

UNIVERSITY OF GHANA

COLLEGE OF HUMANITIES

**BIRTH WEIGHT, BIRTH SIZE AND EXCLUSIVE BREASTFEEDING IN
GHANA**

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA,
LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR
THE AWARD OF PHD POPULATION STUDIES DEGREE**

REGIONAL INSTITUTE FOR POPULATION STUDIES

JULY, 2019

ACCEPTANCE

Accepted by the College of Humanities, University of Ghana, Legon, in partial fulfillment of the requirement for the award of Doctor of Philosophy in Population Studies degree.

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DECLARATION

I, MARTIN WIREDU AGYEKUM, hereby declare that, except for references to other people's work, which have been duly acknowledged, this is the result of my own research and it has neither in part nor whole been presented for another degree.



MARTIN WIREDU AGYEKUM

10th August 2020

DATE

DEDICATION

This work is dedicated to my family especially my best loving parents. Mr. Justice Daniel Attah Agyekum and Elizabeth Boateng, God richly bless you for the support and encouragement.

ACKNOWLEDGEMENT

Glory be to God for His grace, strength, and wisdom to complete this thesis. I am very grateful to God for how far he has brought me. Indeed, we serve a living God.

I wish to express my heartfelt gratitude to my supervisors Professor Samuel Nii Ardey Codjoe, Dr. Fidelia Akpene Ama Dake and Dr. Mumuni Abu whose guidance, supervision and encouragement have led to the completion of this thesis. I really appreciate your comments and suggestions at the various stages of the thesis. God richly bless you all for your excellent supervision.

I would like to sincerely thank Regional Institute for Population Studies Research Development Fund for sponsoring my PhD. My sincere gratitude goes to Dr. Ayaga Agula Bawah and WILLOWS Impact Evaluation Project for their support during my final year and qualitative data collection. I couldn't have collected my qualitative data without your support. God richly bless the entire WILLOWS team. I am also grateful to Dr. Faustina Frempong-Ainguah for her encouragement, contribution and checking up on me regularly for the progress of the work. To Dr. Mawuli Kushitor, Dr. Maame Peterson, Dr. Yaw Atiglo, Dr. Reuben Tete-Larbi, Dr Frank Kyei-Arthur, Charlotte Ofori, Isaac Yeboah, Akua Obeng Dwamena Danquah and Doris Oti Boakye, your support has been priceless.

My sincere appreciation goes to the entire faculty and students of the Regional Institute for Population Studies at the University of Ghana for their diverse contributions and support. Indeed, it is a great family and I am privileged to be part of this family.

I am thankful to Ghana Statistical Service for granting me access to the 2014 Ghana Demographic and Health Survey (GDHS) data.

Rev. Professor Adobea Yaa Owusu, Rev. Bernard Kyeremeh, Rev. Michael Konadu, Akosua Nyamekye, Osafo Nana Osei-Assibey, Adu Manu and Richard Baffo Kodom, I am very grateful for your encouragement and prayers. Words cannot express my appreciation to you all. Thank you all for the support.

Finally, I am very grateful to my family for their support. Yaw Agyekum, Koduah Agyekum, Linda Agyekum, Philip Opoku Agyekum, Appiah Eric Agyekum, Mavis Serwaa Agyekum and Rita Agyekum. I could not have made it this far without your support.

ABSTRACT

Despite the widespread advocacy for exclusive breastfeeding, and associated health, social and economic benefits, there is a low prevalence of exclusive breastfeeding in both developed and developing countries. Whilst several studies have been conducted on exclusive breastfeeding, few of such studies have linked birth weight and birth size independently with exclusive breastfeeding. Given that there is limited data on birth weight, birth size is often used as a proxy for birth weight. However, there is an inconclusive discussion on the relationship between birth weight and birth size. The extent to which the perception of the mother on the size of the infant (perceived birth size) or actual measurement (birth weight) influence exclusive breastfeeding is not known. In addition, there is limited information on the experiences of health workers and mothers on exclusive breastfeeding.

To understand this phenomenon, the study examined the relationship between birth weight and birth size and their influence on exclusive breastfeeding. Furthermore, the study examined experiences of exclusive and non-exclusive breastfeeding mothers and health workers. A mixed research method approach was used to achieve the objectives of this study. Quantitative data was taken from the 2014 Ghana Demographic and Health Survey while the qualitative method used an in-depth interview involving sixteen exclusive and non-exclusive breastfeeding mothers and four health workers. A binary logistic regression was used to examine the influence of birth weight and birth size on exclusive breastfeeding whilst the qualitative data was analysed thematically.

The results of the study showed that exclusive breastfeeding prevalence is 54.8%. The majority (85%) of the infants were of normal birth weight. About 52% of the infants were perceived by their mothers to be of small birth size. On maternal characteristics, about two-thirds of the mothers had secondary education, married with at least one child and slightly more than one-third were Akan. Also, the findings showed that there was a low or weak relationship between birth weight and birth size. Exclusive breastfeeding was significantly predicted by birth weight, birth size and other factors such as the age of the child, household wealth quintile, ethnicity, and religion. The results of the qualitative analysis showed that mothers relied on birth weight rather than birth size to practice exclusive breastfeeding. Furthermore, the decision of the mothers to practice exclusive breastfeeding was also based on information received at the health facilities, type of work engaged in, and advertisement. Both health workers and mothers expressed that exclusive breastfeeding

served as a family planning method, makes children healthy and is very economical. Some of the challenges faced by exclusive breastfeeding mothers include pressure from family members, dizziness and breast sag. Mothers indicated that discontinuation of exclusive breastfeeding was due to insufficient flow of breast milk. Also, mothers eat healthy food and breastfeed when needed to manage exclusive breastfeeding. In addition, counselling and monitoring mothers, maternity leave and advertisement were identified by health workers as ways of improving exclusive breastfeeding practice.

The study concludes that both birth weight and birth size were significant predictors of exclusive breastfeeding. However, validation of the relationship between birth weight and birth size showed a low relationship. In the qualitative analysis, the results showed that mothers rely more on the birth weight of infants rather than the perceived birth size to practice exclusive breastfeeding. Health talk at the health facilities is very essential towards the practice of exclusive breastfeeding. Due to the limited data on birth weight, this study recommends that health workers should be sensitised to record birth weight of infants at birth especially for deliveries occurring outside the health facilities as well as encouraging mothers to keep their health records book. Furthermore, maternity leave should be extended from three months to at least six months to help working mothers to complete exclusive breastfeeding practice.

LIST OF ABBREVIATION

BFHI	Baby Friendly Hospital Initiative
CHPS	Community Based and Health Planning Service
DHS	Demographic and Health Survey
EBF	Exclusive Breastfeeding
GSS	Ghana Statistical Service
GDHS	Ghana Demographic and Health Survey
IYCF	Infant and Young Child Feeding Program
MDG	Millennium Development Goals
SDG	Sustainable Development Goals
SSA	Sub- Saharan Africa
UNICEF	United Nations International Children Fund
WHO	World Health Organisation

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CHAPTER ONE

BACKGROUND OF THE STUDY

1.1 Introduction

Birth weight, perceived birth size and childhood nutritional status are important determinants of child development for immediate and future health outcomes (Galgamuwa et al., 2017; Hindmarsh et al., 2008). Birth weight and birth size are actual and perceived measures of child anthropometrics respectively, which are important indicators for assessing the general health of an infant at birth (Channon, 2011). Additionally, they are useful in determining the risk of morbidity and mortality from childhood, through adolescence to adulthood (Channon, 2011; Mbuagbaw and Gofin, 2010). Globally, about 20 million low birth weight infants, representing 15.5% of infants, are born annually, out of which the majority (95.6%) are born in developing countries (United Nations Children's Fund, 2012).

Generally, infants are supposed to be weighed after birth (Mbuagbaw and Gofin, 2010). In developing countries, unlike developed countries, most infants are not weighed at birth due to a high proportion of deliveries occurring outside health facilities. Furthermore, some birth weights of infants are not recorded or properly documented. This includes births that occur at health facilities (Doctor et al., 2018; Channon et al., 2011). Evidence from the Ghana Demographic and Health Survey (DHS) report in 2008 shows that about 57% of infants had no birth weight records (GSS et al., 2009). Also, in Ethiopia about 86% of infants had no birth weight records in 2016 (CSA and ICF, 2017). However, several studies using national datasets from developing countries, including the Demographic and Health Surveys (DHS), explain that mothers are easily able to recall their children's size at birth, though they may not remember the actual birth weight of their infants (Islam, 2014; Eggleston et al., 2000). Consequently, perceived birth size is often used as a

proxy measure for birth weight and an indicator of the health of an infant, though the relationship between birth weight and perceived birth size is inconclusive (Islam, 2014; Lule et al., 2012; Channon et al., 2011; Eggleston et al., 2000).

There is empirical evidence that birth weight and perceived birth size have consequences on early optimal feeding practices and standard growth of infants (Galloway et al., 2016; Channon, 2011; Mbuagbaw and Gofin, 2010). The ability of an infant to attain standard growth after birth is influenced by optimal feeding or the adequacy of dietary intake (Caulfield et al., 2014; UNICEF, 2012). Hence, early childhood nutrition is very essential for the growth of infants due to its associated health implications and life-long consequences (Agrasada et al., 2011; Black et al., 2008; Edmond et al., 2008). Excessive or inadequate intake of food affects somatic growth while long-term effects of formula feeding such as obesity and diabetes may have effects on the individual in the early stage and later in life (Singh et al., 2009; Ramasethu et al., 1993). Proper feeding practices are critical for infants growth as child characteristics like weight or size and other chronic diseases developed during infancy are carried into adulthood (Chowdhury et al., 2015).

Evidence from both developed and developing countries show that breastfeeding is the most widely acknowledged optimal method of feeding for infant growth and development (Victora et al., 2016; Wambach et al., 2015). Breastfeeding has beneficial effects on nutritional status, morbidity and mortality for both children and mothers (Wambach et al., 2015; Gayawan et al., 2014; Otoo, et al., 2009; Awumbilla, 2003). Additionally, exclusive breastfeeding confers multiple benefits to both the infant and mother (Mamemoto et al., 2013; Agrasada, et al., 2011; Flaherman et al., 2011).

Exclusive breastfeeding (EBF) is the practice of giving infants “only breast milk from her mother or a wet nurse¹, or expressed breast milk, and no other liquids or solids except for oral rehydration solution, or drops/syrups of vitamins or medicine” (WHO, 1991, p.4). The exclusive breastfeeding policy recommends that mothers give only breast milk to their infants from birth up to a minimum of six months (WHO/UNICEF, 2003). Globally, the prevalence of exclusive breastfeeding initiation is very high, but few women continue up to the minimum of six months (Cox et al., 2014). According to the Global Nutrition Report, about 38% of infants were exclusively breastfed between 2008 and 2012. Also, about 33% of infants less than six months in sub-Saharan Africa (SSA) and 38% in Asia were estimated to be exclusively breastfed (Victora et al., 2016; Gupta et al., 2013).

Extant review of literature revealed that exclusive breastfeeding could avert about 13% of infant deaths in a year globally (Jones et al., 2003; Edmond et al., 2008). For infants, exclusive breastfeeding reduces infectious diseases such as gastrointestinal infection (Agrasada et al., 2011) and diarrhoea (Agrasada et al., 2011; Kramer and Kakuma, 2002). Also, exclusive breastfeeding provides energy for infants’ growth (Agrasada et al., 2011; Otoo et al., 2009), boosts cognitive intelligence (Horta et al., 2015) and reduces the risk of childhood obesity (Rollins and Doherty, 2019). Furthermore, the benefits of exclusive breastfeeding for mothers include delayed return of menstruation, rapid loss of weight and cancer prevention (Otoo et al., 2009).

Exclusive breastfeeding results from a complex interplay of multiple factors (Diji et al., 2017; Boccolini et al., 2015; Semenik et al., 2008). These include experiences of mothers and health workers such as decision making, benefits, challenges, cultural practices, and management of

¹ A wet nurse is a woman who breastfeeds and cares for another child who is not her own.

exclusive breastfeeding. In addition, other factors such as child characteristics, birth characteristics, maternal socio-demographics, biomedical, bio-cultural, and environmental factors provide comprehensive insights into exclusive breastfeeding practices (Armstrong et al., 2014; Khanal et al., 2014; Mamemoto et al., 2013; Flaherman et al., 2011). Substantial among these factors are birth characteristics specifically birth weight and perceived birth size (Flaherman, et al., 2013; Agrasada et al., 2011).

Differences in actual birth weight and perceived birth size could change infant feeding practices, which includes exclusive breastfeeding. Some studies have linked perceived birth size and actual birth weight independently to exclusive breastfeeding (Patel et al., 2015; Flaherman, et al., 2013). Anecdotal evidence has shown that in a situation where perceived birth size and actual birth weight of an infant are known by the mother, the decision by the mother to exclusively breastfeed could depend on perceived birth size. Several factors such as mother's knowledge, feelings and perception about their infants' birth size could determine exclusive breastfeeding practice. However, there is a recognition that exclusive breastfeeding could be influenced by the actual birth weight of the child. Mothers tend to rely on the birth weight for infant feeding since it is an objective measure (Singh et al., 2009; Ramasethu et al., 1993).

Furthermore, as perceived birth size and actual birth weight are important factors explaining exclusive breastfeeding, other factors such as experiences of mothers and health workers also contribute to the holistic understanding of the phenomenon. This indicates a complex interaction and understanding of exclusive breastfeeding involving child and maternal factors such as birth weight, birth size, mothers' experiences and their interaction with organisational and structural factors including health workers. This study aimed at assessing the relationship between birth weight and birth size and their influence on exclusive breastfeeding. Furthermore, the experiences

of mothers and health workers are explored to understand the practice of exclusive breastfeeding in Ghana. There is the need to understand the differences in perceived birth size and birth weight and their influence on exclusive breastfeeding in guiding strategies to improve exclusive breastfeeding.

1.2 Statement of the problem

Despite the increasing campaign in support of breastfeeding and the associated benefits, there is a low prevalence of exclusive breastfeeding with substantial variations across the world (Still et al., 2017; Galgamuwa et al., 2017). For instance, in Asia, about 41% of infants were exclusively breastfed while 35% were exclusively breastfed in sub-Saharan Africa in 2010 (Cai et al., 2012). The prevalence of exclusive breastfeeding in sub-Saharan Africa is of concern due to factors such as limited resources, poverty, infectious diseases, under nutrition, environmental and cultural differences affecting the health of infants (Still et al., 2017; Caulfield et al., 2006). The benefits of exclusive breastfeeding is high in poor settings and poor nutritional environments where the incidence of diseases is high (Nukpezah et al., 2018). This is because the administration of food to infants at an early stage is often associated with contamination which can further lead to morbidity.

The 2014 Ghana Demographic and Health Survey (GDHS) reported that exclusive breastfeeding has reduced from 63% in 2008 to 52% in 2014 (GSS et al., 2015) while the introduction of solid, liquid, water and porridge have become more common (Diji et al., 2017; Aborigo et al., 2012; Aidam et al., 2005). Studies have shown that where there is an introduction of solid food to an infant at an early age, the food may lack the essential nutrients required to ensure healthy growth of infants which could lead to sub-optimal feeding (Nukpezah et al., 2018; van der Merwe et al., 2007).

Globally, suboptimal feeding, especially non-exclusive breastfeeding is a burden which affects socio-economic development and contributes to the problem of childhood morbidity and mortality (Joshi et al., 2014). Childhood malnutrition remains the most intractable public health problem. (Black et al., 2013). Malnutrition and sub-optimal feeding affect children's educational development and increase health risk (Marquis et al., 2016; Black et al., 2013; Agrasada et al., 2011). Evidence from literature has shown that childhood practices translate to adulthood and this could contribute to a double burden of diseases now and in the future (Maonga et al., 2016). The introduction of mixed or formula foods to infants could expose them to infectious and non-communicable diseases such as obesity and respiratory tract infections which can lead to mortality (Singh et al., 2009; Awumbilla, 2003).

It is estimated that about 3.5 million deaths worldwide among children under five are attributed to maternal and child malnutrition, out of which most of these deaths occur in the neonatal period (Victora et al., 2016; Black et al., 2013; Black et al., 2008). Some of the causes of neonatal, infant and under-five mortality are socio-demographic characteristics, sub-optimal feeding, perceived birth size and birth weight of infants. These causes account for about 40% of deaths at the neonatal stage (Momeni and Danaei, 2017). However, studies have shown that early initiation of breastfeeding in the first day or hour could avert neonatal deaths of 22.3% and 16.3% respectively (Edmond et al., 2008). Trends in Ghana revealed that neonatal mortality has reduced from 29 per 1000 live births in 2007 to 25 per 1000 live births in 2017 (GSS et al., 2018). This indicates a slight reduction of 12% over two decades. The implication is that, if the current trend of reduction continues, Ghana may not be able to achieve the Sustainable Development Goal 3 which aims at reducing neonatal mortality to at least 12 per 1000 live births in 2030 which currently was 25 per

1000 live births in 2017. Also, this may result in a reduction in quality of life as more deaths will be recorded due to suboptimal feeding.

Even though several studies have been conducted on exclusive breastfeeding globally (Alebel et al., 2018; Velusamy et al., 2017; Diji et al., 2017; Marquis et al., 2016; Aryeetey and Goh, 2013; Aidam et al., 2005), there is no information on the influence of both birth weight and perceived birth size on exclusive breastfeeding. Existing research shows that mothers with small or low birth weight infants introduce substitutes or supplementary food to their infants at an early age to enable the infant put on weight (Flaherman et al., 2013). Also, the physiological characteristics of low birth weight infants could alter their feeding, therefore increasing their risk of negative health effects (Barker, 2004). For instance, Pineda (2011) reported that such infants may have difficulties in initiating and maintaining breastfeeding due to having immature capability of directly sucking the breast (Pineda, 2011). Also, low birth weight infants are sometimes admitted at the hospital which separates them from their mothers and reduces the supply of constant breast milk (Boccolini et al., 2015). However, there are unique health benefits of exclusive breastfeeding for infants irrespective of their birth weight and perceived birth size categories that are not found in other substitutes such as commercial formulas or pasteurised donor milk (Meier et al., 2010).

There have been few studies linking perceived birth size (Khanal et al., 2014; Tampah-Naah and Kumi-Kyereme, 2013) and birth weight independently on exclusive breastfeeding (Patel et al., 2015). Given that there is a limited data on birth weight, studies often use perceived birth size as a proxy for birth weight (Khanal et al., 2014; Islam, 2014; Tampah-Naah and Kumi-Kyereme, 2013). However, there is an inconclusive discussion in the literature as to whether perceived birth size can be used as a proxy for birth weight (Islam, 2014). Some studies have found that perceived birth size is a good proxy for birth weight (Channon, 2011; Mbuagbaw and Gofin, 2010; Blanc

and Wardlaw, 2005), while others have found that perceived birth size is a poor proxy for birth weight (Islam, 2014; Lule et al., 2012; Eggleston et al., 2000). In sub-Saharan Africa like Ghana, where there is limited data, no study has examined how these two parameters, thus, birth weight and perceived birth size of a child, could influence exclusive breastfeeding practice. Is it the actual measurement (birth weight) or perception (birth size) that influences mother's decision to practice exclusive breastfeeding or both?

Furthermore, there is information on the experiences of exclusive breastfeeding from the mother's perspective (Nduna et al., 2015; Ihudiebube-Splendor et al., 2019; Mgongo et al., 2019) but scarce literature on experiences of health workers/professionals (Nieuwoudt & Manderson, 2018) who are always in contact with mothers advocating for exclusive breastfeeding practice. The health workers are the first contact by the mothers at the various health facilities. Knowledge of these health professionals in terms of benefits, challenges and other experiences of mothers on exclusive breastfeeding are very essential as this could help health workers to offer the needed support for mothers on exclusive breastfeeding. Also, there are few studies which use both quantitative and qualitative methods involving mothers and health workers to understand the practice of exclusive breastfeeding. Due to the aforementioned factors, there is a gap in how perceived birth size, birth weight, and experiences of mothers and health workers influence exclusive breastfeeding. All these factors have effect on the interrogation of exclusive breastfeeding and therefore raise questions that need to be addressed.

1.3 Research questions

This study focuses on examining the relationship between actual birth weight, perceived birth size, and exclusive breastfeeding in Ghana. The study aimed at finding answers to the following research questions:

- Is there a relationship between birth size and birth weight of infants in Ghana?
- How do birth size and birth weight influence exclusive breastfeeding in Ghana?
- What are the experiences of mothers on exclusive and non-exclusive breastfeeding practice?
- What are the experiences of health workers on exclusive breastfeeding practice in Ghana?

1.4 Rationale of the study

In sub-Saharan Africa, prevalence of exclusive breastfeeding is low, which is below the recommended 90% coverage for the first six months of life, despite the associated benefits (Agho et al., 2011; Nkala and Msuya, 2011). Several studies have been conducted in Nigeria, Ethiopia, and Tanzania and other countries to help explain the predictors of exclusive breastfeeding (Agho et al., 2011; Mgongo et al., 2013; Nkala and Msuya, 2011). However, in Ghana, studies on exclusive breastfeeding are often related to demographic, socio-economic and health-related factors, often neglecting birth characteristics such as birth weight and perceived birth size, which ultimately influence infant feeding behaviour. Presently, few studies in Ghana and sub-Saharan Africa have examined the relationship between birth weight and perceived birth size on one hand and exclusive breastfeeding on the other hand. Given the wide differences in global socio-cultural practices in feeding, it is not clear how culture influences the mother's decision to practice exclusive breastfeeding taking into consideration perceived birth size and birth weight of infants in Ghana. This study provides insight into this relationship and explains how actual birth weight or perceived birth size of infants influence exclusive breastfeeding practice. Furthermore, the study unearths other socio-cultural practices that promote or proscribe exclusive breastfeeding.

Also, this study is timely due to the declining prevalence of exclusive breastfeeding in Ghana. According to the 2014 Ghana Demographic and Health Survey report, the prevalence of exclusive

breastfeeding has reduced from 63% in 2008 to 52% in 2014 (GSS, GHS, & ICF, 2015). This shows a decline in the practice of exclusive breastfeeding in Ghana, hence a public health problem which needs an intervention. It is therefore imperative to investigate the factors that influence exclusive breastfeeding in Ghana to help improve child nutrition as well as optimal feeding. In addition, the success of optimal feeding programs depends on the modifiable factors susceptible to intervention. Identifying these inhibiting and facilitating factors would help in designing and implementing effective sustainable programs aimed at targeting individuals, families, and communities to promote breastfeeding.

In addition, the study adopted a mixed method approach to add context and depth to the study as well as providing deeper understanding of exclusive breastfeeding. Triangulating these methods (quantitative and qualitative) help to understand the influence of perception and actual measurement on exclusive breastfeeding which could further be up scaled to other health behaviours. Also, the qualitative data helped to unearth exclusive breastfeeding behaviour from the perspectives of exclusive breastfeeding mothers, non-exclusive breastfeeding mothers as well as health workers. Few studies have used mixed methods by interviewing both mothers and health workers. This will, therefore, provide a holistic view and interpretation to the practice of exclusive breastfeeding in Ghana.

Furthermore, in response to the decreasing prevalence of infant and child mortality, Ghana has adopted and implemented several policies including the National Population Policy in 1969 which was reviewed in 1994 to help improve quality of life. The Millennium Development Goals were adopted in 2000 and replaced with the Sustainable Development Goals in 2015. In all these policies, targets were set to reduce neonatal, infant and child mortality. The desired targets for neonatal and child mortality have not been achieved. For instance, the Millennium Development

Goal 4 target on child mortality could not be achieved by 2015. As Ghana has transitioned to the Sustainable Development Goals, there is more to be done to prevent morbidity and mortality as part of efforts to achieve Sustainable Development Goal 3 by 2030. Extant review of literature shows that exclusive breastfeeding reduces childhood morbidity in most low-income countries (Biks et al., 2015; Rollins et al., 2013). Therefore, this study explores the factors that predict exclusive breastfeeding to help enhance an improvement in child health. Understanding exclusive breastfeeding practice would assist health workers and policymakers to identify factors that require intervention to ensure optimal exclusive breastfeeding which leads to reduction of morbidity and mortality.

Also, the paucity of data on birth weight has led to the use of birth size as a proxy for birth weight in most developing countries. Evidence from such studies has shown that this assertion is inconclusive and lacks support (Islam, 2014; Mbuagbaw and Gofin, 2010). In Ghana, no study has been done on the relationship between birth weight and birth size to help contribute to the global debate. This study addresses the problem by examining the relationship between birth weight and birth size, thereby adding to existing literature. Understanding these factors will help epidemiologists, individuals, and policymakers in framing policies to help improve optimal infant feeding behavior.

1.5 Study objectives

The general objective of this study is to investigate the relationship between birth weight and perceived birth size on one hand and their influence on exclusive breastfeeding on the other hand in order to help improve attitudes towards exclusive breastfeeding. The specific objectives of the study are to:

- Examine birth size as a comparable measure for birth weight of infants in Ghana.
- Examine the relationship between birth weight and exclusive breastfeeding in Ghana.
- Assess the relationship between perceived birth size and exclusive breastfeeding in Ghana.
- Explore the experiences of exclusive breastfeeding from the perspective of mothers and health workers.

1.6 Definition of key concepts

Perceived birth size refers to the subjective measure of the size of a child at birth by the mother.

Perceived birth size and birth size were used interchangeable in this study.

Actual birth weight is the objective measure of the weight of a child at birth. The weight is measured with a weighing scale.

Exclusive breastfeeding (EBF) is the giving of infants “only breast milk from her mother or wet nurse, or expressed breast milk, and no other liquid or solids with the exception of oral rehydration solution, drops or syrups consisting of vitamins, mineral supplements or medicines” (WHO, 1991, p.4).

1.7 Organisation of the study

This study is divided into eight chapters. The first chapter focuses on the introduction of the study including statement of the problem, research questions, research objectives and rationale. The next chapter focuses on the literature review, incorporating theories and conceptual framework of the study while chapter three provides details of the methodology of the study. Chapter four provides background characteristics of infants and the association between the background characteristics and exclusive breastfeeding. Chapter five examines the relationship between birth weight and birth size in Ghana. In the sixth chapter, the influence of birth weight and perceived birth size on

exclusive breastfeeding was examined. Chapter seven highlights the experiences of exclusive breastfeeding mothers, non-exclusive breastfeeding mothers and health workers. Chapter eight provides a summary of the findings, interpretation, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on the review of literature on birth weight, birth size, and exclusive breastfeeding, and identifies gaps in the literature. The review focuses on exclusive breastfeeding including the definition and measurement, burden and global rates of exclusive breastfeeding, policies on exclusive breastfeeding, the relationship between birth weight and birth size on one hand and their influence on exclusive breastfeeding. In addition, the review highlights gaps in exclusive breastfeeding literature, and explains theories as well as the conceptual framework for the study.

2.2 Exclusive breastfeeding definition and measurement

There have been varying definitions in the measurement and practice of exclusive breastfeeding (Pullum, 2014). This has resulted in the contention on the components of exclusive breastfeeding and the measurement. Measuring exclusive breastfeeding with a consistent definition is essential for monitoring and comparison among studies. An extant review of the literature shows that different approaches are used in measuring exclusive breastfeeding by relating it to timing, purpose, and duration of studies. For instance, in the past, some studies classified infants who were given water as exclusive breastfeeding infants (Donath and Amir, 2000) while others excluded such infants (Ramasethu et al., 1993). Also, differences in the duration of approaches such as 24-hour recall method and since birth method for measuring prevalence of exclusive breastfeeding have made it difficult for comparison (Alebel et al., 2018; Chandhiok et al., 2015; Jara-Palacios et al., 2015; Nishimura et al., 2018; Velusamy et al., 2017). Due to the contrasting definitions, measurements and practice of exclusive breastfeeding, the first international meeting was held in

1988 to deliberate on infant feeding practices. This was followed by a published set of definitions on infant feeding by the World Health Organisation (Agampodi et al., 2009). In addition, several food indicators were developed in the 1990s by WHO to measure exclusive breastfeeding. These include breast milk, water, solid food, liquid food and other types of food (WHO, 1991).

According to the World Health Organisation, exclusive breastfeeding (EBF) is the giving of infants “only breast milk from the mother or a wet nurse, or expressed breast milk, and no other solid or liquid foods, with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines” (WHO/UNICEF, 2003: WHO, 1991, p.4). Exclusive breastfeeding was recommended in the 1990s, however, the optimal duration of the minimum of 6 months was advocated in early 2000 to achieve optimal growth, and development of infants (Kramer and Kakuma, 2012; WHO, 1991). This recommendation is supported by international communities, organisations, and scientist with support from governmental organisations (Bagci Bosi et al., 2015).

Several indicators have been developed by WHO to measure infant and young child feeding behaviour (WHO, 1991). A review of the extant literature shows that point in time estimate and retrospective or long-life point over time estimate (recall since birth) are the two major ways of measuring exclusive breastfeeding (Greiner, 2014; WHO, 1991). These two definitions differ in timing, duration, and purpose.

The point in time estimate includes the 24-hour recall method. With this method, information on feeding practice is collected for the last or previous 24 hours before the survey. Thus, a 24-hour recall is done by asking mothers with all infants 0-5.99 months of age if they were still currently breastfeeding. (Greiner, 2014; Agampodi et al., 2009). A “yes” response was followed by subsequent questions on the type of food (for instance solid, liquid, milk or others) given to the infants. To obtain the proportion of infants (0 to 0.599 months) exclusively breastfed, the total

number of infants who were provided only breast milk was divided by the total number of infants in the age group (Greiner, 2014; World Health Organization, 2001; WHO, 1991). This method is approved by the World Health Organisation and has been widely used in surveys to measure dietary intake (WHO, 1991). Several studies have used this method in estimating exclusive breastfeeding (Chandhiok et al., 2015; Khanal et al., 2013; Agho et al., 2011; Qiu et al., 2009). Chandhiok et al., (2015) used National Family Health data in India and applied the 24-hour recall method to estimate the prevalence of exclusive breastfeeding. Similarly, the Demographic and Health Surveys adapts the 24-hour recall measure to estimate exclusive breastfeeding. The DHS 24-hour recall method has been used in other studies. For instance, Fombong et al., (2016) used Demographic and Health Survey data to estimate exclusive breastfeeding prevalence in Cameroon. On the other hand, since birth method, thus, a duration from birth to six months is used for the retrospective measure of exclusive breastfeeding (Greiner, 2014; Pullum, 2014). With this method, mothers of infants above 6 months are sampled and asked if they fed their infants with breast milk only from birth to a minimum of six months. Those who fed their infants with only breast milk from birth to the sixth month are divided by the total number of children sampled for the study to get the proportion of infants exclusively breastfed. To avoid recall bias, some studies limit the sample to 12 months old infants (Greiner, 2014; Pullum, 2014).

Limitation of these measures includes overestimation and underestimation emanating from recall bias and the method of estimation. Evidence from research has shown that each method skews our perception of exclusive breastfeeding due to the component of each measurement (Greiner, 2014). Several arguments have been advanced in the literature to explain the limitation of the 24-hour recall method. The results of these studies have shown that the 24-hour recall method overestimates the prevalence of exclusive breastfeeding (Fenta et al., 2017; Noel-Weiss et al.,

2012; Agampodi et al., 2009). For instance, Noel-Weiss et al., (2012) argue that the 24-hour method could overestimate prevalence of exclusive breastfeeding. In that mothers would have introduced complementary or supplementary foods to the infant and stopped before the time of the survey. This could overestimate the rate of exclusive breastfeeding if the mother reports that the infant has not been fed with any food. Likewise, infants who were given food at the irregular basis and not within the 24 hours preceding the survey would be classified as exclusive breastfeeding (Fenta et al., 2017; Noel-Weiss et al., 2012; Agampodi et al., 2009). Fenta et al., (2017) argued that irregular feeds are difficult to monitor unless there is continuous monitoring or assessment of the feeding practice of the infant. Another study by Greiner, (2014) on the measurement of exclusive breastfeeding explains that the 24-hour recall method could be affected by recall bias hence, overestimating exclusive breastfeeding.

In addition, scholars have argued that since birth estimate is affected by recall bias. The method relies on the mother's ability to accurately recall the food introduced to the infants since birth. The limitation is that mothers would have introduced food to their infants and may have forgotten about it. This could lead to overestimation of the proportion of infants exclusively breastfed (Fenta et al., 2017; Greiner, 2014).

Given these limitations, some scholars argued that longitudinal data collection with continuous assessment of infant feeding behaviour would provide a more valid estimate for exclusive breastfeeding (Fenta et al., 2017). However, such scholars recognise that this method or process is costly and time-consuming, hence, one-time retrospective method, since birth, or 24-hour method could be used as a substitute to estimate for exclusive breastfeeding. Further, Greiner, (2014) argued that the best method used depends on the purpose or timing of the study. The 24-hour recall

method is mostly used in cross-sectional surveys due to time whilst since birth method is used for a longitudinal study.

2.3 Global rates and burden of exclusive breastfeeding

Exclusive breastfeeding confers social, economic and health benefits to infants and mothers, thus, averting morbidity and mortality (Agrasada et al., 2011). This includes protection from diarrhoea, respiratory disease, diabetes and hypertension (Agrasada et al., 2011). However, the effect of non-exclusive breastfeeding resulting from morbidity and mortality is on the increase. The Lancet in 2008 reported that globally non-exclusive breastfeeding accounts for 1.4 million mortality (Black et al., 2008). The Lancet further reported in 2013 that about 3.1 million deaths are due to suboptimal feeding which includes non-exclusive breastfeeding practices (Black et al., 2013). The burden of exclusive breastfeeding in developing countries is higher than developed countries, in that exclusive breastfeeding protects infants from morbidity in developing countries than developed countries (Kramer and Kakuma, 2002). For instance, in Ethiopia, it is estimated that about 24% of infant deaths is due to suboptimal feeding such as nonexclusive breastfeeding annually (Alebel et al., 2018).

Globally, despite the improvements in exclusive breastfeeding intervention such as Baby-friendly Hospital initiative, there is a low prevalence of exclusive breastfeeding (Cai et al., 2012). However, the prevalence (37%) of exclusive breastfeeding remained stagnant from 1990 to 2012 (Gupta et al., 2015). Recent studies have reported a global prevalence of 40% in 2016 (Serva et al., 2018). Bagci Bosi et al., (2015) observed 25% exclusive breastfeeding prevalence for countries within the WHO European regions from 2006 to 2012. Exclusive breastfeeding practice in Asia and sub-Saharan Africa is slightly higher than the prevalence in Europe (Alebel et al., 2018; Velusamy et al., 2017; Lauria et al., 2016; Bagci Bosi et al., 2015; Khanal et al., 2014).

Studies from developed countries have shown that exclusive breastfeeding practice is low. In 2003, Semenik et al., (2008) reported 5% prevalence in Canada. Another study in Canada observed 63.6% prevalence of exclusive breastfeeding in 2006 (Al-sahab et al., 2010), which is an increase over the 2003 prevalence. In the United States of America, less than 31% of infants were exclusively breastfed from birth to six months in 2010 (Flaherman et al., 2013). Evidence from fifty-three WHO European region have shown that EBF prevalence is far below the global recommended rate and national targets. This varies substantially within the region (Bagci Bosi et al., 2015). Furthermore, the results of the study indicated that in Italy, about 5.5% infants were exclusively breastfed for six months in 1999, 43.9% in Hungary in 2007, 49.3% in Slovakia in 2010, 17.2% in Denmark in 2012 and 14% in Sweden in 2012 (Lauria et al., 2016; Bagci Bosi et al., 2015). The evidence from the developed world suggests that not more than half of infants were exclusively breastfed from birth to the sixth month.

Most of the reviewed studies in Asia show that almost half of the infants in India were exclusively breastfed. Results from the National Family Health Survey in India show that about 46.3% and 48.6% of infants were exclusively breastfed in 1992/93 and 2005/06 respectively (Chandhiok et al., 2015). In rural India, less than half (48.5%) of infants were exclusively breastfed for six months (Nishimura et al., 2018). Another study in South India estimated the prevalence of exclusive breastfeeding to be 11.4% (Velusamy et al., 2017). Also, the prevalence for some countries in Asia are like the Indian prevalence. For instance, Khanal et al., (2014) reported 49% prevalence of EBF using the 24-hour recall method in Timor Leste. In Bangladesh, the prevalence rate was estimated to be 6% using the 24-hour recall method (Joshi et al., 2014) while in Sri Lanka, the prevalence stands at 71.3% (Perera et al., 2012).

In Africa, the prevalence rate of exclusive breastfeeding was 22% in 1995 and 35% in 2010 (Cai et al., 2012b). In sub-Saharan Africa, existing evidence in Cameroon shows that the prevalence was 12% in 2001 and 18.1% in 2004 (Fombong et al., 2016). In Nigeria, about 16.4% exclusive breastfeeding prevalence was recorded in 2003 (Agho et al., 2011). A cross-sectional study in Kilimanjaro, Tanzania reported a prevalence of 20.7% (Mgongo et al., 2013). Another study in Western Tanzania reported a prevalence of 58% using since birth method (Nkala and Msuya, 2011). Similarly, a cross-sectional study in Western Tanzania recorded 58% exclusive breastfeeding prevalence. In Ethiopia, a pooled prevalence of 59.3% was observed from a systematic review in 2017 (Alebel et al., 2018). Furthermore, about 61.2% prevalence was recorded in Malawi and 61.4% in Kenya (Alebel et al., 2018).

Studies conducted in Ghana have reported exclusive breastfeeding for almost half of infants. In Accra, about 51.6% prevalence of exclusive breastfeeding was reported in 2000 (Aidam et al., 2005). Similarly, a cross-sectional study in 2010 reported about 66% and 56% prevalence rate using since birth and 24-hour recall method respectively (Aryeetey and Goh, 2013). Recent studies have reported fluctuating exclusive breastfeeding prevalence rate. In 2015, Diji et al., (2017) reported exclusive breastfeeding rate of 66.6% among women attending child welfare clinic in Kumasi. Likewise, another study in 2015 also indicated a prevalence of 27.7% in Tamale (Nukpezah et al., 2018).

2.4 Policies on exclusive breastfeeding

The Innocenti declaration was set up in 1990 to protect, support and promote breastfeeding practices. Stakeholders at the meeting endorsed the practice of exclusive breastfeeding. They recommended that infants should be exclusively breastfed from birth to 4-6 months of age and continue with complementary foods up to two years or more (WHO, 1991). This policy is in

consonance with WHO/UNICEF global strategy which recommends that infant should be exclusively breastfed for a minimum of 6 months (UNICEF, 2012). Furthermore, the Innocenti declaration advocated that governments should support exclusive breastfeeding practice by developing appropriate policies with targets.

Ghana has adopted various international breastfeeding policies including WHO/UNICEF exclusive breastfeeding practices, Infant and Young Child Feeding Program (IYCF) and the 1991 Baby Friendly Hospital Initiative (BFHI). Other policies and strategic plans such as Breastfeeding Promotion Regulation 2000, Child Health Policy and Strategy (2007 to 2015) have helped to ensure optimal infant feeding practices (Tampah-Naah and Kumi-Kyereme, 2013). The Breastfeeding Promotion Regulation 2000 aim to promote breastfeeding in Ghana and prevent the inflow of aggressive marketing of breast milk substitutes (Tampah-Naah and Kumi-Kyereme, 2013).

In addition, maternity leave policy was incorporated in Act 57 of Ghana Labour Law to allow mothers spend three months with pay at home after delivery. The three months leave is separated from the accumulated annual leave for mothers. In addition, mothers with twins or triplets and above are entitled to an extension of more leave days (Ghana Selected National Measures 2000; Tampah-Naah and Kumi-Kyereme, 2013). These policies recommend and promote the practice of exclusive breastfeeding for six months.

2.5 Relationship between birth weight and birth size

Birth weight is an important indicator of infant morbidity and mortality, as well as cognitive and physical development (Islam, 2014). Data on infants' birth weight is not easily accessible in developing countries due to deliveries occurring outside the health facilities and unrecorded birth weight of some deliveries in the health facilities (Islam, 2014; Eggleston et al., 2000). Because

many mothers do not know the birth weight of their infants, birth size is often used as a substitute for birth weight (Islam, 2014). The relationship between birth weight and birth size have been examined by scholars. Results of these studies have shown inconclusive and mixed results in developing countries. Whilst some studies have found that birth size is a good proxy for birth weight (Channon et al., 2011; Mbuagbaw and Gofin, 2010; Blanc and Wardlaw, 2005; Boerma et al., 1996), others have found that it is a poor proxy (Islam, 2014; Lule et al., 2012; Eggleston et al., 2000).

Review from the studies showing the good proxy or relationship between birth weight and birth size explained that the relationship is established at the aggregate level. These studies further explained that at the individual level, there is misclassification, thus, small birth weight infants were classified as normal birth size (Channon et al., 2011; Blanc and Wardlaw, 2005; Boerma et al., 1996). Channon (2011), indicated that there is a direct relationship between birth size and birth weight in Cambodia, Kazakhstan, and Malawi. The relationship was identified in all three countries. Comparatively, Cambodian and Malawi had a very clear relationship similar with Kazakhstan. Also, the study concluded that birth size is a good proxy for birth weight in these three countries.

Another study in Cameroon found good relationship between birth size and birth weight at the aggregate level. However, at the individual level, infants were classified at some categories which were unlikely to be correct. For instance, infants of low birth weight were classified as normal or large birth weight (Mbuagbaw and Gofin, 2010).

In other related studies, Blanc and Wardlaw, (2005) used 62 nationally representative Demographic and Health Survey data between 1990 and 2000 and reported that birth size is a good proxy for birth weight. The mean birth weight declined monotonically as birth size declined. They

concluded that though there is consistency at the aggregate level, there is variation between the two measures at the individual level where there is misclassification of birth weight and birth size.

Furthermore, analysis of 15 national Demographic and Health Surveys in developing countries revealed that birth size is a good indicator of birth weight at the aggregate level. The study further cautioned that the assessment of quality data for birth size and birth weight is only possible for children with reported birth weight and birth size (Boerma et al., 1996).

In contrast, review of the extant literature has shown that birth size is a poor proxy for birth weight (Islam, 2014; Lule et al., 2012; Eggleston et al., 2000). Eggleston et al., (2000) argued that perceived birth size is not a good proxy for birth weight. They indicated that only 35% of infants with small birth size was directly proportional to low birth weight category. This implies that the actual estimate of low birth weight infants was underestimated.

In other related studies, a poor relationship between birth size and birth weight was found in Oman and this could be attributed to misclassification and digit preference (Islam, 2014). Furthermore, the results showed that about 44% of infants accurately predicted as low birth weight were of small birth size (Islam, 2014). Also, digit preference and unreported birth weight were cited as the reasons explaining the poor relationship. The findings of the study showed that health professionals rounded up birth weight to the nearest 0.5kg and 28% of such recordings were found, which shows a digit preference. The proportion of low birth weight reduces when there is a digit preference of 2.5kg (Islam, 2014). The unreported birth weight could bias the prevalence of birth weight which could further influence the relationship. For instance, in Oman, unreported birth weight of infants accounted for low proportion of birth weight which further had an influence on the relationship between birth weight and birth size (Islam, 2014).

Furthermore, Lule et al., (2012) observed a moderate relationship between birth size and birth weight in Uganda. The study also concluded that there is an underestimation of actual low birth weight. About 70% of mothers accurately predicted that large birth size and high birth weight were the same.

In addition, the subjective measure of birth size could influence misclassification of birth size. Evidence has shown that birth size is influenced by individual and community factors, and the number of children a mother has (Channon, 2011). A child size may be considered small but may have normal birth weight due to the above-mentioned factors. These could, therefore, affect the matching and the relationship between birth weight and birth size.

In summary, all the above-reviewed studies provided evidence of the relationship between birth size and birth weight. While some studies have established that birth size is a good proxy for birth weight, others have found that it is a poor proxy. The relationship is established at the aggregate level, while there is a misclassification at the individual level. However, misclassification, digit preference, and unreported birth weight were some of the reasons explaining the poor relationship between birth size and birth weight. In addition, the reasons for empirical inconsistencies could be attributed to the reported proportion of birth weight used in these studies. For studies that showed that birth size is a good proxy for birth weight, slightly more than half of the mothers reported the birth weight of their infants (Channon et al., 2011; Mbuagbaw and Gofin, 2010; Blanc and Wardlaw, 2005; Boerma et al., 1996) while almost seven out of ten infants had birth weight for studies that reported that birth size is a poor proxy for birth weight (Islam, 2014; Lule et al., 2012; Eggleston et al., 2000). For instance Boerma et al., (1996) showed that about 50% of infants used in their study had birth weight records while about 65% and 75% were recorded for Eggleston et al., (2000) and Lule et al., (2012) studies respectively. Also, the methods of analysis and data used

could also help to explain the differences of the empirical inconsistencies. Studies that found that there is a relationship between birth weight and birth size used pooled demographic and health survey data set from different countries while those that identified birth size as a poor proxy used only one point country specific data set for their analysis.

2.6. Birth weight, birth size, and exclusive breastfeeding

Globally, evidence from literature has shown that feeding practices of infants differ in terms of birth weight, birth size, and other factors. Nabiwemba et al., (2014) explained that in Uganda, mothers who deliver outside the health facility had poor knowledge on the cut of birth weight categories. Consequently, mothers who deliver at home rely on the birth size of infants to ensure infant feeding practices. However, mothers who deliver at the health facilities are sometimes informed about the birth weight of the infants and they are educated on feeding practices. The study further revealed that the practice of exclusive breastfeeding depends on the knowledge of the mother on infants' birth weight and birth size.

2.6.1 Birth weight and exclusive breastfeeding

In developed countries, studies have alluded that birth weight of infants significantly influences exclusive breastfeeding behaviour. For instance, Flaherman et al., (2013) examined the effect of birth weight on exclusive breastfeeding among three months old infants in the United States of America. The results showed that infants of higher birth weight were more likely to be exclusively breastfed than those with smaller birth weight. The authors concluded that maternal choice and the introduction of infant formulae by physicians to mothers with low birth weight infants could explain why infants of higher birth weight were exclusively breastfed than those with low birth weight. This was because some physicians introduce infants substitute or formula food to mothers with low birth weight infants to enable the infant to put on weight at an early stage. This mostly

happens in private hospitals where studies have found that mothers who deliver at these hospitals are of higher socioeconomic status and could afford infant formula foods.

Similarly, using a Global Network's Maternal and Newborn Registry from 7 research sites in six countries (Kenya, Zambia, India, Pakistan, Argentina and Guatemala) Patel et al., (2015) observed that birth weight is associated with exclusive breastfeeding discontinuation in India and Guatemala. They further indicated that discontinuation of exclusive breastfeeding was higher for low birth weight infants which could be as a result of feeding problems and the inability of these infants to be breastfed well. Also, low birth weight infants are sometimes sicklers and this could hamper their feeding at an early stage.

Likewise, findings from a multilevel analysis in Brazil using a 24-hour recall feeding method to examine the effects of individual and contextual factors of exclusive breastfeeding showed that birth weight is a significant predictor of exclusive breastfeeding (Venancio and Monteiro, 2006). The results from the study further revealed that infants of low birth weight had lower odds for exclusive breastfeeding compared to infants of high birth weight. The authors indicated that low birth weight infants have poor suckling to stimulate the establishment of breast milk production. The difficulties in suckling the breast could propel mothers to introduce substitutes. Also, they explained that infants of low birth weight tend to breastfeed for a shorter period of time and this could disrupt their feeding practices (Venancio and Monteiro, 2006). In addition, Eregie (1998) reported that low birth weight infants require supplementary feeding to enable them to catch up in growth (Sasaki et al., 2010).

Furthermore, in a systematic review in Brazil, Boccolini et al., (2015) identified that low birth weight infants were less likely to be exclusively breastfed. This is because they are very vulnerable and more likely to be hospitalised which separates them from their mothers. The situation could

prevent mothers from having contact with their children and this may lead to the introduction of formula food to the infants at an early stage. A similar study in Brazil by Bicalho-Mancini and Velásquez-Meléndez, (2007) examined the rate of exclusive breastfeeding among discharge of new borns who were admitted at a neonatal intensive care unit in Brazil. The results showed that low birth weight infants were less likely to be exclusively breastfed.

In sub-Saharan Africa, Eregie, (1998) reported that birth weight predicts exclusive breastfeeding in Nigeria. The direction of the results showed that high birth weight infants had a higher likelihood of being exclusively breastfed. The author explained that early introduction of supplementary foods could explain why low birth weight infants were not exclusively breastfed (Eregie, 1998). These practices could further lead to morbidity or mortality.

In other related studies, evidence has shown that mothers with difficulties in continuing exclusive breastfeeding are advised by health professionals such as doctors and nurses to discontinue breastfeeding or introduce complementary feeding (Haider and Saha, 2016). Among the reasons cited for the introduction of supplementary feeds include the baby being sick, baby crying at night, the mother not having sufficient breast milk, and family problems such as quarrels and separation (Haider and Saha, 2016). Also, family members such as grandmothers and in-laws advise influence exclusive breastfeeding decision (Coetzee et al., 2017; Haider and Saha, 2016). Nduna et al., (2015) indicated that grandmothers and husband encourage mothers to practice exclusive breastfeeding.

In contrast, using pooled data from three similar birth cohort, Velusamy et al., (2017) reported that birth weight is not a significant predictor of exclusive breastfeeding in Southern India. Similarly, Serva et al., (2018) used the 24-hour recall method to examine factors predicting exclusive

breastfeeding in Brazil and concluded that birth weight is not a determinant of exclusive breastfeeding.

2.6.2 Perceived birth size and exclusive breastfeeding

Perception of birth size is influenced by individual experiences such as previous births by the mother or family members, society, and culture (Channon, 2011). In the past, larger body size was cherished and associated with wealth, power and beauty, while thinness was associated with illness. However, the trend of perceived body size is changing in both the developed and developing countries making people appreciate normal, small and large body size (Gitau et al., 2014). This behaviour tends to judge mothers on the birth size of their infants and hence influence their decision on the feeding pattern (Gitau et al., 2014). Mothers may be satisfied or not satisfied with the perceived birth size of their infants and this could encourage or discourage them to practice exclusive breastfeeding.

In terms of the relationship between birth size and exclusive breastfeeding, research emphasises the significant influence of birth size on exclusive breastfeeding in both developed and developing countries. The findings of this research demonstrate that exclusive breastfeeding is determined by birth size of infants. In Timor-Leste, infants of average birth size were more likely to be exclusively breastfed compared to infants of non-average birth size (Khanal et al., 2014). The findings further showed that poor suckling, separation of small birth size infants from their mother and early introduction of complementary feeding discontinue exclusive breastfeeding.

Findings from Darmstadt et al's., (2008) study in India indicated that birth size of infants was not considered as a significant factor for infant feeding. It was considered as irrelevant as perceived observable characteristics of infants were the main determinants of infant feeding. Local names such as theek and Kamjor have been developed by community members using observable

characteristics of infants at birth. Other factors considered include infants feeding habits, growth, level of activity of the baby, and overall appearance. These characteristics are linked to the birth weight categories. However, the findings of the study revealed that the local names overlap with birth weight categories which makes it difficult to compare and pose risk in caring for these infants. Feeding practices of these infants are introduced based on the interpretation of the local names as perceived by the mother. This, therefore, enforces the idea of mothers' perception of birth size as a major factor in infants' breastfeeding decision.

In Ghana, Tampah-Naah and Kumi-Kyereme, (2013) reported that average birth size infants had higher odds of being exclusively breastfed. They explained that mothers who perceived their infants to be of large birth size may be complacent and content. This may deter them from practicing exclusive breastfeeding while infants of small birth size may lack the energy to suckle breast milk of their mothers. Flaherman et al., (2013) argued that infants of small birth size are more likely to receive formulae feeds to catch up on weight with normal birth size infants.

However, the notion that infants of low birth weight or small birth size do not catch up on growth with normal or high birth weight or birth size infants when they are exclusively breastfed has been refuted by other studies. These studies found that infants of low or normal birth weight put on similar weight or are parallel but sometimes below the WHO child growth standards (Stark, 2017). Likewise, Singh et al., (2009) argued that low birth weight infants gain weight when they are exclusively breastfed. They are also protected from infectious diseases and build a strong immune system. Furthermore, Ramasethu et al., (1993) assert that low birth weight infants double in birth weight by 10 weeks of age and triple by 18 weeks. The findings of these studies reiterate the importance of birth size and birth weight of infants on exclusive breastfeeding.

On the other hand, other studies have found that birth size is not a significant predictor of exclusive breastfeeding. Using two rounds of demographic and health survey data, Khanal et al., (2013) observed that birth size is not a determinant of exclusive breastfeeding in Timor-Leste.

2.7 Factors inhibiting and proscribing the practice of exclusive breastfeeding practice

Evidence has shown that factors emanating from mothers, infants, family members, institutions and culture influence exclusive breastfeeding behaviour. In terms of culture, Wambach et al., (2015) identified in their study in the United States of America that exclusive breastfeeding is a woman's decision but is influenced by factors such as tradition, guidance, and encouragement. The authors further reported that cultural beliefs, practices, and values hinder or promote the practice of exclusive breastfeeding. Similarly, Charlick et al., (2019) reported a mixed feeling of cultural practices towards exclusive breastfeeding mothers in Australia. They found that there is a low acceptance of women breastfeeding in public. Some women felt happy breastfeeding in public while others felt embarrassed due to negative reactions from the public towards them. Furthermore, mothers were faced with guilt since people judge them on their decision to practice exclusive breastfeeding. This makes them uncomfortable and feel bad. The decision by mothers to practice exclusive breastfeeding was contrary to the social norms, hence, there was a lack of support for women practicing exclusive breastfeeding (Charlick et al., 2019). Likewise, Thet et al., (2016) reported that women feel shy to breastfeed in public and this limits their breastfeeding practice.

Furthermore, in Ghana, Diji et al., (2017) reported that mothers are advised by family members to give water and other supplementary food to their infants at an early age. Certain foods are proscribed in some cultures while others are prescribed. In Nigeria, Davies, (1997) indicated that nursing mothers are not allowed to eat salt or corn because their culture forbids those foods. In a

situation where a mother eats the forbidden food, the oldest woman in the household helps in reversing the effect through herbal preparation.

Other studies have found that family and friends hinder or aid in the practice of exclusive breastfeeding (Coetzee et al., 2017; Thet et al., 2016; Nduna et al., 2015; Wambach et al., 2015; Mukerem and Haidar, 2012; Otoo et al., 2009). Findings from these studies explained that family members especially mothers support exclusive breastfeeding practice (Coetzee et al., 2017; Thet et al., 2016; Nduna et al., 2015). In addition, friends and other family members such as grandmothers play a critical role in the support of exclusive breastfeeding practice. The support was described as emotional, advice, guidance and encouragement to breastfeeding (Wambach et al., 2015). However, Diji et al., (2017) argued that a shift from the extended family to the nuclear family could disrupt the support mothers get from other family members. Furthermore, Otoo et al., (2009) reported a mixed feeling of the attitude of grandmothers in Ghana. They reported that some grandmothers may force nursing mothers to give their babies water while other mothers may be encouraged not to give water to their babies. In Myanmar, Thet et al., (2016) documented the support mothers receive from their husbands and grandmothers. Husbands support wives in child health care, for instance, by babysitting and feeding the children. Grandmothers provide similar support through cooking and feeding the children.

Furthermore, Charlick et al., (2019) explained that the benefit of breastfeeding encourages mothers to practice exclusive breastfeeding. Mothers feel deeply bonded with their babies and redefine their identity when they breastfeed. However, maternal factors such as insufficient breast milk, breast engorgement, body changes of women, nipple pain and work inhibit the practice of exclusive breastfeeding (Ihudiebube-Splendor et al., 2019; Melina Mgongo et al., 2019; Diji et al., 2017; Nduna et al., 2015; Wambach et al., 2015; Lakati et al., 2002). In Ghana, Otoo et al., (2009)

found that some women do not want their breast to sag or become big so they do not breastfeed for long. They want their breast to stay firm as the changes affect their appearance. In Myanmar, studies have found that wealthy women do not breastfeed for long because they feel that they will become less attractive (Thet et al., 2016).

In Uganda, a qualitative study by Nabiwemba, et al (2014) identifies that despite the awareness of exclusive breastfeeding, mothers believe that low birth weight babies need additional foods to enhance weight gain. Some infants may have a weak jaw, impairing their ability to suckle (Diji et al., 2017). For infants who could not suckle from the breast, milk was expressed and given with a spoon.

Furthermore, health professionals provide the needed support and information to mothers through education and counselling (Wambach et al., 2015; Thet et al., 2016). Studies have reported that health education provided by health professional at the various health facilities aid in the exclusive breastfeeding decision (Ihudiebube-Splendor et al., 2019).

2.8 Other determinants of exclusive breastfeeding

Factors predicting exclusive breastfeeding are multidimensional. Different factors predict exclusive breastfeeding based on the settings (Aidam, et al., 2005). These factors operate at different levels and include child characteristics, maternal socio-demographic factors, household factors, bio-medical factors and community/structural or organisational factors. These factors are discussed in the subsequent sections.

2.8.1 Maternal socio-demographic factors and exclusive breastfeeding

Evidence has shown that age, education, marital status, and children ever born are determinants of exclusive breastfeeding. The influence of age on exclusive breastfeeding is inconsistent in both

developed and developing countries. Some studies have established that there is a relationship between age of mother and exclusive breastfeeding (Perera, et al, 2012, Al-sahab et al., 2010; Asemahagn, 2016) while others have reported no relationship (Fombong et al., 2016). Even for studies that have established the relationship between age and exclusive breastfeeding, the relationship is not linear. Some studies have found that younger mothers practice exclusive breastfeeding (Perera, et al, 2012, Al-sahab et al., 2010), while others have reported that older mothers are more likely to practice exclusive breastfeeding (Asemahagn, 2016). For instance, using the six months method of exclusive breastfeeding in a prospective observational study among 2215 mothers with infants in Sri Lanka, Perera et al., (2012) observed that younger mothers practice exclusive breastfeeding compared to older mothers.

In contrast, studies in Canada (Al-sahab et al., 2010), Tanzania (Maonga et al., 2016) and Nigeria (Gayawan et al., 2014) reported that older women were more likely to practice exclusive breastfeeding. Likewise, Asemahagn, (2016) used a 24-hour recall method in Ethiopia and reported that older women were more likely to practice exclusive breastfeeding compared to younger women. Nishimura et al., (2018) explained that an increase in age could afford mothers more experience to facilitate infant feeding management practice such as exclusive breastfeeding. On the other hand, research has shown that age is not a predictor of exclusive breastfeeding. For instance, Fombong et al., (2016) reported that the age of mother is not a determinant of exclusive breastfeeding in Cameroun (Fombong et al., 2016).

Education of mother has been found to predict exclusive breastfeeding behaviour. However, the direction of significance is not clear. For instance, studies in India have explained that mothers with no education were more likely to practice exclusive breastfeeding compared to educated mothers (Nishimura et al., 2018; Velusamy et al., 2017). Scholars have explained that educated

mothers are exposed to other breastfeeding substitutes such as formula feeds and they may perceive them as more viable and good alternative for exclusive breastfeeding (Velusamy et al., 2017; Qiu et al., 2009).

On the other hand, Al-sahab et al., (2010) carried out a study with the aim of examining the prevalence and predictors of exclusive breastfeeding among 6421 Canadian women. The study used the since birth (6 months) method for exclusive breastfeeding practice and the findings showed that educated mothers were more likely to practice exclusive breastfeeding in Canada. Similarly, Fombong et al., (2016) found that, educated mothers were more likely to practice exclusive breastfeeding in Cameroon. Likewise, in Nigeria, Gayawan et al., (2014) reported that higher educational level of mothers predict exclusive breastfeeding behaviour (Gayawan et al., 2014). This is because education provides mothers with the necessary information which equips them to formulate well-informed decisions regarding breastfeeding management (Fombong et al., 2016).

Empirical evidence available has shown that marital status is significantly related to exclusive breastfeeding in both developed and developing countries (Mgongo, et al., 2013; Adugna et al 2017). In Tanzania, single mothers were less likely to practice exclusive breastfeeding compared to married or cohabiting mothers (Mgongo, et al., 2013). Likewise, Adugna et al (2017) reported that married women were more likely to practice exclusive breastfeeding compared to single women. A similar pattern has also been reported in other developed countries, Al-sahab et al., (2010) reported that married women were more likely to practice exclusive breastfeeding in Canada. A plausible reason could be that women who were single may not have had the needed social support from other people as compared to married women to encourage them to practice exclusive breastfeeding. Married women could receive support from their partners and in-laws to

aid them in caring for the child. Such support could encourage mothers to practice exclusive breastfeeding as has been found in other studies (Mgongo et al., 2013).

In both developed and developing countries, parity has been found as a significant predictor of exclusive breastfeeding. This relationship is not directional. In developing countries, Khanal et al., (2013) examined the predictors of exclusive breastfeeding in relation to social and health determinants using two rounds of Nepal DHS. The findings of their study showed that mothers with two or more children had higher odds of practicing exclusive breastfeeding. Also, in developed countries, Al-sahab et al., (2010) noted that in Canada, mothers with one child were less likely to practice exclusive breastfeeding. They explained that multiparous mothers could have had experience in exclusive breastfeeding from their previous births/children and would be able to overcome encountered challenges. Also, the inexperience of single child mothers and the influence of relatives such as grandmothers and in-laws could hinder them from practicing exclusive breastfeeding for their first child (Tan, 2011).

Conversely, evidence has shown that single child mothers' practice exclusive breastfeeding than multiparous mothers. For instance, a study in India among slum dwellers revealed that having more children contribute to the cessation of exclusive breastfeeding (Velusamy et al., 2017). The study further explained that the presence of other children into the family contribute to maternal fatigue which deters women from practicing exclusive breastfeeding.

2.8.2 Household factor and exclusive breastfeeding

With regards to wealth, studies have documented the relationship between wealth and exclusive breastfeeding, but the direction of this relationship is not clear. In Bangladesh and Ethiopia, mothers from richer households were more likely to practice exclusive breastfeeding compared to those belonging to the poorest household (Shifraw et al., 2015; Joshi et al., 2014). A study in

Nigeria by Agho, et al, (2011) found that women in the middle wealth status were more likely to practice exclusive breastfeeding compared to richer and poorer women. Joshi et al., (2014) explained that mothers from richer households may have a better educational level which could enhance easy accessibility of health information and increase their likelihood of practicing exclusive breastfeeding.

In contrast, other studies in India and Nepal have identified that poorer women were more likely to practice exclusive breastfeeding compared to women from rich households (Chandhiok et al., 2015; Khanal et al., 2013). These studies further explained that women from poorer household were unable to afford infant formulae and other substitutes. On the other hand, women from richer household were more likely to afford infant substitute food, and this could influence their decision to discontinue exclusive breastfeeding (Chandhiok et al., 2015). Another explanation is that mothers from high income household may be professional mothers and this could separate them from their children as they may not be staying home often. This therefore could reduce the practice of exclusive breastfeeding (Shifraw et al., 2015; Chandhiok et al., 2015; Joshi et al., 2014).

2.8.3 Community/organisation/structural factors and exclusive breastfeeding

In addition to the maternal socio-demographic factors and household factors, studies have found that community/organisation/structural factors such as place of residence, ethnicity, religion employment and maternity leave are predictors of exclusive breastfeeding. In terms of place of residence, Chandhiok et al., (2015) used two rounds (1992 to 2006) of National Family Health Survey data in India to examine the changes in exclusive breastfeeding practices and its determinants. The study adopted the 24-hour recall method and used a sample of 34,176 and 25,459 infants respectively for the first and second rounds. The findings showed that place of

residence differ by exclusive breastfeeding practice such that rural dwellers had higher odds of exclusively breastfeeding their infants than urban dwellers.

In other related studies, Tan, (2011) examined factors predicting exclusive breastfeeding in Malaysia. The study used a maternal recall of one month to classify exclusive and nonexclusive breastfeeding infants. Findings from the binary logistic regression model revealed that women residing in rural areas were more likely to exclusively breastfeed compared to infants of women residing in urban areas. This is because urban dwellers have access to breastfeeding information due to their exposure to media such as radio, posters, and internet as well as other tertiary health facilities. These factors could influence women's breastfeeding behaviour as they could be exposed to infants substitutes (Chandhiok et al., 2015; Tan, 2011).

Furthermore, emerging studies have argued that ethnic differences influence feeding practices such as exclusive breastfeeding. A study in Ghana by Tampah-Naah and Kumi-Kyereme, (2013) reported that cultural practices of some ecological regions shape exclusive breastfeeding behaviour of women. They observed that the cultural practice among Voltarians in Ghana facilitates the practice of exclusive breastfeeding. Living arrangement and support from kin group reduce the burden of mothers on other household chores which enable her to take care of the child. On the other hand, Awumbilla, (2003) explained that in the Northern part of Ghana, infants are given water within three days after birth to welcome them to the world. They believe that water is the foremost and essential thing used in welcoming a child. Similarly, Marquis et al., (2016) explained that the practice is more prevalent in the northern part of Ghana. The study further explained that mothers from the Ga/Adangbe ethnic group were less likely to discontinue exclusive breastfeeding early due to their social networks. The social network provides mothers emotional and physical support to exclusively breastfeed.

In addition, religion emphasises the importance of a lifestyle that encourages women to practice exclusive breastfeeding. Studies have found that religion is very essential in the practice of exclusive breastfeeding (Kamoun and Spatz, 2018; Bhatta, 2013). Kamoun and Spatz, (2018) argue that Islamic teachings lay emphasis on the importance of breastfeeding by providing guidelines and virtues of favourable text to praise women who breastfeed. They, therefore, feel that it is their religious obligation to breastfeed their children. In the same review, the authors argued that Catholic faith has clear social teachings on breastfeeding. This was reiterated by Pope Francis when he called for greater support for breastfeeding women in his remarks in 2013, 2015 and 2017. He emphasised that women should breastfeed without fear.

Furthermore, in both developing and developed countries, studies which have explored the relationship between mothers' employment status and exclusive breastfeeding have shown that employment status is a significant predictor of exclusive breastfeeding. Findings from these studies revealed that non-working mothers were more likely to practice exclusive breastfeeding compared to working mothers (Asemahagn, 2016; Wambach et al., 2015; Khanal et al., 2014; Mgongo et al., 2013; Sasaki et al., 2010; Tan, 2011). Factors such as early weaning, distance from home to work, fatigue, short maternity leave, unfavourable working conditions not supporting breastfeeding practice and juggling between work and home could influence working mothers to discontinue exclusive breastfeeding as compared to non-working mothers (Tan, 2011; Lakati et al., 2002).

For instance in Malaysia, Tan, (2011) reported that unfavourable working conditions make mothers to discontinue exclusive breastfeeding. Likewise, in Tanzania, unfavourable working conditions force mothers to introduce complementary feeding to infants at an early stage (Mgongo et al., 2013). The situation is not different in developed countries. In the United States of America,

Wambach et al., (2015) observed that women discontinue exclusive breastfeeding due to demands outside the home and other personal concerns. A qualitative study in Ghana reported that mothers start supplementary feeding early because they work away from home, mostly in the market or farm (Awumbilla, 2003). In addition, Khanal et al., (2014) indicated that caregivers employed by working mothers introduced formula, cow or buffalo milk to infants when their mothers were away for work. These practices discourage the practice of exclusive breastfeeding.

Also, there is a difference in maternity leave with respect to exclusive breastfeeding practices. Bicalho-Mancini and Velásquez-Meléndez, (2007) explained that maternity leave enables women to keep close contact with their infants as well as keeping a safe source of income which enables greater dedication to breastfeed. In Ghana, Diji et al., (2017) explained that short maternity leave disrupts the practice of exclusive breastfeeding. When mothers resume work, they combine office and household duties which sometimes separate them from their new-born infants. These hinder the practice of exclusive breastfeeding.

2.8.4 Biomedical and cultural factors, and exclusive breastfeeding

Beyond the socio-demographic characteristics, household and organisational factors, biomedical and cultural factors have also received considerable attention in both developed and developing world literature, as predictors of exclusive breastfeeding.

A critical look at studies between antenatal care and exclusive breastfeeding revealed a linear relationship. Women who frequent antenatal clinics at least four times were more likely to practice exclusive feeding. For instance, in South India, Nishimura et al., (2018) reported that women who had four or more antenatal visits were more likely to practice exclusive breastfeeding. A similar pattern was observed in Nepal (Khanal et al., 2013). These studies explained that antenatal clinics provide the opportunity for health workers to interact and educate mothers about nutrition and

other child development conditions. Women are provided the necessary information on breastfeeding and their challenges are discussed. These probably could have influenced their decision to practice exclusive breastfeeding as women who frequently attend antenatal care clinic were more likely to have more interaction with health providers (Nishimura et al., 2018; Khanal et al., 2013; Chandhiok et al., 2015).

In addition to the biomedical factors, several studies have examined the influence of the type of delivery on exclusive breastfeeding. These studies posit that vaginal delivery predicts exclusive breastfeeding compared to caesarean delivery (Joshi et al., 2014; Khanal et al., 2013; Al-sahab et al., 2010). Women who deliver by caesarean might be under the influence of anaesthesia and could not initiate breastfeeding early as well as practicing exclusive breastfeeding. Mothers may find it difficult to hold the baby and breastfeed successfully (Khanal et al., 2013). Furthermore, pains and discomfort associated with caesarean could prevent women from practicing exclusive breastfeeding because of catheterization and intravenous lines (Qiu, et al., 2009). In Ethiopia, women who had normal delivery were more likely to practice exclusive breastfeeding than those who had caesarean birth (Shifraw et al., 2015). Furthermore, pains emanating from caesarean could delay the initiation of breast milk which could facilitate the introduction of other formula or substitutes (Shifraw et al., 2015). In Ghana, studies have shown that normal delivery leads to early discharge from the hospital which further encourages family reattachment and post-partum care as well as increasing exclusive breastfeeding practices (Tampah-Naah and Kumi-Kyereme, 2013).

With regards to the place of delivery and exclusive breastfeeding, Al-sahab et al., (2010) explained that in Canada, women who deliver at home practice exclusive breastfeeding than those who deliver at the hospital. They further explained that the influence of formula at some hospitals could account for the discontinuation of exclusive breastfeeding. In contrast, Asemahagn, (2016)

reported that women who deliver at the health facilities practice exclusive breastfeeding as compared to those who deliver at home in Ethiopia. Women are introduced to breastfeeding lessons at the various health facilities and this could influence their decision to practice exclusive breastfeeding. In addition, using cross-sectional data in Ghana, Tampah-Naah and Kumi-Kyereme, (2013) attributed the higher proportion of women practicing exclusive breastfeeding to the adoption of Baby Friendly Health Initiative at the various hospitals. This policy encourages health providers to educate and encourage women to practice exclusive breastfeeding (Tampah-Naah and Kumi-Kyereme, 2013). In Nigeria, Gayawan et al., (2014) explained that lactational management training provided at the health facilities encourage women who deliver at the health facilities to practice exclusive breastfeeding.

Furthermore, Fombong et al., (2016) found that women who attended postnatal care were more likely to practice exclusive breastfeeding than those who do not attend. Similarly, using a 24-hour recall method Asemahagn, (2016) explained that women who attended postnatal care practice exclusive breastfeeding relatively better than those who do not attend.

2.8.5 Child characteristics and exclusive breastfeeding

Studies have shown that there is a difference in sex with respect to exclusive breastfeeding and this varies from country to country. For instance, Indian women were more likely to exclusively breastfeed males than females (Verd et al., 2018). In contrast, in the United States of America, Hispanic women infants were more likely to exclusively breastfed females than male infants. In Brazil, Venancio and Monteiro, (2006) reported that females were more likely to be exclusively breastfed than males. This pattern is likely to be so because there is a cultural belief among mothers and health care professionals that support the practice of exclusive breastfeeding for females. According to the belief, males have more needs than females, so they need to be introduced to

complementary feeding at an early age. This therefore prolong breastfeeding of females than males.

Extant review of literature in developing countries shows that there is a linear relationship between age of child in months and exclusive breastfeeding. In Asia, Khanal et al., (2014) reported that an increase in infant age is negatively related to exclusive breastfeeding in Timor-Leste. Likewise Gayawan et al., (2014) reported that in Nigeria, as the age of an infant increases, the rate of exclusive breastfeeding decreases. In Ethiopia, age of infant is inversely related to exclusive breastfeeding. Infants of younger age were more likely to exclusively breastfeed. A cross-sectional study conducted in Ghana by Diji et al., (2017) concluded that age of infant differ by exclusive breastfeeding. However, there is an inverse relationship between age of child and exclusive breastfeeding. Adugna et al., (2017) explained that the traditional practice of post-partum and maternal leave for mothers might have encouraged exclusive breastfeeding at the early stage of the infants and then discontinue when the infant's age increases. Also, mothers might have introduced complementary food to infants when they are aging based on a belief that breast milk alone is not enough for infants.

A study in Sri Lanka by Perera et al., (2012) reported that working mothers rely on expressed milk as an alternative due to the long hours they spend out of the home. However, the expressed milk sometimes is not enough which leads to discontinuation of exclusive breastfeeding. In Tanzania, Mgongo et al., (2013) reported that infants are exclusively breastfed more in the first three months and then reduces after three months. Mothers are relieved from their household chores as they get help from their in-laws and grandmothers for the first three months after delivery. During this time, the mothers are fed with special food that enhances milk production. This encourages mothers to practice exclusive breastfeeding for the first three months after delivery.

2.9 Gaps in the literature

Extant literature on the relationship between birth size and birth weight have revealed that the result is mixed and inconclusive. While some studies have reported that birth size is a good proxy for birth weight, others have reported otherwise. Few studies have examined the relationship between birth weight and birth size in sub-Saharan Africa. Nevertheless, there are no studies in Ghana examining this relationship to contribute to the global debate. Furthermore, evidence from literature has identified maternal child characteristics, socio-demographic characteristics, biomedical and cultural factors, and interpersonal factors as correlates of exclusive breastfeeding. The results of these studies have been inconclusive and conflicting in terms of magnitude and direction in both developed and developing countries. However, the practice of exclusive breastfeeding is reducing globally, and this suggests the need to consider other factors such as birth weight and birth size which are very important for understanding the phenomenon. Few studies have examined the relationship between birth weight and birth size on the one hand, and exclusive breastfeeding on the other hand. In addition, studies examining the experiences of mothers and health workers on exclusive breastfeeding in Ghana are scanty. There is, therefore, the need to examine how birth weight, birth size and experiences of mothers and health workers influence exclusive breastfeeding independently in sub-Saharan Africa and Ghana to help contribute to the global discourse.

2.10 Theoretical framework

Several theories and behavioural change models have been used to explain exclusive breastfeeding in various settings. These theories, directly and indirectly, explain the relationship between birth weight, birth size, and exclusive breastfeeding. The theories underlying this study are the Health Belief Model and the Socio-Ecological Model. The Health Belief Model explains and predicts

health behaviour, focusing on perceptions, attitudes, and beliefs while the Socio-Ecological Model (SEM) explains behaviour from a multifaceted and interactive effect on an individual and the environment they are found.

2.10.1 Health belief model

The Health Belief Model (HBM) model was developed by Hoachbaum, Rosenstock, and Kegels in 1950. It was designed in response to a tuberculosis screening program (Rosenstock et al., 2005; Becker, 1974; Rosenstock, 1974). The model seeks to explain and predict health behavior by focusing on attitudes, perceptions, and beliefs of individuals (Hayden, 2009). The initial constructs of the model were four, namely, perceived susceptibility, perceived severity, perceived barriers, and perceived benefits (Andy, 2016; Hayden, 2009). Recently, modifying variables such as cues to action and self-efficacy have been added to the constructs (Andy, 2016).

Perceived susceptibility is the subjective belief that an individual is likely to acquire a disease by adapting a behaviour. However, individuals will probably adopt a healthy way if they are vulnerable to a particular negative health outcome due to their lifestyle (Orji et al., 2012; Rosenstock, 2005). Perceived severity explains the extent of harm or the consequences of acquiring a disease because of a behaviour. An individual is more likely to change a particular behaviour if he believes that his action has consequences on his health (Rosenstock et al., 2005). Perceived benefits explain the importance or usefulness of adapting a particular health behaviour to offset the perceived threat. With this, an individual perceives that his behaviour will yield in a positive results (Orji et al., 2012). Perceived threat lays emphasis on the conditions that prevent an individual from performing a particular action. These conditions make it very difficult for an individual to perform or adapt a health behaviour. Furthermore, cues to action also explains how both external and internal forces and situations help individuals to perform an action (Orji et al.,

2012; Rosenstock, 2005). Self-efficacy explains the capability or the belief that someone can perform an action (Orji et al., 2012; Rosenstock, 2005). For instance, if an individual thinks that an action or behaviour is very important and can be performed by him, there are chances that the individual will adopt that behaviour.

The model further explains that perceived susceptibility and severity combine to form a perceived threat. If the perceived benefits of taking health behavior are greater than the perceived threat, then the individual is likely to take a health behavior action (Kim et al., 2012). On the other hand, if the perceived threat of taking an action is greater than the benefit, then the individual might modify or change his health behavior (Kim et al., 2012). Therefore, the model hinges on the premise that a health-related action would be taken if it would yield a positive result. The model has been used to explain factors influencing exclusive breastfeeding (Ogwezzy-Ndisika and Oloruntoba, 2017; Andy, 2016), HIV among youth in Kenya (Kabiru et al., 2011) and nutrition among college students (Kim et al., 2012).

The theory posits that perception influences the behaviour of people. Perceived benefits of breastfeeding and child characteristics have an influence on exclusive breastfeeding decision (Ogwezzy-Ndisika and Oloruntoba, 2017). In a systematic review, Andy, (2016) explained that perceived risk, perceived severity of consequences, cues to action, and experiences have an influence on breastfeeding intention. Exclusive breastfeeding decision is influenced by birth weight, birth size, and other characteristics. The decision to practice exclusive breastfeeding depends on the perceived benefits for the infant and mother. If the mother understands the perceived benefits of practicing exclusive breastfeeding for infants of small, normal, or large birth size as well as low, normal or high birth weight infants, she could overcome associated challenges and exclusively breastfeed her child. These associated challenges (perceived barriers) include

socio-cultural norms, maternal factors such as insufficient milk and child characteristics including poor suckling. Again, if the mother feels that the decision to practice exclusive breastfeeding is threatened, thus little or no support (cues to action) from health workers and family members, there will be a discontinuation of exclusive breastfeeding practice.

The ability of the model to easily apply and test for a health behaviour is the major strength of the model (Orji et al., 2012). However, the main weakness of the model is its inability to account for other factors/variables such as demographic, economic, and socio-cultural factors that also predict health behaviour.

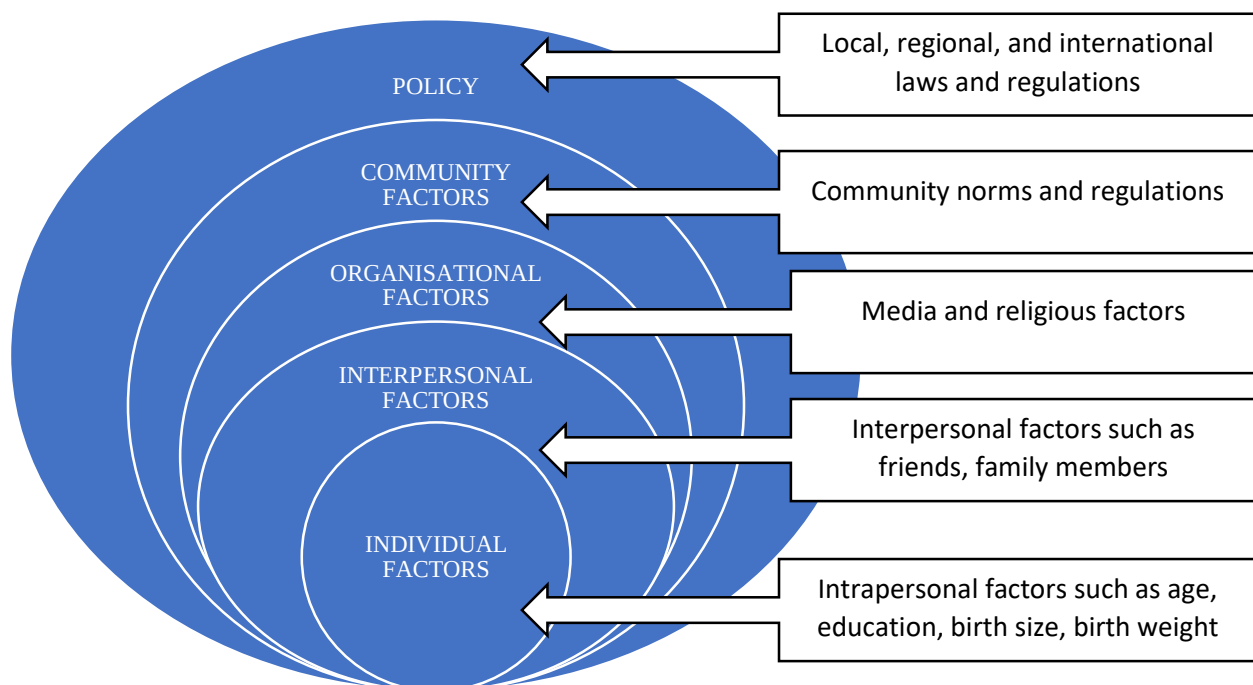
2.10.2 Socio-ecological model

The Socio-Ecological Model (SEM) was developed by Urie Bronfenbrenner in the 1970s to help explain human development. The model is a theoretical framework which is applied in different fields including health, population studies, psychology, and sociology to explain the interaction between individuals and their environment (Salihu, et al., 2015; Nuss et al., 2016). The underlying principle of the model is that an individual is integrated into a dynamic interaction of interpersonal, institutions/organizations, community factors, and policies (Kilanowski, 2017; Khasawneh, 2017). These factors (individual factors/intrapersonal factors, interpersonal factors, organisational/institutional factors, community factors, and public policies) form the five nested levels of the model.

The first level of the model is the individual/intrapersonal factors which include age, education, marital status, employment level, birth weight, and birth size which influence health behaviour. Also, there is an interaction of the individual with other factors such as family members, friends, formal and informal networks and peers at the interpersonal level. The organisational factors

include the media and religious groups that support individuals in their behaviour change or development. In addition, community-level factors are the existence of norms and values that regulate the behaviour of people. At the last level, there is an existence of local, national, and global policies to support health programs including nutrition.

Figure 2.1 Socio-Ecological Model



Source: Adapted from Bronfenbrenner (1979); Robinson (2008).

The model has been used extensively to describe factors that inhibit or facilitate breastfeeding behaviour for intervention planning (Mateus-Solarte, 2012; Bueno-Gutierrez and Chantry, 2015). In addition, it has helped to describe an integrated view of understanding exclusive breastfeeding practice and identifying modifiable factors (Bueno-Gutierrez and Chantry, 2015). Applying the

model to this study, the practice of exclusive breastfeeding could be viewed as the interplay of individual, interpersonal, organisation, community, and structural factors. The decision of the mothers to consider the birth weight and birth size of their child to practice exclusive breastfeeding depends on these interacting factors.

Evidence has shown that individual factors such as birth weight, birth size, age, education, and other personal characteristics influence exclusive breastfeeding practices (Al-Sahab et al., 2010; Cox et al., 2014; Semenik, et al., 2008; Wambach et al., 2015). At the interpersonal level, studies have shown that household characteristics such as wealth influence the decision of mothers to practice exclusive breastfeeding (Krouse, 2002). Furthermore, religious groups, provide education on exclusive breastfeeding which influences the decision of the mother to practice exclusive breastfeeding at the community or institutional level. At the structural level, employment, maternity leave and global breastfeeding policies such as Baby-Friendly Hospital Initiative (BFHI) and Ghana National Breastfeeding Policy Legislative Instrument have an influence on the decision of exclusive breastfeeding. These integrated factors influence the perception of the mother on the decision to practice exclusive breastfeeding.

2.11 Conceptual framework

The conceptual framework of this study is adapted from the Health Belief Model and the Socio-Ecological Model. This is an integrated framework explaining the factors that influence the practice of exclusive breastfeeding. The framework (Figure 2.2) of this study incorporates factors in both Socio Ecological Model and Health belief Models that influence or predict exclusive breastfeeding. These factors include birth weight and birth size, and other background factors such as maternal socio-demographic characteristics, child characteristics, interpersonal/household characteristics, community/organisation/structural characteristics, and biomedical/cultural

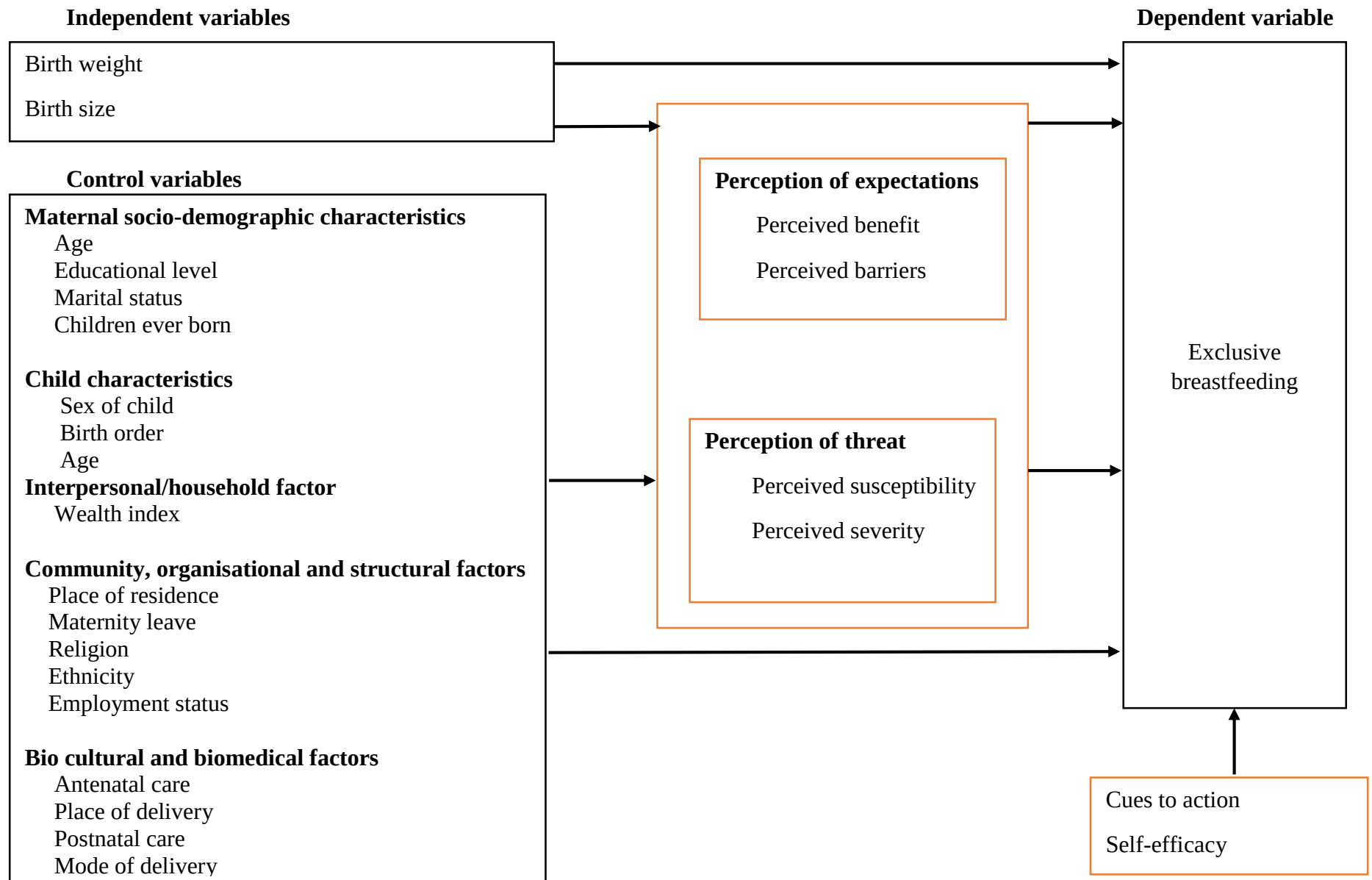
characteristics. The framework also incorporates perception factors such as perceived benefits, perceived barriers, perceived susceptibility, perceived severity, self-efficacy, and cues to action that also interact with the background characteristics to have an influence on exclusive breastfeeding.

In the framework, exclusive breastfeeding is the outcome variable which could be influenced by the main independent variables; birth weight and birth size. In addition, other background factors that have an influence on exclusive breastfeeding were controlled. Furthermore, the perception factors mediate birth weight, birth size, other background characteristics and exclusive breastfeeding.

The framework (Figure 2.2) posits that there is an interaction between factors in each level of the model which could influence the practice of exclusive breastfeeding directly or indirectly. The independent and control variables could exert an influence on exclusive breastfeeding through perception factors. There is also a recognition that there could be a direct influence of the dependent and control variables on exclusive breastfeeding without the recognition of perceptions factors.

In this current study, not all the variables were measured quantitatively. This is because perception factors such as perceived threat, perceived benefits, perceived susceptibility, perceived barriers, cues to action and self-efficacy were not found in the data (Ghana Demographic and Health Survey) that was used for this study. Hence, they were measured using qualitative approach to examine their influence on exclusive breastfeeding practice. In the qualitative study, questions on importance of exclusive breastfeeding, factors preventing mothers from practicing exclusive breastfeeding and cues to action factors were asked.

Figure 2.2 Conceptual framework showing the relationship between birth weight, birth size and exclusive breastfeeding.



Source: Authors construct

Evidence from literature has shown that maternal socio-demographic factors such as age, educational level, marital status of mother and number of children ever born have an influence on exclusive breastfeeding practice (Boccolini et al., 2015; Wambach et al., 2015; Maastrup et al., 2014; Flaherman et al., 2011; Kramer and Kakuma, 2002).

Household factors such as wealth has an influence on exclusive breastfeeding. It is expected that mothers from poor households will practice exclusive breastfeeding as compared to those from rich households. Mothers from rich household are more likely to introduce substitute to their infants than mothers from poor households (Chekol et al., 2017).

Community, structural and organisational factors play a vital role in explaining exclusive breastfeeding practice. Place of residence, religious affiliation, employment status, ethnicity, and maternity leave have an influence on the decision of mothers practicing exclusive breastfeeding (Fombong et al., 2016; Gayawan et al., 2014). Women who live in rural areas are more likely to practice exclusive breastfeeding than those living in urban areas. This is due to the influx of infant food substitutes found in urban areas compared to rural areas. Again, unemployed mothers are expected to practice exclusive breastfeeding than employed mothers.

Furthermore, the study recognises the importance of biomedical factors that contribute to exclusive breastfeeding. These include antenatal care, place of delivery, mode of delivery and postnatal care. For instance, a relationship exists between delivery at a health facility and exclusive breastfeeding. In addition, it is expected that mothers who had normal delivery are more likely to practice exclusive breastfeeding compared to those who had caesarean delivery.

Lastly, there exists a relationship between age of the child, sex of child and birth order. Evidence has shown that these characteristics have an influence on the practice of exclusive breastfeeding.

With regard to the age of the infant, it is expected that the age of infants in months is negatively related to exclusive breastfeeding.

2.12 Hypotheses

- Low birth weight infants are less likely to be exclusively breastfed compared to normal birth weight infants.
- Small birth size infants are less likely to be exclusively breastfed compared to normal birth size infants.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter presents details of the methodology of the study. It discusses the study design, study area, sources of data, sampling design, unit of analyses, sample size, measurement of variables, analytical methods and the limitation of the study.

3.2 Study design

This study adopted a sequential explanatory design. The methodological design consists of two distinct phases involving the use of both quantitative and qualitative methods. The first phase involves the application of a quantitative method to collect and analyse data which was followed by the qualitative method (Creswell, 2003). In applying this method to this study, an existing cross-sectional data from the 2014 Ghana Demographic and Health Survey (GDHS) was first analysed to investigate the influence of birth weight and birth size on the practice of exclusive breastfeeding in Ghana. This was followed by a qualitative approach where interviews were conducted in two health facilities to provide insights into the findings from the quantitative data. The application of these two methods helped in explaining and clarifying conflicting issues pertaining to birth weight, birth size, and exclusive breastfeeding.

3.3. Study settings

The quantitative aspect of this study used a national data set, hence took into consideration the entire country as a study area. However, to be able to explain some of the quantitative findings, an in-depth interviews were conducted in two polyclinics (Kekeli Poly Clinic and Rawlings Circle Polyclinic) at Madina, Accra.

3.3.1 Quantitative study area: Ghana

Ghana is located in West Africa and situated between both the eastern and western hemispheres. There are ten administrative regions ²in Ghana which includes; Greater Accra, Ashanti, Western, Eastern, Central, Volta, Brong Ahafo, Upper East, Upper West, and Northern region. Data from the 2010 Population and Housing Census revealed that there were 24,658,823 people in Ghana in 2010 with a growth rate of 2.5% per annum between 2000 to 2010 (Ghana Statistical Service, 2013). Ashanti Region had the highest population of 4,780,380 (19.4%), followed by Greater Accra with 4,010,054 (16.3%) while Upper West recorded the lowest population of 702,110 (2.8%). The recorded sex ratio for 2010 was 92 males per 100 females (Ghana Statistical Service, 2013). Also, the age structure revealed evidence of an increase in the elderly population and a dependency ratio of 76 per 100 population (Ghana Statistical Service, 2013). The census report further revealed that about two-thirds of households in Ghana were headed by males. With regards to religion, 71% were Christians and 17.6% were Muslims. Regarding literacy, 74% of the population were literate. The economically active population aged 15 years and above was 71.1% (Ghana Statistical Service, 2013). A larger proportion (41.7%) of the economically active population were engaged in agricultural-related activities including skilled agriculture, forestry, and fishery. This was followed by sales and service with 21%, and craft and related trade workers representing 15.2% (Ghana Statistical Service, 2013).

According to the 2014 Ghana Demographic and Health Survey report, about 98% of last-born children in the past two years were breastfed at some point in time. This implies that children who have ever been breastfed has remained around 98% over a decade (GSS et al., 2015). More than

² The ten administrative regions have recently been changed to sixteen regions. These are: Greater Accra, Central, Eastern, Western, Ashanti, Northern, Upper East, Upper West, Volta, Brong Ahafo, Oti, Western North, North East, Savannah, Bono East and Ahafo region

half (56%) of the children and 87% of the infants were breastfed within one hour of birth and one day of birth, respectively. Pre-lacteal feeding which is the practice of giving infants food before breastfeeding has declined from 20% in 2003 to 15% in 2014 (GSS et al., 2015).

The 2017 Maternal Health Survey recorded a total fertility rate of 3.9 children per woman in 2017 (GSS et al., 2018). Infant and under-five mortality were estimated to be about 37 and 52 deaths, per 1000 live births respectively (GSS et al., 2018). In addition, 25 and 12 deaths per 1000 live births were recorded as neonatal and post neonatal mortality respectively (GSS et al., 2018). According to the Population Reference Bureau, life expectancy at birth for males and females was 62 and 64 years respectively in 2018 (Population Reference Bureau, 2018). With regards to nutrition, the 2014 Ghana Demographic and Health Survey revealed that among children under five years, 19% were stunted, 5% were wasted, 11% were underweight and 3% were overweight. In addition, 42% of women in their reproductive ages 15-49 were anaemic and 66% of children under five were also anaemic. Furthermore, 12% of children under five years had diarrhoea two weeks preceding the survey. With regards to malaria, about 36% and 27% of infants aged 6 to 59 months reported of having malaria measured by rapid diagnostic test and analysis of blood respectively (GSS et al., 2015).

Furthermore, the 2017 Maternal Health Survey revealed that about 98% of women aged 15 to 49 years attended antenatal care clinic. Institutional delivery was 79% in 2017, while skilled birth assistance at delivery was 79%. About 84% of women received a postnatal check for their most recent birth (GSS et al., 2018).

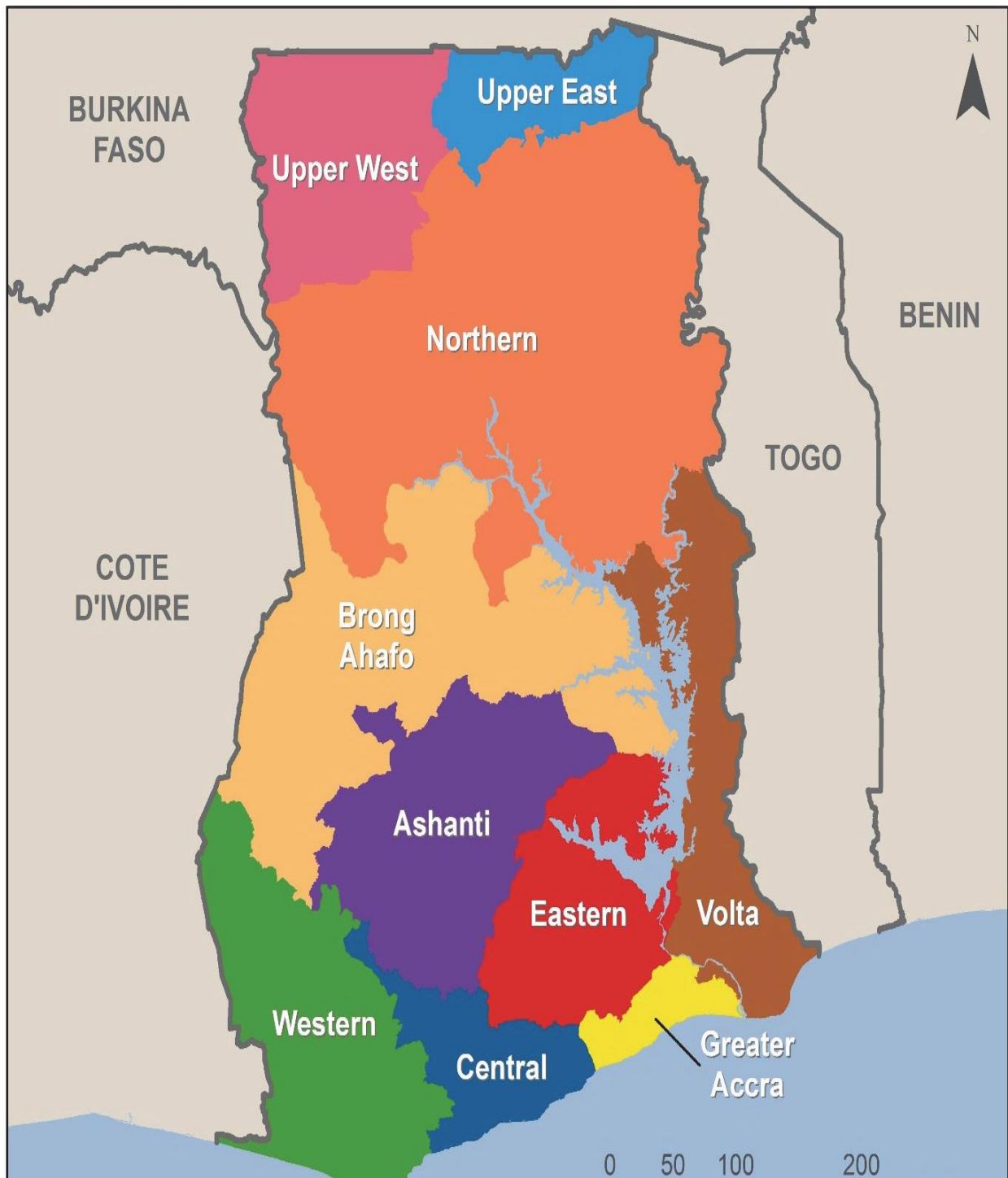
3.3.2 Qualitative study area: Madina

The qualitative component of the study was conducted in two health facilities at Madina. Madina is the municipal capital town of La-Nkwantanang Municipal. It is located at the northern part of the Greater Accra, Region and covers 70.887 square kilometres. The Municipal share boundaries in the West with the Ga East Municipal, East with Adenta Municipal, South with Accra Metropolitan Assembly and North with Akuapim South District (Ghana Statistical Service, 2014).

According to the 2010 Population and housing census report, the population of the Municipal was youthful (38.7%) with a small (5.0%) proportion of elderly (Ghana Statistical Service, 2014). The indigenous people of the municipality are Ga-Dangbe and the main language is Ga-Adanbge. Most of the people in Madina are migrants with the highest proportion from the Eastern and Volta region. The main economic activities are commerce, agriculture, services and manufacturing. The Madina market serves as a main trading centre in the municipality (Ghana Statistical Service, 2014).

In terms of health facilities, Madina has both private and public health facilities. The public health facilities include two polyclinics, health centres, and Community-Based Health Planning and Service (CHPS). Among some of the private health facilities are Pentecost Hospital, Passion Clinic and Esidem Hospital (Ghana Statistical Service, 2014).

Figure 3.1 Map of Ghana showing administrative regions



Source: GSS et al., (2015)

3.4 Quantitative data

3.4.1 Data source

This study used data from the 2014 Ghana Demographic and Health Survey. The survey was conducted by the Ghana Statistical Service. The 2014 GDHS is part of the worldwide Demographic and Health Survey Programme of the United States Agency for International Development (USAID). The 2014 GDHS is the sixth round of nationally representative survey on demographic and health issues. The survey collected in-depth information on socioeconomic and demographic characteristics, maternal and child health, reproductive health behaviors, morbidity, and mortality. Data was elicited from children under five years, women in their reproductive ages (15-49 years), men (15-59 years) and household (GSS et al., 2015).

3.4.2 Sampling design

The sample frame used for the survey was a complete list of census enumeration areas (EAs) created from the 2010 Population and Housing Census in Ghana (GSS et al., 2015). The survey used a Stratified, Multistage Cluster Sampling design to select respondents.

The sampling units for the survey were selected using the ten administrative regions and place of residence. The administrative regions were then stratified into rural and urban residence. Sampling strata were selected from each rural and urban residence in every region (GSS et al., 2015). Enumeration areas were then selected from the stratum in two stages. The first and second stages involved listing and selection of respondents for interview respectively.

The first stage involved the selection of clusters consisting of enumeration areas and listing of households. A total of 427 clusters, consisting of 216 clusters in urban and 211 rural areas were independently selected for the survey (GSS et al., 2015). This was followed by household listing

in each of the selected clusters (GSS et al., 2015). The final household listing served as the sampling frame for the survey. However, not every enumeration area was listed due to the size of the areas and the population. Enumeration areas with 200 households were divided into different segments and only one segment was selected for the survey. Hence, a cluster was defined as either an enumeration area or a segment of an enumeration area (GSS et al., 2015).

The second stage involved the selection of households and respondents for the interview. In all, 30 households were selected per cluster from the household listing constituting 12,841 households for the interviews (GSS et al., 2015). Interviews were conducted in the selected households with no replacement or changes to avoid bias. All women aged 15-49 years, and men aged 15-59 years were eligible for the study. In addition, information on children under five years in the selected clusters was collected (GSS et al., 2015).

Three questionnaires, specifically for women, men and household were used for the survey. They were first written in English and later translated into other Ghanaian languages such as Twi, Ewe, and Ga. The survey protocol was approved by the “Ghana Health Service Review Committee and Institutional Review Board of ICF International” (GSS et al., 2015). The training was done for all interviewers for a period of almost one month. Pretesting was done, and fieldwork was carried out in the period of four months, that is from September to December 2014. The interview response rate was 99% (GSS et al., 2015).

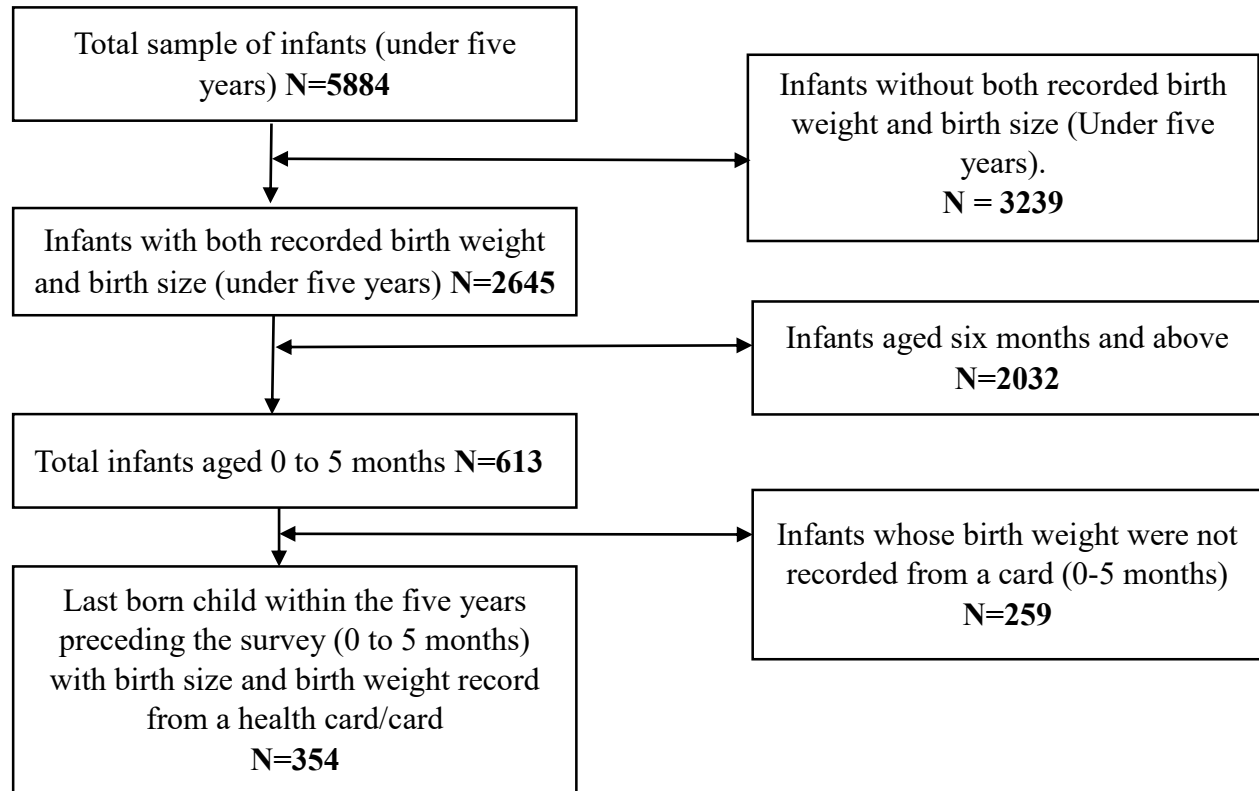
3.4.3 Unit of analysis

The unit of analyses for this study is children born in the five years (5) preceding the survey and their mothers.

3.4.4 Inclusion criteria and sample size

The inclusion criteria for the sample size (354) comprise infants who are last-born child of their mother born in the five years preceding the survey and aged 0 to 5 months, with both birth weight and birth size records (Figure 3.2). For the birth weight, only birth weight records on infants' health card were used. According to the WHO definition of exclusive breastfeeding, infants from 0-5 months are to be exclusively breastfed with breast milk only. After six months, they are introduced to solid and semi-solid food. Therefore, infants who were 6 months and above were excluded from this analysis.

From the data set, 5884 mothers with infants under five years were interviewed in the 2014 Ghana Demographic and Health Survey. However, information about birth size and birth weight from a health record book or card was available for only 2645 infants under five years. About 3239 infants under five years had no records of birth weight and these infants were excluded from this study. The total sample (2645) which was made of all children under five with both recorded birth weight and birth size was limited to infants 0 to 5 months. The sample for all infants from 0 to 5 months was 613. This was further limited to last born infants within the five years preceding the survey who had both birth size and birth weight written in a health record book or cards. This implies that infants with recall birth weight records were excluded from the study. In all, about 354 infants had both birth size and birth weight records from a health record book or card.

Figure 3.2 Diagram showing how infants were selected for the study

3.4.5 Categorization and measurement of variables

3.4.5.1 Dependent variable

The dependent variable for the study is exclusive breastfeeding which is defined “as feeding infants aged 0 to 5 months with only breast milk, and no other liquids, solids or water except for oral rehydration solution, drops or syrups” (WHO, 1991, p 4). The outcome variable was defined based on the World Health Organisation infant feeding indicators for assessing breastfeeding practices and the guide to Demographic Health Survey statistics (WHO, 1991). For this study, exclusive breastfeeding is considered as the current exclusive breastfeeding and is based on the 24-hour recall method. Current exclusive breastfeeding is defined as the practice of exclusive breastfeeding for infants 0 to 5 months who are still within the recommended exclusive breastfeeding duration.

This does not represent the proportion of infants who have passed the exclusive breastfeeding age, thus, infants aged six months and above. The 24-hour recall method is supported by the World Health Organisation for measuring exclusive breastfeeding for surveys of dietary intake. Several studies have used the 24-hour recall measurement in reporting exclusive breastfeeding (Chandhiok et al., 2015; Khanal et al., 2014; Joshi et al., 2014; Qiu et al., 2009).

During the survey, mothers were asked if infants were fed with any of the foods during the 24-hours preceding the survey as shown in Table 3.1 below. Exclusive breastfeeding was then computed from several food items categorised under breast milk, water, liquids, milk, and solid food. Each of the food items had different types of food categorised under them.

Table 3.1 Food items used in computing exclusive breastfeeding in Ghana

Breast milk	Liquids	Milk	Water	Solid
Yes No	Juice	Tinned, powdered or fresh milk	Plain water	Fortified baby food (cerelac, etc)
	Soup/clear broth	Baby formula		Bread, noodles, other made from grains
	Other Liquids			Potatoes, cassava, or other tubers
				Eggs
				Meat (beef, pork, lamb, chicken, etc)
				Pumpkin, carrots, squash (yellow or orange inside)
				Any dark green leafy vegetables
				Mangoes, papayas, other vitamins A, fruits
				Any other fruits

				Liver, heart, other organs
				Fish or shellfish
				Food made from beans, peas, lentils, nuts
				Cheese, yogurt, other milk products
				Child other solid-semisolid food

Source: 2014 Ghana Demographic and Health Survey Data.

For instance, to compute for those who gave milk food to the infants, mothers were asked if they gave tinned, powdered milk, fresh milk, and baby formula to the infants. Those who gave any of the food items under milk were coded as “0”, while those who did not give any food were coded as “1”. The procedure was followed to compute for breast milk, liquids, water, and solid food. After that, these food items were combined to compute exclusive breastfeeding. Infants who were breastfed with only breast milk were coded as “1” and labeled as “Yes” while those who were given breast milk together with either liquids, milk, water, solid or all were coded as “0” and labelled as “No” for non-exclusive breastfed infants as shown in Table 3.2.

3.4.5.2 Independent variables

The main independent variables for the study are perceived birth size and birth weight. Birth size is a subjective measure of the size of the infants at birth by the mother whilst birth weight is an objective measure taken with a weighing scale and recorded at birth.

3.4.5.2.1 Perceived birth size

From the survey, mothers were asked, “when (NAME) was born, was he/she larger, larger than average, average, smaller than average, or very small?” The responses in the data were very large, larger than average, average, smaller than average and very small (GSS et al., 2015). These were

recategorised into three (small, average and large) because the proportions of respondents falling within very large and very small were few. Those who responded that their babies were smaller than average and very small were recoded as “small”. Average was maintained as “average”, while those who responded that their babies were larger and larger than average were recoded as “large” as shown in Table 3.2.

3.4.5.2.2 Birth weight

During the survey, mothers were asked if infants were weighed at birth. If they were weighed, what was the weight of the infant in kilograms (kg) or grams (g)? Entries of the weight on the card are completed by health personnel and given to the mothers during discharge at the health institution (Channon et al., 2011). Enumerators recorded the birth weight if available from written records or mother’s recall. For the purposes of this study, birth weight from written records (child’s health card/book) were used as it is more reliable than maternal recall. The responses ranged from 1700g to 5000g and this was recategorised into three based on the standard of WHO birth weight classification (UNICEF and WHO, 2004). Infants weighing less than 2500g were categorised as “low birth weight”, those from 2500g to 4499g were categorised as “normal birth weight” and those with 4500g and above were categorised as “high birth weight” as shown in Table 3.2.

Table 3.2 Measurement of dependent and independent variables

Variable	Description	Type of measurement	Categorisation
Exclusive breastfeeding	Exclusive breastfeeding of infants aged 0 to 5 months	Categorical	0. No 1. Yes
Birth size	A subjective measure of the birth size of infants as recalled by mother at birth (0 to 5 months)	Categorical	1. Small birth size 2. Normal birth size 3. Large birth size
Birth weight	An objective measure of birth weight of infants at birth (0 to 5 months)	Categorical	1. Low birth weight 2. Normal birth weight 3. High birth weight

3.4.5.3 Control variables

The study controlled for other variables that may have an influence on exclusive breastfeeding in Ghana. These include maternal socio-demographic characteristics, household factors, community/organisational/structural factors, biomedical factors, and child characteristics. Details of the variables are described as follows;

3.4.5.3.1: Maternal socio demographic factors**Table 3.3 Measurement of socio demographic characteristics**

Variable	Description	Type of measurement	Categorization
Age of mother	This measured the age of the mother at the time of the survey. The responses were categorized into seven.	Categorical	1. 15-19 2. 20-24 3. 25-29 4. 30-34 5. 35-39 6. 40-44 7. 45-49
The highest educational level of the mother	The highest educational level of the mother at the time of the survey	Categorical	1 No education 2 Primary 3 Secondary 4. Higher
Marital status of the mother	This measured the marital status of mothers at the time of the survey. Responses from the survey included; never in a union, married, living with a partner, widowed, divorced and no longer living together/separated. These responses were re-categorised into three: never married (never in the union), married (including married and cohabiting) and ever married (including the widow, divorced and separated)	Categorical	1. Never married 2. Currently Married 3. Ever married
Children ever born of a mother	Respondents were asked to indicate the number of children they have had in their lifetime at the time of the survey. The responses range from 1 to 9. This was categorized into single child mother (one child) and multiparous mother (two or more children)	Categorical	1.Single child mother 2.Multiparous mother

3.4.5.3.2: Household factors**Table 3.4 Measurement of household factor**

Variable	Description	Type of measurement	Categorization
Wealth index of household	The wealth index of households was computed from household assets such as television, fridge, radio, etc. and was categorised as poorer, poor, middle, rich and richer.	Categorical	1. Poorer 2. Poor 3. Middle 4. Rich 5. Richer

3.4.5.3.3 Community/organisation and structural factors**Table 3.5 Measurement of community/organisation and structural factors**

Variable	Description	Type of measurement	Categorization
Place of residence of the mother	Place of residence of the mother at the time of the survey	Categorical	1. Rural 2. Urban
Ethnicity of mother	Ethnic affiliation of the mother. Responses from the survey included Akan, Ga/Adangme, Ewe, Guan, Mole-Dagbani, Grusi, Gruma, Mande and others. These responses were recategorised into Akan, Ga/Adangme, Ewe and other. The other includes Guan, Mole-Dagbani, Grusi, Gruma, Mande and other ethnic groups not specified in the data. These were put together	Categorical	1. Akan 2. Ga-Adangme 3. Ewe 4. Other

	because the proportion belonging to each category was few.		
Religion of mother	Mothers were asked about their religious affiliation at the time of the survey. The following responses were provided; Catholic, Anglican, Methodist, Presbyterian, Pentecostal/charismatic, other Christian, Islam, Traditional/Spiritualist, No religion and other. These were re-categorised as orthodox (Catholic/Anglican), Protestant (Presbyterian/Methodist) Pentecostal/Charismatic, Other Christians, Islam and other religious group comprising traditional/spiritualist, no religion and minor groups. These were put together because they had small proportion of sample size.	Categorical	1.Orthodox 2.Protestant 3.Pentecostal/Charismatic 4.Other Christians 5. Islam 6.Other religious groups
Employment status of the mother	Mothers' were asked to indicate whether they were working or not at the time of the survey. Those who were working were coded as employed while those who were not working were coded as unemployed	Categorical	1. Unemployed 2. Employed
Maternity leave by the mother	This measured the maternity leave of mothers for their last child. Employed mothers were asked if they took maternity leave after birth. Those who took maternity leave were coded as "Yes" while those who did take were coded as "No". Those who were self-employed or not working at the formal settings that required no formal maternity leave were coded as "not formally required maternity leave"	Categorical	1.No 2.Yes 3.Not formally required maternity leave

3.4.5.3.4 Biomedical factors

In this study, the biomedical factors include frequency of antenatal care, place of delivery, assisted delivery and postnatal care. These are discussed in Table 3.6

Table 3.6 Measurement of biomedical and cultural characteristics

Variable	Description	Type of measurement	Categorization
Antenatal care	Antenatal care measures the frequency and utilization of health services by pregnant women on their visit to health facilities. The frequency captured the number of times a woman visits the health facility for a health check-up. The responses start from zero through four and beyond.	Continuous	
Place of delivery	Place of delivery captured the location of delivery of the last pregnancy of the mother. The responses included a public facility, private facility, home, and traditional birth attendant. This was recorded into public facility, private facility and others including home and traditional birth attendant.	Categorical	1. Public facility 2. Private facility 3. Other (home and traditional birth attendant)
Postnatal care	This measured postnatal care received by the mother for the last-born child during the five years preceding the survey. Mothers were asked if they attended postnatal clinic after delivery. Those who attended postnatal clinic were coded as “Yes” while those who did not attend were coded as “No”	Categorical	1. Yes 2. No
Mode of delivery	This measured the mode of delivery of a mother. Mothers who had normal delivery through the vaginal were coded as “normal” while those who delivered through surgical procedures were coded as “Caesarean”	Categorical	1. Normal 2. Caesarean

3.4.5.3.5. Child characteristics

Child characteristics used in the study are described in Table 3.7

Table 3.7 Measurement of child's characteristics

Variable	Description	Type of measurement	Categorization
Sex of child	This measured the sex of a child.	Categorical	Male Female
Birth order of child	This measured the order a child is born at the time of the survey	Continuous	
Age of child	The current age of the child (in months). The current age of infants' ranges from 0 to 5 months. This was applicable for exclusive breastfeeding.	Categorical	0 1 2 3 4 5

3.4.6 Method of analysis

This study adopted several analytical techniques. At the univariate level, frequencies and percentages were used to describe the proportion of categorical variables. This was shown using tables and graphs. The mean, minimum, maximum and standard deviation were used to describe the summary of continuous variables.

Bivariate tests were carried out to examine the association between birth weight, birth size, and control variables against exclusive breastfeeding. Chi-square test and Spearman Correlation were used to test for the associations. The Chi-square test was used to examine the association between two categorical variables while the Spearman Correlation was used to test for the association

between categorical and continuous variables. The probability value for both the chi-square and Spearman correlation was set at $\alpha=0.05$ to indicate the significance of the association between the variables.

In addition, Kendall's Coefficient of Concordance (W) test was used to examine the level of agreement or relationship between birth weight and birth size. Kendall W test is a non-parametric method which is used for assessing an agreement by raters or people. For this study, birth weight and birth size were rated by two different raters. Birth size is the subjective view of the size of the infant after delivery by the mother while birth weight was measured with a weighing scale mostly at the health facility after delivery. Hence, Kendall's Coefficient of Concordance (W) is the appropriate method for testing the agreement between the two. The result of Kendall's Coefficient of Concordance (W) ranges from 0 to 1 where "0" means perfect disagreement and "1" means perfect agreement. The closer the value is to 1, the stronger the agreement while the closer the value is to 0, the lower the agreement.

For the multivariate analyses, binary logistic regression was used to determine factors associated with exclusive breastfeeding in Ghana. This was used because the dependent variable (exclusive breastfeeding) is a dichotomous variable (yes or no). Infants who were exclusively breastfed were coded as "1" while those who were not exclusively breastfed were coded as "0". Odds ratios were reported to explain the probability of the occurrence of exclusive breastfeeding. The logistic regression model can be given as the odds of an event occurring in terms of the independent variable(s). An odds ratio greater than one ($OR>1$) shows a greater chance of exclusive breastfeeding while an odds ratio less than one ($OR<1$) shows a lesser chance of exclusive breastfeeding.

The logit transformation model equation is stated below:

$$\text{Logit } P = \ln\left(\frac{P}{1-P}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n$$

Where P is the probability that a child is exclusively breastfed

1-P is the probability that a child is not exclusively breastfed

α is a constant

$\beta_1, \beta_2, \beta_3$, and β_n are the regression coefficients.

X_1, X_2, X_3 , and X_n are the main independent and control variables which are birth weight, birth size, mothers' age, education, wealth, marital status, sex of the child, etc.

3.5 Qualitative data

The qualitative data focused on the experiences of health workers and mothers on exclusive breastfeeding practice among women attending child welfare clinic. It further explores benefits, challenges, reasons for non-exclusive breastfeeding, management, improvement of exclusive breastfeeding and socio-cultural practices which prescribe or proscribe the practice of exclusive breastfeeding. While the quantitative data explains factors predicting exclusive breastfeeding, the qualitative data offers an explanation to the statistical relationship and unearth the differences in birth weight and birth size as well as other factors explaining exclusive breastfeeding behavior.

3.5.1 Study design

The qualitative approach for this study was integrated under the Willows International Project, which is an ongoing project in Madina, Abokobi, Ashongman and the coastal towns (Labadi, Osu, Teshie and Nungua) in Accra. The project is a longitudinal study designed to provide information on the impact of the Willows Reproductive Health program as implemented in Ghana. For this

study, an exploratory design was used to examine exclusive breastfeeding experiences of health workers and mothers. Individual in-depth interviews were conducted using a semi-structured interview guide at the two health facilities in Madina, Accra. The interview guide focused on child characteristics, decision to practice exclusive breastfeeding, management of exclusive breastfeeding, challenges of exclusive breastfeeding, benefits of exclusive breastfeeding, and reasons for not practicing exclusive breastfeeding. The interviews were conducted in June 2019 and each interview lasted for about 15-20 minutes.

3.5.2 Facility setting

The data was collected in two Polyclinics located in Madina, Greater Accra. The two Polyclinics are Kekeli and Rawlings Circle. These are the biggest government hospitals found in Madina (La Nkwantanang Municipal Assembly) and its surrounding towns. They were chosen among other health facilities in Madina because they are part of the health facilities selected for WILLOWS International project on reproductive health behaviour. Further, they are well-organized polyclinics with good child welfare clinics with well-trained health workers. They are easily accessible by mothers due to good road network and their location within the centre of Madina. Lastly, more women attend child welfare clinics at these health facilities because they have good staff and provide education on maternal and child health during child welfare clinic days.

3.5.3 Sampling and sample size

Purposive sampling was used to select the health facilities and participants for the study. The two health facilities were purposively selected due to the factors mentioned above. Mothers attending child welfare clinic were purposively selected for the interviews with the help of the health workers. They assisted in the screening of mothers for the study based on the following criteria;

- Mother must be within the reproductive age of 15-49 years.

- They must have a child who is less than 6 months old.
- They must be practicing exclusive breastfeeding or not.

The health workers were purposively selected for the interview based on the following criteria

- Should be a permanent staff of the health facility.
- Interact with pregnant and nursing mothers.

In all, twenty participants were interviewed for the study; four health workers and sixteen mothers. For the mothers, ten were practicing exclusively breastfeeding while six were not practicing exclusive breastfeeding. Eight mothers were selected from each facility. This comprised five mothers practicing exclusive breastfeeding and three mothers who were not practicing exclusive breastfeeding. Furthermore, four health workers comprising of two from each health facility were purposively selected and interviewed. The number of interviewees was determined by meaning saturation. After the fourth and sixteenth interview with health workers and women respectively, there were repetitions of findings which informed the decision to the end of the interviews.

3.5.4. Ethical clearance

The qualitative part of the study was submerged into the Willows International Evaluation Project, hence the ethical clearance for the bigger project was used for this study. Willows International Evaluation Project obtained clearance from the Ethics Review Committee of Ghana Health Service and the Harvard T.H Chan School of Public Health Institutional Review Board. The ethical clearance was further used to obtain administrative permission from the two polyclinics and from the participants, thus, mothers and health workers.

3.5.5 Data collection

The fieldwork was carried out in June 2019. All the interviews were conducted by the researcher. The participants were selected for the interviews through the following process. Upon entering the hospitals, permission was sought from the management to use the facility for the study. After that, permission was also sought from the participants (mothers and health workers) to be included in the study. First, the purpose of the study including the general objectives, benefits, and risk of taking part in the study was explained to the participants. After that, the respondents, if literate, signed an informed consent form and, if illiterate, provided a thumb print or verbal consent was sought. Furthermore, participants were informed about the confidentiality and anonymity of the information provided. Lastly, they were informed about their right to stop participating in the study at any point if they desired to do so. Some of the interviews were conducted in an office while others were conducted at a quiet place without interference or presence of anyone at the hospital. All the interviews were carried out by the researcher. They were conducted in a preferred language by the participants, recorded and audiotaped. The preferred languages of the participants were mainly English and Twi. The interviews on breastfeeding experiences lasted between 15 and 20 minutes. This is because, few questions were asked to explore the experiences of women and health workers on exclusive breastfeeding to support the quantitative results.

3.5.6 Transcribing and translating

The interviews were conducted in both English and Twi. Interviews conducted in English were transcribed verbatim in English whilst those done in Twi were transcribed into English. The transcription was done by a professional transcriber. Data quality check was done by going through the transcripts and playing the audio tapes along to verify that all the audio files have been transcribed correctly.

3.5.7 Data analysis

The data were analyzed thematically using a qualitative analytical software called Atlas.ti. The thematic analysis approach involves searching across a range of text or transcript to find a repeated pattern of meaning and organising these into various levels of themes such as basic, organising and global (Braun and Clarke, 2013). The initial stage involves reading of the transcripts repeatedly to gain familiarity with the text as well as noting down initial ideas. This was followed by assigning codes to the text segment of the transcript. The assigned codes were organised to generate cross-cutting themes from all the transcripts. At this stage, different codes from the transcripts were sorted into potential themes, as all relevant codes were collated within the identified themes (Braun and Clarke, 2013). Thematic networks were constructed to show the relationship between the various themes at the three levels: basic, organising and global themes.

The basic theme is the lowest order evidence found in the text. These are the initial codes assigned to the segment of text. The organising themes are the middle-level themes that summaries all basic themes with similar meanings. Furthermore, the organizing theme groups the main ideas of basic themes into one perspective. This was used to group codes generated into the various themes of exclusive breastfeeding experience. After this, the global theme was developed. This is the super-ordinate theme that groups all the organising themes together (Braun and Clarke, 2013; Attride-Stirling, 2001).

3.6 Method of analysis for each objective

3.6.1 Objective 1: Examining birth size as a comparable measure for birth weight in Ghana

This objective examines birth size as a comparable measure for birth weight. The sample includes infants with recorded birth weight and birth size. Infants with no birth weight and birth size or both were excluded from this analysis. Birth weight and birth size were each categorized into three for

easy comparison. Kendall's Coefficient of Concordance (W) test was applied to test for the comparison/agreement between the two variables.

3.6.2 Objective 2: To examine the relationship between birth weight and exclusive breastfeeding in Ghana.

The objective examines the relationship between birth weight and exclusive breastfeeding. Exclusive breastfeeding was categorised as a dichotomous variable “Yes” and “No”. Birth weight was measured as low, normal and high. Low birth weight was used as the reference category. Binary logistic regression was used to examine the relationship between birth weight and exclusive breastfeeding in Ghana. The analysis was conducted at a significance level of 0.05 (95% confidence interval).

3.6.3 Objective 3: To examine the relationship between birth size and exclusive breastfeeding.

The independent and dependent variables for this section are birth size and exclusive breastfeeding, respectively. The birth size was categorized as small, normal and large. Small birth size was used as a reference category. Exclusive breastfeeding was categorised as “Yes”, and “No”. Binary logistic regressions were used to examine the relationship between birth size and exclusive breastfeeding in Ghana. The analysis was conducted at a significance level of 0.05 (95% confidence interval)

3.6.4 Objective 4: To explore the experiences of mothers and health workers in practicing exclusive breastfeeding.

A qualitative approach was used to explore this objective. The experiences including challenges, benefits, and management of exclusive breastfeeding were discussed according to themes.

3.7 Study limitations

The 24-hour recall method used for computing exclusive breastfeeding was obtained from mothers who were still breastfeeding their infants 0-5 months. This method measures the “current status” of exclusive breastfeeding but not completed exclusive breastfeeding. The measure does not take into consideration the entire 6 months duration recommended by the World Health Organisation.

Again, researchers have argued that this measure represents a substantial exaggeration or may overestimate the population practicing exclusive breastfeeding (Greiner, 2014). Mothers may have introduced liquid or solid foods or given infants water and may have forgotten during the survey. In addition, mothers’ currently practicing exclusive breastfeeding may stop before the recommended six months. Despite these limitations, the 24-hour method helps to reduce the risk of recall bias which has been identified by researchers as a limitation to the six months method. Again, this measure is recommended by WHO especially for cross-sectional surveys due to time and cost constraints (WHO, 1991).

Also, the subjective measure of birth size is affected by recall bias. Mothers may forget the birth size of the infant at birth and may recall incorrectly during the time of the survey. Also, maternal recall of birth size varies with time, influenced by individual factors, cultural and socio-economic factors (Mbuagbaw and Gofin, 2010). These factors could influence the decision of the mother to judge the birth size of the infants especially at the time of the survey.

In addition, birth weight is affected by misclassification and digit preference as health professionals tend to round digits to the nearest 500grams. Studies have shown that misclassification and digit preference have an influence on the proportion of infants who have low birth weight (Islam, 2014; Eggleston et al., 2000). Mothers report normal birth weight for their infants even when they have low birth weight. Despite these limitations, birth weight and birth size

from the demographic health survey may be preferred and used due to the nationwide coverage. In addition, not all births are delivered at the health facilities, hence, surveys capture more births than facility data.

About half of the mothers who had delivered within the five years preceding the survey did not have records of birth weight for their infants. For those who had birth weight, some were recalled, and this did not give a true measure of birth weight of the infants. As a result of this, infants who were six months and above were taken from the analysis and this reduced the total sample size for the study. Only infants with recorded birth weight in a child health record book were included in the analysis. To ensure that the missing cases do not affect the selected sample for the analysis, a background characteristics of the study sample (354) and infants (259) excluded from the study (infants from 0 to 5 months with no birth weight and birth size records) were run to test for the significant difference. The results showed that there was no significant difference between the background characteristics of the selected sample and infants who were excluded from the study (refer to appendix H). This helped to ensure that the selected sample is not biased.

CHAPTER FOUR

ASSOCIATION BETWEEN BACKGROUND CHARACTERISTICS AND EXCLUSIVE BREASTFEEDING

4.1 Introduction

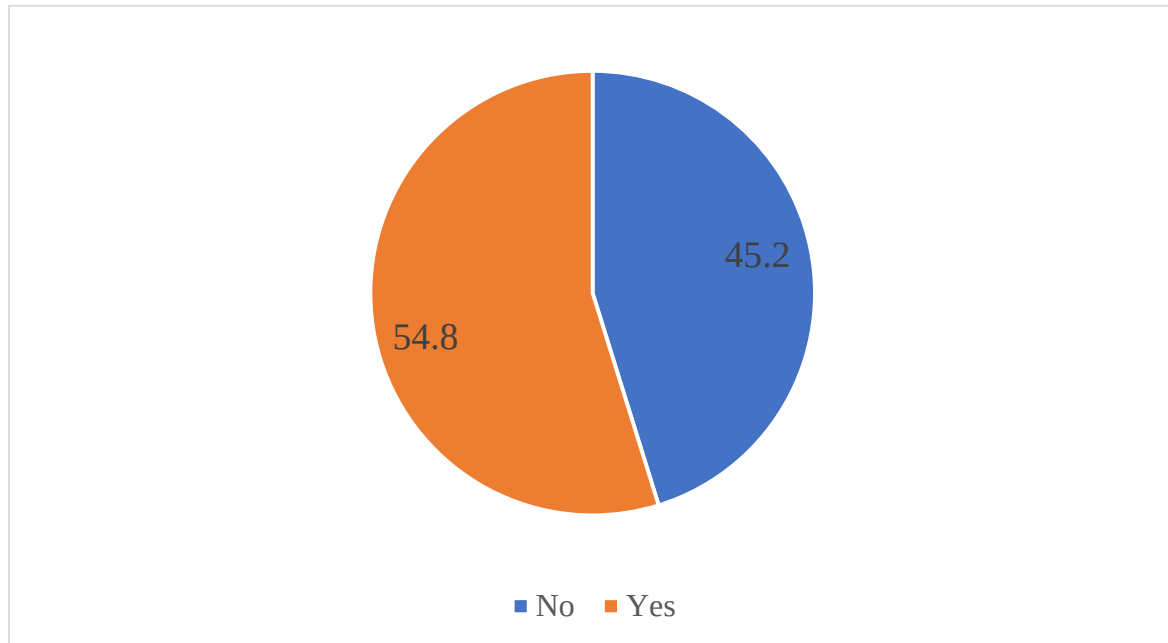
This chapter examines the association between background characteristics and exclusive breastfeeding. The results are presented in two main sections. The background characteristics including birth characteristics, maternal socio-demographic characteristics, household characteristic, community/organisational/structural factors, biomedical factors, and child's characteristics are presented in the first section. At the second stage, the study assesses the association between the background characteristics and exclusive breastfeeding in Ghana using Chi-square tests and Spearman Rank Correlation.

4.2 Univariate analysis

4.2.1 Exclusive breastfeeding

Figure 4.1 presents exclusive breastfeeding practice for infants less than six months. There is a marked variation between infants who were exclusively breastfed and those who were not. Majority of the infants (54.8%) were exclusively breastfed while about 45.2% were not exclusively breastfed within the 24 hours preceding the survey.

Figure 4.1 Pie chart showing the prevalence of exclusive breastfeeding



Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.2.2 Birth characteristics

As shown in Table 4.1, majority (85.0%) of the infants had normal birth weight. About 8.5% of infants had high birth weight and 6.5% had low birth weight. With regards to birth size, about 52.0% of the infants were perceived by their mothers to be of small birth size, slightly below one third (32.2%) were perceived to be of normal birth size and 15.8 % were perceived to be of large birth size.

Table 4.1 Percentage distribution of child characteristics

Variables	Frequency	Percentage
Birth Weight		
Low	23	6.5
Normal	301	85.0
High	30	8.5
Birth Size		
Small	184	52.0
Normal	114	32.2
Large	56	15.8

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.2.3 Maternal socio-demographic characteristics

From Table 4.2, slightly more than a quarter (26.3%) of the mothers were 25-29 years, 22% were 30-34 years, and the least proportion (1.1%) were 45-49 years old. With regards to education, about 44.9% of the mothers had attained secondary education, almost three out of ten (29.1%) had never attended school and 6.5% had a higher education than secondary level. In terms of marital status, more than two-thirds of the mothers (68.9%) were married, about one fifth (20.9%) were living with their partners and one-tenth (10.2%) have never been married. Also, more than three-quarters were multiparous mothers, while 22.9% were mothers with one child.

Table 4.2 Percentage distribution of maternal socio-demographic characteristics

Variables	Frequency	Percentage
Age of mother		
15-19	24	6.8
20-24	75	21.2
25-29	93	26.3
30-34	78	22.0
35-39	62	17.5
40-44	18	5.1
45-49	4	1.1
Educational level		
No education	103	29.1
Primary	69	19.5
Secondary	159	44.9
Higher	23	6.5
Marital status		
Never married	36	10.2
Married	244	68.9
Living with Partner	74	20.9
Children ever born		
Mothers with one child	81	22.9
Mothers with two or more children (multiparous mother)	273	77.1
Total	354	100.0

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.2.4 Interpersonal factor

According to Table 4.3, about 29.3% of the mothers were in the poorest household wealth category, one-fifth (20.1%) were in the richer quintile category, slightly less than one-fifth (19.8%) were in the middle quintile category and 14.7% were in the poorer quintile category.

Table 4.3 Percentage distribution of interpersonal factors

Wealth	Frequency	Percentage
Poorest	104	29.3
Poorer	52	14.7
Middle	70	19.8
Richer	71	20.1
Richest	57	16.1
Total	354	100.0

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.2.5 Community/organizational/structural factors

As shown in Table 4.4, about three-fifths (64.7%) of the mothers were working during the time of the survey. With regards to ethnicity, more than one third (34.7%) were identified as Mole-Dagbani, 34.5% were Akans, and one-tenth (10.2%) were Ewes. In addition, slightly more than half (50.8%) of the mothers live in rural areas. Also, about 42.4% did not take maternity leave, about 11.6% took maternity leave and the highest proportion (46.0%) of mothers were working in the informal sector which did not require formal maternity leave. In terms of religion, the highest proportion (31.1%) of mothers were affiliated with Pentecostal/Charismatic Churches. Mothers belonging to the other religious groups had the least proportion of less than one tenth.

Table 4.4 Percentage distribution of community/organisational/structural factors

Variables	Frequency	Percentage
Employment status		
Not working	125	35.3
Working	229	64.7
Ethnicity		
Akan	122	34.5
Ewe	36	10.2
Mole-Dagbani	123	34.7
Other	73	20.6
Place of residence		
Urban	174	49.2
Rural	180	50.8
Maternity leave by mother		
No	150	42.4
Yes	41	11.6
Self-employed or not required formal maternity leave	163	46.0
Religious group		
Orthodox	65	18.4
Protestants	34	9.6
Pentecostal/Charismatic	110	31.1
Other Christians	44	12.4
Muslims	82	23.2
Other religious groups	19	5.4
Total	354	100

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.2.6 Biomedical factors

Antenatal care visit ranged from 0 to 20 times with an average visit of 6.4 and a standard deviation of 2.8. Generally, more than three-quarters of the mothers had their last child delivered at government health facilities. About one-tenth (9.9%) of the mothers delivered at home while 9.0% delivered at a private facility (Table 4.5). Majority of the mothers attended postnatal care within

two weeks after delivery. With regards to the mode of delivery, 86.4% of the mothers had normal delivery whilst 13.6% had caesarean delivery (Table 4.5).

Table 4.5 Percentage distribution of biomedical factors

Continuous variables	Minimum, Maximum	Mean, Standard deviation
Antenatal care	0, 20	6.4, 2.8
Categorical Variables	Frequency (N)	Percentage (%)
Place of delivery		
Home	35	9.9
Government Facility	287	81.1
Private Facility	32	9.0
Postnatal within two months		
No	92	26.0
Yes	262	74.0
Mode of delivery		
Caesarean	48	13.6
Normal delivery	306	86.4
Total	354	100.0

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.2.7 Child characteristics

Slightly more than half (52.5%) of the infants were males while 47.5% were females (Table 4.6). The age of the infants ranged from 0 to 5 months. Almost a quarter (24.6%) of the infants were five months old. About one fifth (20.3%) of the infants were three months old, slightly less than one-fifth (18.9%) were two months old, about 13.6% were one month old and the least proportion (4.2%) were under one month (Table 4.6). The birth order for infants ranged from 1 to 9, with mean birth order of 3.

Table 4.6 Percentage distribution of child characteristics

Continuous variables	Minimum, Maximum	Mean, Std deviation
Birth order	1.0, 9.0	3.1, 1.9
Categorical Variables	Frequency	Percentage
Sex of child		
Male	186	52.5
Female	168	47.5
Age of Child (months)		
0	15	4.2
1	48	13.6
2	67	18.9
3	72	20.3
4	65	18.4
5	87	24.6
Total	354	100.0

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.3 Factors associated with exclusive breastfeeding

This section describes the factors associated with exclusive breastfeeding. Factors examined include birth characteristics, maternal socio-demographic factors, household factor, community/organisation/structural factors, biomedical factors and child's characteristics. Chi-Square and Spearman Rank Correlation were used to test for the relationship between the independent variables and dependent variable (exclusive breastfeeding). The tests were done at 95% confidence interval ($p\text{-value} < 0.05$).

4.3.1 Associations between birth characteristics and exclusive breastfeeding

From Table 4.7, the results showed that exclusive breastfeeding practice differ by birth weight of infants. Generally, about 57.1% of normal birth weight infants were exclusively breastfed while 56.7% of high birth weight infants were exclusively breastfed. In contrast, 78.3% of low birth weight infants were not exclusively breastfed (Table 4.7).

The results further show that perceived birth size was not statistically correlated with exclusive breastfeeding. However, the pattern of birth size shows that 62.3% of normal birth size infants were exclusively breastfed, while more than two-fifths (44.6%) of large birth size infants were exclusively breastfed. In contrast, a higher proportion of large birth size infants were not exclusively breastfed, though this is not statistically significant (Table 4.7).

Table 4.7 Association between birth characteristics and exclusive breastfeeding

Variables	Exclusive Breastfeeding		Chi Square (p value)	P value
	No (%)	Yes (%)		
Birth Weight			10.859	0.004
Low	78.3	21.7		
Normal	42.9	57.1		
High	43.3	56.7		
Birth Size			5.084	0.079
Small	46.7	53.3		
Normal	37.7	62.3		
Large	55.4	44.6		

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.3.2 Associations between maternal socio-demographic characteristics and exclusive breastfeeding

From Table 4.8, maternal socio-demographic characteristics such as age, education, marital status and number of children ever born were not significantly associated with exclusive breastfeeding. However, with regards to age of mother, the proportion of mothers practicing exclusive breastfeeding was highest among the age category of 40-44. In terms of education, 60.9% of mothers with higher education exclusively breastfed their infants. Also, exclusively breastfeeding was highest among married mothers and the lowest was among never married mothers. Mothers

with two or more children had the highest proportions of their children who were exclusively breastfed.

Table 4.8 Association between maternal socio-demographic characteristics and exclusive breastfeeding

Maternal socio-demographic characteristics	Exclusive Breastfeeding		Chi Square	P value
	No (%)	Yes (%)		
Age of mother			6.510	0.369
15-19	58.3	41.7		
20-24	49.3	50.7		
25-29	47.3	52.7		
30-34	38.5	61.5		
35-39	41.9	58.1		
40-44	33.3	66.7		
45-49	75.0	25.0		
The educational level of the mother			0.901	0.825
No education	45.6	54.4		
Primary	49.3	50.7		
Secondary	44.0	56.0		
Higher	39.1	60.9		
Marital status of the mother			4.668	0.097
Never married	55.6	44.4		
Married	41.4	58.6		
Living with Partner	52.7	47.3		
Children ever born			0.743	0.389
Mothers with one child	49.4	50.6		
Mothers with two or more children	44.0	56.0		

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.3.3 Associations between household factor and exclusive breastfeeding

The results from Table 4.9 show that household wealth quintile is associated ($p\text{-value} < 0.05$) with exclusive breastfeeding. More than two-thirds (68.3%) of infants from poorest households were exclusively breastfed, while slightly more than half (53.5%) of infants from richer households

were exclusively breastfed. The lowest proportion of infants from the household wealth quintile categories who exclusively breastfed belong to the poor category.

Table 4.9 Association between household factor and exclusive breastfeeding.

Household factor	Exclusive Breastfeeding		Chi Square	P value
	No (%)	Yes (%)		
Wealth Quintile			12.706	0.013
Poorest	31.7	68.3		
Poor	57.7	42.3		
Middle	52.9	47.1		
Richer	46.5	53.5		
Richest	47.4	52.6		

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.3.4 Associations between community/organisational/structural factors and exclusive breastfeeding

Table 4.10 shows that exclusive breastfeeding differs by ethnicity. Except for infants belonging to Akan ethnic group, all the other ethnic groups had more than half of their infants being exclusively breastfed. The highest proportion of infants exclusively breastfed belong to mothers of the Ewe ethnic group.

Place of residence was not significantly associated with exclusive breastfeeding. About 58.3% of infants in rural areas were exclusively breastfed while 51.1% of infants in urban areas were exclusively breastfed (Table 4.10).

In addition, maternity leave, employment status, and religious affiliation were not significantly related with exclusive breastfeeding. Nonetheless, the pattern revealed that mothers who did not

take maternity leave had the highest proportion of infants who were exclusively breastfed. Within the categories of employment status, women who were working had the highest proportion of practicing exclusive breastfeeding compared with those who were not working.

Table 4.10 Associations community/organisational/structural factors and exclusive breastfeeding

Category	Exclusive Breastfeeding		Chi Square	P value
	No (%)	Yes (%)		
Ethnicity			10.411	0.015
Akan	55.7	44.3		
Ewe	36.1	63.9		
Mole-Dagbani	36.6	63.4		
Other	46.6	53.4		
Place of residence			0.175	0.200
Urban	48.9	51.1		
Rural	41.7	58.3		
Maternity leave			2.762	0.251
No	34.1	65.9		
Yes	48.7	51.3		
Self-employed or not required formal maternity leave	44.8	55.2		
Employment status			0.313	0.576
Not working	47.2	52.8		
Working	44.1	55.9		
Religious affiliation			10.131	0.072
Orthodox	27.7	72.3		
Protestants	52.9	47.1		
Pentecostal/Charismatic	48.2	51.8		
Others Christian	50.0	50.0		
Islam	48.8	51.2		
Other religious groups	47.4	52.6		

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.3.5. Association between maternal biomedical factors and exclusive breastfeeding

According to Table 4.11 there is no significant association between mode of delivery, place of delivery, postnatal care, and exclusive breastfeeding. However, the pattern of the mode of delivery shows that mothers who delivered by caesarean were the highest group practicing exclusive breastfeeding. With regards to the place of delivery, about 56.4% of mothers who delivered at government facilities exclusively breastfed their infants, while 42.9% of mothers who delivered at home exclusively breastfed their infants. In terms of postnatal care, women who attended postnatal care had the highest proportion of exclusively breastfeeding their infants.

Table 4.11 Association between maternal biomedical factors and exclusive breastfeeding

Category	Exclusive Breastfeeding		Chi Square	P value
	No (%)	Yes (%)		
Mode of delivery			0.707	0.401
Normal	46.1	53.9		
Caesarean	39.6	60.4		
Place of delivery			2.366	0.306
Government facility	43.6	56.4		
Private facility	46.9	53.1		
Home	57.1	42.9		
Postnatal Care			0.919	0.507
No	45.7	54.3		
Yes	45.0	55.0		

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.3.6 Association between child characteristics and exclusive breastfeeding

Table 4.12 shows that exclusive breastfeeding differed by age of child in months. Proportion of infants exclusively breastfed reduced with an increase in child's age. About four-fifth of infants

who were less than one month were exclusively breastfed while slightly more than one-third of infants who were five months old were exclusively breastfed. In terms of the sex of the child, no significant association was found between the sex of the child and exclusive breastfeeding practice. However, a relatively higher proportion of females (56.0%) than males (53.8%) were exclusively breastfed.

Table 4.12 Association between child characteristics and exclusive breastfeeding

Child Characteristics	Exclusive breastfeeding		Chi Square	P value
	No (%)	Yes (%)		
Age of child			31.457	0.000
0	20.0	80.0		
1	27.1	72.9		
2	29.9	70.1		
3	45.8	54.2		
4	53.8	46.2		
5	64.4	35.6		
Sex of child			0.679	0.380
Male	46.2	53.8		
Female	44.0	56.0		

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.3.7 Correlations of other factors and exclusive breastfeeding

A Spearman rank was used to test for the correlation between birth order, antenatal care and exclusive breastfeeding. The results from Table 4.13 show that there was no significant relationship between these variables and exclusive breastfeeding.

Table 4.13 Spearman-Rho Correlation between children ever born, birth order, antenatal care, and exclusive breastfeeding

Variable			Exclusive breastfeeding
Spearman's rho	Birth order	Correlation coefficient	0.054
		Sig. (2 tailed)	0.314
		Number	354
	Number of antenatal care visits	Correlation coefficient	-0.045
		Sig. (2 tailed)	0.401
		Number	354

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

4.4 Discussion

The aim of this chapter was to describe the background characteristics and the association between the background characteristics and exclusive breastfeeding. Exclusive breastfeeding prevalence among infants from birth to less than six months was 54.8%. This implies that slightly more than half of the infants were exclusively breastfed during the 24 hours preceding the survey. Even though exclusive breastfeeding prevalence observed in this study is high, it still falls below the World Health Organisation recommendation of 90%. This, therefore, underscores the need to improve on infants feeding practice by adopting more strategies to enhance exclusive breastfeeding practice.

Furthermore, when the prevalence of exclusive breastfeeding observed in this study (54.8%) was compared to the 2008 Ghana Demographic and Health Survey prevalence of exclusive breastfeeding (63%), there is an indication of a decline in exclusive breastfeeding prevalence in

Ghana. Evidence from other studies has shown that early introduction of complementary feeds, child physiological characteristics such as birth weight and birth size, perceived insufficient breast milk, influence of family members and friends are the reasons for the decline of exclusive breastfeeding (Diji et al., 2017; Otoo et al., 2009; Aidam et al., 2005). Also, child characteristics, an influx of substitute foods and short maternity leave could impact on exclusive breastfeeding as more women are now working. In addition, changing pattern of the extended family to nuclear family could lead to lack of support for mothers in caring for their children and this could contribute to discontinuation of exclusive breastfeeding.

Also, studies using the 24-hour recall method have reported lower exclusive breastfeeding prevalence compared to what was observed in this study. For instance, in Nigeria, a prevalence of 16.4% was observed from the DHS in 2003 (Agho et al., 2011). Again, a prevalence of about 36.0% was recorded in Bangladesh (Joshi et al., 2014) and 48.6% in India (Chandhiok et al., 2015). In contrast, other studies using the 24-hour recall method have recorded a higher prevalence of exclusive breastfeeding than what was observed in this study. In Nepal, Khanal et al, (2013) reported exclusive breastfeeding prevalence of 66.3% while in Sri Lanka 71.3% was recorded from a cohort study in 2007 (Perera et al., 2012). The difference in variation of exclusive breastfeeding could be explained by cultural practices.

With regards to birth weight, a higher proportion of the infants had normal birth weight. More than 8 out of 10 infants had a normal birth weight. A study in Malaysia reported a similar pattern (Tan, 2011). Likewise, a similar pattern was observed in China where a higher proportion of normal birth weight infants was recorded (Qiu et al., 2009). In a similar studies in Oman, Islam, (2014) reported a higher proportion of normal birth weight infants. In this current study, a higher

proportion of infants having normal birth weight could be attributed to the use of the records from a health card. Studies have shown that infants mostly with recorded birth weight on a health card usually have normal or high birth weight. In contrast, infants with no records on a health card have been reported to have low birth weight (Channon, 2011; Mbuagbaw and Gofin, 2010). This probably could explain why more infants belonging to the normal birth weight category as was found in this study

Furthermore, about 6.5% of low birth weight infants were recorded in this study. Studies have reported that sometimes low birth weight prevalence is underestimated due to unreported birth weight, rounding of birth weight to the nearest 500g and misclassification of low birth weight as normal birth weight (Islam, 2014; Mbuagbaw and Gofin, 2010; Robles and Goldman, 1999). In Oman, Islam (2014), identified that about 2.7% infants reported as weighing 2500g actually weighed less than 2500g, leading to misclassification of low birth weight as normal birth weight. Also, Moreno and Goldman, (1990) reported an underestimate of low birth weight infants in Peru, where about 18.3% of infants were of low birth weight instead of the 11.0% reported in the survey. They concluded that most infants with missing data on birth weight are more likely to be low birth weight. The low birth weight estimate for this study could be attributed to high unreported birth weight and the use of infants with only recorded birth weight from health records book/card. This could have affected the estimate of low birth weight.

With regards to birth size, a higher proportion of the women in this study reported a small birth size of their infants. Similar patterns have been observed in Cameroon (Mbuagbaw and Gofin, 2010) and India (Chandhiok et al., 2015). Birth size is influenced by the mother's perception, culture, community and mass media. A plausible explanation of the higher proportion of small

birth size could be attributed to the subjective opinion of mothers including their perception about the size of other infants in their families or community (Channon et al., 2011). These factors could have an influence on the mother's judgment of the size of their child as they may cherish reporting small birth size of their infants than large birth size. The probable reason could be that mothers may classify their infants to be of small birth size and this would enable them to introduce complementary feeding. However, most of the reviewed studies contradict the findings of this current study. These studies reported a higher proportion of normal birth size infants (Islam, 2014; Lule et al., 2012; Channon et al., 2011).

Results of the maternal socio-demographic characteristics show that a higher proportion of the mothers were between the age group of 25-29. Half of the mothers were youth that is from 15 years to 29 years. A similar pattern of age grouping of mothers has been observed in other studies in Nepal (Khanal et al., 2013) and Sri Lanka (Perera et al., 2012). With regard to education, about 7 out of 10 mothers have at least primary education. Most of the mothers had secondary education. A plausible reason could be that an improvement in the Ghanaian educational system through interventions such as free basic education which was initiated in the early 2000s could have motivated most of the women to attain secondary education. The improvement has led to an increase in the enrollment of students at the basic level as well as enabling more women to attain secondary education during the time of the survey. In terms of marital status, most of the women were married, and the highest proportion were Mole-Dagbani. A higher proportion of mothers in the marital status category was expected because the Ghanaian culture frowns on children born out of wedlock. This, therefore, encourages women to marry before giving birth.

The findings further showed that the highest proportion of the women belong to the poor household wealth quintile category and this could influence their exclusive breastfeeding practice. Some of

the maternal characteristics including education, place of residence, marital status, employment status are similar to the patterns of other studies found in Cameroon (Fombong et al., 2016), Tanzania (Maonga et al., 2016; Mgongo et al., 2013) and Bangladesh (Joshi et al., 2014).

The pattern of biomedical and cultural factors such as mode of delivery, place of delivery and antenatal care attendance are similar to the patterns observed in other studies (Velusamy et al., 2017; Joshi et al., 2014; Agho et al., 2011; Tan, 2011). Findings from the current study showed that the highest proportion of mothers had a normal delivery, delivered at health facilities and attended antenatal care for at least four times. Velusamy et al., (2017) reported similar findings as found in this study in South India. They reported that about 8 out of 10 women had normal delivery while almost 98% delivered at health institutions.

For child characteristics, most of the infants were five months old. Similar patterns of results have been reported in other studies (Adugna, et al., 2017; Khanal et al., 2013). Furthermore, most of the infants were males. In a related study, Nishimura et al., (2018), observed more males than females in India. Likewise, Velusamy et al., (2017) reported more males than females in South India.

The results further showed that background characteristics such as birth weight, wealth quintile, ethnicity and age of the child were significantly associated with exclusive breastfeeding. Birth weight was found to be significantly associated with exclusive breastfeeding. A higher proportion of normal birth weight infants were exclusively breastfed. Findings similar to the current study have been reported in Brazil where a higher proportion of normal birth weight infants were exclusively breastfed (Venancio and Monteiro, 2006). A possible explanation for this is that infants of smaller birth weight may have physiological and other characteristics that may discourage or lead to discontinuation of exclusive breastfeeding. Again studies have found that complementary

foods are introduced to low birth weight infants to enable them to gain weight (Lee et al., 2009). Also, studies have reported that low birth weight infants are introduced to complementary feeding due to poor suckling of breastmilk (Flaherman et al., 2013).

There was evidence of a significant association between the age of infants and exclusive breastfeeding. The percentage of exclusively breastfed infants decreased as the age of infants increases. For instance, there was a sharp decline in the proportion of exclusive breastfeeding from less than one month (80.0%) to three months (54.2%), and it further declined to 35.6% at five months. Findings of this current study corroborate with other studies (Adugna, et al., 2017; Khanal et al., 2013; Sasaki et al., 2010). These studies have reported that exclusive breastfeeding decreases as age increases. A plausible reason could be that mothers may introduce complementary feeding to the infants when their age increases on the assumption that the child needs more food in order to be satisfied because breast milk might not be enough for the infant.

Household wealth quintile was significantly associated with exclusive breastfeeding practice. The findings show that a higher proportion of women in poorer households exclusively breastfed their infants compared to women in other household wealth quintile categories. The finding of this current study is consistent with the observed pattern in other studies (Khanal et al., 2013). The possible reason for this finding could be that women from the poorer household may not have money to purchase infant formulae for their babies and this could explained the higher proportion of their infants being exclusively breastfed. Again, exclusive breastfeeding has economic benefits. Mothers may feel financially secured practicing exclusive breastfeeding. This is because exclusive breastfeeding is natural which makes it cost less. As a result, mothers from poorer households may not incur any cost and this could influence their behaviour to exclusively breastfed their infants.

The findings of the study show that ethnicity is significantly related to exclusive breastfeeding. The findings corroborate with what other studies have reported between ethnicity and exclusive breastfeeding (Marquis et al., 2016; Fombong et al., 2016; Awumbilla, 2003). A significantly higher proportion of Ewe women exclusively breastfed their children compared to women in the other ethnicity categories. The plausible reason could be that traditional practices such as living arrangement, social ties, kin support and beliefs among the Ewe ethnic group could enhance exclusive breastfeeding. Living arrangements, social ties and kin group support among the Ewe ethnic group could enhance exclusive breastfeeding practice. These practices reduce the work load of mothers and enable them to concentrate on caring for the baby as well as breastfeeding on demand to promote the practice of exclusive breastfeeding practice. Also, healthy cultural practices that promote good infant feeding behaviour could influence mothers desire to exclusively breastfeed their infants (Fombong et al., 2016).

CHAPTER FIVE

RELATIONSHIP BETWEEN BIRTH WEIGHT AND BIRTH SIZE

5.1 Introduction

This chapter seeks to examine the relationship and the level of agreement between birth weight and perceived birth size of infants. Birth size was categorised as small, normal and large while birth weight was categorised as low, normal and high. After this, Kendall's Coefficient of Concordance (W) test was applied to examine the relationship between the two indicators. The results of Kendall's Coefficient of Concordance (W) range from 0 to 1. The closer a value is to 1, the higher the level of agreement and when it is close to 0, the lower the level of agreement, and when Kendall value is 0, there is no relationship.

5.2 Relationship between birth weight and perceived birth size of infants

As shown in Table 5.1, the Kendall's Coefficient of Concordance (W) statistics for the relationship between birth weight and perceived birth size is 0.188. This figure (0.188) is close to zero and it implies that there is a low level of agreement between birth weight and perceived birth size.

The results from the qualitative data support the low or weak relationship between birth weight and birth size as was found in the quantitative data. Responses from both mothers and health practitioners showed a mismatch of birth weight and birth size categories. For instance, a non-exclusive breastfeeding mother mentioned that her child's size was bigger than the weight. The notion expressed by a non-exclusive breastfeeding mother is illustrated by the following quote;

"Some children weigh more than they look, so, when I looked at her, she was bigger than the weight. (P6, Non-exclusive breastfeeding mother)

In addition, a health practitioner also indicated that sometimes, birth weight categories are not proportional to birth size categories. The quote below provides insight into the views of the health practitioner:

“The baby might be big in size but light in weight that happens. You can see a child and with the appearance, you think this child will not weigh, but when you weigh the baby you will not expect the weight. I will see a child and I will be estimating that the child will fall below the normal range or moderately malnourished but when I weigh the child, the child will be within the normal. The mother may think the child is heavy, but the child may be malnourished when we weigh the baby” (Registered General Nurse).

Results from both the quantitative and qualitative data revealed that birth weight categories are not always proportional to birth size. This implies that there is an independent difference in birth weight and birth size. Hence, the use of birth size as a proxy for birth weight in Ghana should be done with caution.

Table 5.1 Kendall’s coefficient of concordance results showing the level of agreement between birth weight and birth size

Statistics	
Number of cases	354
Kendall’s W test	0.188
Chi Square	66.602
Degree of freedom	1
Asymptotic significance	0.000

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

5.3 Discussion

The findings from both the quantitative and qualitative data showed that there is a low or weak agreement between birth size and birth weight in Ghana. This result contradicts findings of other studies where birth size was reported to have a good relationship with birth weight (Channon, 2011; Blanc and Wardlaw, 2005; Boerma et al., 1996). On the other hand, findings from this study are consistent with what other studies have shown. These studies have shown that there is a weak or low relationship between birth weight and birth size (Eggleston et al., 2000; Islam, 2014; Lule et al., 2012).

In this current study, the birth weight records on the health card show that majority of the infants had normal birth weight while the mothers perceived their infants to be of small birth size. About 89.2% of infants were of normal birth weight while 33.1% were perceived by their mothers as having normal birth size. In addition, about 6.5% of infants were identified to be of low birth weight while 52.0% of infants were perceived by their mothers to be of small birth size. The highest proportion of infants perceived by their mothers to be of small birth size when juxtaposed with low birth weight could mean that there is underestimation of low birth weight. This also implies that there is a difference in birth weight and birth size categories. The probable reason could be that what mothers perceive or eye-ball to be of small, normal or large birth size is not directly proportional to birth weight categories. This, therefore, explains the variations in actual birth weight and perceived birth size.

Similarly, results from the qualitative data revealed that mothers' perception of birth size categories is different from actual birth weight categories. Some mothers viewed their children to be of large birth size, but the actual birth weight records showed that they were of normal birth weight. In this study, the difference in birth weight and birth size categories could be attributed to

the measurement of the variables. Birth weight is an objective measure which is not influenced by many factors compared to birth size which could be influenced by factors such as culture, community attributes and individual perception. Using data from developing countries, Channon, (2011) explained that in developing countries, birth size is influenced by individual and community factors, number of children born to the mother and the children she has encountered. These factors redefine and shape the perception of mothers on birth size and therefore explains the variation between perception and actual measurement.

Also, another reason that could explain the differences between the results in this study and those of other studies that found birth size as a good proxy for birth weight is the method or data set used in the analysis. In almost all the studies that found birth size as a good proxy, pooled data set from different countries were used while in this study and other studies that found that birth size is a poor proxy, only one point data was used. Furthermore, the data set used for the studies that established that birth size is a poor proxy for birth weight were collected in the 1990s with few in the early 2000s. In this study, the data set used were collected in 2014 and this could account for the difference. There is a tendency that perception or factors that influence birth size have changed in the 21st century and this could account for the differences in birth size categories and birth weight.

Another plausible explanation is that in this study infant with birth weight between 2.5kg and 2.9kg might have been classified by their mothers as small birth size. Such infants may have characteristics which might not be much different from infants with low birth weight (below 2.5kg) or small birth size. Furthermore, a bivariate analysis of the data showed that about 24.9% of infants weighed between 2.5kg and 2.9kg. Specifically, 2.2% of infants in this study weighed 2.5kg, 2.7% weighed 2.6kg, 1.6% weighed 2.7kg, 3.8% weighed 2.8kg and 5.4% weighed 2.9kg. A cross

tabulation of birth weight and birth size showed that about 15.7% of 24.9% of infants weighing between 2.5kg and 2.9kg were perceived by their mothers as having small birth size instead of normal birth size.

Similar observation of misclassification was reported by Islam, (2014) in Oman and Eggleston et al., (2000) in Ecuador. The findings of their study showed that there is a misclassification of birth weight categories across all categories of birth size. These studies explained that infants with low birth weight category were classified by mothers as normal birth weight. For example, Eggleston et al., (2000) reported that in Oman about three out of ten low birth weight infants were correctly identified to belong to small birth size category while almost 65% of the low birth weight infants were misclassified as belonging to the normal or high birth weight category. In addition, some health professionals round up weights of infants to the nearest 500grams digits, and this could bias the estimate of low birth weight and then affect the relationship between birth weight and birth size.

In conclusion, the results of the chapter from both the quantitative and qualitative analysis have shown that most of the infants have normal birth weight but were perceived by their mothers to be of small birth size. Furthermore, there is a low relationship between birth weight and birth size. The findings, therefore, reveal differences in birth size and birth weight which calls for attention and the need to use each appropriately. Hence, there should be caution when using birth size as a proxy for birth weight.

CHAPTER SIX

EXAMINING THE RELATIONSHIP BETWEEN BIRTH WEIGHT, BIRTH SIZE AND EXCLUSIVE BREASTFEEDING

6.1 Introduction

This chapter investigates the independent effects of birth weight and birth size on exclusive breastfeeding, controlling for background characteristics such as maternal socio-demographic factors, household factors, community/organisational/structural factors, biomedical factors, and child characteristics. Binary logistic regression was used to predict exclusive breastfeeding practice.

6.2 Correlates of exclusive breastfeeding

In this chapter, four logistic regression models were carried out to examine the influence of birth weight and perceived birth size on exclusive breastfeeding. The first model examines the unadjusted effect of birth weight on exclusive breastfeeding. In the second model, the unadjusted effect of perceived birth size was examined whilst the third model investigated the effect of both perceived birth size and birth weight on exclusive breastfeeding. The final model incorporated the two independent variables (birth weight and perceived birth size) and the control variables to predict exclusive breastfeeding factors.

Table 6.1 presents the results of binary logistic regression models of birth weight and perceived birth size on exclusive breastfeeding. Model 1 explains the unadjusted effect of perceived birth size on exclusive breastfeeding. The results showed that perceived birth size was not statistically significant in predicting exclusive breastfeeding. The Nagelkerke R^2 value of 0.019 indicates that perceived birth size explains only 1.9% variation in exclusive breastfeeding.

In model 2, the Nagelkerke R^2 suggests that about 4.2% variation in exclusive breastfeeding is explained by birth weight (Table 6.1). Furthermore, birth weight was statistically significant in predicting exclusive breastfeeding. Normal birth weight infants were 4.800 times as likely to be exclusively breastfed compared with low birth weight infants. Likewise, infants with high birth weight were more likely to be exclusively breastfed compared with low birth weight infants.

In model 3, when the independent effects of perceived birth size and birth weight were examined, the results showed that both were statistically significant in predicting exclusive breastfeeding (Table 6.1). With regards to birth weight, high birth weight infants were 5.506 times as likely to be exclusively breastfed compared with low birth weight infants. Similarly, infants with normal birth weight were 5.166 times as likely to be exclusively breastfed compared to infants with low birth weight. Also, infants of normal birth size were 1.669 times as likely to be exclusively breastfed compared to infants with low birth size. The Nagelkerke R^2 indicates that both birth weight and perceived birth size together explain 6.2% variation in exclusive breastfeeding.

A full model incorporating the independent variables and control variables such as socio-demographic factors, household factor, community/organisational/structural factors, biomedical and child characteristics were examined in model 4 (Table 6.1). The results showed that birth weight, birth size, household wealth quintile, ethnicity, religion, and age of the child were statistically significant in predicting exclusive breastfeeding. Furthermore, all the independent and control variables explain 32.3% variation in exclusive breastfeeding.

Table 6.1 Binary logistic regression showing the relationship between birth size, birth weight and exclusive breastfeeding

Variables	Model 1: Birth size	Model 2: Birth weight	Model 3: Birth size and Birth weight	Model 4: Full Model
	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)
Birth size				
Small (<i>Ref</i>)				
Normal	1.449 (0.900-2.334)		1.669 (1.019-2.733) *	1.894 (1.050-3.415) *
Large	0.708 (0.388-1.291)		0.856 (0.458-1.602)	0.884 (0.417-1.875)
Birth weight				
Low (<i>Ref</i>)				
Normal		4.800 (1.736-13.268) **	5.166 (1.818-14.677) **	7.907 (2.295-27.242) **
High		4.708 (1.381-16.042) *	5.506 (1.575-19.246) **	7.019 (1.574-31.294) *
Age of mother				
15-24 (<i>Ref</i>)				
25-34				1.535 (0.730-3.228)
35+				1.684 (0.627-4.523)
Education of mother				
No education (<i>Ref</i>)				
Primary				1.132 (0.512-2.504)
Secondary				2.009 (0.909-4.441)
Higher				1.447 (0.354-5.917)
Marital status				
Never married (<i>Ref</i>)				
Married				2.055 (0.761-5.545)
Living with Partner				1.039 (0.375-2.884)
Children Ever Born				
Single mother (<i>Ref</i>)				
Multiparous mother				1.095 (0.461-2.599)

Table 6.1 cont'd

Variables	Model 1: Birth size	Model 2: Birth weight	Model 3: Birth weight and Birth size	Model 4: Full Model
	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)
Household Wealth quintile				
Poorest (<i>Ref</i>)				
Poorer				0.293 (0.124-0.692) **
Middle				0.466 (0.191-1.138)
Richer				0.495 (0.181-1.353)
Richest				0.419 (0.128-1.373)
Employment status of the mother				
Not working (<i>Ref</i>)				
Working				1.130 (0.600-2.128)
Ethnicity				
Akan (<i>Ref</i>)				
Ewe				3.496 (1.343-9.105) *
Mole-Dagbani				1.813 (0.775-4.237)
Other				1.919 (0.829-4.443)
Place of residence				
Urban (<i>Ref</i>)				
Rural				1.338 (0.659-2.718)
Maternity leave				
No (<i>Ref</i>)				
Yes				1.257 (0.481-3.284)
Self-employed or not required formal maternity leave				1.106 (0.593-2.065)
Religion				
Orthodox (<i>Ref</i>)				
Protestant				0.495 (0.164-1.493)
Pentecostal/Charismatic				0.540 (0.233-1.248)
Other Christians				0.418 (0.149-1.171)
Islam				0.380 (0.155-0.932) *
Other religious groups				0.855 (0.233-3.140)

Table 6.1 cont'd

Variables	Model 1: Birth size	Model 2: Birth weight	Model 3: Birth weight and Birth size	Model 4: Full Model
	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)
Antenatal Care				0.941 (0.851-1.042)
Place of delivery				
Private facility (<i>Ref</i>)				
Home				0.443 (0.126-1.561)
Government facility				0.860 (0.343-2.157)
Postnatal				
No (<i>Ref</i>)				
Yes				0.892 (0.483-1.647)
Mode of delivery				
Caesarean (<i>Ref</i>)				
Normal delivery				1.344 (0.601-3.007)
Sex of child				
Male (<i>Ref</i>)				
Female				1.298 (0.755-2.233)
Age of child				
Less than a month (<i>Ref</i>)				
1 month				0.617 (0.128-2.972)
2 months				0.470 (0.099-2.219)
3 months				0.294 (0.065-1.331)
4 months				0.152 (0.033-0.705) *
5 months				0.086 (0.019-0.389) **
Birth order number				0.973 (0.783-1.208)
Goodness of fit				
Model Chi Square (Omnibus Test)	0.078	0.004	0.002	0.000
Nagelkerke R ²	0.019 (1.9%)	0.042 (4.2%)	0.062 (6.2%)	0.323 (32.3%)
Percent Correct Prediction	56.5	58.5	56.5	70.9
Number of respondents	354	354	354	354

Source: Generated from the 2014 Ghana Demographic and Health Survey Data.

*p<0.05;

**p<0.01

***p<0.001

Ref: Reference category

In the full model (model 4) birth weight was found to predict exclusive breastfeeding (Table 6.1). Normal birth weight infants were 7.907 times as likely to be exclusively breastfed compared to low birth weight infants. Also, high birth weight infants were 7.019 times as likely to be exclusively breastfed as compared to low birth weight infants. Thus, both normal and high birth weight infants were more likely to be exclusively breastfed as compared to low birth weight infants.

Similarly, perceived birth size of the infant was found to be a determinant of exclusive breastfeeding. Normal birth size infants had higher odds (OR=1.894) of being exclusively breastfed as compared to small birth size infants.

Furthermore, household factors such as wealth was significantly related to exclusive breastfeeding. Mothers from poorer households were 0.293 times as likely to be practicing exclusive breastfeeding compared to mothers from poorest households.

The results further show that community/organisation/structural factors such as ethnicity and religion were predictors of exclusive breastfeeding. In terms of ethnicity, mothers from the Ewe ethnic group were 3.496 times as likely to be practicing exclusive breastfeeding as compared to mothers belonging to the Akan ethnic group.

Moreover, the findings show that religious affiliation significantly predict exclusive breastfeeding practice. Muslim mothers were 0.380 times as likely to be practicing exclusive breastfeeding compared to orthodox mothers.

Lastly, child characteristic such as the age of the child was found to significantly predict exclusive breastfeeding. The results show that there is an inverse relationship between age of infants and exclusive breastfeeding. Infants who were five months old had a lower likelihood of been exclusive

breastfed compared to infants who were less than a month old. This implies that infants less than a month were more likely to be exclusively breastfed compared to the other categories.

Findings from the qualitative data revealed that infants are given water and food before the sixth month. Also, mothers are encouraged by their biological mothers and in-laws to give infants water. This notion was expressed by a non-exclusive breastfeeding mother as illustrated in the following quote;

“He will be six months next month, so I started giving him water last week. My mum said there are some things if he doesn’t get used to now, he wouldn’t get used to and six months he should be taking water. So, she suggested I should start giving him small water for him to know that this is water” (P1, Non-exclusive breastfeeding mother).

The results showed that giving of water and foods at an early stage to the infants discontinue exclusive breastfeeding. This reduces the duration of exclusive breastfeeding practice

6.4 Discussion of results

This discussion focuses on the effect of birth weight and perceived birth size on exclusive breastfeeding. In addition, the section discusses other background factors that predict exclusive breastfeeding. The results from the first model show that birth size is not significantly related to exclusive breastfeeding. In the second model when the independent effect of birth weight was examined, there was a significant relationship with exclusive breastfeeding. However, both birth weight and perceived birth size were found to be significant predictors of exclusive breastfeeding in model three. When other variables were controlled for in the final model, birth weight and birth size remained significant. Furthermore, household wealth quintile, ethnicity, religion and age of infants were found to be determinants of exclusive breastfeeding.

The findings from this current study are consistent with findings from other studies where evidence has shown that birth weight significantly predicts exclusive breastfeeding practice (Patel et al., 2015; Flaherman et al., 2013). In this current study, the odds of mothers practicing exclusive breastfeeding for infants with normal or high birth weight was higher than infants with low birth weight. Studies have explained that low birth weight infants are less likely to be exclusively breastfed due to prolonged hospitalisation and medical complications (Flaherman et al., 2011). These infants are sometimes kept for long periods at an intensive care unit due to their physiological characteristics (Boccolini et al., 2015). This could reduce the contact between the mother and infants, hence, leading to the introduction of formula food.

Another plausible reason could be that infants with low birth weight may find it difficult to initiate and maintain exclusive breastfeeding as compared to normal and high birth weight infants. They may have low frequency and poor suction of breast milk which could influence the mothers' decision to introduce formula feeds at an early age (Patel et al., 2015; Flaherman et al., 2013; Venancio and Monteiro, 2006). Also, Flaherman et al., (2013) explained that mothers with low birth weight infants may worry about the physiological characteristics of the infants, which might influence the mother's decision to discontinue exclusive breastfeeding. Mothers may feel satisfied exclusively breastfeeding normal or high birth weight infants than low birth weight infants. Again, health workers introduce formulae foods to mothers with low birth weight infants. They inform mothers with low birth weight infants to introduce formulae foods to enable the infant catch up on weight (Flaherman et al., 2013).

Also, perceived birth size significantly predicts exclusive breastfeeding practice. Normal birth size infants were more likely to be exclusively breastfed compared to small birth size infants. Evidence from the developing world such as Asia and SSA suggests that normal birth size infants are more

likely to be exclusively breastfed as compared to small birth size infants (Khanal et al., 2014; Tampah-Naah and Kumi-Kyereme, 2013). In the current study, mothers have the tendency of practicing exclusive breastfeeding if they perceived their infants to be of normal birth size. Perception is influenced by factors such as cultural, environmental and individual experiences (Channon, 2011). These factors influence the decision of the mother to perceive the size of their infants to be small, normal or large at birth. Prior to the twentieth century, larger body size was valued and associated with wealth, power and strength while thinness was perceived as poverty or ill-health. There is a recognition that in Ghana and other sub-Saharan African countries, society now values normal birth size and this influences feeding practices of infants. Gitau et al., (2014) argues that in South Africa, normal body size is preferred than fatness and thinness. The decision of the mother to practice exclusive breastfeeding, therefore, depends on the satisfaction of the perceived birth size of the infants. This probably could explain why perceived normal birth size infants were more likely to be exclusively breastfed compared to small birth size infants.

The results from the quantitative data shows that both birth weight and perceived birth size predict exclusive breastfeeding behaviour. However, from the qualitative analysis, majority of the mothers mentioned that they were influenced by the birth weight of the child to practice exclusive breastfeeding. These are mothers with normal and high birth weight infants. They indicated that birth weight is very important to them than the perceived birth size of infants. These mothers were of the view that the weight helps them to monitor the growth of the child. The notion was expressed by exclusive breastfeeding mothers as illustrated in the following quotes;

“The birth weight was very important in my decision to practice exclusive breastfeeding”
(P6, Exclusive breastfeeding mother)

“Because the birth weight helps you to know that the child is growing. It is always important than the size, so I considered the birth weight of the child to practice exclusive breastfeeding” (P9, Exclusive breastfeeding mother).

“When I give him other food, he will become plump and not heavy but when you breastfeed, he will gain the normal weight and he won’t fall sick” (P4, Exclusive breastfeeding mother).

Few mothers who were influenced by the birth size to practice exclusive breastfeeding also indicated that birth size will help them to easily know the changes in the size of infants than the birth weight. They will be able to see how large or small the child has grown at any time.

“I don’t know anything about the weight. I was influenced by the birth size to practice exclusive breastfeeding” (P8, Exclusive breastfeeding mother).

“The size will help me to see how big he or she is. I would want to maintain it and don't want her to be falling sick. I won’t introduce any other thing. I will maintain it or increase it” (P3, Exclusive breastfeeding mother).

Results from the qualitative analysis provide more explanation to the findings of the quantitative analysis. Though mothers agreed that they consider both the birth size and birth weight in their decision to practice exclusive breastfeeding, most of these mothers mentioned that birth weight influences their decision to practice exclusive breastfeeding. This underscores the relevance of actual measurement than perception in decision making. The plausible reason could be that mothers are educated on the weight of infants at both antenatal and postnatal clinics. In addition, infants’ weight are taken at every child welfare clinic and this stresses on the relevance of birth weight than birth size. Also, the ability to scientifically monitor weight could have compelled mothers to consider the birth weight of the child than the birth size. Furthermore, mothers expressed that breast milk helps infants to put on weight than formula foods. In their view, formula

foods make infants size large but do not allow for an increase in weight. Hence, the interest of mothers to have children with a good weight rather than large size motivated them to consider birth weight as an important factor in exclusive breastfeeding.

Household wealth quintile significantly predicts exclusive breastfeeding practice. The pattern shows that mothers from the poorest household were more likely to practice exclusive breastfeeding. The results from this study corroborate with the observed patterns in other studies (Chandhiok et al., 2015; Khanal et al., 2013). The reason could be that the practice of exclusive breastfeeding is affordable with no monetary cost. Mothers from the poorer household may have been influenced by this reason as they may not have money to purchase formula food to feed their children. This probably could have influenced their decision to practice exclusive breastfeeding (Shifraw et al., 2015).

Results from the qualitative study showed that women from rich household do not listen to advice from health professionals and they rarely practice exclusive breastfeeding. However, many mothers practice exclusive breastfeeding because it is free. A midwife indicated that rich women do not practice exclusive breastfeeding because they have money to buy formula foods and sometimes refuse to listen to health practitioners.

“Rich women refuse to listen to us, maybe she is rich and can do whatever she wants so she will not even listen to what you are saying. Majority of rich women can buy the formula so they think they should go for the formula. Remember we talked about cost so, if the person doesn’t have money then why should the person be thinking about the formula. She will be thinking about giving only the breast milk” (Midwife, Health Worker).

Another reason could be that mothers from the richest households may have a higher educational level and be working far from home. Hence, the opportunity to stay at home to practice exclusive

breastfeeding may be compromised. Responses from the qualitative analysis support that women practice exclusive breastfeeding because of their financial status. A mother indicated that, she cannot afford to buy the child formula food, so she decided to practice exclusive breastfeeding which does not involve cost.

“If I give him the canned food and I don’t have money to buy more then it means he will starve” (P1, Exclusive breastfeeding mother)

Results from both the quantitative and qualitative data explain the nuances that wealth is a significant factor in exclusive breastfeeding. The data supports the findings that women from poor households were more likely to practice exclusive breastfeeding. Exclusive breastfeeding has economic benefit since mothers spend less amount of money on it. This probably could explain why poorer women were more likely to practice exclusive breastfeeding.

The findings of this study show that ethnicity significantly predicts exclusive breastfeeding. Many studies are incongruent with this finding (Marquis et al., 2016; Fombong et al., 2016; Awumbilla, 2003). Ethnicity is associated with cultural practices and traditional beliefs which explain the patterned behaviour of people. Some ethnic groups have cultural and traditional beliefs that could facilitate and improve exclusive breastfeeding practice. Healthy cultural practices promote good infant feeding practices which could facilitate the practice of exclusive breastfeeding (Fombong et al., 2016). In this current study, the findings showed that Ewe women, predominantly in the Volta region of Ghana had the higher odds of their infants being exclusively breastfed as compared to Akan women.

The results from the qualitative data show that some ethnic groups specifically in the northern part of Ghana give water and herbs to their children. For instance, a respondent from the Dagomba

ethnic group indicated that if she was to be the northern part of Ghana, herbs would have been prepared for her child to bath with and drink.

“That is done in the North. If I was in the North, they will be doing that, but I am here, and my mother is not here to give him any drug. They will prepare some herbs for you and the baby to bath with and drink” (P4, Exclusive breastfeeding mother).

However, among the Ewes, studies have reported that pregnant women are taken care of by their kin group to ensure that the child is delivered and grows up properly (Badasu, 2004). Another plausible reason could be that mothers may have a more supportive social network from their family and friends to provide the needed care for the child. This probably could aid in the bonding of the mother with the new infant, hence influencing the use of health service and then practicing exclusive breastfeeding (Marquis et al., 2016).

Furthermore, in Ghana, Adongo et al., (2013) found that policies such as Community-Based Health Planning and Services (CHPS) improve health education on nutrition and exclusive breastfeeding. Mothers are educated on nutrition, such as the required nutrient that helps to build strong immunity for children. The introduction and piloting of Community-Based Health Planning and Services (CHPS) in the Nkwanta District, Volta Region which assisted in providing primary health care could influence exclusive breastfeeding. Volta Region was part of the piloting regions after the success in Navrongo, Upper East Region. The program involved community members and health service personnel in providing primary health care. In addition, community engagements such as durbars and provision of services at homes were practiced. Studies have shown that the Nkwanta project in the Volta Region aided in improving health care utilization (Kanmiki et al., 2019). The ripple effect could probably explain the reasons why infants of Ewe mothers were reported to be exclusively breastfed as compared to other ethnic groups.

Results from the quantitative study show that mothers' religious affiliation significantly predict exclusive breastfeeding practice. The result is consistent with other studies (Bhatta, 2013). The direction of the results showed that Muslim mothers were less likely to practice exclusive breastfeeding compared to women affiliated to orthodox churches such as Roman Catholic and Anglican. Further interrogation of the results show that compared to other Christian denominations, Muslims were less likely to practice exclusive breastfeeding. Findings from the qualitative data help explain the nuances of religion and exclusive breastfeeding. The results from the qualitative data showed that Christians are taught the relevance of exclusive breastfeeding practice at church especially in generational groups meetings and this could enforce their desire to practice exclusive breastfeeding. Again, Catholic teachings support the practice of breastfeeding and abhor factors that discourage breastfeeding as well as infants feeding substitutes. The teachings of the Catholic as reiterated by Pope Francis in 2015 and 2017 support breastfeeding practices (Kamoun and Spatz, 2018). Hence, this probably could enforce the practice of exclusive breastfeeding among orthodox churches than Muslims.

On the other hand, the qualitative results revealed that the Quran encourages mothers to breastfeed for long as it bonds the baby and the mother. However, a health practitioner expressed that fasting by Muslims could force mothers to discontinue exclusive breastfeeding as compared to Christians since Muslims are encouraged to fast from morning to evening. Kamoun and Spatz, (2018) argue that Islamic teachings emphasise on the importance of breastfeeding by providing guidelines and virtues of favourable text to praise women who breastfeed. Mothers feel that it is their religious obligation to breastfeed their children. However, in this study Muslim women were less likely to be practicing exclusive breastfeeding. Saaty et al., (2015) argued that most Muslim women initiate and practice breastfeeding for long, but few women practice exclusive breastfeeding. The

qualitative data revealed that some Muslim women discontinue the practice of exclusive breastfeeding due to fasting. They give water or fluid to the infants as a way of ensuring that the child is not dehydrated.

Again, the results of the study have shown that age of child was significantly related to exclusive breastfeeding. The odds showed that there is an inverse relationship between the age of the child in months and exclusive breastfeeding. As the age of the child increases, exclusive breastfeeding practice decreases. Similar findings have been reported in developing countries and Ghana (Diji et al., 2017; Khanal et al., 2014; Gayawan et al., 2014). In Ghana, Diji et al., (2017) reported that exclusive breastfeeding reduces with an increase in child's age. The plausible reason could be that at an early age of the child, mothers may feel comfortable practicing exclusive breastfeeding. As the child's age increases, mothers may introduce other supplementary food in anticipation that breast milk alone is not enough.

Also, Adugna et al., (2017) argue that the traditional practice of post-partum and maternity leave could discourage mothers from practicing exclusive breastfeeding. Postpartum care such as maternity leave given to women enhances their opportunity to practice exclusive breastfeeding. For instance, in Ghana, women are given three months of maternity leave which enables them to confine themselves at home as well as create the opportunity to exclusively breastfeed their children. Exclusive breastfeeding becomes difficult for mothers when they resume work after maternity leave. This explains why exclusive breastfeeding practice is inversely related to infants' age. The qualitative results of this study revealed that maternity leave influences exclusive breastfeeding behaviours. Some participants mentioned that they are affected by the three months maternity leave, hence, they take leave of absence after the maternity leave in order to complete the six months exclusive breastfeeding practice.

Furthermore, traditional practices encourage exclusive breastfeeding after delivery and then discontinue exclusive breastfeeding for some time. For instance, in Tanzania, in-laws, and grandmothers relieved mothers from household chores for three months (Mgongo, et al., 2013). During this period, mothers are fed with a special diet that enhances the production of breast milk. This period encourages mothers to practice exclusive breastfeeding as they get help from in-laws and grandmothers. After three months, mothers are left alone to cater for the child and this may result in discontinuation of exclusive breastfeeding (Mgongo, et al., 2013).

In summary, this chapter examined the influence of birth weight and birth size on exclusive breastfeeding controlling for other factors such as maternal socio-demographic factors, household factor, community/organisational/structural factors, biomedical factors, and child characteristics.

The findings from the various models show that the independent effect of birth weight significantly predicts exclusive breastfeeding while birth size was not. When other factors were incorporated in the final model, the effect of birth size changed. Both birth weight and birth size were significant predictors of exclusive breastfeeding. Other variables that were found to predict exclusive breastfeeding were household wealth quintile, ethnicity, religion, and age of the child.

Following the significant effect of both birth weight and birth size on exclusive breastfeeding, the next chapter incorporates qualitative accounts on the experiences of health workers, exclusive breastfeeding mothers and non-exclusive breastfeeding mothers. The chapter focus on the decision making (aside birth weight and birth size) of mothers to practice exclusive breastfeeding, the challenges they encounter, benefits associated with exclusive breastfeeding and management of exclusive breastfeeding.

CHAPTER SEVEN

EXPERIENCES OF EXCLUSIVE AND NON EXCLUSIVE BREASTFEEDING MOTHERS AND HEALTH WORKERS

7.1 Introduction

This chapter focuses on the experiences of exclusive breastfeeding mothers, non-exclusive breastfeeding mothers as well as health workers. The first section describes the background characteristics of exclusive breastfeeding, non-exclusive breastfeeding mothers, and health workers. This is followed by the experiences of the mothers, and health workers. The experiences are triangulated and discussed according to themes.

7.2 Background characteristics of exclusive breastfeeding, non-exclusive breastfeeding mothers and mothers

Table 7.1 presents the background characteristics of exclusive breastfeeding, non-exclusive breastfeeding mothers and health workers interviewed for the study. The detailed profiles of the participants are presented in appendixes E and F. In all, sixteen (16) mothers and four (4) health workers were interviewed for this study. The results show that a higher proportion of both the mothers and health workers were between 25 to 30 years. About 6 (30.0%) of both the mothers and health workers had Junior High School education and 16 (80.0%) were Christians. In terms of marital status, 16 (80.0%) mothers and health workers were married. In addition, a community health nurse, nutritionist, midwife and registered community nurse were interviewed.

About half of the mothers (62.5%) had normal delivery. With regards to the age of the children born to these mothers, half were two months old and about 10 (62.5%) were males. For birth weight, about 14 infants (87.5%) had normal birth weight, 1 (6.2%) had low birth weight and 1

(6.2%) had high birth weight. Furthermore, about 3 (18.8%) mothers perceived their infants to be of small birth size, 10 infants (62.4%) had normal birth size and 3 (18.8%) had large birth size.

Table 7.1 Socio-demographic characteristics of exclusive breastfeeding, non-exclusive breastfeeding mothers and health workers

Characteristics	Exclusive breastfeeding mothers (N=10)	Non-exclusive breastfeeding mothers (N= 6)	Health workers (4)	Total Number of Participants (N=20)
Age of mother				
25-30	3	4	1	8
31-35	5	2	2	9
36-40	2	0	1	3
Education of mother				
Primary	1	0	0	1
JHS	6	1	0	7
SHS	1	4	0	5
Tertiary	2	1	4	7
Ethnicity				
Akan	1	3	3	7
Dagomba	2	1	0	3
Gonja	1	1	0	2
Bimbilla	1	0	0	1
Ewe	4	0	1	5
Ga	1	0	0	1
Other (Nigerian)	0	1	0	1
Religious affiliation				
Muslim	3	1	0	4
Christian	7	5	4	16
Marital Status				
Never married	2	1	1	4
Married	8	5	3	16
Employment status				
Employed	8	5	4	17
Unemployed	2	1	1	3
Category of health worker				
Nutritionist	-	-	1	1
Midwife	-	-	1	1
Community Health Nurse	-	-	1	1
Registered Community Nurse	-	-	1	1

Table 7.1 Continued

Characteristics	Exclusive breastfeeding mothers (N=10)	Non-exclusive breastfeeding mothers (N= 6)	Health workers (N=4)	Total Participants (N=20)
Children ever born by mothers				
1	2	4	-	6
2	1	2	-	3
3	3	0	-	3
4	4	0	-	4
Mode of delivery				
Normal	7	3	-	10
Caesarean	3	3	-	6
Sex of child				
Male	6	4	-	10
Female	4	2	-	6
Age of child				
1 month	1	0	-	1
2 months	6	2	-	8
3 months	3	1	-	4
4 months	0	3	-	3
Birth weight (Recorded from health card)				
Low	0	1	-	1
Normal	9	5	-	14
Large	1	0	-	1
Perceived birth size				
Small	3	0	-	3
Normal	5	5	-	10
Large	2	1	-	3

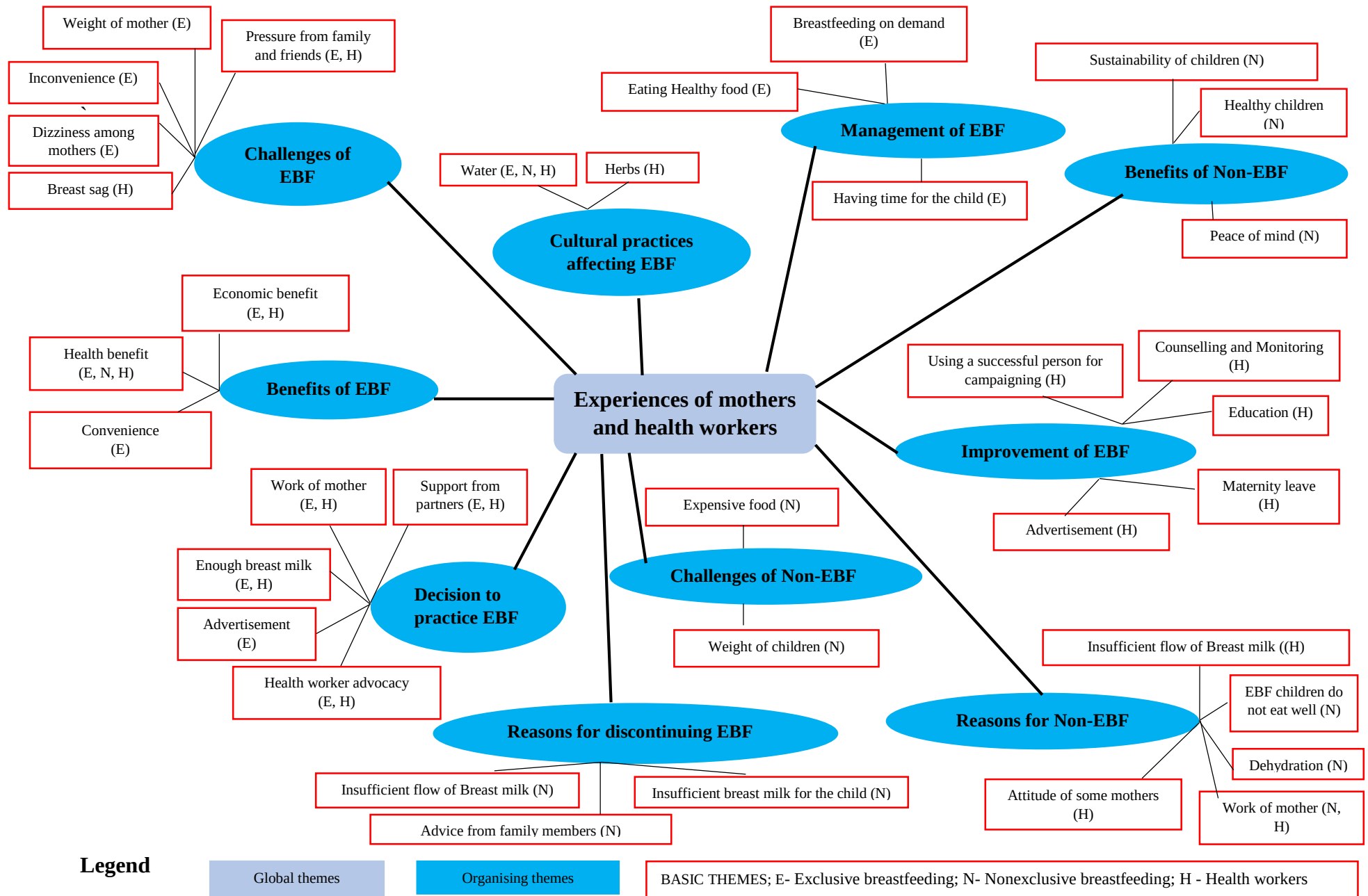
Source: Fieldwork, 2019

7.3 Experiences of exclusive breastfeeding mothers, non-exclusive breastfeeding mothers, and health workers

This section discusses the experiences of exclusive breastfeeding mothers, non-exclusive breastfeeding mothers and health workers. The experiences are triangulated and presented under global, organizing and basic themes. As shown in Figure 7.1, surrounding the global theme of

experiences of mothers and health workers are ten organizing themes including decision to exclusively breastfeed, benefits of exclusive breastfeeding, challenges associated with exclusive breastfeeding, cultural practices affecting exclusive breastfeeding, managing exclusive breastfeeding, improving exclusive breastfeeding, reasons for non-exclusive breastfeeding, reasons for discontinuing exclusive breastfeeding, benefits of non-exclusive breastfeeding, and the challenges associated with non-exclusive breastfeeding. These organising themes have basic themes explaining further the global and organising themes

Figure 7.1 Thematic network of mothers and health workers experiences on exclusive and non-exclusive breastfeeding



7.3.1 Decision to practice exclusive breastfeeding

Decision making played an important role in exclusive breastfeeding practice. This is influenced by varied sources of information that strengthen the knowledge of women on exclusive breastfeeding. Five main themes were identified from the narratives as factors influencing the mother's decision to practice exclusive breastfeeding. These include advertisement, work of mother, health workers advocacy, support from partners and ability of mother to produce enough breast milk. The experiences were derived from the narratives of both exclusive breastfeeding mothers and health workers.

From the narratives, advertisement was identified as an important factor in exclusive breastfeeding decision. Advertisement informed and provided mothers the needed information on the importance of exclusive breastfeeding thereby influencing their decision to practice exclusive breastfeeding. This was mentioned by only exclusive breastfeeding mothers as illustrated below;

“I have seen an advertisement that says that if you give the baby only breast milk, it develops her brains. That is why I planned to give her only breast milk” (P9, Exclusive breastfeeding mother)

The narratives also indicated that the decision to practice exclusive breastfeeding was based on the work of the mother. This was mentioned by both exclusive breastfeeding mothers and health workers. Some mothers indicated that exclusive breastfeeding decision differs with work. Mostly, mothers working in the formal sector sometimes find it challenging to practice exclusive breastfeeding for six months compared to those working in the informal sector. Mothers working in the formal sector are mostly separated from their children when they resume work and this affects their breastfeeding practice as well as their decision regarding exclusive breastfeeding. A

respondent who works in the informal sector indicated that she decided on exclusive breastfeeding because the nature of her work (trading) allows her to be with the child always.

“Because of the nature of my work (trading), I think that’s a factor which made me practice exclusive breastfeeding. Those in the government sector such as banks, if you want to practice exclusive breastfeeding, it would be quite difficult. Even if you pump breast milk and place it in the fridge for the child, I don’t think it would be healthy for the child. The nature of my work also helps me practice exclusive breastfeeding, because my child is with me always and I can take her everywhere, I go” (P10, Exclusive breastfeeding mother).

Breast milk production emerged as a basic theme under the decision to practice exclusive breastfeeding. Both health workers and exclusive breastfeeding mothers indicated that breast milk is a natural gift from God and is easily accessible. The ability of mothers to produce enough breast milk influences their decision to practice exclusive breastfeeding. A health worker mentioned that because of the easily accessibility of breast milk, mothers do not need to spend time preparing for food in the kitchen and this influence their decision to practice exclusive breastfeeding

“I have a lot of breast milk so I do not see why I should add any other thing when the breast milk is there. I always give and she is always satisfied after taking it. So, I don’t have to add anything” (P3, Exclusive breastfeeding mother).

“You can easily access breast milk when the baby is crying, it is available, and you don’t prepare or have to go to the kitchen. It is available and brings love” (Midwife).

Health advocacy including talks on exclusive breastfeeding by health workers at the health facilities during antenatal and postnatal clinics played a critical role in mothers’ decision-making. For instance some mothers mentioned that at the clinics, health workers teach them how to breastfeed their babies. Sometimes they use a doll to demonstrate how to hold the baby and breastfeed. Also, they are taken through nutrition lessons including exclusive breastfeeding

management, benefits, and challenges. This helped them to understand exclusive breastfeeding practice and thereby influence their decision to practice exclusive breastfeeding. In addition, the health workers indicated that when mothers understand the education received at the health facilities on exclusive breastfeeding, they are encouraged to practice exclusive breastfeeding.

“Yes, they really taught us how to breastfeed. They sometimes bring a doll and teach us how we should hold the breast, how you should feed the baby, the kind of food you can give it and how to keep yourself neat.” (P7, Exclusive breastfeeding mother).

“We normally explain exclusive breastfeeding to them for their understanding. If they understand the benefits of breastfeeding, then there is a need for them to start” (Midwife).

In addition, all exclusive breastfeeding mothers indicated that they had support from their partners in their decision to practice exclusive breastfeeding. Their partners agreed and supported them to practice exclusive breastfeeding. Some mentioned that their partners did not want them to add water and even wanted them to practice exclusive breastfeeding for a year.

“Yes, my husband understands so I am okay” (P6, Exclusive breastfeeding mother)

“Left to him alone he says I should even do it for one year and I told him is not done like that” (P10, Exclusive breastfeeding mother)

7.3.2 Benefits of exclusive breastfeeding

The practice of exclusive breastfeeding has benefits for both the mother and the child. Three benefits associated with exclusive breastfeeding were identified from the narratives and these include economic benefit, health benefit, and convenience by mothers. These experiences were derived from exclusive breastfeeding mothers, non-exclusive breastfeeding mothers, and health workers.

From the text, exclusive breastfeeding mothers indicated that the practice of exclusive breastfeeding has an economic benefit because breast milk is natural, and mothers do not pay for anything. This was confirmed by the health workers as they also indicated that exclusive breastfeeding reduces the burden of cost which helps mothers to save money. Furthermore, some mothers mentioned that they use the money which would have been used to buy food to sew dresses for the child. Also, others indicated that they are saving money for their child's future.

“I should say that for the child and the mother, it saves money for her. It's costless for the mother to buy breast milk for the child. The father becomes happy because he is not spending much money on buying those things” (Community health nurse).

“It is cheaper than non-exclusive breastfeeding, so when you tend to calculate the amount for the formulae food and then compare to no money for breast milk. You can use that money for something else” (Registered community nurse).

“I don't buy food for the baby, so I use that money to sew clothes for the baby” (P4, Exclusive breastfeeding mother)

From the narratives, health benefit also emerged as a theme. This benefit is for both the mothers and infants. This was mentioned by exclusive breastfeeding mothers and health workers. For the benefits associated with mothers, exclusive breastfeeding mothers mentioned that breastfeeding for long serves as a natural family planning method which delays menstruation after birth. This experience of mothers was confirmed by the health workers. A midwife indicated that prolonged and demand breastfeeding delay menstruation. Also, some mothers indicated that exclusive breastfeeding reduces their desire for sex because they do not want anything to mix with the breast milk. This, therefore, prevents pregnancy.

“When you breast the baby and you don’t stop breastfeeding the baby, in time, it becomes a family planning method for the mother” (P7, Exclusive breastfeeding mother).

“To the mother when you are doing exclusive breastfeeding, it prevents you from having an early pregnancy because you are breastfeeding on demand. It helps you not to get pregnant which is physiology by itself” (Midwife).

In addition to the health benefits of exclusive breastfeeding, it was identified from the narratives that the practice of exclusive breastfeeding makes the children healthy. This was mentioned by non-exclusive breastfeeding mothers, health workers and exclusive breastfeeding mothers. The health workers indicated that scientifically, exclusive breastfeeding makes children healthy and the child does not fall sick often. This is because breast milk is very nutritious which helps in brain development, builds strong immunity and protects the child from infectious diseases such as diarrhoea and acute respiratory syndrome. Consequently, it enables the child to grow healthy

“It makes the child healthy and she doesn’t get diarrhoea. When you are doing exclusive breastfeeding all the nutrients that she needs are in the breast milk, so you don’t need to add any other thing” (P3, Exclusive breastfeeding mother).

“They said exclusive breastfeeding protects them from diseases and it makes them grow healthy” (P3, Non-exclusive breastfeeding mother).

“Breast milk is natural, made by God, all the necessary nutrients are in it. So, we can’t beat nature, or we can’t doubt what God has prepared for us. It’s nutritious. All the nutrient the child or the baby needs to feed on is in the breast milk” (Nutritionist).

From the narrations, convenience was mentioned as one of the benefits of exclusive breastfeeding. This was however, mentioned by only exclusive breastfeeding mothers. Some mothers indicated that children relax and feel comfortable when they get satisfied with breast milk. This gives mothers free time to move around and perform other activities without interruption. This was expressed by most respondents.

“When he sucks both breasts properly, he can sleep longer, and I will have the opportunity to do what I have to do. Sometimes he will still be sleeping after I am done with what I have to do so I wake him up to breastfeed him again” (P7, Exclusive breastfeeding mother).

7.3.3 Challenges of exclusive breastfeeding

Despite the benefits of exclusive breastfeeding, exclusive breastfeeding mothers are faced with some challenges which sometimes limit their ability to continue the practice up to six months. Five themes were identified from the narratives of exclusive breastfeeding mothers and health workers. Among the challenges mentioned by exclusive breastfeeding mothers include inconvenience, the weight of the mother and dizziness among mothers. Also, the health workers indicated that breast sag and pressure from caregivers were some of the challenges experienced by exclusive breastfeeding mothers.

Dizziness was mentioned as a challenge faced by exclusive breastfeeding mothers. These mothers indicated that after breastfeeding, they become dizzy and are unable to perform any other activity. This makes them restless for some time before gaining strength to perform normal activities.

“There are times when you breastfeed your baby, you will feel dizzy and you will have to lie down because you will not be able to do anything” (P6, Exclusive breastfeeding mother).

Another challenge mentioned by exclusive breastfeeding mothers was inconvenience. Exclusive breastfeeding mothers indicated that because they breastfeed on demand, the child is always with them wherever they go and this sometimes inconvenience or limits their movement. A mother illustrated that;

“Because of her feeding, you would have to take her everywhere you go. You cannot tell somebody to take care of your child. I will say I face them” (P10, Exclusive breastfeeding mother).

Increase in weight of mothers was identified as a challenge only by exclusive breastfeeding mothers. Exclusive breastfeeding mothers mentioned that they put on weight because they eat more food to enable them to produce more breast milk. Some of the mothers were uncomfortable with this situation as their appearance changes.

“Because of exclusive breastfeeding you put on weight even when you do not want to, you have to eat so the baby can also benefit. Due to this, you put on weight by so doing” (P10, Exclusive breastfeeding mother).

There were narrations of health workers indicating that exclusive breastfeeding mothers were faced with the problem of breast sag. They explained that some mothers think that their breast will sag when they breastfeed for long. As a result of this, they shorten the practice of exclusive breastfeeding. However, a midwife explained that this is a misconception and ignorance on the part of mothers. She emphasised that breast sagging is not as a result of exclusive breastfeeding or prolonged breastfeeding.

“.... .that is ignorance because whether you breastfeed or not your breast will sag. They do not know because if they knew they wouldn't say that. Because if you have small breast that cannot come down, it will not come down... It is the weight that sags the breast. What about those who haven't delivered, and their breasts are sagging? Will the men that suck their breast sag their breast or not? I think those who are educated are the problem” (Midwife)

Pressure from family and friends, mostly caregivers, emerged as a challenge associated with exclusive breastfeeding. This was mentioned by exclusive breastfeeding mothers and health workers. They indicated that caregivers, mostly mother-in-laws who are not in support of exclusive breastfeeding, sometimes give water and food to the children without the knowledge of the child's

mother. This sometimes leads to the contraction of infectious diseases because of contamination of food. Also, some friends discouraged mothers from practicing exclusive breastfeeding. They explained to mothers that exclusive breastfeeding children do not eat well after six months of exclusive breastfeeding.

“Our challenge is the caregivers; the caregivers are mothers-in-law who are their own mothers. They are old and did not practice exclusive breastfeeding, so they don’t want to believe that what we are saying is right. At times they even hide to give water to the child. When they see that the mother insists that they do not have to give, during bathing they will steal and give water to the child” (Midwife).

“Some of my friends told me to give him food, while others said no, but I had decided to practice exclusive breastfeeding. When they ask me to give the baby food, I only said yes knowing that I would not do it” (P10, Exclusive breastfeeding mother).

“My friends told me he will not have an appetite for food when he grows up and I told them I will start giving him beans, maize and rice when he is six months. I believe he will have an appetite for food when he turns 6 months” (P4, Exclusive breastfeeding mother).

7.3.4 Cultural practices affecting exclusive breastfeeding

Cultural practices or beliefs have been noted to proscribe or encourage exclusive breastfeeding practice. These beliefs differ from community to community as well as cultures. From the text, giving of water and herbs were mentioned as the main cultural practices for discontinuing exclusive breastfeeding.

Water was identified as a cultural practice that discontinues exclusive breastfeeding. This was mentioned by exclusive breastfeeding mothers, non-exclusive breastfeeding mothers as well as health workers. Mothers expressed that some ethnic groups or communities give water to infants after delivery which prevents them from practicing exclusive breastfeeding. However, all mothers

in this study indicated that they are aware of these cultural beliefs and practices, but none has been influenced by these beliefs. A health worker indicated that she has heard and seen the practice in her career. The following quotes illustrate this point:

“I have only heard of water, that you can give the baby water right after birth” (P2, Non-Exclusive breastfeeding mother).

“People within some cultures tend to tell mothers to give the child water and food, but what you have to do as a nurse is to teach them the right thing” (Nurse).

Another cultural belief or practice identified was the giving of herbs for children to drink and bath after delivery. According to a participant, the herbs make the children strong.

“Some cultures think that they should give herbs to their new-born babies to become strong. They do not give formula, but they give herbal water. Some bath them and some prepare it for them to sip” (Midwife).

7.3.5 Management of exclusive breastfeeding

The various ways in which mothers manage exclusive breastfeeding were explored during the interview. Three main sub-themes from only exclusive breastfeeding mothers emerged from the narratives. These include eating healthy food, breastfeeding when needed and having time for the baby.

From the narrations, eating healthy food by mothers was identified as one of the ways of managing exclusive breastfeeding practice. Majority of the exclusive breastfeeding mothers indicated that there are specific healthy foods such as groundnut soup, palm nut soup, mashed kenkey, and fruits that help in the production of breast milk. Mothers eat these foods regularly to enable them to produce enough breast milk.

“You must eat well. You must drink more soup-like palm nut soup and groundnut soup. That will give you more milk. Also, mashed Fante kenkey with groundnut also helps to produce more milk for the baby” (P9, Exclusive breastfeeding mother).

“I only have to eat healthy foods. I must eat to my satisfaction because they normally say the breast milk is dependent on the food you eat. They also say if the mother eats healthy foods, she will produce healthy milk for the baby. I can prepare “tuo zaafi with ayoyo” (maize dish) in the morning. We drink “agushi soup” and I eat fruits. After every meal, I eat fruits” (P7, Exclusive breastfeeding mother).

Also, breastfeeding on demand was identified as one of the ways of managing exclusive breastfeeding. Exclusive breastfeeding mothers mentioned that they keep an eye on their children in order to breastfeed when needed. Mothers breastfeed at regular intervals and do not wait for long for the child to cry for food. Some mothers indicated that in their absence, they express breast milk for caregivers to breastfeed their children.

“You must keep an eye on him so that you can breastfeed him regularly. You should not wait for a long period before you breastfeed him. You should be feeding him regularly so that he will not cry and disturb. He doesn’t cry and disturb me” (P4, Exclusive breastfeeding mother)

Also, time management is very important in exclusive breastfeeding. Some participants expressed that having time for the baby enables them to monitor the wellbeing of the child as well as breastfeeding well. This includes prioritising the baby over any other thing.

“I have to get time for the baby. If I don’t have time for the baby, he will worry me, and I will be tempted to add other foods when he is not 6 months old. I have to make time for the baby and not prioritize the baby over my work” (P7, Exclusive breastfeeding mother).

7.3.6 Improvement of exclusive breastfeeding

Five themes emerged from the ways to improve exclusive breastfeeding. This includes using a successful person to campaign, counselling and monitoring, maternity leave, advertisement and education. These were narratives from only health workers.

There were narrations of using a successful exclusive breastfeeding mother(s) to create awareness on exclusive breastfeeding. The health workers indicated that sometimes mothers find it easy to understand their own peers than the health professionals. The health workers therefore use mothers who have been successful in practicing exclusive breastfeeding to talk to their own colleagues about misconceptions and benefits of exclusive breastfeeding practice. This motivates and encourages others to practice exclusive breastfeeding.

“They tell them the baby will be thirsty if you don’t give him water, but we explain to them that breast milk contains water and they understand it. But if you want them to understand, then you use a colleague who has done it and has been successful like I said. That is the best way to teach a mother” (Registered community nurse).

Health education was also mentioned by health workers as one of the ways to improve exclusive breastfeeding. Narrations of the health workers showed that education at the antenatal clinic, postnatal clinic, and child welfare clinics provide mothers with the necessary knowledge and create awareness on exclusive breastfeeding practice. Consequently, this improves and increases exclusive breastfeeding practice. Furthermore, education on exclusive breastfeeding should not target only mothers but others including grandmothers, partners, and in-laws.

“It can be improved through health education at the antenatal service, postnatal services, child welfare clinic even including those at the OPDs... when we give talk, they are not excluded. It’s not only pregnant women that we must talk to, their partners, but we also

have men as partners too involved because it's not only them and sometimes those at the OPDs like grandmothers, caregivers. So, when we give talks like that, they also extend it to them" (Nutritionist).

"We must intensify our education at our antenatal clinics, child welfare clinics, and the communities. It is more of the education" (Registered community nurse).

Furthermore, counselling and monitoring of women were mentioned as one of the strategies for improving exclusive breastfeeding. The health workers indicated that due to the misconceptions about exclusive breastfeeding, most mothers were put on counselling and then monitored. Through this, mothers have understood the benefits, misconceptions and challenges associated with exclusive breastfeeding and they are now encouraged to practice exclusive breastfeeding. A health worker expressed that counselling has helped women to understand the benefit of exclusive breastfeeding and this should continue;

"With much counselling and monitoring, they are now understanding the main reason(s) why you should exclusively breastfeed your baby" (Community health nurse).

Also, controlling of advertisement of infant formula feeding was identified in the narrative to enhance exclusive breastfeeding. The health workers indicated that restriction on advertisement of infant formula could help to reduce the patronage of these foods, which consequently, could help to improve the practice of exclusive breastfeeding.

"If the advertisement of infant formula food can go down, most people will love to breastfeed because if you don't know of a formula that you can give to your baby, you will definitely breastfeed because you want your baby to live" (Community health nurse).

Maternity leave also featured in health workers narration as a way of improving exclusive breastfeeding. The health workers indicated that working mothers do not get more time to practice

exclusive breastfeeding due to short maternity leave. Furthermore, the working environment does not allow mothers to go to work with their children to breastfeed on demand. This therefore limits their ability to exclusively breastfeed for six months. For instance, a midwife gave an account of a colleague nurse who closed at work early to take care of the child at home.

“We said mothers should take leave up to 6 months so they can breastfeed their babies. Like the lady (nurse) who closed from work to go home and breastfeed. The child is 3 months so if she has maternity leave for 6 months she would not have come to work, she would have stayed at home to breastfeed, but the challenges are there. I think that will be the only way that can help to make exclusive breastfeeding effective. Mothers should be with babies for 6 months. The sixth month you introduce the solid foods then you start work” (Midwife).

7.3.7 Reasons for discontinuing exclusive breastfeeding

Out of the six mothers who were not practicing exclusive breastfeeding, three started with exclusive breastfeeding and discontinued to introduce other foods to their children. From the narratives, three main reasons were mentioned for the discontinuation of exclusive breastfeeding. These include insufficient flow of breast milk, insufficient breast milk for the child and advice from family members.

Insufficient flow of breast milk was one of the reasons why mothers discontinued the practice of exclusive breastfeeding. Mothers mentioned that they wanted to practice exclusive breastfeeding but when they realised that they were not producing enough breast milk, they introduced other supplementary food to the child.

“I planned practicing exclusive breastfeeding when I give birth. There are some people who do not have breast milk naturally, when I gave birth the breast milk wasn’t flowing so we added other foods” (P2, Non-Exclusive breastfeeding mother)

Furthermore, two mothers who started with exclusive breastfeeding and stopped gave an account that breast milk was not enough for their children. They attributed this to the fact that their children were not able to sleep well at night. In view of this, one of the mothers revealed that her mother-in-law advised her to introduce other food to the child. Another mother recounted that her child was not sleeping at night so she gave her coconut water for the first time which helped her to sleep. Later she introduced other complementary foods such as SMA to the child and she slept well.

“My mother in law was not in support. Anytime the baby cries she thinks the baby is hungry, so she asks me to give the baby porridge or something else” (P4, Non-Exclusive breastfeeding mother).

“When I gave birth, I was giving her only breast milk, but she was not sleeping, she kept crying at night. So, I thought it was because of what she ate, so I first gave her coconut water and after drinking it she slept throughout the night. I could not give her coconut water all the time because the peel of the coconut might be in... So, I gave her SMA for a month and then I stopped” (P3, Non-Exclusive breastfeeding mother)

Advice from family members including biological mothers of nursing mothers and mother in-laws facilitates the discontinuation of practice of exclusive breastfeeding. A mother expressed that she wanted to practice exclusive breastfeeding up to six months, but her mother advised her to give water and food to the child, and this discontinued the practice of exclusive breastfeeding;

“He will be six next month so I started the water last week because my mum said there are some things if he doesn’t get used to it, he wouldn’t get used to it. He should be taking water, to get him going, so if he is not used to it now, he is now going to start in six months, and he will get used to it in the eighth or ninth month. I should start giving him small, so he knows this is water” (P1, Non-Exclusive breastfeeding mother).

7.3.8 Reasons for non-exclusive breastfeeding

Non-exclusive breastfeeding mothers and health workers mentioned several reasons that prevent mothers from practicing exclusive breastfeeding. From the narratives, the reasons mentioned include dehydration of child, type of work of mother, exclusively breastfed children do not eat well, insufficient flow of breast milk, and attitudes of mothers. These were experiences from both non-exclusive breastfeeding mothers and health workers.

Dehydration of children was mentioned as one of the reasons for non-exclusive breastfeeding. Mothers (non-exclusive breastfeeding) were of the view that when they practice exclusive breastfeeding their children will be dehydrated. This is because the practice of exclusive breastfeeding does not allow parents to give their children water. Some mothers indicated that water is very essential and as adults cannot deny themselves of water so children should also not be denied. For example, a mother expressed her opinion as;

“I can’t stay without drinking water and talk about my baby. I prefer giving her water and when I give her water she drinks, and she is satisfied” (P6, Non-Exclusive breastfeeding mother).

The narratives also show that work limits the ability of mothers to practice exclusive breastfeeding. Working mothers expressed that they find it difficult to continue exclusive breastfeeding when they resume work. As a result, some mothers do not start the practice. Furthermore, the health workers acknowledged the challenges of working mothers and indicated that most of them do not practice exclusive breastfeeding due to their work scheduled.

“I have not seen or heard anybody telling me I won’t do it. They will accept that they will do it then maybe later on four months before they will come that because of work, they have to leave the baby for a caregiver, maybe their grandmother and they have to start

infant formulae or maybe pre-complementary feeding so that's the only challenge some don't adhere to the six months that's all" (Nutritionist).

"I thought I would be working by then because am processing my certificate for work so I did not want a situation whereby I will get the work and he is not six months and I have to go to work" (P1, Non-Exclusive breastfeeding mother).

The narratives from the text show that some children were not exclusively breastfed because their mothers thought that they will not eat well after six months. Mothers expressed that children who are exclusively breastfed for six months sometimes find it very difficult to eat when they are introduced to food after six months. Due to this, some mothers decided not to practice exclusive breastfeeding. A non-exclusive breastfeeding mother indicated that;

"I do not like it. Normally children who are giving only breast milk do not eat well but children who were not given only breast milk eat well. Like my firstborn, I did not do exclusive, she drinks a lot of water and she eats well. My friends did exclusive and they are now forcing their children to eat" (P6, Non-Exclusive breastfeeding mother).

Most of the health workers indicated that some mothers complain of insufficient flow of breast milk for their children. Such mothers feel that they cannot produce enough breast milk to satisfy their children. This limits their ability to practice exclusive breastfeeding for long.

"Some mother say that breast milk is not enough for their children and they are not satisfied. They see that all the time that they are eating, the child feels like maybe eating some, so they think it's not enough, so they have to add food to it that's all" (Nutritionist).

"The challenge for most of them is that the breast milk is not enough for the baby especially for the male babies" (Registered community nurse).

From the narratives, the attitude of some mothers emerged as a basic theme under reasons for non-exclusive breastfeeding. This was mentioned by health workers. No matter the campaign on exclusive breastfeeding, some mothers have made up their mind not to practice exclusive breastfeeding.

“Some people just don’t want to do it” (Midwife)

“It is like they have the mentality that the breast milk is not enough for the baby so, they have to look for a supplementation. Another source of feeding for the baby to be satisfied” (Community health nurse).

7.3.9 Benefits of non-exclusive breastfeeding

Three main themes were derived from the benefits of non-exclusive breastfeeding for mothers and infants. The benefit to the child includes sustainability and good health. For the mothers, peace of mind was identified from the text.

Sustainability of children was identified as a benefit of non-exclusive breastfeeding. Some mothers recounted that children need water to sustain them as well as make them human. A participant mentioned that in as much as adults need water for sustainability, so do children need water for the regulation of the body. Even though breast milk contains milk and water, there is still the need to give the child water.

“We all need water to sustain, every human being needs water to sustain but with them before the six months. What we know is that breast milk is water and milk, so they are still taking water before the sixth month. After, they are being introduced to food and so you need to add water, I mean to also make him just like a human. You are supposed to drink eight glass of water and is good for the body, heart and kidney, that is the same way I think it should be done for the child” (P1, Non-Exclusive breastfeeding mother)

There were narrations of children becoming healthy when they are not exclusively breastfed. Mothers indicated that non-exclusive breastfeeding children eat well, which makes them grow strong and healthy.

“She also stopped crying and sleeps longer. Previously he would cry when he is hungry, but he doesn’t cry anymore, and he doesn’t disturb. When he is satisfied, he sleeps well and has made the baby healthy” (P5, Non-Exclusive breastfeeding mother).

Peace of mind of mothers was mentioned as a benefit for non-exclusive breastfeeding. Children who are fed with formula foods eat well and do not worry their mother. This, therefore, helps their mothers to have peace of mind.

“Some of the benefits you might have derived after feeding the baby with formula food is your peace of mind” (P2, Non-Exclusive breastfeeding mother).

7.3.10 Challenges of non-exclusive breastfeeding

Challenges of non-exclusive breastfeeding were identified in the narrative. Mothers mentioned that the cost of formula food is expensive while the challenges associated with the children is weight gain.

Weight was identified in the text as a challenge associated with non-exclusive breastfeeding children. Mothers expressed that their children put on weight when they are not exclusively breastfed because they are fed with formula and other foods which makes them put on weight. This has forced some mothers to reduce the food given to these children.

“Before giving the baby other feed he wasn’t as big as this when I started feeding the baby with other feed, he increased in size and weight” (P2, Non-Exclusive breastfeeding mother)

“She started gaining weight when I started giving her food. She grew rapidly and she looked all grown. That is why I have reduced the food I gave her” (P3, Non-Exclusive breastfeeding mother)

Also, the narrations indicated that foods for infants are expensive. Mothers buy formulae food for their children and these foods are expensive which sometimes deter them from buying.

“I said it was expensive but we were able to buy it for her so she will stay healthy” (P3, Non-Exclusive breastfeeding mother).

7.4 Discussion.

This section seeks to discuss the experiences of exclusive breastfeeding mothers, non-exclusive breastfeeding mothers, and health workers. Examining the experiences of these people provide a holistic understanding of exclusive breastfeeding practice.

7.4.1 Decision to practice exclusive breastfeeding

The findings of the study revealed that exclusive breastfeeding decision is also influenced by advertisement, mother’s ability to produce enough breast milk, work of mother, health workers advocacy and support from partner.

The dominant theme among these factors is the education of health workers on exclusive breastfeeding at the health facilities. The results imply that mothers place emphasis on education by health workers. Studies have reported the influence of health professionals in mothers decision making regarding exclusive breastfeeding (Coetzee et al., 2017; Wambach et al., 2015; Otoo et al., 2009). The plausible reason could be that health workers communicate clearly to mothers using simple expressions in English and local languages. Also, the findings show that demonstration of cases was done using objects such as dolls and other relevant materials. In this study, observations

during the data collection show that health workers communicate clearly to the understanding of mothers and health talk is done almost every morning at child welfare clinics. They use simple expressions in the various forms of local languages and English during child welfare clinics. The health talk sometimes turn into an interactive section where mothers are allowed to ask questions and health workers respond to the various questions. This increased the mother's self-confidence and offered them security in their decision as they understand the practice of exclusive breastfeeding through their interaction with the health workers (Wambach et al., 2015). The findings also underscore the relevance of sources of exclusive breastfeeding information. This is consistent with literature which also shows that source of knowledge is very important towards the decision to exclusively breastfeed (Ihudiebube-Splendor et al., 2019).

Also, mothers work was found to influence exclusive breastfeeding practice. This was mentioned by exclusive breastfeeding mothers and health workers. The findings of this study are consistent with other studies which have reported that some types of work, mostly informal work, influences the decision to exclusively breastfeed (Wambach et al., 2015; Lakati et al., 2002). Informal work such as trading enables mothers to be in contact with their children always, unlike formal work which separates mothers from their children as well as having unfriendly working facilities that limit mother's ability to continue exclusive breastfeeding after maternity leave. In this study, a professional working mother expressed that she takes three months leave of absence after her maternity leave to continue exclusive breastfeeding for six months. In contrast, other people indicated that their work schedule prevents them from practicing exclusive breastfeeding. Their schedules at work makes it very difficult for them to go to work with their babies. These situations therefore discourage mothers from practicing exclusive breastfeeding as the institutions or working environment do not support or favour them.

In addition, support from family is valued as an important factor in the decision making of exclusive breastfeeding practice. Almost all mothers discussed the practice of exclusive breastfeeding with their partners and they agreed. Mothers received physical and emotional support from their partners and this created an enabling environment that influenced their decision to practice exclusive breastfeeding. The findings of this study corroborate with other studies in sub-Saharan African countries (Coetzee et al., 2017; Nduna et al., 2015; Arts et al., 2011). Arts et al., (2011) reported that partners and grandmothers support exclusive breastfeeding practice. In this study, most partners supported exclusive breastfeeding. The benefits of exclusive breastfeeding and the financial burden of partners buying formula foods could have influenced their desire to support exclusive breastfeeding.

7.4.2 Benefits of exclusive breastfeeding.

The benefit of exclusive breastfeeding mentioned by mothers and health workers cut across health, economic and social benefits. The themes include health benefits, economic benefits and convenience by the mother. These are perspectives from exclusive breastfeeding mothers, non-exclusive breastfeeding mother and health workers. From the narratives, the emphasis was placed on healthy children and family planning. The desire for the child to eat well, put on weight, and the protection of infants from infectious diseases were mentioned as the benefits of exclusive breastfeeding. This is consistent with other studies which have reported similar benefits of exclusive breastfeeding (Wambach et al., 2015; Agrasada et al., 2011; Singh et al., 2009). Wambach et al., (2015) reported that exclusive breastfeeding ensures the highest level of health by preventing illness, infections and promoting good development. These benefits are essential towards the well being of the children and mothers. The awareness and understanding of these benefits probably influenced mothers to practice exclusive breastfeeding.

Furthermore, many of the participants expressed that exclusive breastfeeding serves as a family planning method. They recounted that prolonged and intermittent breastfeeding delay menstruation which consequently prevents pregnancy. The assertion of exclusive breastfeeding acting as a family planning method was supported by the health professionals. The findings corroborate with other studies (Wambach et al., 2015) and therefore reveal the relevance of exclusive breastfeeding in limiting and spacing births.

Again, the practice of exclusive breastfeeding has an economic advantage. From the narratives, both exclusive breastfeeding and non-exclusive breastfeeding mothers indicated that it is cheap to practice exclusive breastfeeding since there is no monetary cost attached to it. Coetzee et al., (2017) reported that exclusive breastfeeding is cheap as compared to non-exclusive breastfeeding. In this study, some mothers indicated that they could not afford formula food, and this influences their desire to practice exclusive breastfeeding. This practice also helps mothers and partners to save money for other use.

Also, exclusive breastfeeding enables mothers to move about without food as well as having free time for other activities. This finding has not been reported by literature reviewed in this study. The plausible reason could be that exclusive breastfeeding prevents mothers from introducing other foods to the infants. This saves them from carrying food around. Again, when children are breastfed and they get satisfied, mothers mentioned that they sleep for long hours and this gives them the opportunity to perform other activities.

7.4.3 Challenges of exclusive breastfeeding

Several factors were mentioned as challenges of exclusive breastfeeding. These challenges were associated with both mothers and infants. They include inconvenience, mothers putting on weight,

dizziness experienced by mothers, breast sag and caregivers. The various challenges provide complexity to the understanding of exclusive breastfeeding.

The findings of the current study show that mothers become dizzy after breastfeeding for long. This limits and makes them inactive for some time. Similar health challenges have been reported in Australia (Charlick et al., 2019). This could be because mothers may have health conditions which could predispose them to dizziness after prolonged breastfeeding. Also, wrong positioning of babies during breastfeeding could also lead to dizziness as experienced by mothers.

Furthermore, some mothers indicated they have put on weight because of exclusive breastfeeding. In contrast, other studies have reported that women lose weight when they practice exclusive breastfeeding because they breastfeed all the time in order to satisfy the child (Mgongo et al., 2019). Probably, mothers in this study may have support from their family members and friends in caring for their children. This might have reduced their daily activities, hence making them to have more time to relax after eating and breastfeeding. Furthermore, less physical activities and eating a lot of food could also contribute to the increase in weight of these mothers.

Another uncommon and interesting finding of the study revealed the act of taking infants everywhere by mothers. According to the mothers, the practice does not allow them to leave the child at home. The reason could be that infants are fed on demand and mothers' absence will deny them of food. Probably, mothers do not like the idea of expressing milk which could enable them to leave the child at home whiles they are away. This, therefore, forces them to take the child everywhere.

Perception of some mothers revealed that the practice of exclusive breastfeeding will make their breast sag when they breastfeed for long. This will change their appearance, hence affecting their

looks (Mgongo et al., 2019; Otoo et al., 2009). Narrations from the health workers in this study revealed that the perception is not scientifically proven. Women are ignorant of the causes of breast sag and they use it as an excuse not to practice exclusive breastfeeding. Rinker et al., (2008) reported that breastfeeding does not have an adverse effect on breast sag. This implies that mothers should be educated on this misconception to enable them to breastfeed for long.

Furthermore, non-adherence to exclusive breastfeeding was mentioned as a challenge faced by health workers. Health workers indicated that mothers accept to practice exclusive breastfeeding when they come to the health facility but refuse to practice or discontinue before the sixth month. The practice is sometimes disrupted covertly without the awareness of health practitioners. One health practitioner expressed that she interrogated a mother for a long time before she admitted that she has given water and other food to the infant. This mostly happens with working, educated and rich mothers (Coetzee et al., 2017).

In addition, water and herbs were the main cultural practices that proscribe the practice of exclusive breastfeeding. Generally, exclusive and non-exclusive breastfeeding mothers and health workers mentioned that the practice of giving infants herbs and water to drink are common. This practice is reinforced by grandmothers and other elderly people found in our homes to entrench their belief system. Though participants were aware of these cultural practices, none mentioned that they were influenced by the practice. Similar practices have been reported by other studies (Nduna et al., 2015; Arts et al., 2011; Davies, 1997) and this disrupts exclusive breastfeeding. In this study, participants mentioned that these practices are more common in the northern part of Ghana than the southern part where the study was conducted. For instance, a woman mentioned that if she was to be in the northern part of Ghana in her hometown, she would have been forced to give herbs and water to the baby. Some of the mothers indicated that these beliefs and cultural practices are

not binding as compared to the past. Education of health workers, religion and other stakeholders have helped to reduce these practices. The health workers emphasised that they educate women not to give herbs and other foods to the infants.

7.4.4 Reasons for discontinuing exclusive breastfeeding

Reasons for the discontinuation of exclusive breastfeeding focused on insufficient flow of breast milk, pressure from family members and insufficient breast milk for infants. Participants expressed that naturally, they are unable to produce enough breast milk to feed their children. Insufficient breast milk production could be as a result of a medical or non-medical problem which disrupts the practice of exclusive breastfeeding. This underscores the relevance of counselling and education to identify the cause of insufficient flow of breast milk to help mothers in practicing exclusive breastfeeding. The findings of the study are consistent with what literature suggests as disruptions to exclusive breastfeeding (Thet et al., 2016; Nduna, et al., 2015; Lakati et al., 2002; Arts et al., 2011). In Kenya, Lakati et al., (2002) reported that women discontinue exclusive breastfeeding because of low breast milk production. This requires counselling and support on the positioning and attachment of infants.

In conclusion, the practice of exclusive breastfeeding from the perspective of health workers, exclusive breastfeeding mothers, and non-exclusive breastfeeding mothers provides insight into the understanding of the practice. The decision to practice exclusive breastfeeding was based on the influence of advertisement, advice by health professionals at various hospitals and partner support. In addition, both mothers and infants benefit from exclusive breastfeeding. The challenges identified in the study included dizziness by mothers, mothers putting on weight, and breast sag. These factors if not addressed could prevent mothers from practicing exclusive breastfeeding.

CHAPTER EIGHT

SUMMARY OF FINDINGS, CONCLUSION, CONTRIBUTION AND RECOMMENDATION

8.1 Introduction

Birth weight is an important child health indicator for determining subsequent risks of infant morbidity and mortality from childhood to adulthood. Accurate and complete birth weight data is a challenge in most developing countries due to deliveries occurring outside health facilities and unrecorded birth weight at some health facilities. Mothers are easily able to recall the birth size of their infants, hence, birth size is often used as a proxy measure for birth weight. However, the association between birth size and birth weight is inconclusive and contested due to mixed results.

Evidence has shown that both birth weight and birth size have consequences on early infant feeding including exclusive breastfeeding (Galloway et al., 2016). Despite the widespread advocacy for exclusive breastfeeding, and associated health, social and economic benefits, there is low prevalence in both developed and developing countries. Studies have linked birth weight and perceived birth size independently with exclusive breastfeeding. However, the extent to which the perception of the mother on the size of the infant (perceived birth size) or actual measurement (birth weight) influence exclusive breastfeeding is not known.

To understand these nuances and fill the gap, this study sought to investigate the relationship between birth weight and perceived birth size on one hand and their influence on exclusive breastfeeding on the other hand. A mixed method approach using both qualitative and quantitative methods was adopted to achieve the objectives of this study. The quantitative method examined and predicted the influence of birth weight and perceived birth size on exclusive breastfeeding using the data from the 2014 Ghana Demographic and Health Survey. Also, the qualitative data

provided more explanation to the quantitative results and further examined the experiences of health workers, exclusive breastfeeding mothers and non-exclusive breastfeeding mothers. The summary of the findings, the implication for theory and recommendations are discussed in this chapter.

8.2 Summary of empirical findings

The sample for the study was the last-born child of mothers with both recorded birth weight and birth size within the five years preceding the survey. About 54.8% of mothers in this study reported practicing exclusive breastfeeding. Majority (85%) of the infants were of normal birth weight while mothers perceived half of their infants to be of small birth size. On maternal characteristics, about two-thirds of the mothers had secondary education, married with at least one child and slightly more than one-third were Akans. The highest proportion of the mothers were 15-29 years. Furthermore, about one-third were affiliated with an orthodox church (Pentecost/Charismatic). Majority of the mothers delivered at government health facilities and had a normal delivery. The age of child ranged from 1-5 months and the highest proportion of the infants were five months old. In the qualitative analysis, 8 out of the 20 participants were between 25 to 30 years. About 35.0% of the participants had Junior high school education, 87.50% of infants had normal birth weight and 18.8% were perceived by their mothers to be of small birth size. The results showed that birth weight, household wealth quintile, ethnicity and age of the child were statistically associated with exclusive breastfeeding.

Supporting findings of the objectives are discussed as follows. First, the study sought to examine the relationship between infants' birth weight and birth size. Results from both the quantitative and qualitative data showed that there is a low level of agreement between birth weight and perceived birth size. This was evident from Kendall's Coefficient of Concordance (W) test value

of 0.188, which implies that there is a low agreement or weak relationship between actual birth weight and perceived birth size.

The second objective assessed the relationship between perceived birth size and exclusive breastfeeding. The results showed that there was no significant relationship between perceived birth size and exclusive breastfeeding as the sole independent variable. However, when other factors were controlled in the final model, birth size significantly predicted exclusive breastfeeding. Infants perceived to be of normal birth size were more likely to be exclusively breastfed as compared to infants perceived to be of small birth size.

The third objective examined the relationship between birth weight and exclusive breastfeeding. Results of both the unadjusted and adjusted model show that birth weight significantly predicts exclusive breastfeeding. Specifically, compared with low birth weight infants, normal birth weight and high birth weight infants were more likely to be exclusively breastfed.

The qualitative data supports the view that mothers consider both birth weight and birth size in their decision to practice exclusive breastfeeding. However, the decision is based more on birth weight rather than perceived birth size of the infants. The two hypotheses of the study were accepted.

In addition, other variables were found to be significant predictors of exclusive breastfeeding. The results show that individual (age of the child), interpersonal (household wealth quintile), organisational (religion), and community norms (ethnicity) were predictors of exclusive breastfeeding.

The fourth objective explored the experiences of mothers and health workers on exclusive breastfeeding practice. The various experiences were triangulated to provide a comprehensive and holistic view on exclusive breastfeeding.

The findings show that exclusive breastfeeding decision was mainly based on information received at the health facilities, mothers work and advertisement. Most mothers indicated that their decision was based on the information received at the health facilities provided by the health workers. This shows the relevance of health education at the various health facilities. Furthermore, the health workers emphasised that the decision for mothers to practice exclusive breastfeeding was based on the understanding and accessibility of breast milk by the mothers. Also, husbands/partners provided the necessary support which encouraged mothers to practice exclusive breastfeeding.

With regards to the benefit of exclusive breastfeeding, mothers and health workers mentioned that exclusive breastfeeding makes infants healthy, serves as a family planning method and is very economical. On the challenges of exclusive breastfeeding, work, breast sag, caregivers, dizziness, insufficient flow of breast milk and mothers putting on weight were mentioned. Also, the practice of giving babies water and herbs to drink were identified as cultural practices that discontinue exclusive breastfeeding. In addition, both health workers and mothers mentioned that insufficient flow of breast milk and pressure from family members were the reasons that discouraged mothers from practicing exclusive breastfeeding.

Furthermore, reasons for non-exclusive breastfeeding included dehydration of children, mothers' work, children not eating well after exclusive breastfeeding and family members' advice. The benefits of non-exclusive breastfeeding include sustainability of children, healthy children and mothers having their peace of mind.

In terms of the management of exclusive breastfeeding, some mothers mentioned that they manage exclusive breastfeeding by breastfeeding on demand, eating healthy food and having time for the child. For ways of improving exclusive breastfeeding, health workers mentioned that using a successful person to campaign, counselling and monitoring, maternity leave, education on exclusive breastfeeding and restrictions on advertisement were some of the strategies that should be adopted.

8.3 Conclusion and contribution to knowledge

This study concludes that, both birth weight and birth size are significant predictors of exclusive breastfeeding when other factors are considered. However, validation of the agreement between birth weight and birth size shows a weak relationship. This implies that perception of birth size categories may be inaccurate and offers unreliable clues about birth weight categories. In the qualitative analysis, it was found that mothers rely more on the birth weight of infants rather than the birth size of infants to practice exclusive breastfeeding. Also, the benefits of exclusive breastfeeding cut across health, social and economic factors while the challenges of exclusive breastfeeding were related to personal, health and social issues.

The study findings indicate that there is a weak relationship between birth weight and birth size. This implies that birth weight and birth size should be used independently for different purposes. For instance, birth size could be used for studies or policies that target behaviour or understanding of individuals or community perception of infants. Also, this would be appropriate for settings where there is low level of education and deliveries occurring outside the health facility. This is because in such settings, mothers may not have much idea about the categories of birth weight. Birth weight could be used as an objective measure for studies or policy relevance in a situation where most infants' birth weight are taken at birth and recorded.

In addition, the findings underscore the relevance of perception and actual measurement in exclusive breastfeeding. This enforces actual birth weight measurement in the practice of exclusive breastfeeding and further has relevance for the development of a framework for other related studies on health behaviour.

Moreover, the qualitative methodology adds to the context of the study. This provided an in-depth understanding of exclusive breastfeeding from the perspectives of mothers and health workers. Mixed methods combine the strength of both methods as well as offsetting the weakness of each other.

The study drew on both the Health Belief Model and the Socio-Ecological Framework. The findings of the study have relevance in the application of Socio-Ecological Model and the Health Belief Models. In terms of Socio-Ecological Model, the finding of the study showed that different level factors predict exclusive breastfeeding. At the interpersonal level, birth weight, birth size and age of child were identified to shape the practice of exclusive breastfeeding. At the intrapersonal level, household wealth quintile, support from husbands and mother-in-law explain exclusive breastfeeding behaviour. At the community level, ethnicity and interaction of mothers with health workers at health facilities influence a mother's decision to practice exclusive breastfeeding. Media and religious factors such as religious affiliation influence exclusive breastfeeding. In addition, the adaptation and implementation of baby-friendly policy at the various hospitals promote exclusive breastfeeding and prohibit the introduction of infant supplements at an early stage.

The findings illustrated the relationship between individual and contextual factors that have influence on the decision of mothers to practice exclusive breastfeeding. This enforces the different levels of factors which may influence exclusive breastfeeding decision. Identification of these

factors such as birth weight, birth size and others could help to understand and explain the complex interaction of factors predicting exclusive breastfeeding practice.

The findings of this study also support the Health Belief Model. With regards to the Health Belief Model, most mothers have a favourable understanding of the perceived benefits of practicing exclusive breastfeeding as well as the dangers associated with non-exclusive breastfeeding practices (perceived severity). This, therefore, enforces the desire of mothers to practice exclusive breastfeeding. However, a perceived threat, that is discontinuation of exclusive breastfeeding as a result of insufficient flow of breast milk and cultural practices that discourage exclusive breastfeeding were identified. Furthermore, external factors such as relatives, husband and health workers serving as cues to action encouraged mothers to continue exclusive breastfeeding practice. Information from health professionals and advertisement also support the practice of exclusive breastfeeding.

8.4 Recommendations

Empirical findings from this study show that birth weight was a predictor of exclusive breastfeeding. This, therefore, underscores the relevance of recording and keeping of infants' birth weight records. Consequently, health workers should be sensitised to record birth weight of infants after delivery as well as encourage mothers to keep their health record books. This would help policy makers and other relevant institutions to monitor the growth of infants as well as provide other interventions. Furthermore, policy makers should also focus on perception of mothers on birth size in drafting policies. Individual or community perception is very important in healthy behaviour as the findings of this study have shown. There is therefore the need to understand the factors that influence perception of mothers on infant birth size and other health behaviours for policy and research implications.

Another important finding of the study was that mothers discontinued exclusive breastfeeding when child's age increases within the exclusive breastfeeding window. Formula feeds are introduced to infants as mothers perceived that breast milk alone is not enough for the infants. Health workers should assist mothers when the baby is nearing the sixth month as well as assist mothers to overcome challenges and misconceptions that could lead to discontinuation of exclusive breastfeeding. Education on the relevance of exclusive breastfeeding from birth to six months should be strengthened. Furthermore, mothers should be educated that breast milk alone is enough for infants after birth up to the sixth month.

Furthermore, the findings revealed that not all working mothers practice exclusive breastfeeding for six months due to short maternity leave of three months. There is the need to extend maternity leave in Ghana from three months to six months to enable working mothers to practice exclusive breastfeeding for six months.

Also, there is evidence from this study that some partners and other family members support the practice of exclusive breastfeeding. However, the support of men is weak in facilitating the practice of exclusive breastfeeding. Most of the exclusive breastfeeding programs target women thereby neglecting men. There should be involvement of men in exclusive breastfeeding programs. Information and education on exclusive breastfeeding should also target men, grandmothers, and mothers-in-law. This is because the findings also showed that grandmother and mothers-in-laws are likely to discourage young mothers from practicing exclusive breastfeeding.

In addition, continued promotion of exclusive breastfeeding programs should incorporate traditional and religious leaders as well as targeting women belonging to the poor households to encourage them to continue practicing exclusive breastfeeding.

The results of the study show that advertisement influenced mothers' decision to practice exclusive breastfeeding. This is very important for policy to scrutinise adverts on exclusive breastfeeding in our public space. In that, if there are adverts in our public spaces misinforming mothers on the practice of exclusive breastfeeding, mothers would be less likely to practice exclusive breastfeeding.

There is the need for future studies to examine the influence of both birth weight and birth size on exclusive breastfeeding using longitudinal data or since birth method. Furthermore, Demographic and Health Surveys should collect data on exclusive breastfeeding using since birth method to complement the existing 24-hour recall method of exclusive breastfeeding measurement. This would help to improve data quality and compare the two methods.

Also, the findings of the study showed that ethnicity significantly predict exclusive breastfeeding. Based on this, there is the need for future studies to examine the feeding practices of women and the pattern of exclusive breastfeeding among the various ethnic groups. This will unearth the differences in the various cultural practices among the various ethnic groups regarding exclusive breastfeeding.

In addition, future studies should examine the months or season of birth of the baby (seasonality of births) and its influences on breastfeeding. This may help to explain the availability of food and the nutrition status of mother as well as the practice of exclusive breastfeeding

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Appendix A:

In-depth Interview guide for exclusive breastfeeding mothers

Section 1: Demographics

- 1.1 What is your highest level of education?
- 1.2 What is your ethnic affiliation?
- 1.3 What is your religious affiliation?
Specify your denomination if a Christian?
- 1.4 What is your marital status?
- 1.5 What is your employment status? If yes, indicate what you do?
- 1.6 How many children do you have?
- 1.7 How old are you?
- 1.8 What is your age when you first gave birth or age for your last child?
- 1.9 Locality of residence?
- 1.10 Sex of the child?
- 1.11 Mode of delivery?
- 1.12 How old is your child?

Section 2: Child characteristics

- 2.1 What was the birth size of your child when he/she was born?
- 2.2 Were you satisfied or not satisfied with the size of your child when he/she was born?
Probe: Reason for been satisfied or not satisfied
- 2.3 What was the birth weight of your child? (Check weighing card book to record)
- 2.4 Were you informed about the birth weight of the child after delivery?
- 2.5 Did you consider the birth size or birth weight to be more important to you?

Section 3: Decision to exclusively breastfeed

- 3.1 Did you plan to exclusively breastfeed your child after delivery?
Probe: Reason for intention to exclusively breastfeed
- 3.2 What informed your decision to practice exclusive breastfeeding?
Probe: Birth weight and birth size

Probe: Were you told at the hospital to practice exclusive breastfeeding? If yes, by who?

Probe: Were you taken through nutrition lessons during antenatal clinics and after delivery

Probe: Breastfeeding management? If yes, what lessons

Probe: Partner support, in-law support, economic reasons

Section 4: Management/Practice of exclusive breastfeeding

4.1 What has been the most difficult part of practicing exclusive breastfeeding?

4.2 What has been the most satisfying part of practicing exclusive breastfeeding?

4.3 How have you managed your experience?

Probe: support from family members, friends, etc

Influence of ethnicity, wealth, religion, birth weight and birth size on exclusive breastfeeding?

Section 5: Benefits of exclusive breastfeeding

5.1 What are the benefits of practicing exclusive breastfeeding?

Probe: Benefit for the child.

Benefit for the mother

Section 6: Challenges of exclusive breastfeeding

6.1 What are the challenges you faced in practicing exclusive breastfeeding?

Probe: Challenges from the child

Challenges from the mother

Social, religion, work, environment, family, friends

6.2 Are there cultural issues promoting the practice of exclusive breastfeeding?

Probe: for local beliefs

6.3 Are there cultural issues inhibiting the practice of exclusive breastfeeding?

Probe: for local beliefs

6.4 How are you coping?

Appendix B

In-depth interview guide for non-exclusive breastfeeding mothers

Section 1: Demographics

- 1.1 What is your highest level of education?
- 1.2 What is your ethnic affiliation?
- 1.3 What is your religious affiliation?
Specify your denomination if a Christian?
- 1.4 What is your marital status?
- 1.5 What is your employment status? If yes, indicate what you do?
- 1.6 How many children do you have?
- 1.7 How old are you?
- 1.8 What is your age when you first gave birth or age for your last child?
- 1.9 Locality of residence?
- 1.10 Sex of the child?
- 1.11 Mode of delivery?
- 1.12 How old is your child?

Section 2: Child characteristics

- 2.1 What was the birth size of your child when he/she was born?
- 2.2 Were you satisfied or not satisfied with the size of your child when he/she was born?
Probe: Reason for been satisfied or not satisfied
- 2.3 What was the birth weight of your child? (Check weighing card book to record)
- 2.4 Were you informed about the birth weight of the child after delivery?
- 2.5 Did you consider the birth size or birth weight to be more important to you?

Section 3: Decision to exclusively breastfeed

- 3.1 Did you plan not to exclusively breastfeed your child after delivery?
Probe: Reason for intention not to exclusively breastfeed
- 3.2 What informed your decision NOT to practice exclusive breastfeeding?
Probe: Birth weight and birth size

Probe: Were you told at the hospital to practice exclusive breastfeeding? if yes, by who?

Probe: Were you taken through nutrition lessons during antenatal clinics and after delivery breastfeeding management? If yes, what lesson

Probe: Partner support, in-law support, economic reasons

Section 4: Challenges of exclusive breastfeeding

4.1 Why you are not practicing exclusive breastfeeding?

Probe: Challenges from the child

Challenges from the mother

Social, religion, work, environment, family, friends

4.2 Are there cultural issues promoting the practice of exclusive breastfeeding?

Probe: for local beliefs

4.3 Are there cultural issues inhibiting the practice of exclusive breastfeeding?

Probe: for local beliefs

Appendix C

In depth interview guide for health workers

1. Can you please provide a brief description of your work?
2. Do you inform mothers about the birth weight of their child after delivery?
3. What is your view on exclusive breastfeeding?

Probe for policy on EBF

4. Are mothers taken through nutrition lessons during antenatal and postnatal care?
5. What do you tell mothers with low birth weight, normal birth weight and high birth weight about exclusive breastfeeding?
6. Do you inform mothers to practice exclusive breastfeeding?
7. Why do you think mothers' practice exclusive breastfeeding?
8. What are the reasons why mothers don't practice exclusive breastfeeding?
9. What are the challenges you faced in telling mothers to practice exclusive breastfeeding?

Probe: Misconceptions relating to EBF

10. What are the cultural issues promoting the practice of exclusive breastfeeding?
11. What are the cultural issues inhibiting exclusive breastfeeding?
12. How can exclusive breastfeeding be improved?

Appendix D

Consent Form

General information about the Research

Purpose: My name is I am a PhD candidate at the Regional Institute for Population Studies (RIPS) at the University of Ghana. I am conducting a research on how birth weight and birth size influence exclusive breastfeeding. The study focusses on the experiences of women in practicing or not exclusive breastfeeding as well as factors that prescribe and proscribe the practices. The study aims to interview women attending child welfare clinic who are within the reproductive age of 15 -49 years, have a child who is less than 6 months old and is either practicing or not exclusive breastfeeding. You have been invited to participate in this study because you fall within the criteria. If you agree, I would like to include you in this research. The interview is expected to last for 15 to 20 minutes.

Benefits and Risks

The study will help improve health outcomes especially infant feeding behavior by providing useful information that can assist in policy. Some of the issues that will be discussed will broaden your knowledge of exclusive breastfeeding practices. This will help you on how to improve infant feeding practices. There are no known physical, social and financial risks or discomforts associated with participating in this study. However, if any question makes you feel uncomfortable, you can choose not to answer the question.

Confidentiality

The information you will provide in this study will be protected to the best of our ability. The discussion will be recorded and will not be shared with anyone. The tapes will be kept in a locked file and protected. Only the researcher will have access to the information. Your personal name will not be attached to any information or given to anyone. The recorded tapes will be transcribed and then the tape will be destroyed.

Compensation

You will be given a token in appreciation for your time. A credit of 5 cedis will be given to you after the interview to compensate for your time.

Voluntary participation and withdrawal from the study

In this study, you are free to decide if you want to be interviewed. Participation is entirely voluntary. In the course of the interview, you may choose not to answer a question or even stop participating in the discussion altogether.

Contacts for Additional Information

For additional information or any concern about this research after the interview, please contact the principal investigator Martin Wiredu Agyekum on 0241331070 or at the Regional Institute for Population Studies, University of Ghana, Legon.

Volunteer Agreement

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to me. I have been given the opportunity to have any questions about the research answered to my satisfaction. I agree to take part in the study

Name of Person who Obtained Consent

Signature of Person Who Obtained Consent

Date

If the volunteer cannot read the form themselves, a witness must sign here;

I was present while the benefits, risks, and procedures were read to the participants. All questions were answered, and the participant agreed to take part in this research.

Signature of Interviewer

Date

Interviewer's statement

I, the undersigned, have defined and explained to the participant in a language that she/he understands the procedures to be followed, the risks and benefits involved, and the obligations of the interviewer.

Interviewer Name: _____

Signature of Interviewer

Date

Appendix E
Detailed profile of non-exclusive breastfeeding mothers

Variables	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Age of mother	26	27	26	27	30	33
Education of mother	University	JHS	SHS	SHS	Vocational (SHS)	SHS
Ethnic affiliation of mother	Gonja	Dagomba	Akan	Akan	Akan	Non-Ghanaian (Nigerian)
Religious affiliation of mother	Muslim	Christian (Trinity Baptist Church)	Christian (lighthouse)	Christian (Grace of light Ministries)	Christian (Methodist)	Christian (Jehovah Witness)
Marital status of mother	Married	Married	Not married	Married	Married	Married
Employment status of mother	Not working	Hairdresser	Sells food	Businesswoman	Caterer	Businesswoman
Children Ever born	1	1	1	2	1	2
Current Residence of mother	Ashaley-Botwe	Doku, Madina	Abokobi-Madina	Madina	Madina	Madina Zongo Junction
Mode of delivery	Cesarean	Cesarean	Normal	Normal	Cesarean	Normal
Sex of child	Male	Male	Female	Male	Male	Female
Age of child	4 months, 3 weeks	2 months, 3 weeks	4 months	4 months, two weeks	3 months and 3 weeks	2 months, 2 weeks
Birth weight (Recorded from Health Card)	4.2 kg	2.3 kg	2.6 kg	3.0 kg	3.2 kg	4.2 kg
Birth size	large	Normal	Normal	Normal	Normal	Normal

Appendix F**Detailed profile of exclusive breastfeeding mothers**

Variables	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Age of mother	32	29	40	33	28	32	34	33	36	30
Education of mother	JHS	SHS	Tertiary	JHS	JHS	Primary	JHS	JHS	JHS	Tertiary
Ethnic affiliation of mother	Ewe	Ewe	Dagomba	Dagomba	Ewe	Gonja	Bimbilla	Ewe	Ga	Akan
Religious affiliation of mother	Christian	Christian	Muslim	Christian	Christian	Christian	Muslim	Christian	Muslim	Christian
Marital status of mother	Married	Not married	Married	Not married	Married	Married	Married	Married	Married	Married
Employment status of mother	No	Trader	No	Hairdresser	Trader	Hairdresser	Seamstress	Government worker	Trader	Trader
Children Ever born	2	3	4	1	3	3	4	4	4	1
Current Residence of mother	Ashaley Botwe	Oyarifa Teyiman	Msdina	Oyibi	Madina	Madina	Madina Redco	East legon	Korle Gorno	Oyarifa
Mode of delivery	Normal	Normal	Normal	Caesarean	Normal	Caesarean	Normal	Normal	Normal	Cesarean
Sex of child	Male	Male	Female	Male	Male	Male	Male	Female	Female	Female
Age of child	1 month, 2 Weeks	2 months, 2 weeks	2 months	3 months	2 months, 2 weeks	2 months, 2 weeks	2months	3 months	2 months	3 months
Birth weight (Recorded from Health Card)	3.2kg	3.5 kg	3.6kg	4.5kg	3.5kg	3.5kg	3.6kg	2.5kg	2.5kg	3.2kg
Birth size	Small	Large	Normal	Large	Normal	Normal	Normal	Small	Small	Normal

Appendix G:

Global themes, organizing themes and basic themes from the perspectives of exclusive and non-exclusive breastfeeding mothers, and health workers.

Global Themes	Organising theme	Basic theme	Sub-basic theme	
Decision	Decision to exclusive breastfeed	Advertisement		<i>“I have seen an advertisement that says that if you give the baby only breast milk, it develops her brains. That is why I planned to give her only breast milk” (P9, Exclusive breastfeeding mother)</i>
		Work of mother		<i>“Because of the nature of my work (trading), I think that’s a factor which made me do exclusive breastfeeding. Those in the government sector such as banks, if you want to practice exclusive breastfeeding, it would be quite difficult. Even if you pump breast milk and place it in the fridge for the child, I don’t think it would be healthy for the child. The nature of my work also helps me practice exclusive breastfeeding, because my child is with me always and I can take her everywhere, I go” (P10, Exclusive breastfeeding mother).</i>
		Enough breast milk		<i>“You can easily access breast milk when the baby is crying, it is available, you don’t prepare or have to go to the kitchen. It is available and brings love. Most mothers based on this to practice exclusive breastfeeding” (Midwife).</i> <i>“I have a lot of breast milk so I do not see why I should add any other thing when the breast milk is there. I always give and she is always satisfied after taking it. So, I don’t have to add anything” (P3, Exclusive breastfeeding mother).</i>

		Health workers advocacy		<i>“Yes, they really taught us how to breastfeed. They will sometimes bring a doll and teach us how we should hold the breast, how you should feed the baby, the kind of food you can give it and how to keep yourself neat.” (P7, Exclusive breastfeeding mother).</i> <i>“We normally explain exclusive breastfeeding to them for their understanding. If they understand the benefits of breastfeeding, then there is a need for them to start” (Midwife).</i>
		Support from partner and other family members	<i>Partner</i> <i>Mother in laws and friends</i>	<i>“Yes, my husband understands so I am okay” (P6, Exclusive breastfeeding mother)</i> <i>“Left to him alone he says I should even do it for one year and I told him is not done like that” (P10, Exclusive breastfeeding mother)</i> <i>“Some told me to give him food and others told me not to, but I had decided to practice exclusive breastfeeding. When they ask me to give the baby food, I only said yes knowing that I would not do it” (P10, Exclusive breastfeeding mother).</i> <i>“They told me he will not have an appetite for food when he grows up and I told them that I will start giving him beans,</i>

				<i>maize and rice when he is six months. I believe he will have an appetite for food when he turns 6 months” (P4, Exclusive breastfeeding mother).</i>
	Benefit of exclusive breastfeeding	Economic benefits		<i>“I should say that for the child and the mother, it saves money for her. It’s costless for the mother to buy breastmilk for the child. The father becomes happy because he is not spending much money on buying those things” (Community Health Nurse).</i> <i>“I don’t buy feed for the baby, so I use that money to sew clothes for the baby” (P4 Exclusive breastfeeding mother)</i>
		Family planning		<i>“When you breast the baby and you don’t stop breastfeeding the baby, in time, it becomes a family planning method for the mother” (P7 Exclusive breastfeeding mother).</i> <i>“To the mother when you are doing exclusive breastfeeding, it prevents you from having an early pregnancy because you are breastfeeding on demand. It helps you not to get pregnant which is physiology by itself” (Midwife).</i>
		Health benefits		<i>“It makes the child healthy and she doesn’t get diarrhea. When you are doing exclusive breastfeeding all the</i>

				<i>nutrients that she needs are in the breast milk, so you don't need to add any other thing</i>" (P3 Exclusive breastfeeding mother) <i>"They said the exclusive breastfeeding protects them from diseases and it makes them grow healthy"</i> (P3 Non-exclusive breastfeeding mother)
	Challenges of exclusive breastfeeding	Inconvenience		<i>"Because of her feeding, you would have to take her everywhere you go. You cannot tell somebody to take care of your child. I will say I face them"</i> (P10 Exclusive breastfeeding mother).
		Weight of mother		<i>"Because of exclusive breastfeeding you put on weight even if you don't want to, you have to eat so the baby can also benefit. Due to this, you put on weight by so doing"</i> (P10 Exclusive breastfeeding mother).
		Dizziness among mothers		<i>"There are times when you breastfeed your baby you will feel dizzy and you will have to lie down because you will not be able to do anything"</i> (P6 Exclusive breastfeeding mother).

		Mother's breast sag		<i>"That is ignorance because whether you breastfeed or not your breast will sag. They don't know because if they knew they wouldn't say that. Because if you have small breast that cannot come down, it will not come down... It is the weight that sags the breast. What about those who haven't delivered, and their breasts are sagging? Will the men that suck their breast sag their breast or not? I think those who are educated are the problem"</i> (Midwife)
		Pressure from family members and friends		<i>"Our challenge is the caregivers; the caregivers are mothers-in-law who are their own mothers. They are old and did not practice exclusive breastfeeding, so they don't want to believe that what we are saying is right. At times they even steal to give water to the child. When they see that the mother insists that they do not have to give, during bathing they will steal and give water to the child"</i> (Midwife).
	Cultural practice	Giving child water		<i>"I have only heard of water. That you can give the baby water right after birth"</i> (P2, Non-Exclusive breastfeeding mother)

		Giving child Herb		<i>“Some cultures think that they should give herbs to their new-born babies to become strong. They don’t give formula, but they give herbal water. Some bath them and some prepare it for them to sip” (Midwife).</i>
	Management of exclusive breastfeeding	Eating healthy food		<i>“You must eat well. You must drink more soup-like palm nut soup and groundnut soup. That will give you more milk. Also, mashed Fante kenkey with groundnut also helps to produce more milk for the baby” (P9, Exclusive breastfeeding mother).</i> <i>“I only have to eat healthy foods. I must eat to my satisfaction because they normally say the breast milk is dependent on the food you eat. They also say if the mother eats healthy foods, she will produce healthy milk for the baby. I can prepare “tuo zaafi with a yoyo” (maize dish) in the morning. We drink “agushi soup” and I eat fruits. After every meal, I eat fruits” (P7, Exclusive breastfeeding mother)</i>
		Breastfeeding on demand		<i>“You must keep an eye on him so that you can breastfeed him regularly. You shouldn’t wait for a long period before you breastfeed him. You should be feeding him regularly so that he won’t cry and disturb. He doesn’t cry and disturb me” (P4, Exclusive breastfeeding mother)</i>

		Having time for the baby		<i>“I have to get time for the baby. If I don’t have time for the baby, he will worry me, and I will be tempted to add other foods when he is not 6 months old. I have to make time for the baby and not prioritize my work over the baby” (P7, Exclusive breastfeeding mother).</i>
	Improvement of exclusive breastfeeding	Successful person for campaigning		<i>“They tell them the baby will be thirsty if you don’t give him water, but we explain to them that breast milk contains water and they understand it. But if you want them to understand, then you use a colleague who has done it and has been successful like I said. That is the best way to teach a mother” (Registered General Nurse).</i>
		Counseling and monitoring		<i>“With much counselling and monitoring, they are now understanding the main reason(s) why you should exclusively breastfeed your baby” (Community Health Nurse).</i>
		Maternity leave		<i>“We said mothers should take leave up to 6 months so they can breastfeed their babies. Like the lady who closed from work to go home and breastfeed. The child is 3 months so if she has maternity leave for 6 months she wouldn’t have</i>

				<i>come to work, she would have stayed at home to breastfeed, but the challenges are there. I think that will be the only way that can help the exclusive breastfeeding to be effective. Mothers should be with babies for 6 months. The sixth month you introduce the solid foods then you start work” (Midwife).</i>
		Education		<i>“It can be improved through health education at the antenatal service, postnatal services, child welfare clinic even including those at the OPDs... when we give talk, they are not excluded. It’s not only pregnant women that we must talk to, their partners, but we also have men as partners too involved because it’s not only them and sometimes those at the OPDs like grandmothers, caregivers. So, when we give talks like that, they also extend it to them” (Nutritionist).</i> <i>“We must intensify our education at our antenatal clinics, child welfare clinics, and the communities. It is more of the education” (Registered General Nurse).</i>
		Advertisement		<i>“If the advertising of the formulas can go down, most people will love to breastfeed because if you don’t know of</i>

				<i>a formula that you can give to your baby, you will definitely breastfeed because you want your baby to live” (Community Health Nurse).</i>
	Reasons for non-exclusive breastfeeding	Dehydration		<i>“I can’t stay without drinking water and talk about my baby. I prefer giving her water and when I give her water she drinks, and she is satisfied” (P6, Non-Exclusive breastfeeding mother).</i>
		Exclusive breastfeeding children do not eat well		<i>“I do not like it. Normally children who are giving only breast milk do not eat well but children who were not given only breast milk eat well. Like my firstborn, I did not do exclusive, she drinks a lot of water and she eats well. My friends did exclusive and they are now forcing their children to eat” (P6, Non-Exclusive breastfeeding mother).</i>
		Work of mother		<i>“I have not seen or heard anybody telling me I won’t do it. They will accept that they will do it then maybe later on four months before they will come that because of work, they have to leave the baby for a caregiver, maybe their grandmother and they have to start infant formulae or maybe pre-complementary feeding so that’s the only</i>

			<i>challenge some don't adhere to the six months that's all"</i> (Nutritionist). <i>"I thought I would be working by then because am processing my certificate for work so I didn't want a situation whereby I will get the work and he is not six months and I have to go to work" "</i> (P1, Non-Exclusive breastfeeding mother).
		Insufficient flow of breast milk,	<i>"Some mothers say the breast milk is not enough for their children and they are not satisfied. They see that all the time that they are eating, the child feels like maybe eating some, so they think it's not enough, so they have to add food to it that's all"</i> (Nutritionist). <i>"The challenge for most of them is that the breast milk is not enough for the baby especially for the male babies"</i> (Registered General Nurse).
		Attitudes of mothers	<i>"Some people just don't want to do it"</i> (Midwife) <i>"It is like they have the mentality that the breast milk is not enough for the baby so, they have to look for a</i>

				<i>supplementation. Another source of feeding for the baby to be satisfied” (Community Health Nurse).</i>
	Reasons for discontinuing exclusive breastfeeding	Insufficient flow of breastmilk		<i>“I plan to practice exclusive breastfeeding when I give birth. There are some people who don’t have breast milk naturally when I gave birth the breast milk wasn’t flowing so we added other foods” (P2, Non-Exclusive breastfeeding mother)</i>
		Insufficient breast milk for the child		<i>“When I gave birth, I was giving her only breast milk, but she wasn’t sleeping, she kept crying at night. So, I thought it was because of what she ate, so I first gave her coconut water and after drinking it she slept throughout the night. I couldn’t give her coconut water all the time because the peel of the coconut might be in it. So, I gave her SMA for a month and I have stopped” (P3, Non-Exclusive breastfeeding mother)</i>
		Advice from family members		<i>“He will be six next month so I started the water last week because my mum said there are some things if he doesn’t get used to it, he wouldn’t get used to it. He should be taking water, to get him going, so if he is not used to it now, he is</i>

				<i>now going to start in six months, and he will get used to it in the eighth or ninth month. I should start giving him small, so he knows this is water” (P1, Non-Exclusive breastfeeding mother).</i> <i>“My mother in law is not in support. Anytime the baby cries she thinks the baby is hungry, so she asks me to give the baby porridge or something else” (P4, Non-Exclusive breastfeeding mother).</i>
	Benefits of non-exclusive breastfeeding	Sustainability of children		<i>“We all need water to sustain, every human being needs water to sustain but with them before the six months. What we know is that breast milk is water and milk, so they are still taking water before the sixth month. After, they are been introduced to food and so you need to add water, I mean to also make him just like a human. You are supposed to drink eight glass of water and is good for the body, heart. Kidney and all of that, that is the same way I think it should be done for the child” (P1, Non-Exclusive breastfeeding mother)</i>
		Healthy children		<i>“She also stopped crying and sleeps longer. Previously he would cry when he is hungry, but he doesn’t cry anymore, and he doesn’t disturb. When he is satisfied, he sleeps well</i>

				<i>and has made the baby healthy” (P5, Non-Exclusive breastfeeding mother).</i> <i>“The child gained weight and she was eating properly” (P3, Non-Exclusive breastfeeding mother)</i>
		Peace of mind.		<i>“Some of the benefits you might have derived is after feeding the baby, you have your peace of mind” (P2, Non-Exclusive breastfeeding mother).</i>
	Challenges of non-exclusive breastfeeding	Weight of children		<i>“Before giving the baby other feed he wasn’t as big as this when I started feeding the baby with other feed, he increased in size and weight” (P2, Non-Exclusive breastfeeding mother)</i> <i>“She started gaining weight when I started giving her food. She grew rapidly and she looked all grown. That is why I have reduced the food I gave her” (P3, Non-Exclusive breastfeeding mother)</i>
		Expensive food		<i>“I said it was expensive but we were able to buy it for her so she will stay healthy” (P3, Non-Exclusive breastfeeding mother)</i>

Appendix H
Data quality check on missing cases

Variables	Frequency	Percentage		Variables	Frequency	Percentage
Age of mother				Age of mother		
15-19	24	6.8		15-19	24	9.3
20-24	75	21.2		20-24	62	23.9
25-29	93	26.3		25-29	55	21.2
30-34	78	22.0		30-34	63	24.3
35-39	62	17.5		35-39	34	13.1
40-49	22	6.2		40-49	21	8.1
Educational level of mother				Educational level of mother		
No education	103	29.1		No education	105	40.5
Primary	69	19.5		Primary	60	23.2
Secondary	159	44.9		Secondary	87	33.6
Higher	23	6.5		Higher	7	2.7
Marital status of the mother				Marital status of the mother		
Never married	36	10.2		Never married	23	8.9
married	244	68.9		married	155	59.8
Living with Partner	74	20.9		Living with Partner	81	31.3
Children Ever born				Children Ever born		
Single mother	81	22.9		Single mother	46	17.8
Multiparous mother	273	77.1		Multiparous mother	213	82.2
Maternity leave				Maternity leave		
No	150	42.4		No	111	42.9
Yes	41	11.6		Yes	31	12.0
Not formally required maternity leave	163	46.0		Not formally required maternity leave	117	45.2
Total	354	100.0		Total	259	100.0