior actions have been put in place, greater understanding of mothers' complementary feeding practices is needed. Child malnutrition is still a concern in Ghana, understanding complementary feeding knowledge in Ghanaian mothers' will assist effort in preventing and identifying solutions to this problem.

Therefore, the purpose of this study was to investigate the factors that influence Ghanaian mothers' choices in the introduction and variety of complementary foods offered to their children, and to understand their perceived implications of complementary foods on children's health, growth, and development. Findings from the project will help health professionals address malnutrition and infant mortality in Ghana.

CHAPTER 3: Ghanaian Mothers' Complementary Feeding Practices and their Perceived Impacts on Young Children*

Abstract

Appropriate and timely complementary feeding practices are fundamental to a child's growth, health, and development during the first two years of life. This study aimed to understand 1) Ghanaian mother's complementary feeding practices, and 2) their perceived impacts of complementary feeding on their children. Ghanaian mothers with children four to twenty four months of age were recruited from four communities in the Komenda Edina Eguafo Abrem district in the Central Region of Ghana (n=99). A qualitative methodological approach with focus group interview discussions was used. Eleven focus group interviews were conducted, lasted approximately 1 hour, and were audio recorded and transcribed. The audio transcriptions were coded and analyzed into pertinent themes, meta-themes, and theoretical concepts. While over 80% (85) of mothers reported some knowledge about the effects of complementary feeding on their children, 45% (45) of the children were undernourished, indicating inaccurate knowledge or a lack of application of their knowledge. Some mothers held misconceptions about the effect of food on children's health. Four overarching themes were identified: 1) mothers' background knowledge about food, child health and growth outcomes; 2) mothers' motivation in feeding their children; 3) barriers to feeding; 4) foods mothers offered to their children.

* This chapter has been prepared for publication

Nutrition education on complementary feeding is needed for Ghanaian mothers. Health facilities and community outreach programs could be a venue to provide education to mothers regarding infant and young child feeding practices in Ghana.

Introduction

Complementary feeding practices are essential determinants of growth, health, and development among young children (Kinney et al., 2010). The period from birth to two years is critical to prevent growth faltering and under nutrition (Wu et al., 2014). Nutrition problems among children in developing countries are often a result of inadequate nutrient intake, insufficient calorie intake, and infections (Children's Health and Nutritional Status in Ghana, 2008). Inadequate nutrient intake can be due to inappropriate complementary feeding practices of mothers and caregivers (Burgess & Danga, 2008). Approximately 28% of children in Ghana are stunted and about one in ten children are moderately or severely underweight (Children's Health and Nutritional Status in Ghana, 2008). Although under nutrition extends across the country, children in rural areas are more under nourished than their urban counterpart (Children's Health and Nutritional Status in Ghana, 2008).

Recommended child feeding practices and guidelines are available (Wu et al., 2014) and designed to improve the quality, and quantity of food as well as improve the feeding behaviors of caregivers (Imdad, Yakoob, & Bhutta, 2011). To better support mothers to follow these guidelines, the factors that influence their complementary feeding practices must be understood as well as the best means to promote or help change the feeding behaviors of caregivers (Imdad, Yakoob, & Bhutta, 2011).

Therefore, this study aimed to investigate the factors that influence Ghanaian mothers' choices in the introduction and variety of complementary foods, and their perceived implications of these foods on children's growth, health, and development.

Methods

Qualitative methodology with focus group interviews was used to gather and explore thoughts, perceptions, opinions, and feelings (Krueger & Casey, 2009) about complementary feeding practices of Ghanaian mothers. The University of Idaho Institutional Review Board (see Appendix A) and the Ghana Health Service Ethical Review Board approved the study.

Population, Sample, and Location

A convenient sample of participants was recruited from four communities in the Komenda Edina Eguafo Abrem (KEEA) District in the Cape Coast Metropolitan Assembly, Central Region. The district is located in southern Ghana and includes nineteen communities, and four sub districts. The inhabitants in the district are predominantly Akans, and their main occupation is peasant farming: fishing and cultivation of crops. A convenient sample was recruited from four communities: Komenda, Kissi, Antado, and Kokwado. Forty nine of the participants (50%) were from Komenda, a larger community of mothers who were available to participate after a Child Welfare Clinic (CWC) session. Forty nine mothers (50%) were recruited from Komenda, 19 participants (19%) were recruited from Antado, 12 participants (12%) from Kissi, and 19 participants (19%) from Kokwado. The focus group interviews were performed at one health facility, and three community centers respectively. Mothers who normally attend their routine CWC in Komenda and Kissi were asked to participate.

The remaining participants from the other two communities, Antado and Kokowado, were mobilized by community volunteers. Data collection took place at their various community centers.

Eligibility to participate in the study included: mothers with children between four months and two years of age, the child did not have health complications, and the mother was 18 years of age or older. Participants were asked to complete a consent form (see Appendix B), and a demographic questionnaire, measure their height, and weight, and attend a focus group interview that lasted approximately one hour. Prior to each session, participants were informed of the purpose of the study, and potential risks. For mothers who could not read, one on one interviews were conducted to complete the demographic questionnaire. After completing the questionnaire, the participants sat around a table and a trained moderator (lead researcher) led a discussion regarding their complementary feeding using a discussion guide.

Research Instruments

The research instruments included a socio demographic questionnaire (Appendix C), focus group discussion guide (see Appendix D), and a researcher's journal. All materials were translated into the local dialect (Akan) by the trained moderator. The questionnaire and discussion guide were developed using existing literature and reviewed by a nutrition expert for face validity. The questionnaire was reviewed by two mothers from Africa for content validity. The moderator pretested two pilot focus groups (n=5). Two questions in the discussion guide elicited the same responses from mothers, and the guide was edited accordingly to avoid repetition.

The demographic questionnaire (see Appendix C) captured socio-demographic information of the children and mothers including the child's gender, date of birth, weight, activity level, food intake, mother's age, height, weight, marital status, tribe, education level, and employment status respectively. Child feeding questions, such as age of introducing complementary foods, types of foods mothers offer, duration of complementary feeding, and factors that influence feeding practices, were included. Children's nutritional status were identified by calculating weight for age Z score (WHO, 2012). Mothers were asked to mark the factors that influenced the foods they offered their children, with five options: time, finances, convenience, own food preference, and cultural beliefs.

The focus group interview took the form of open discussions where participants shared their concerns and opinions (Krueger & Casey, 2009) about complementary feeding. Interviews and focus groups were conducted in Fante, the local language of the area. Beginning each session, the moderator welcomed participants and introduced herself and the goal of the project. She informed the participants that she wanted to hear their thoughts and opinions about their complementary feeding practices. The participants were invited to speak freely and were reinforced that there were no wrong answers or opinions. Participants were assured of confidentiality in the use of the collected data. The only stated request was to let each other finish sharing their opinion, for both clarity of the discussion and to make transcription possible (Krueger & Casey, 2009). The trained moderator used predetermined questions or a discussion guide (Appendix D) with open ended questions and probes to conduct each session (Krueger & Casey, 2009). Eleven focus group sessions were conducted with 6 to 10 participants at each session.

Thus, five focus group sessions were organized in Komenda, two in Antado, two in Kissi, and two in Kokwado. Following each session, participants were provided compensation with snacks and a beverage.

Data Analysis

Descriptive statistics were gathered from the demographic questionnaire to identify the characteristics of mothers and their children. Frequency data such as age, weight, and height, were analyzed using Microsoft Office 365 ProPlus (Excel 2013 version 15.0.4693.1002). Means, standard deviations, frequencies, and percentages were determined. Body mass index was calculated for each mother using measured weight and height. Weight for age measurements for children were calculated using Z scores Center for Disease Control/ National Center for Health Statistics (CDC/NCHS). The focus group sessions were audio recorded and transcribed, translated into English, and analyzed for pertinent themes (Krueger & Casey, 2009). The researcher reviewed and listened to the tapes, made notes, and summarized the data for analysis (Krueger & Casey, 2009). Using the transcription, the data was organized into labels, and were assigned codes or phrases found in the transcript (Krueger & Casey, 2009). Connections were identified, meta-themes created, and theories were created among themes. The researcher reviewed, and listened to the tapes, and made notes to confirm codes, and analysis (Krueger & Casey, 2009).

Results

Socio Demographics of Mothers and Children

Eleven focus group interviews were conducted (n=99). The socio demographic information of mothers and their children are summarized in Table 3.1.

Each mother had at least one child whose age did not exceed 24 months at the time of the study. Analysis of BMI data revealed 59 mothers (60%) had normal weight, 30 mothers (30%) were overweight/obese and 10 (10%) were underweight. Fifty six (57%) of the children were girls and the remaining 43 (43%) were boys. The nutritional status of the children was assessed using CDC/NCHS Infant Weight for Age Percentiles/z score for children less than 36 months of age. With reference to WHO (2012), a z score below -2 and -3 indicate moderately under nutrition and severe under nutrition respectively. Half of the infants (49, 50%) had normal weight for their age, while 45, 45% were moderately or severely undernourished as reported in Table 3.1 (two mothers did not report their children's height and weight).

Table 3.1. Demographic Information of Mothers and their Children (N = 99)

	Range	Mean (SD)
Mothers		
Maternal Age	18 – 44	26 ± 6
Maternal BMI*	16 – 38	24 ± 4
Children		
Age (Months)	4 – 24	13 ± 5.5
Weight (Kg)	5 – 12.5	8.6 ± 1.6
	N=99	%
Children's weight classification		
Normal weight	49	50
Moderately underweight	31	31
Severely underweight	14	14
Overweight	3	3
No response	2	2

Marital status		
Married	74	75
Single	16	16
Divorced	6	6
No response	3	3
Education Level		
None	22	22
Elementary**	52	53
High	15	15
Tertiary	7	7
No response	3	3
Tribe		
Akan	88	89
Ewe	1	1
Gawuli	4	4
No response	6	6
Religious Affiliations		
Christian	88	89
Muslim	6	6
No response	5	5

*Mothers who were pregnant were not included in BMI

**Elementary level included up to nine years of basic elementary education

Caregiver Reported Feeding Practices from the Demographic Questionnaire

Fifty seven (58%) mothers reported introduction of solid foods with breast milk at six months. However, twenty mothers (20%) gave their babies foods before the age of 6

months, while 11% introduced foods at a later age (7 months or later). When mothers were asked how often they fed their children in a day, the majority (63, 64%) responded that they fed their babies “3-4 times” a day, 18 mothers (18%) said “less than three times” a day and 7 mothers (7%) responded “more than 4 times” a day.

The duration at which mothers intended to complementary feed was reported. The majority of mothers intended to complementary feed breast milk and complementary foods until their children were 24 months of age (45, 46%). Eighteen mothers (18%) intended to start weaning (complete cessation of breastfeeding, where children rely solely on family foods) when their children were between 13 to 23 months of age, and 15 mothers (15%) reported they would start weaning before their children reached 13 months of age.

Mothers’ infant feeding practices varied due to the different ages of children (distributed from 4 to 24 months). Whereas some mothers were exclusively breastfeeding, others had introduced complementary foods. The percentage of mothers who were complementary feeding (breastfeeding and complementary foods) was 67%, as is typical for children 4 – 24 months of age. Only 14 (14%) and 15 (15%) mothers practiced weaning and exclusive breastfeeding respectively. The remaining 4% (4 mothers) practiced bottle-feeding. Most mothers (73, 74%) reported that they ate breakfast with their children more than 3 times a week. Meanwhile, 12 mothers (12%) responded that they do not eat breakfast with their children, although they supervised or fed their children themselves.

Mothers reported how they perceived and felt about their children’s weight. The majority of mothers, (74, 75%) reported that their children had normal weight, 16 mothers

(16%) also reported their children were underweight, and the remaining 6 mothers (6%) responded that their children were overweight.

Many factors affected mothers' food selection. In this study, mothers were asked how often they considered nutrition in the selection of foods they offered their children, and the responses were: forty one mothers (42%) responded "always", 29 mothers (29%) indicated "often", 18% responded sometimes, 1% indicated "rare" and 5% responded "never." Mothers mentioned some local foods they normally offered their children (see Figure 3.1); however, only a few (5, 5%) offered food from animal sources (meat, milk, eggs) or a high protein substitute. Mothers, 31 (32%) and 26 (26%) offered grain and starchy root staples respectively. According to mothers, vegetables were used in soups, and stews and they were offered in addition to grains and staples. Only 10 mothers (10%) offered fruits to their children and 6 (6%) offered commercially fortified complementary foods.

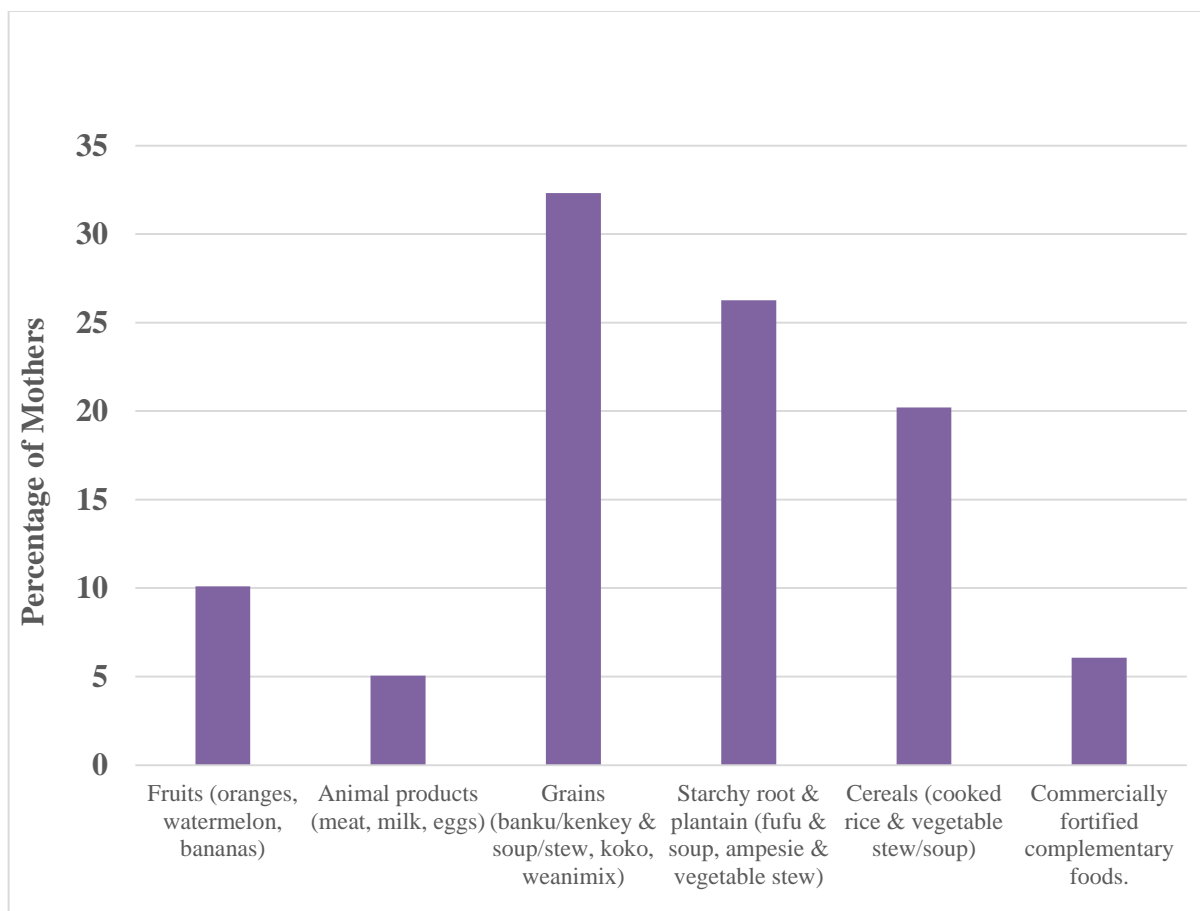


Figure 3.1. Types of Foods Mothers Offered their Children 4-24 Months of Age

Mothers reported how they identified their children's readiness for complementary foods. Five major reasons were reported by mothers on why they introduced complementary foods to their children. This is indicated in Table 3.2.

Table 3.2. Mothers Identified their Child's Sign of Readiness for Complementary Foods

Sign of Readiness	N=99	%
Child watched adult eating or cried when he/she saw adult eating	13	13
Child reached for food	16	16
I was educated to start complementary food at 6 months	22	23
I perceived the child to be hungry	9	9
My breast milk was not enough for my child	10	10
Relatives decision	3	3

*Twenty six mothers did not respond to this question

Mothers reported factors that influenced the foods they fed their children (see Figure 3.2). The diagram (Figure 3.2) represents five factors mothers reported that affected their food choices. The numbers indicated by each factor is the summation of mothers' responses as represented by the diagram. The rings overlap because some mothers indicated two or more factors.

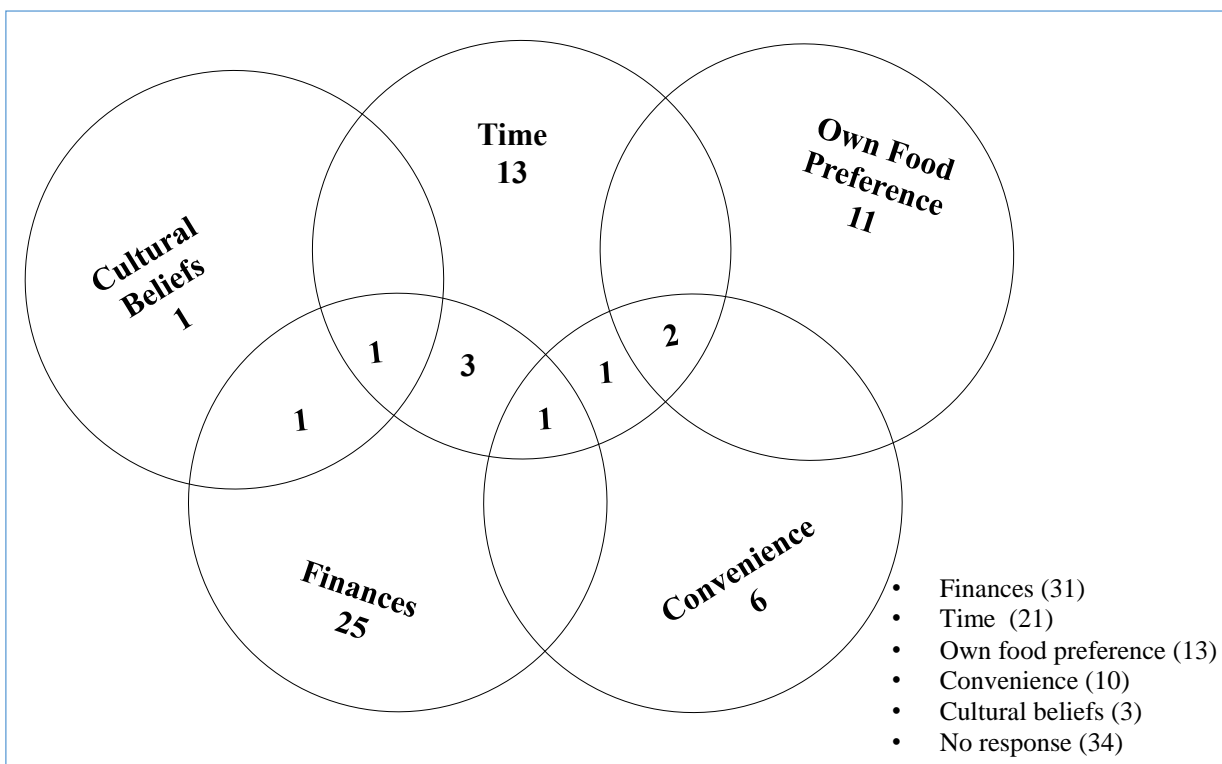


Figure 3.2. Schematic Representation of the Percent Distribution of Mothers' (n = 99) Reported Factors that Influence their Food Choices

Mothers' Responses from the Focus Group Interviews about Complementary Feeding

From the focus group interview, four major themes emerged related to complementary feeding practices. The four themes include: background knowledge, motivation to feed, barriers to feeding, and foods mothers offered (see Figure 3.3). Mothers' nutrition knowledge (first theme) represents mothers' reported information about food, child health, and growth outcomes. The variety of foods and its appropriateness is influenced by their knowledge about that food. Mothers also believed that the growth and overall health of their children is influenced by the foods they offered. Mothers' source of motivation in feeding their children (second theme) is based on their child's physical health and growth as well as positive reinforcement and modeling appropriate behavior of mothers. Though mothers were motivated to feed their children, they were often hindered by some barriers. Mothers' reported barriers to feeding (third theme) included: financial, paternal, child, and beliefs. The foods mothers offered (fourth theme) were guided by their perceptions and beliefs. Each theme is reviewed in detail below.

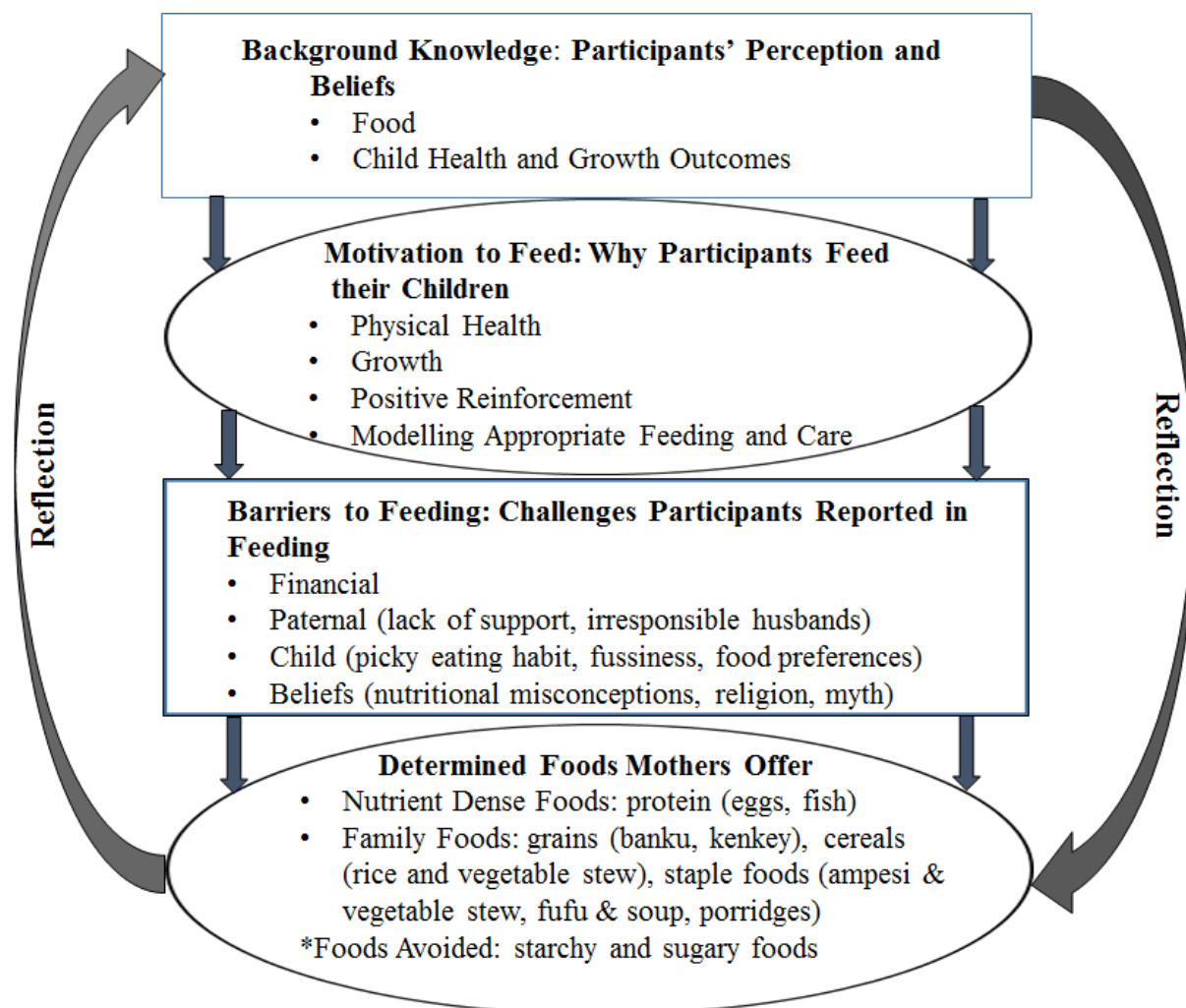


Figure 3.3. The Feeding Practice Model

*The model presents the interactive processes that affect mothers' feeding practices.

Mothers' Knowledge, Perception, and Beliefs about Food, Child Health and Growth Outcomes

Mothers' knowledge and perceptions as indicated by Figure 3.3, are centered on food, child health, and growth outcomes. Mothers described food in relation to child health, and they believed that food influenced the health and growth of their children. As one mother described, "Food is life.... Food makes children grow healthfully, and prevent sicknesses." Mothers believed that lack of food may cause poor growth. On the other hand, they described how healthfully food increased positive health outcomes, such as growth and an increase in children's activity level.

Most mothers reported knowledge about both positive and negative effects (long term) of complementary feeding on their children. They reported that obesity and related chronic diseases were not related to complementary foods offered during childhood, but were a result of poor eating habits during adulthood. A mother noted, "I do not believe that some foods offered to children during infancy may cause obesity or hypertension, but instead foods these children consume when they become adults." Majority of mothers knew that complementary feeding had immediate positive and negative effects depending on the type of foods offered to a child. For positive short term effects, mothers mentioned growth, increased energy/activity level, intelligence, prevention of illness, and satiety. Knowledge of short term effect is demonstrated by one mother:

In my opinion, food helps children grow well and protects them from diseases...the only thing a mother desires is for her child to be healthy and strong. Another mother stated: I think when children are offered well-balanced meals, it makes them smart,

active, and very lively. Feeding children with the necessary nutrient-dense foods could make them brilliant too.

About 40 mothers (40%) perceived the negative effects of inadequate complementary foods: protruded belly associated with poor growth, anemia, and weight loss. For example, one mothers stated:

We are well informed that lack of adequate nutrients could cause deficiencies and sicknesses, for instance, a lack of protein in children could cause protruded belly and poor growth, and a child's weight loss indicates that he/she is being underfed or is not fed properly.

Mothers had a misconception about certain types of food and claimed they were detrimental to the health of children. For instance some mothers mentioned that spicy foods offered to young children may cause high blood pressure during their adult age and gari (a food made from cassava tubers) was associated with fever in children due to its starch content. Also, sugary foods (foods that contain artificial sweeteners) was described to cause diabetes in children. These misconceptions are demonstrated by mothers' comments, "Foods like dry gari, cassava fufu, and spicy meals may cause fever and shortness of breath respectively, and foods that are of low nutritive value could cause deficiencies in children, for instance, protruded belly."

Motivation to Feed: Why Participants Feed their Children

Identification of mothers' motivation in child feeding may provide information for health professionals to reinforce mothers' feeding practices. Mothers' source of motivation in feeding their children was based on the physical health of their children, growth, positive

reinforcement, and modeling appropriate feeding behaviors (see Figure 3.3). Specifically, mothers stated that when their children are healthy and strong as a result of foods they offered their children, they felt motivated, and eager to continue such behavior. One mother stated, “What actually motivates me is seeing my child grow healthfully and lively..., breastfeeding alone is not enough for my child, and so I offer other family foods as well.” Mothers reported being motivated when they see their children grow in weight and height. Another mother commented on what motivated her:

What motivates me to offer my child complementary food is to see him grow and reach a stage where he can be of help to others in the community. In addition, foods help my child become strong and healthy. The foods I offer protect him from sicknesses.

Mothers reported being motivated to feed when their children are in good health, very active, lively, strong, and not weak or infected with illness.

Mothers reported their motivation to feed their children on positive reinforcement. Mothers’ stated how the health personnels’ recommendation on appropriate feeding practices was motivating. As one mother indicated, “I get motivated when I am told that my child is strong and healthy during child welfare clinic session and I am commended by a health personnel for a good work.”

Modeling Appropriate feeding behaviors: Mothers reported being motivated when their fellow mothers look up to them for appropriate care and feeding behaviors. Some mothers indicated how they felt motivated when other mothers saw them as their role model. A mother stated her experience on how other mothers consulted her about her feeding

practices, “It’s very motivating..., when other mothers seek my advice on how to feed and care for their children... because they feel my child is always good-looking and healthy...”

Barriers to Complementary Feeding: Challenges Participants Reported in Feeding their Children

A number of barriers were reported by mothers that impacted complementary feeding practices. Though mothers were motivated to feed their children, they were faced with barriers that prevented them from offering adequate complementary foods (see Figure 3.3). The barriers noted were financial, paternal, child, and beliefs barriers. One mother commented on her challenges:

It is not easy to feed my family. Foods are expensive these days... and there are no jobs in this community... we only work on the farm, so I sell some farm produce to buy other food ingredients that may be needed in my home.

Financial constraint was the most challenging factor that influenced mother’s complementary feeding practices. Financial barriers were noted by financial constraint. Some mothers fed their children with less quality/nutritious foods that their limited money could afford. The financial constraint is demonstrated by one mother’s comment, “The money allocated for feeding is often small and not enough to buy quality and nutritious ingredients for food preparation so I purchase cheaper ones that could be afforded.” Another stated: Money is hard to come by, due to this, I am forced to buy cheaper and less nutritious food for my child and family.” Nutritious and adequate complementary foods are costly. Thus, mothers offered less quality or less nutritious foods irrespective of their nutritional implications.

Paternal barriers such as lack of support from the spouse was a major concern of mothers. Some mothers mentioned that their spouses were irresponsible and did not perform their responsibility as bread winners of the family, which made feeding the family difficult. This situation resulted in mothers offering less nutritious foods. As indicated by two comments from mothers:

Some husbands do not perform their responsibilities; either they do not cater for the children or they provide insufficient money for housekeeping. This does not support good feeding because we are not able to procure nutritious food for the children and the family and some husbands advise us to stop breastfeeding the children because they think the children are of age and have passed breastfeeding stage. So we are forced to start weaning them even before 1.5years.

Some mothers reported that their children had picky eating habits and that frustrated mothers during mealtimes, hence, mothers offered less nutrient dense food to appease their picky eating children. Two mothers described the picky eating habits of their children:

My child does not eat; she rejects every food I offer her; this makes me worried almost all the time and sometimes too, the children stop breastfeeding... Other children reject every food offered them; they become the problem... We are always willing to feed them the best we can.

Religious and cultural beliefs were challenges that affected feeding, though only 6% of mothers were Muslims and stated that they restricted foods. Mothers specifically noted that their religion forbids pork, and so they would never offer pork or its product to their children. "My beliefs affect the type of meat I give my child. For example, I am a Muslim

and my religion forbids me to eat pork, hence I never feed my child with any pork.” One mother described her cultural belief about eggs, and this was her experience in eating boiled eggs:

Well, I never ate eggs or offered them to my children... When I was pregnant with this child, I use to eat boiled eggs and during delivery, the birth attendant noted that my child’s head was covered with a white sheath which is also found in boiled eggs.

Mothers’ Determined Foods they Offered

Mothers mentioned foods they normally offered their children, such as family foods and nutrient-dense foods (see Figure 3.3). Starchy and sugary foods were avoided. These are described below.

Family Foods: Mothers offered more staples, grains, and cereals but less protein rich foods, and fruits/vegetables. Two mothers indicated the types of family foods they offered their children:

I normally offered my child fufu, banku, rice balls, and sometimes gari and red-oil as well as powdered fish, and my child likes porridge (koko) and milk, fufu and soup, banku and okro stew so I offer them to her.

Protein based foods such as meat and milk were often described by mothers as nutrient dense foods and these were offered, but less frequently because most mothers could not afford to buy them. One mother stated, “I am willing to offer my child foods such as milk and meat but they are very expensive these days I cannot afford any of them... perhaps once in a while.”

Foods Avoided: Starchy foods and sweets were avoided because mothers perceived them to be unhealthy for their children. Three mothers commented on why starchy foods and sweets should not be offered to children:

Dry and starchy food like gari should not be given to children because it makes them vomit and causes yellowness in their eyes, I avoid dry gari and cassava, because it contains too much starch which causes fever in children, and I always avoid candies, sweetened biscuits and carbonated drinks because my child may develop diabetes....these foods are very high in sugar.

Discussion

The study identified factors affecting complementary feeding practices in Ghanaian mothers. Mothers' perceptions, and knowledge about nutrition were centered on food, and growth outcomes of their children. Though mothers were motivated (by the overall physical health, and growth of their children) to feed their children, they reported barriers that affected their feeding practices, and the foods they offered their children. As reported in a previous study, feeding practices of mothers indicated both good practice and areas of concerns (Ghana Baseline Report, 2011). Common problems related to complementary feeding practices were early introduction of solids, early cessation of breastfeeding, inadequate frequency of complementary foods, and inappropriate cues that led mothers to introduce complementary foods, which have been previously reported (Ghana Baseline Report, 2011). Mothers' reported that their choices of complementary foods was influenced by financial problems, a common factor noted in the literature (Monterrosa et al., 2012; Peltó & Armar-Klemesu, 2011)). Among the factors reported, finances was the major

determinant of complementary food types offered to children, and led to the choice of cheap low nutritional quality foods (Ruel et al., 2010).

For most of the mothers, the main reason for introducing complementary foods was that they were educated to start offering them at six months by their health personnels, a practice encouraged by WHO (2009). Result from the study indicate mothers were told to start complementary feeding at six months, but were not educated on the cues or developmental readiness for solid foods. For cues or milestones that indicate that infants are ready for solid foods, other important factors should be considered: the ability of the child to sit up alone or with support, the ability of the child to hold his/her head straight and steady and open his/her mouth when he sees food coming and so on (Brown, 2011). Reading infant cues of readiness is necessary because babies grow and develop at different rates (Infant Nutrition; WIC & CSF, 2009).

Most mothers mentioned that they considered nutrition in the selection of foods they offered their children.

The majority of mothers claimed to be conscious about nutrition because they reported to have obtained nutrition information from health personnels. Even though they described themselves as nutritious conscious and obtained nutrition information from health workers, it was not always reflected in their children's health outcomes which may indicate mothers may not have adequate knowledge about the nutritional status of their children at the time of this study, a phenomena previously identified (Appoh & Krekling, 2005). As reported in a previous study, children whose age are < 1 SD (Z score) are at greater risk of death and undernourished children are prone to infections (Caulfield et al., 2006).

Most mothers offered regular family foods or locally prepared foods such as starchy roots and plantain such as fufu and soup, ampesi and vegetable stew, grains such as porridges (weanimix or tom brown, maize porridge), banku and soup which is typical of most Ghanaian mothers (Nti & Lartey, 2007). However, animal products and fruits were least likely offered and few mothers offered commercial fortified foods because they believed the foods would make their children healthier as previously noted (Ghana Baseline Report, 2011; Sika-Bright, 2010).

Previous research identified inappropriate feeding practices of mothers in Ghana (Ghana Demographic & Health Survey, 2008), which was identified in this study. Thirty one (31%) did not introduce complementary foods at the appropriate time, thus, foods were introduced either too early or too late (Sika-Bright, 2010). However, majority of mothers introduced complementary foods at six months, which is highly recommended (WHO, 2009). Some mothers fed their children more than 3 times in a day, which follows WHO (2014) recommendations, but most of the mothers did not follow the recommendation (Palmer, 2009) and fed their children less than 3 times a day (Palmer, 2009), which implies some children were underfed at the time the study.

The majority of mothers reported that they ate breakfast with their children throughout the week. Though this is not a common practice of most Ghanaian mothers (Davis, Tagoe-Darko & Mukuria, 2006), it is recommended that mothers have mealtimes with their children and support child feeding (Satter, 2013).

The leading source of information for mothers was health personnel, a common phenomenon in Ghana (Ghana Demographic and Health Survey, 2008). Infant and young

child nutrition information given to mothers by health facilities was primarily on breast feeding and complementary feeding, which has been reported in other studies (Ghana Baseline Report, 2011; Wu et al., 2014). Thus, majority of the mothers (79, 80%) received most of their breastfeeding and complementary feeding information during monthly growth promotion sessions in the health facility or during community outreach clinics. This indicates that the community health nurses provided infant feeding education sessions for mothers, although nurses in Ghana do not receive extensive education about nutrition (Crogan, Shultz & Massey, 2001). While this was expected, the study demonstrated that some mothers did not adhere to all the information they received from the health personnels as previously reported (Saaka, 2014). Media information (TV) also was available (Ghana Baseline Report, 2011) and was accessed by 9% (9) of the mothers. Six percent of breastfeeding and complementary feeding information came from relatives, mostly grandmothers and other significant others. Thus, health professionals, and relatives should be equipped with the necessary resources, training, and skills to enable them to offer accurate and specific information to mothers about their feeding practices.

Implications for Practice

While mothers have background knowledge about food and child health outcomes and they are motivated in feeding their children, they are faced with barriers that affect their food choices, and feeding practices. As reported in Ghana Baseline Report (2011), complementary feeding practices are less than ideal, thus, the nutritional qualities of complementary foods that are offered are low and the prevalence of under nutrition is fairly high among children in this study. The results of the study indicate a need for nutrition intervention programs aimed at educating mothers, and other significant others on

improving nutrient intake among young children, through improved diet diversity and increased use of local foods rich in iron and other nutrients (WHO, 2012). The barriers that were reported by mothers, and the poor feeding practices have to be recognized and incorporated into communication nutrition education strategies in order to improve mothers' knowledge about child feeding. Health personnels should be trained on appropriate nutrition information and communication skills that will promote the dissemination of nutrition information.

CHAPTER 4: Report to the District Health Directorate

Complementary feeding is defined as the process of giving solid or semi-solid foods in addition to breast milk starting at 6 months (Hetherington et al., 2011; Hamilton, et al., 2011). Complementary feeding is needed to provide energy and essential nutrients required for continued growth, and development of young children (Kinney, 2010). Therefore, complementary feeding is a critical time for establishing variety and appropriate feeding practices. Inappropriate feeding practices are the major cause of malnutrition and infant mortality, and these have been reported in Ghana (FAO, 2009). In consideration of maternal feeding practices and its effects on young children, research is needed to understand the phenomenon of complementary feeding practices of Ghanaian mothers, and their perceived impact on their children's health. Thus, the purpose of this study was to investigate the factors that influence Ghanaian mothers' choices in the introduction and variety of complementary foods and to identify their perceived implications of these foods on children's health, growth, and development.

Qualitative methodology for this project included focus group interviews. The purpose of the focus group interviews was to gather and explore thoughts, perceptions, opinions, and feelings about complementary feeding practices of Komenda Edina Eguafo Abrem (KEEA) mothers (Krueger & Casey, 2009). The University of Idaho Institutional Review Board and the Ghana Health Service Ethical Review Board approved the study.

The findings from the study revealed that feeding practices of mothers indicated both good practice and areas of concerns. Some mothers had a background knowledge about food and its health outcomes, however, there were misconceptions about some local foods.

Some mothers perceived certain foods to cause health problems to their children. In addition, mothers were faced with some barriers that affected their feeding practices and the foods they offered their children.

Common problems related to complementary feeding practices were identified: early introduction of solids, early cessation of breastfeeding, inadequate frequency of complementary foods, and inappropriate cues that led mothers to introduce complementary food. Mothers' choices of complementary foods was greatly influenced by financial problems. Among other factors, finances was the major determinant of complementary food types offered to children, and led to the choices of cheap low nutritional quality foods.

Implications for Practice

Inadequate complementary feeding practices were reported among the study participants. Under nutrition was fairly high among children in this study. Nutrition intervention programs aimed at educating mothers, the communities, and other significant others on improving nutrient intake among young children through improved diet diversity, and increased use of local foods rich in iron and other nutrients is needed. Health educators should be trained on appropriate communication skills that will help disseminate nutrition information appropriately. In addition, this report provides recommendations that should be considered by health professionals in Ghana.

Strengthening Health Education/Counselling for Mothers at Health Facilities and Communities

Nutrition education and counseling can assist health care providers in the ability to identify individual's perceptions, preferences, barriers to behavior change, and they can provide possible solutions to overcome those barriers (USAID, 2012). Hence, nutrition education offered by nutrition officers and community health nurses should focus on these areas:

- Mothers should be given practical support on complementary feeding practices such as one on one counselling that addresses some challenges that mothers face in breastfeeding and complementary feeding children. Continued breastfeeding is important during the complementary feeding period as it offers protein and enhances the social and emotional bond between mother and child.
- Mothers should be educated on the appropriate cues for introducing complementary foods, and the signs to watch out for in infants during CWC sessions and outreach programs.
- Mothers should be informed that almost all children experience a form of picky eating, and that increased exposure to variety of foods will help them learn to like such foods (Birch & Martin, 1988). Mothers should expose their children to a wide variety of foods starting at an early age, preferably 6 months. Usually children reject certain foods because they are new (Birch & Martin, 1988). It may take numerous exposures before children develop a liking to initially unfavorable foods (Birch, 1989).

- Mothers should be provided education on the effects of both good and poor feeding practices on children should be emphasized so that mothers will understand both the short and long term effects of complementary feeding on young children.
- Mothers should be given basic nutrition information such as the six food groups and their importance in child growth and development is vital to this effect.
- Mothers' misconceptions about the use of local foods should be clarified. For example, mothers believe that gari contains starch and it is the main cause of fever among young children though they encourage fufu and soup for their children which is equally high in starch.
- Multiple communication media and information channels should be used such as radio stations, and community information centers may also help increase dissemination of nutrition messages such as importance of exclusive breastfeeding, good hygiene and proper food handling, texture, and adequacy of complementary foods, responsive feeding, etc.
- Nutrition officers, and nurses should organize cooking demonstrations that teaches mothers about how to prepare nutritious and meals with locally available ingredients could be a source of knowledge.

Community and Family Support

Community mobilization is needed, and this includes community volunteers/members, family members, traditional birth attendants, and individuals get involved in the promotion of infant feeding practices. Rosato et al (2008) indicated that community participation in health issues is very effective in promoting health, because health experiences such as antenatal/postnatal clinic for women, infant and young child

feeding practices, and growth promotion usually take place in the community rather than the health facilities. Therefore, strategies to improve child health should involve the community. In this way, health workers and community volunteers should support local communities to become actively involved in health activities and decisions that affect their own health. Training materials such as booklets with key messages, and picture cards on breastfeeding and complementary feeding should be made available in educating community volunteers/members, and traditional birth attendants on the importance of IYCF as well as address health problems. These training materials could be provided by the Ghana Health Service through the KEEA district health directorate. Reaching out to the community members through various community information centers will be an effective tool.

Addition community support suggestions:

- Community based mother-to-mother support groups will be beneficial to provide support, information, counselling, and group discussions to enable mothers and caregivers practice appropriate breastfeeding, complementary feeding, and child care.
- Involving the family members in nutrition education increase the awareness and importance of infant and young child feeding so that spouses and significant others may take up their responsibility in supporting adequate feeding of their children. For example male involvement could be very essential in infant feeding since majority of the mothers were married. In addition, grandmothers should be included in nutrition education programs since they are mostly found to give advice to their daughters on infant feeding issues.

- Community health nurses should promote routine follow up visits for mothers with under nourished children in order to monitor feeding practices of such mothers and to provide the necessary support.
- Locally manufactured foods such as powdered soybeans, fish powder, and weanimix should be sold at the health facility or during child welfare clinic and outreach. According to mothers this will make some complementary foods more accessible and convenient to them.

Training of Health Care Providers (Community Health Nurses)

Health care providers are the major source of nutrition information for mothers and caregivers in Ghana. Therefore, the Ghana Health Service should provide the necessary training for community health nurses to equip them with skills in educating mothers and caregivers as suggested below:

- Effective communication is the core element of the counselling process. Positive rapport is an essential and initial component of counseling which is enforced in the counseling process (USAID, 2012). Showing warmth and care through nonjudgmental verbal and non-verbal behavior, listening attentively and behaving responsibly is very essential in helping (Egan, 2007) a caregiver. Therefore, health workers should be trained on appropriate communication skills that will help disseminate nutrition information appropriately. Periodic training on infant and young child feeding should be organized to up-date the knowledge and skills of health caregivers so they can impart appropriate messages to mothers and the community.

- Nurses should be provided periodic nutrition counselling education and training that will equip them with the skills in educating mothers/caregivers about infant and young child feeding and enable them disseminate appropriate nutrition messages.

Conclusion

Optimal complementary feeding practices have been reported to promote growth and overall health of young children. This study aimed to investigate the factors that influence Ghanaian mothers' choices in the introduction and variety of complementary foods and to identify their perceived implications of these foods on children's health, growth, and development. Complementary feeding practices were found to be inadequate among Ghanaian mothers, and mothers identified barriers that influenced their food choices, which led to the choice of low nutritional quality foods. To improve complementary feeding practices, it is suggested that mothers be educated on appropriate feeding practices, communities and families support infant feeding practices, and health personnels be trained on appropriate nutrition information and communication skills that will promote the dissemination of nutrition information.

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Appendix A: Human Assurances Information

Institution Review Board Approval - irb@uidaho.edu

On behalf of the Institutional Review Board at the University of Idaho, I am pleased to inform you that the protocol for the above-named research project is approved as offering no significant risk to human subjects.

This study may be conducted according to the protocol described in the application without further review by the IRB. As specific instruments are developed, each should be forwarded to the ORA, in order to allow the IRB to maintain current records. Every effort should be made to ensure that the project is conducted in a manner consistent with the three fundamental principles identified in the Belmont Report: respect for persons; beneficence; and justice.

This IRB approval is not to be construed as authorization to recruit participants or conduct research in schools or other institutions, including on Native Reserved lands or within Native Institutions, which have their own policies that require approvals before Human Participants Research Projects can begin. This authorization must be obtained from the appropriate Tribal Government (or equivalent) and/or Institutional Administration. This may include independent review by a tribal or institutional IRB or equivalent. It is the investigator's responsibility to obtain all such necessary approvals and provide copies of these approvals to ORA, in order to allow the IRB to maintain current records.

As Principal Investigator, you are responsible for ensuring compliance with all applicable FERPA regulations, University of Idaho policies, state and federal regulations.

This approval is valid until March 30, 2015.

Should there be significant changes in the protocol for this project, it will be necessary for you to submit an amendment to this protocol for review by the Committee using the Portal.

If you have any additional questions about this process, please contact me through the portal's messaging system by clicking the 'Reply' button at the top of this message.

Traci Craig, Ph.D.

Appendix B: Consent Form

University of Idaho (Informed Consent Form)

“Factors that influence Ghanaian mothers’ choices in the introduction and variety of complementary foods and their perception of the implications on children’s growth, health, and development”

You are being asked to participate in a research study that will be looking into the influences of mothers’ food choices and their perceived impact on children. This consent form will give you the information you need to decide whether to be in the study or not. You may ask questions at any time about the research and anything on this form that is not clear. We will give you a copy of this form for your records. The University of Idaho Institutional Review Board has approved this study.

Purpose and Benefits: The purpose of this study to gain insight on the factors that influence moms’ choices in the introduction and variety of complementary foods and their perception of the implications on children’s health, growth and development. The benefit of this study will enable health care providers to address issues related to negative perceptions of mothers associated with the choice of food for their infants through nutrition education.

Procedure: Your participation in this study will consist of a focus group discussion which will involve 5 to 10 participants lasting approximately one and a half to two hours. At the beginning of the session, we will ask you to fill out a short questionnaire with information on your child’s activity and food intake, as well as some personal characteristics such as gender, age, and education. Following the questionnaire, the participant group will sit

around a table and discuss issues related to complementary feeding. The discussion will be audio-recorded, and led by a trained moderator.

Voluntary Nature of the Study: You do not have to answer any question in the questionnaire or during the discussion if you do not wish to. No one will treat you indifferently if you decide not to be in the study. If you decide to join the study now, you can still change your mind during the study. If you feel stressed during the study you may stop at any time.

Confidentiality: The interview will be audio recorded; however, your name will not be recorded on the tape. We will ask that you use a pseudo name during the interview. You will not be required to write your name in any part of the written report of the research. All of your information and interview responses will be kept confidential. The researcher will not share your individual responses with anyone other than the research supervisor.

Printed name of Researcher

Signature

Date

Participant's Statement

I acknowledge that I have been informed of the nature and purpose of this research study and that I have read and understood the information presented above, and that I have received a copy of this form for my records. If I have any questions or concerns regarding the study or my participation in the study, I can contact Samantha Ramsay, Assistant Professor and Director of the CPD, School of Family & Consumer Sciences, and University of Idaho- Phone: 208-885-6026 and Bridget K. Egyir, Phone: 208-596-8163.

Printed name of Participant

Signature

Date

Bridget Kesewah Egyir, Graduate Student, School of Family and Consumer Science,
University of Idaho

Samantha Ramsay, Assistant Professor of Foods and Nutrition and Director of the CPD,
School of Family & Consumer Sciences, and University of Idaho

Appendix C: Demographic Questionnaire

Food Intake and Activity Pattern of Children 6 to 24 Months

First, we would like to ask you a few questions about your 6 to 24 month old child.

1. What is the gender of your child? *(Please circle your answer)*
 - a. Male
 - b. Female

2. What is your child's date of birth? *(Please write your answer in the space below).*
 ____/____/____day/month/year

3. How much does your child weigh? *(Please write your answer in the space below).*
 _____ Kilogram

4. What is your relationship to this child? *(Please circle your answer).*
 - a. Mother(biological, adopted, step or foster)
 - b. Grandparent
 - c. Other family member
 - d. Other Please tell us: _____

Next, we would ask you a few questions about your child's activity at home and his/her food intake.

5. Compared to other children of the same age and gender, is your child:
 - a. A lot more physically active than most
 - b. A little more physically active than most
 - c. Average – same as most
 - d. A little less physically active than most
 - e. A lot less physically active than most

6. In a typical week, what is the average number of days you prepare your child's complementary foods? *(Please write your answer in the space below).*
 _____ Days

7. In a typical week, what is the average number of days you eat breakfast with your child? *(Please write your answer in the space below).*
 _____ Days

8. When both you and your child are at home, which of these statements best describes where you usually are when your child eats a meal? *(Please circle one)*

- a. I sit with my child and help him/her to eat
- b. I am in the room but don't sit or eat with my child
- c. I am not in the room with my child during mealtime
- d. Other (*Please specify*): _____

9. How long do you intend to breastfeed your child in addition to complementary foods? (*Please write your answer in the space below*).

- a. _____ Months
- b. Have stopped breastfeeding. (*Please write the number of months you breastfed your child*) _____ Months

10. How are you currently feeding your child? (*Please circle all that apply*)

- a. Breastfeeding at the breast
- b. Bottle feeding with infant formula
- c. Breastfeeding and Complementary foods
- d. Weaning
- e. Other(*please specify*) _____

11. At what age did you start giving complementary foods to your infant?

- a. _____ months
- b. Have not introduced solid foods

12. How did you know that your baby was ready for complementary foods?

Please tell us:

13. On average how many times do you feed your child complementary foods in a day?
(*please circle one*)

- a. never
- b. 1-2 times
- c. 3-4 times
- d. 5-6 times
- e. More than 6 times

14. On average, how often do you offer the following food groups of food to your child in each day? *(Mark the all that apply)*

	Never	Once a day	Twice a day	3 times a day	4 or more times a day
Animal and animal products					
Fruits					
Vegetables					
Beans, nuts and oily seeds					
Staple root and plantain					
Cereals and grains					
Fats and oils					

15. At the present time, how often do you consider nutrition in the selection of foods you give your child? *(Please circle one)*

- a. Never
- b. Rarely
- c. Sometimes
- d. Often
- e. Always

16. Do you feel your child is:

- a. underweight
- b. overweight
- c. normal weight

17. Which of the following factors influence the foods your child consumes? *(Circle all that apply)*

- a. time
- b. convenience
- c. finances
- d. own food preference
- e. Cultural beliefs
- f. other *(please specify)* _____

18. Where do you obtain information about how to feed your child? *(Please circle your answer)*

- a. Television, program
- b. Health personnel
- c. Advertisement

- d. books
- e. Other (*please specify*) _____

Finally, we would like to ask you few questions about yourself.

19. What is your age? (*Please give us your best estimate if you do not know*)
_____ Years old
20. How tall are you? (*Please give us your best estimate if you do not know*)
_____ Centimeters
21. How much do you weigh? (*Please give a best estimate if you do not know*)
_____ Kilogram
22. Which of the following best describes you? (*please circle your answer*)
 - a. Pregnant
 - b. Not pregnant
23. What is your current marital status? (*please circle your answer*)
 - a. Single
 - b. Divorced
 - c. Separated
 - d. Married or in a committed relationship
24. Which of the following tribes do you belong to? (*Please circle your answer*)
 - a. Akan
 - b. Ewe
 - c. Nzema
 - d. Ga
 - e. Other (*please specify*) _____
25. What is the highest education level you have completed?
 - a. Elementary school
 - b. Vocational school
 - c. High school
 - d. Tertiary level (*please specify*) _____
 - e. Graduate degree
 - f. Non
26. How would you describe your current employment status? (*please circle your answer*)

- a. Full time worker
- b. Part-time worker
- c. Not working/stay home with kids
- d. Other (*please specify*) _____

27. What was your family income last year? (*please circle your answer*)

- a. Less than GHC1000
- b. GHC1000 - GHC3000
- c. GHC3001 – GHC4500
- d. Over GHC4500

28. What is your religious preference? (*please circle your answer*)

- a. Protestant
- b. Roman Catholic
- c. Muslim
- d. Seventh- Day Adventist
- e. Other (*please specify*) _____

Thank you!!!

Appendix D: Focus Group Guide

Understanding the factors that influence Ghanaian mothers' choices in the introduction and variety of complementary foods and their perception of the implications on children's health, growth and development

- ✓ Rationale and reasons for choices
- ✓ Mother's perceived and observed implications on the children

Welcome: Name tags dispensed

Introduction: Moderator introduces self and study, administers informed consent

Opener:

1. What fascinates you most about caring for your child?
Projective technique activity:
2. What is the first thing that comes into your mind when you hear infant feeding?
Explain your thoughts?
3. Imagine yourself as a baby, how would you expect your mother to feed you? Which kinds of foods do you think would be beneficial to you? Which of them would be avoided? What are your reasons?

Feeding values questions:

4. Imagine a typical day when you are going about your activities. Now think about feeding your child. What is influencing your decision to feed your child?
 - Most important?
 - Time of the week? Weekdays/Weekends?
 - Special Occasions?
5. The following note cards list things that could influence the feeding practices mothers use with their children. Take a moment and tell us your thoughts. How does _____ (factor) influence how you feed your child?
 - Money?
 - Time?
 - Beliefs?
 - Own Food Preferences
 - Food Safety?
6. What is influencing the types of foods you give your child?

Probes:

- Most important?
- Time of the week? Weekdays/Weekends?

- Special Occasions?

How mothers feed their children questions:

Now we would like you to think about how you feed your child. First start by picturing yourself feeding your child, then we would like you to draw how you see yourself feeding your child. Include what you might be saying and what you might be thinking. Use exemplar (have them draw a picture of themselves feeding their child. – What are they saying, what are they thinking)

7. Looking at your pictures, I would like each of you to describe what you drew.

8. In what way does the food given to your child affect him or her?

Probes:

- Health/illness?
- Energy level
- Growth
- fussiness

Follow-up Questions:

9. What are the benefits to feeding your child in terms of his/her 1) physical health, 2) growth, 3) cognitive growth and 4) overall health?

Probe: Negatives?

10. What are the long-term implications of feeding your child?

- As an adolescent?
- As an adult?
- Future disease conditions?

Food questions:

11. What complementary foods do you normally feed your child?

Which complementary foods do you try to avoid when feeding your child?

Which complementary foods do you encourage when feeding your child?

12. Describe some of barriers you have in feeding complementary foods to your child.

- Maternal or paternal barriers
- Child
- Other?

13. Do you have any other comments?

Thank you!

Appendix E: Letter of Permission

Quaning Mends Kofi is the focal person for the four communities (Elmina, Kissi, Agona and Komenda) in the Central Region, who will be helping out in the research. He is also the District Director for the Komenda Edina Eguafo Abrem (KEEA) District (where the research will be carried out)

Dr. Barry Bilderback, who is also a Professor in the Music department, University of Idaho, will also be coordinating with the Nungua community in the Greater Accra Region.

Hi,

Your request is granted. However you may have to leave a copy of your findings at the Municipal Health Directorate.

Quaning Mends Kofi

quamendsk@yahoo.com

Municipal Health Directorate

P.O. Box El 74

Elmina

Dear Sir,

This letter is to request permission to undertake a research project in your district. My name is Bridget Egyir. I am from Ghana and I am currently studying for a Master of Science degree from the School of Family and Consumer Sciences at the University of Idaho,

Moscow, ID, USA. My research is aimed at investigating the factors that influence Ghanaian mothers' choices in the introduction and variety of complementary foods offered to their children, and to understand their perception of the implications of complementary foods on children's health, growth and development. The research approach to gather this information is the qualitative methodology of group interviews. In order to do this, I would like to conduct group interviews from selected areas across the country.

I am hereby seeking your consent and support to conduct the research group interviews in four communities (Elmina, Kissi, Agona and Komenda) within your district from May 29th to June 10th, 2014. The group interviews would be conducted during child welfare clinics and consist of pre-arranged meetings with 3-10 mothers at one time. During the meetings, the mothers would be offered some refreshments and snacks and they would individually complete a brief demographic questionnaire followed by a series of questions asked to the entire group. No maternal discomfort is anticipated and the study will be approved by the University of Idaho Institutional Review Board.

This project will be supervised by Dr. Samantha Ramsay, who is my major advisor and a food and nutrition faculty member at the University of Idaho. If you have any questions, please feel free to contact Dr. Ramsay via email at sramsay@uidaho.edu or via phone at (208) 885-6026.

I would be very grateful if my request is granted.

Thank you.

Sincerely,

Bridget Egyir