SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ESTIMATION OF THE COST OF INFANT FEEDING DURING THE FIRST 6 MONTHS OF LIFE IN NEW JUABEN MUNICIPALITY.

BY

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DECLARATION

I, Simon Dagbie, do hereby declare that except references to other people's work which have been duly acknowledged and cited, this work is my handy work and has not been submitted either in part nor whole anywhere for any degree.

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(SUPERVISOR)

DEDICATION

I wish to dedicate this work of mine to God Almighty for his compassions and provision to me throughout my stay on campus. Also, to Alfredina Kulah my lovely wife for her understanding and encouragement. My teachers at all levels, who diligently taught me the value of knowledge.

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This work was possible by the unfailing grace and direction from the Almighty God. I wish therefore to first and foremost thank the Almighty God for making this work a success. I wish to acknowledge Prof. Richmond Nii Okai Aryeetey my supervisor, who stood out as a mentor. His enthusiasm and spirit of enquiry lives on in everyone who come in contact with him. Many thanks to Gideon Agyare and Richmond Agbanyo for their enormous contribution to this work. I am extremely grateful to the respondents who participated in this study. This work would not have been possible without the generous support from my son and daughter Serlom Dagbie and Ama Dzigbordi Dagbie respectively.

ABSTRACT

Introduction: Many studies have proven that breast milk is the most important infant feed, and in the first six months of life, it is adequate for sustenance. Exclusive breastfeeding (EBF) for the first 6 months of life has been recommended by World Health Organization (WHO) as the best infant feeding strategy. Breast milk provides infants with the antibodies and nourishment needed to begin a healthy life. Mixed feeding with breast milk and other fluids/foods is common in Ghana, starting from around the third month after delivery. In Ghana, the cost of feeding an infant remains unknown.

Objective: To determine the cost of infant feeding during the first six months of life.

Methods: This study was a cross sectional study. A total of 417 mothers with infants (≥ 6 months) attending postnatal services were recruited for this study from 4 hospitals in the New Juaben south municipality. The hospitals were SDA hospital, St. Joseph's hospital, Providence hospital and the Koforidua regional hospital. Mothers who were apparently healthy were recruited as they qualified for the study until the sample size target was reached. A semi-structured questionnaire was used to collect data on maternal socioeconomic and demographic factors, child feeding practices, and cost of feeding items. Data were entered and cleaned with STATA version 14. Continuous variables were reported using means and standard deviations whereas categorical variables were reported in frequencies and percentages. Independent Student's T-test was used to compare exclusive breastfeeding and mixed feeding costs whereas binary logistic regression was used to find the association between feeding cost and the maternal factors. Level of significance was tested at $p < 0.05$.

Results: The mean age ± standard deviation of the women was 29.8± 5.0 years. The majority of the women were between 18 and 29 years (52.5%), had post-basic education (59.8%), were non-

salaried workers (58.4%), married (81.9%) and were Christians (81.2%). Over three-thirds of the women practicing mixed feeding (88.5%) and breastfeeding (84.6%) bought breastfeeding brassier during the first 6 months of life. Almost all the women who practiced mixed feeding (96.3%) and breastfeeding (93.4%) bought feeding utensils during the infant's first six months of life. The average total cost of feeding for 6 months since birth was significantly higher for mixed feeders as compared to exclusive breast milk feeders (1111.7 ± 10.83.3 vrs 885.1 ± 952.9, p-value = 0.025). Salaried mothers were almost five times more likely to have high infant feeding cost as compared with non-salaried mothers (OR: 4.91, 95% CI 3.0, 7.93, p-value < 0.001) whereas mothers who practised mixed feeding were almost twice more like to have high infant cost of feeding as compared exclusive breastfeeding mothers (OR: 1.84, 95% CI 1.25, 2.72, p -value = 0.02).

Conclusion: The prevalence of appropriate initiation breastfeeding was high among the mothers while the rate of exclusive breastfeeding was low. The cost of mixed feeding was higher than exclusive breastfeeding. Salaried mothers and those who practised mixed feeding spent more money on infant feeding.

Recommendation: Education should be intensified on exclusive breastfeeding. Further research should be conducted on the cost of infant feeding within the 6 months of life.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

BFHI	Baby Friendly Hospital Initiative
CHAG	Christian Health Association of Ghana
CHPS	Community-Based Health Planning and Services
CWC	Child Welfare Clinic
GDHS	Ghana Demographic and Health Survey
HIV	Human immunodeficiency virus
IYCF	Infant and Young Child Feeding
SDA	Seven-day Adventist
SSA	Sub Saharan Africa
UN	United Nation
WHO	World Health Organization
GSS	Ghana Statistical Service

CHAPTER ONE

INTRODUCTION

1.0 Background

Many studies have proven that breast milk is the most important infant feed, and in the first six months of life, it is adequate for sustenance (Van Esterik, 2015). An extensive review of the literature on breastfeeding shows that breastfed children have chance of better survival, and decreased risk of diseases (such as urinary tract infections, allergic diseases, diarrhoea, insulin-dependent diabetes, otitis media, respiratory infections, sudden infant death syndrome), and improved cognitive abilities than non-breastfed children (Lawrence & Lawrence, 2011). Breast-feeding is not only important for the child, but also the mother (Lindsay, Machado, Sussner, Hardwick, & Peterson, 2008). It reduces the occurrence of ovarian cancer, premenopausal breast cancer, and endometrial cancer (Chlebowski, 2000). Feeding a child with breast milk improves their immune system capacity, and thereby reduces susceptibility to acquiring infections, reducing the cost of health care in present and future years (Walters et al., 2016). According to Agunbiade & Ogunleye (2012), human milk has economic significance on three interwoven levels: commercial, family and the community levels. Breast milk can be considered as any food because of the cost incurred and the benefit it brings (Ganapathy, Hay, & Kim, 2012).

Based on the benefits, early and exclusive breastfeeding is recommended. Exclusive breastfeeding, involves giving only breast milk and no other liquid or solids, not even water. However, drops or syrups consisting of vitamins, mineral supplements, or medicines does not limit exclusive breastfeeding. (Berhanu, Zemene, & Mekonnen, 2015). Therefore, non-exclusive breastfeeding is

when food or fluids other than vitamins, minerals, and drugs are given to infants before the age of six months. However, although breastfeeding is widely known for it benefits, duration of breastfeeding is remains short. The short duration of breastfeeding is mostly seen among women with low socioeconomic status. Thus, the impact on the health of mothers and children is substantial when there is suboptimal feeding of children (Duong, Binns, & Lee, 2004). Suboptimal breastfeeding has both short and long term health consequences on children as well as on the economy of both developed and developing countries (Rollins et al, 2016).

Although breast milk is ready-to-use food and is freely available to mothers at no cost, however, suppliers such as breastfeeding brassiere, breast pump and support pillow may be needed for feeding the infant that has a cost. For infants who are fed formula, the cost of feeding also include the cost of the equipment like formula, Muslim clothes and the fuel needed for boiling water (Berridge, Hackett, Abayomi, & Maxwell, 2004).

In the USA. the Department of Agriculture estimated that in 2010, a total amount of $184.40 million dollars was spent to encourage women to properly feed their young children (Bartick, 2011). In 2007, other feeding, besides breastfeeding cost the US economy $13 billion dollars (Bartick, 2011). The difference in the cost of feeding methods might influence the preference of infant feeding However, only a few studies have been done on the cost implications of infant feeding (Kirstin Berridge, 2004).

According to Ball & Bennett (2001), it is estimated that, the average cost of buying formula is two times the cost of breastfeeding, Cumulatively infant feeding amounts to $885 for the first year in a child's life. Furthermore, most of the studies done on this subject do not take into consideration the indirect cost such as time and social stigma as well as the burden on women of infant feeding, but often, only concentrates on the direct cost (Berridge et al., 2004).

In Honolulu, families require an extra $45 to $70 to feed and infant with formula compared with breast milk, over a 62-day period. This estimate, however, does not account for other costs for using feeding bottles, teats, sterilizers, breast pumps, time and social stigma etc., and so the total cost of feeding an infant will be higher (Jarosz, 1993).

1.2 Problem Statement

Infant feeding for the first six months of life is important, because of advantages to both the mother and the child. It is proven that babies who are not breastfed exclusively for the first six months of life have higher likelihood of dying from pneumonia (that is 15 times more those that are fed with formula milk (Garcia et al., 2011). About 220,000 babies could be saved if they are properly breastfed (Arafat, Yousuf, & Al-Battawi, 2017).

Breastfeeding is considered free but a study done in Canada found that families spend so much even when they want to exclusively breastfeed their babies (Knaak, 2005). There is direct cost implication that comes with feeding a child such as buying brassiere, nightwear, formula, breast pump, breast shell/nipple shield, support pillow, breast pad, Muslim clothes, breast pump bottle (Berridge et al., 2004). An obvious difference in cost between feeding exclusive breastfeeding and mixed feeding might affect a family's selection of feeding method. Globally it is estimated that

69% of mothers initiate breastfeeding when they give birth but breastfeeding rate reduces to 42% after six weeks and after six months, it further decreases to 21% (Hamlyn, Brooker, Oleinikova, & Wands, 2002). Breastfeeding rate decline among women with better education and the same trend is seen when income of countries rises (Victora et al., 2016).

The low rate of breastfeeding is mostly among women with high socioeconomic status. The impact on the health of mothers and children is substantial (Duong et al., 2004). It is also estimated that about US$58 billion was spent on commercial baby food including breastfeeding (Holla-Bhar, Iellamo, Gupta, Smith, & Dadhich, 2015).

Also, a decade of new research has shown that the global cost of feeding a child with formula has accelerated from $22.4 billion to over $58 billion and most of this sales growth has been in the developing countries (Muditambi, 2015). The cost of feeding an infant with formula has been reported to have a serious impact on the budgets of a family and the nation (Ryan & Zhou, 2006).

It is estimated that family budgets for infant feeding can range from $6.44 to $13.52 per week for powdered varieties, compared to $24.47 to $32.20 for ready-to-feed products. Families on limited budgets may resort to unsafe practices in order to feed their babies such as skipping feeds, watering down formula or adding low nutrient foods (Greene, 2009). Mothers who are in active careers where payment is dependent on the duration of work could lose income because they would have to cut down on their work to feed their child appropriately (White, Hill, McGovern, Mills, & Smeaton, 2003).

Although the cost of feeding an infant is a major barrier to achieving optimal infant feeding, much attention has not been given to research that seeks to find out the direct cost of feeding an infant.

In Ghana and Sub-Saharan Africa, there is paucity in research on infant feeding cost. With this background, this research seeks to determine the direct cost of infant feeding during the first 6 months of life.

1.3 Justification

Optimal infant feeding is widely recommended because of the health benefit it has on both the child and the mother. Suboptimal feeding an infant has an economic effect on both the mother, family and the nation at large. Even though we know how much mothers, families or nations would have saved if there is optimal breastfeeding, critical attention has not been given to the direct cost of infant feeding. In Ghana and sub-Saharan Africa, much work has not been done on the direct cost of infant feeding. So, the study will help unveil the direct component of how much it costs to feed an infant for the first six months of life. The study will also help to understand the cost of feeding an infant for the first six months of life. Furthermore, the study will add to the literature and serve as a vital source for future research on the cost of feeding an infant for the first six months.

1.4 Objectives of the study

1.4.1 General Objective

To determine the cost of infant feeding during the first 6 months of life.

1.4.2 Specific Objectives

1. To estimate the average household cost of infant feeding for the first 6 months of life.
2. To determine maternal socio-demographic factors associated with the cost of feeding.
3. To describe the breastfeeding practices of women with children under 6 months.

1.5 Conceptual Framework on the cost of infant feeding for the first 6 months of life

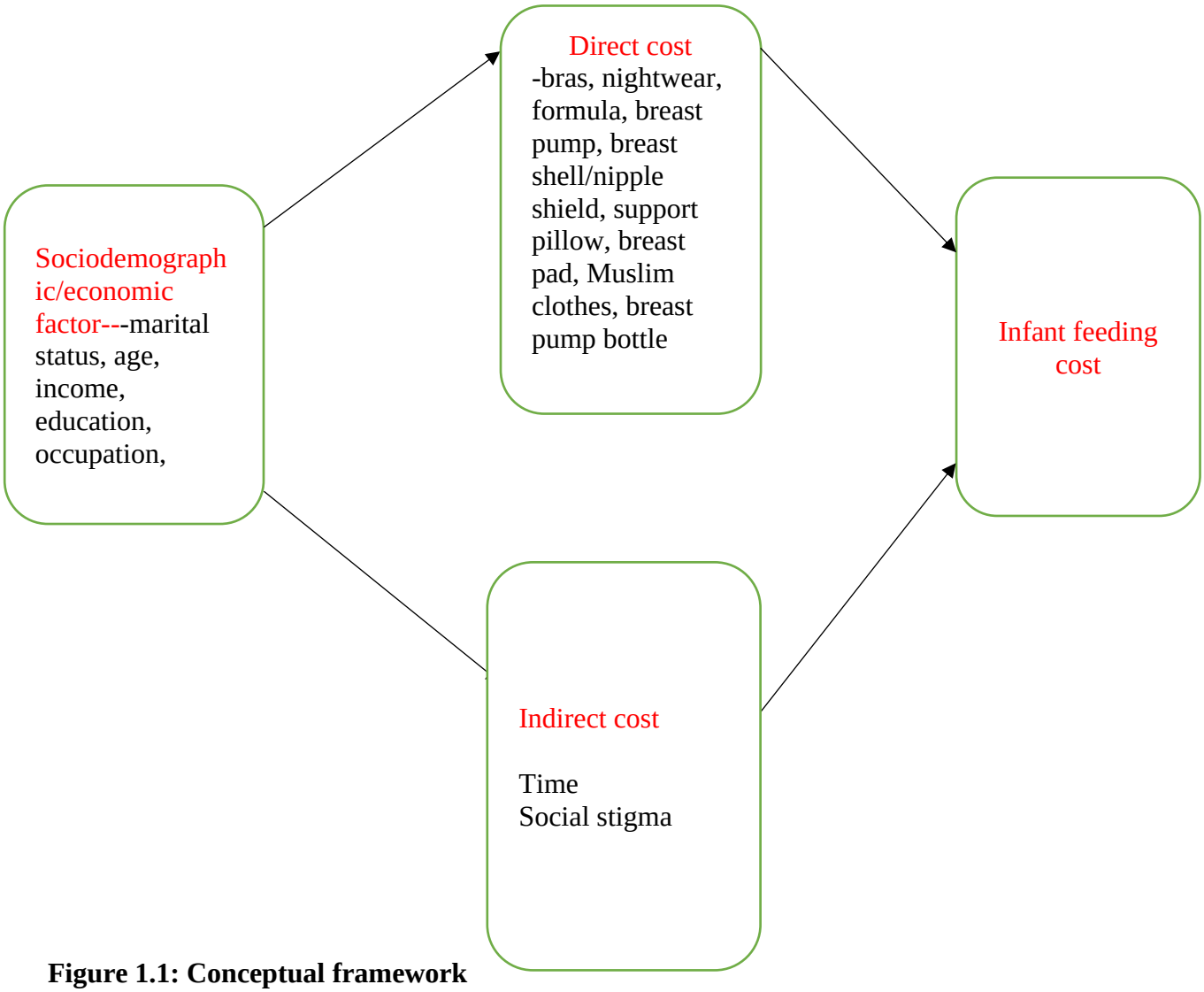


Figure 1.1: Conceptual framework showing the interrelationship between factors that can affect the cost of infant feeding in the first 6 months of life. Adapted from Berridge (2004).

1.5.1 Narration of the conceptual framework

The socio-demographical and economic background of a mother such as income, age, educational level can bring variations in the cost of feeding an infant either directly or indirectly; and the combination of direct or indirect cost leads to the total cost of feeding a child (Dube, 2013). The

direct cost is attributed to inputs that should be bought to either feed or help feed the child such as breastfeeding brassiere, formula, breast pump and support pillow. Indirect cost are activities which could be translated into cost that a mother of family incurs as a result of feeding an infant. Example are time and social stigma. When women have a high level of education, it affords them the opportunity of a career that is involving as a result of that, most do not optimally feed their child and resort to infant formulas and the high cost of these formula increase infant feeding cost. Exclusive breastfeeding rate decline in women with better education (Victora et al., 2015). Also, the maternal occupation has the tendency of influencing infant feeding cost. If a mother is in gainful employment, she can buy things like breastfeeding pump, breastfeeding brassier to enhance feeding the infant. The cost of these items increases the feeding cost of the baby (Silva, Lott, Wickrama, Mota, & Welk, 2011). Moreover, the age of the mother can have an influence on the feeding cost of the child (Lindsay et al., 2008). Teenage girls who do not want to lose their body shape, as a result, they resort to formula feeding instead of breastfeeding (Ijumba et al., 2014). The cost of the formula and other peripherals like spoon, cup and feeding bottle will add to the feeding cost. A household with higher income has the chance of purchasing items like breastfeeding brassier, breast pump and special dresses which increases the cost of feeding an infant. For example, if a woman is using a breast pump which uses electricity, the more it is used, the higher electricity bill and this add up to the cost of feeding a child.

Formula feeding includes acquiring things such as feeding bottle, feeding spoon and cup. The cost of these items increases infant feeding cost (Boye, 2012).

Infant feeding comes with a cost. This is because a woman may have to pay for a lactation consultant if she needs help from the hospital. She'll need nursing bras and nursing pads to put in those bras and maybe nipple cream, a pumping bustier and milk storage bags. An optional

accessories include a nursing pillow and a modesty drape, though those could be replaced with a strategically-placed rolled-up towel and a large square scarf (Berridge et al., 2004).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

In this chapter, the literature on works done that are relevant to this topic is reviewed. Infant feeding practices such as exclusive breastfeeding, prevalent of exclusive breastfeeding globally,

Africa and Ghana, barriers to exclusive breastfeeding, mixed feeding and component of the cost feeding an infant

2.1 Infant Feeding Practices

Breast milk is a fluid of huge complexity, which contain a lot of compositions and helps in growth and development (King, Burgess, Quinn, & Osei, 2015). Breast milk has a balanced composition of the nutrient with 45 and more bioactive factor classes and types, such as growth factors, hormones and enzymes, which has a central role of supporting growth and development in children (Martin, Ling, & Blackburn, 2016). Breast milk is the natural food for an infant, it gives them the natural nutrient and energy requirement needed for the first six months of life (Wojcik, Rechtman, Lee, Montoya, & Medo, 2009).

Breast milk protects infant against infections It also decreases the rate of mortality and helps in the fast recovery of the infant when they are ill. In addition, it improves sensory and cognitive development. It also does not just help the child it also helps in the wellbeing of the mother, helps in births spacing, it also reduces the potential of breast and ovarian cancer and helps reduces the family and national resources on health (Danso, 2014) Most of the malnutrition cases in Ghana is seen among (0-59 months) infant and much of these conditions is linked to poor infant and child feeding practices (Akombi et al., 2017).

2.2 Exclusive breastfeeding

Exclusive breastfeeding is feeding an infant with only breast milk from their mother or wet nurse without anything liquid or solid food with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines (Jessri et al., 2013). The prevalence of exclusive breastfeeding

globally was 36% in 2014 and increased to 43% in 2015 and dropped to 38% in 2016 (Lee et al., 2016).

The prevalence of exclusively breastfed children in Africa, Asia and Latin America below 2 months is 47%-57% (Black et al., 2008). In Ghana, breastfeeding is almost universal among infant. Children who were exclusively breastfed could be affected with other related diseases if after the six months they do not receive complementary feeding. The demand for micronutrients to help keep up growth and development increase and when the right quantity is not given, the child will lack the necessary requirement of nutrient which may lead to undernutrition (Black et al., 2008).

The immense benefits of exclusive breastfeeding prompted the UNICEF and WHO in 1992 to institute the Baby-Friendly Hospital Initiative (BFHI) to reinforce maternal practices in supporting breastfeeding and currently setting a goal of reaching a worldwide target of 50% in exclusive breastfeeding within the first 6 months of life by 2025 (Gomez-Pomar & Blubaugh, 2018).

Globally, exclusive breastfeeding rates of 140 countries were studied by Cai, Wardlaw, & Brown (2012), in a longitudinal study to understand how countries are performing. Analysis of the rates among infants aged five months and below showed a general increase from 33% to 39% in 1995 and 2010 respectively in developing countries. From 12% in 1995 to 28% in 2010, Central and West Africa recorded more than a hundred per cent increase while Eastern and Southern Africa recorded 35% to 47% in 1995 and 2010 respectively. South Asia, however, recorded 40% in 1995 to 45% in 2010. According to Taren & Lutter (2017), 40% of infants have been reported to be breastfed exclusively from birth up to 6months. Of the 60% exclusive breastfeeding rate target set for countries to achieve by the year 2030, only 23 out of 129 countries with available data have achieved the target. Countries in America are not performing well as the scorecard shows only 6%

of these countries having exclusive breastfeeding rates of 60%. Similarly, the situation is not any different in some parts of the African region as countries show disparities in exclusive breastfeeding rates. According to Duubon (2019), low exclusive breastfeeding rates have been recorded in countries such as Cote d'Ivoire (4%), Chad (2%), Gabon (6%), Sierra Leone (8%), Benin (70%) and Rwanda (85%). Exclusive breastfeeding rate for Ghana to be 63% which declined to 46% in 2011 and then increased to 52% in the year 2014 (Duubon, 2019). Though there were an increase and records of steady increases have been noted across Africa as a result of interventions, it still falls below the 90% exclusive breastfeeding rate recommended by WHO to improve the health and wellbeing of infants. This calls for a look into other factors that may be causing declines and small increases in order to reposition and find workable strategies to improve exclusive breastfeeding practices (Mogre, Dery, & Gaa, 2016).

2.3 Exclusive breastfeeding practices

Breastfeeding practices lead to improved health, development and nutrition of infants, the reason why WHO/UNICEF advocate for breastfeeding infants exclusively for longer periods, that is for their first six months after delivery. The longer the period, the greater the benefits derived. Few women according to (Meedya, Fahy, & Kable, 2010) breastfed exclusively up to six months in Western countries which is desirable for the development as well as the growth of the infant. Introducing other liquids, feeds, substitutes of breast milk and using bottles compromise exclusive breastfeeding practices. These practices occur globally, in Africa as well as Ghana which negatively influences exclusive breastfeeding thereby affecting infants, mothers, and the larger

population (Meedya et al., 2010). Studies carried out by Arts et al., (2011) among mothers of infants younger than six months in Mozambique reveled that generally, there was acceptance of the importance and benefits of exclusive breastfeeding, however, mothers gave other foods such as traditional medicines, water and porridges to their infants before they turned six months. Reasons for introducing these feeds ranged from the fact that infants need water to grow well, traditional medicines to cure or prevent certain childhood diseases sometimes caused by spirits and porridges at about months four to six so that the child can learn how to eat as well as help in child growth as breast milk alone is not sufficient. Findings of Aborigo et al., (2012) in rural Northern Ghana also showed that though mothers know how important it is to exclusively breastfeed, their traditional practices regarding the general feeding of the infant resulted in the introduction of water and other feeds which are consistent with the above foods to infants below the age of six months thereby hampering breastfeeding exclusively. Again, reports from studies conducted in a military barracks in Nigeria showed that findings. Another study in South Africa by Goosen (2013) showed that mothers introduced water, formula feed and others than recommended practice of breastfeeding exclusively from birth until six months Breastfeeding mothers introduced other feeds as well as used bottles to feed infants below six months (Akinyinka, Olatona, & Oluwole, 2016). Data form the GDHS indicate that in 1993, 2% of Ghanaian children aged 4-6 months were exclusively breastfed, this increased to 36% in 1998 and 53% in 2003. In 2008, the prevalence of exclusive breastfeeding stood at 63% and this was attributed to the Baby-Friendly Hospital initiative that was being implemented within the country, but there was a drop-in prevalence from 63% in 2008 to 52% in 2014. Averagely, the prevalence of breastfeeding among Ghanaian mothers has always been above 97% from 1988 to 2014 (GSS et al, 1988, 1993, 1998, 2003 and 2015). Consequences of not exclusively breastfeeding have great implications for

the future prosperity of a country. Countries, however, are not protecting, promoting, and supporting breastfeeding adequately through funding and/or policies. Malnutrition has been found to increase the chances of a child having to die from numerous diseases such as diarrhoea, pneumonia and measles. About 70% of neonatal deaths can be prevented when they are exclusively breastfed (Onah et al., 2014). The global burden of diseases, injuries and risk factors reported that the second largest factor in the world regarding children below five years is sub-optimal feeding and this accounts for a financial loss of 47.5 million. African countries that are in the south of the Sahara, however, are the most terribly affected recording the highest rates of the burden of disease-associated to breastfeeding sub-optimally (Mogre et al., 2016). Sudden infant death syndrome is also associated with non-breastfed infants (Danso, 2014). The benefits of breastfeeding exclusively derived by mother and infant as well as the consequences of not practising it translates to families, communities and the nation at large. Less time and money will be used to treat diseases thus resulting in economic gains if exclusive breastfeeding is practised and for longer periods otherwise, huge sums of monies and time will be spent on medicines and in the hospitals to treat diseases that could have been prevented (Danso, 2014). According to Rollins et al., (2016), when there is a commitment from countries in support of policies and programs relating to exclusive breastfeeding, the rates will go up.

2.4 Barriers to Breast Feeding

Long stay at the hospital after delivery can result in initiating breastfeeding late (Prior et al., 2012) Again, hospital practices where mother are separated from infant affect early breastfeeding initiation (World Health Organisation, 2009). Also, inadequate knowledge and skill of health care providers on providing breastfeeding information to nursing mothers, teaching them on the benefits and technique of breastfeeding affect breastfeeding practice (Levinienė, Petrauskienė,

Tamulevičienė, Kudzytė, & Labanauskas, 2009). Furthermore, unfounded beliefs and some cultural practices where colostrum is seen as harmful and contaminated and thrown away also serve as a barrier to exclusive breastfeeding (Bandyopadhyay, 2009). Poor positioning and attachment which result in breast problems like mastitis, engorgement, nipple sores and abscess affect breastfeeding (Avery, Zimmermann, Underwood, & Magnus, 2009).

2.5 Mixed Feeding

Mix feeding is feeding a child with breast milk and other food, this feeding method affects the production of breast milk; this is because the production of breast milk is linked with the frequency of sucking from the child which the liquid interrupt. Mixed feeding is initiated for reasons such as; when the baby is not gaining required weight when the breast milk supply is low when their social stigma and occupational pressures. A study found that about 5% of postpartum mothers are not able to produce enough milk to exclusively breastfeed infants for the first six months and so result to mix feeding (Duong, Lee, & Binns, 2005). According to work done by Chudal (2018), shows that when practicing mixed feeding for the first six months of life of an infant can open up the child's organ system and also expose the child gastrointestinal tract to inflammation, illness and diseases and cause babies to turn to prefer the bottle teat to the breast.

2.6 Cost and Component of Infant Feeding

In the US the Department of Agriculture found out in 2010 that, a total amount of $184.40 million dollars was spent on infant feeding to encourage women to properly feed their children (Bartick, 2011). Feeding a child with breast milk boosts the immune system and reduces susceptibility to

acquiring infections which also reduces the cost of health care in present and future years (Walters et al., 2016).

In 2007 other feeding aside breastfeeding cost of $13 billion dollars of the US economy (Bartick, 2011). Suboptimal breastfeeding does not only bring short and long term health consequences but also has a negative implication on the economy of both developed and developing countries (Rollins et al, 2016).

The difference in the cost of feeding methods influence the preference of infant feeding, but very little studies have been done on the cost implications of infant feeding (Kirstin Berridge, 2004). Those researches conducted focused on the cost of infant feeding concentrated on the savings to the health-care system. According to the US department of health it was approximated that about $35 million was used every year treating gastroenteritis among infant fed with formula, and when there is 1% increase in breastfeeding rate for three months, an amount of $500000 is saved on the treatment of gastroenteritis (Furber & Thomson, 2006).

According to Weimer (2001) it has been estimated that the USA will save a minimum of $3.6 billion when breastfeeding is increased from the current (64% initiation, 29% at 6 months), (75% initiation and 50% at 6 months) as recommended by the US Surgeon General.

According to Agunbiade & Ogunleye (2012), human milk has economic significance on three interwoven levels: commercial, family and the community levels. Breast milk can be considered as any food because of the cost incurred and the benefit it brings (Ganapathy et al., 2012).

The breast milk is an already prepared food and the equipment needed for feeding the infant form the cost of feeding infant and also the cost in feeding the child with breast milk is the food the

mother needs to consume to produce the milk. This is different for formula, the cost of formula does not include only the cost of the formula, but also the cost of the equipment and the fuel needed (Berridge, Hackett, Abayomi, & Maxwell, 2004).

According to Ball and Bennett (2001), it is estimated that averagely the cost of buying formula is two times the cost of breastfeeding and cumulatively infant feeding amount to a cost of $885 for the first year in a child's life. Furthermore, most of the studies done do not take into consideration the indirect cost of infant feeding but only concentrate on the direct cost (Berridge et al., 2004).

A research in Honolulu, on the cost of food a mother require to feed an infant and the cost of formula for 62 days, after calculating it was revealed that, at least an extra $45 to $70 is needed to feed child with formula than breastmilk, but these amounts did not account for other accessories used for infant feedings such as bottles, teats, sterilizers, breast pumps, time and social stigma etc., and so the total cost of feeding an infant will be higher than what is being estimated (Jarosz, 1993).

CHAPTER THREE

METHODS

3.0 Introduction

This chapter is on the methodology of the study. It looks at the study design, study site, study population, data collection, quality control, data capture and analysis, sample size and techniques and ethical consideration.

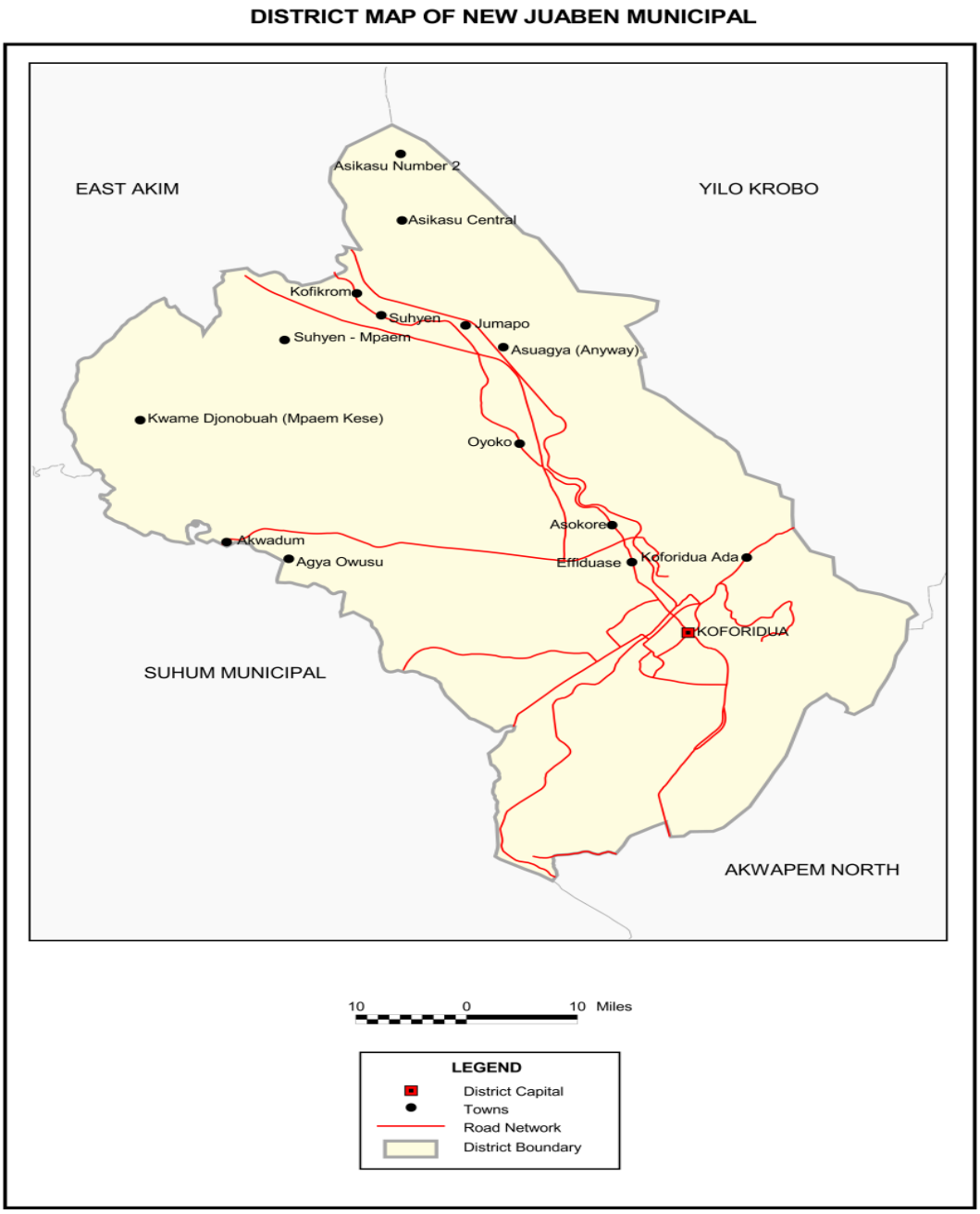
3.0 Study Design

This was a cross sectional study involving mothers with infants of at least 6 months who were attending postnatal clinics in the New Juaben south municipality.

3.1 Study Site

The New Juaben south is one of the 13 municipalities in the Eastern Region of Ghana. Its capital is Koforidua. The municipal shares boundaries with the East Akim district in the north, the Akuapim north district in the south, the Yilo Krobo municipal in the east and the Suhum municipality in the west. The municipal is the smallest in the region. The municipality has a total fertility rate of 2.4. It is lower than the Eastern region average of 3.5. In terms of the General Fertility Rate (GFR), the municipal has a rate of 68 births per 1000 women aged (15-49 years) whereas the Crude Birth Rate (CBR) is 19.7 per 1000 population (*New Juaben municipal*, 2014). The municipal has a total of 7 hospitals, 54 Community-Based Health Planning and Services (CHPS) compounds, 3 polyclinics and 3 health centres. In order facilitate recruitment of the study participants, the study elected to the hospitals. Four hospitals were randomly selected the list of 7. The selected hospitals were SDA hospital, St. Joseph's hospital, Providence hospital and the

Koforidua regional hospital. All the selected hospitals are located in Koforidua. In all the selected hospitals, child welfare clinics are held on each day.



(GSS, 2010).

3.2 Study population

The study population were nursing mothers (18-45 years) who attended child welfare clinic (CWC) within the municipality with their infants (≤ 6 months).

3.4 Sample Size Determination

The target sample size was calculated using the Cochran formula (Cochran, 1963).

$n = \frac{z^2 \times p\,(1 - p)^2}{d^2}$ where:

n = target sample size

z^2 = z-score for 95% Confidence interval (1.96)

p = prevalence for appropriate infant feeding practices (50% for unknown)

d^2 = desired precision (0.05)

$n = 1.96^2 \times 0.50\,(1 - 0.50)^2 / (0.05)^2$

= 377 lactating mothers.

After accounting for 10% non-respondent rate, the targeted sample size became 415.

3.5 Data collection

A pretested questionnaire was used to collect data on data on maternal background characteristics socioeconomic and demographic factors, child feeding practices, and cost of feeding items. Maternal background included questions on maternal age, highest level of education completed, primary occupation, marital status and religion. Child feeding practices included questions on initiation of breastfeeding, and diet intakes. Cost of feeding items includes cost items on breast pump, breastfeeding brassier, feeding utensils, breast milk storage cup/bag, breastfeeding-friendly dresses, breastmilk substitute, thermos flask, water, and fuel. It also included the cost of babysitting services.

3.6 Data Capture and Analysis

Data was entered and cleaned with STATA version 14. Continuous variables were reported using means and standard deviations whereas categorical variables were reported in frequencies and percentages. Variable categorizations and analyses are summarized below in Tables 3.1 and 3.2. The nursing mothers were asked the things they bought to feed infant such as the brassier, breast pump, cup, spoon, utensil, time spent and thermos flasks over the period. Total feeding cost was calculated by summing up all the costs associated with infant feeding.

Table 3.1 Variable categorization

Variable	**Variable definition**
Maternal demographic factors	
Maternal age	18 – 29 > 30
Highest educational level completed	No education up to Junior Secondary School – Basic education After Junior Secondary School – Post-basic education
Primary occupation	Salaried Non-salaried workers
Marital status	Married Single Divorced/separated/widowed
Religious affiliation	Christianity Islamic No religion
Child feeding	
Initiation of breastfeeding	Appropriate initiation of breastfeeding – within the first hour of birth Inappropriate initiation of breastfeeding – After the first hour
Dietary intake (for the previous day)	Exclusive breastfeeding Mixed feeding
Cost of feeding items	
Cost items for breast pump, breastfeeding brassier, utensils, breastmilk cup/bag, special dress, thermos flask, water, fuel	Continuous variables
Babysitting services and monthly income lost	Continuous variables

Table 3.2 Data analyses

Objectives	Variable	Statistical test
Objective 1: To compare exclusive breastfeeding cost and mixed feeding cost	1. Mean exclusive breastfeeding cost 2. Mean mixed feeding cost	Independent T-test. Level of significance was tested at p-value < 0.05.
Objective 2: To determine maternal factors associated with the cost of feeding	1. Maternal socio-economic factors (feeding type, age, primary occupation, and marital status) 2. Feeding costs	Logistic regression was used to find the association between feeding cost and the maternal factors. The feeding cost was used as the dependent variable. The feeding cost was categorized using the median as cut-off value. The feeding costs that were below the median value were coded as '0' and labelled 'low feeding cost'. Those above the median value were coded '1' and labelled as 'high feeding cost'. The Receiver operating characteristic was used to validate the cut-off point. The independent variables were maternal age, highest education completed and occupation. Level of significance was tested at p-value < 0.05.
Objective 3: To describe the breastfeeding practices of women with children under 6 months	1. Initiation of breastfeeding 2. Dietary intakes (for the previous day)	1. Proportion of the women who initiated breastfeeding within an hour of delivery to the total participants. 2. Proportion of the women who exclusive breastfed to the total participants.

3.7 Sampling Techniques

Table 3.2. Sample Selection from the Hospitals

Hospitals	Women in fertility age population attending Hospital in 2017.	Proportion from each hospital based on the sample size (415)
Koforidua Reginal	28,953	174
ST Joseph	22,749	136
SDA	9651	59
Providence	7583	46

The study was carried out in four selected government hospitals in the New Juaben Municipality. The study took place from 31st July, 2018 to 30th August, 2018. On each of the field data collection day, mothers were targeted for recruitment based on the child's age. Nursing mothers' others of

children who were apparently healthy were included in the study. Nursing mothers were excluded if they decided against participating in the study. Those who agreed to participant signed an informed consent. Eligible mothers were enrolled on the study as they qualified using a simple random sampling technique until the target sample size at the various hospitals was exhausted.

3.7 Quality Control

Questionnaires were pretested at the Koforidua polyclinic. The pre-testing helped to correct ambiguous and estimate average for the administration of the questionnaire. Furthermore, research assistants were trained for three days and took part in the pretesting. After each field day, the questionnaires were checked for completeness and consistency.

3.8 Ethical Consideration

Ethical clearance was sought from Ghana Health Service Review Board (GHS-ERC104/12/170). Questionnaires were administered to those who agreed to participate. Furthermore, permission was sought from the management of the various hospitals involved in the study. The coded questionnaires were kept in a cupboard under lock and key which was kept by the principal investigator. The entered data was also kept on the computer and was password protected.

CHAPTER FOUR

RESULTS

4.0 Introduction

Chapter four presents findings of the study on estimation of the cost of infant feeding within the first 6 months of life in the New Juaben Municipal. The result presented in this chapter is for the 425 mothers who completed the study.

4.1 Socio –demographic characteristic of the respondents

The mean age ± standard deviation of the women was 29.8± 5.0 years. The majority of the women were between 18 and 29 years (52.5%), had post-basic education (59.8%), were non-salaried workers (58.4%), married (81.9%) and were Christians (81.2%).

Table 4.1: Socio-demographic characteristics of the respondents (n=425)

Characteristic	Frequency/ mean± SD	Percentage
Maternal age (in completed years)	29.8± 5.0	
18 – 29	223	52.5
> 30	202	47.5
Highest education completed		
No Formal Education	15	3.5
Basic[a]	156	36.7
Post-basic [b]	254	59.8
Maternal primary occupation		
Salaried	175	41.4
Non-salaried	248	58.4
Marital status		
Single	68	16.0
Married	348	81.9
Divorced/separated/widowed	9	2.1
Religious affiliation		
Christianity	345	81.2
Muslim	78	18.4

[a] Up to Junior Secondary School
[b] Includes Secondary School/Senior High School and Tertiary education

4.2 Child Feeding

Majority of the women appropriately initiated breastfeeding (57.2%) (See Figure 4.1) and mixed fed (57.2%) (See Figure 4.2) their infants within the 24-hours preceding the interview.

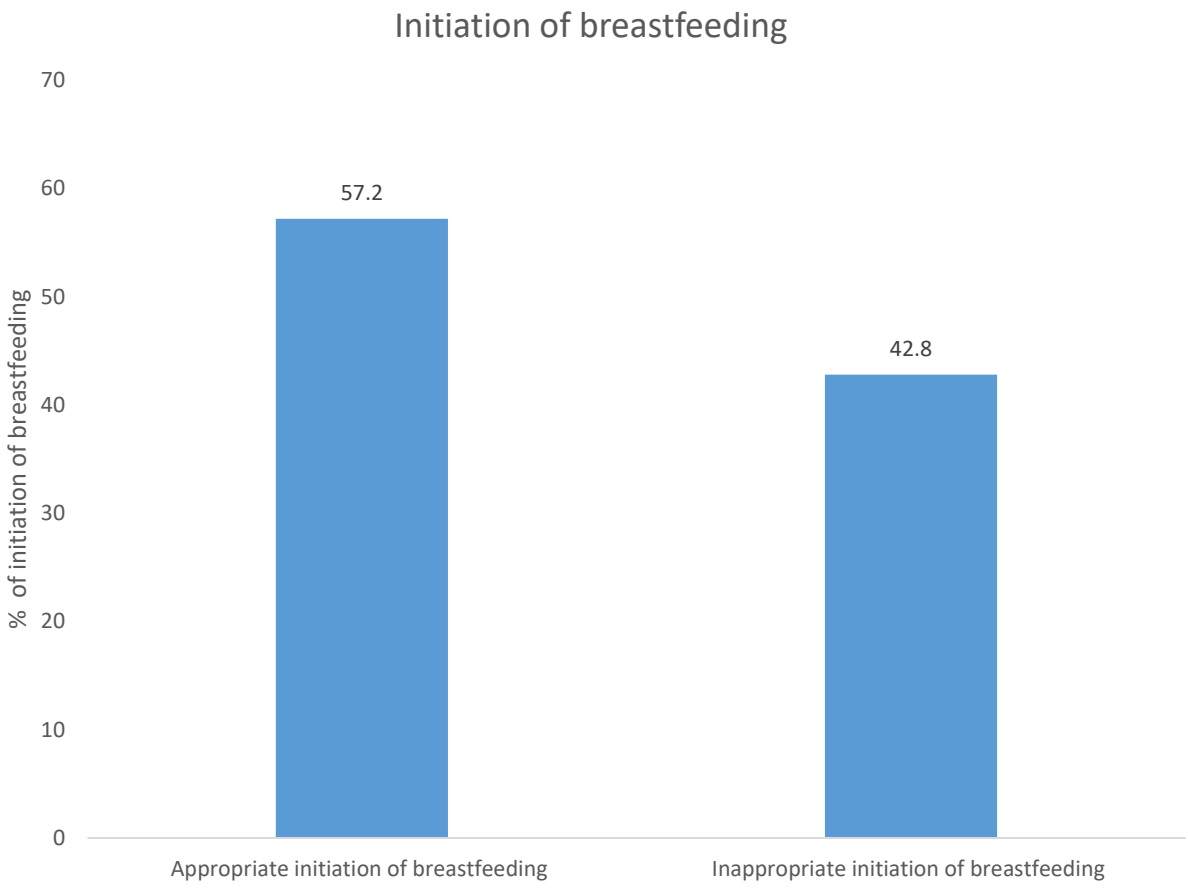


Figure 4.1: Initiation of breastfeeding among the mothers

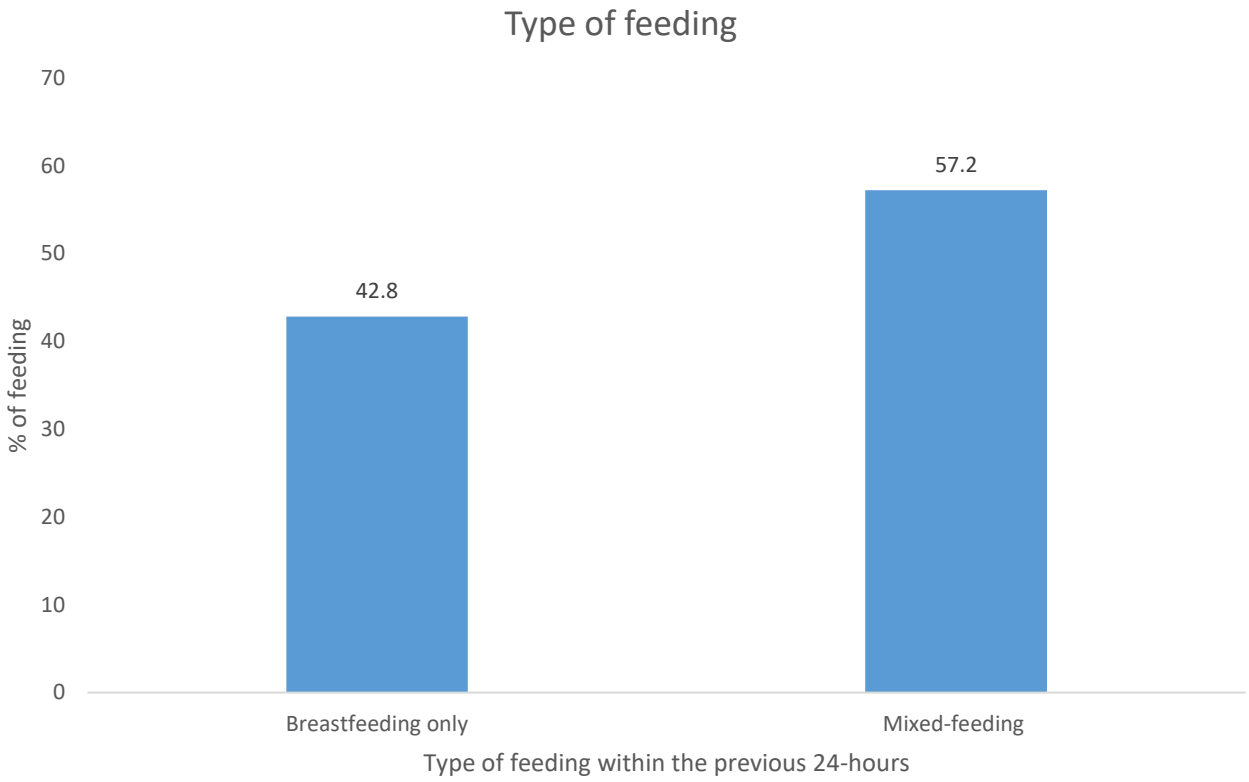


Figure 4.2: Types of feeding within the 24-hours preceding the interview

4.3 Feeding items

The majority of the women who practiced mixed feeding (65.3%) did not buy breast pumps while the majority of the women who practiced exclusive breastfeeding (68.1%) did. Over three-thirds of the women practicing mixed feeding (88.5%) and breastfeeding (84.6%) bought breastfeeding brassier during the first 6 months of life. Almost all the women who practiced mixed feeding (96.3%) and breastfeeding (93.4%) bought feeding utensils during the infant's first six months of life. The women who practiced mixed feeding (62.0%) bought more breastmilk substitute than those who practised exclusive breastfeeding (2.3%), bought more fuel (75.8%) than those who practised exclusive breastfeeding (9.7%), went to work (7.5%) more than those who practised

exclusive breastfeeding (2.8%) and engaged the services of babysitters (6.1%) more than those who practised exclusive breastfeeding (1.7%).

Table 4.3: Feeding items between mixed feeding and exclusive breastfeeding

		Feeding type	
Feeding items		Mixed-feeding (n=243)	Exclusive breastfeeding (n=182)
Breast pump/ per six months since birth	No	156 (65.3%)	124 (68.1%)
	Yes	83 (34.7%)	5.8 (31.9%)
Breastfeeding brassier/ per six months since birth	No	28 (11.5%)	28 (15.4%)
	Yes	215 (88.5%)	154 (84.6%)
Feeding utensils/ per six months since birth	No	9 (3.7%)	12 (6.6%)
	Yes	234 (96.3%)	169 (93.4)
Breastfeeding storage cup/ per six months since birth	No	166 (71.2%)	135 (75.4%)
	Yes	67 (28.8%)	44 (24.6%)
Breastfeeding special dress/ per six months since birth	No	15 (6.2%)	12 (6.6%)
	Yes	227 (93.8%)	170 (93.4%)
Breastmilk substitute/ per six months since birth	No	60 (38.0%)	172 (97.7%)
	Yes	98 (62%)	4 (2.3%)
Thermos flask/ per six months since birth	No	8 (3.3%)	12 (6.6%)
	Yes	235 (96.7%)	169 (93.4%)
Water/ each day	No	53 (28.0%)	163 (91.6%)
	Yes	130 (71%)	15 (8.4%)
Fuel for cooking/ each day	No	40 (24.2%)	158 (90.3%)
	Yes	125 (75.8%)	17 (9.7%)
Babysitting services/ per month	No	154 (93.9%)	176 (98.3%)
	Yes	10 (6.1%)	3 (1.7%)
Absence from work/ for any month	No	221 (92.5%)	173 (97.2%)
	Yes	18 (7.5%)	5 (2.8%)

4.4 Feeding costs

Women who practiced mixed feeding bore a significantly higher cost than those who practiced exclusive breastfeeding.

Table 4.4: Feeding costs between mixed feeding and exclusive breastfeeding

Feeding item costs	Mixed feeding/ mean ± SD	Exclusive breastfeeding / mean ± SD
Breast pump	93.4 ±48.2	83.6 ± 43.6
Breastfeeding brassier	69.0 ±45.9	60.0 ± 41.6
Feeding utensil	25.9 ±38.1	22.7 ± 18.2
Breastfeeding storage cup	26.3 ± 9.4	26.6 ± 8.8
Special dress cost	315.8 ± 228.4	260 ± 165.2
Breastfeeding substitute cost	32.2 ± 13.6	37.8 ± 13.3
Thermos flask cost	44.0 ± 40.53	38.7 ± 21.6
Water cost	1.62 ± 2.35	2.2 ± 4.8
Fuel cost	14.57 ± 4.8	11.8 ± 2.7
Babysitting services cost	280.0 ± 150	300.0
Cost in kindness	75 ± 33.35	150.0
Average Total cost of feeding/ per for 6 months since birth	1111.7 ± 10.83.3	885.1 ± 952.9*

* p-value associated with the Independent T-test is 0.025. Level of significance is tested p-value < 0.05.

4.5 Association between feeding costs and characteristic of the mothers

Primary occupation and type of feeding were the significant factors in the logistic regression analysis. Salaried mothers were almost five times more likely to have high infant feeding cost as compared with non-salaried mothers whereas mothers who practised mixed feeding were almost twice more like to have high infant cost of feeding as compared exclusive breastfeeding mothers

Table 2.5: Association between infant feeding cost and socio-demographic characteristic of the mother

Maternal socio-demographic factor[1]	Odds ratio (95%CI)	p- value[2]
Type of feeding		
Mixed-feeding	1.84 (1.25 – 2.720)	0.02
Exclusive breastfeeding	1	
Maternal age		
18 – 29	0.969 (0.64 – 1.49)	0.882
> 30	1	
Education		
Basic	0.955 (0.59 – 1.55)	0.853
Post-basic	1	
Occupation		
Salaried	4.91 (3.0 – 7.93)	< 0.001
Non-salaried	1	

[1]The dependent variable is adequate feeding cost.
[2] p- value associated with linear regression. Significance is tested at $p < 0.05$

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter discusses the findings of the study.

5.1 Breastfeeding practices of women with children under 6 months.

It is recommended by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) that breastfeeding should be initiated within the first hour of birth and exclusive breastfeeding be done for six months (*Capture the Moment – Early initiation of breastfeeding: The best start for every newborn.*, 2018). Early initiation of breastmilk provides the infant with colostrum which has been shown to prevent infants from infections, reduce child morbidity and mortality and is a predictor of exclusive breastfeeding (Abie & Goshu, 2019). In the current study, more than half of the women appropriately initiated breastfeeding. This figure is higher than the 40% and 43% of appropriate initiation of breastfeeding recorded in West and Central Africa and 13 Economic Community of West African States (ECOWAS) respectively ("Capture the Moment – Early initiation of breastfeeding: The best start for every newborn.," 2018; Ezeh et al., 2019). The difference in the prevalence reported here could be due to the difference in sample sizes.

The prevalence of appropriate initiation of breastfeeding in this study was, however, lower than 63.4% reported in Tema (Asare, Preko, Baafi, & Dwumfour-Asare, 2018). Tema is an urban area. It has been shown that urban areas tend to have higher rates of initiation of appropriate breastfeeding than rural areas (Senanayake, O'Connor, & Ogbo, 2019). In Tamale, 39.4% of the women initiated breastfeeding within an hour after birth (Nukpezah, Nuvor, & Ninnoni, 2018).

This might be due to regional inequalities and cultural factors surrounding initiation of breastfeeding.

Exclusive breastfeeding (EBF) has shown to have many health benefits from both mother and child including protection from infections, maternal obesity, and child neurodevelopmental outcomes (Dieterich, Felice, O'Sullivan, & Rasmussen, 2013). According to the 2014 Ghana Demographic and Health Survey, the national prevalence of exclusive breastfeeding was 52% at 6 months (Ghana Statistical Service & Ghana Health Service, 2015). In the current study, half of the participants practised exclusive breastfeeding which is lower than the national rate. This is might be because of difference in the sample sizes.

The prevalence of exclusive breastfeeding recorded in this study was lower than 66% reported in Tema (Asare et al., 2018). This could be because Tema is an urban area. The prevalence of EBF, is however, similar to 51.8% recorded among mothers in Accra (Aidam, Pérez-Escamilla, Lartey, & Aidam, 2005). In Wa, among professional working women, it was reported that 10.3% practiced EBF (Dun-Dery & Laar, 2016). This could be that the work was a barrier to EBF among the women.

5.2 Cost of infant feeding

A cost difference might suggest which feeding method that a woman might decide on. Breast milk comes 'ready-to-feed'. Even though the equipment needed for its delivery is free, the mother might purchase items including breast pump and special breastfeeding dress which might aid in breastfeeding. The cost of formula-feeding might include the cost of infant formula, equipment

and fuel needed to prepare infant food (Berridge et al., 2004). In the current study, the cost of formula feeding was significantly higher than the cost of EBF. Even though, there is paucity of data to compare with, this is expected. This might be because mothers who formula fed their infants bought many items purposely for infant feeding.

5.3 Factors associated with infant feeding

Socioeconomic status has been shown to be associated with infant feeding costs. Demographic factors such as occupation have been used as proxies for socioeconomic status (Onah et al., 2014). In this study, salaried women were significantly more likely to have a higher cost infant feeding as compared to non-salaried women. This might be because salaried mothers might have more disposable income.

Women who practised mixed-feeding were significantly more like likely to spend a higher cost on infant feeding than those who breastfed. This might be because bought many items purposely for infant feeding.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter draws conclusion and recommendation from the findings.

6.1 Conclusion

The prevalence of appropriate initiation breastfeeding was high among the mothers while the rate of exclusive breastfeeding was low. The cost of mixed feeding was higher than exclusive breastfeeding. Salaried mothers and those who practised mixed feeding spent more money on infant feeding.

6.2 Recommendations

1. The lower cost of exclusive breastfeeding should be used in advocacy and promotion of breastfeeding

2. Further research should be conducted on the cost of infant feeding beyond the 6 months of life.

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APPENDICES

Appendix 1: Timeline

WORK PLAN	July-August 2017	October 2017	December 2017	January 2018	February-April 2018	May 2018
Proposal Developing						
Submission of proposal for ethical approval						
Training of Research Assistant						
Data Collection						
Data Analysis						
Submission of report						

Appendix 2: Budget

ACTIVITY	RESOURCES NEEDED	QUANTITY	FREQUENCY	UNIT COST₵	TOTAL COST ₵
Proposal Developing	Ream of A4 sheet	2	1	85.00	170.00
Training of data collectors	Lunch T&T	4 4	1 1	50.00 75.00	200.00 300.00
Printing of 422 questionnaire		422 questionnaires	1	0.25	105.50
Data collection	T&T	4	30	5.00	600.00
Printing and binding of report		4	1	50.00	200.00
Grand Total					1575.50

A. PARTICIPANT CONSENT FORM

Study Title: Estimation of the Cost of Infant Feeding for the First 6 months of life in New Juaben Municipality.

Introduction: My name is _Simon Dagbie_ (interviewer's name) and 1 work with the new Juaben Municipal Health Directorate. I am here to conduct a research on Estimation of the cost of infant feeding for the first 6 months of life in New Juaben Municipality.

Purpose: The purpose of the study is to determine the cost and time for feeding infant for the first 6 months of life.

Procedures: If you are willing to be part of this study, 1 will ask you some questions about yourself and your child feeding. The exercise of administering the questionnaire will take about 35 minutes.

Risks /Discomforts

There is no possible risks of the study only you may feel uncomfortable answering some questions. If there are questions that you do not want to answer, you may refuse to answer them without consequences. The information obtained in this interview will not be identified with you in any way. There are no direct benefits to participating in this study. However, findings from the study is expected to be used to improve nutritional status of infant.

Costs and Compensation: Also, there will not be any cost incurred by you as a result of participating in this study. You will also not be paid for your participation in this discussion however should your participation in the study result into you incurring any cost then the principal investigator will reimburse it back to you.

Confidentiality

During the interview, whatever you say will be treated confidential so feel relax to express your views. Your name will not be used in the analysis or dissemination of the results. The information you give to us will be put together with what others tell us so it cannot be linked to you. The information obtained from you will be kept confidential and will be used solely for the intended purpose and you will not be identified in any public report.

Voluntary participation/withdrawal: Your participation in this study is voluntary. You can stop participating in this study at any time without consequence. If you do not want to be in this study, there will be no consequences. However, your view will help enrich the interventions to address infant feeding. . I would be grateful if you could take some time off your busy schedule to participate in the aforementioned exercise

Outcome and Feedback: The outcome of this study will be used to improve nutrition of infant in New Juaben Municipality and beyond.

Funding information: The study is solely being funded by the principal investigator.

Do you have any questions for me to clarify before we proceed further with the discussions?

Yes ☐ **No** ☐

B. PARTICIPANT STATEMENT AND SIGNATURE

I have been adequately informed about the purpose, procedure, potential risks and benefits of this study. I have had the opportunity to ask questions and have been provided answers to my satisfaction. I know that I can refuse to participate in this study without any loss of benefit for which I would be entitled. I understand that even if I agree or as I have agreed, I can withdraw my consent at any time without losing any benefits or services to which I am entitled. I also understand that the information collected will be treated confidentially and will be used only for the purpose informed. Finally findings/results may assist us in policy development as regards to infants feeing in New Juaben Municipality and beyond.
I freely agree to participate in this study

_____ _____

Respondent's Name/ signature/thumb print Date

C. INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed. It is my opinion that the participant understands the purpose, risks, benefits and procedures that will be followed in this study and has voluntarily agreed to participate

_____ _____

Interviewer's Name / Signature Date

Who to Contact for Clarification: For further information or clarifications you may contact **Simon Dagbie** (Principal Investigator) on telephone number **0243466478, email:dagbie.simon@yahoo.com** or Hannah Frimpong **(GHS-ERC)** on telephone number 0507041223.

Appendix 4: Data collection tool

SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF GHANA, LEGON
MASTER IN PUBLIC HEALTH PROGRAMME

Title of project: Estimation the cost of infant feeding for the first 6 months of life
Date of interview: / / Time of interview
Form No: ----------

No	Question and filters	Coding/Response category		Skip To
1.	How old were you? (at your last birth day)			
2	What is your highest level of education completed?	1 No formal education 2 Primary 3.JSS/Middle school 4.Secondary/SHS 5.Diploma holder 6. Tertiary		
3	What is your primary occupation?	1.Petty trader 2. Civil servant 3.Business women 4.Banker 5. Teacher 6. security services 7 Other (specify)_____		
4	What is your current marital status	1.Single 2.Married 3.Divorced 4.Separated 5.Widowed 6.Other(specify)_____		
5	Which religious group are you affiliated with?	1.Christianity 2.Muslim 3.Traditionalist 4.No Religion 5.Other (specify)		
Child feeding				
6	How long after birth was <youngest child name> put to breast?	1. Immediately 2. Within 1 hour of delivery 3. Within 2 hours of delivery 4. After 24 hours of delivery 5.Never		
7	Tell me everything that <youngest child name> ate or	Food/fluid consumed	Time	

	drank yesterday at this time until now. *(List every thing given [including water] and the time and ensure that everything consumed in the past 24 hours is accurately reported; probe by asking is that all?*			
	Breastfeeding Items			
8	Tell me which items you have purchased or used to feed <youngest child name> in the past one month.			
	For the next questions, ask the woman to answer for the past 4 weeks			
9	Did you buy breast pump when you gave birth to this < youngest child name>?	1.Yes 2.No		
10	If question 9 is yes , how many were bought			
11	How much or the cost of the breast pump?			
12	Did you buy breastfeeding brassier purposely for this child?	1.Yes 2.No		
13	If yes, how many?			
14	How much or cost?			
15	Did you buy Feeding cup/spoon or other utensil purposely for this child?	1.Yes 2.No		
16	If yes, how many?			
17	The cost?			
18	Did you buy breast milk storage cup/bag	1.Yes 2.No		
19	If yes, the cost involved?			
20	special/different dress related to feeding the child (e.g. breastfeeding-friendly dress)	1.Yes 2.No		
21	If yes to question 20?			
22	How much?			
23	Formula (Breast milk substitute) *Ask respondent to tell the price per can, number of cans*			

	fed per week to use it calculate the cost		
24	Did you buy Thermos Flask purposely to feed this child?	1.Yes 2.No	
25	If yes, how many?		
26	How much?		
27	Did you buy water for this child?	1.Yes 2.No	
28	How much?		
29	Did you buy fuel for preparing child's food	1.Yes 2.No	
30	If yes, type of fuel?	1.Fire wood 2.Gas 3.Electricity 4.Charcool 5.Other (specify)	
31	How much?		
32	How much time did you spend purchasing the child food?		
	Considering activities related to feeding the child how much time did you spend in a day <youngest child name>?	1.Preparing food for the child 2.Feeding the child 3. Cleaning the child	
33	Preparing food for the child		
34	Feeding the child		
35	Cleaning the child		
36	Did you engage services of someone to feed your baby?	1.Yes 2.No	
37	If yes how much money did it cost you?	_____cedis	
38	If yes, how much did it cost you, in kind?		
39	How much time was spent		
40	Did someone else in the family e.g. spouse, child or relative feed the child in the past one month?	1.Yes 2.No	
41	If yes, how much time was spent in one week?		
42	Were you able to go to work or earn income in the past one month?	Yes No	
43	If No, how much income did it cost you or lost for not going to work?	_____cedis	

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

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Ghana Health Service
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Email: ghserc@gmail.com

MyRef. GHS/RDD/ERC/Admin/App 18/366
Your Ref. No.

31st July, 2018

Simon Dagbie
University of Ghana
School of Public Health
Legon, Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC104/12/17**
Project Title	Estimation of Cost of Infant Feeding for the First Six (6) Months of Life
Approval Date	31st July,2018
Expiry Date	30th July, 2019
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra