CULTURAL PRACTICES, EXCLUSIVE BREASTFEEDING AND NUTRITION STATUS AMONG CHILDREN 0–12 MONTHS IN VOINJAMA DISTRICT, LIBERIA

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DECLARATION

This dissertation is my original work and has not been submitted for the award of a degree in any other University

Signature: …… Date: **08/18/2022**

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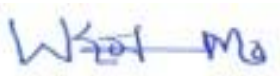

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To my inspiration, my lovely Ama R. Nyenatoh, for her continuous love and support, and to my dad, whom the veil that divides us could not allow him to see me write this thesis, you always challenged me to be courageous. Lastly, to my family, with love.

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LIST OF ABBREVIATIONS

AAP	American Academy of Paediatrics
ANOVA	Analysis of Variance
EBF	Exclusive Breastfeeding
HIV	Human Immunodeficiency Virus
MAM	Moderate Acute Malnutrition
MS	Microsoft
OPD	Outpatient Department
PMU	Pentecostal Mission Unlimited
PMTCH	Prevention of Mother-To-Child Transmission
SAM	Severe Acute Malnutrition
SIDS	Sudden Infant Death Syndrome
SPSS	Statistical Package for Social Sciences
UN	United Nation
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Anthropometry: Is the science that deals with the measurement of size, weight and proportion of the human body.

Breast milk substitute: Food that is used to replace breastmilk

Breastfeeding: The process of nursing the infant with breastmilk directly from the breast of the mother

Complementary feeding is the act of feeding of a child on other foods in addition to breast milk when breast milk is considered no longer able to meet the nutritional need of a child.

Cultural Practices is the belief, customs, and behaviour of a particular group of people. It can be measured in terms of language, symbols, norms, values, and artefacts.

Education levels refers to the highest level of education attained through schooling.

E**xclusive breastfeeding**: this refers to the feeding of an infant with only breast milk wait any additional means solid food or vitamins-based liquids.

Formula feed: refers to a prepared formula used for feeding an infant or toddler in addition to breastfeeding. Formula feeding is indicated when the mother has an illness that could be passed on to the baby through breast milk or the close physical proximity.

Household: People who live in the same dwelling place and share meals.

Infant: an infant is a baby who is a newly born child or who is between 0-12 months of age.

Mixed feeding: The process of giving a baby a fed formula as well as breastmilk.

Nutrition Knowledge: is the understanding of concepts that are related to nutrition and healthy diet of food representing major sources of nutrients in the diet.

Nutrition status: Birth weight and height of children aged 0-12 months under this study

Weaning: It is act of introducing the infant gradually to food and withdrawing the supply of his or her mother breast milk

ABSTRACT

The health of women and children has been a target for United Nations World Health Organization. For instance, the health and nutrition status of children under six months solely depends on exclusive breastfeeding where an infant receives only breast milk including the colostrum from the mother without any other liquid or kind of food. However, in Liberia, many women discard colostrum believing that it is not good or healthy for the infant. In addition to the placenta, colostrum is usually discarded with believed that babies will die if they consume it. Thus, the objective of this study was to determine the cultural practices, exclusive breastfeeding, and education on the nutrition status of children aged 0-12 months in Voinjama District, Liberia. The results of this study show that majority of the mothers with children aged 0-12 months disliked compliments to their infant believing that an evil eye can cause the infant to fall ill. Mothers preferred to cut the umbilical cord within one week, believing that the cord should be 5-7 cm from the skin and that it should be buried as a way of disposal. Multi-stage sampling technique was used to collect data from 149 mothers of children aged 0 – 12 months in Voinjama District, Lofa County. Descriptive statistics were used to access the cultural practices, demographic and social characteristics of mothers; nutrition status and breastfeeding practices on nutritional status of children aged 0 – 12 months. Additionally, Binary Logistics regression model were employed for data analysis. The results revealed that mothers exclusively breastfeed a child between the age of three and six months. Children between 0 to 12 months ate food and snacks three times other than liquids; consumed Iron-rich or Iron-fortified foods, and were fed with food to which powder or sprinkles had been added. On the age when babies should start eating food in addition to breast milk, mothers recommended the 7^{th} month. On average, an infant's birth weight, height, and the child's index weight were 3.9kgs, 44.3cm, and 4.2kg, respectively. Almost all (99.1%) children under study were stunted, 14% of the children had a moderate wasting status and were moderately underweight while 87% of the 0-12 months old children had a severe wasting status and were severely underweight. The findings further show that cultural practices had significant and negative influence on exclusive breast feeding and level of education had significant and positive effect on exclusive breastfeeding. Therefore, the study suggested that more emphasis should be place on education among women due to its positive effect on exclusive breastfeeding. At the same time, some cultural practices should be discontinued as they im-pede the gains made in the study area. Additionally, there is need to highlight their areas of weakness and take measures to improve on them to ensure that nutrition is taken seriously with concern over the health and

wellbeing of the children. The study further recommends the need for other stakeholders including ministry of education to consider incorporating nutritional education in institutions of learning to enhance capacity as well as competency among persons disseminating information about breastfeeding and nutrition to mothers. Finally, it is important for relevant institutions and government agencies to consider evaluating the attitude of peers and healthcare providers towards breastfeeding.

CHAPTER ONE: INTRODUCTION

1.1. Background

World Health Organization (WHO) defines exclusive breastfeeding as the condition where the infant has received only breast milk from the mother without any other liquid or any kind of food to replace breast milk but except for drops of syrups containing vitamins and minerals supplements or medicines for the infants (WHO, 2017). The health of women and children has been the target set by WHO. It has been focused on as the significant factor responsible for increasing population. According to WHO about 21.9 million children are exclusively breastfed for the first six (6) months of life in about 49 developed countries worldwide. In 2012, who presented the implementation plan for maternal, infants, and young child nutrition has been (According to UNICEF & WHO, 2018). Globally, the average of breastfeeding is estimated to be 37% and is expected to increase to 50% by 2025 given the guidelines and measures put in place (UNICEF, 2018; WHO, 2018).

According to UNICEF (2012), 15% of Liberian children die before their 1st birthday, one of the highest rates of under-five infant death in the world. Thus, the low level of breastfeeding is a major problem in Liberia. The myths that breastfeeding is harmful has influenced many parents of not breastfeeding their babies. A recent report by Save the Children's (Year) shows that 80% of mothers in Liberia exclusively breastfeed their children immediately after birth. However, the number decreases rapidly after three months to 40% and only 30% continue breastfeeding up to six months. The likelihood of an infant that is exclusively breastfed becoming sick or dying from diarrhea and infections is low. Further, they are less likely to get pneumonia, meningitis, and ear infection compare to those that were not fed exclusively with breast milk thus leading to a low rate of hospital visit.

The risk for hospitalization is to protect against single and repeated incidences of otitis media or a particular lower respiratory tract infection during the first year of life. In addition, by breastfeeding benefits the society by reducing healthcare costs, absence of parents from job, and the loss of family income that is associated with formula feeding (Dagbie et al., 2020; UNICEF, 2015). Norms of culture and belief have a powerful influence on human nutrition and has been pointed out as one of the determinants of breastfeeding practices. For example, in Liberian culture, mothers are advised not to breastfeed their new born babies for the first three to four months. This because some cultures believe that breasts milk is toxic for infants. Hence, the design of interventions that seek to improve health and nutrition of new born should

take into consideration the culture beliefs of the parents. Wanjohi, Griffiths & Wekesah (2016) emphasized the need to consider the cultural beliefs and practices of the parents in designing health and nutrition interventions. They further argued that the strategy that has been designed globally for young child feeding added more emphasis on the need to promote breastfeeding to understand the environmental situation and the social culture concerning breastfeeding.

1.2. Statement of the problem

According to UNICEF (2016), feeding new-borns with food or liquid in the first few days of life is a common practice in many parts of the world. This is linked to cultural norms, traditional beliefs and family practices. However, they are not based on scientific evidence. In most developing countries, including Liberia, beliefs and misconceptions have negative effect on breastfeeding during the first hour of birth. For example, some beliefs hold that colostrum is dangerous and could cause harm or death for the new born, thus causing them to discard the precious substance. According to Kumeh et al. (2020), colostrum is the first breast milk discharged from the mother's breast immediately after birth and is considered very nutritious and rich in antibodies for the growth of an infant. It is believed that colostrum was a part of the waste of giving birth in addition to the placenta. Furthermore, Kumeh et al. (2020) noted that health workers in South-eastern Liberia confirmed the myths about colostrum that most people believe that its yellowish hue is a sign of ill health of the mother, thereby substituting the breast milk with water in the first hour of birth. Additionally, in some culture, new-borns are fed with complementary foods such as tea, butter, sugar water or honey before they are fed with breast milk. They believe that introducing complementary foods in the early stages of an infant's life helps to complement the breast milk (Hitachi et al., 2019).

Poor breastfeeding practices increase the risk of morbidity and mortality among infants mainly resulting to diarrheal and respiratory diseases. It also impairs their physical and mental development. According to the United Nations Inter-Agency Group for Child Mortality Estimation report (UNICEF 2018), Liberia has one of the highest under-five mortality rates in the world. The report further adds that more than 15% of children in Liberia die before reaching their first birthday. The World Health Organization (WHO) recommends that children are fed exclusively with breast milk for the first six months of life. According to Liberia's Demographic and Health Survey report (LISGIS & ICF, 2021), less than two-thirds (55%) of children under six months are exclusively breastfed, while 6% are not breastfed.

Furthermore, breastfeeding and feeding with complementary foods are very common in Liberia with 97% of children reported ever breastfed. Additionally, about one-third were not breastfed within the first hour of life and nine percent were not breastfed within 24 hours after delivery. Complementary foods should be introduced when a child is six months old to reduce the risk of malnutrition (LISGIS & ICE, 2021). The report also shows that 30% of children under 5 were stunted, 3% were wasted and 11% were underweight. However, the proportion is much higher in the children between 0 – 12 months. Mortality among infants in Liberia is mainly attributed mother's education, and household wealth. Children whose mothers have no formal or only primary education or who are from poor households are more likely to die before their 5^{th} birthday.

Understanding the cultural practices, exclusive breastfeeding and nutrition status among children 0–12 months may help to highlight important determinants that could improving breastfeeding for children 0 – 12 months, particularly among mothers who may not have formal education, access to key resources and health education. Analysis of these factors has shown that socio-economic and other factors that shape infants breastfeeding practices, as well as decisions for and against seeking better nutritional practices (Kumbe et al., 2020). It also highlights the complexity of breastfeeding behaviour and the relationship between infant feeding with economic status and the perceived social norms that underpin the development of a child.

Previous studies have explored the experience of breastfeeding among women (Gallegos et al., 2013), identified the prevalence and correlates of exclusive breastfeeding (Hitachi et al., 2019) and structural factors that enable or constrain the adoption of evidence-based recommendations (Kumeh et al., 2020). Furthermore, public health interventions intended to improve healthy behaviour usually promote nutritional awareness and knowledge for children under-five. However, they do not consider the cultural practices that support or deprive the use of exclusive breastfeeding and nutrition among children 0–12 months. Consequently, in a post-conflict country such as Liberia with high child stunting rate, cultural practices that negatively affect exclusively breastfeeding and nutrition status of infants (0-12 months) contributes malnutrition and mortality.

1.3. Justification of the study

Exclusive Breastfeeding provides optimal health of infants and contributes to desirable child growth and development. Specifically, it has economic and significant health impact at the

household, community, and nation level. The importance of the economic and health impact of exclusive breastfeeding is that it helps reduce economic burden for the poor people, particularly in developing countries such as Liberia. Such people are economically disadvantaged and grieved from the lack of basic social services and sustainable livelihood sources. With the best breastfeeding applies, poor mothers would save money that may have been used to purchase formula feedings and other liquids. It is essential to have enough access to a complete, precise, impartial and scientific facts about exclusive breastfeeding to encourage the continuous practice of breastfeeding, information that provides knowledge on the cultural practices of mothers of children between 0 - 12 months are highly needed to revise and improve unsuitable practices that affect the growth of infants. Access to, availability and control of accurate and precise information is essential to the infant feeding decision-making process of any mother (Wanjohi et al., 2017). Additionally, knowledge of the nutritional status of children aged 0 – 12 months is critical because it will provide evidence that policymakers and stakeholders can use to drive interventions that could increase food consumption among young children. Also, an insight into the breastfeeding practices on the nutritional status of children aged 0 – 12 months will provide information on the different breastfeeding practices amongst mothers of infants and how it affects the nutritional status of the child. Furthermore, the findings on the relationship between cultural practices and education level of mothers on exclusive breastfeeding practices and nutritional status will inform government and partners about what need to be address in order to sustain exclusive breastfeeding practices among mothers of children aged 0 -12 months in Liberia. Finally, the outcome of the study will fill the existing gap in knowledge about exclusive breastfeeding in Liberia and contribute to the Sustainable Development Goal (SDG) 3.

1.4. Aim of the study

The study aims to contribute towards the improvement of exclusive breastfeeding practices among mothers and nutrition status of children of ages 0-12 months in Voinjama District, Liberia.

1.5 Purpose of the Study

The purpose of this study is to generate data that can be used to improve the cultural practice, exclusive breastfeeding, and nutrition status of children of ages 0-12 months in Voinjama District, Lofa County, Liberia.

1.6 Objectives of the study

1.6.1 General objective

The main objective of the study is to determine the cultural practices, exclusive breastfeeding and nutrition status among children 0–12 months in Voinjama district, Liberia

1.6.2 Specific objectives

1. To establish the cultural practices, demographic and socio-economic characteristics of mothers of children aged 0-12 months Voinjama District, Liberia
2. To assess the nutritional status of children aged 0-12 months in Voinjama District, Liberia.
3. To determine the breastfeeding practices on nutritional status of children aged 0-12 months in Voinjama District, Liberia.
4. To establish the relationship between cultural practices and education level of mothers on exclusive breastfeeding practices and nutrition status of children aged 0-12 months Voinjama District, Liberia.

1.7. Research questions

1. What are the demographic and socio-economic characteristics of mothers on the nutrition status of children aged 0-12 months Voinjama District, Liberia?
2. What is the level of nutritional knowledge of mothers on the nutrition status of children aged 0-12 months Voinjama District, Liberia?
3. What are the cultural practices, exclusive breastfeeding and the nutritional status of children aged 0-12 months in Voinjama District, Liberia?
4. What is the relation between cultural practices and the education level of mothers on the nutrition status of children aged 0-12 months Voinjama District, Liberia?

1.8. Risks and potential adverse effects of the study

1. During data collections, it was observed that mothers and caregivers were faced with anxiety and depression thus influencing them not to give actual information about breastfeeding.
2. Mothers feared that they will lose respect if they disclosed that they do not breastfeed their children (0- 12 months) properly.
3. Ensure confidentiality of identifiable information regarding children 0-12 months was a major consideration during the field work.
4. The study ensure that the privacy of mothers was not invaded and the protection of their dignity regarding breastfeeding practices was assured.

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview of exclusive breastfeeding

A woman who has had a baby or babies have been breastfeeding for since the birth of her first baby. Many years ago, breastfeeding, also known as nursing, sucking and lactation, has considered most preferred way for a mother to feed her baby. Accordingly, breast milk is an important food for the survival of the child. In the early 1900s, recognized and safe substitutes for breastfeeding began to emerge. As infant formula became safer, many mothers began to choose bottle-feeding formula over breastfeeding. By the mid-19th century, breastfeeding gradually lost its value and became less popular, and by the 1960s breastfeeding was reported at a low rate. However, in the late 1970s, the rate of breastfeeding began to rise slowly because mothers had access to information on breastfeeding. According to Jasny et al. (2019), women in Morocco affirmed receiving most of their information during pregnancy from friends and relatives, and the minority received their information from community health workers. They reported that community health workers were beneficial in giving facts and clearing doubts.

Breastfeeding is now gaining numerous support and admiration and dissemination of knowledge concerning breast milk and all the associated benefit are important for the wellbeing of the child. Previous studies have proven that breastfeeding provides adequate nutrition for the infant within the first six months. During the growth of the child, breastfeeding remains beneficial to child food alongside adding solid food. Breastfeeding is good for the mother. It helps them to recover from childbirth faster than mothers who refuse to breastfeed or nurse their infant. Additionally, nursing helps to reduce the risk of ovarian and breast cancer. It is also helps decrease the high chances of developing rheumatoid arthritis, diabetes, hypertension, and cardiovascular diseases among women who have had a child, as you grow old.

2.2 Benefit of exclusive breastfeeding for infants

According to Jama et al (2020) Breastmilk provides ideal nutrition for infants. For example, it contains vitamins, protein, and fat. In addition, breastmilk contains antibodies which helps fight against bacteria and viruses within infants. Furthermore, it contains everything that the baby needs to grow. Breast milk is digested easily than infant formula. It has been proven that breastfeeding lowers the risk of an infant having asthma (Jama et al, 2020).

Studies have shown that exclusive breastfeeding leads to higher intelligence quotient (IQ) level in infants when growing. The American Academy of Paediatrics (AAP 2) revealed that

breastfeeding also plays a major role preventing of sudden infant death syndromes (SIDs). The sudden death of infants is unexplained death for children younger than one-year-old. Even though there is no sure way to prevent it, parents and caregivers can minimize the risk of SIDS. Also, children that are inadequately breastfed stand the risk of having obesity, diabetes, and cancers.

2.3. Benefit of exclusive breastfeeding for mothers

Breastfeeding an infant helps to burn additional calories for the mother and further helps accelerate the loss of weight resulting from pregnancy. During the period of breastfeeding hormone, oxytocin is released, that adjusts the uterus to its normal pre-pregnancy status. Exclusive breastfeeding also reduces uterine bleeding after a woman shall have given birth. Furthermore, exclusive breastfeeding lessens the risk of breast and ovarian cancer and does lower the risk of osteoporosis in mothers as well. Exclusive breastfeeding reduces the breading of buying artificial sterilized nipples, worm bottles and measuring formulas. Thus, reducing the extra-economic burdens for the household during breastfeeding. It helps mothers to relax regularly with their new-born as they bond together. A mother who regularly breastfeeds is less likely to develop postpartum depression as compared to mothers who wean early or do not breastfeed at all. However, a mother who experiences postpartum depression early after delivery is more likely to have serious breastfeeding and do so for a shorter period (Lessen et al, 2015).

2.4 Trends of exclusive breastfeeding rate

Breastfeeding after birth and exclusive breastfeeding during one to six months of age have so many benefits for the child. Do so have a high impact and low-cost intervention on the well-being of the child. Nevertheless, the global rate of these important activities has had a challenge because of the population-based data to be able to describe the rate of early initiation of breastfeeding within an hour of birth. Breastfeeding exclusively at the 42 days postpartum. There are so many reasons associated with the failure to initiate early breastfeeding and exclusive breastfeeding (Seidu AA et al, 2020).

2.5 Factors influencing exclusive breastfeeding practices

Breastfeeding practices have so many factors that are associated with the first six (6) months of an infant's life. Past studies have examined the most influential factors that are relative to exclusive breastfeeding. Amongst them are social demographic characteristics, parents' education levels, living in the rural area of the city have biosocial factors that includes the

available support for breastfeeding. Some of these factors are cultural attitudes and social norms toward breastfeeding, economic factors, and employment law and policy. The influence of all of these factors differs differently from nation to region, over the length of time, and even within a population (Qu et al, 2015).

2.5.1 Maternal and infant factors

The education and the social class of a mother affect her motivation to exclusively breastfed her child. For example, in the Southern Ethiopia, a study was conducted to assess the prevalence and associated factors of exclusive breastfeeding practice among mothers who have infants 6-12 months of age. The findings show that socio-demographic variables like maternal or paternal education and economic status have significant influence on exclusive breastfeeding. The higher the education level of mothers, the higher the level of exclusive breastfeeding (Azeze et al., 2019). Improving the education level of maternal enable a better understanding of mothers and their appreciation of the benefit of exclusive breastfeeding which gives them the knowledge to reject every external interference and pressure that discourages mothers from breastfeed exclusively. Asare et al. (2018) found that mothers with secondary education breastfed their infants at 0.5% as while to those with no education did at 0.6% (Asare et al., 2018). Borowitz & Borowitz (2018) mentioned that there has been a constant debate in the time that infants should start eating food. However, there is no harm or complication noted in feeding children early, and therefore, women can begin at any time.

2.5.2 Socio-Cultural factors

Socio-cultural beliefs and norms have had a significant influence on human nutrition and have been identified as the determinants of breastfeeding practices. Furthermore, it amplifies the need to understand cultural beliefs and practices. There is a need to have a health and nutrition intervention for implementation. It is good to understand socio-cultural and environmental issues around breastfeeding. The global strategy for infant and Young Child feeding further amplified the need for promoting breastfeeding.

Even though misconceptions, myths, and cultural beliefs have been marked as some of the hurdles to optimal breastfeeding and infant feeding practices in rural Liberia. Some cultural beliefs and practices on exclusive breastfeeding have been on the increase, especially in areas where poor breastfeeding practices are rampant. This research documents the cultural beliefs, and misconceptions surrounding breastfeeding practices in a rural community. With this evidence generated, the design and implementation of an intervention to create policies to improve breastfeeding and consequently infant health and nutrition is critical for rural settings.

2.5.3 Demographic factor

There are major socio-demographic factors that affect breastfeeding practices including marital status, age, education, and income level. Evidence has also shown that older age, high level of income, being married, and being well educated are associated with a longer breastfeeding period. These factors are not adaptable to change by midwives once the mothers of childbearing age are pregnant, especially the uneducated and young women. Bearing in mind that successful breastfeeding is the wrong way around correlated with being young, unmarried, uneducated, and living in poverty helps midwives to better target their education and give support to these groups of mothers (Tewabe et al., 2016)

2.5.4 Biological Factors

Biological factors refer to genetic influences, hormone levels, brain chemistry, nutrition, and sex. Genetic features are outside mothers' breast growth, nipple problems, and the efficiency of postpartum disorder and child breastfeeding. The delay of breastfeeding weakens the capacity of the mother to breastfeed for the first time exclusively. The risk that is developed from the delay of breastfeeding includes obesity, greater maternal age, and short proceeding of birth intervals. Motherly obesity is in line with impaired lactogenesis in humans and animals but the solution for this relationship is unclear. Research in California found that mother with a body mass index greater than twenty-seven kg/m2 was half time more likely to have delayed onset of lactation than mothers with a lower BMI and their children are three more likely to have suboptimal infant breastfeeding attitude on day seven (Tadesse et al, 2016).

2.5.5 Economic Factors

Women in developing countries have not been supported economically but have been heavily relied on by some because the opportunities for men to get employment are lesser, in so many cases because they abundant their families. To complement the family’s income, mothers are to go work with their young infant or hire a nurse to take care of that child. Exclusive breastfeeding is not possible because of the tightly scheduled nature of most paid work and the length of separation from the infant leads to non-adherence to EBF and with the idea of exclusive breastfeeding being demanded. In places that have limited resource sites, promoting EBF that is suitable, possible, harmless, and viable is not common because it is expensive (Nkrumah, 2016).

2.6 Nutrition status

Globally, about 10.5 million undernutrition children died every year. Malnutrition is a generational thing that comes and goes with time. It is advisable for a girl who is malnourished and wants to have babies should be physically fit before she can have babies other than that the babies will be too small and more likely to have poor health status throughout the lifecycle into their adulthood which in turn will affect generation to come in the future. Despite all of these circumstances, the benefit of breastfeeding practices for mothers and infants in Africa remains suboptimal with issues around the current HIV epidemic and prevention of mother-to-child transmission. Significantly, the nutrition and health needs of African new-borns and their mothers are linked to optimal growth and development and it is fundamental for the government to speed up the economic empowerment for mothers and infants (Stein et al., 2016).

2.7 Conceptual Framework

The conceptual framework (figure 2.1) indicates the interplay of the basic factors likely to influence breastfeeding practices which include maternal factors, social-economic and demographic factors, and cultural factors. From the literature, these factors have proven to be key underlying causes of poor breastfeeding practices, inadequate healthcare service, and food insecurity in the household. They are predictor variables whose influence on exclusive breastfeeding result in disease and inadequate dietary intake which is the immediate cause of infant malnutrition. Exclusive breastfeeding has done have further effect on the nutritional status, growth, and morbidity status of infants as a predictor.

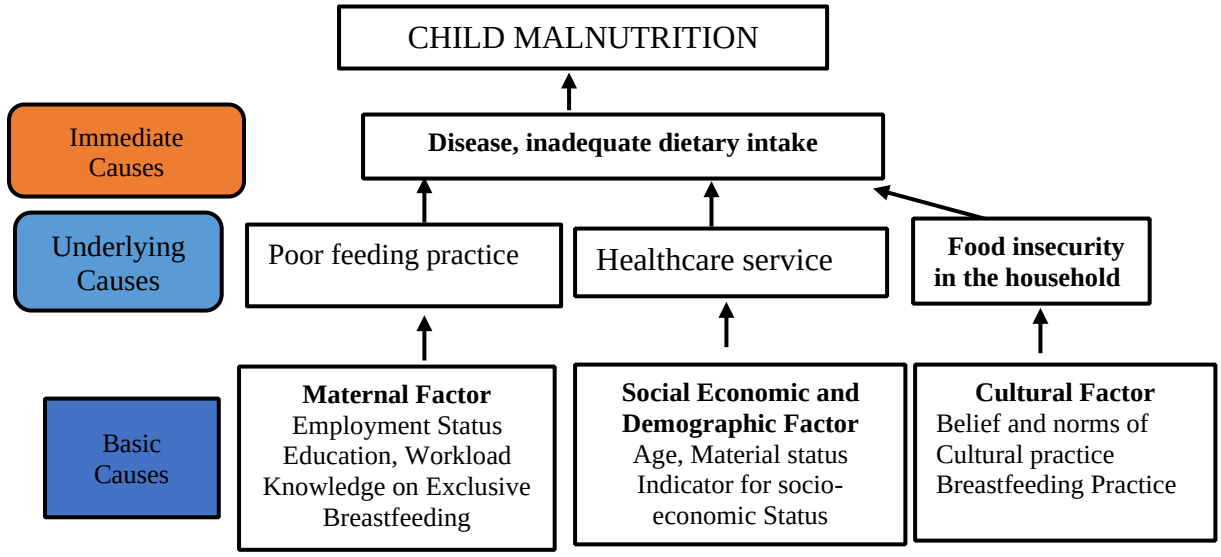

Figure 2. 1 Conceptual Framework
Source: UNICEF (2013)

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Study Setting

The study conducted in Voinjama District, Lofa County. Lofa County is situated in the northern part of Liberia and is known as the bread-basket of the country. The county covers an area of 9,982 square kilometres (3,854 sq mi). Voinjama is the capital of Lofa County. It has a total population of 26,594, representing 9.6% of the total population (276,863) of Lofa County. Lofa County is bordered by Bong and Gbarpolu on the south and West, respectively; while the north western part is bordered by Sierra Leone and the north-eastern part is bordered by Guinea. The highest mountain in Liberia, which is called Mount Wuteve, lies in the north-central part of the county. The household number during the 2008 census was 45,095 while the average size of the households was 5.5. It has been observed that most of the houses in the Voinjama District are semi-permanent with no electricity to all its inhabitant.

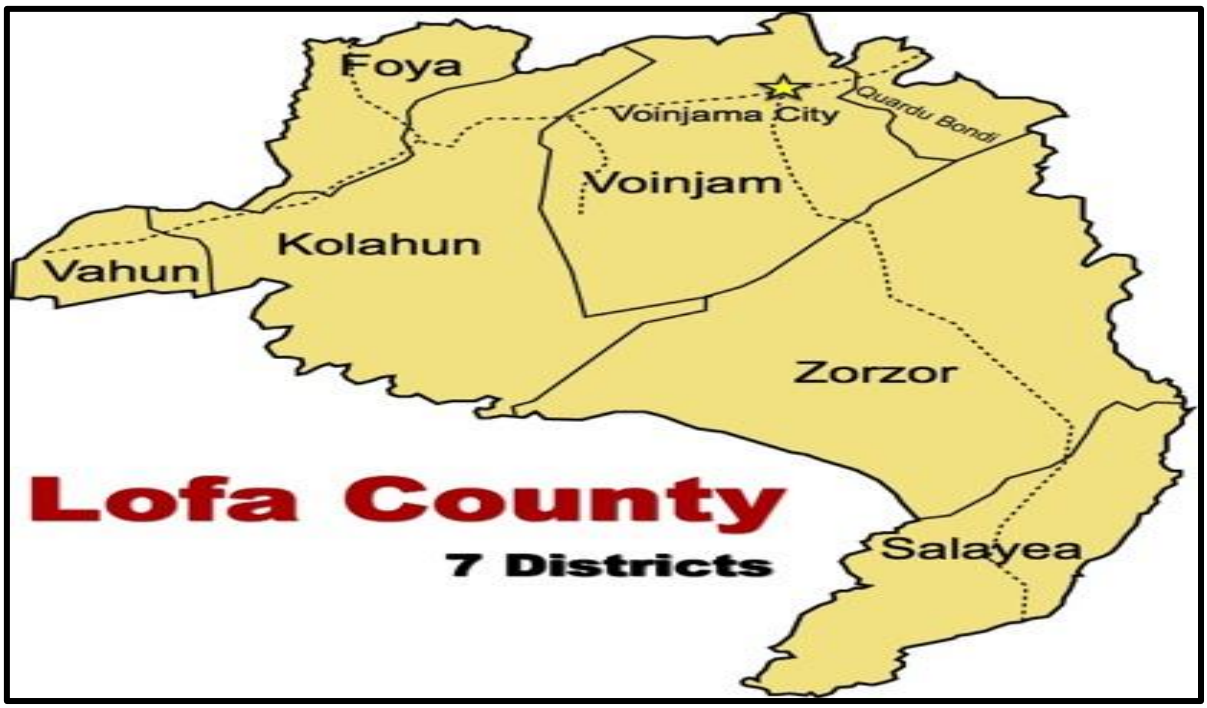

Figure 3. 2 Map of Lofa County
Source: MSF (2014)

3.2 Study Design

The study employed a cross-section research design and descriptive statistics for analysis. This research design facilitated the collection of data at one point in time (cross-section), then the exploration of data to give frequencies (proportions), the measure of central tendency (mean),

and the measure of dispersion (standard deviation). These descriptive statistics addressed the objectives of the study in determining the cultural practices and education level of mothers on exclusive breastfeeding on nutrition status of children 0-12 months Voinjama District, Liberia.

3.3 Study population

3.3.1. Study Population

The study population was mothers with children aged 0-12 months residing at Tellewoyan, Malamai and Pentecostal Mission Unlimited (PMU) health facilities Voinjama District. The target population was 237 mothers of children aged 0 – 12 months who visited at least once of the three health facilities in Voinjama District.

3.3.2 Sample size determination

Based on the research design, data were collected from a sample of 149 mothers of children aged 0-12 months in the Voinjama District of Lofa County. The sample size was calculated using a formula by Yamane (1967) as follows;

$$n = \frac{N}{(1 + N(e^2)}$$

where:

n = the desired sample size

N = The target population

e = the error allowed (0.05) by adopting 95% level of confidence, therefore;

$$\text{n} = \frac{237}{1+237(0.05^2)} = 148.82 \cong 149$$

3.3.3 Sampling

The sampling procedure refers to the method of selecting part of a population to use to test hypotheses about the entire population (Kumar, 2018). It is used to choose the number of participants, interviewees, or work samples to use in the assessment process. A multi-stage sampling technique was used to select 149 the samples for the study. In the first stage, Voinjama District is selected purposively because it is situated in a highly culture dominated setting. Furthermore, the researcher has control over the local dialect that is spoken. Voinjama is the largest district in Lofa County. In the second stage, mothers of 0 – 12 months who visited one of the three health facilities within the district were selected. In the final stage, 149 mothers of children aged 0-12 months were selected using a simple random sampling technique (Etikan et al, 2017). Figure 3.2 shows the sampling frame.

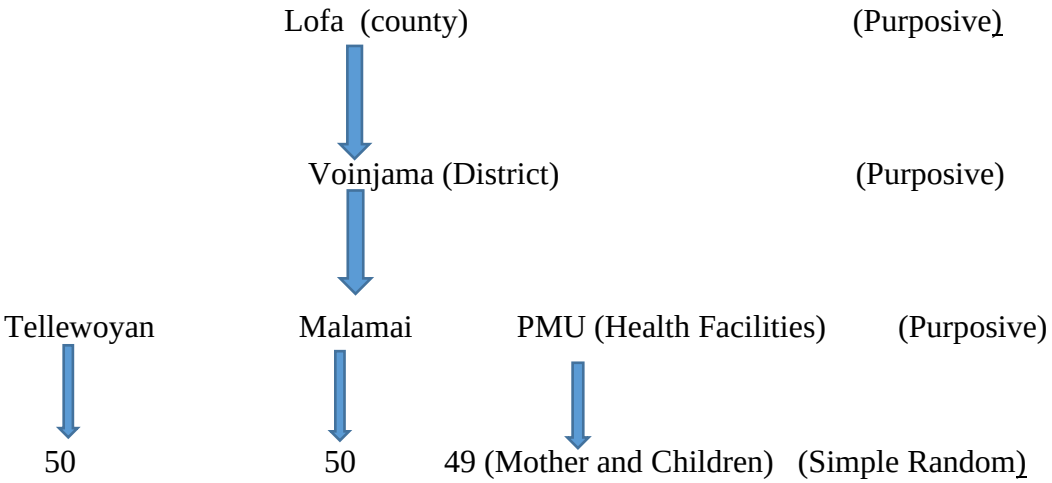

Figure 3. 3 Sampling Schema

3.3.4 Inclusion Criteria

Inclusion criteria describes the key features of the target population from which the sample selected for investigation to answer the research questions. In order to be included in the study, a respondent has to be a:

mother of child aged 0-12 months residing in Voinjama District and attend one of the three health facilities (Tellewoyan, Malamai and Pentecostal Mission Unlimited) at the time of the survey.

A caregiver who gave voluntary consent and signed the consent form.

Households with children 0-12 months, both boys and girls who resided in the study area.

3.3.5 Exclusion Criteria

The study applied the following exclusion criteria

1) Mothers who had not lived in the district for a period of six months prior to the study

2) Those mother who had physical or cognitive impairment or suffered substance use disorder.

3.4.1 Data collection procedures base on research objectives

Specific objective One: Demographic and social economic characteristic of the household.

Semi-structured questionnaire was used to collect primary data on the demographic and social-economic characteristics of mothers of children aged 0-12 months. Primary data on age, sex, education level, income level, household size, occupation, marital status, and wealth category variables. Data were obtained by face-to-face interviews with the sampled respondents and were analysed using descriptive statistic.

Specific objective 2: Nutrition education of mothers on the nutrition status of children.

The descriptive statistics were used to determine the effect level of nutritional education of mothers on the nutrition status of children aged 0-12 months using the FAO recommended guideline while conducting nutrition-related knowledge, attitude, and practices (KAP) surveys (Macias & Glasauer, 2014). Semi-structure questionnaires and anthropometric measurements were taken, informant interviews with mothers and caregivers of children.

Specific objective 3: Breastfeeding practices on the nutritional status of children

The descriptive statistics were used to examine the breastfeeding practices on nutritional status of children aged 0-12 months in Voinjama District, Liberia, Liberia using the FAO recommended guideline while conducting cultural practices on nutritional status, (KAP) surveys. Semi structure questionnaires and anthropometric measurements were taken, informal group discussions, informal interviews with mothers and caregivers of children.

Specific objective 4: Nutrition status and the indicator rate in children

With the guideline from WHO, four anthropometric data were taken during the period of the study. The study considered height (length), weight, sex, and age while WHO (2008b) takes into account three nutrition indicators (stunting, wasting, and underweight) were determined for the assessment of the nutrition status and the indicator rate in children. The anthropometric tools used for measurement were length board, electronic weighing scale, and the mid-upper arm circumference (MUAC) tape for the nutrition status of children.

3.4.2. Tool for the Research

3.4.2.1 Questionnaire

The data were collected using a semi–structured and pretested questionnaire that was separated into sections based on social demographic and socioeconomic parameters such as maternal nutrition awareness, infant and young child feeding (IYCF) practices, nutrition information network, and anthropometric measure. The mother was interviewed, and each response was carefully recorded in its appropriate part. The questionnaire was divided into sections for quantitative and qualitative data.

3.4.2.2 Anthropometric measurement

WHO (2014) recommends the guidelines for the anthropometric measurement for measuring the weight and the height (length) of children under 0-12 months. The guidelines include:

a. Length (Height)

The length board is used when taken the length of a child, it is placed on a flat surface where a child is laid on in a supine position. With their eyes looking vertically, they pressed their head against the fixed headboard. On the knee, pressure is being applied. The feet and lower limbs are at a straight angle. The upright piece foot was moved in order to make firm contact with the heels, and the length board's reading was taken to the nearest 0.1cm. This was done again to get the second reading at the same 0.1cm, and both readings were recorded. To reduce inter-observer error, the measurement was taken. As soon as the interview was completed, the length of the average was computed by summing the two readings to find the average reading using the equation below.

$$\frac{\text{Reading 1 + reading 2}}{2}$$

b. Weight

To check for accuracy, the salter scales were used at the standard 2kg sugar packet. The measuring of the scale was up to a maximum of 25kg. To keep it stable, it was suspended from the pole make sure that the children are safe in the process of weighing. We then place a plastic pan on it and the pointer reading was adjusted to zero. All the children that were weighed were undressed and place in the weighing pants. Children that were under two months and they who their neck has not stabilized, was laid in a sisals basket that was place on the salter hook and the pointer was adjusted to zero as well, to put in safety guard. By putting in place safety mention the infant on the weighting scale was suspended. At this stage, the pointer stopped wobbling then the reading was recorded. Repeated reading was taken to reduce inter observers' error. Consequently, the reading was to the nearest 0.1kg and it was recorded on a table in the questionnaire. The weight was calculated as soon after the interview, by adding up the two readings to get the average reading.

$$\frac{\text{Reading } 1^{st} + \text{Reading } 2^{nd}}{2}$$

3.4.3 Recruitment and training of enumerators

The researcher recruited four (4) enumerators for the actual data collection and recording process. The requirement for the recruitment process of the enumerator was placed on a poster. The age range that the researcher was looking for is 19- 26 years and you should be a college graduate or a student of the community college in the Voinjama District. You should be influent in the communication of the local language, English, be a person who upholds good self-presentation and computer literacy was an added value. Based on the requirement, the applicant was interviewed and four (4) were selected to help with the data collection and analysis. The

4-enumerator selected participated in the pretesting of the equipment that is used in data collection and was also made familiar with the data collection tool.

3.4.3.1 Training

After recruitment of the enumerator, they were given one-day training. Before the training, the researcher developed a curriculum that served as a guide during the training session. Before the training, we consider a brief explanation of the study, objective, aim, and purpose of the study, review of the questionnaire, role-play of the interviewing techniques, taking the anthropometric measurement, and training on ethics during fieldwork.

3.5. Ethical considerations

1. Approval was sought from the local chief's office governing each of the villages to be involved in the research.
2. Permission from the individual community leader and community health officer.
3. Informed consent was sought from each respondent
4. Anonymity was ensured during data presentation

3.6. Pre-testing study tools

All tools were pre-tested prior a day before the actual data collection day, to ensure that everything was accurately calibrated and that they were all set for data collection.

The weighing scale, the length/height boards were tested in a place called Voinjama to make sure all the tools are correct and working accurately.

The online questionnaires were tested and installed in the enumerators' devices a day before the actual data collection.

3.7. Data quality control

To ensure the collection of data is of high quality, the following considerations in Table 3.1 were put in consideration:

Table 3. 1 Data quality assurance

ASPECT	ATTRIBUTE OF DATA QUALITY
Accuracy	Used measuring tape, weighing scale & MUAC tape.
Validity	Pre-testing all Questionnaire and other tools
Uniqueness	Used appropriate software and analysis tools.

3.8. Statistical Data analysis

The analysis was essential since it enabled the anthropometric data collected to define the nutrition problem in the study area. For efficient data description, Chi-square, correlation, Cross tables, frequencies and proportions were computed. The results from the analysis were presented using Graphs, charts, and trends in the matters addressed were developed for easy presentation and understanding of the results. Table 3.2 illustrates the data analysis.

Table 3. 2 Analysis and Presentation

Variables	method of analysis
Social Demography	a. Percentages, frequent distribution b. Mean and mode c. Standard deviation d. Chi-square for categorical variables
Nutrition Education – independent variable	a. Percentages b. Mean and mode c. Standard Deviation d. Diagnostic Tests (different between two groups) e. Correlation analysis
Anthropometric - dependent variable	a. Frequency distribution b. Median and mean c. Interquartile and range d. Standard deviation e. Chi-square and correlation analysis
Breastfeeding practices - Independent variables	a. Percentage b. Means and mode c. Standard deviation d. Diagnostic test for difference between two groups

CHAPTER FOUR: RESULTS

4.1 Number of study participants from each Health Facility

A total sample size of 149 patients was randomly sampled in three health facilities as follows; Sixty-three 63 (42%) of the patients were in Tellewoyan Facility, 44 (30%) in PMU Facility while 42 (28%) in Malamai Health Facility (Figure 4.1).

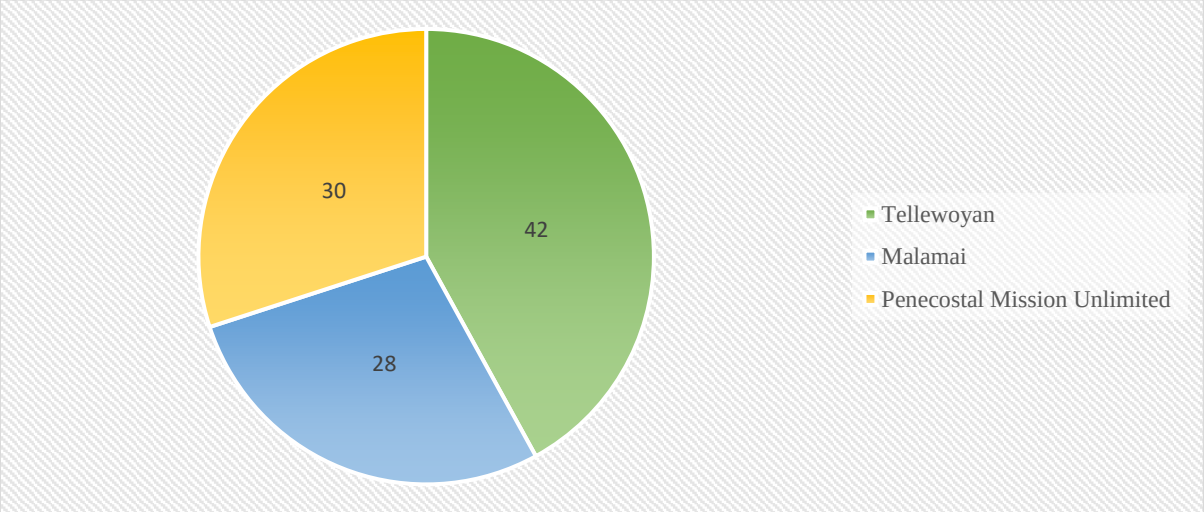

Figure 4. 4 Proportion of patients sampled in three health facilities included in this study

4.2. Demographic and socio-economic characteristics of study participants

4.2.1. Distribution of household size

The mean household size was 4.3 members. About 33.8% of the households had a household size of 3, 27% were from households with five members while 25.7% and 10.8% were from households with four members and six members, respectively (Figure 4.3). Only 3.4 percent of the mothers were from households with more than six members.

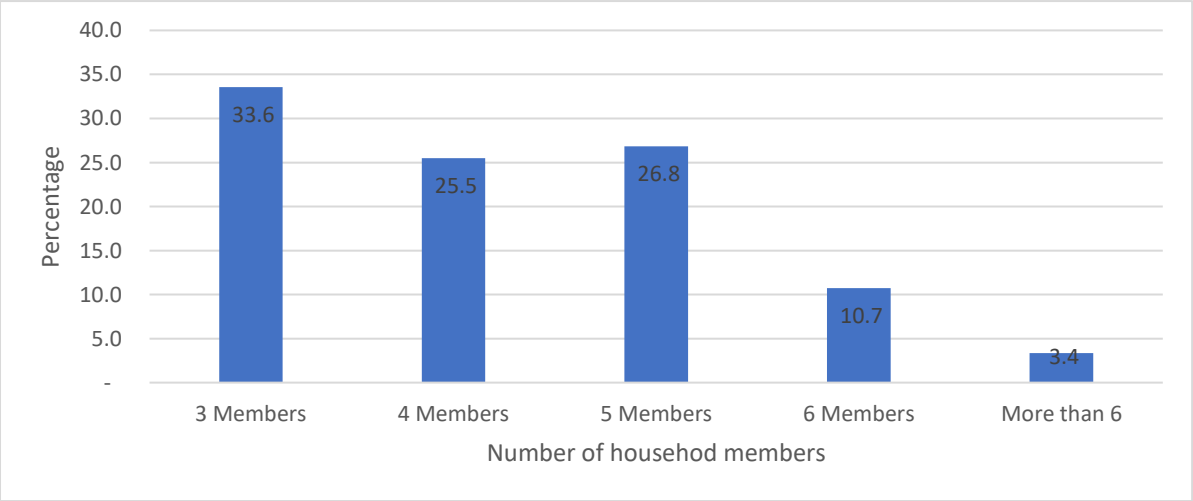

Figure 4. 5 Number of a household member

4.2.2 Occupation of mother

The majority (63%) of the mothers were in business, whereas 17% were farmers, while 3% were on salaried jobs or formal employment. On the other hand, 16% of the mothers did not have any pay job, even though they were willing to work. Therefore, they were unemployed While women whose main occupation is to care for the family – (house managers), managing the household affairs, while the owner(s) go out to work was 1% (Figure in 4.4).

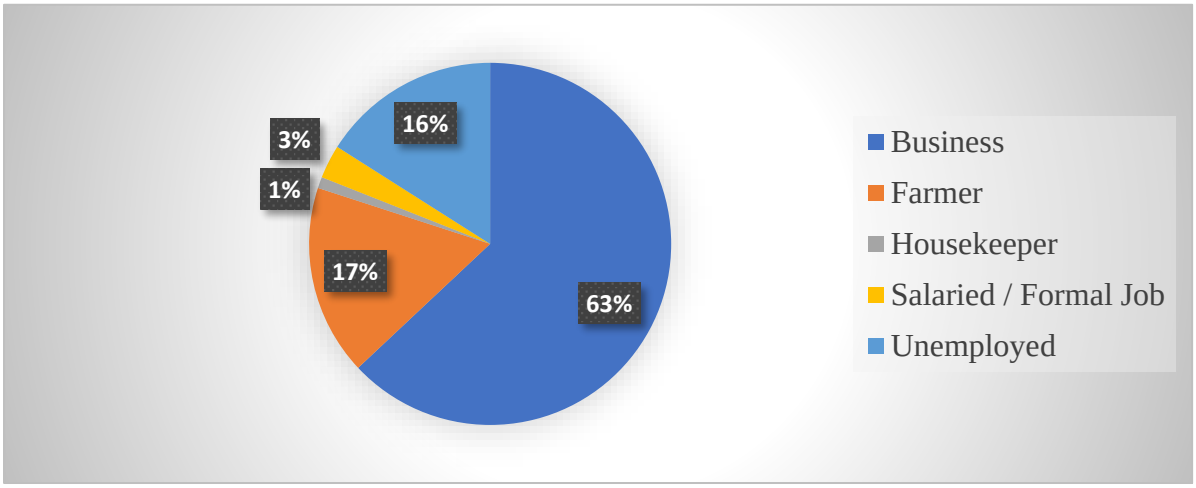

Figure 4. 6 Index child mothers' occupation

4.2.3 Income of the households

Majority (67.1%) of the households had business as their source of income (Figure 4.5) while remittance/gift and casual labour were the sources relied upon by the least proportion of households.

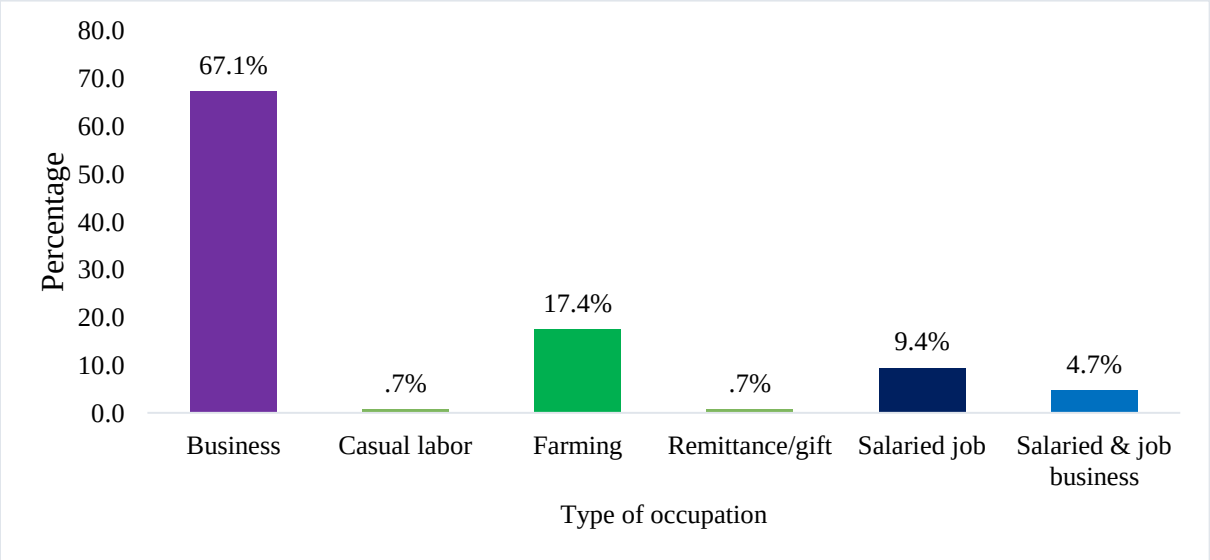

Figure 4. 7 Source of income in the household

4.2.4 Household head educational level

In terms of educational attainment of household heads, 36.2% of the household heads had completed secondary school, 18.8% had some primary education, 18.1% had university/ college education and 16.8 % had some secondary education (Table 4.1). The proportion of household head and child's mothers without education was 4%.

Table 4. 1 Level of the education of household heads

Education levels	Numbers	Percent
Complete secondary	54	36.2
No education	6	4.0
Primary completed	7	4.7
Some primary	28	18.8
Some secondary	25	16.8
University/college	27	18.1
Vocational school	2	1.3

4.3 Demographic and socio-economic characteristics of mothers with children 0-12 months in Voinjama District

4.3.1 Age of mothers and household sizes in the study

The youngest mother was 18 years of age while the oldest was 40 years and the mean age of mothers was approximately 28±5.6 (mean ± standard deviation [sd]). The mean (±sd) household size was at approximately 5±1.4 individuals, with the least household size comprising of 3 individuals and the largest household comprising 11 individuals (Table 4.2). On average, a child was approximately 7.8± 3.98 months old. The minimum recorded age was at one months, while the maximum was at 12 months.

Table 4. 2 Means, standard deviations and range of households' sizes, mothers age, and child age

Variable	Mean	Standard deviation	Minimum	Maximum
Age of the mother (years)	29.7	5.6	18	40
Household size	4.4	1.4	3	11
Age of children (months)	7.8	3.98	1	12

4.3.2 Age categories of mothers

The majority (49%) of the mothers were aged 30-39 years, followed by mothers aged 20 – 29 years (47%). Mothers aged above 40 years were less than 1 % (Figure 4.6).

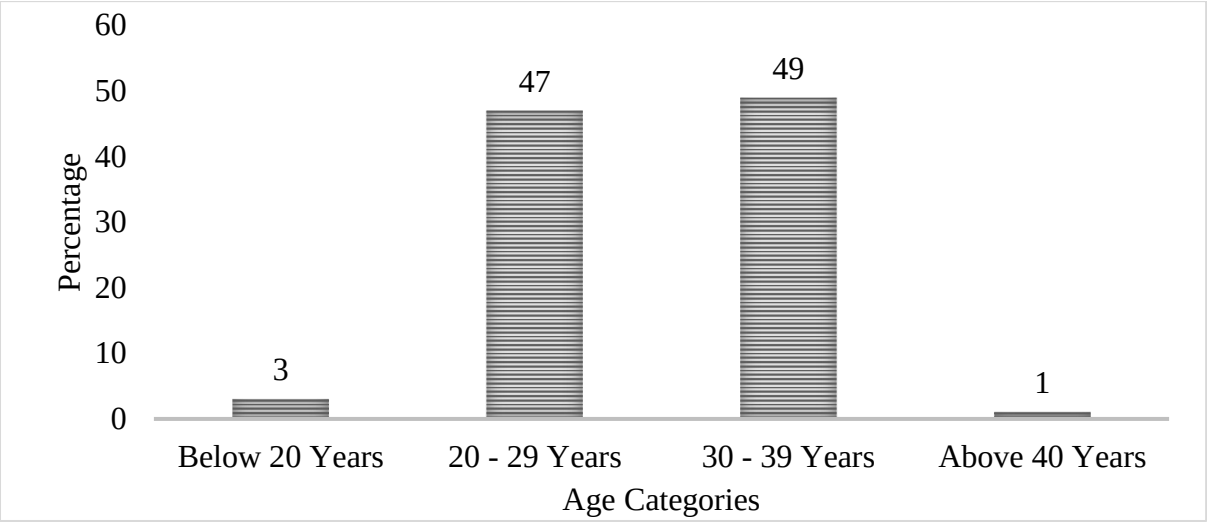

Figure 4. 8 Mothers' Age category

4.3.4 Marital status, education level and occupation of mothers in the study

Out of 149 mothers in the study, 81.9% were married, 8.7% were single and 9.4% were separated/widowed (Table 4.3). For the distribution of the respondents by religions, the results show that the majority (89.3%) of the participant's households were Christian while only 10.6% were Muslims. Furthermore, majority of mothers were spouses (83.3%) of the household heads, while 9.9% of mothers were the head of household, 7.1% of the mothers were living singly and 0.7% were daughters of the household head.

Table 4. 3 Socio-demographic characteristics of mothers with children under 12 months

Socio-Demographic Characteristics	Number	Percentage
Marital status		
Single	12	8.7
Married	115	81.9
Separated/widowed	14	9.4
Religion of the households		
Christian	133	89.3
Muslim	16	10.7
Relationship to the head		
Daughter	1	0.7
Head	14	9.9
Self	10	7.1
Spouse	116	83.3
Level of the education of the mother		
No education	5	3.4
Some primary	49	36.2
Primary completed	17	12.1
Some secondary	40	28.4
Complete secondary	20	13.4
Vocational school	4	3.4
University/college	6	4.0

4.3 Access to land for crop production, crop types, percentage of food production consumed/ sold at the household level

Table 4.4 shows the various types of crops produced by the households. About 18.1% of households owned land while 81.9% did not have access to land. The most crops cultivated were cereals 96%, roots crop 93% and %, vegetables 85%. Other crops produced were legumes 52, fruit tree 56% and tea/coffee 4%. The greater percentage of the food produced (96%) is consumed in the majority of the households. Only 4% of the households consumed less than 10% of the food produced at the household (Table 4.4).

Table 4. 4 Access to land for crop production, crop types, percentage of food production consumed/ sold at the household level

Variable	Number=149	Percentage
Does the household have access to land for food production		
Yes	27	18.1
No	122	81.9

What are the types of crops produced in the land

Types of crops produced	Number	Percent of households growing crops among the whole study population (N_1=149)	Percent of households growing crops among those growing crops (N_2=27)
No crops	122	82	-
Cereals	26	17	96
Legumes	14	9	52
Root crops	25	17	93
Vegetables	23	15	85
Fruits trees	15	10	56
Tea/Coffee	1	1	4

4.4 Feeding practices for infants and children aged 0 to 12 months attending Health services in Voinjama District, Liberia

On average a child between 0 to 12 months ate food and snacks other than liquids three times (96.6%), with the least frequency of taking food and snacks other than liquids at zero times (2.0%) while 1.3% of the children between 0 to 12 months ate food and snacks other than liquids two times (Table 4.5).

Table 4. 5 Summary of times a child ate foods and snacks other than liquids

Number of times in a day	Number	Percentage
0	3	2.0
2	2	1.3
3	144	96.6

4.5. Iron fortified food consumption

Concerning consumption of iron-rich or iron-fortified foods, 86.6% of the mothers affirmed that children of 0 to 12 months were fed with iron-rich or iron-fortified foods. Only 13.4% of

the mothers did not affirm that children between ages 0 to 12 months were fed with iron-rich or iron-fortified foods. In the consumption of powder or sprinkles, 81.9% of the mothers affirmed that children of 0 to 12 months were fed with food to which powder or sprinkles were added while 18.1% of the mothers did not affirm that children between ages 0 to 12 months were feed food to which powder or sprinkles were added (Figure 4.7).

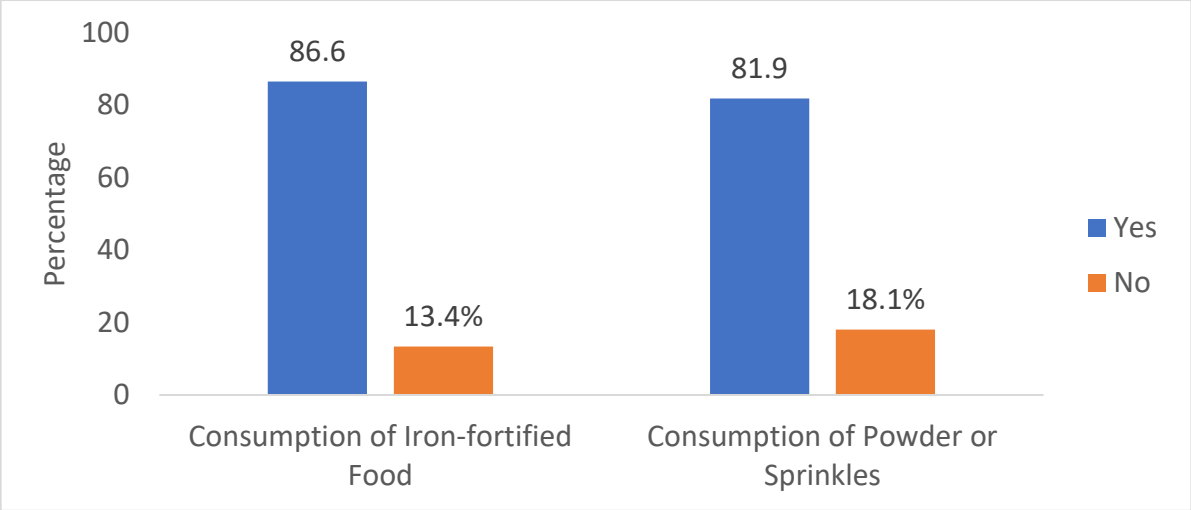

Figure 4. 9 Consumption of iron-fortified food by 0 to 12 months children

4.6 Cultural practices on nutritional status of children aged 0-12 months in Voinjama District, Liberia

Table 4.8 shows that 35.6% of spouses to mothers with children aged 0 to 12 months were present during child birth while 64.4% of the husbands did not attend the birth.

Table 4. 6 Mothers Cultural Practices with children of ages 0-12 months

Cultural Practices	Proportion of	
	Yes	No
Do your spouse usually attend a child birth	35.6	64.4
Women in some cultures indeed believe that cutting of umbilical cord before the placenta is expelled may cause an infant's death	97.9	2.1
It was acceptable in your culture to compliment a new-born child.	96.6	3.4
Some women may dislike compliments addressed towards their infants,	97.3	2.7
Some women may not wish their child to wear worn clothes by another infant.	94.6	5.4
Will you follow any cultural practices before breastfeeding?	4.7	95.3
Are there foods that are prohibited by your community or religion among the children?	1.3	98.7

A small proportion of mothers (2.0%) believed that if the placenta is expelled before the cutting of umbilical cord, it may cause an infant death (2.0%), however, 97.9% did disagree with the belief thus dispelling the view that expelling the placenta before cutting the umbilical would lead to harms or death of the infant The results further show that 96.6% agreed that it was acceptable that the new-born babies feeding on breast milk is complemented with food while and only 3.4% disagree with the statement. This is however not best practice in nutrition as the expectation is to have exclusive breastfeeding. Additionally, 97.3% of some women disliked compliments towards their infant believing that an evil eye can cause the infant to fall ill while only 2.7% of the women did not believe so. Mothers of children were also asked if they would follow any cultural practices before breastfeeding and the result show that only 4.7% said disagreed while 95.3% agreed. Furthermore, a few (1.3%) of the mothers said there are foods that are prohibited by their community or religion while a majority (98.7%) of the mothers said no food had been prohibited by their community or religion (Table 4. 6).

The majority of the mothers (73.1%) preferred to cut or remove the umbilical cord from the infant within one week, 25.5% said within one to two weeks while 1.3% preferred within one to three weeks (Table 4.7). The study also revealed that 26.2% of mothers believed the cord should be 5-7 cm stump and 18.8% affirmed that it should be 2-3cm from the skin. However, in their opinion on how long the placenta and umbilical cord were to be disposed or kept, 93.3% preferred burying, 6.0% preferred to keep them while 0.7% preferred to dry and keep them. The majority (99.3 %) of the mothers said they would like their infant to have their first bath within one week and 0.7% of mothers preferred two weeks.

Table 4. 7 Frequency of Culture Practices

Cultural practices	Frequencies	Percent
When would you likely cut the umbilical cord	One to three weeks	1.34
	One to two weeks	25.50
	One week	73.2
How long should the Cord be that is left with the infant	2-3cm from the skin	18.8
	5-7 cm stump	26.2
How would you like the placenta and umbilical cord to be disposed	Be kept	6.0
	Buried	93.3
	Dried and kept	0.7
When would you like your infant to have their first bath	One week	99.3
	Two weeks	0.7

Results on the cultural practices of mothers with children aged 0-12 months are presented in Table 4. 8. The results show that 6.3% of respondents believed that mothers wash or clean their entire breast after work before breast feeding the child and 1.5% believed that only the nipple or sucking area should be cleaned. About 9.8% also believed that mothers should wash the breast before breastfeeding and 17% said mothers need to wash the breast after sweating.

Table 4. 8 Cultural Practices followed by Mothers with children aged 0-12 months

Practices	Percentage supporting the practice (%)
Washing breast after work	6.3
Wash the socking part of the breast	1.5
Wash the breast before breastfeeding	9.8
After sweating, one needs to wash the breast before breastfeeding	17

4.7 Breastfeeding practices and nutritional status of children aged 0-12 months in Voinjama District, Liberia.

All mothers interviewed knew about exclusive breastfeeding.

4.7.1 Breastfeeding Practices for children aged 0 to 12 months in Voinjama District

When mothers were requested to indicate the source of information on breastfeeding, about 92% of the mothers got the information from CHWS, 44% got from mass media. Only 3% of the mothers got their information from friends and no information from relatives (Table 4.9).

Table 4. 9 Proportions of participants that show trust to various information sources

Sources of breastfeeding information	N=149	Percent
Clinic	149	100
Relatives	0	0
Friends	3	2
CHWs	137	92
Mass media	66	44

4.7.2 Information relating to breastfeeding

Regarding the source of information on breastfeeding and nutrition, 82% of the mothers got the information from community health workers (CHWs), 46% from Radio/Mass media, 52% got from mother support group. Only 2.0% of the mothers got their information from relatives, respectively (Table 4.10).

Table 4. 10 Proportion of participants that sourced nutrition information from different sources

Source of information on nutrition	**N=149**	**Percent**
Clinic	148	99
Relatives	2	1
CHWs	122	82
Mass media	69	46
Mother support group	77	52

4.7.3 Breastfeeding length of children 0-12 months

According to the WHO, the total length of breastfeeding of children should be about 24 months. Majority of the mothers (92.6%) in this study recommended breastfeeding their children up to 18 months. However, the remaining 7.4% indicated a very short period where 4% of the mothers recommended breastfeeding for 6 months, 2% of the mothers recommended breastfeeding for 3 months and a small fraction of the mothers (0.7%) recommended breastfeeding for between 7 to 9 months (Figure 4. 8).

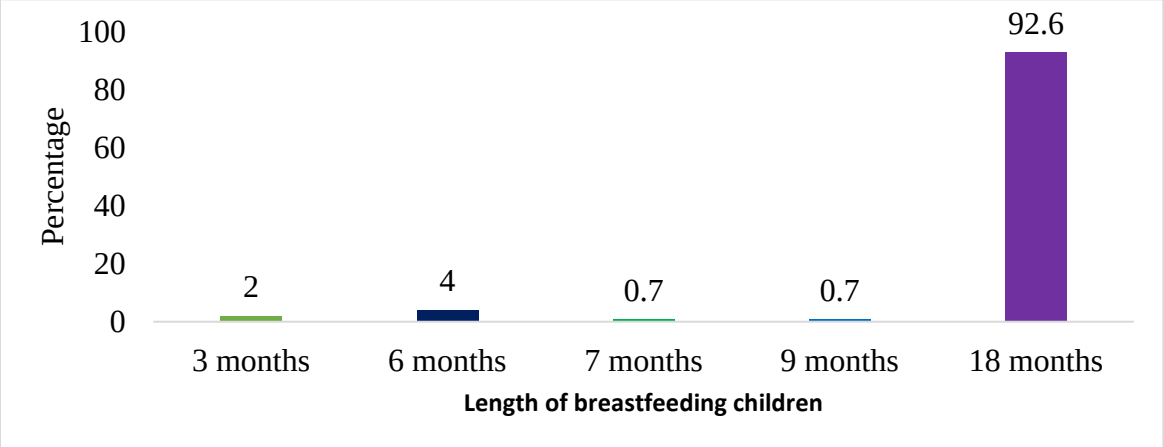

Figure 4. 10 Mothers knowledge of the length of breastfeeding of children by mothers in Voinjama district

4.7.4 Mothers knowledge on sufficiency of breast milk for children between 3-6 months

Almost all mothers (99.3%) affirmed that breast milk only without addition of other solids or fluids was enough for a child between 0 to 6 months old (figure 4.9Figure 4. **11**). Only one mother disaffirmed the singular consumption of breast milk as enough for a child between 0 to 6 months old. Furthermore, all the mothers agreed to have breastfed their children aged between 0 to 6 months old.

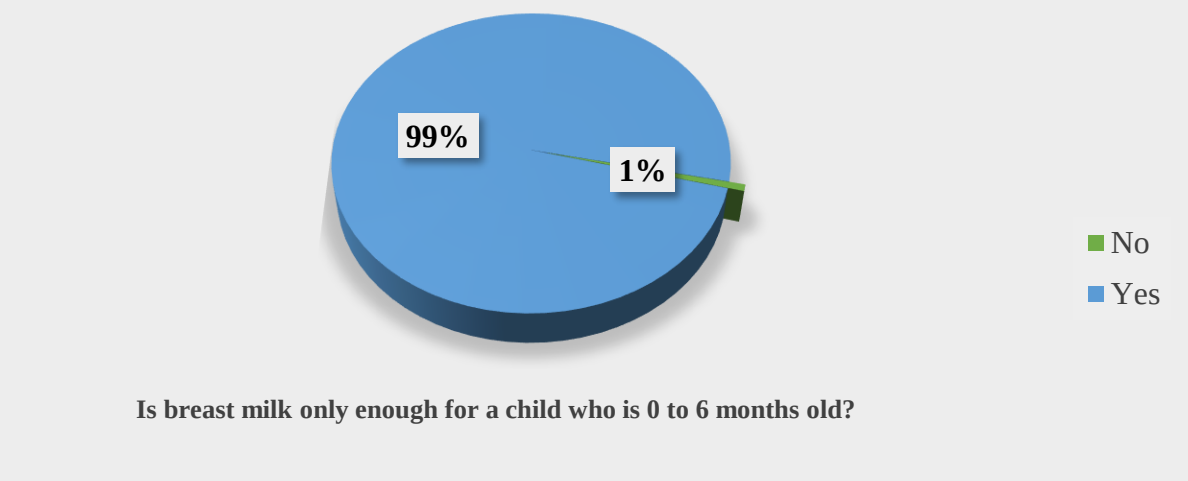

Figure 4. 11 Is breast milk only enough for a child who is 0 to 6 months

Table 4.11 presents the results on cultural reasons for breastfeeding at a particular time. The affirmation that breast milk is enough for children aged between 0 to 6 months, was further supported by the following reasons. One, that breast milk makes a child healthy (supported by 91.3%), makes the brain active/fresh (supported by 69.1%), boosts immunity (supported by 65.1%), it's just a first food for a child (supported by 11.4%), serves as antibiotics (supported by 8.7%) and generally helps in the development of a child as supported by 4.7. However, in their opinion on how colostrum is, 73.8% of the mothers affirmed that colostrum offers protection/ immunity while 26.1% affirmed that it was just good for a child.

Table 4. 11 Cultural reasons for breastfeeding at a particular time

Cultural reasons	Number	Percent
Child development	7	4.7
First food for the child	10	6.7
Immunity	80	53.7
Make the brain active/fresh	6	4.0
Make the child healthy	33	22.1
Serves as antibiotics	13	8.7

As indicated in Figure 4.10, majority of the respondents that is 74% concurred that colostrum protected or improved child immunity. On the other hand, only 26% of the respondents stated that colostrum to children aged 0-12 months was just good.

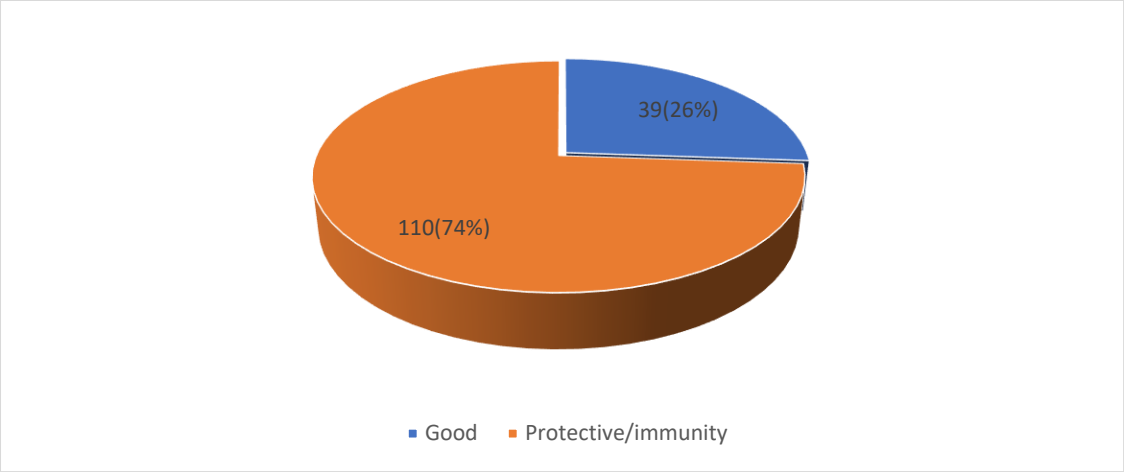

Figure 4. 12 Importance of Colostrum to children aged 0-12 months

4.7.5 Initiation of breastfeeding after delivery.

On when breastfeeding should be initiated after delivery, almost all (97%) mothers interviewed suggested that breastfeeding be initiated within an hour after birth, while only 3% suggested that the initiation of breastfeeding be done a few hours after birth (Figure 4.11). Further, all (100%) of the interviewed mothers had understood the meaning of exclusive breastfeeding as their definition was that, an infant gets only breastmilk and no other liquids or food in the first 6 months.

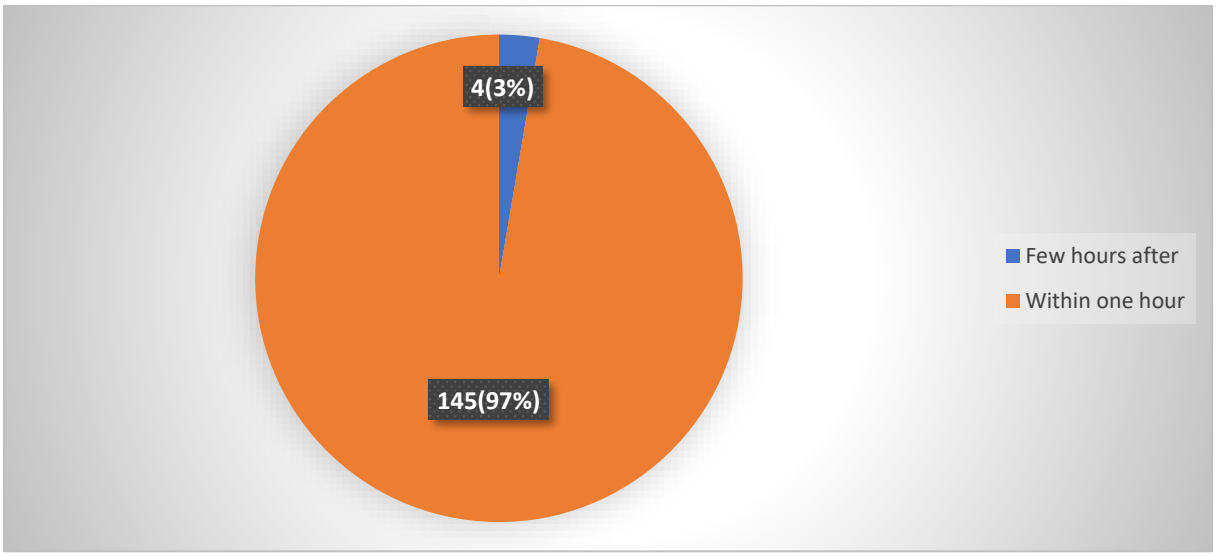

Figure 4.13 When should breastfeeding be initiated after delivery

4.7.6 Mothers knowledge on the benefits of breastfeeding to children

Additionally, on benefits of breast milk whether right or wrong, Table 4.12 below shows that breast milk as supported by all mothers (100%), only without other foods is enough for the child's nutrition during the first 6 months after the birth of a child, is cheap, convenient, promotes mother to child bonding and promotes child growth development. Contrastingly, 84.6% of the mothers affirmed that breast milk transfers immunity against diseases to the child while 15.4% disaffirmed that breast milk transfers immunity against diseases to the child. Nonetheless, on whether first breast milk can cause some diseases or ill health to a child, causes death to a child, or the breast milk produced in the first few hours after birth be disposed of/thrown away. Only 3.4%, 2.0%, and 2.0% affirmed that first breast milk can cause some diseases or ill health to a child, cause death to a child, or the breast milk produced in the first few hours after birth should be disposed of/thrown away.

Table 4. 12 Mothers' opinion on Breastfeeding

Benefits of exclusive breastfeeding	Right	Wrong
Breast milk ONLY without other foods is enough for the child's nutrition during the first 6 months after the birth of a child	100	0.0
Breast milk is cheap	100	0.0
Breast milk is convenient	100	0.0
Breast milk promotes mother to child bonding	100	0.0
Breast milk promotes growth development	100	0.0
Breast milk transfer immunity against diseases to the child	84.6	15.4
First breast milk can cause some diseases or ill health to a child	3.4	96.6

N=149

4.7.7 Influence of household members on what the infants should be feed

On the question of who influences the food to be introduced to a child, the study found out that mothers have a huge influence (supported by 99.3%) as compared to fathers (supported by 0.67%), while aunties and mothers-in-law do not influence the food to be introduced to a child, as portrayed in Figure 4.12.

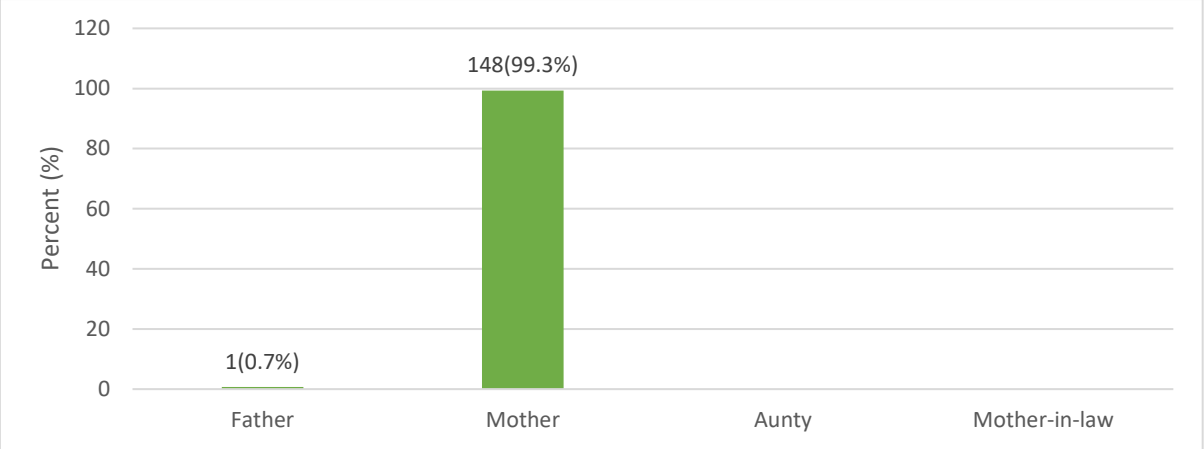

Figure 4. 14 The person in the household who have the greatest influence on the food to be introduced to a child

4.7.8 Father influences on breastfeeding children

On the question of whether the father influences when a child is first introduced to breastfeeding, 93.9% of the interviewed mothers affirmed that the fathers do not influence when a child is first introduced to breastfeeding. Only 6% of the interviewed patients affirmed that fathers also influence when a child is first introduced to breastfeeding (Table 4.13). However, in the custom as illustrated in Table 4.13, the fathers have a substantial say (supported by 86.6%) on when other foods should be introduced to a child. But 13.4% of the mothers affirmed that the fathers do not influence when food should be introduced to a child.

Table 4. 13 Influence fathers have on when a child is first put to breastmilk and initiation of complementary feeding

	Yes		No	
	n	%	n	%
When the child is first put on breast milk	9	6.0	140	93.9
When food should be introduced to a child?	129	86.6	20	13.4

4.7.9 Complementary feeding among children in addition to breast milk

In terms of the age when babies should start eating food in addition to breast milk, most (65.8%) recommended at the age of 7 months, 19.5% of the mothers recommended the introduction of food for a baby at the age of 8 months, 10.7% of the mothers recommended the introduction of food for a baby at the age of 9 months and a small fraction of the mothers, 2% recommended the introduction of food for a baby at the age of 6 months. Only 0.7% recommended the introduction of food for a baby at the age of between 10 to 18 months (Figure 4.13).

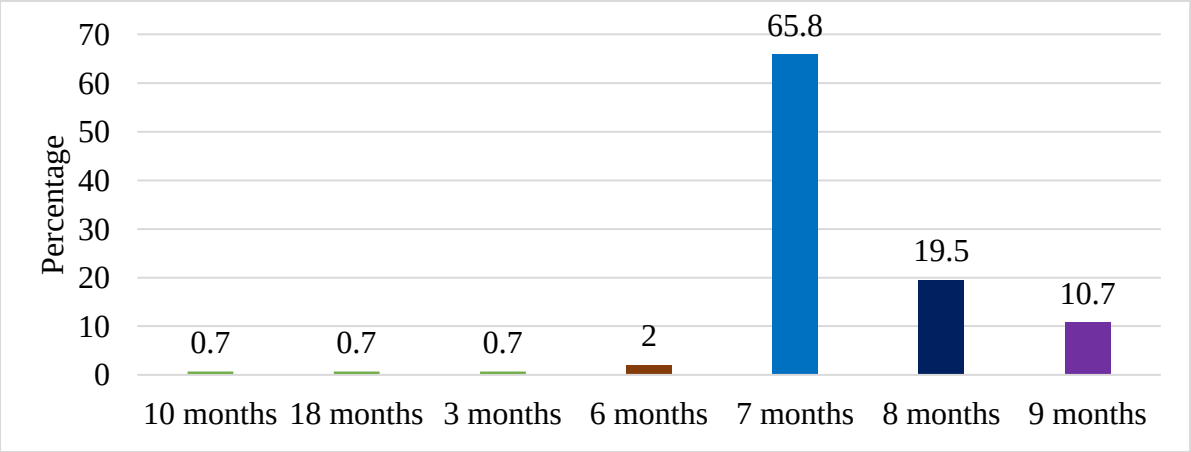

Figure 4. 15 Age for a baby to start eating food in addition to breast milk

4.7.10 Selection of food for children below six months

The mothers were also required to select all the foods that a baby aged below six months can be given in addition to breast milk. Nearly all of the mothers (98%) showed that dry Eddoes are very good for babies below 6 months, 97% of the mothers affirmed that dry Fish Bennis and dry plantain dust are very nutritious for babies below 6 months (Table 4.14).

Table 4. 14 Usefulness of foods selected in addition to breast milk for children below 6 months

Selected food	Yes		No	
	n	%	n	%
Dry Eddoes	3	2	146	98
Dry Fish Benn	4	3	145	97
Dry Plantain dust	4	3	145	97

4.8 Nutritional status of children

4.8.1 Birth weight and height of children aged 0-12 months

On average, an infant's birth weight (mean±SD), a child's weight (mean±SD) and an infant's height (mean±SD), were 2.8±0.8kgs, 2.7±1.0 kgs, and 46.4±8.3cm, respectively. With the minimum infant's birth weight, child's weight and infant's height is 2kg, 1kg and 41cm and maximum infant's birth weight, a child's weight and an infant's height are 4kg, 5.3, and 143cm. The age that breastfeeding becomes inadequate, a child with approximately 7 months on average should no longer be exclusively breastfed according to the culture. The minimum age was 6 months but some were breastfed exclusively up to 10 months. The findings are as shown in table 4.15.

Table 4. 15 Means and standard deviation of child anthropometric measurements

Variable	Observations	Mean	Std. Dev.	Min	Max
Birthweight (kg)	144	2.8	0.8	2	4
Weight (kg)	144	2.7	1.0	1	5.3
Height (cm)	142	46.4	8.3	41	143

4.8.2 Prevalence of stunting, wasting and underweight among the study children at the health facilities in Voinjama District

Table 4. 16 portrays the stunting, wasting, and underweight status for children between 0 to 12 months in Voinjama District, Liberia. Overly, stunting, wasting, and underweight status of children from 0 to 12 months were evaluated. 99.1% of the children under study were stunted and 0.9% were moderately stunted. 13.7% of the children had a moderate wasting status and were moderately underweight while 86.3% of 0 to 12 months children had a severe wasting status and were severely underweight. These proportions for stunting, more especially on severe wasting (86.3%) and underweight (86.3%) status are alarm raising among the 0 to 12 months children.

Table 4. 16 Prevalence of stunting, wasting and underweight among the study children at the health facilities in Voinjama District

Nutritional Status	Status	Percent
	Stunted (low)	99.1
Stunting group	Moderate	0.9
	Severe	0.0
	Low	0.0
Wasting group	Moderate	13.7
	Severe	86.3
	Low	0.0
Underweight group	Moderate	13.7
	Severe	86.3

4.9 Comparative analysis to determine the effect culture in addition to other factors on child feeding and nutritional status

4.9.1 Selection of variable for binary logistic regression model

In responding to the fourth objective, which sought to determine the joint effect of cultural practices and education level of mothers on exclusive breastfeeding of children aged 0-12 months Voinjama District, a binary logistic regression was fitted. The selection of binary logistic regression was arrived at during the classification of data. The three variables (cultural practices, education level of mothers and exclusive breastfeeding) qualified to be categorical variables with the dependent variable having binary responses (Yes and No). In section 4.8.2 which follows assumptions of regression are evaluated.

4.9.2 Diagnostic Tests

The assumption under investigation was that the independent variables (Cultural practices [CP] and educational level [EDL]) should not depict multicollinearity and the residual error variance must be constant (No heteroscedasticity).

4.9.3 Multicollinearity

In evaluating whether one dependent variable (say CP) could be expressed in terms of the other dependent variable (say EDL), a Variance Inflation Factor (VIF) test was conducted. Results presented in Table 4.17 show that there was no existence of multicollinearity between the variables. The VIF values were less than 10, mean VIF was also less than 10, and tolerance was more than 0.2).

Table 4. 17 VIF Test

Variable	VIF	1/VIF
Cultural Practices	1.03	0.969871
Educational Level	1.03	0.969871
Mean VIF	1.03	

4.9.4 Heteroscedasticity

Heteroscedasticity or absence of homoscedasticity exist in a data set when the variance of the error terms are not constant across all observations. To test for the absence of homoscedasticity, the Breusch-Pagan and Cook-Weisberg test was conducted. The Chi-square value was 3.18 and was statistically significant at 10 percent (p-value=0.0743). Therefore,

study failed to reject the null hypothesis of constant variance thus implying that heteroscedasticity exists.

Chi^2 (1) = 3.18

Prob > Chi_2 = 0.0743

Therefore, from the diagnostic tests the variables of interest; cultural practices, educational level, and exclusive breastfeeding (dependent variable) were fit for further analysis using a non-parametric method, for the purpose of this study, utilization of a Logistic regression model.

4.9.5 Correlation Analysis

Further, Chi-square correlation analysis was conducted to ascertain whether there existed an association between one, cultural practices (independent variable) and Exclusive breastfeeding (dependent variables) then two educational levels (independent variable), and Exclusive breastfeeding (dependent variables). Cultural practices had weak but negative correlation to exclusive breastfeeding while the educational level was also had a weak but positive correlation with exclusive breastfeeding among mothers with children aged 0-12 months old in Voinjama District (Table 4. 18).

Table 4. 18 Correlation

	EB	**CP**	**EDL**
EB	1.0000		
CP	-0.0047	1.0000	
EDL	0.0392	0.1736	1.0000

4.9.6 Joint Effect of Cultural Practices and Educational Level of Mothers on Exclusive Breastfeeding

The joint effect of cultural practices and educational level on exclusive breastfeeding among mothers with children 0-12 months was modelled using Binary Logistic regression. The model is statistically significant (P_{values} = 0.0333), with 0.059 as the coefficient of determination (Table 4.19).

From the findings, cultural practices had a negative effect ($\beta_1 = -0.074$) on exclusive breastfeeding while educational level had a positive effect ($\beta_2 = 0.577$) on exclusive

breastfeeding for mothers with children aged 0-12 months. The negative and significant effect of cultural practices and the positive and significant effect of educational level on exclusive breastfeeding for mothers with children aged 0-12 months were significant at 99% (P_{values} of 0.003) and 95% (P_{values} of 0.025) level of confidence interval, respectively.

Table 4. 19 Multiple Regression

Variables	**Logistic Regression Results**			
Dependent Variable = Exclusive Breastfeeding	**Coefficient**	**Standard Error**	p_{-value}	**Exp (β)**
Constant	1.256	0.590	0.376	3.511
Cultural Practices	-0.074	0.561	0.003	0.929
Education Level 1- Primary	0.577	0.376	0.025	1.781
Education Level 2- Secondary	-0.215	0.390	0.016	0.807
Education Level 1- Tertiary	-0.568	0.383	0.043	0.567
Cox & Snell R Squared	0.059			
Breusch-Pagan test (Heteroscedasticity)	3.18 (0.074)			
Overall model significance	0.0333			

The equation for the Binary Logistic regression model used to explain the joint effect of cultural practices and educational level on exclusive breastfeeding among mothers with children 0-12 months is presented below.

$$EB = e^{(-0.268-0.074CP+0.577EDL1-0.215EDL2-0.568EDL3)}$$

Where;

EB = Exclusive Breastfeeding

CP = Cultural Practices and

EDL = Educational Level

In terms of the Odds Ratio (represented by Exp (β)), mothers with children aged 0-12 months old are 92.9% more likely to minimize on exclusive breastfeeding when they indulge more into cultural practices and are 78.1% more likely to increase on exclusive breastfeeding when they have primary education as compared to no education. Contrastingly, mothers with children aged 0-12 months old are 80.7% and 56.7% more likely to minimize on exclusive breastfeeding for an increase in education to secondary level and to tertiary level from primary level, respectively. Thus, the study observes that cultural practices and increase in level of education significantly and in a negative way impact exclusive breastfeeding of children aged 0-12 months from their mothers.

CHAPTER FIVE: DISCUSSION

5.1 Demographic and socio-economic characteristics of mothers with children 0-12 months in Voinjama District.

The majority of the mothers interviewed were between the ages 30 – 39 and the mean age was about 30 years. Despite high number teenage mothers in Liberia are teenagers (aged 15 – 19), the study revealed that teenage mothers in Voinjama District rarely seek medical care at the health facilities. According to Liberia Demographic and Health Survey (LISGIS & ICF, 2021), about 30% of young women age 15-19 are already mothers or are pregnant with their first child. This study corresponds to a survey conducted in Kenya where most caregivers or mothers were 28-30 years old (Gitonga, B. M. et al., 2014).

The World Health Organization (WHO, 2001) recommends exclusive breastfeeding should be practiced from 0 – 6 months of age and continued breastfeeding up to at least 2 years. According to the result, the mean age of infants between aged 0 – 12 months was approximately 8 months implying that majority of the infants were more than 6 months and could eat other food in addition to the breast milk. The result revealed that most of the mothers were married (81.6%) and had spouses who were the household head. This means that most of the households with both parents of the child had less stress compared to mothers who were single and head of the household. A Greek study revealed that mothers who go through pregnancy and parenting with infants between 0-12 months tend to go through parental stress, resulting in poor child parenting. The article described parental stress as one of the causes of poor parenting in children (Ekizoglou et al., 2022). . The rates of feeding with formula increased with education and wealth (Gallegos 2015). Although it is reported that in Liberia, 31% of mothers between the ages 15 – 49 do not have any form of formal education, this study shows that almost all of the mothers' interview have acquired some form of formal education and only 3.6% did not. This is inconsistent with the 31% of women age 15 – 49 who do not have formal education as reported by Liberia Demography and Health Survey (LISGIS & ICF, 2021).

The results from the survey show that business was the main occupation of majority of the mothers who were engaged in different enterprises. Breastfeeding mothers been engaged in business is not observed to be an obstacle to breastfeeding. However, is reported to have significantly reduced the duration and frequency per day and the health of the infants (Al-Ruzaihan, 2017). Furthermore, mothers' occupation could be a contributory factor to formula feeding.

The findings show that majority of the household owned land for food production and the mean household size was 4.4 persons. The findings are consistent with Liberia Demographic and Health Survey (LISGIS & ICF, 2021) report that majority of the households in rural areas own farmland and the average household sized is 4.6.

5.2 Cultural practices on nutritional status of children aged 0-12 months

On the culture practices in Voinjama District, majority of the mothers with children aged 0-12 months disagreed that women in some cultures believe that cutting of umbilical cord before the placenta is expelled may cause an infant death.

Importantly, it is generally accepted that mothers exclusively breast feed their babies for the first 6 months of her life. However, mothers' engagement in economic activities such as formal or informal employment makes unable to care for their babies as frequently as required thus leading them to introduce complementary feeding prematurely.

In most settings, infant feeding choices of the mother are usually attached to some cultural belief. It is important to understand how such practices influence breastfeeding and the health of the child. Mothers follows different practices that are culturally mandated during breastfeeding of an infant. In Cameron, cultural practices compelled mothers to mix-feed their babies. For example, it is belief that breast milk is an incomplete food that could cause underweight of the child and that all families should have a share of food during harvest (Kakute, 2005).

The majority of mothers with children aged 0-12 months strongly hold onto cultural practices during child birth in Voinjama District. This can be attributed to numerous traditional practices their households are linked to thus compelling them to follow those practices that are required when a child is born. However, their different cultural practices or religions do not ban a particular food that a mother would desire to feed their young babies.

The respondents believe that umbilical cord should be cut within a week at 5-7 cm from the skin of the infant. Additionally, regarding their opinion on how the placenta and umbilical cord were to be disposed based on their cultural practices, the respondents agreed that the placenta and umbilical cord should be disposed by burying. Further, it was also revealed that mothers preferred to bath their babies once in the first week after birth. The findings are consistent with Kucuk & Tanriverdi (2021) that mothers believe that the infant should not be washed until the umbilical cord falls off on its own in Turkey. The umbilical cord usually falls off in a week.

5.3 The nutritional education and culture practices of mothers with children 0-12 months

The results show that only 18.1% of the respondents owned land for farming. The low land ownership is because Voinjama is an urban area where majority of the inhabitants are engaged in entrepreneurship. Those who are engaged in farming, produced either cereal, roots crop, and vegetables, while those who do not own land for farming, are likely to be engaged in different business activities from which they earn livelihood., The households interviewed do not have enough capital for farming. Thus, the majority of the food produced is for household consumption. Only a small percent of the household consumed less than 35% of the food they produce.

Mothers in Voinjama District feeds their babies with other foods in addition to breast milk. They usually feed them with food and snack about three times a day. However, according to the WHO standard, babies should be exclusively feed with breast milk from the first day of birth to the 6^{th} month. Concerning consumption of Iron-rich or Iron-fortified foods, most mothers affirmed that children of 0 to 12 months are fed with iron-rich or Iron-fortified foods. This is similar to an Australian study that highlighted infant food products that wrote on the guidelines that the food was iron-rich with no additives (Moumin et al., 2020). However, most of the food they gave children was iron deficient, low in sweetness, and comprised of fruit mixtures (Moumin et al., 2020). The study was completed by explaining the importance of analysing the products given to children. Furthermore, a small proportion of the mothers disagreed that children between ages 0 to 12 months are fed with iron-rich or Iron-fortified foods. Likewise, most mothers confirmed that children aged 0 to 12 months are fed with food to which powder or sprinkles were added. A small portion of the mothers disagreed that children between ages 0-12 months are fed with food to which powder or sprinkles were added.

Among the food mostly consumed by a household, amaranth leaves, amaranth whole grain, apple green skin, apple red skin, banana cavendish, banana plantain, green, arrowroot, arrowroot flour, anjera, mixed fruit juice, avocado ripe, beans kidney dry, beans lima dry, biryani rice, biscuit savory, busara whole maize, finger millet, coconut water, and terere stirred were identified by mothers of children aged 0 to 12 months.

5.4 Breastfeeding practices and nutritional status of children aged 0-12 months in Voinjama District, Liberia

The mass media are making significant contribution to the delivery of breastfeeding messages to mothers in Voinjama District. It is revealed as the leading source of information on

breastfeeding by mothers in addition to health care workers. Almost half of the mothers got the information from health care workers and Mass Media. Another similar proportion got information on breastfeeding from health care workers and Mass Media. The penetration of mass media in the dissemination of breastfeeding information to mothers is due to the proliferation of smart phones and social media in various parts of the study. Regarding the source of information on breastfeeding and nutrition, almost half of the mothers got the information from community health workers (CHWs). Community health workers (CHWs) are crucial to resolving breastfeeding and nutrition problems especially at the household levels in Voinjama. CHWs guide mothers on best breastfeeding practices and techniques during breastfeeding and continually encouraged them to effectively breastfeed their babies up to six months. This is similar to research done in Morocco that involved the different places where women got information on breastfeeding. According to the study, women in Morocco affirmed receiving most of their information during pregnancy from friends and relatives, and the minority received their information from community health workers (Jasny et al., 2019). They reported that community health workers were beneficial in giving facts and clearing doubts.

Almost all mothers affirmed that only breast milk was enough for a child between 3 to 6 months old. According to WHO (2021), at least 44% of infants between 0-6 months are fed exclusively with breast milk. The study showed that it is healthier to breastfeed fully for the first six months to reduce health complications during childhood. Exclusive breastfeeding was associated with high IQ in children and reduced expenditure on formula food. WHO (2021) considers exclusive breastfeeding as feeding an infant with only breast milk and no additional food, water, or other liquids. Mothers in the study area admitted to breastfeeding them up to 6 months old. In a research study, exclusive breastfeeding among women moves from a rate of 50+% at one month of exclusive breastfeeding to 37% at six months of breastfeeding (Chipojola et al., 2020). Among the reasons supporting exclusive breastfeeding, breast milk makes a child healthy, makes a child's brain active/fresh, boosts immunity, is just a first food for a child, serves as antibiotics, and generally helps in the development of a child mentioned. Emphatically, colostrum offered protection/ immunity and was just suitable for a child, so breastfeeding was initiated within an hour after birth.

A positive attitude, support, and involvement of the father in breastfeeding increased breastfeeding rates and durations for infants (Al Namir et al., (2017). However, the majority of

the mothers agreed that the fathers do not control when a child is first introduced to breastfeeding and mothers have a significant influence on the food presented to a child as compared to fathers. According to Al Namir et al. (2017), when men are excluded from breastfeeding, quality of life reduces. The study recommended that fathers be involved in the breastfeeding and preparation process to increase breastfeeding rates (Al Namir et al., 2017). The majority of the mothers are aware that long term breastfeeding is good for the health of the child and recommended that breastfeeding should be done from the first day of life of the child to 18 months. Furthermore, mothers in Voinjama District mothers are knowledgeable that babies aged 0 – 6 months should be fed with only breastmilk and should introduce other food in addition to breast milk at the 7^{th} month. The findings are contrary to Borowitz & Borowitz (2018) women can begin feeding their babies with other food at any time. They further noted that there was no harm or complication reported in feeding children early. Although the most recommended period for infants to start eating is nine months, however, those who opt to start earlier, that is, before six months, are expected to use clean and sterilized utensils to avoid introducing harm to the child's life (Borowitz & Borowitz, 2018). The study compared to these results supports the responses given by women who said nine months; however, generally, they are all correct depending on how they feed the child.

An infant's birth weight, height, and a child's weight were 3.9kgs, 44.3cm, and 4.2kg on average, respectively. The minimum infant's birth weight, infant's height, and child's weight were 2kg, 10.2cm, and 1.2kgs while the maximum infant's birth weight, an infant's height, and a child's weight were 4.5kg, 143cm, and 5.5kg. When breastfeeding becomes inadequate, on average, a child with more than seven months and at least six months should no longer be exclusively be breastfed. Overly, 99.1% of the children under study were stunted, and 0.9% were moderately stunted. About 13.7% of the children had a moderate wasting status and were moderately underweight, while 86.3% of children aged 0-to-12-month had a severe wasting status and were severely underweight. These proportions for stunting, especially severe wasting, and underweight status, are alarms raising among the 0-to-12-month children in Voinjama District, Liberia.

On the combined effect of mothers' cultural practices and educational level on exclusive breastfeeding, cultural practices had an inverse association with exclusive breastfeeding. In contrast, academic level directly and positively affected exclusive breastfeeding

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Exclusive Breastfeeding contributes to health, growth and development of a child. Specifically, it has economic and significant health impact at the household, community, and nation level. Access to, availability and control of accurate and precise information is essential to the infant feeding decision-making process of any mother. Additionally, knowledge of the nutritional status of children aged 0 – 12 months is critical because it provides evidence that policymakers and stakeholders can use to develop interventions that could increase food consumption among young children. However, exclusive breastfeeding continues to encounter enormous challengers including cultural practices and lack of knowledge amongst mothers. Therefore, this study determines the cultural practices, exclusive breastfeeding and nutrition status among children 0–12 months in Voinjama district, Liberia. To accomplish the objective, four specific objectives fulfilled: 1) to establish the cultural practices, demographic and socio-economic characteristics of mothers of children aged 0-12 months; 2) to assess the nutritional status of children aged 0-12 months; 3) to determine the breastfeeding practices on nutritional status of children aged 0-12 months, and 4) to establish the relationship between cultural practices and education level of mothers on exclusive breastfeeding practices and nutrition status of children aged 0-12 months. Multi-stage sampling technique was used to collect data from 149 mothers of children aged 0 – 12 months in Voinjama District, Lofa County. Descriptive statistics were used to access the cultural practices, demographic and social characteristics of mothers; nutrition status and breastfeeding practices on nutritional status of children aged 0 – 12 months. Additionally, Binary Logistics regression model were employed for data analysis.

The results from the study show that about 42 percent of the mothers visited the Tellewoyan Hospital. On average, households had about 4.4 members. The predominant occupation and sources of income for households were business and farming where majority of the households owned land for food production. About one-third of the household heads completed secondary education while 18% completed some primary education and university education, respectively. Additionally, about 36.2% of the mothers completed some primary education and 28.4% completed some primary education. Mothers aged between 18 - 40 years and the mean age was 29.7 years. The average age of children age 0-12 months was 7.8 months. Majority of the children between 0 to 12 months ate food and snacks three times other than liquids, consumed Iron-rich or Iron-fortified foods, and are fed with food to which powder or sprinkles have been added. Also, cultures or communities do not prohibit a particular food for infants.

However, mothers do not allow complements towards their new born. Mothers preferred to remove the umbilical cord and bath their child in a period of one week. They also believed that the placenta and the umbilical cord should be buried. Mothers believes that one needs to wash the breast after sweating before breastfeeding an infant.

The study also revealed that mothers get information on breastfeeding and nutrition from health care workers, Mass Media, and clinics. Fathers as compared to mothers did not influence when a child is first introduced to breastfeeding. On the age when babies should start eating food in addition to breast milk, mothers recommended the 7th month. Surprisingly, almost all children under study were stunted, of the children had a moderate wasting status and were moderately underweight of children 0 to 12 months children had a severe wasting status and were severely underweight. On severe wasting and underweight status, the statistics were alarming and require redress for Voinjama District, Liberia. From the logistic regression model, it was revealed that breastfeeding practices in Voinjama, Lofa County are influenced by level of education of mothers and cultural practices. Education of women had positive effect on exclusive breastfeeding while cultural practices had a negative effect on exclusive breastfeeding.

6.2 Recommendations

i. That government and partners provide maternal and nutrition education for mothers of children aged 0 – 12 months at both the community and health facility levels in Voinjama District. Doing so will help shrink the prevalence of stunting, wasting, and underweight among children aged between 0-12 months.

ii. Also, there is need for other stakeholders including ministry of education considering incorporating nutritional education in institutions of learning to enhance capacity as well as competency among persons relaying information about breastfeeding and nutrition to mothers. Correspondingly, more clinics must form education programs on feeding infants where women can be educated on various nutrients for the children's healthy growth. These programs can be set up during pregnancy clinics and post-partum visits to ensure that they are informed in time and children born underweight can be helped in time.

iii. Given that education of mothers had positive effect on breastfeeding practices there is need for policymakers to place emphasis on educating childbearing women especially

in rural areas to ensure that breastfeeding and other nutritional practices for children are taken seriously with concern for their health and wellbeing. They should be told that exclusive breastfeeding is to be prioritized for the first six months to ensure that the child is fed better. Exclusive feeding has been highlighted to reduce the cases of poor feeding and healthy eating habits as the children grow.

iv. The logistics regression results also show that cultural practices had a negative effect of exclusive breastfeeding. While it is true that cultural practices are way of life for most people in the rural areas, it is imperative that health practitioners and other stakeholders in health and nutrition formulate methods that will influence mothers to adopt exclusive breastfeeding without affecting their cultural practices immediately but in the long term. By doing so, exclusive breastfeeding among rural populations will increase while cultural practices will decline.

v. CHWs played a key role in transmitting nutrition knowledge within the community. However, there is need to assess their nutrition competences, since, there are still deep-seated cultural challenges within the community.

vi. Lastly, more funding by both government and non-governmental organizations should be directed towards demystifying the specific cultural practices that detract the gains made on exclusive breastfeeding among women.

5.4 Future Research

From the study findings, similar studies should be replicated in other districts to reveal the stunting, wasting, and underweight status of children aged between 0-12 months. Also, future research can consider incorporating competency measurements on persons relaying information about breastfeeding and nutrition to mothers, as this study did not focus on competencies. In addition, another study can consider evaluating the attitude of peers and healthcare providers towards breastfeeding. Lastly, another research could explore the specific cultural practices that undermine the gains made.

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APPENDICES

Appendix I: Study Introduction and Consent

Title of the Study: **Cultural practices, exclusive breastfeeding, and nutrition status among children 0–12 months in Voinjama District, Liberia**

Liberia

Introduction

Hello, my name is _____ and I am carrying out research on **Cultural practices, exclusive breastfeeding, and nutrition status among children 0–12 months in Voinjama District, Liberia.** The study is for partial fulfillment of a Master of Science in Applied Human Nutrition, from the University of Nairobi

Purpose

The purpose of the study is to generate information that will be used to improve breastfeeding practices as well as the nutritional status of children in Liberia.

Confidentiality

Please be assured that all your information will be treated will confidentially and the anonymity of your responses in the final report is guaranteed. I assure you that all responses received will be only used for scientific purposes within the framework of the survey. Also, note that participation is voluntary, there is no monetary gain, and you may withdraw your permission to participate at any stage without negative consequences.

However, I hope that you will participate in the survey since your views are very important. For any enquires about any aspect of this study, please contact the principal investigator on **Telephone Number: +231-776-089-794.**

Signing or approving this consent indicates that you understand what will be expected of you and you are willing to participate in the survey.

Name and signature of respondent_____ Date

Name of interviewer_____ Date

Appendix II: Questionnaire

<u>TITLE OF THE STUDY</u>: Cultural practices, exclusive breastfeeding, and nutrition status among children 0–12 months in Voinjama District, Liberia

Identification

Sector..... Cell.....Village.....

Health center name: …….. Date of interview...../...../2021

Name of Interviewer.....

Respondent's name..... Sex: Female----- Male---

SECTION 1	Socio-Demographic, Economic characteristics
1.1	Age of the mother's years
1.2	Number of household members [how is this defined}
1.3	Number of children 0-12 Months
1.4	Marital Status of the mother 1. Married ☐ 2. Single☐ 3. Separated☐ 4. Divorced☐ 5. Windowed☐
1.5	Relationship to the Head of household: 1. Head☐ 2. spouse ☐ 3. Daughter ☐ 4. Daughter in law☐ 5. Grandchild ☐ 6. Self7. Others (specify) ☐
1.6	Level of Education of the mother: 1. Some primary☐ 2. Primary completed☐ 3. Some Secondary☐ 4. Completed secondary ☐ 5. University/college ☐ 6. Vocational school☐ 7.No education ☐
1.7	Level of Education of Head of household: 1 Some primary☐ 2. Primary completed☐ 3. Some Secondary☐ 4. Completed secondary ☐ 5. University/college ☐ 6.Vocational school ☐ 7.No education ☐
1.8	What is the main religion of the household? 1. Catholic ☐ 2. Protestant ☐ 3. Muslim ☐ Others ☐

1.9	Occupation of Mother: 1. Salaried Job☐ 2. Farmer☐ 3. business☐ 4. Casual Labor☐ 5. Crop/animal sales 6. Housewife☐ 99 Unemployed☐ student other Specify_____
1.10	Occupation of the head of household 1. Salaried Job☐ 2. Farmer☐ 3. business☐ 4. Casual Labor☐ 5. Crop/animal sales 99. Unemployed☐ Other Specify: _____
1.11 a	What are the sources of income in the household? 1. Salaried Job☐ 2. Farmer☐ 3. Business☐ 4. Casual Labor☐ 5. Remittance/gift ☐ 6. Casual trade ☐ 7. Others ☐ specify_____
11b	What are the main sources of income in the household? 1. Salaried Job☐ 2. Farmer☐ 3. Business☐ 4. Casual Labor☐ 5. Remittance/gift ☐ 6. Casual trade ☐ 7. Others ☐ specify
1.12	What was the total household income last month (in Liberian franc)?
1.13	Does the household have access to land for food production? 1.Yes ☐ 2. No ☐
1.13.1	What are the types of crops produced on that land? 1. Cereals ☐ 2. Root crops ☐ 3. Legumes ☐ 4. Vegetables ☐ 5. Fruits ☐ 6. Cash crops (tea, coffee, etc.) ☐
1.13.2	What is the percentage of food products consumed in the household? 1. Below 25 % ☐ 2. 25-50 % ☐ 3. 50-75 % ☐ 4. Above 75% ☐
1.13.3	What is the percentage of food products sold? 1. Below 25 % ☐ 2. 25-50 % ☐ 3. 50-75 % ☐ 4. Above 75% ☐
SECTION 2	**Information About the Index Child**
2.1	First Name the Child:_____ Date of Birth: DD_____MM------YR Age of the child in Months
2.2	Gender of the Child: 1. Male☐ 0. Female☐
	Position of birth e.g., 1st born 2nd born 3rd born, and last born
2.3	Where was the child born?

	1. Health Facility☐ 2. At Home☐ 3. Trained TBA home☐ Not trained TBA ☐ 4. Others Specify
SECTION 3	**Infant And Young Child Feeding Practices (adapted from FAO, 2014)**
	Birth weight Grams ____ Source Clinic card____, recall___ Not known Traditionally, are there special ways of feeding a baby born small What is the reasoning
3.1	Has ***(name of the child)*** ever been breastfed? 1.Yes ☐ 2. No ☐
3.1.1	How long after birth did you first put ***(NAME)*** to the breast? 1. Within an hour of birth☐ 2. Few hours after birth☐ 3. 1-2 days after birth☐ 4. Cannot remember☐ 5. Others Specify☐
	What is the reason for putting to the breast at this particular time- there could be a (cultural) reason? Do husbands fathers influence when a child is first put to breast Yes ☐ No ☐ If yes what is the reason_____ In a household in your culture who has the most influence on child feeding after birth to the age of six months 1. Father 2. Mother 3. Mother-in-law 4. Aunty
	Find out how colostrum is considered e.g., good toxic, bad, protective/immunity dangerous, or what
3.1.2	In the first six months after delivery, was [NAME] given anything to drink or other food other than breast milk? 1. Yes ☐ 2.No ☐
	if given before 6 months- what was the reason?
	In your opinion is breastmilk adequate for a child aged 3-6 months 1.yes ☐ 2. no ☐ In your culture at what age (months) is breastmilk alone considered inadequate for a child?
	In your custom do fathers/husbands influence when other foods should be introduced to children's feeding?
3.1.3	According to your rate, is exclusive breastfeeding good for your child 1. Yes ☐ 2.No ☐ **Question on continued breastfeeding**

	1. Do you know the benefit of breastfeeding? Yes, ☐ 2. No ☐ If yes, what are the benefits of breastfeeding? Encircle all the benefits of breastfeeding a child. Do not probe, listen and encircle when mentioned 1. Nutritional value 2. It is cheap 3. It is convenient 4. Promotes mother to child bonding 5. Promotes growth and development 6. Transfer immunity against diseases 7. Others (specify)_____
3.2	**Sources of Breastfeeding information Yes/No**
3.2.1	Health care worker Mass media Print media Mother-in-law Her mother Other's relatives (specific) Friends Watching/observing other Experience Learn from school Public banner Health pamphlet When did the health care workers inform you about breastfeeding? Tick all mentioned 1. Before pregnancy 2. During Pregnancy 3. After child delivery 4 other (Specify)_____ Do you think that it is your right to obtain information about breastfeeding from a health care worker? Yes ☐ No ☐ If yes how is the right fulfilled (specify)_____ If no how is the right fulfilled (specify)_____ If no what do you do about it?

3.2.2	**Request her to allow you to ask her questions about HIV/AIDE that might refer to her or about her and are necessary for the conclusion of the study. Reassure her that the information will be confidential and will not be used about her. Obtain consent** If the mother is HIV positive, should she breastfeed her child 1. Yes ☐ 2. No ☐ If not, why should not breastfeed 1. May infect her child 2. Mother will become sick 3. Mother will become weak 4. Others (Specify) Do you know your HIV status? 1. Yes, ☐ 2. No ☐ If YES, when did you know your status? 1. Before pregnancy 2. During Pregnancy 3. After child delivery 4. Don't remember
3.2.3	**Growth and monitoring curve** Is your child weight every time you visit the clinic? 1. Yes☐ 2. No☐ Does the health worker always plot the measured weight in the card? 1. Yes ☐ 2. No ☐ If no why (Specify) _____ (Observe the growth chart for the following question) Growth curve 1. Within the road to health 2. Above the road to health 3. Below the road to health The current slope of the growth curve 1. Good 2. Danger 3. Very dangerous 4. N/A The consistency 1. Never sloping downwards 2. _____ Times sloping downwards 3. Others (Specify)_____ What was the reason for any downward/ horizontal slope _____? Where was the child born? 1. Hospital 2. Home

3.2.4	**MORBIDITY AND NUTRITIONAL STATUS**
3.2.5	Has the child suffered from any illness in the last 14 days? 1. Yes, ☐ 2. No ☐ If yes which one? 1. Diarrhea 2. Cough/ common cold 3. Malaria 4. Worm 5. Fever 6. Pneumonia 7. Other (specify)
3.3	**Dietary for the index child** Now I would like to ask you about (other) liquids or food that (name of the baby) ate yesterday during the day or at night. I am interested in whether your child had the item even if it was combined with other food.
	Grains, roots, and tubers Example. Bread, rice, maize, spaghetti, porridge, or other foods made from grain. White potatoes. White yams. Manioc. Cassava or any other food made from roots Yes, ☐ 2. No ☐
	Legume and nut Any food made from beans, peas, lentils, nuts, or seed: Yes, ☐ 2. No ☐
	Dairy Products **e.g.** infant formula, milk, such as tinned, powdered, or fresh animal milk, yogurt, fermented, cheese: Yes, ☐ 2. No ☐
	How many times has the child consumed milk products (fresh or powdered)?
	Flesh food e.g. Liver, kidney, or other organ meats, such as beef, pork, lamb, goat, chicken. Duck, fresh or dried fish, shellfish or seafood, or insects: Yes, ☐ 2. No ☐
	Egg: Yes, ☐ 2. No ☐
	Vitamin A fruits and vegetables Carrot, squash, pumpkin or yellow or orange sweet potatoes Any dark green vegetable (cassava leaves, amaranths, bean leaves, pumpkin leaves Ripe mangoes, ripe papayas, musk melon Food made with red palm oil: Yes, ☐ 2. No ☐
3.2.7	**Other fruits and vegetables** **E.g.** Tomato, cabbage, eggplant, onions fruit, tree tomato, pineapple: Yes, ☐ 2. No ☐

	Preliminary analysis Number of food groups consumed the previous day _____/7
3.3	**Minimum meal frequency**
	How many times did (name of the bay) eat foods, which are meals and snacks other than liquids yesterday during the day or at night? Number of times Don't know/ no answer
3.4	**Consumption of iron-rich or iron-fortified food** Yesterday, during the day or night did (Name) consume any iron-fortified solid, semi-solid, or soft food E.g., Shishak Bondo flour, etc Yes, ☐ 2. No ☐
	Did (Name) consume any food to which you added a (powder or sprinkles) like this Show common types of micronutrient powders available in the survey area Yes, ☐ 2. No ☐
	Maternal Knowledge of IYCF practices
	Breastmilk at birth When should breastfeeding be initiated after delivery? 1. Within one hour ☐ 2. Don't know/ others ☐
	Meaning of exclusive breastfeeding What does exclusive breastfeeding mean? 1. ☐ Exclusive breastfeeding means that the infant gets only breastmilk and no other liquids or foods 2. ☐ other/ Don't know
	Recommended length of exclusive breastfeeding How long should a baby receive nothing more than breastmilk? 1. ☐ From birth to six months 2. ☐ Don't know/ other
	Continued breastfeeding How long is it recommended that a woman breastfeeds her child? 1. ☐ 24 months or more 2. ☐ other/ don't know
	Age of start of complementary foods At what age should babies start eating foods in addition to breastmilk?

	1. ☐ At six months 2. ☐ Other/ Don't know
	Reason for giving complementary foods at six months Why is it important to give foods in addition to breastmilk to babies from the age of six months? 1. ☐ Breastmilk alone is not sufficient (enough) cannot supply all the nutrients needed for growth/ from six months, the baby needs more food in addition to breastmilk 2. ☐ other/ Don't know
	Dietary diversity and ways of enriching porridge To feed their children, many mothers give them sorghum, maize porridge, or other cereals Which food or types of food can be added to porridge makes it more nutritious (or other types of food to give to child others than porridge)? ☐ Animal–source foods (e.g. meats, poultry, fish, liver/ organ meat, eggs, etc) ☐ pulse and nuts- flours of groundnut and other legumes (Peas, beans, lentils, etc.) sunflower seed, peanut, soybeans ☐ Vitamin- A-rich fruits and vegetables (e.g. Carrot, orange-fleshed sweet potato, mango, yellow pumpkin, papaya, etc. ☐ Green leafy vegetables (e.g. Spinach) ☐ Energy-rich foods (e.g. oil, butter/ghee) ☐ Others/ Don't Know
	Consistency of meals Please look at these two pictures of porridges. Which one do you think should be given to a young child? ☐ shows the thick porridge; ☐ shows the watery; ☐ Does not know
	Meal frequency How many times per day a baby should be fed (liquids not included)? ☐ 2-3 times (6-8 months); ☐ 3-4 times (23 months); ☐ other / Don't know
	Responsive feeding ☐ Giving them attention during meals, talking to them, making mealtimes happy times ☐ Clap hands ☐ Make funny faces/play/ laugh ☐ demonstrate opening your mouth very wide/modeling how to eat ☐say encouraging words ☐ draw the child's attention ☐ others ☐ Don't know **NUTRITION INFORMATION NETWORK**

	1. Have you ever received nutrition information on good child feeding practices? Yes, ☐ 2. No ☐
	2. If yes, where did you receive the nutrition information (source of information) ☐ Clinic ☐ Relatives ☐ Friends ☐ CHWs ☐ Radio/ Mass media ☐ Mother-to – mother support groups ☐ Seminar/ workshop Others specify _____
	3. Which source of information do value or trust the most? 1. Clinic ☐ 2. Relatives ☐ 3. friends ☐ 4. CHWs ☐ 5. Radio/ Mass media ☐ 6. Others (Specify) ☐
	4. How do you access those sources of information? (Channels such as meetings, radio/ mass media, mother to mother support groups, visiting friends
	5. What kinds of information did you receive (what was the message about)
	6. When did you receive the nutrition information (e.g., during pregnancy? Exclusive breastfeeding, complementary feeding period, etc.)
	7. How can mothers be helped to get easily information on child feeding practices (channels of information)?
	COMPLICATIONS DURING PREGNANCY AND BIRTH
	1. Is your culture have an appropriate way of disclosing bad news (e.g. the risk of miscarriage) Yes ☐ 2. No ☐ If yes, when a woman has miscarriage who tell her 1. Mother ☐ 2. Sister ☐ 3. Aunty ☐ 4 others specify_____ 2. Do you receive support to overcome emotions related to bad news? Yes, ☐ 2. No ☐ 3. Do you have any concerns about surgical intervention based on culture and beliefs (Hmong women may be afraid that they lose a soul or be afraid for other reasons) Yes ☐ 2? No ☐ If yes please specify _____
	CULTURAL BIRTH AND HOSPITAL STAY
	1. In your culture do your father usually attend birth Yes ☐ 2, No ☐

	2. When would you like the umbilical cord to be out one week ☐ 2 One to two weeks ☐ 3, One to three weeks ☐ 4? Four weeks ☐ 3. Women in some cultures indeed believe that cutting the umbilical cord before the placenta is expelled may cause an infant's death. Yes, ☐ 2. No ☐ 4. How long should the cord be that is left with the infant ☐ 2-3 cm from the skin ☐ 5-7 cm stump ☐ Don't know the answer How would you like the placenta and umbilical cord to be disposed of? ☐ Be kept ☐ Buried ☐ Thrown in the bush ☐ Dried and kept
	INFANT CARE AND FEEDING
	1. Is it acceptable in your culture to compliment a newborn child? 1. Yes, ☐ 2. No ☐ 2. Some women may dislike compliments addressed to their infants, believing that an evil eye can cause the infant to fall ill. Yes, ☐ 2. No ☐ 3. Are there any precautions with holding the infant? Yes, ☐ 2. No ☐ 4. When would you like your infant to have their first bath? ☐ one week ☐ two weeks ☐ Two-three days ☐ Five days 5. Do you plan to practice any type of skincare for your child? Yes, ☐ 2. No ☐ 6. How would you like your child's belly button cared for? ☐ clean coin with alcohol and use a piece of cloth to avoid infection ☐ wash it soap ☐ use baby web ☐ Don't know 7. Do you have any precautions for an infant's eye, nose, or ear care? Yes, ☐ 2. No ☐ 8. Do you want to provide care to your infant yourself or do you want support staff to do this while you rest? Yes, ☐ 2. No ☐

	9. How would you like to dress your newborn child? Yes, ☐ 2. No ☐ 10. Some women may not wish their child to wear clothes that have been worn by another infant. Will love to do the same Yes ☐ 2. No ☐ 11. Do you plan for your son to be circumcised? Yes, ☐ 2. No ☐ If yes. At what age? ☐ one week ☐ eight days ☐ one year ☐ two years 12. Have you provided sufficient information about circumcision - preferably in? the woman's first language? Yes, ☐ 2. No ☐ 13. Do you intend to feed colostrum to your infant? Yes, ☐ 2. No ☐ 14. Have you discussed preferable substitutes for colostrum (eg. water, formula)? Are these substitutes acceptable or not? Yes, ☐ 2. No ☐ 15. Will you follow any cultural practices before breastfeeding? 1. Yes, ☐ 2. No ☐ 16. Have you explained that honey will not be offered to newborns due to the risk of botulism and increasing blood sugar levels? 1. Yes, ☐ 2. No ☐ 17. Are you aware that some women may not breastfeed their infants until colostrum is fully expressed? 1. Yes, ☐ 2. No 18. Have you explained the importance of breastfeeding, including colostrum? health conditions and treatments required 1. Yes, ☐ 2. No 19. Have you discussed if the woman has any concerns related to her cultural or religious background (eg. severe jaundice or exchange transfusion)? 1. Yes, ☐ 2. No ☐ 20. if an infant needs to be admitted to intensive or special care. Have you explained the purpose of admission, and how the infant might benefit)? 1. Yes ☐ 2. No ☐ 21. Have you ensured that all questions and concerns regarding the admission have been addressed? 1. Yes, ☐ 2. No ☐ 22. Have you explained what happens to the infant while under special care? 1. Yes, ☐ 2. No ☐ 23. Have you explained how the woman can access her child? 1. Yes, ☐ 2. No ☐ 24. Have you explained how she can help? 1. Yes, ☐ 2. No ☐

	CULTURE AND NUTRITIONAL STATUS
	1. Are there foods that are prohibited by your community or religion among the children? Yes, ☐ 2. No ☐ If yes which ones?..... 2. Do you have any feeding time restrictions in your community or religion among children? 1. Yes, ☐ 2. No ☐ 3. What is the staple food in your community? ..... 4. At what age did you wean the child? …….....…… 5. What kinds of foods did you use to wean your child? ..... 6. Are pregnant mothers restricted from intake any type of food? 1) Yes ☐ 2. No ☐ If yes which ones?.....
	FOOD BELIEFS AND PRACTICES
	According to your culture or belief, what foods are restricted during pregnancy from eating among the list of food items Animal organ Meat Eggs Oily food Avocado Alcohol and cigarettes Soil/soft stones Sugary food Fresh milk Cabbages and kale Are not nutritious, Salt Sheep's head Coldwater Plantain Sheep meat Vegetables Beans Fermented milk Fermented porridge Rice and Irish potatoes What is the food recommended during pregnancy according to traditions or beliefs? Milk Fruits Traditional herbs

	Rice Porridge Liver Water Animal blood Beans Fish Red soil and soft stones Meat Cooked bananas
3.5 ANTHROPOMETRY FOR CHILDREN 0-12 MONTHS	
	Date of birth_____ Obtain from the growth and monitoring chart Sex of the child 1. Male 2. Female Edema 1. Present 2. Absent (If edema is present do not take the height and weight)

Indices	First Reading	Second Reading	Average
Weight			
Height			

Appendix III: 24-hour Questionnaire

Individual 24- hour recall questionnaire diet for children 0-12 months

Interviewer---------- **Health center----------**

Interview date---------- **Subject ID----------**

Age ---------- **Subject Name----------**

Time	**Place eaten**	**Name of the dish**	**Ingredients**
Was Yesterday a celebration or a feast day were you able to eat the usual food? **Yes or No**			

A. Was the child sick yesterday? **Yes or No**

I. If yes did the sickness affect the appetite of the child? **Yes/ No**

II. If yes how? Decreased or increased?

III. Are there foods that are withheld when the child is sick

IV. If a mother is sick, does she continue breastfeeding Are there conditions in which she is prohibited from breastfeeding? What illnesses. List

V. Which ones are common among mothers in this area>

Appendix IV: Permit from Voinjama District Commission

REPUBLIC OF LIBERIA

Voinjama District Commission

Vezala Township, Voinjama District

Voinjama City, Lofa County

August 12, 2021

Mr. Yekeh Gayflor

Voinjama District

Telephone +231-776-089-794

Email: gayfloryekeh8@gmail.com

Ref: Approval to conduct a research study in Voinjama District for Academic purpose

Dear Mr. Gayflor

Reference is made to your letter received on the 12th of August 2021 requesting permission to conduct a study among mothers with children attending the Health Centers in Voinjama District for your Master's Dissertation on "Cultural practices, exclusive breastfeeding, and nutrition status among children 0–12 months in Voinjama District, Liberia"

I am pleased to inform you that you are allowed to conduct a research study, for academic purposes only, respecting the ethic related to Research, and upon completion of the study, we look forward to receiving your report on the finding

Sincerely Yours,

DISTRICT COMMISSIONER OFFICE VOINJAMA R.L.

Date:.....

Albert Sirleaf

Voinjama District Commission