

**MOTHER'S SOCIOECONOMIC STATUS AND BREASTFEEDING
IN SAVALUGU NANTON DISTRICT OF NORTHERN GHANA**



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Declaration

I hereby declare that except for the existing data used and references to other people's work which have been duly acknowledged, the work presented here was done by me as a student of the Research Centre for Health Promotion, University of Bergen under the supervision of Professor Maurice Mittelmark. This work has never been submitted in whole or in part for any degree or to any university.

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Dedication

This work is dedicated to my children, Mark and Michael and their father Eric.

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I am very grateful to Jehovah the Almighty God for His love, protection and undeserved kindness throughout my studies in Norway.

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ABSTRACT

PURPOSE: The aim of this research is to identify socioeconomic factors associated with mother's breastfeeding infants from 0-6months old in Savelugu Nanton district of Northern Ghana. Although many previous studies have focused on socioeconomic factors such as occupation, education and breastfeeding, much has not been done to tackle other factors including distance to primary fuel source, room density and their relationship with breastfeeding. Most of the recommendations from previous studies do not reflect local interest. Accordingly, this study is designed to address some of these gaps and focus more on local needs.

METHOD: The Study is based on a survey conducted in Savelugu-Nanton of Northern Ghana in 2001 by the United Nations Children's Emergency Fund (UNICEF), the International Food Policy Institute (IFPRI) and the University for Development Studies (UDS). One thousand six hundred and eighty- four households in sixty- four communities participated in the survey. The sample for the survey was 1588 children. Standardised and structured questionnaires were used in the survey. The questionnaire provided information on demographic characteristics, food consumption, socioeconomic factors, nutritional status, social support, household feeding practices, health of index child and community infrastructure. The standard multiple regression analysis was performed to determine the contribution of each of independent variables to the variance in the dependent variable.

RESULTS: The results of this study indicate that breastfeeding correlated with number of food groups consumed and also with compound cleanliness.

However there was no correlation between breastfeeding and most of the socioeconomic variables. This implies that the socioeconomic factors in this study are not important in predicting breastfeeding in Savalugu Nanton district of Northern Ghana.

CONCLUSION: The current study showed a relationship between breastfeeding and compound cleanliness and also with number of food groups consumed. Most of the socioeconomic factors did not correlate with breastfeeding. This does not mean that other socioeconomic factors are not important to predict breastfeeding. Previous studies in western countries and inter-country studies in Africa have indicated a significant relationship between breastfeeding and socioeconomic factors such as occupation and education. It is therefore important that future studies in Savalugu Nanton district of Northern Ghana determine socioeconomic factors appropriate to predict breastfeeding and for that matter the health of the child. In a very poor area like Savalugu Nanton, socioeconomic factors may not only influence breastfeeding. Future research should therefore consider infrastructure and social amenities and their relationship with breastfeeding.

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Abbreviations

ICBD- Integrated Community Based Development

IFPRI- International Food Policy Research Institute

NGO- Non Governmental Organisations

GSS- Ghana Statistical Service

UDS- University for Development Studies

WHO –World Health Organisation

UNICEF- United Nations Children’s Emergency Fund

CHAPTER ONE

1. Introduction

Breast milk is the basic food for the child. The human milk is the appropriate source of nutrition for infants. Breast milk contains all the nutrients the infant needs to grow healthy. Thus it contains the right amount of all nutrients such as carbohydrate, protein, water and fat. There is no dispute about the health benefits of breastfeeding. Breastfeeding saves the lives of many infants. The World Health Organisation (2003) pointed out that, increased breastfeeding can save the lives of 1.5 million infants every year.

The importance of breastfeeding cannot be overemphasised. It is cheaper and saves resources. There is no contamination of the breast milk. Breastfed children have low rate of hospitalisation and health care visits. It boosts the immunity level of babies. There are no frequent illnesses since it protects infant against infectious diseases. Breastfeeding is convenient to both the infant and the mother. The infant is fed immediately when hungry. The mother does not need to purchase and prepare non human formula which takes time. Breast milk is always ready to be fed with. It strengthens the bond between the mother and the infant. The mother's physical contact with the infant during breastfeeding ensures closeness and bonding. Breast milk is good for the immature digestive tract of the infant. Thus it is easily digested (Boston 2005). In spite of the

benefits of breastfeeding, statistics show that not more than 35 percent of infants worldwide are exclusively breastfed (Khin, et al. 2002).

To realise the benefits of breastfeeding, it is important to practice exclusive breastfeeding. According to the WHO (2001) exclusive breastfeeding for six months is the optimal period of feeding infants. Hence, infants should receive complimentary foods with continued breastfeeding up to two years. In order to achieve exclusive breastfeeding, WHO (2000) recommends the following:

There should be initiation of breastfeeding within the first hour of life. The infant should only receive breast milk without any additional food or drink, not even water. Infants should be fed on demand. This means as often as the child wants. There should be no use of bottles, teats or pacifiers.

Although mothers have the edge to practice breastfeeding, majority of them are unable to exclusively breastfeed their infants for the recommended period. This is confirmed by Haughwout et al. (2000) who found that among American women in 1995, only 22% continue breastfeeding at six months even though close to 66% planned to breastfeed their infants before leaving the hospital.

Differences exist in the trends of breastfeeding around the world. In Bangladesh, the rate of breastfeeding is universal. The majority of mothers, 92 percent reported breastfeeding their children (Howlader and Bhuiyan, 1999).

Investigators have indicated that, 90 percent of Australian women initiate breastfeeding but only 48 percent continue to one month after birth. Twenty

three percent are involved in any type of breastfeeding up to six months (Lund-Adams et al 1996). The situation is similar in the United States (Ryan 1997). This is as a result of growing market for breast milk substitutes. Advertising for infant formulae, feeding bottles and teats are widely blamed for early weaning. In certain instances, there is free distribution of non human milk products in hospitals which encourages bottle –feeding. There has been dramatic decline in breastfeeding in parts of the Gulf (Abdulrahman 1990). Mothers no longer continue to breastfeed their infants until the end of the second year. In developing countries, the literature available show that, there has been increase in the duration of breastfeeding from 39% to 46% between 1989 and 1999 (WHO 2003). However, variations exist across countries. In the Dominican Republic, the rate of exclusive breastfeeding was 25% in 1996. In 2000, the rate of exclusive breastfeeding was 78% in Peru ((WHO 2003). Countries such as Morocco and Tunisia experienced decline in the rate of exclusive breastfeeding (Grummer-Strawn 1996). In Ghana knowledge of breastfeeding is widespread. Although 98% of mothers understand the benefits of breastfeeding and 85% planned to breastfeed after delivery, only 51% practiced exclusive breastfeeding (Aidam et al 2005). Nevertheless breastfeeding initiation in the first hour of delivery had increased from 32% in 2000 to 40% in 2003 (Ghana Ministry of Health 2005).

A number of factors account for the rate at which mothers practice breastfeeding. These factors include maternal, infant, cultural and

environmental (Otoo et al. 2009). There is the belief that the colostrums are not good for babies. That the colour is dirty and causes diarrhoea .Other women stop breastfeeding when pregnant with the belief that the breast milk of the pregnant woman is harmful to the infant. Most mothers fear the amount of milk the infant receives is not enough to satisfy him which makes him cry often (Aggarwal, et al. 1998). Hence most mothers supplement breast milk with infant formula. Insufficient breast milk produced by most mothers in developing countries is due to poor nutritional status of the mothers. Religious and cultural beliefs may also prevent mothers from practice exclusive breastfeeding (MOH, Ghana 2005).

The socioeconomic status of mothers plays a major role in determining the health of children. Children from high income homes have improved nutrition, improved access to healthcare facilities and good sanitation, hence good health. Better income, good education and wealth are all linked with better health. However, high prevalence of diseases, shorter life expectancy are associated with low socioeconomic status. For instance diseases spread rapidly in populations living under overcrowding conditions due to poverty. High illiteracy levels, unemployment and high poverty rates are reflected in low personal and environmental hygiene and poor nutrition which result in poor health. Many infants in developing countries are affected by malnutrition. Childhood malnutrition affects growth and results in mortality. The health of children depends on the degree of family poverty. Thus good socioeconomic

status means good health and poor socioeconomic status implies poor health. Breastfeeding improves the health of infants. It has been established that exclusive breastfeeding could save the lives of many infants annually. Socioeconomic factors are known to influence breastfeeding. Many studies have investigated socioeconomic determinants of breastfeeding. These studies have focused more on socioeconomic factors such as income, education, occupation and wealth. However researchers have not given much attention to other equally important socioeconomic factors including distance to primary water source, room density and total non food expenditure that reflect local interest. Consequently this study is designed to address some of these gaps and touch more on local needs.

4. Aims

To identify socioeconomic factors that are associated with mothers' breastfeeding infants 0-6 months old.

Objectives

1. To find out if mothers of good socioeconomic status are more likely to practice breastfeeding than mothers with poor socioeconomic status.
2. To find out if households with high per capita expenditure practice breastfeeding more than households with less per capita expenditure.

5. Research questions

From the above objectives the following questions are considered in this research.

1. What is the relationship between socioeconomic status of mothers and breastfeeding?
2. What is the association between compound cleanliness and breastfeeding?
3. Is there any relationship between number of food groups consumed and breastfeeding?
4. Does household per capita expenditure affect breastfeeding?
5. Is there any linkage between distance to primary fuel source and breastfeeding?

CHAPTER TWO

LITERATURE REVIEW

Socioeconomic status determines the extent to which people have good or poor health. Socioeconomic inequality leads to stunting and wasting in children from poor countries. Hence low socioeconomic status results in malnutrition which is the major cause of mortality in developing countries. Nonetheless stunting and wasting are low in richer population groups (WHO 2008). In spite of the fact that other factors play important role in determining health of individuals, mortality rates are higher in populations with lower income. In a separate study, it was indicated that the rate of low birth weight of children born into high income families was 6 percent compared to 7 percent of children born into low income families (Currie 2008). Socioeconomic status is linked to maternal education and child nutritional status. The quality of maternal education influences health knowledge and the use of health care facilities (Frost et al 2005). More educated women search for information on the benefits of infant feeding practices. Considering the role of education in breastfeeding, Blythe et al. (2002) found no difference in self-efficacy in breastfeeding among mothers with high or less school education than those who had post secondary education.

On the contrary, in a research carried out by Grummer-Stawn (1996), the result showed that mothers with no education continued breastfeeding at any given

time than those with at least 7 years of education. Better education is likely to result in higher incomes and thereby reducing poverty. Nevertheless women who work outside the home for long hours have less time to breastfeed their children. The type and nature of work makes it difficult to maintain exclusive breastfeeding. There may be difficulty in expressing breast milk in dangerous work settings where the mother does strenuous physical work (Aggarwal et al. 1998). In most cases, work settings do not allow the mother to bring the child to work. The only alternative is to feed the infant on non human milk. Nevertheless, mothers of high income are able to purchase all kinds of infant formulas when the need arises.

The literature available also reveals the influence of socioeconomic status of mothers on breastfeeding. Grummer- Strawn (1996) found that, children from homes of high socioeconomic status were less breastfed than those from homes of low socioeconomic status. With high per capita income mothers are able to purchase all kinds of formulas (Musaiger 1990). Mothers of high socioeconomic status work outside the home. Substitute caregivers are used while the mother is away from home to feed the child on infant formula. However in a study carried out by Heck et al., (2006) the result pointed out that women with higher incomes, those with partners of higher education and professional or executive jobs were more likely to breastfeed than their counterparts, Aggarwal et al (1998) documented that socioeconomic status, family support, maternal education, motivation for breastfeeding and maternal

nutrition were not associated with duration of exclusive breastfeeding. In the work of Facking et al. (2007) however, the results indicated that maternal unemployment benefits and the least household disposable income were found to be associated with weaning infants before six months in mothers of preterm infants.

In the work of Vogel and colleagues (1999) to determine breastfeeding duration in New Zealand, young maternal age and resumption of full work in the first year were found to be associated with shorter duration of breastfeeding.

Breastfeeding plans during delivery were also significantly associated with the duration of breastfeeding. Mothers who had planned to stop breastfeeding at a specific time after six months had longer breastfeeding duration than those with no plans. Even though in same study, the most common reason given by mothers to stop breastfeeding was perceived insufficient milk.

In some advanced countries, the mean age of weaning infants is very low. In the United Kingdom for instance, most mothers introduce solid foods between three and four months. The reasons for early weaning were sighted to include baby being hungry, rapid weight gain and lower socioeconomic status (Wright et al., 2004). The study further indicated that, the tendency to wean early was high in boys than in girls because of their large size and higher energy requirements.

Another study in Denmark by Kronborg and Væth (2004) also pointed to the fact that although 98% of mothers initiated breastfeeding after delivery, 51% stopped breastfeeding within five weeks but 59% exclusively breastfed for four months. In the same study it was explained that self efficacy influence duration of breastfeeding. Low self efficacy was negatively associated with breastfeeding.

In the United States Arora and his colleagues (2000) showed that 78% of mothers made the decision to breastfeed or bottle feed before pregnancy or in the first trimester. Hence 44.3% initiated breastfeeding and 46.3% initiated bottle feeding whilst in hospital. The most significant factors identified in this study to influence mothers decision to initiate breastfeeding included infants health, emotional bonding with infant and naturalness. The reasons for initiation of bottle feeding were mentioned to be mother's perception of father's preference, uncertainty regarding amount of milk infants receive and return to work. Mothers would however switch from bottle feeding to breastfeeding if influenced by information from prenatal class, information from magazines, TV, books and support from infant's maternal grandmother.

Rooming-in is not likely to prolong duration of breastfeeding. The practice is not possible in all situations. In assessing the effects of maternity-care practices of breastfeeding, DiGirolamo et al., (2008) found that rooming-in was not significantly associated with the duration of breastfeeding. The most important

thing to do was to bring the child to the mothers' room for feeding at night. On the other hand, breastfeeding becomes comfortable for mothers when spacious rooms are provided. Some paediatricians designate a room within the office for breastfeeding during consultation. Such a room is equipped with a sink, clean towels, pillows for the mother to support her infant and her arms as well as a comfortable chair for the mother (Geraghty, 2008).

A study in Switzerland by Songa and colleagues (2005) to examine the influence of baby-friendly hospitals on duration of breastfeeding, revealed that full rooming-in, breastfeeding on demand and putting the child to the breast within the first hour after delivery had a positive effect on breastfeeding. The study further indicated that duration for breastfeeding of infants born in baby friendly hospitals was longer than infants born in other hospitals.

Discussing behavioural interventions to promote breastfeeding, Gruise et al., (2003) mentioned maternal contact with new born, avoidance of formula supplementation for breastfeeding and rooming-in. This study further emphasised the need to provide electric or mechanical pumps for mothers who wish to continue breastfeeding after resumption of work.

Breastfeeding in developing countries

Evidence of breastfeeding knowledge in developing countries has been established. In estimation, over 95% of infants in Africa are breastfed (Dop

2002). However, exclusive breastfeeding is low as most mothers continue to feed water and other liquids to their infants. It is also indicated that, there is high rate of bottle feeding in Tunisia, Sudan, Nigeria and Namibia (Dop 2002). In Nigeria it has been found that 82% of mothers' breastfeed yet only 20% breastfeed exclusively (Salami 200).

Researchers have reported a close association between socioeconomic factors as such income per capita, literacy and child mortality (Amouzou & Hill 2003). The knowledge of such benefits determines the feeding practices to adopt. In a study conducted in Ghana, the results indicated a significant association between maternal education and child feeding practices (Armar-Klemesu et al. 2000). On the other hand, higher illiteracy rate makes it impossible for mothers to read instructions for preparing infants foods. This could be dangerous to the health of the child since ignorance can lead to wrong preparation of the food. Thus mothers turn to initiate exclusive breastfeeding as there is no alternative to feeding their infants

In assessing breastfeeding behaviour and practices in Nigeria and Ghana, Adeyinka and colleagues (2008) identified several factors that prevent mothers from practicing exclusive breastfeeding. They mentioned nature of job, personal frustration, and lack of confidence in breastfeeding and long period of recommended exclusive breastfeeding with the opinion that infants become addicted to such behaviour. Mothers would practice exclusive breastfeeding with the provision of social support, modelling and good public education

(Adeyinka et al., 2008). Mothers work can affect a child's health positively as increase income contributes to the welfare of the child. At the same time, as a result of mothers work children suffer malnutrition and morbidity. Concerning occupation and exclusive breastfeeding, it has been noted that women who have attained higher education and work in the formal sector are unable to exclusively breastfeed. Nonetheless in certain instances lower income and self employed mothers are also unable to exclusively breastfeed their infants. In examining factors influencing breastfeeding practices in Edo state of Nigeria, it was reported that market conditions do not encourage mothers to attend to their babies (Salami 2006).

When assessing the influence of mothers work and place of residence on breastfeeding patterns in Nigeria and Uganda, Ukwuan and colleagues (2001) demonstrated that mothers work has a negative effect on exclusive breastfeeding in Nigeria but no negative effect in Uganda. However, urbanization and media exposure were found to have negative effect on exclusive breastfeeding in both Nigeria and Uganda (Ukwuan et al., 2001). In Sudan the result of a study of breastfeeding indicators showed a significant association between breastfeeding and mother's occupation, as well as pregnancy and family income (Haroun et al 2008).

Good nutritional status of mothers improves breastfeeding. As mothers consume different kinds of foods, more milk is produced and also rich in

quality. This is not easy to come about because of cultural beliefs and taboos.

Foods that would promote good health are rather neglected.

In a study carried out in rural India by Bandyopadhyay (2009) the result has shown that women observe strict food taboos after delivery. Certain foods such as leafy vegetables, melons, pumpkins, eggplant, and varieties of fish, bananas, yoghurt and grapes were forbidden. Mothers were however encouraged to consume special foods according to the traditions believed to improve health and increase milk production (Bandyopadhyay, 2009). A similar finding in Ghana showed that mothers were encouraged to consume certain foods and liquids in order to produce more milk. Other foods such as mangoes and okra were forbidden although it is believed that insufficient milk production results from intake of fewer foods (Otoo et al 2009).

In Africa, women adhere to cultural beliefs in selection of food choice and preparations. These cultural taboos and factors also affect patterns and feeding practices of infants. For instance, in South Africa, there should be separate cooking pot for the child with the belief that eating from the pot of adults would have negative effect on the child especially when the mother becomes pregnant (Kruger and Gericke, 2002). According to a different research in South Africa, the use of traditional herbal mix is popular among mothers. More often than not, infants receive these herbal mixtures in the first month of life. Besides, mothers discard a small amount of breast milk prior to each feeding. This was

to rid the breast of any evil spirit or stale milk if the mother had been out (Sibeko et al., 2005).

In Tanzania, a study by Gunnlaugsson et al., (2001) in a rural area to assess the feeding practices in the first six months of life portrayed that 46% of mothers discarded the colostrums. Such mothers believed that the colostrums stayed longer in the body and was dirty, sticky and yellow. The mothers also believed the colostrum could cause diarrhoea and vomiting. As a result, a mother washes and cleans the breast with local herbs for five days. Water, water based drinks and ritual fluids are also fed to the child (Gunnlaugsson et al., 2001). The situation is not different in Malawi. As much as sixty- five percent of infants are given food in the first month though information on breast breastfeeding is widely spread (Kerr et al., 2009). Only 4% of infants are exclusively breastfed for first six months. Although mothers make decision as to when to give food to infants, mother-in laws and father-in laws are also influential in making such decisions with the intention to prevent infant illness (Kerr et al., 2009).

Both rainy and dry seasons influence mothers' attitude towards breastfeeding in Africa. In the work of Simondon and Simondon (1998) variations in the duration of breastfeeding could be attributed to seasons. Early weaning in the rainy season was due to intense maternal farming activities. Mothers have less time to breastfeed. On the other hand, in the dry season with low food availability, mothers delay weaning because of high infant mortality rate. In a

related study, it was observed that lactating women produce more milk in the harvesting season than in the dry season when food was scarce. In the famine season, lactating mothers have less food to eat and thus poor maternal nutritional status (Hennart et al., 1983). In Malawi, the months of December through March are regarded as the "hungry season" where infants do not receive enough breast milk. During this season, there is high level of illness from water born disease (Kerr et al., 20009)

Hygienic conditions also influence the duration of exclusive breastfeeding. This is largely based on area of residence. The area of residence of mothers determines extent to which breastfeeding is practiced. A Study have indicated that mothers who live in rural areas experience high duration of breastfeeding than those who live in urban centres (Grummer-Strawn, 1996).

In rural areas, exclusive breastfeeding becomes necessary as a result of poor sanitation and hygienic practices, inadequate water and poor method of food preparation (Otoo et al 2009).

In a different study, it was reported that people in urban areas with good hygienic conditions do not breastfeed for longer time. The risk of bottle feeding is high where hygienic conditions are better (Omandi et al., 1990). This study showed a statistical association between hygienic and economic household conditions with breastfeeding. More rooms for human habitation, shorter distance to water source, pipe water indoors and flush toilet were also found to be associated with shorter duration of breastfeeding (Omandi et al., 1990).

In a separate study, it was documented that mothers who bottle fed their babies were unable to maintain proper bottle hygiene (Aggarwal et al 1998). This is in contrast with the work of (Shirima et al. 2000). The study was done to compare the feeding practices of rural and urban mothers. The result showed that urban mothers start breastfeeding earlier and delayed the introduction of solid foods. The reason for the differences was sighted to be urban mothers receiving information on breastfeeding from hospitals and the media than rural mothers.

Compound cleanliness measured by the presence of animal excreta, refuse in a living room and soap availability were found to be associated with child mortality in Northern Ghana (Binka et al 1995). The same research revealed association between post-neonatal infant deaths and lack of zinc roof in the compound and dry season water source. Congestions in sleeping rooms hinder exclusive breastfeeding. In South Africa most mothers 82% reported living with up to six individuals in their homes with only one room for dwelling (Sibeko et al., 2005).

The availability of health services also affects breastfeeding. Hospitals and health centres promote breastfeeding through the provision of education on breastfeeding to mothers. In one study mothers were asked to evaluate the information they received on breastfeeding from the hospital. The result indicated that 78% of the mothers said they received breastfeeding information while in the hospital and 81% reported that they received information on

breastfeeding from the hospital before delivery (Kuan et al. 1999). The increase in the initiation of breastfeeding was among mothers who had access to health services. This is especially so among those who attend antenatal care. Mothers who send their children to health centres frequently for immunisation and other treatments also receive education and practical guidance on breastfeeding.

However, Derose, (2007) documents a negative relationship between modern health care and exclusive breastfeeding. The reason given for this negative relationship was that immunisation for instance can improve the immune system of the child even if not exclusively breastfed.

Another factor which results in increase breastfeeding in developing countries is household size and composition. In most African countries where the extended family system is practiced, nursing mothers have support and encouragement from other family members when breastfeeding. Household activities are performed by other household members especially where young girls are available. Hence the mother has time to breastfeed the infant.

However, mothers who have support from their mothers are less likely to breastfeed for longer period (Susin et al. 2005). Thus in the absence of the mother, grandmothers feed infants with breast milk substitutes.

In polygamous marriages, the child is left in the care of other mothers when the biological mother is away (Gyimah 2005). Husbands with sound economic status provide for their wives. The woman thus devote less time on income generating activities than on the reproductive roles. Single mothers especially teenage mothers, have low initiation of breastfeeding because they have to

provide themselves. Hence married mothers are more likely to breastfeed than single mothers but also cohabiting mothers also practiced breastfeeding more than romantically involved mothers (Gibson-Davis and Brooks-Gunn, 2007).

Many of the studies across the world and also in Ghana have examined relationship between socioeconomic factors such as occupation, education and income with breastfeeding. The above literature review however does not reflect much of the socioeconomic factors covered in this study. To the knowledge of the researcher, the current study is the first of its kind in Savalugu Nanton district of Northern Ghana that has considered socioeconomic factors such as distance to water source in dry season, room density, and number of food groups consumed and distance to primary fuel source and their relationship with breastfeeding.

CHAPTER THREE

Methodology

3.1 Study area

Savalugu Nanton is a district in Northern Region of Ghana. It is located 15km away from Tamale the capital of Northern region in Ghana. The population of this area is about 91,415. This constitutes 44,793 males and 46,621 females (Ghana Statistical Service, 2004). The Dagombas dominate the population of the district although there are sizable groups of the Manprusi, Gonjas and Frafra. The main religion is Islam. However Christians have a significant number. The main economic activity in the district is farming. A combination of hired labour and hand hoes are used to prepare land for planting. Both monocropping and intercropping are practiced. Illiteracy levels are high in the District. There are large households with average members of 14 most of whom are dependants. A significant number of household members are mobile as a result of social visits and unemployment. Micro-credit is usually obtained from friends, relatives and acquaintances for business and purchase of agricultural inputs. Few communities have trained Traditional Birth Attendants and health posts. There is poor sanitation in the District. Only few households have latrines with the majority going “free range”. Access to portable water is difficult. Unsafe sources of water include dugouts, dams, ponds and streams. There are limited transportation services. Residents would have to travel many kilometres to have access to commercial transportation system.

3.2 Population and Sample

This study is based on a survey conducted in 2001 by the United Nations Children's Fund (UNICEF), the International Food Policy Research Institute (IFPRI) and University for Development Studies (UDS) in Savelugu Nanton District of Northern Ghana. A total number of one thousand six hundred and eighty-four (1684) households in sixty-four (64) communities participated in the survey. In the communities, every household with a child less than three years was a participant for the survey. The purposive method was used to select fifty (50) communities for the first round of the Integrated Community Based Development (ICBD) program in the District. Thus two strata were identified. One stratum represented by the fifty (50) communities for the ICBD program and the other stratum represented by communities for the non ICBD program. The cluster sampling was used to allocate and implement the interventions in both the ICBD and non ICBD communities (Kenneth 2005).

3.3 Material

A standardised and structured questionnaire was used to collect data on the nutritional status of children in the Savelugu Nanton District. The questionnaire was divided into sixteen modules and some with sub modules. Modules 7A&B, 8, 9A&B 10B and 13C were used in this research. Module 7A&B gave information on food and expenditure of households. Module 8 obtained information on household non-food expenditures. Module 9A provided

information on dwelling characteristics and 9B gave on water and sanitation. Module 10B supplied information on breastfeeding practices and 13C covered sanitation spot- check. There was translation of the questionnaire from English to Dagbani (a local dialect in Northern Ghana).

3.4 Procedure

Data collection started on 22nd May through 20th August 2001. Prior to the actual survey meetings were held with community members to explain the purpose of the study and to seek the consent of the community to carry out the study. This was also done to explain issues that would be confusing to participants. There was pre-testing of the questionnaire outside the research area to precede the actual survey. This helped to review the questionnaire and ascertain faults that needed modification. As a result of large size household and length of the questionnaire, it took a day to complete a survey in each household on the average. However, in certain instances the interview was split into two days where it was not completed in a sitting. Feedback was given to interviewers by supervisors after reviewing the completed questionnaire.

3.4 Measures of variables

3.4.1 Outcome variable

The outcome variable was measured using questions on module 10A of the questionnaire. Although there are several questions on this module, for the purpose of this study four of the questions have been used to measure breastfeeding. The answers were reverse coded. Separate scales were created for each of the four questions because of different questions and responses. For the question “how soon after birth is child put to the breast”? the responses were rated on scale 0-3. The rest of the questions were reversed coded on a scale 0-1. A high value meant a significant contribution and low value meant less contribution to the measurement of breastfeeding. This means that a high value reflects good breastfeeding practices. A low value on the other hand, indicated poor breastfeeding practices. After reverse recoding, all the scores were added up to get total score for breastfeeding. The following questions were used to measure breastfeeding

1. How soon after birth is child put to the breast?
 1. Within one hour after delivery,
 2. 1- 6 hours after delivery,
 3. 6 hours to one day,
 4. After more than one day.
 5. don't know

2. What was done to the colostrum?

1. Discarded,
2. fed to the child
3. don't know

3. Was index child given water first few days?

1. Yes
2. No

4. Was index child still breast fed at the time of the interview?

1. Yes
2. No

3.4.2 Socioeconomic factors

The following variables were used to measure socioeconomic status in the Savalugu Nanton.

Distance to primary water source:

What was the distance to source?

1. In the compound
2. Less than 500m
3. 2km-5km
4. More than 5km
5. 5km, 2-5km
6. Don't know

These responses were reverse coded on scale 0-4. A high score indicated a short distance and a low score showed a long distance to water source. This also implies that respondents with good socioeconomic status travel a short distance to water source and those with poor socioeconomic status travel a long distance to water source.

Sleeping density: How many rooms are on the compound? How many rooms are used for sleeping at night? These were open-ended questions. The number of rooms used for sleeping was divided by the number of rooms available on the compound. This gave the proportion of rooms used for sleeping in the household. Good socioeconomic status meant more rooms for sleeping and poor socioeconomic status indicated few rooms for sleeping.

Distance to primary fuel source:

How far do you travel for it?

1. Less than 500m
2. 500-2km
3. 2km-5km
4. 5km-10k
5. Over 10km.

There was reverse coding of responses on a scale 0-4. A high score showed a short distance and low score meant long distance to fuel source. Respondents

who travel a short distance for primary fuel implies good socioeconomic status. Travelling a long distance for primary fuel indicates a poor socioeconomic status.

Household per capita expenditures: This covered the expenditure on both food and non-food items. High per capita expenditure meant good standard of living and low per capita expenditure indicated poor standard of living.

Per capita total food household expenditures: This variable provided information on amount of money households spend on food. Questions were asked on purchased and non-purchased foods items. The questions included: How much was purchased? How much did you spend? How much was from home production? How much was received as payment in-kind? How much was from any other source? Responses were categorised into low, medium and high amount.

Per capita total non- food household expenditures: How much of item was acquired? What is the money value of the amount purchased or obtained in-kind by the households during the reference period? These were open-ended questions. Responses were in quantity of amount which was grouped into low, medium and high. Households who spent more on non-food expenditures were considered to have good socioeconomic status and those who spent less on non-food expenditures were considered to have poor socioeconomic status. Non-

food household expenditures were equally considered important apart from food expenditures in Savalugu Nanton. The most obvious were clothing and shelter. However fuel for cooking and lightening, transportation, health services, education, the cost of participation in ceremonies like weddings funerals, and outdoorings were also considered important.

Number of food groups consumed: In the Savalugu Nanton district survey, food items were grouped into twelve categories. These were cereals and grains, roots and tubers, vegetables, oil and fats, fruits, fish and seafood, sugar and honey, pulses and legumes, milk products, eggs, meat and offal and other foods. Consuming more food groups indicates good socioeconomic status. However, consuming less food groups shows poor socioeconomic status.

Compound cleanliness: What is the general appearance of the immediate surroundings compound?

1. Very dirty
3. Dirty
2. Very clean
4. Very dirty

Responses were reversed coded on a scale 0-3. A high score means clean compound and good socioeconomic status. A low score however shows dirty compound and a poor socioeconomic status.

3.5 Data Analysis

Statistical methods were used to analyse the data using SPSS version 15.

Descriptive statistic was performed for the dependent and independent variables. To obtain information on the strength of association between the dependent and independent variables the Person's correlation was performed.

The standard multiple regression was used to determine the contribution of each of the independent variable in the variance of the dependent variable. Prior to running the analyses the data set was screened for missing data. Some of the variables were reverse coded so that responses were in one direction.

3.6 Ethical Issues

The research was conducted using data from a public data file. The data file was provided by the supervisor of the researcher who has permission to use the data. In this data file, there was no information to identify participants, answers or the individual. Since no new data was collected, the researcher did not seek permission from any ethical review boards before conducting the research. The exact information collected was analysed. There was no falsification of data.

No biased words or language were used against participants in interpreting the data.

CHAPTER FOUR

RESULTS

3.1 Descriptive Statistics

Table 4.1 shows the descriptive statistics of the dependent and independent variables that went into the regression analysis. There was higher means for non food expenditure, total food expenditure and per capita expenditure.

The mean for the independent variable (Breastfeeding) was 3.26. This implies that more mothers will breastfeed their infants.

The mean for non food expenditure was 4,053,956 cedis per annum. This amount was quite reasonable. This is because the expenditure covers the whole household. In addition these spending are not daily but occasional. For instance spending on clothing, education and ceremonies are periodic.

For total food expenditure, the mean was 4,315,654 cedis. The amount was smaller than expected. The reason is that in Ghana, food expenditure takes more than half of a family's disposable income. So in such a rural area where households are large, this amount is inadequate.

Per capita expenditure covers both household food and non food items. The mean was 59,666 cedis. Given this amount, it is not enough to take care of household food let alone spending on non food items.

The mean for number of food groups consumed was 6.55. This was low which shows that households consume few different food groups.

For distance to primary fuel source the mean 2.57km indicating that respondents travel a relatively short distance for primary fuel. Nevertheless in this poor region of Ghana where majority of the population use firewood as the source of primary fuel, they could travel longer than the mean shows

With room density the mean was 1.52 which portrays that few people sleep in a room. Given the poverty level in the locality, one would have expected that there would be more people sleeping in a room. But, again considering the nature of the buildings mostly made of mud and thatch, this is within their means.

The mean for distance to primary water source during dry season was 2.23km. This indicates respondents travel a short distance for water. This could be possibly so in the rainy season when rivers, lakes and ponds tend to be full. Yet in the dry season respondents could travel a longer distance for water.

The mean for compound cleanliness was 1.3 which shows that there is poor sanitation in this study area. This could be due to poor sanitation practices, and poor disposal of refuse.

4.2 Inter item correlation

Table 4.2 indicates the inter item correlation. Inter item correlation was performed to assess the relationship between the dependent and independent variables. The result indicated that some of the variables were significant at

$p < 0.01$ and $p < 0.05$ (2-tailed). Breastfeeding correlated with number of food groups consumed as well as with compound cleanliness. This implies that as mothers eat more food groups the more likely is it that they would practice breastfeeding. As with compound cleanliness, the cleaner the compound is, then mothers are more likely to practice breastfeeding. Breastfeeding however did not correlate with most of the predictive variables.

4.3 Regression Analysis

Standard multiple regression was performed to assess the influence of each of the independent variables in predicting the dependent variable. Breastfeeding and the socioeconomic variables were entered into the model. Although the inter item correlation indicated that only two of the predictive variables were associated with the outcome variable, all the predictive variables were entered into the standard multiple regression model. This was done to give the overall picture of the predictors of the outcome variable. Strictly speaking, the model should have been presented with only the two socioeconomic factors found to be significant. In the standard multiple regression analysis all the independent variables were entered into the equation simultaneously. Thus each of the predictive variables was assessed in terms of the predictive power over and above the contribution the other variables offer.

Table 4.3 shows the model summary of the standard multiple regression. The model summary indicates that the whole model explains 13.4% of the variance

in breastfeeding. This value is quite expected because only two independent variables correlated with the dependent variable. More so, the correlation between the outcome variable and predictors was weak.

Table 4.4 depicts the ANOVA table to assess the statistical significance of the result. This model did reach statistical significance [$F(8, 1487) = 3.401, p > .001$]

The table 4.5 indicates the coefficient table. Scanning through the beta column of this table, number of food groups consumed has the larger beta value of 0.096. This means that number of food groups consumed makes the stronger statistical unique contribution in explaining breastfeeding after controlling for the variance contributed by the other variables. This was followed by compound cleanliness. The beta value for compound cleanliness was 0.077. This was slightly lower which means compound cleanliness made a less contribution to explain the variance in breastfeeding than number of food groups consumed.

CHAPTER FIVE

DISCUSSION

The main aim of this study was to examine the association between socioeconomic status of mothers and breastfeeding. Thus the research questions considered were: what is the relationship between mothers' socioeconomic status and breastfeeding? What is the association between compound cleanliness and breastfeeding? Is there any relationship between number of food groups consumed and breastfeeding? Does household per capita expenditure affect breastfeeding? Is there any linkage between distance to primary fuel source and breastfeeding?

The result indicated that breastfeeding correlated with number of food groups consumed and with compound cleanliness. However, no correlation was found between breastfeeding and room density, per capita expenditure, total food expenditure, non food expenditure, distance to primary fuel source and distance to water source in the dry season.

One finding of the current study is that breastfeeding is associated with number of food groups consumed. This implies that as mothers consume more different food groups the more breast milk is produced. The survey in the Savalugu Nanton District of Ghana, revealed twelve categories of food groups. Of this, respondents consume grains and cereals more than any other foods. This is especially so among the poor. This is partly explained by the fact that, carbohydrate- riched foods are cheaper than micronutrients rich foods in Ghana.

With high poverty level in this area, it is not surprising respondents consume more grains and cereals as it is easy to afford. Besides, the main occupation in Savalugu Nanton is farming. A large proportion of households produce are grains and cereals. Although some are sold to raise cash for other requirements, productions are mainly for consumption. More so, as illiteracy rate is high, respondents may not know the essence of micronutrients rich foods. As a result, they may not spend on such foods and sometimes the little that is produced is sent to the market. This shows the low socioeconomic status in the study area.

In a related study, Arma-klemesu et al., (2000) showed a significant association between maternal education and feeding practices. Consumption of nutritious food improves breast milk production. In some developing countries, cultural believes and taboos influence consumption patterns which influence breastfeeding. In Ghana, whereas mothers are encouraged to eat certain foods, the eating of others are forbidden (Otoo et al.2009). Bandyopdhay (2009) indicated that beliefs and taboos affect the consumption of nutritious foods. In certain areas herbal mixtures are fed to new born babies (Sibeko et al., 2005). Also, the beliefs that colostrum is yellow, dirty and sticky make some mothers discard the colostrums without feeding it to the baby (Gumlaungssen et al., 2001). The seasons are also known to influence breastfeeding in some African countries. Hennart et al., (1983) found that more breast milk is produced in the harvesting season than in dry season when food is scarce. In the dry season mothers have less to eat hence poor nutritional status. Simondon and Simondon

(1998) on the other hand, explained that because of maternal farming activities in the rainy season, mothers have less time to breastfeed. Mothers however prolong breastfeeding duration in the dry season as a result of high mortality rate.

Another finding of this study indicated a correlation between breastfeeding and compound cleanliness. Thus good compound appearance means good breastfeeding practices and poor compound appearance reflects poor breastfeeding practices. This study confirms the previous findings of Omandi et al., (1990) where a statistical association was found between breastfeeding and hygienic conditions.

General sanitation in Savalugu Nanton district is poor. A great number of respondents defecate in the open. Most children also defecate in rubbish pits. A larger proportion of households dump rubbish in heap outside the compound. This reflects poor socioeconomic status in the study area. Respondents are unable to provide flush toilets. There are few pan latrine, traditional pit latrine and public toilets in the communities. However with the rapid population growth these toilet facilities are inadequate. In addition, as a result of ignorance respondents may not be aware of the effects of improper disposal of human and household waste and thus are less concerned about it.

It was also observed in the survey that few mothers wash their hands with soap before food preparation or feeding their infants, after defecation, attending to a child who has defecated. Although two thirds of the respondents will wash their

hands after a dirty work, more than half have a dirty compound. This also highlights the poor socioeconomic status of Savalugu Nanton. The practice of poor hygiene affects the feeding practices of mothers since this could negatively impact on the health of the child. In a related study it was found that compound cleanliness measured by the presence of animal excreta, refuse in living room and soap availability were associated with infant mortality (Binka et al., 1998). For this reason breastfeeding becomes necessary in such a poor rural area where hygienic practices are not good.

This study is in line in with a recent study by Otoo et al (2009). In their work, emphasis was put on the need to practice exclusive breastfeeding because of poor sanitation and hygienic practices and also poor method of food preparation. This finding has also been observed in the work of Gruman-Strawn (1990) that mothers in rural areas have a high duration of breastfeeding than those who live in urban areas. These findings contradict with the finding of Shirima et al (2000) who found that urban mothers initiate breastfeeding earlier and delayed the introduction of solid foods. Nevertheless there is high risk of bottle feeding where hygienic conditions are better (Omandi et al., 1990). In certain instances mothers practicing bottle feeding are unable to maintain proper bottle hygiene Aggarwal et al (1998). Apart from the fact that poor environmental conditions make breastfeeding important, economic hardships make mothers have no option but to breastfeed even when the need arises to supplement breast milk with infant formula.

Many of the socioeconomic variables in this study did not correlate with breastfeeding. No correlation was found between breastfeeding and room density. This is consistent with the work of DiGirolamo et al (2008) who found no significant correlation between rooming-in and breastfeeding. The study however stressed the importance of bringing the child to the mother for feeding at night. Contrary to this finding, Songa and colleagues (2005) reported that full rooming-in, breastfeeding on demand and putting the child to breast in the first hour after delivery have a positive effect on breastfeeding. Overcrowding in dwelling places interfere with breastfeeding. In South Africa, 82% of mothers live with six other individuals with just one room for dwelling (Sibeko et al., 2005). To make breastfeeding more comfortable for mothers, it is important to ensure they live in spacious rooms. In line with the study of Geratgthy (2008) some pediatricians designate a room within the office which is well equipped with sink, clean towels and pillows for mothers to make breastfeeding more enjoyable.

Poverty stricken areas in Ghana are characterized by congestions and filth. As many as five or more people dwell in one room. Thus in a poor area like Savalugu Nanton, with large household members of about fourteen, one would have expected congestion in the households. The survey however showed that there are about thirty four rooms on a compound. Seven rooms on average, five of which are used for sleeping. This implies that there are more rooms for sleeping in each household. This is not surprising considering the nature of the building materials which are mostly locally acquired. Buildings are usually

made of mud walls, concrete floors and thatch roof. Very few houses are built with improved materials. This shows the poor socioeconomic status of households in this district of Ghana. Additionally, migration also account for few household members at a time. Social visits are usually the common reason why household members travel. Traveling with parents and also child birth visits also make household members mobile. In this poor area, there are few or no job opportunities. The youth thus move to the cities in search of jobs and better life. Some do seasonal work and bush farming.

The result of this study also showed no correlation between breastfeeding and per capita expenditure. This finding contradicts the finding of Amouzou and Hill (2004) which found a close association between socioeconomic factors such as income per capita, literacy and child mortality. The survey showed that per capita expenditure is low in Savalugu Nanton. As food cost much in Ghana, to have low per capita expenditure reflects the low standard of living in the study area. This could affect feeding practices of mothers as mother themselves would have poor nutritional status and also find it difficult to purchase food items considered to be healthy for their infant. This implies that there is abject poverty in Savalugu Nanton. In a previous study by Wright et al (2004) it was found that low socioeconomic status results in early weaning. In line with the study of Facking et al (2007) the result showed that maternal unemployment and least household disposable income were associated with early weaning of preterm infants. In contrast to the finding of Musaiger (1990) high per capita income enables mothers to purchase all kinds of infant formulas.

In support of the research by Heckel et al (2006) the result revealed that mothers with higher incomes and those whose partners have attained higher education and have professional jobs were more likely to have longer duration of breastfeeding than their counterparts

There was no correlation between total food expenditure and breastfeeding. The amount indicated by respondents shows that less is spent on food in Savalugu Nanton. Considering the low socioeconomic status in this area, it is not surprising households spend less on food. Another possible reason for low total food expenditure could be due to poor documentation on the part of respondents due to high illiteracy rate. Respondents are likely to recall from memory such an expenditure which often may be incorrect. More so, as majority of the population in the district are farmers, some food items are locally produced for consumption and thus are not priced. Therefore such farm produce may not have been included in the expenditure.

There was also no correlation between total non food expenditure and breastfeeding. Households in Savalugu Nanton spend less on non food items. This is not worrying as some of these items are acquired periodically. Among these items, the largest budget share goes into clothing and footwear, then fuel, utilities, lightening, ceremonies and personal items.

Distance to water source in the dry season also showed no association with breastfeeding. However, Omandi et al (1990) found an association between shorter distance to water source, pipe water indoors and shorter duration of

breastfeeding. This is consistent with the study of (Binka et al., 1995) who found association between post neonatal infant deaths and dry water source. In the dry season, the sources of drinking water in Savalugu Nanton are mostly ponds, dugouts dams, rivers and streams. These sources are unprotected. As a result of low socioeconomic status, protected sources of drinking water in the dry season such as borehole and protected wells are few. Proper methods of treating unsafe water are not common. This may account for high infant mortality rate because of diarrhea and other diseases. Mothers who practice exclusive breastfeeding are more likely to protect their infants.

Finally, there was no association between distance to primary fuel source and breastfeeding. The main source of cooking fuel in Savalugu Nanton is firewood. This indicates the low standard of living in this area. With rapid increase in population which has led to increase in farming activities it is difficult to fetch firewood within a short distance. Also as a result of poverty, respondents may cut down trees to burn charcoal to sell as a means of livelihood. This has brought about deforestation which eventually leads to desertification. Thus making it difficult to fetch firewood.

5.1 IMPLICATIONS OF THE STUDY

Breastfeeding knowledge is universal in Ghana and for that matter in Savalugu Nanton. Yet exclusive breastfeeding is yet to be fully realised. Many mothers

feed sugar water, tea and other liquids to their infants before six months. This is attributed to the low socioeconomic status in the Savalugu Nanton. Compound cleanliness and number of food groups consumed of the socioeconomic variables used in this study showed correlation with breastfeeding. This shows that these variables influence breastfeeding and the health of children.

It is important to ensure good sanitation in this study area. There should be proper disposal of refuse to keep the compound clean as respondents indiscriminately dump refuse on the compound. There should be education on how to use some home refuse as compost. Since livestock are left on a free range, they defecate on the compound. Respondents should provide an enclosed area to keep them. Most adults in Savalugu Nanton always go on a “free range” that is, defecating in the open space. The few toilet facilities that are available are also not used. These habits lead to the spread of infectious diseases which affect the health of the mother and also the baby. There should be education on the need to use the toilet facilities to keep the surroundings clean to promote good health. With low socioeconomic status, inexpensive toilet facilities such as traditional pit latrine should also be provided so adults do not go on a “free range”. Stagnant waste water always located behind bathrooms are breeding grounds for mosquitoes. The presence of mosquitoes threatens the health of mothers and their babies. Knowledge of good drainage system to keep the surroundings clean is vital to ensuring good health. When these sanitation measures are implemented, the general health of the mother will improve and subsequently enhance breastfeeding.

Number of food groups consumed influence breastfeeding in this study. As mothers consume more food groups more breast milk is produced. Nevertheless, there is large consumption of grains and cereals than any other food in Savalugu Nanton. This may be due to lack of information and knowledge on the nutritional importance of consuming variety of foods. Hence nutritional education would be important in this area to encourage mothers to consume more food groups in order to produce more breast milk and in good quality. Given the high poverty level, cost and affordability of food also result in consumption of few food groups. Respondents should be encouraged to grow variety of foods themselves which would be less expensive. A greater percentage of household food expenditure is devoted to grains and cereals. This should be reduced to include other kinds of foods.

5.2 METHODOLOGICAL ISSUES

Several methodological issues might have accounted for the non correlation between the dependent and most of the independent variables. The different methods of data collection could affect the outcome of this study. The traditional way of breastfeeding and weaning might be different from how the questionnaire was designed. Thus it is important to consider the knowledge and norms before designing the questionnaire.

Also, the sample of the study was drawn from a rural setting. Perhaps a blend of the sample from populations with different background such as rural, semi-rural and urban communities might have given a true picture of the correlation.

The stratified sampling technique used in this survey may not have provided accurate information about the population due to measurement error. Using stratified technique, it is also difficult to select the variable with the relevant strata. Stratified sampling method is more suitable in homogenous populations.

Furthermore, surveys provide only verbal descriptions of feelings but lack accurate descriptions of what people actually do. This is so, as respondents do not provide information beyond the questions asked. Surveys may also lead respondents to over or under report the actual fact as a result of social desirability.

5.3 GENERALISATION OF THE STUDY

Considering the above methodological issues, even with those independent variables which correlated with the dependent variable, the result in this study cannot be generalised. To generalise, there should be a blend of qualitative and quantitative methods. As qualitative method would give an in-depth understanding and address some core questions from the quantitative data.

5.4 STRENGTHS AND WEAKNESSES OF THE STUDY

This study is the first of its kind to tackle variables such as distance to fuel source and its relationship with breastfeeding in the Savalugu Nanton district of Ghana. Thus the current study provides the opportunity for a baseline for future researchers.

The time lag between data collection and analysis was too long. The situation that prevailed at the time of data collection might be different from what prevails today.

The result of the study could be compromised by the fact that most of the data were missing.

Using existing data, it is difficult to understand the effects of the manipulated variables.

CONCLUSION

The study found a relationship between breastfeeding and compound cleanliness as well as number of food groups consumed as the variables measuring socioeconomic status. This implies that the material and financial capita in this study are not important in predicting the outcome variable. This does not mean that other socioeconomic factors like education and occupation could not be important in predicting breastfeeding. Studies in Western countries and inter-country studies in Africa have been significant. It is important that future studies in Savalugu Nanton take into consideration other socioeconomic factors that may be important in predicting breastfeeding. Besides socioeconomic factors, there is the need to also look into the infrastructure as well as basic social amenities to assess their relationship with breastfeeding. This study will go a long way to provide understanding of the dynamics of the role of socioeconomic status of the mother in predicting breastfeeding. The study will also provide guidelines and tools to policy makers, nutritionists, mothers and all those who deal with mother-child care for effective policy management to improve the health of mothers and children.

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APPENDIX

Table 4.2: Descriptive statistics

Source	N	Mean	Stand. Dev	Skewness	Kurtosis
Breastfeeding	1505	3.26	1.37	-.44	-.37
Total Food Exp	1588	4315654.08	2876485.26	2.60	13.46
Consumed food Grps	1588	6.55	1.32	.48	464.00
Per Capital Exp	1585	596661.09	322676.11	2.11	8.05
Non-Food Exp	1585	4053956.79	5008997.26	4.92	39.96
Room Density	1588	1.52	1.01	20.35	596.42
Fuel Source (distance)	1577	2.57	.75	-.21	.11
Water Distance	1568	2.23	.81	-.85	.18
Compound Cleanliness	1588	1.13	.64	.27	.28

Table 4.2: Inter item correlation

	2	3	4	5	6	7	8	9
1.Breastfeeding	-.004	.094**	.005	.002	-.027	-.003	.041	.089**
2.Total Food Exp		.122**	.502**	.410**	-.076**	-.042	-.009	-.001
3.food Grps Consumed			.246**	.284**	-.080**	.040	-.029	.111**
4. Per Capital Exp				.311**	.029	.009	-.023	.050*
5.Non-Food Exp					-.111**	-.050*	-.054*	.055*
6.Room Density						-.034	.066**	-.030
7. Fuel Source (distance)							.161**	.037
8.Water Distance								.076**
9.Compound Cleanliness								

Key: ** Correlation is significant at the 0.01 level (2-tailed).

*** Correlation is significant at the 0.05 level (2-tailed).**

Table 4.3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.134	.018	.013	1.364

Table 4.4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.650	8	6.331	3.401	.001
	Residual	2753.193	1479	1.862		
	Total	2803.843	1487			

Table 4.5: Coefficients

SOURCE	STAN. ERROR	BETA	t- VALUE	<i>p</i>
NON-FOOD EXPENDITURE	.000	-.001	-.047	.962
TOTAL FOOD EXPENDITURE	.000	-.026	.890	.374
FOOD GROUPS CONSUMED	.029	.096	3.841	.001
PER CAPITAL EXPENDITURE	.000	-.012	.378	.706
ROOM DENSITY	.036	-.023	.385	.385
DISTANCE TO FUEL SOURCE	-.48	-.018	-.697	.486
DISTANCE TO WATER SOURCE	.044	.040	1.527	.127
COMPOUNDCLEANLINESS	.055	.077	2.963	.003