

**TITLE: Factors Affecting Infant Feeding Choices among Teenage Mothers in
Lilongwe District in Malawi**

by

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DECLARATION

I declare that **Factors Affecting Infant Feeding Choices among Teenage Mothers in Lilongwe District in Malawi** is my own work. Complete referencing has been indicated and acknowledged for all the sources of information that have been used or quoted. This work has not been submitted before for any other degree at any other institution.

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ABSTRACT

Optimal breastfeeding practices are a key to improve child survival and promote healthy growth and development. Evidence has shown that the rates of breastfeeding in Malawi are alarmingly low, particularly among teenage mothers despite the alluded benefits of breastfeeding. The purpose of the study was to investigate factors that affect infant feeding choices among teenage (13-19 years of age) mothers in the Lilongwe District in Malawi.

The study was conducted at baby wellness clinics, commonly known as 'under five clinics'. A quantitative, descriptive, cross-sectional study was used in this research. Structured questionnaires were issued to 250 teenage mothers who were selected using probability, random sampling. Data was analysed using the STATA 14 statistical package using descriptive statistics and regression models.

The results show that although a majority of teenage mothers (236 representing 95% of the all teenage mothers) reported that they breastfed their babies soon after birth signifying a desire for breastfeeding, only 85 teenage mothers (representing 34.27%) practiced exclusive breastfeeding by six months. This low prevalence of exclusive breastfeeding signifies the existence of challenges around exclusive breastfeeding for teenage mothers. Determinants of the choice of exclusive breastfeeding include being single, being in rural areas, public sentiments, poor government support mechanisms and negated exclusive breastfeeding. Prior knowledge, good attitude, and a business occupation encouraged exclusive breastfeeding.

There were low levels of breastfeeding in Lilongwe and many of the infant feeding practices are not consonant with recommended practices which begs for awareness creation and support.

Key words

Infant feeding; exclusive breastfeeding; teenage mothers; Malawi

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DEDICATION

This dissertation is dedicated to my husband and children. Bright, Laura and Luntha, the sky is the limit, if mom can do it, I believe you can do even better. To my husband Greenwell, words fail me in expressing how grateful I am to have you in my life. Thank you Lord for blessing us unconditionally.

ABBREVIATIONS

EBF	Exclusive breast feeding
TPB	Theory of planned behaviour
NCRSH	National Committee on Research In The Social Sciences And Humanities
UNICEF:	United Nations International Children's Emergency Fund
WHO	World Health Organisation
NSO	National statistics office
MOH	Ministry of health
HSA	Health surveillance assistant
NGO	Non-Governmental Organisation
CHAM	Christian health association of Malawi
DHS	Demographic and Health Survey
DHO	District Health Office
HIV	Human Immunodeficiency virus
BSE	Breastfeeding Self Efficacy

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CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION

It is estimated that globally, 5.9 million children under 5 years died in 2015 and 2.7 million children under 5 years die annually due to undernutrition (WHO 2016: 34). Infant and young child feeding particularly optimal breastfeeding practices are a key area to improve child survival and promote healthy growth and development. UNICEF (2018) recommends early initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding for the first 6 months of life and introduction of adequate and safe complimentary (solids) foods at 6 months together with continued breastfeeding up to 2 years or beyond. Breast milk is the best form of nutrition for the child's first year of life because it is easy to digest, helps fight against diseases, decreases the likelihood of the infant developing allergies, improving cognitive function and enhances mother-child bond (Labbok 2001:152. Despite the alluded benefits of breastfeeding, it is yet to be a favourite choice for teenage mothers globally (WHO 2016: 34). Studies have shown that despite substantial evidence of maternal and infant benefits of breastfeeding, adolescent mothers initiate breastfeeding less often and maintain breastfeeding for shorter durations when compared to their adult counterparts (Wambach et al 2011:486). Although many teenage mothers initiate breastfeeding after birth, many children are not exclusively breastfed in the first six months (Kalanda et al 2006: 404).

Currently, there are few studies in Malawi that focused on teenage specific factors that influence their infant feeding choices. Malawi is facing an increased number of teenage mothers with the current fertility rate being one of the highest in the world standing at 160 per 1000 women (WHO 2016). Children born from teenage mothers are at a greater risk of sickness and death due to social economic, cultural and individual factors faced by the young mothers (Croffut et al 2016:404). Again, if policy makers knew what factors in practice influenced teenage mothers' decisions to choose infant feeding methods including to effectively breastfeed their children, policy change and awareness campaigns would be structured accordingly to catalyse positive behavioural change and create a supportive environment for optimal breastfeeding practice. This would contribute to the global efforts to increase exclusive breastfeeding in the first six months up to at least 50% by 2025 (WHO 2016). It is partly for these reasons that the researcher considers it worthwhile to study the topic, generate information and recommendations to feed into

infant feeding campaigns that may then improve nutrition thereby reducing infant mortality rates. Once the complexities of breastfeeding in teenage mothers are better understood, targeted interventions can be developed to facilitate initiation and continuation of good infant feeding practices, as well as support successful attainment of the maternal role (Kanhadilok & McGrath 2015:125).

1.2 BACKGROUND

1.2.1 Global trends

Globally, WHO (2018) indicated that only 40% of infants aged 0 -6 months are exclusively breastfed while 149 million children under the age of 5 years were estimated to be stunted. Although the rates of breastfeeding are alarmingly low, breastfeeding has a significant positive impact on reducing infant mortality rate. For instance, it is estimated that interventions to help promote optimal breastfeeding could prevent about a fifth of under 5 children deaths in countries with high mortality rates (Gareth et al 2003). At the same time, the WHO (2016), estimated that the life of 820,000 children under 5 years could be saved every year if all children of 0-12 months were optimally breastfed.

Studies in England show that breastfeeding is viewed as a morally inappropriate behaviour by most teenage mothers, with formula feeding being perceived as the appropriate behaviour (Dyson et al 2010: 147). A study in North Carolina in America on infant feeding experiences for teenage mothers found that the attitude to breastfeeding was generally negative among teenage mothers who never initiated breastfeeding at all with some teenage mothers citing not liking breastfeeding in general and disliked leaking which may be triggered by breastfeeding (Tucker et al 2011:4). In India, studies show that teenage mothers lack knowledge of early breastfeeding initiation, colostrum, exclusive breast milk, breastfeeding techniques, and complementary feeding. Other studies have shown that cultural and socio-economic factors are important in both the decision to exclusively breastfeed and how long one exclusively breastfeeds. For instance, mothers often skip breastfeeding due to working time constraints which results in infants consuming semi-solid and even solid food before reaching six months of age (Suryavanshi, et al. 2003;1329).

1.2.2 Sub-Saharan region

According to the world health statistics, WHO (2018), the ten highest risk countries for teenage motherhood are mostly in the Sub-Saharan region with average birth rates ranging from 132/1000 in Niger to as high as 233/1000 in the Central African Republic in comparison with an average of 49/1000 births worldwide.

Studies in Kenya and South Africa have shown that teenage mothers who may still be attending formal education, issues of body image, peer intimidation or the need to concentrate on education, poor knowledge of importance of breastfeeding, among others play a key role in the determination of their breastfeeding choices (Doherty et al. 2006: 90-95; Kimani-Murage et al 2014: 322). Specifically, in Kenya, young and single mothers were said to be highly concerned about body image among many other factors that affect their choice to breastfeed and many teenage mothers opted not to breastfeed or not to breastfeed optimally due to lack of confidence and skills with regards to breastfeeding (Kimani-Murage et al 2014: 322).

In Sierra Leone, studies have shown that although many teenage mothers initiated breastfeeding after child birth, majority of teenage mothers reported that they provided their child with water or other breastmilk substitutes. In some cases, they believed that due to their poor nutritional status, their milk was not sufficiently nutritious to respond to the child's needs (Lai & Towris 2014 :4).

1.2.3 Malawi

In Malawi at present, infant mortality rates remain high with 41 deaths per 1000 live births (WHO 2018) relative to those of the Western countries (with just around 3 per 1000 live births). Poor child nutrition has been shown in a study as one factor that contributes to the high infant mortality rates (WHO 2018). While the 2015 Malawi Demographic and Health Survey (NSO & Macro 2017) estimated the rate of exclusive breastfeeding (EBF) for children less than six months for the general population of mothers to be as high as around 61%, the reality from detailed studies of mothers in the general population in many parts of Malawi has found low rates of EBF, with the highest rates being 39.1% and 7.5% at two and six months of life respectively (Kafulafula et al 2013:2).

A study seeking to understand breastfeeding practices in Malawi amongst adolescent (13-19 years) mothers found that many mothers in this category intended to breastfeed during pregnancy but abandoned breastfeeding in favour of other feeding methods. In fact, initiation of breastfeeding ranged from just 39% to 69% whereas about half of the mothers stopped exclusive breastfeeding just within 1 month (Kanhadilok & McGrath 2015:125). Although some studies in Malawi have found that breastfeeding and later complementary feeding to be associated with significantly lower morbidity from respiratory infection, mixed feeding is a norm in Malawi (Kalanda et al 2006:406).

1.2.3.1 Teenage pregnancy in Malawi

Again, Malawi is facing an increased number of teenage mothers with the current fertility rate being one of the highest in the world standing at 160 per 1000 women (WHO 2016). World health statistics in WHO (2018) rates Malawi as one of the top 10 high risk countries for teenage motherhood. Other studies found that a third of adolescent women in Malawi will have been pregnant or given birth by the time they reach 20 years of age (Myzel et al 2010 :2). Studies have shown that children born from these mothers are at a greater risk of suffering from adverse health problems particularly malnutrition, growth and developmental challenges, and they are at a higher risk of neglect and injury (WHO 2018),(Croffut et al 2016:1152).

1.2.3.2 Population and economic climate in Malawi

Malawi was ranked the world's poorest country in 2017 by the World Bank and it is currently sitting at 3rd poorest in the world (World Bank 2019). The current population for Malawi is 16 million (World Bank 2020). Malawi relies chiefly on agriculture for its economy and an average Malawian relies on subsistence farming for food. Malawi's Gross Domestic Product (GDP) per capita is also low and stood at under US\$350 per annum in 2016 (World Bank 2016: 3).

1.2.3.3 The health system in Malawi

In Malawi, health care services are delivered by both the public and the private sectors. The public sector includes all facilities under the Ministry of Health (MoH) and Ministry of

Local Government and Rural Development (MoLGRD), those of other ministries such as Education, and the Police, the Prison Service and the Army. The private sector consists of private-for-profit and private not-for-profit providers, mainly those under the Christian Health Association of Malawi (CHAM). The public sector provides services free of charge while the private sector charges user fees for its services. In accordance with the Decentralization Act (1997), the MoLGRD is responsible for the delivery of health services at district and lower levels with technical guidance from the MoH. The MoH headquarters are mainly responsible for development of policies, standards and protocols and for providing technical support for supervision. It also manages central hospitals (Government of Malawi 2017: 89).

Levels of care include, primary, secondary and tertiary care. The primary level consists of community initiatives, health posts, dispensaries, maternity facilities, health centres, and community and rural hospitals. At community level, health services are provided by community health workers such as Health Surveillance Assistants (HSAs), community-based distributing agents (CBDAs), Village health committees VHCs and other volunteers, mostly from Non-Governmental Organisation (NGOs). HSAs provide promotive and preventive health services including HIV testing and counselling (HTC) and provision of immunization services. Some HSAs have been trained and are involved in community case management of acute respiratory infections (ARIs), diarrhoea and pneumonia among children under five years of age. Services at this level are conducted through door-to-door visits, village clinics and mobile clinics. Community health nurses and other health cadres also provide health services through outreach programs (Government of Malawi 2017: 87). Most rural areas are served by the community rural hospitals as well as health centres. This study will focus on primary health care by focusing on teenage mothers attending baby wellness clinics, known as Under Five Clinics.

District hospitals constitute the secondary level of health care and each district has a district hospital. They are referral facilities for both health centres and rural hospitals, and district hospitals have an admission capacity of 200 to 300 beds. They also deliver both in-patient and out-patient services to the local town population. CHAM hospitals, too, provide secondary level health care. The district or CHAM hospitals provide general services, PHC services and technical supervision to lower units. District hospitals also provide in-service training for health personnel and other support to community-based

health programs in the provision of EHP (Government of Malawi, 2017: 89). Tertiary level on the other hand, consists of central hospitals (CH) that provide referral health services for their respective regions. Central hospitals offer specialised services such as obstetrics and gynaecology and serve as teaching hospitals too (Government of Malawi 2017: 91).

Lilongwe District is the largest of the 28 districts in Malawi and has 1 central hospital, 30 health centres, 2 dispensaries, 4 rural hospitals and 4 other hospitals. This study will focus on teenage mothers visiting the health centres as well as other rural hospitals, which together constitute 38 of such facilities (Ministry of Health 2017:15). The baby wellness clinics operate at these health centres and hospitals and cater for both immunization and child illnesses. The hospital visits are not *per se* appointment visits, but women with under-five children routinely visit those centres for various purposes to ensure health development of their under five children. There has also been an increase in the number of women delivering at health centres from 57.2% in 2004 to 73% in 2010 (Government of Malawi 2017: 12). The numbers of recognized hospitals are highlighted in Table 1.

TABLE 1: THE NUMBER OF FACILITIES IN 2010

Ownership	Central Hospital	District Hospital	Mental Hospital	Community / Rural Hospital	Hospital (other)	Health Centre	Dispensary	Maternity	Rehabilitation Unit	TOTAL
CHAM	0	0	1	18	20	109	12	4	1	162
Local Government	0	0	0	0	0	10	7	13	1	31
MoH	4	23	1	18	1	258	54	2	0	361
MoH/CHAM	0	0	0	0	0	1	0	0	0	1
MoH/Local Government	0	0	0	1	0	45	4	0	0	51
Total	4	23	2	37	21	423	77	17	2	606

Source: MoH. (2010) *Annual report on the work of the health sector Lilongwe*: MoH

Most rural areas are served by the community rural hospitals as well as health centres. There is a total of 606 key health facilities in the country, with 4 central hospitals, 17 maternity facilities and 423 health centres. With a population of 18 million people, the number of key hospitals is small and access to health services is generally low, which may also imply that the diffusion of infant feeding information may be limited to teenage mothers.

1.3 STATEMENT OF THE RESEARCH PROBLEM

Poor infant feeding practices have had a significant contribution to the alarming high rates of infant mortality in Malawi. About 25% of Malawian under-five children are underweight (Kerr, Berti & Chirwa, 2007: 91). Mild to moderate child malnutrition has been estimated to account for 53% of all child deaths in developing countries including Malawi (Caulfield et al 2004:193). For various reasons which include poor feeding practices, the WHO (2018: 30) reported that Africa's under 5 mortality rates are among the highest at 74 per 1000 live births. Yet this figure pales in comparison with the higher figure of 84 per 1000 live births reported for Lilongwe district (NSO 2017: 351). These mortality statistics have been reported to be correlated by feeding practices, and other factors interplaying within the early years of infancy (see the NSO 2017: 351). Statistics show that there may be as many as 170,000 teenage women in Lilongwe and about 26000 of them may be mothers, who, owing to poverty and low education factors characteristic of the district are likely to find problems with child feeding and some of them lose children as a result (NSO 2017:351).

Yet, there is a dearth of knowledge about what factors actually affect infant feeding choices among teenage mothers. Understanding these factors would be useful in ensuring that correct policies are put in place by the government to encourage effective infant feeding practices such as breastfeeding and exclusive breastfeeding in particular. The rates of exclusive breastfeeding are alarmingly low (the number of children who are exclusively breastfed in the first 6 months is reported to have gone down from 71% in 2011 to 61% in 2016) in Malawi despite the potential benefits of breastfeeding (UNICEF 2018 :10). The study seeks to obtain a better understanding of infant feeding practices, particularly exclusive breastfeeding, including facilitating and enabling factors to initiation and continuation of breastfeeding among teenage mothers. Knowing the factors that

influence infant feeding choices by teenage mothers may be instructive in the design of infant health education, health workers awareness campaigns and may impact on procedural and substantive changes that may catalase positive behavioural change and create a supportive environment for an effective breastfeeding practice.

1.4 RESEARCH PURPOSE

The purpose of the study was to investigate factors that affect infant feeding choices among teenage mothers in Malawi. The factors that were explored included their practices, knowledge, attitudes and barriers regarding breastfeeding choices.

1.5 RESEARCH OBJECTIVES

The objectives of the study were to:

- Identify infant feeding practices among teenage mothers with infants aged 0 to 24 months
- Investigate the level of knowledge of teenage mothers on breastfeeding options for infants aged 0-24 months
- Assess the attitude of teenage mothers with children of 0-24 months with regards to breastfeeding
- Assess barriers to breastfeeding among teenage mothers of infants aged 0 -24 months

1.6 RESEARCH QUESTIONS

1. What are the infant feeding practices among teenage mothers with infants aged 0 to 24 months babies in Lilongwe district?
2. What are the reasons underlying those feeding practices among teenage mothers with 0-24 months babies in Lilongwe District?
3. What is the level of knowledge on breastfeeding among teenage mothers with 0-24 months babies in Lilongwe District?

4. What is the attitude of teenage mothers towards feeding options of infants aged 0-24 months?

1.7 SIGNIFICANCE OF THE STUDY

Studies focusing on teenage mothers and moreover using quantitative methods are scant in Malawi and this study stimulates studies in that direction. This research examines several factors that drive infant feeding, and so its findings may benefit other teenage mothers beyond the sample. These dimensions of the research differentiate this study from many others. Once the complexities of infant feeding in adolescence are better understood, targeted infant support interventions can be developed to facilitate initiation and continuation of breastfeeding, as well as support successful attainment of the maternal role (Kanhadilok & McGrath, 2015). The results of the study may also be used to develop health education and health awareness campaigns targeting teenage mothers.

1.8 OPERATIONAL DEFINITIONS

Teenage mother: Refers to women between the ages of 10 and 19 who become pregnant and parent their children (WHO 2018). In this study, a respondent is referred to as a teenage mother if she has a child at the age of 13 to 19.

Adolescence: Describes the teenage years between 13 and 19 and can be considered the transitional stage from childhood to adulthood. It should also be noted that while the age of majority is 18 in Malawi, for most purposes, any teenaged woman loses minority the moment they get married (Mwambene & Mawodza, 2017: 29). According to the Constitution of Malawi as spelled out in SAT legal review report regarding the age to consent (SRHR Africa Trust 2016:2), the law of the country recognizes any girl aged 16 and above to be capable of giving a valid consent for sexual intercourse including any other aspects related to sexual activities except for gay relationships. In this study, girls in the age group between 13 and 18 were referred to be in the adolescent stage.

Infant: The term "infant" is typically applied to young children under one year of age; however, definitions may vary and may include children up to two years of age (WHO 2013). In this study, infants referred to children from birth up to two years.

Breastfeeding: Refers to infant consumption of breast milk either directly from the breast or expressed (WHO 2018). Same definition applies to this study.

Exclusive breast feeding (EBF): refers to giving the infant no other food or drink, not even water, apart from breastmilk (including expressed breastmilk), with the exception of drops or syrups consisting of vitamin, mineral supplements or prescribed medicines (WHO 2010). The same definition was used in this study.

Mixed feeding: Giving a baby some breastmilk and any other fluid or feeds, even a teaspoon of water (World Health Organization 2010). This definition applied to this study in the same way.

Early initiation of breastfeeding: defines early initiation of breastfeeding as it is the initiation of breast milk feeding to a new born baby within 1 hour after delivery (WHO 2019). Same meaning was applied in this study.

Weaning: Weaning is the gradual process of introducing complementary foods to an infant's diet while continuing to breastfeed (WHO 2018). This definition was used in this study.

1.9 THEORETICAL FRAMEWORK

This study followed the Theory of Planned Behaviour. The Theory of Planned Behaviour (TPB), (Ajzen 2011:3) proposes a model about how human action is guided and it predicts the occurrence of a specific behaviour provided that the behaviour is intentional (Francis et al. 2004: 8). Intention is itself determined by three sets of factors: attitudes, which are the overall evaluations of the behaviour by the individual. The second one consists of subjective norms, which consist of a person's beliefs about whether significant others think he/she should engage in the behaviour; and thirdly, perceived behavioural control, which is the individual's perception of the extent to which performance of the behaviour is easy or difficult (Norman & Conner 2005:10). Following the Theory of Planned Behaviour, it is conceptualized that adolescent mothers' health behaviours are jointly determined by their intention to perform the behaviours and their actual ability to do so. Intention to perform the behaviour may in turn be determined by their attitude toward the behaviour, subjective norms regarding the behaviour, and perceived ability to perform the behaviour. Consequently, participants were asked about their personal attitudes towards

breastfeeding including positive and negative aspects, family and friends' norms around breastfeeding, perceived and actual ability to breastfeed including information and support received and barriers encountered, and intentions to breastfeed prior to delivery (McMillan et al 2009: 3). TPB significant predictors of intention to breastfeed were having positive attitudes, high PBC, and perceived social approval towards breastfeeding, along with more years spent in education (McMillan et al 2009:9)

1.10 RESEARCH PARADIGM

The chosen paradigm of this study is quantitative research method. At the ontological level, quantitative research is guided by positivist worldview which holds a deterministic philosophy that causes effects or outcomes, hence at the level of epistemology, the researcher develops numerical measures of observations and studies the behaviour of individuals (Phillips & Burbules 2002:110). Quantitative research is deductive in nature, which means it starts with a theory, develops hypothesis and then tests the latter by observation (Bruce, Pope & Sanistreet 2008:4). This design is chosen in this study because the main goal is to understand the relationships between breastfeeding choices and the underlying factors. This is also in line with (Creswell and Creswell 2018: 147). The quantitative research approach is a means of testing objective theories by examining the relationship among variables (Creswell and Creswell, 2018:147). Owing to the nature of the quantitative approach, whether using an experimental or survey design, it has an advantage that results can be generalized over a broader population of interest (Creswell and Creswell, 2018:148)

1.10.1 Research Design

This study was a cross sectional descriptive quantitative research. A survey design was used for this study. Survey design attempts to measure attitudes, opinions, activities and beliefs with an aim of examining relationships among the variables, make predictions, and determine how subgroups differ by studying a sample of that population (Christensen et al. 2015:336). Survey design helps to answer questions about the relationship between variables hence making it a suitable design for this study since the study seeks to understand the relationship between the age of teenage mothers and other factors that affect their infant feeding choices.

This survey research used questionnaires for data collection that were issued to respondents for completion. The questionnaires were translated into Chewa (vernacular language) hence respondents who could read were able to fill the questionnaire on their own. Data was analysed using the STATA statistical package. The detailed information regarding methodology has been presented in chapter 3 of this study.

1.11 SCOPE OF THE STUDY

The study covered teenage mothers in rural and urban centres in Lilongwe district of Malawi but it did not cover the entire district and also not other parts of Malawi. There may be spatial differences within Malawi in respect of teenage mother infant feeding behaviours but it would not be possible to cover all the heterogeneities that exist. The research endeavoured to study as many nuances as possible within Lilongwe through random sampling, in order to improve inference and generalizability.

1.12 STRUCTURE OF THE DISSERTATION

The rest of this dissertation is structured as follows: Chapter 2 presents and discusses the literature relevant for the study. The literature covers several issues related to breastfeeding, infant feeding practices, as well as factors that underlie infant feeding decisions. Chapter 3 then presents the methods used in the study, and hence issues of study design, data collection, sampling and data analysis are presented. This is followed by Chapter 4 which presents results from the various analyses undertaken, which are then discussed in Chapter 5. The dissertation then closes with Chapter 6 which presents conclusions, limitations and implication of the study findings.

1.13 SUMMARY

This chapter has presented the background to the study including why the issues in focus are important. It has also presented the study objectives, and highlighted the methods which are elaborated in later parts of the study. The next chapter presents the underlying literature review.

CHAPTER 2 : LITERATURE REVIEW

2.1 INTRODUCTION

Infant feeding practices consisting of both breastfeeding as well as complementary feeding have a major role in the health and morbidity profile among children. This chapter reviews the key literature that discusses the infant feeding practices in general and among teenage mothers. Among other issues, this chapter focuses on infant feeding behaviours, factors influencing such choices and the consequences thereof.

2.2 OVERVIEW OF INFANT FEEDING PRACTICES

There are several definitions of infant feeding behaviours that are widely used in infant feeding research as well as HIV transmission research. According to WHO (2010), infant feeding is categorised into four, namely; exclusive breastfeeding, mixed feeding, complementary feeding and replacement feeding. Exclusive breastfeeding is referred to as giving the infant no other food or drink, not even water apart from breastmilk (including expressed breast milk) with the exemption of drops or syrups consisting of vitamins, mineral supplements or prescribed medicines. Mixed feeding on the other hand, is defined as giving a baby some breast milk and also any other fluids or feeds, even a teaspoon of water. Replacement feeding is defined as feeding a child who is receiving breastmilk with a diet that provides all the nutrients the child needs until the child is fully fed on family foods. Lastly, complementary feeding is defined as giving other foods (called complementary foods) in addition to breastmilk (WHO 2010).

2.3 EXCLUSIVE BREASTFEEDING

Exclusive breast feeding (EBF) involves feeding a child only breast milk for six months. Breast milk changes in composition over time, from colostrum for the new born to mature milk for older infants, to meet nutrient needs of the growing infant. For instance, the stages of lactation correspond roughly to the following times of postpartum: colostrum (0–5 days), transitional milk (6–14 days), and mature milk (15–30 days) (Bai, et al., 2010:26). Exclusive breastfeeding ought to be initiated within the first hour after child birth which falls in the colostrum phase which is a very critical period to ensure that the baby obtain colostrum for strengthening a child's immune system (Essien 2009:73; Wambach et al

2011:499). It is recommended that a child is fed on demand, meaning as often as the child wants to feed, often whenever the baby cries, or at least every 3 hours in 24 hours (WHO 2018). It is estimated that exclusively breastfed babies take in an average of 25 oz (750 mL) per day between the ages of 1 month and 6 months, which is deemed sufficient for child growth. Again, research has shown that EBF for 6 months and continued breastfeeding for the first year of infants' life could avert 13% of more than 10 million deaths every year among children younger than 5 years (Bai et al 2009:26; WHO 2018).

Adolescent mothers show a lower prevalence of breastfeeding initiation and shorter breastfeeding duration when compared with adult mothers (Muelbert et al 2018 :2). A study on experiences of breastfeeding among teenage mothers observed a reduction of EBF over a course of three months mainly due to perceived obstacles to the practice of breastfeeding such as nipple trauma, latching difficulties and insufficient milk production (Camarotti et al 2011:58). In other studies, teenage mothers reported challenges with continuation of breastfeeding and expressing breast milk after returning to school hence the decision to stop breastfeeding altogether (Norman & Conner 2005:7).

2.4 BENEFITS OF EXCLUSIVE BREASTFEEDING

Exclusive breastfeeding and continued breastfeeding is linked to improved infant and maternal health outcomes in both the industrialized and developing world (Aswathy et al 2020:17). Despite being the less favourite choice for teenage mothers, exclusive breastfeeding (EBF) has been shown to provide greater protection for infants against childhood illnesses that may come through possible contamination such as gastrointestinal infections, lower respiratory infections and otitis media (Kramer & Kakuma 2012:66). Other findings show that the risk of hospitalization for lower respiratory tract infections in the first year is reduced by 72% if infants are breastfed exclusively for more than 4 months (American academy of paediatrics 2012:828). A study in Malawi found that infants under 6 months of age who were exclusively breastfed were longer, heavier and less likely to be stunted than non-exclusively breastfed infants (Kuchenbecker et al 2015:19). Empirical evidence has also provided a strong association that exclusive breastfeeding reduces obesity, diabetes and allergies in children such as atopic eczema (Roll and Cheater 2016:146).

Exclusive breastfeeding for six months contributes to maternal health benefits; among others, reducing both breast and ovarian cancer, increasing child spacing secondary to lactational amenorrhoea and decreased postpartum blood loss. Again, mothers who exclusively breastfeed are reported to be more likely to return to their pre pregnancy weight with ease (American academy of paediatrics 2012:831).

Breastfeeding provides short-term and long-term economic gains for individual families as well as at a national level. Efforts to improve breastfeeding play a significant role in improving child development and health hence reducing health costs incurred by both families and the nations at large. For instance, it is estimated that effective breastfeeding practices would result in \$35 of economic return per each dollar invested (WHO 2018). Again, breastfeeding is also believed to improve IQ, school attendance and is associated with higher income in life (WHO 2018).

2.5 SCIENTIFIC RATIONALE OF BREAST MILK

Human milk provides all required nutrients in easily digestible and bioavailable forms for the optimal growth of an infant. Breast milk changes in composition over time, from colostrum for the new-born (in the first 3 days) to mature milk for older infants, to meet nutrient needs for the growing infant.

Breastmilk, particularly colostrum, contains secretory immunoglobulin A (SIgA) which are responsible for boosting the infant's immune system against gastrointestinal infections. Immunoglobulin A (SIgA) is passed from the mother to the baby's intestinal mucosa where it is able to adhere to the mucosa surface hence providing a defence system against disease causing organisms such as *Escherichia coli* which causes diarrhoea (Butte et al 1984:14). Similarly, smaller amounts of other immunoglobulins such as Immunoglobulin M (IgM) and Immunoglobulin G (IgG) antibodies are released into the infant's gastrointestinal tract to provide further boost to the baby's immune system to fight against gastrointestinal infections (Mickleson & Moriarty, 1982:381).

2.6 MIXED FEEDING

Studies have shown that non breastmilk feeds are usually introduced as early as one month (Croffut et al 2016: 1152). Among other feeds, babies are given water, watery porridge, bean soup, and traditional herbs to protect them from evil spirits (Théodore 2019:2299s; kalanda et al 2006:404). Mixed feeding practice is a result of many factors ranging from cultural influences, personal attributes of the mother and lack of good support system. For instance, studies have shown that the majority of teenage mothers who are often first-time mothers have limited knowledge and skills on optimal feeding of infants hence without an effective health care support system right from initiation to continuation of breastfeeding, mixed feeding is bound to be the norm (Kramer & Kakuma 2012:66). Also, early supplementing is introduced with the belief that women often have insufficient milk when breastfeeding, and babies may need water or porridge to supplement breastmilk (Muelbert & Giugliani, 2018:9). Mixed feeding has been linked to poor health outcomes and deaths among babies globally. For instance, studies have found higher rates of diarrhoea and fever among non-exclusively breastfed infants (Kuchenbecker et al 2015:19).

Studies have shown that mixed feeding is a norm among teenage mothers whereby most of the babies were given water almost soon after birth followed by foods of various kinds as eaten by the family, as complimentary diets, contrary to national and WHO guidelines (Kuchenbecker et al 2015:19). Issues of body image and convenience play a big role in infant feeding practices among teenage mothers. Studies have reported that teenagers find breastfeeding inconvenient and not feasible when they return to school (Tucker et al 2011:4). Again, other findings have echoed that despite teenage mothers being aware of the benefits of exclusive feeding, majority opt for early supplementation for fear of body image changes such as sagging of breasts after breastfeeding and the potential of exposing breasts in public (Dyson et al 2010: 146). Studies have shown that although many teenage mothers started out exclusively breastfeeding, supplementation with formula milk was prevalent barely a week after being discharged when breastfeeding challenges kicked in, perhaps underscoring the importance of continued breastfeeding support for several weeks after being discharged from the hospital (Wambach et al 2011 :498). In resource poor countries, where the negative impact of shortage of food, poor sanitation and HIV/AIDS is high, exclusive breastfeeding for the first six months has greater benefits than mixed feeding or formula feeding for the prevention of malnutrition, and mother to child transmission of HIV (Kuhn et al 2007:4).

2.7 DANGERS OF MIXED FEEDING

Mixed feeding has been linked to poor health outcomes among children. Early introduction of solids to infants before the age of six months could lead to intestinal complications simply because at that age, infants bowels and kidneys are not mature enough to handle high protein and other nutrition contents of solid foods hence leading to other health problems such as obesity and diabetes (Gupta et al 2016 :1). Introduction of any other liquid or food apart from breast milk, especially before the age of 4 months, is associated with increased risk of gastro-intestinal disease, which may result in growth retardation, micronutrient deficiencies and vulnerability towards various infectious diseases within the first 2 years of life (Théodore 2019: 2299s). Other studies found higher rates of diarrhoea and fever among non-exclusively breastfed infants (Kuchenbecker et al 2015:19).

Mixed feeding during the first six months of an infant's life carries a four to tenfold increased risk of MTCT of HIV compared to exclusive breastfeeding due to an increased risk of diarrhoea because of poor hygiene hence altering the integrity of the gastrointestinal system (Kafulafula et al 2013: 2).

2.8 COMPLEMENTARY FEEDING

WHO (2018) recommends that age-appropriate complementary feeding ought to offer diversity foods that are of good quality and quantity from six months onwards. It is estimated that interventions that promote optimal breastfeeding and complementary feeding could prevent about a fifth of under five deaths in countries with high mortality rates (Gareth et al 2003:17). On the contrary, studies have shown that solids are often introduced before a child reaches six months. (Kalanda et al 2006:56) found that by 3 months, over 65% of breastfed infants would have received complementary feeding with porridge, and over 33% would have received some other solids (Table 2). Later complementary feeding was associated with significantly lower morbidity from respiratory infection (Kalanda et al 2006:56).

In the context of poverty, in which food is scarce, complementary foods used in low-income populations are mostly monotonous and staple foods, such as maize, and include very few animal-based products, fruits, or vegetables (Theodore 2019: 2290s). Maternal

age appears as one of the factors that can influence duration of breastfeeding. For adolescents, the association of age with personal factors increases the risk of early weaning compared with adult women (de Sá Guimarães 2017:110).

2.9 REPLACEMENT FEEDING

Replacement feeding involves feeding the child non breast milk feeds, more often feeding a baby formula milk right after birth. Formula feeding raises risks of illness by depriving infants the protection offered by immune properties of breast milk and through possible contamination of water and formula, through non sterile bottles, or when the high costs of formula lead families to dilute the feedings (Bai et al 2010 :26). Studies have shown that formula milk feeding is preferred among teenage mothers in developed countries whereby teenage mothers were four times as likely to intend to formula feed their first infant than women aged 20 years and older. Among other reasons, breastfeeding, particularly in public is viewed as a morally inappropriate behaviour by most of these teenagers, with formula feeding being perceived as the appropriate behaviour (Dyson 2010: 147).

Global guidelines for HIV-infected mothers recommend exclusive breastfeeding when breast milk replacement is not acceptable, feasible, affordable, safe or sustainable (WHO 2014). Although replacement feeding (feeding a child only formula milk or other nutritive foods from birth) may be ideal, infant feeding choice for children born from HIV positive mothers, breastmilk remain the best and safe infant feeding option for HIV exposed infants(WHO 2010). Studies have shown that breast milk remains the most appropriate infant feeding method for child growth and survival worldwide (UNICEF 2008) and breastfeeding has been linked to health and superior child growth (Kalanda et al 2006: 404). Moreover, while there is a risk that 15% of children can contract HIV through breast milk, estimations have shown that children are likely to die for not being breastfed than being exclusively breastfed by HIV mothers whether in poor or richer environments (Kuhn, et al 2007). It is for instance estimated that if HIV-infected mothers chose exclusive breastfeeding, circa 300,000 babies would be infected with HIV each year in the world but if breastfeeding was avoided, the world would lose 1.5 million children each year (UNICEF 2008). Mixed feeding is greatly associated with increased risks of infectious diseases including HIV, malnutrition and the death of the infant (Kuhn et al 2007: 4).

2.10 TEENAGE MOTHERHOOD

There are 12.8 million births among adolescent girls aged 15 -19 years every year, representing 44 births per 1000 adolescent girls in this age group (WHO 2018:5). Although a large percentage of teenage motherhood takes place in marriage unions in sub-Saharan Africa, most teen pregnancies are often unwanted and happen outside marital unions hence rendering them single parents and predisposing them to unsafe abortions (Gyesaw & Ankomah 2013 :731; Rzechowska & Dacka, 2016:26). Other studies have shown that due to the unplanned nature of many teenage pregnancies, the majority of teenage mothers reported not being ready to be mothers when they got pregnant. As a result, making their journey as a young mother rather more difficult as their minds are not in tune with the expectations of motherhood (Sodi & Sodi 2012 :431; Pillay et al 2017:18).

Studies have shown that teenagers who have grown up in disadvantaged families particularly from low income and single parenthood households are at a greater risk of becoming teenage mothers. In such instances, often due to financial constraints, girls engage in transactional sex to obtain financial assistance which further predisposes them not only to teen pregnancy but also to sexual violence, rape and sexual diseases (Gyan 2017:133). On the other hand, early sexual experimentation and looking for acceptance from peer groups leading them to succumbing to peer pressure by engaging in early and unprotected sex without adequate knowledge on sexual and reproductive rights and services, have been alluded in many studies to have a significant contribution to teenage motherhood (Kirchengast et al 2016: 47). In other studies, teenage mothers reported that they did not have enough information regarding sex before their pregnancies for them to understand safe sex practices including contraception (Sodi & Sodi 2012: 430). In developing countries, teenage motherhood also is a consequence of child marriage and early marriages, often than not, forced marriages (Gyesaw & Ankomah 2013 :731).

Teenage mothers, particularly in the sub-Saharan Africa face tremendous challenges during pregnancy and motherhood. Among others, teenage motherhood is significantly associated with dropping out of school, low education level, low income, poverty and single parenting (Kirchengast 2016 :47). Girls who have received minimal education are 5 times more likely to become a mother than those with higher levels of education.

Pregnant girls often drop out of school, limiting opportunities for future employment and perpetuating the cycle of poverty (Gyan 2017:134).

In the face of rife stigma that teenage mothers face, young mothers are subjected to a whole lot of stereotypes ranging from prostitution to laziness. For instance, teenage motherhood was often stereotyped as an outcome of promiscuity, poor upbringing and a cynical attempt to access welfare financial support. As a consequence, to such stigma, young mothers are forced to drop out of school, and subsequently a decreased likelihood that an adolescent mother will resume schooling after her baby is born (Mayzel et al 2010:7). Adolescent pregnancies are of concern world-wide since they often lead to obstetric or neonatal complications such as preeclampsia and neonatal mortality rates increase in adolescent pregnancies (Pillay et al 2017:14).

On the other hand, other researchers have argued that teenage mothers are either excluded from rationality or have their rationalities for parenthood reshaped to fit commonly held stereotypes. For example, teenage pregnancy is generally considered to be either unintended, accidental, unwanted or a mistake (Ellis-Sloan 2014:133). In support of this notion, other researchers have echoed that many studies have underestimated the ability of teenage mothers to take care of their children (Camarotti et al 2011:56). Although such studies argue that becoming a mother is challenging regardless of age and that women under the age of twenty can claim a legitimate desire to becoming a mother too, majority of findings have shown that teenage mothers not only do experience much worse health outcomes with child birth but also face financial challenges, single parenthood and struggle with motherhood simply because of circumstances that are a consequence of their age (Gyesaw & Ankomah 2013 :731), (Malata & Chirwa 2011 :44), (Pillay et al 2017: 15).

Support that teenage mothers obtain from family, partners, community, health workers, government and other institutions, has a significant impact in assisting teenage mothers to adjust into the new role of motherhood (Gyesaw & Ankomah 2013 :731). Teenage mothers who have limited support succumb to depression, are at a greater risk of neglecting and even abusing their children hence compromising the overall health of their children (Rzeochoska & Dacka 2016: 27).

2.11 IMPACT OF TEENAGE MOTHERHOOD ON INFANT FEEDING PRACTICES

2.11.1 Enablers of breastfeeding in teenage mothers

2.11.1.1 *Self-efficacy*

Maternal breastfeeding self-efficacy (BSE) is reflective of a mother's confidence in breastfeeding and is a modifiable factor that may improve breastfeeding initiation, duration, and exclusivity (Brockway et al 2017:486). Breastfeeding self-efficacy theory purports that women with higher BSE will have better breastfeeding outcomes (Brockway et al 2017: 486). Among other things, breastfeeding self-efficacy is reported to be influenced by performance accomplishments, vicarious experiences, verbal persuasion and physiological responses (Blyth 2002:279). For instance, past breastfeeding experiences, watching other women breastfeed, encouragement from influential individuals, such as friends, family and lactation consultants may facilitate breastfeeding behaviour in adolescent mothers while stress and anxiety may hinder breastfeeding behaviour (Bai et al 2009:26).

A new mother's breastfeeding self-efficacy may be altered through success, difficulty, or failure with early breastfeeding attempts (McQueen 2011:42). Moreover, the physical feeling experienced by women just after the delivery in which women may experience higher anxiety, stress and pain hence reduce the level of oxytocin and reflex of maternal milk ejection, leading to perception of insufficient milk and, consequently reduce the levels of self-efficacy (de Sá Guimarães et al 2017:113). Scientific literature reports that adolescent mothers have a higher risk of not beginning to breastfeed, higher risk of early weaning, especially during the hospitalization, lower chance of exclusively breastfeeding after being discharged at the hospital and higher risk of discontinuing breastfeeding after being discharged from the hospital (de Sá Guimarães 2017 et al :113). Studies have also reported an increase of self-efficacy among adolescents when they reported to be helped by others to take care of the baby (Gyan 2017:134).

2.11.1.2 *Knowledge*

The knowledge of teenage mothers in the aspect of the development of a child and looking after the child is frequently not precise (Rzeochoska & Dacka, 2016:26). Studies have highlighted some key knowledge gaps among teenage mothers which include misinterpretations of the meaning of exclusive breastfeeding; confusion regarding appropriate timing of initiation and duration of breastfeeding; negative expectations regarding breast milk production; and confusion about appropriate complementary feeding practices in relation to the baby's health and intelligence, all of which are key aspects of the process of preventing childhood malnutrition and associated mortality (Zweigenthal et al 2017:999). This again, highlights the importance of educational efforts and community efforts to change perceptions and give correct information to adolescent mothers and their families (Pillay et al 2017 :18).

Studies have shown that although many teenage mothers report to be aware of not only EBF and its benefits but also that breastmilk alone is sufficient for infants in the first six months of their lives, only less than two-thirds of them actually practiced EBF (Essien et al 2009 :73). Other teenage mothers had shown knowledge on the benefits of breastfeeding such as that it protects the child from sickness, protects baby from allergies and that it promotes mother and child bonding (Kramer and Kakuma, 2012:66). The benefits of breastfeeding known to these mothers were often superseded by the perceived barriers of breastfeeding such as going back to school or work (Nankumbi & Muliira 2015:116). Perhaps highlighting the importance of providing adequate messages and education that should be aimed at encouraging teenage mothers that continued breastfeeding is possible, even if they return to school (Pillay et al 2017 :18).

Research has shown that the majority obtained their infant feeding knowledge particularly exclusive breastfeeding and complementary feeding from health talks conducted by health workers at antenatal clinics, while some teenage mothers reported that they were only given books by health workers to read about infant feeding recommendations (Sholichah 1997 :217).

2.11.2 Health care support

Health workers support is very instrumental for initiation and continuation of breastfeeding and optimal infant feeding hence adolescents constitute a target of care for the health professionals in order to make them aware of the maternal role and prepare them for this

(Camarotti et al 2011:56). Teenage mothers in other studies reported to have received breastfeeding support from health workers such as; information about breastfeeding and some received hands-on assistance on how to hold the baby for feeding, other findings have echoed limited information provided by the health workers (Wanjohi et al 2016:6). On the other hand, other teenage mothers have reported receiving limited to no hands on assistance with breastfeeding from health care workers after child's birth (Tucker et al.2011: 9). WHO advocates for provision of supportive health services with infant and young child feeding counselling during all contacts with caregivers and young children, such as during antenatal and postnatal care, well-child and sick child visits and immunization (WHO 2018).

Studies have shown that health professionals who undergo training in breastfeeding counselling and technical knowledge, are more likely to provide systemized breastfeeding support that is teenage mother specific and that goes beyond biological frontiers (Camarotti et al 2011:59). Moreover, strategies to improve health workers' competency in infant feeding counselling are needed to better prepare pregnant women to overcome common breastfeeding challenges and build mothers' confidence and self-efficacy, thus increasing EBF rates (Jama et al 2017:12).

2.11.3 Family support

The developmental phase and age of teenage mothers means that they are often dependent on their mothers or other close family members for guidance and support (Gyesaw & Ankomah 2012:778). Infant feeding practices among teenage mothers have been found to be strongly informed by their own mothers who may not be well informed about optimal breastfeeding practices (Wanjohi et al 2016:6). Similar findings were eluded by studies which advocate for the inclusion of family members particularly the mothers to the teenage mothers simply because they are often directly involved in the infant feeding of the child (Camarotti et al 2011 :59). Studies have shown that positive maternal grandmothers support of breastfeeding has shown a significant association with breastfeeding maintenance for at least 6 and 12 months, but not for 24 months (Muelbert 2018:8).

2.11.4 Community initiatives

WHO (2018), recommends that breastfeeding protection, promotion and support must be available in the community through mother support groups and community-based health promotion and education activities. Behaviour change communication is important in addressing infant feeding practices as well as targeting not only mothers of under-three children but also key influencers in the community who are responsible for decisions relating to infant and young child feeding (Aswathy et al., 2020:17). For instance, peer counselling methods through trained peer councillors have shown to be successful in improving various aspects of infant and young child feeding, breastfeeding in particular (Wambachi et al 2011: 487). Similarly, other studies reported that support group interventions, more importantly from other breastfeeding teenage mothers, can increase breastfeeding knowledge and negate outside barriers to breastfeeding from family and friends by offering peer support to young mothers, leading to increased initiation and duration of breastfeeding (Manion et al 2018: 33;Turker et al 2011:9).

2.12 BARRIERS TO BREASTFEEDING IN TEENAGE MOTHERS

2.12.1 Maternal age and education

There was a clear relationship between maternal age, initiation and continuation of breastfeeding. The effect was particularly marked at 3 months with 3.6% in the 16–19 age group exclusively breastfeeding compared to 33%. Other researchers have also found that breastfeeding intention and continuation was found to be closely bound to maternal age, whereby younger mothers aged 16 to 19 years reported poor attitude to breastfeeding and subsequently, low levels of breastfeeding rates (Bai et al 2010:31).

Studies have shown that maternal education has a significant impact on infant feeding choice by the mother. Maternal education is important not only because it influences the mother's ability to seek, understand, and appreciate the infant feeding information but also because it influences their attendance of antenatal classes and acceptance of health care advice contrary to the cultural beliefs (Malata & Chirwa, 2011 :44). The age of teenage mothers who usually have low levels of education and still developing in their cognitive aspect and often immaturity find it challenging to take care of a child but also to understand the concept of child care (Turker et al 2011:9). Studies on breastfeeding have shown that exclusive breastfeeding and general adherence to breastfeeding improved with maternal education (Vaahtera, et al. 2001). Women who left full-time education aged

less than 17 years were significantly less likely to breastfeed at all points in time (Malata & Chirwa 2011 :44).

2.12.2 Attitude

Attitude and subjective norm have been found to be most influential in prediction of the overall intention to breastfeed and maintain EBF for 6 months among teenage mothers (Henderson & Renshaw 2010:752). This is consistent with other studies whereby moral norms were identified as the most predictive variable influencing teenage intention to formula feed or breastfeed. Breastfeeding is reported to be perceived as morally unacceptable versus formula feeding as a norm among teenage mothers (Dyson et al 2010:147). Young mothers are said to be highly concerned about body image, breastfeeding in public, going back to school and concerns of being rejected by peers which influenced their breastfeeding practices (Henderson & Redshaw 2010:751). For instance, breastfeeding is considered tiring, inconvenient and embarrassing among teenage mothers especially when it is done in public spaces (Wambachi et al 2011: 487).

Often teenage mothers perceive breastfeeding challenges as obstacles to breastfeeding leading to early supplementation or even completely abandoning breastfeeding altogether (Tucker 2011: 17). Studies have shown that the perception of lack of sufficient breast milk to sustain the baby was common among teenage mothers. The reasons for this perception include the baby constantly crying, the baby wanting to breastfeed for longer, or no milk being produced when expressing (Jama 2017:11).

On the other hand, perceived benefits for breastfeeding on both mother and baby such as strengthening a baby's immune system, helping to develop their IQ, helping to prevent breast cancer and regaining one's pre pregnancy shape more quickly, have been linked to positive attitude to breastfeeding and consequently an increased likelihood that a teenage mother will engage in breastfeeding behaviour (Giles 2007:19). Also, attendance of support group meetings has shown to improve breastfeeding attitudes in teenage mothers (Manion et al 2018:28).

2.12.3 Cultural factors

Sociocultural factors are very helpful for understanding the complex relation between infant's nutrition and its contribution to health issues with emphasis on the importance of making breastfeeding the cultural norm in society (Dyson et al 2010:147). Understanding of child illnesses and infant feeding practices by teenage mothers, is largely influenced by how the society around them perceive breastfeeding and illness in general, informed by the cultural values and practices in their context (Henderson & Redshaw, 2010: 750). Other studies have shown that exclusive breastfeeding is considered the social norm during the first 3–4 months of an infant's life although it was reported that rural women adopted the norm than their urban counterparts and even less common among teenage mothers who believe that it causes breasts to sag or fall (Theodore 2019: 2296s).

Cultural factors may act as barriers or influences of optimal infant feeding practices. Other cultural beliefs can be detrimental to child's nutritional needs such as considering colostrum as 'dirty' or 'curdled milk', a curse 'bad omen' associated with breastfeeding while engaging in extra marital affairs, eggs should not be eaten by infants below one year old, among others (Wanjohi et al 2016:6). In other cultural practices, older women insist on giving babies liquid consistency of some of the family food with the belief that doing so is important to prepare babies to adapt to family foods (Théodore 2019:2298s).

In other studies, it is reported that the involvement of mothers and grandmothers in breastfeeding counselling and support during the first four months of children's lives proved to be effective in increasing exclusive breastfeeding duration among adolescent mothers (Zweigenthal et al 2017: 999). Similar findings were echoed by researchers on the importance of the deliberate effort by health workers to familiarise themselves with the cultural norms of the societies that they are serving to ensure that they offer culturally sensitive care with regards to appropriate infant feeding practices (Muelbert 2018:8).

2.12.4 Economic factors

Early pregnancy is associated with dropping out of school, lower educational level, less purchasing power and, often, single parenthood (Camarrotti et al 2011:58). Teenage mothers often drop out of school which subsequently makes it extremely challenging for

them to get paid employment (Gyan 2017:134). The socioeconomic disadvantages faced by adolescent mothers place their infants at a greater risk for infant morbidity, mortality, and developmental delays (Wambach et al 2011: 487). A study in Sierra Leone reported that due to rampant levels of poverty and subsequently poor diets, the majority of teenage mothers opted for mixed feeding with a belief that with their poor nutritional status, their milk was not sufficiently nutritious to respond to the child's needs (Lai & Towriss, 2014: 3)

Majority of teenage mothers have reported dependency on family members particularly their parents and partners for financial support and in some instances on government child grants (Gyan 2017:134). For instance, a study in South Africa found that although teenage mothers had knowledge on recommended infant feeding practices, financial dependency on older family members, particularly their mothers, diminished their autonomy and ability to influence feeding practices or challenge incorrect advice given at home (Jama et al 2017:12).

Although some teenage mothers, particularly in developed countries, receive financial support from the government, the majority of them report struggling with surviving on low incomes (Ellis-Sloan 2014:132). Financial support helps teenage mothers to have access to their basic needs and secure their health and that of their babies during and after pregnancy, continue with education and in some instances, to secure capital to start a business in order to become financially independent (Gyan 2017:134). Other studies have shown that balancing the responsibilities of teenage motherhood with going back to school or going back to work becomes a challenge considering the financial implications that comes with child care in their absence such as paying creche fees, buying milk bottles and breast pumps, just to mention a few (Sodi & Sodi 2012: 431).

2.12.5 Policy

While individual level interventions to change behaviour may be important, macro-level policies and interventions that take into consideration the ecological setting are particularly needed in order to improve breastfeeding behaviours among teenage mothers

(Kimani-Murage 2014:319). Studies have shown that some of the important reasons for the erosion of breastfeeding culture, particularly in sub-Saharan Africa, are the aggressive marketing of breast milk substitutes by the infant feeding industry and lack of clarity regarding optimal infant feeding practices in the context of the HIV/AIDS epidemic (Pillay et al 2017:14). The constant changes of infant feeding guidelines, particularly for babies born from HIV positive mothers brought confusion not only among health workers but also on mothers themselves.

WHO (2018) advocates for the adoption of policies such as the International Labour Organization's *"Maternity Protection Convention 183"* and *"Recommendation No. 191"*, which complements *"Convention No. 183"* by suggesting a longer duration of leave and higher benefits; the *"International Code of Marketing of Breast-milk Substitutes"* and implementation of the *"Ten Steps to Successful Breastfeeding"* specified in the Baby-Friendly Hospital Initiative (WHO 2018). Although there are efforts to increase duration of maternity leave for working mothers in general, studies have shown limited efforts targeting the specific needs of teenage mothers who are bombarded with little or no financial support and often having to juggle between motherhood and schooling.

Navigating the dilemma of how to discourage teenage pregnancy while making provisions for teenage mothers to bring their children to school for breastfeeding is a debate that all stakeholders need to engage in (Pillay et al 2017:18).

There is also a visible significant role of mothers-in-law and grand mothers who usually hold powerful positions within the extended families and community in feeding choices. In general, they are able to impose child care decisions on young mothers which promote traditional infant feeding practices which often clash with the recommendations presented to the young mothers at health centres (Kerr 2007:1103). This point perhaps underscores the importance of involving family members especially as grandmothers in health education by health workers.

Again, Kerr et al (2007), studying breastfeeding practices in Malawi, found that exclusive breastfeeding was uncommon in Malawi and in fact in their sample only 4% exclusively breastfed up to 6 months. In the majority of cases without exclusive breastfeeding, children were fed with water, some herbal infusions, porridge and other family foods. Mixed feeding, has also been the common practice of infant feeding in Malawi, whereby

besides being breastfed, babies are fed with water, some herbal infusions, porridge and other family foods before the age of six months (WHO 2008).

2.13 THEORY OF PLANNED BEHAVIOUR

The theory of planned behaviour purports that Intentions to perform behaviours of different kinds can be predicted with high accuracy from attitudes toward the behaviour, subjective norms, and perceived behavioural control (Ajzen 1991: 3). Attitude refers to the overall evaluations of the behaviour by the individual while subjective norms consist of a person's beliefs about whether significant others think he/she should engage in the behaviour and lastly perceived behavioural control consists of the individual's perception of the extent to which performance of the behaviour is easy or difficult (Norman & Conner, 2005:12). Intentions are strong indicators of how hard people are willing to try and the effort they can put in order to perform a behaviour, therefore, the stronger the intention, the higher the likelihood to perform the behaviour. (Francis et al. 2004: 8).

Use of the theory of planned behaviour may elucidate influential predictors associated with breastfeeding, which in turn provide guidelines for promotion strategies (Bai et al 2009:27). Studies have shown variations in decision making among teenage mothers on initiation of breastfeeding and continuation of breastfeeding. For instance, a positive attitude to breastfeeding is strongly linked to initiation of breastfeeding while maternal confidence in the ability of breastfeeding, is strongly associated with improved duration of breastfeeding behaviour among teen mothers (de Sá Guimarães et al 2017:110). It has been reported that many teenage mothers initiate breastfeeding but many abandon it as early as six weeks postpartum, perhaps due to breastfeeding challenges encountered after initiation of breastfeeding (Wambachi et al 2011:500).

Studies have shown that efforts to improve breastfeeding among teenage mothers should focus on improving the attitude and subjective norm (Henderson and Redshaw, 2010:752). Attitude is reported to be significantly improved by teaching mothers on the benefits of breastfeeding such as facilitating bonding between mother and child, health development of the child, boosts emotional health of the mother through oxytocin that is released by suckling stimulus during lactation (Bai Yeon et al 2009: 29).

Explaining human behaviour, particularly for continuous behaviour such as breastfeeding is a complex dynamic process which involves psychological, physiological and

sociological processes (Norman & Corner 2005:11). Therefore, breastfeeding support interventions ought to be deliberately structured to meet teenage specific needs, with understanding of the factors that facilitates intention to perform breastfeeding behaviour among teenage mothers (Wambach et al 2011:501)

2.14 SUMMARY

The literature reviewed thus far shows that there are many factors that affect breast feeding choices. However, there is also evidence to show how the factors end up influencing the decisions is dependent on the context. Thus, is important to examine the context specific decision processes that govern feeding choices in Lilongwe district of Malawi.

CHAPTER 3: METHODOLOGY

3.1 INTRODUCTION

Chapter three presents the methods utilized in this research as well as the design used to investigate the factors affecting infant feeding choices among teenage mothers in Malawi. Research design and methods informs the researcher on procedures of inquiry, specifically on the actual strategies for gathering data, processing it, and providing meaning to the data (interpretation) based on the nature of the problem under inquiry and the stakeholders who will use the study results (Creswell & Creswell 2018:3).

3.2 RESEARCH PARADIGM

Elshafie (2013:5), define research paradigms as the basic belief system or worldview, which influences the researcher's choice of epistemology, ontology and methodology of the research. A research paradigm is "the set of common beliefs and agreements shared between scientists", about how problems should be understood and addressed (Kuhn 1970:175). The paradigm represents and summarises the beliefs of the researcher. Positivism or naïve realism is suited to quantitative research methodology due to the ontological view of social reality being external and objective, and the epistemological belief that only observable phenomena can provide credible data or facts (Wahyuni 2012:70-71). Regarding axiology, positivism is characterised by a value-free approach to research and the maintenance of separation of the researcher from those being researched (Wanjohi 2012:71). The researcher decided to use this paradigm as the focus of the study was more suitable to quantitative methods of research.

3.3 RESEARCH DESIGN

Research design is referred to as a framework through which a research question is studied while ensuring that maximum control is exercised on variables which may undermine the authenticity of the results from the research (Polit & Hungler 1999:155). The design of a study aids those researching in planning and implementing the research such as researchers and they are aided in getting the results proposed. This in turn increases the likelihood of gathering information which may be related to the actual reality (Gray, Grove and Burns 2013:223). In this research, a survey quantitative design was used to proffer a description of trends, attitudes as well as opinions of a population, or tests for associations among variables of a population, by studying a sample of that population (Creswell & Creswell 2018: 147). Questionnaires are used in survey research for either one to one interview or for self-administration whereby the respondents fill the questionnaires on their own via post, online, telephone calls etc (Christensen et al

2015:46). This is compatible with the goals of this study since it seeks to understand the relationships between variables. Surveys research can be used to probe into a given state of affairs that exists at a given time and involves collecting huge amounts of data at that particular time (Polit & Hungler 1999:155). The design is also suited to this study because it is economically cost saving, and it has rapid turn-round in data collection. Moreover, the experimental design, which is a possible alternative, is unsuitable for this research owing to impracticability and high costs. This study used a design that may be described as both quantitative, cross-sectional and descriptive.

3.3.1 Quantitative research

This is quantitative research. Quantitative research systematically investigates observable processes/behaviour using strategies that rely on mathematics, statistics, or advances in computing. More often, studies that are quantitative seek to use or develop models which are mathematically based, as well as theoretical underpinnings and often a hypothesis about observed phenomena. Issues of measuring are cardinal to research that is quantitative as it offers the central link between empirical realities and numerical meaning of such quantity-based relationships (Creswell & Creswell 2018: 147).

3.3.1.1 *Characteristics of quantitative research*

The following are some of the characteristics of research that is quantitative; it relies on data that is quantitative and such a property allows such data to be transposable into numbers, in a manner that is informal, unbiased and methodical in order to acquire evidence and define factors and associated linkages (Christensen et al 2015:46). Again, analyses that rely on statistics are undertaken to process and manage data, pin down important linkages and detect variations as well as resemblances among various kinds of data (Brink & Wood 1998:305; Gray, Grove & Burns 2013:29). Another characteristic is that the underlying sample ought to represent the rest of the population. Comprehensive data collection is crucial using data collection instruments that are valid and reliable resulting in a full portrayal of the dimensions or the units being under study. It therefore proffers a precise description of traits of particular study units, scenarios, or categories (Brink & Wood 1998:5; Gray, Grove & Burns 2013:26). This study attempted to quantify factors identified as contributing to making decisions on infant feeding choices among teenage mothers in Lilongwe district. Descriptive cross-sectional study design was used.

3.3.2 Descriptive research

Descriptive research offers an account of features of study units, events or groups in reality (Polit & Hungler 1999:189). A design that is descriptive can be utilized to develop theoretical basis of phenomena, problem identification, justification of practices in existence, judging, or making determinations of that which others may be doing in situations that are identical (Tashakori and Teddli 2009:283) Descriptive designs aims at providing the insights and opinions of the interviewees about the phenomena under study (Gray, Grove & Burns 2013: 293). This study then describes variables that were associated with infant feeding choices among teenage mothers.

3.3.3 Cross-sectional study

In cross-sectional studies, survey data is collected from the research participants during a single relatively brief time period (Christensen et al 2015:338). This was convenient because, firstly it is not scientifically wrong (Creswell & Creswell 2018:148), but further, it is cost-effective for the researcher to collect data in one go than twice (Creswell & Creswell 2018:148). The researcher collected data from all the identified clinics for a period of two weeks. As a student, cross sectional study was convenient since there was limited time to collect data.

3.4 RESEARCH SETTING

Research setting of this study was Lilongwe district in Malawi. Five health centres were selected, particularly child wellness clinics in Lilongwe district in Malawi. Three of these five clinics were from rural areas, namely; Mitundu, Kabudula and Lumbadzi health centres, while Area 25 and Kawale health centres represented the urban population. Targeting both urban and rural areas was important and informed by existing statistics which shows that there are more teenage mothers in rural areas urban areas (see below).

Firstly, the World Bank (2016:3); and the DHS (2017:79), estimated the total Malawi population to be around 17,2 million as of 2017. About 50% were women. Lilongwe District is the largest and accounts for 14.51% i.e. around 2,500,000 people. The World Bank (2016:3) reports that 11% of the population are aged between 15-19 years which roughly translates to stating that 13,6% (or 2,340,000) are aged 13-19 years (see World Bank 2016:4). Since Lilongwe has an average proportion of 14,51% of the population,

Lilongwe has around 340,000 teenagers. Therefore, the total of women teenagers is 170,000 (i.e. 50%) (DHS 2017:73).

The NSO (2017:81:) shows that the prevalence of pregnancy/motherhood among teenage mothers is higher around 18-19 years and is on average 29% in the 15-19 age category and yet it is almost 0-2% at 13-14 years on average, hence teenage (13-19 years) pregnancies can be assumed to be around $(29+2)/2\% = 15.5\%$. The total number of teenage women expected to be pregnant in the entire area is estimated as 15.5% of 170,000 = 26350.

It is important to note further that teenage childbearing increases with age. The percentage of women aged between 15-19 who have begun childbearing rises from 5% among women aged 15 to 59% among women aged 19 (DHS 2017:81). In rural areas, 31% of women aged between 15-19 have begun childbearing, compared with 21% in urban areas. Teenage women in the lowest wealth quintile are more likely to have begun childbearing than women in the highest wealth quintile (DHS 2017:78).

3.5 RESEARCH METHOD

3.5.1 Sampling

The process of drawing study units from within a population is what is known as sampling (Christensen et al 2015:162). The most important aspect of sampling is that selected samples represent the population under study, well. Representative means that the characteristics of the sample closely match those of the population (Sarstedt & Mooi, 2019). Probability sampling was used because it provides each member an equal chance of being selected for inclusion in the sample (Christensen et al 2015 :162). The selection of the health centres as well as the teenage mothers who participated followed probability-based sampling. This technique is principally used in quantitative research. The method involves selection of many study units from a population, or subcategories (stratum) of a population, randomly whereby the chance of including any member in the population can be determined (Teddle & Tashakorri 2009:283). The selection of health centres involved cluster random sampling while simple random sampling was used for participants.

Firstly, with regards to cluster sampling, the researcher randomly selects clusters rather than individual units in the first stage of sampling which usually include multiple individual elements or units (Christensen et al 2015:169). Using a sampling frame (a list) of public

clinics in Lilongwe Urban and Lilongwe Rural areas available at the Ministry of Health, two clinics in the urban and three clinics in the rural areas were selected at random. These 5 clinics formed the clusters (from which the respondents were selected). For urban clinics, the researcher conducted the research at Area 25 health centre and Kawale health centre. The rural hospitals were Mitundu hospital, Lumbadzi health centre and Kabudula health centre.

Second stage of selecting respondents used simple random sampling. After the 5 clusters of clinics were selected, the next step was to select respondents from each clinic to take part in the study. Simple random sampling is an example of sampling in which each unit has the same chance that it can be selected and it produces representative samples from which you can directly generalise from your sample to the population (Christensen et al 2015:165). It was not practicable to get a precise list of all teenage mothers who use the respective public clinics hence a sample frame of teenage mothers was done on each day of data collection. The researcher asked mothers at the waiting area who had come to the baby wellness clinic to raise their hands if they were aged 13 to 19 years and had children of 24 months and below. The teenage mothers were then given numbers to create a sample frame. The researcher then randomly picked numbers from the list of the given numbers (sample frame), in order to choose the participants. The chosen numbers (teenage mothers) were called aside where they were briefed about the study and they were asked to make a decision if they wanted to participate or not. Consent forms were given to those who could read to fill. The researcher read the consent form and clarified it to those who could not read and let them sign the consent form if willing to participate.

This method was suitable because respondents who were available on that particular day were all given an equal chance to be included into the research study through random sampling (Creswell & Creswell 2018; 150). This was a convenient way of ensuring as many of the needed teenage mothers were included in the sample.

Of the 250 teenage mothers, a handful (9) aged between 13-17 years, whereas the rest were 18 or 19 years of age. Consent to participate in the survey was obtained directly from the teenage mothers aged 18-19 years using the Chichewa based consent forms. For the few teen mothers who were younger than 18 years, the researchers only admitted those who had visited the baby wellness centres under the escort of their legal guardian.

In this case assent to participate in the study was obtained from those teenage mothers using a Chichewa based assent form, and then a consent form was also given to their legal guardian to allow the researcher to collect data from the those under 18 teenage mothers. The Chewa based assent forms were handed over to the under 18 teenage mothers and were filled before the research, while their legal guardians received and filled the consent forms.

Where an under 18 teenage mothers did not have a legal guardian accompanying her, they were excluded from the study, unless they were able to call them, where they lived near the baby wellness centres. In case of the mothers and legal guardians who could not read, the researcher and her assistants read the assent and consent form contents to them and clarification was given where needed until the mothers or their legal guardians verbalised their understanding. Afterwards, the teenage mothers as well as their legal guardians were asked to sign the assent and consent forms respectively.

In practice, the researcher visited each clinic in the morning of the clinic day and administered (oversaw it being filled by respondents) the questionnaire together with 4 research assistants who were trained for collecting data for the survey prior to this study.

3.5.2 Target Population

The population for this study was all teenage mothers from Lilongwe district areas. This study targeted teenage mothers (13-19 years) with children of 0-2 years, from both rural and urban centres within Lilongwe District in Malawi. The study was conducted on teenage mothers (13-19 years) with children of 0 to 24 months from catchment areas of 5 public under-five clinics (3 rural based and 2 urban based) namely, Kawale, Lumbadzi, Kabudula, Area 25, and Mitundu in Lilongwe district.

3.5.3 Sample Size

The researcher conducted a survey of 250 teenage mothers (112 urban and 114 rural and 22 from one peri-urban area) with children aged 0- 2 years. These were drawn from 5 clinics, 2 from urban and 2 from rural areas and 1 from a peri-urban health centre. The DHS states that under 20% of the population of teenage women were urban while the rest were rural based (DHS 2018). For the same reason, each of the urban clinics

contributed 45% respondents while the rural clinics contributed 45 respondents, leaving the 10% for the peri-urban health centre.

Larger sample sizes increase the precision of the research but are also much more expensive to collect (Sarstedt & Mooi, 2019). In other words, sample size determination is a trade-off exercise in practice. Some rules of thumb for sample size determination include choosing a fraction (for instance, 10%) of the population based on past studies, but studies are different and so these may be optimal (Creswell & Creswell 2018).

The justification for this sample size is that, since the sample selection is based on cluster sampling of clinics, the sample selection was informed by (Naing, Winn, Rusli 2006: 9) who state that the sample N can be chosen by the formula $N = Z^2 * p(1-p)/d^2$ where N = sample size, Z = Z statistic for a level of confidence, P = expected prevalence or proportion (in proportion of one), and d = precision (in proportion of one; if 5%, d = 0.05).

Z statistic (Z): For the level of confidence of 95%, which is conventional, Z value is 1.96. Typically, investigators present their results with 95% confidence intervals (CI).

When these were applied, N was about 200. This is because indeed the P can be assumed to be around 15% (see the calculation on the prevalence of pregnancies in Malawi, informed by the World Bank (2016:3) and (DHS 2017:81). The d or margin of error of 5% is allowable, and Z is the conventional 1.96. This yields a sample of $N = (1.962 * 0.15(1-0.15))/0.052 = 196$. This implies that 250 is within the statistically sound limit since it is even above the minimum.

Furthermore, note that this sample size is sufficient to provide enough variation needed to permit meaningful statistical analysis. The studies referenced herein have dealt with sample sizes ranging from as low as 40 to as larger as more than the chosen sample of 250. Statistically, a sample size of 30 and above is sufficient for drawing valid inferences for purposes of allowing a Type I error of 5% (Wooldridge 2003;18).

3.6 DATA COLLECTION

Data collection involves the selection of study units and obtaining data from these study units (Gray, Grove & Burns 2013:430). This study began with conducting a survey. Surveys are applicable to cross-sectional and longitudinal studies using questionnaires

for data collection, with the intent of generalizing from a sample to a population (Christensen et al 2015:340). The actual data collection was based on self-reports using a questionnaire designed to capture the factors that may explain breastfeeding choices (Fowler 2014: 8). The rationale for using questionnaires compared to telephone, and online methods is that the form is easy to administer, and moreover, owing to the low-income status of Malawi, internet coverage is low (6% penetration) and for the rural areas it is non-existent (Freedom on the Net 2015: 2). The questionnaire was in English and Chewa (a vernacular language spoken by over 99% of the population in Lilongwe) and was deployed to gather data from the respondents. In this study, the Chewa questionnaire was given by the researcher to the respondents. The teenage mothers completed the questionnaire on their own and returned it back to the researcher immediately after completion.

The data were collected data from five health centres, (specifically, child wellness clinics) in Lilongwe district in Malawi. Three of these five clinics were from rural areas, namely; Mitundu, Kabudula and Lumbadzi health centres, while Area 25 and Kawale health centres represented the urban population. Mitundu lies about 40 km to the South West of Lilongwe central Business District (CBD), while Kabudula lies around 50 km to the North West of Lilongwe Central Business District. Lumbadzi lies 10 km north of Lilongwe CBD, while Kawale and Area 25 Health Centres are within the Lilongwe CBD.

3.7 DATA COLLECTION APPROACH AND METHOD

The data was gathered using a structured questionnaire with predetermined responses. The researcher explained the purpose of the research to the participants and the participant's rights on voluntary participation. The researcher used data collection assistants who were trained and oriented to the study purpose and the data collection instrument prior commencing the data collection process. Questionnaires were distributed to all eligible respondents to fill in their responses on their own while the researcher and her assistants remained visible for clarification if need be.

3.8 DEVELOPMENT AND TESTING OF DATA COLLECTION INSTRUMENT

To collect the required data, the study used questionnaires. A questionnaire contains questions that are used to collect the information sought and is filled by researchers or

interviewees as the case may be (Christensen et al 2015: 340). The questions were structured into closed ended questions with a list of predetermined responses provided, from which the participants chose the answers from. Closed-ended questions are a type of question format in which respondents have a certain number of response categories from which to choose from (Sarstedt & Mooi 2019). Closed ended questions provide a framework for responding in a form of questions with options, hence it ensures that the same information is collected for all respondents (Polit & Hungler 1992:283), they also facilitate immediate statistical analysis of the responses as no ex post coding is necessary (Sarstedt & Mooi 2019: 67). Closed-ended questions are usually preferred in survey research because of the ease of counting the frequency of each response (Covell, Sidani & Ritchie 2012:10).

The questionnaire was developed in English then translated into Chewa, the vernacular language that is spoken in the area of the study. The questionnaires were developed by the researcher upon consulting the supervisor and an expert in statistical analysis and survey design. The structure and content of the questionnaire were developed with consideration of the research variables that were derived from the research problem, purpose, study objectives, and literature review. A questionnaire was suitable because; with a questionnaire it was easier to ensure that respondents answered the exact questions they were meant to answer. Again, questionnaires are not only a convenient tool for collecting data from large numbers of people but also questionnaires are a good tool to determine facts about the participants (Polit & Beck 2017:296).

3.8.1 Pilot study

The questionnaire was piloted on five teenage mothers from a health centre not included in this study. This led to a rephrasing of some questions before the commencement of the study. The questionnaire was in Chichewa. Piloting involves administering the questionnaire on a small number of units as a strategy to guarantee validity for the major study to follow since the results are used to improve the questionnaire (Sarstedt & Mooi 2019).

3.9 CHARACTERISTICS OF THE DATA COLLECTION INSTRUMENT

The data collection instrument comprised the following sections:

Part 1: This section had questions regarding general information about the interviewees including biographic data such as occupation, family size, gender, age, marital status and religion.

Part 2: This section had questions on the infant, age of the infant, feeding behaviour, as well as the infants health, among others. This is about childbirth history. The questions were addressed to the teenage mothers.

Part 3: This covers information on knowledge of appropriate infant feeding practice (breastfeeding), feeding of infants 0-24 months. Closed questions were also used in this section.

Part 4: Had questions on attitude to breastfeeding (infant feeding practices).

Part 5: Had questions on barriers to practising appropriate infant feeding choices. All these questions were closed ended.

3.10 DATA COLLECTION PROCESS

The researcher and the research assistants issued the questionnaires to mothers/guardians who brought their infants to the baby wellness clinics. The respondents filled the questionnaires in the presence of the researcher and her assistants who in turn provided clarifications where the respondents did not understand. This approach ensures that filled in data has high usability because the researcher ensures that the respondents are answering the correct questions and no blanks are left unnecessarily and it is also highly inclusive because those who cannot read were still given an opportunity to fill the questionnaires under guidance (Creswell & Creswell, 2018; Polit & Hungler 1989:194). Again, meeting the respondents face to face made it possible to explain the questions further while they responded. This is better but would be impossible in emailed questionnaires.

The researcher collected data from 250 participants of whom about 50% were from the rural baby wellness clinics and the other were from the urban baby wellness clinics. These proportions are in line with prevalence of teenage mothers in rural and urban centres as calculated with data from the (DHS 2016: 81). In the urban centres, two clinics were sampled. Two clinics were selected from the rural areas and one further clinic was selected from a peri-urban area.

3.11 DATA MANAGEMENT

The quantitative data collected through the survey were recorded (by writing) directly from respondents on the hard copy-based responses from questionnaires, each of which was assigned a unique number. After every data collection day, the responses were then entered into Microsoft Excel spreadsheets. The arrangement in the Microsoft spreadsheet was such that each questionnaire was identified by the unique number above and was recorded in one row across as many columns as demanded by the number of questions in the questionnaire. After these entries, the data was checked to look for outliers, blatantly incorrect entries, or response, omissions, and other inconsistencies and where possible fix them before analysis.

Upon completion of data diagnostics, the next stage was to transfer the data into STATA, a statistical package, for analysis.

3.12 DATA ANALYSIS

The analysis of data involves the quantification and statistical manipulation of data to render it amenable for interpreting and deductions (Creswell and Creswell 2018:156). It is a process deployed to confer meaning to data (Gray, Grove and Burns 2013:41).

For purposes of analysis, firstly, the researcher performed descriptive analysis where summaries of the variables for example averages, ranges, variances were analysed. Then Chi-square and two sample t- tests were used to assess if responses of rural areas were different from those in urban areas. Thereafter the analysis progressed to regression analysis that sought to establish the factors that influenced the choices of infant feeding practices. Specifically, bivariate analysis was carried out to study the relationship between variables such as characteristics of the mothers and infant feeding methods.

Before the actual analysis, the researcher also performed exploratory diagnostic analysis to rule out irregularities in the data as well as to detect and resolve outliers and issues of data normality. The researcher computed averages and variances for continuous, but utilized cross-tabulations, Chi-squares statistics and percentages for discrete data.

The quantitative data was analysed by the researcher using the STATA statistical package to yield means, ranges, t-tests and chi-square tests in order to understand group differences in respect of feeding practices (Kumari, Rani & Rao 2017: 790). STATA is a

popular statistical package used by health scientists and other social scientists (StataCorp/IC 2017). Multivariate regression analysis was performed in STATA and the accompanying t-tests, Chi-squares as well as F-statistic are used to judge the significant of not only the models but also the individual model coefficients, which are used in deciding which of the variables under study are more influential in driving the infant feeding practices (Wooldridge 2003:630). Regression models were used to analyse the baby feeding choices and characterise the contribution of each factor to those decisions (Doherty et al 2006:92).

3.13 RIGOUR OF THE STUDY

3.13.1 Validity

Validity measures the degree of exactness of a questionnaire to capture the construct it ought to measure (Polit & Beck 2017:329). The questionnaire was evaluated for structure, substance and validity in terms of the construct.

Face validity is individual judgement summarising whether what is measured by the instrument is what it ought to measure (Gray, Grove & Burns 2013:376). Piloting ensured that face validity was maintained. The fact that the research supervisor and an independent statistician and survey designer also checked the questionnaires, improved its face validity.

Content validity is about seeing to it that all key parts of the factors are included in the questionnaire (Gray, Grove & Burns 2013: 377). By carrying out an in-depth literature review, it ensured content validity. The pre-testing as well as the role of the supervisor in checking the drafts also ensured that the content was valid.

Construct validity is about seeing to it that variables, confounders and concepts are measured with adequacy and with logic. It also sees to it that linkages among variables can be identified using the questionnaire based on theoretical underpinnings, and well-defined definitions for operationalizing constructs (Gray, Grove & Burns 2013:217). Both literature review, and theoretical understanding of the relationships were very instrumental in the development of the questionnaire for this study.

3.13.2 Reliability

To guarantee reliability of the instrument for data collection, questions were framed with care and accuracy to avoid conferring ambiguous meaning. The instrument was piloted on some respondents to see to it that questions were accurate, consistent, and the entire tool was dependable. Reliability thus, is the degree to which what we measure is free from random error and therefore relates to a situation where the ER is zero (Sarstedt & Mooi 2019) . Reliability is about whether the questionnaire can produce roughly the same results if it were to be reused in a study by different investigators (Gray ,Grove & Burns 2013:374; Polit & Beck 2017:324,328). Reliability therefore means stability, consistency or dependability of an instrument (Polit & Beck 2017:324,328). In this study, reliability was assured by the following; questions were clearly worded in order to be interpreted correctly, the interview was conducted in Chichewa (the local language) to limit any misinterpretations, questions which were not interpreted correctly during the pre-test were reconstructed and finally, respondents who participated in the pre-test responded in the same manner as those who formed the study population.

3.14 ETHICAL CONSIDERATION

Ethics in research involve guidelines or principles which aid those conducting research to decide how to conduct research that does not offend ethics (Christensen 2015: 108). Ethical considerations are aimed at protecting research participants by developing trust, promoting the integrity of the research and avoiding misconduct and wrongdoing (Creswell & Creswell 2018:88). In this study the following ethical issues were taken into consideration;

3.13.1 Permission to conduct the study

The researcher obtained permission to carry out the study from the Higher Degrees Committee of University of South Africa (UNISA). Ethical clearance was obtained in Malawi from the National Committee on Research in The Social Sciences and Humanities (NCRSH). Permission was also sought from the institutions involved such as the Lilongwe district health office then from the individual health centres involved (see annexure 2).

3.13.2 Informed consent and assent

Informed consent refers to fully informing the research participants about all aspects of the study before they are engaged in the research in order for research participants to make an informed decision to either take part or decline participation in the study (Creswell & Creswell 2018:88). On the other hand, assent means that a minor has agreed to participate in the research after receiving an appropriate explanation (Christensen 2015:127). In this study, minors were teenage mothers aged 13 to 17 years.

The researcher obtained informed consent from parents/mothers/guardians of the teenage mothers selected for the study and assent was obtained from teenage mothers aged between 13 and 17 (see annexure 5 and 6). Thereafter, the participant was asked to sign the informed consent form, or assent form as well as the confidentiality form. The researcher also obtained consent from legal guardians of teenage mothers aged 13 to 17 (see annexure 4). The researcher specified essential information in these forms such as the purpose of the study, explanation of study procedures and the fact that the participants were not being forced to participate.

3.13.3 Self determination

Participants entered into the study voluntarily without coercion. The researcher informed the participants of their right to withdraw from the interviews at any point if they so wished. Informed consents and assent were obtained prior to participation into the study.

3.13.4 Privacy

Privacy refers to controlling other people's access to information about a person (Christensen 2015:134). Privacy of the participants was achieved by making sure that the participants were given a quiet space free from intrusion from other people so that nobody sees the responses except for clarification from the researcher. The researcher gave all teenage mothers with a child aged 0-24 months an equal chance to be included in the study, so long as they expressed interest to take part in the study and were at the baby wellness clinic at the time of data collection.

3.13.5 Confidentiality and anonymity

Confidentiality in research involves not revealing information obtained from a research participant to anyone outside the research group (Christensen 2015:135). While

anonymity refers to keeping the identity of the research participants unknown (Christensen 2015:135)

Confidentiality was achieved by assuring the participants that the information obtained will remain strictly confidential. The contents will be used only for the infant feeding study and that their information will be protected from being shared without their permission or against their will. The data collected and stored in both hard copy and soft form was secured in the best possible way. For example, the data on hard copies was locked in a safe place so that it will be accessible to the researcher alone, whereas the soft data was kept in password secured computers and will be accessed by the researcher alone.

Anonymity was ensured whereby participants were identified by numbers other than names. For purposes of identification, the questionnaires were numbered from 1 to 250. The data obtained by the researcher did not have any identifying information of the participant, such as name of participant and their address were not requested. Again, the researcher assured all participants that their identity will not be disclosed in any manner and all information obtained will not bear any details pertaining to their identity.

3.13.6 Risk benefit ratio

There were no anticipated risks or discomforts in this research, but the participants were assured that should there be any, they should not hesitate to notify the researcher so that the researcher may address the problem accordingly. The researcher communicated to the participants that although they may not directly benefit from the research, the results of the research will benefit many people as it may be used to improve strategies for helping teenage mothers and children with regards to improving feeding.

The principal researcher also trained the research assistants, which was a relatively easy task because they were nurses too and were familiar with the issues under study and the hospital environment. The principal researcher worked together with the research assistants for purposes of supervision. At the end of each data collection day, the questionnaire responses were checked to identify flaws, omissions and then the questionnaires were kept in a lockable box.

3.15 SUMMARY

This chapter has presented methodologies that were used in carrying out this research. In brief, the study used quantitative design, and collected quantitative data with a questionnaire issued to teenage mothers selected using stratified random sampling in five health centres in Malawi's Lilongwe district. The data was then analysed using quantitative techniques.

3.16 RESEARCH DISSEMINATION STRATEGY

Upon publication of this dissertation, it will be available at the UNISA library to everybody who has access to the library. Again, the researcher plans to publish the results in accredited journals as well as presenting the thesis in conferences in an effort to maximise dissemination of the research findings as much as possible. The summary of the research will also be made available to the clinics where data collection will be conducted.

CHAPTER 4: RESULTS AND DISCUSSIONS

4.1. INTRODUCTION

This chapter presents the results and discussion of the study. As discussed in the earlier chapters, the purpose of this study was to examine the factors that determine the choices of feeding practices among teenage mothers in the Lilongwe district targeting a number of rural and urban health centres with baby wellness clinics. These health centres included Mitundu, Kabudula, Lumbadzi, Area 25 and Kawale.

4.2. DATA COLLECTION

Data for the study was gathered using questionnaires that were issued to the respondents by the researcher and assistants. The sample targeted was 250 respondents drawn from the mothers who attended the baby wellness centres using stratified random sampling, the details of which are provided in Chapter 3. The questionnaire used had questions that covered issues of socio-economic factors, knowledge, and attitude as well as skills factors.

4.3 RESULTS

The first part presents descriptive statistics using mainly the categorical data available which presents data in frequencies and percentages. Thereafter univariate tests of significance of variables using Pearson statistics are also presented to show whether there are any significant differences in variables of focus, among groups. These are then followed by multivariate analysis of factors that explain the choice of exclusive breastfeeding in the study area. This section presents two types of results, from Ordinary Regression model and logistic regression model presenting odds ratios. Two observations do not report most of the data and thus for many of the analysis, the applicable sample is 248 teenage mothers instead of the 250 teenage mothers who were interviewed.

4.3.1 Part A: Demographic data

The demographic data gathered included the distribution of mothers by health centre, age, education, marital status, religious affiliation, employment and occupation.

4.3.1.1 Distribution of mothers by health centre

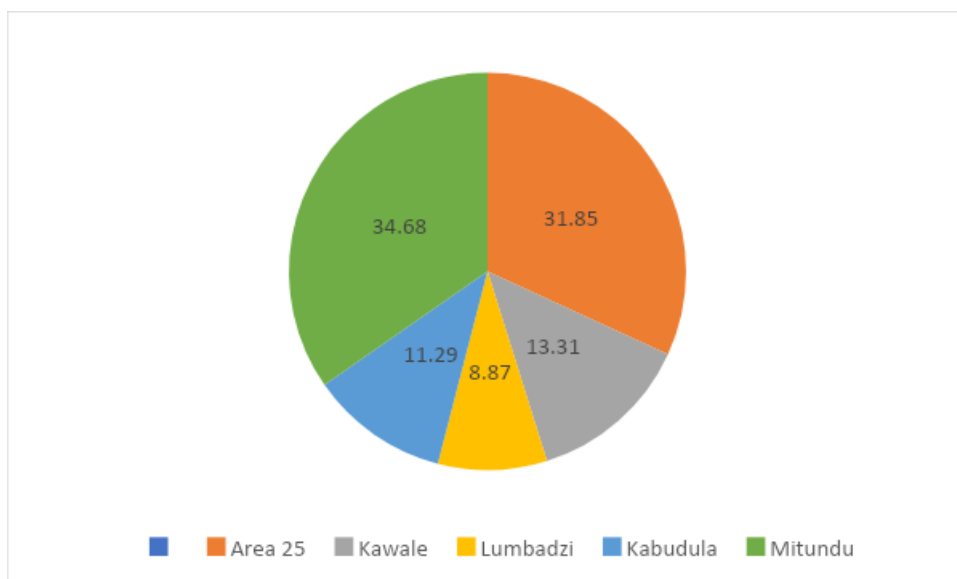


Figure 1: Distribution of mothers by Health Centre

Figure 1 shows that in the sample interviewed, 34.68% of the teenage mothers were drawn from Mutundu health centre while 31.85% were drawn from Area 25. Kawale, Lumbadzi and Kabudula Health centres contributed 13.31%, 8.87% and 11.29% respectively. This distribution was dictated by the availability of the teenage mothers on the interview days in those locations. Kabudula and Mitundu are in rural areas of Lilongwe whereas Area 25 and Kawale are in urban areas of Lilongwe and Lumbadzi can be considered a peri-urban area. Therefore, there was an almost equal proportion of respondents from urban locations (45.16%) and rural locations (45.95%). Sampling from rural and urban locations allowed the researcher to appreciate the different issues around infant feeding in urban and rural locations. Pearson Chi-square showed that location of the teenage mother had a significant effect on infant feeding choice (see Table 15).

4.3.1.2 Age of mothers by health centre

The respondents were asked to reflect their ages in the questionnaire. Table 2 shows age ranges per health centre.

TABLE 2: AGE RANGES PER HEALTH CENTRE

A	13-14 years	15-17 years	18 years	19-years	Total

Area 25	0	3	26	50	79
	0.00	3.80	32.91	63.29	100.00
Kawale	0	3	6	24	33
	0.00	9.09	18.18	72.73	100.00
Lumbadzi	1	0	9	12	22
	4.55	0.00	40.91	54.55	100.00
Kabudula	0	0	16	12	28
	0.00	0.00	57.14	42.86	100.00
Mitundu	0	2	42	42	86
	0.00	2.33	48.84	48.84	100.00
Total	1	8	99	140	248
	0.40	3.23	39.92	56.45	100.00

Table 2 shows the age distribution within the sample. Many of the mothers (140 mothers representing 56.45%) were aged 19 years whereas 99 mothers (39.92%) were aged between 18 years. The remaining 3.63% (9) were under 18 years. The finding that most of the teenage mothers were between 18 and 19 years is in line with perhaps because of the narrow variation within age, a cross tabulation of age and infant feeding choices did not show any significance implying that age was not important within that sample for decision making (Pearson Chi-Square P-Value =0.586). However, it should be noted that within the sample, rural health centres had more teenage mothers of ages lower than 19 years compared to urban centres where most of the teenage mothers were 19 years. At the very least, this suggests that women are likely to enter into motherhood earlier in rural areas. This agrees with previous findings by Human Rights Watch 2014, who show that child marriages are more prevalent in rural areas. This is the case because access to reproductive and maternal health services is poor in rural areas owing to inadequate

health infrastructure and personnel being largely based in urban or semi-urban areas and limited means of transport (Human Rights Watch 2014).

4.3.1.3 Mothers' marital status

TABLE 3: MARITAL STATUS OF MOTHERS

	Area 25	Kawale	Lumbadzi	Kabudula	Mitundu	Total
Single	2	2	5	4	9	22
	9.09	9.09	22.73	18.18	40.91	100.00
Has a boyfriend	11	3	1	1	8	24
	45.83	12.50	4.17	4.17	33.33	100.00
Married in polygamy	0	0	0	0	2	2
	0.00	0.00	0.00	0.00	100.00	100.00
Divorced	9	0	1	2	9	21
	42.86	0.00	4.76	9.52	42.86	100.00
Married in monogamy	57	28	15	21	58	179
	31.84	15.64	8.38	11.73	32.40	100.00
Total	79	33	22	28	86	248
	31.85	13.31	8.87	11.29	34.68	100.00
Pearson chi2(16) = 22.2834 Pr = 0.134						

Most of the teenage mothers in the sample were married (180 representing 72.5%), while the rest were unmarried either because they were divorced or having a boyfriend. The distribution of marital status across the health centres did not show any significant difference (Pearson chi2(16) = 22.2834 P-value = 0.134). The cross tabulations of marital status and choices of exclusive breastfeeding showed significant differences, even when marital status is split into a dummy of married and unmarried teenage mothers

(see Table 15 which shows the Pearson Chi-square P-value =0.036). This meant that marital status was important in feeding choice decisions such that married teen mothers were likely to choose exclusive breastfeeding than non-married ones, which is in line with the study conducted by Jacdonmi, et al. (2016) who found that some single mothers find EBF a social limiting factor and negated exclusive breastfeeding in Nigeria. Kong & Lee (2004) report that another reason is the fact that married women have financial support from their husbands which influences sufficient maternal nutrition that directly supports breast milk production unlike single mothers who have to fend for themselves (Kong & Lee 2004).

4.3.1.4 Level of education of mother

TABLE 4: EDUCATION OF TEENAGE MOTHERS

Mother	Area 25	Kawale	Lumbadzi	Kabudula	Mitundu	Total
Primary	60	10	22	23	71	186
	32.26	5.38	11.83	12.37	38.17	100.00
Junior Certificate	15	7	0	3	11	36
	41.67	19.44	0.00	8.33	30.56	100.00
Senior certificate	4	14	0	2	4	24
	16.67	58.33	0.00	8.33	16.67	100.00
College	0	2	0	0	0	2
	0.00	100.00	0.00	0.00	0.00	100.00
Total	79	33	22	28	86	248
	31.85	13.31	8.87	11.29	34.68	100.00
Pearson chi2(12) = 73.1303 Pr = 0.000						

Education of teenage mothers vary significantly across the centres signifying systematic variation in opportunities. Many of those with secondary education and beyond (Junior Certificate, Senior Certificate and College) were in urban areas. Since education is important for decision-making, it is also used in the multivariate analyses reported later. This was necessary because exclusive breastfeeding and infant feeding have previously shown that education enhances exclusive breastfeeding partly because educated

mothers can easily understand and adhere to principles and counsel on EBF during antenatal care visits (Akpan, Ibadin and Abiodun 2015).

4.3.1.5 Employment

TABLE 5: OCCUPATION OF THE TEENAGE MOTHERS

Occupation	Area 25	Kawale	Lumbadzi	Kabudula	Mitundu	Total
Not employed	61	22	11	13	42	149
	40.94	14.77	7.38	8.72	28.19	100.00
Business	6	5	2	6	5	24
	25.00	20.83	8.33	25.00	20.83	100.00
Piece work	6	1	2	0	14	23
	26.09	4.35	8.70	0.00	60.87	100.00
Domestic work	0	0	0	0	1	1
	0.00	0.00	0.00	0.00	100.00	100.00
Family paid for labour	6	5	7	9	24	51
	11.76	9.80	13.73	17.65	47.06	100.00
Total	79	33	22	28	86	248
	31.85	13.31	8.87	11.29	34.68	100.00
Pearson chi2(16) = 36.8801 Pr = 0.002						

Occupation of the teenage mother varies across the health centres and it may be a factor in infant feeding decision-making. Many (149 representing 60%) reported that they were not employed, although most of the rural based mothers were engaged in subsistence farming. Its occupation is related to time availability and financial ability and thus it is useful for understanding feeding choices. For example, in Ethiopia, it has been reported that government employed mothers were less likely to practice EBF compared to mothers

who were housewives (Hunegnaw et al. 2017). This relationship is however context specific because in places where women are allowed to take their infants to work such as Bangladesh, working class women are known to more likely breastfeed exclusively (Akter and Rahman 2009).

4.3.1.6 *Religious affiliation of mothers*

TABLE 6: RELIGIOUS AFFILIATION OF MOTHERS

Teenage mother	Area 25	Kawale	Lumbadzi	Kabudula	Mitundu	Total
Christian	68	27	19	28	79	221
	30.77	12.22	8.60	12.67	35.75	100.00
Moslem	10	6	0	0	4	20
	50.00	30.00	0.00	0.00	20.00	100.00
Pagan	1	0	3	0	3	7
	14.29	0.00	42.86	0.00	42.86	100.00
Total	79	33	22	28	86	248
	31.85	13.31	8.87	11.29	34.68	100.00
Pearson chi2(8) = 23.9228 Pr = 0.002						

There were systematic differences (Pearson Chi-square P-value=0.002) across the health centres sampled. Christians accounted for a huge proportion (221 representing 89.1%) of the sample while Islam accounted for 8% and Paganism accounted for 2.8% of the sample. Many of the Moslems were in urban centres, which makes sense considering that Lilongwe is predominantly Christian and the few non-Christians are

predominantly immigrants who occupy urban centres. Religion however was not found to be significant in explaining infant feeding choices (see Table 15). This may be explained by the fact that there was limited religious variation in the sample as almost all were Christians, which supports the observation in Hunegnaw et al. (2017) who found that religion did not matter because in the Gozamin district, northwest of Ethiopia, the sample was almost more than 87% Christian and there was no sufficient variation. Where Christian mothers were found to more likely exclusively breastfeed in Nigeria, the reason was that the La Leche League founded by the Christian catholic mothers had deliberately promoted and supported EBF.

4.3.2 Part B: Feeding practices

4.3.2.1 *Initiation of breastfeeding*

TABLE 7: INFANT FEEDING CHOICE AT BIRTH

Infant feeding choice at birth	Area 25	Kawale	Lumbadzi	Kabudula	Mitundu	Total
Exclusive breast milk	77	31	20	25	83	236
	32.63	13.14	8.47	10.59	35.17	100.00
Exclusive formula mil	0	0	1	2	0	3
	0.00	0.00	33.33	66.67	0.00	100.00
Both breast milk and	0	0	0	0	1	1
	0.00	0.00	0.00	0.00	100.00	100.00
water	2	0	0	1	0	3
	66.67	0.00	0.00	33.33	0.00	100.00
Total	79	33	22	28	86	248
	31.85	13.31	8.87	11.29	34.68	100.00
Pearson chi2(20) = 31.8577 Pr = 0.045						

The Table 7 shows that at birth, many of the mothers (236 representing 95%) chose exclusive breastfeeding and only 5 % chose a mixture of breast milk and formula milk or water. The significant Chi-square P-value above indicates that the choices were different across health centres. The choice of exclusive breastfeeding up to six months or more is examined further below using multivariate analysis. The finding that at birth many teenage mothers breastfeed their infants is encouraging because breast milk at birth is critical for child immune system development. Such milk is said to have colostrum feeding which has been reported to have anti-infective properties as it contains IgA antibodies protective against many infections (Jacdonmi, et al. 2016; Edmond, et al. 2006).

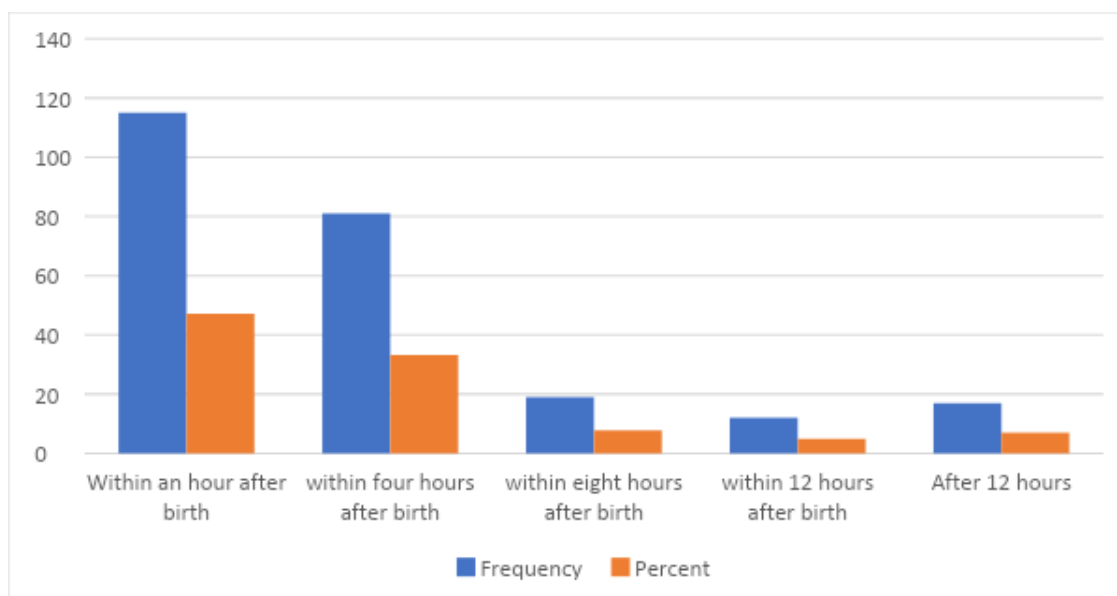


Figure 2: Initiation of breastfeeding

A majority of the mothers breastfeed their infants within 1 hour of birth (115 which is 47%) and the rest breastfed thereafter (Figure 2). Of the rest, 81 mothers (33.2% of the total sample) breastfed within four hours. It is important to give infants breast milk immediately when they are born because studies have shown that this facilitates lactation for mothers thereby reducing chances that the mother gives up breastfeeding. More importantly, in Ethiopia studies have found that early introduction of breastfeeding prevents new-born death due to sepsis, pneumonia, diarrhoea and hypothermia (Ekubay, et al., 2014). It may be useful for policy purposes to consider awareness campaigns in these areas.

4.3.2.2 *Frequency of breastfeeding*

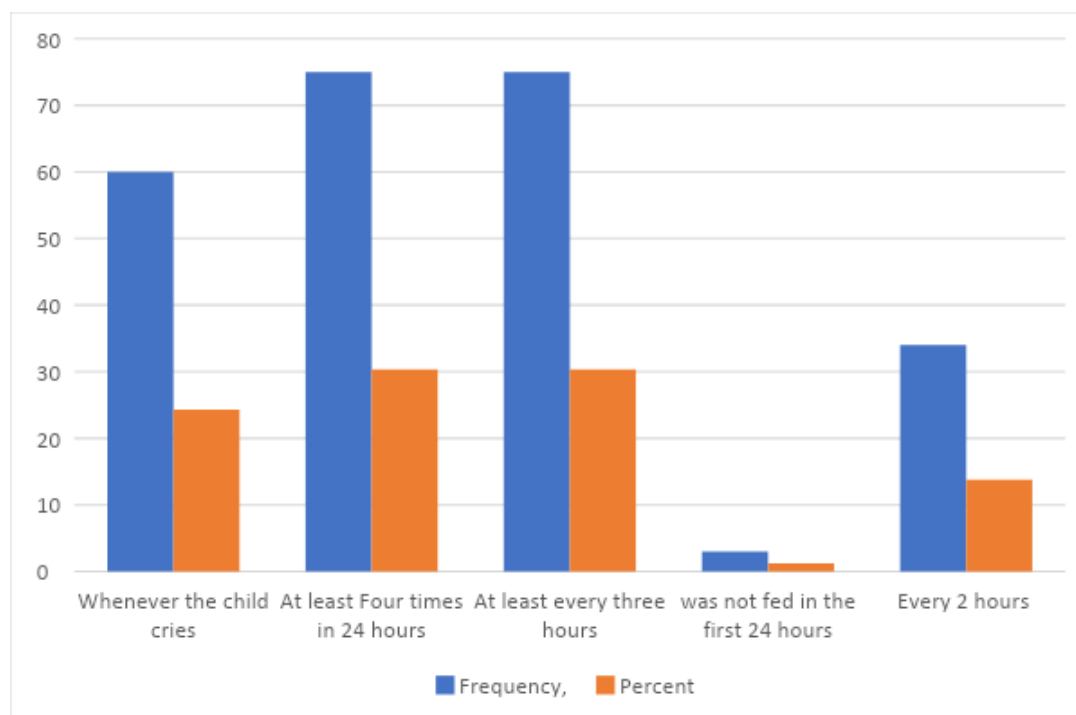


Figure 3: Frequency of breastfeeding immediately after birth

About 30.36% of mothers, representing 75 mothers reported that they fed their infants four times in every 24 hours while another 30.36% indicated that they feed their infants once every three hours and about 13.77% fed their new-borns once every two hours (Figure 3). The results show that just over 70% of the mothers followed the recommended breastfeeding frequency by the WHO, which recommends that babies should be fed on demand and at least every three hours in 24 hours. However, this also means that over 30% of mothers underfed their new-born babies by feeding them only four times in 24 hours. This is important information for corrective interventions.

4.3.2.3 Complementary feeding

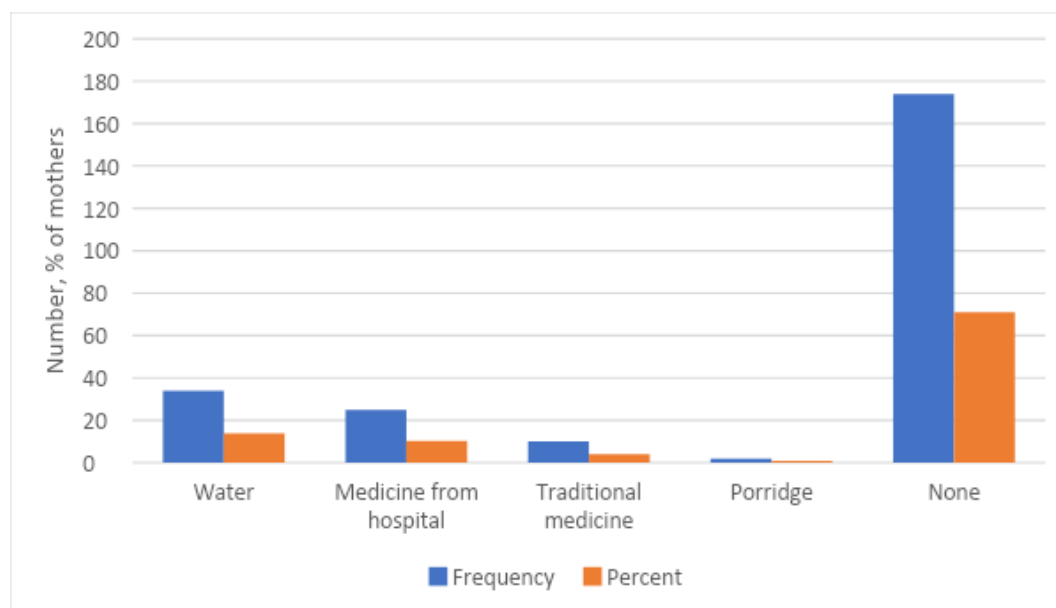


Figure 4: Type of other foods given to infants

For the mothers who responded to this question, a majority (174 representing 71%) reported that they did not give any food apart from breast milk within the first week after giving birth (Figure 4). However, 13.88% gave the children water, and 10.20% were subjected to traditional medicine. Only 0.82% reported feeding porridge to their infants. This implies that based on this information, 34 (13.88%) others (who gave water to their infants), and the 2 (0.82%) mothers who gave porridge to their infants within this period practiced mixed feeding, which is dangerous for the baby since it can expose the child to gastrointestinal infections. Thus, it is important that education programs be brought to the mothers to reduce this incidence. Indeed studies elsewhere have shown the importance of education in infant feeding choices, for example Hunegnaw et al. (2017) in Ethiopia as well as a study conducted in Nova Scotia, Canada, which showed that EBF was associated with good maternal education and family income implying that little education may negate good breastfeeding choices (Brown et al. 2013).

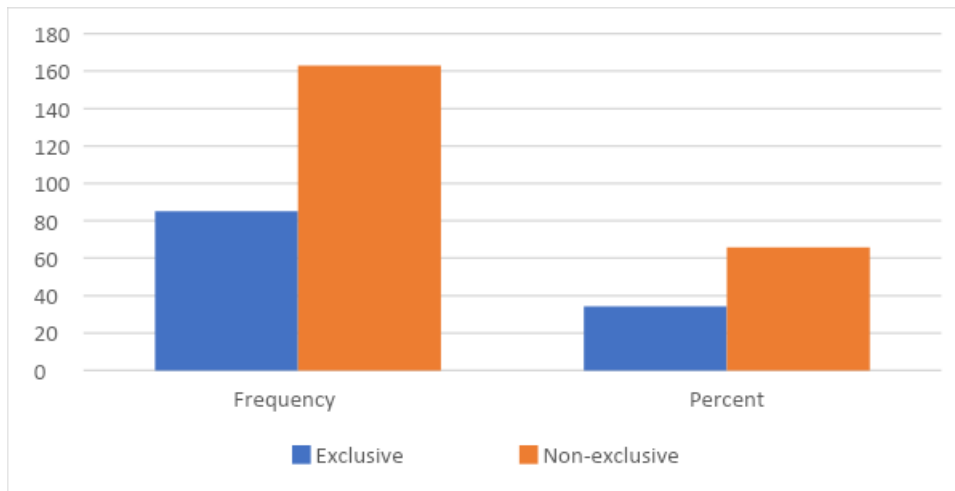


Figure 5: Exclusive breastfeeding prevalence among the teenage mothers

In Figure 5, exclusive breastfeeding applies to those mothers who breastfeed their infants for up to six months, while non-exclusive breastfeeding were those mothers who stopped exclusive breastfeeding before six months. This is concerning that over 65% of teenage mothers stopped breastfeeding their babies before six months. This underscores the importance of breastfeeding support initiatives, firstly, from health care where there is contact with mothers when they come for baby wellness clinics to community and again community support. Majority of mothers who exclusively breastfeed reported to have done so following advice from healthcare workers. On the other hand, following advice from family members was associated with non-exclusive breastfeeding. They also support Kakute et al. (2005) who found that in Cameroon, advice from family members embodied culture and often negated exclusive breastfeeding. This is in line with findings from other studies in South Africa, which show that, although teenage mothers initiated breastfeeding soon after birth, only 31% maintained breastfeeding by the infant's 14-week immunisation visit and only 12% were still breastfeeding by six months (Pillay et al. 2018:

4.3.2.4 Age at which mothers gave complementary food to their infant

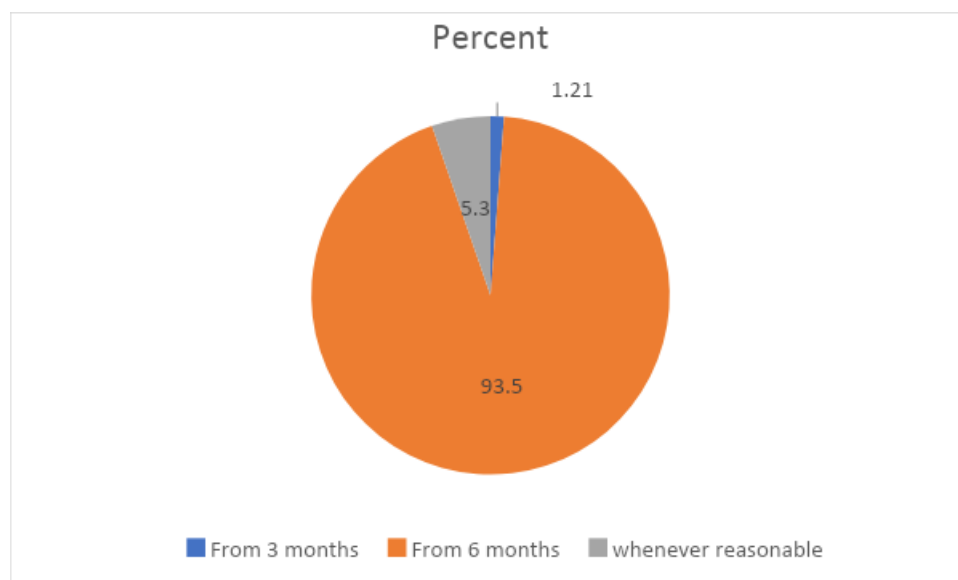


Figure 6: Opinion on the age at which complementary food should be introduced

Many mothers (93.52%) in the sample believed that complementary foods needed to be introduced from 6 months of birth rather than earlier, although as observed, this was not the case in practice, as some mothers introduced other foods earlier than 6 months (Figure 6). All these are an indication that awareness creation in this area is important to ensure that foods are only introduced at appropriate times for example after 6 months, as this is the goal of exclusive breastfeeding (see Jacdonmi, et al. 2016).

TABLE 8: BABY-WEANING PLANS FROM BREASTFEEDING

	Frequency	Percent	Cumulative
When the child is 3 months	5	2.04	2.04
When the child is 6 months	14	5.71	7.75
When the child is 12 months	20	8.16	15.91
When the child is 18 months	19	7.76	23.67
When the child is 24 months	165	67.35	91.02
Undecided	22	8.98	100.00

Total	245	100.00	
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The teenage mothers in general had planned to wean their babies from any form of breastfeeding at various times (see Table 8). Majority (67.35% representing 165 mothers) planned to wean at 24 months of age which is commendable as infants ought to be on breastmilk longer after birth. It is however still alarming that up to 23.67% planned to wean before two years and another 8.98% remained undecided. Other studies also found that teenage mothers lacked knowledge of early breastfeeding initiation and duration, colostrum, pre-lacteal food, exclusive breast milk, breastfeeding techniques, and complementary (Wambachi et al. 2011:499). This highlights the importance of comprehensive health talks by health care workers, that captures all important elements of breastfeeding, particularly for teenage mothers who are often first-time mothers. For example, Hunegnaw et al (2017) highlights the importance of awareness and knowledge in proper breastfeeding practice.

4.3.2.5 Reason for choice of feeding method

TABLE 9: REASON FOR CHOICE OF INFANT FEEDING PRACTICE

	Freq.	Percent	Cumulative
Relatives advice	128	52.24	52.24
Advice from hospital staff	108	44.08	96.32
Baby unable to latch and breastfeed	2	0.82	97.14
Breast milk was not yet established	3	1.22	98.37
Other	4	1.63	100.00
N = 245			

Many of the mothers (128 representing 52.24% of those who responded) reported that they chose the breastfeeding method because of what they had learnt through advice and observation from family relatives and community, whereas 44.08% followed advice

from hospital staff. Similar findings were eluded in Kenya where by teenage mothers reported cultural beliefs on early supplementation of breastmilk with other food stuffs, mainly learnt from parents, grandparents, spouses or from older women in the community (Wanjohi et al. 2017:6). This distribution underscores the importance for health workers to involve family members of teenage mothers in breastfeeding education, particularly influential female figures in teenage families who are more likely to influence the infant feeding choice for the young mothers. Knowledge from health professionals, family and relatives in feeding choice decision-making and is in line with findings in Nieuwoudt and Manderson (2018) on the prevalent reliance of mothers on health hospital staff and close family.

TABLE 10: SOURCES OF INFORMATION ON BREASTFEEDING

	Freq.	Percent	Cum.
Health talks from hospitals	198	80.16	80.16
Awareness campaigns in the community by NGOs	5	2.02	82.19
Family and friends	17	6.88	89.07
Media eg radio and tv	11	4.45	93.52
Other community sources/meetings	16	6.48	100.00
N	247		

Table 10 shows that important sources for breastfeeding information include hospital talks (80.16%), family and friends (6.88%) and other community sources (6.48%). Similar findings were eluded in an American study whereby many participants reported that they obtained information about breastfeeding including hands on assistance on holding baby

for feeding from the hospital at antenatal clinics and after delivery (Tucker et al 2011). However, lack of continued health care support after discharge from hospital has a significant impact on low rates of exclusive breastfeeding among teenage mothers. It is also important to strengthen the role of community structures, and media sources including radios in the spread of behaviour change messages on breastfeeding. For example, Rollins et al. (2016) found that media serves as key means for distributing messages of exclusive breastfeeding.

TABLE 11: WHETHER MOTHERS ARE STILL SCHOOLING OR NOT

	Freq.	Percent	Cum.
Not schooling	240	96.77	96.77
Schooling	8	3.23	100.00
Total	248	100.00	

There is a need to ensure that teenage mothers are supported so that they do not give up studying the moment they have a child, because from *Table 11*, it is clear that there is a problem. For example, an overwhelming 97% of the mothers reported that they had left schooling whereas only 2% (8 mothers) were still studying at the time. Majority of those who dropped out of school got married. This is alarming because since the teenage pregnancy rate is high in Malawi, then teenage school dropout will also remain high unless teenage pregnancies are prevented, or teenage mothers are supported to continue schooling. Other researchers have weighed in on the importance of concerted efforts by stake holders to discourage teenage pregnancy while making provisions for teenage mothers to bring their children to school for breastfeeding (Pillay et al. 2018: 17). This is because research has found that teenage motherhood and school dropouts are closely linked (Rosenberg et al. 2015).

TABLE 12: RULES FOR BREASTFEEDING AT SCHOOL

	Freq.	Percent	Cum.

The school allows teenage mothers back in school	89	44.06	44.06
The school expels girls who fall pregnant	24	11.88	55.94
Breastfeeding babies are not allowed in the school	6	2.97	58.91
I am not informed of any rules	64	31.68	90.59
There are no rules	19	9.41	100.00

Those who responded to the question in Table 12 indicated that to their knowledge, teenage mothers would be allowed back in school (44%), while 12% and 3% indicated that teenage mothers were not allowed at school (15% in total). The rest did not show any knowledge of any rules available. In any case, this indicates that there is a huge proportion of teenage mothers who are not incentivised to go back to school (around 55%). If breastfeeding and schooling campaigns can strengthen the messages that it is not illegal for teenage mothers to study, and teenage mothers are supported to continue breastfeeding while studying, school drop-out rates may reduce among teenage mothers. For example, McGaha-Garnett (2007) found that for students (teenage mother students inclusive) who are not given the appropriate support, the risk factors such as school dropout may greatly increase.

TABLE 13: RESPONSE OF OTHERS WHEN THEY SEE MOTHERS BREASTFEED

What happens when you breastfeed in public?	Freq.	Percent	Cum.
They make fun of me	13	5.53	5.53

They stare at me	106	45.11	50.64
They are proud of me and offer encouragement	76	32.34	82.98
They get embarrassed and leave	2	0.85	83.83
Not observed	3	1.28	85.11
No problem	35	14.89	100.00

Table 13 Shows that the society and its cultural norms may negatively influence breastfeeding. For example, 45% of those who responded to this question indicated that when a teenage mother tries to breastfeed in public, the public stares at them with disapproval. At the same time, 6% reported that they are laughed at, and 1% gets embarrassed. In total therefore, at least 52% are not supported by the public's attitude towards breastfeeding. This is a significant number even though 32% reported that they receive encouragement and support and another 15% reports no problems. This is consistent with findings of a study in England where embarrassment of breastfeeding was reported to be relating to the need to protect one's modesty, avoiding the act of being seen to behave indecently, and preventing unwanted voyeurism from strangers (Dyson et al. 2012:147).

It is important to present the policy support system available or known to the teenage mothers which they may tap into for infant feeding (Motjelebe, 2009).

TABLE 14: COMMUNITY SUPPORT AVAILABLE

	Freq.	Percentage	Cum.

Women groups	20	8.23	8.23
Non-governmental organisations initiatives	8	3.29	11.52
Baby friendly health initiatives	5	2.06	13.58
Health talks by community health work	127	52.26	65.84
None	83	34.16	100.00
Total	243	100.00	

Table 14 shows that about 52.26% of the mothers reported that they were aware of community support in the form of health talks by community health workers that could help as a source of advice, but again a huge percentage (34.16%) also indicated that there was no known community support mechanism from government in their communities. This highlights the existing gaps in the muchneeded infant feeding programs that are tailored for teenage mothers, noting the influence of society and peer pressure (Pillay et al. 2018). Studies have shown that among others, peer counselling and community breastfeeding support groups plays a significant role in improving breastfeeding exclusivity and duration (Wambachi et al. 2011:501). There is a need to strengthen the presence of support by the government to teenage mothers in both rural and urban areas (Motjelebe, 2009).

TABLE 15: GOVERNMENT SUPPORT

What kind of infant feeding support do you get from the government?			
	Freq.	Percentage	Cum.
Child grant in form of money	10	7.81	7.81
No Government support	103	80.46	88,27
Free porridge flour	2	1.56	89.83
Clothes and soap	4	3.13	92.96
Advice to encourage girls to go back to school	9	7.04	100
Total	128	100.00	

Of the 128 teenage mothers who provided an opinion on this question, an overwhelming 80.46% reported that they were not aware that the government actually actively helped teenage mothers in breastfeeding efforts. About 7.81% stated that the government or its agencies give out grants, while those who stated that the government gave out free porridge, or clothes and soap were (1.56%) clothes and soap (3.13%) respectively. Those who claimed that the government only gave general advice for teenage mothers to return to school accounted for 7.04%. This implies that either the government is generally absent in the area for teenage mother support, or indeed that many teenage mothers are unaware. From a policy perspective, it is imperative that the government ups its efforts to create awareness on programs it has in the area of breastfeeding by teenage mothers, but must also increase the spread of those programs (see for example, Motjelebe 2009).

4.3.3 PART C: FACTORS THAT LEAD TO CHOICE OF FEEDING PRACTICES

TABLE 15: DEMOGRAPHIC FACTORS AND EXCLUSIVE BREASTFEEDING

		Exclusiv e		Non- exclusive		Total				
		Frequen cy	%	Frequenc y	%	Frequ ency	%	DF	Chi- squa re	P- Valu e
Age of teen mother										
	Under 19	35	41.18	73	44.79	108	43.55	1	0.29	0.58 6
	19 years	50	58.82	90	55.21	140	56.45			
	Total	85	100.0 0	163	100.00	248	100.00			
Marital status										
	Single	16	18.82	51	31.29	67	27.02	1	4.4	0.03 6
	Married	69	81.18	112	68.71	181	72.98			
	Total	85	100.0 0	163	100.00	248	100.00			
Health centre										
	Area 25	29	34.12	50	30.67	79	31.85	4	9.9	0.04
	Kawale	10	11.76	23	14.11	33	13.31			
	Lumbadzi	12	14.12	10	6.13	22	8.87			
	Kabudula	13	15.29	15	9.20	28	11.29			
	Mitundu	21	24.71	65	39.88	86	34.68			
	Total	85	100.0 0	163	100.00	248	100.00			
Confidence										
	Not confident	60	71.43	95	58.64	155	63.01	2	17.1	0.00
	A bit confident	16	19.05	15	9.26	31	12.60			
	Very confident	8	9.52	52	32.10	60	24.39			
	Total	84	100.0 0	162	100.00	246	100.00			
Religion										
	Christian	76	89.41	145	88.96	221	89.11	2	0.10	0.98
	Moslem	7	8.24	13	7.98	20	8.06			
	Pagan	2	2.35	5	3.07	7	2.82			
	Total	85	100.0 0	163	100.00	248	100.00			
Knowledge of breastfeeding										
	Poor knowledge	25	29.76	26	16.05	51	20.73			
	Good knowledge	59	70.24	136	83.95	195	79.27	1	6.32	0.01 2
	Total	84	100.0 0	162	100.00	246	100.00			
Exclusive breastfeeding Knowledge										
	Poor knowledge	23	27.38	31	19.25	54	22.04			

	Some knowledge	48	57.14	72	44.72	120	48.98	2	11.43	0.003
	Good knowledge	13	15.48	58	36.02	71	28.98			
	Total	84	100.00	161	100.00	245	100.00			

From Table 15, several factors on their own appear to show a correlation with the choices of exclusive breastfeeding. For example, the sample showed that a total of 163 teenage mothers out of the total representing 66% did not choose exclusive breastfeeding while the remaining 34% chose exclusive breastfeeding. These results therefore are in line with the findings by the WHO (2018) who found that 40% of infants aged 0 -6 months are exclusively breastfed world-wide. It is also in support of the findings which revealed highest rates of exclusive breastfeeding in Malawi as being 39.1% (Kafulafula et al 2013:2). However, of those who chose exclusive breastfeeding, 81% were married while only 19% were single. Of those who did not choose exclusive breastfeeding, only a relatively smaller fraction (69%) represented married teenage mothers. These figures indicate that being single pulled away teenage mothers from exclusive breastfeeding. This may be explained by the possibility that single mothers may lack family support systems especially husband support for carrying on with exclusive breastfeeding (Motjelebe 2009). These differences are statistically significant with a Pearson Chi-square Statistic of 4.4 and a P-Value of 0.036. Policies that seek to strengthen exclusive breastfeeding should recognize the differential prevalence of non-exclusive breastfeeding depending on marital status. Single mothers may likely have to work more hours to make a living, which in turn may make exclusive breastfeeding unattainable (Rosenberg et al. 2015).

It is further interesting that the location of the teenage mother appears important for purposes choosing methods of infant feeding. Table 15 shows that the teenage mother choices of infant feeding practices differed systematically across the various health centres (Pearson Chi-square=9.9; P-value=0,04). These differences were likely existing because rural areas had different characteristics and opportunities compared to urban areas. Indeed, of the mothers who chose exclusive breastfeeding, many were in urban centres rather than in rural areas overall. This is also an indication of knowledge, information as important for decision-making (Rollins et al. 2016). Thus, it is important to

put in place exclusive breastfeeding campaigns in rural areas. This may also reflect the spatial differences in culture between the urban and rural communities.

Attitude is also important for breastfeeding decisions. Table 15 for example shows that the percentage of those who elected to exclusively breastfeed were also those teenage mothers who expressed that they were either a bit confident or very confident in exclusive breastfeeding matters (Rollins et al. 2016). For instance, of the mothers who claimed lack of confidence in matters of breastfeeding, 61% chose exclusive breastfeeding, however, an overwhelming percentage (86% i.e. $52/60 \times 100$) of those who were very confident chose exclusive breastfeeding, underscoring the importance of this attitude. This relationship also showed a statistical significance at 1% level (Pearson Chi-square =17.1; P-value =0.0001).

Furthermore, an understanding of mixed feeding and its potential effects on infants appeared to be highly correlated with the choice of exclusive breastfeeding. Table 15 shows that of those who did not choose exclusive breastfeeding, 70% had good knowledge of feeding practices and especially mixed feeding, but on the other hand, the percentage of those who chose exclusive breastfeeding but also had good knowledge of feeding practices was an overwhelming 84%. This shows that knowledge of breastfeeding choices tended to encourage teenage mothers to choose exclusive breastfeeding thereby confirming the hypothesis that good knowledge on these matters led to better choices. This relationship was significant at 5% with a Pearson Chi-square value of 6.32 and P-value of 0.012. In support of the same, more prior knowledge of exclusive breastfeeding also made it more likely that the teenage mothers would choose exclusive breastfeeding (Pearson Chi-square =11.43; P-value=0.003). On this point the results in Table 15 show that of those who did not choose exclusive breastfeeding, 72.88% ($57.14+15.48$) had some to good knowledge of exclusive breastfeeding, whereas for those who chose exclusive breastfeeding, it was an overwhelming 80.72% that had knowledge, and these differences were statistically significant at 1% level (Chi-square =11.43; P-value=0.003). Again, awareness campaigns aimed at knowledge creation among teen mothers on the nature and benefits of exclusive breastfeeding is important for ensuring that this feeding practice is adopted widely (Rollins et al. 2016).

The relationship between exclusive breastfeeding choices and religion, age and others for the teenage mother did not show outright relationships in the univariate tests. The results presented above are of interest because they suggest that there is a good association between knowledge, skill, attitude as well as other variables and infant feeding choices.

In order to strengthen these results and look at more parameters on interest, the study utilized multivariate analysis methodology where a number of factors thought to explain feeding choice were regressed against exclusive breastfeeding choice. This is also important in order to examine if the other univariate results may still stand out after controlling for the other covariates. For the multivariate analysis of the dependent variable, exclusive breastfeeding choice was constructed to take the value of 1 if a teenage mom chose exclusive breastfeeding, and 0 if the choice was non-exclusive breastfeeding. The other explanatory variables also entered the model as categorical variables as explained in Table 16. The model was then estimated using regression analysis as described in Chapter Three. The results presented in the Table 16 are from ordinary Least Squares Regression (OLS), the Logistic regression (Logit) and the same Logistic regression reporting Odds ratios (Odds Ratio).

4.3.2.6 *Feeding practices and other related factors significantly associated choice*

TABLE 16: FACTORS THAT DETERMINE FEEDING CHOICES- REGRESSION RESULTS

Dependent variable : Exclusive breastfeeding choice			
VARIABLES	OLS	Logit	Logit - reporting Odds Ratio
Health centre attended (Kawale)	0.0503	0.156	1.169
	(0.112)	(0.603)	(0.705)
Health centre attended (Lumbadzi)	-0.156	-0.697	0.498
	(0.144)	(0.824)	(0.410)
Health centre attended (Kabudula)	-0.0239	-0.0565	0.945
	(0.150)	(0.836)	(0.790)
Health centre attended (Mitundu)	0.169	1.079	2.942

	(0.130)	(0.782)	(2.300)
Confident in breastfeeding , (not really confident)	-0.143	-0.820*	0.440*
	(0.094)	(0.498)	(0.219)
Confident in breastfeeding, (Very confident)	0.233***	1.384***	3.990***
	(0.071)	(0.452)	(1.802)
Age of teen (19 years)	-0.0509	-0.210	0.810
	(0.066)	(0.355)	(0.288)
Marital Status (married)	-0.0727	-0.563	0.570
	(0.072)	(0.438)	(0.249)
Religion of teenage mother (Moslem)	-0.0351	-0.158	0.854
	(0.109)	(0.581)	(0.496)
Religion of teenage mother (Pagan)	0.0917	0.386	1.472
	(0.176)	(0.950)	(1.399)
Education of teen mother (Junior Certificate)	-0.049	-0.226	0.798
	(0.087)	(0.493)	(0.393)
Education of teen mother (No education)	-0.203*	-1.036*	0.355*
	(0.113)	(0.617)	(0.219)
Education of teen mother (College)	0.0853		
	(0.332)		
Occupation (Farming)	-0.0951	-0.574	0.563
	(0.136)	(0.784)	(0.442)
Occupation (Piece work)	0.0140	0.0222	1.022
	(0.112)	(0.626)	(0.640)
Occupation (Business)	0.218*	1.484*	4.412*
	(0.129)	(0.806)	(3.554)
Good General knowledge of infant feeding	0.185**	1.076**	2.932**
	(0.079)	(0.433)	(1.269)
Some General knowledge of infant feeding	0.0225	0.124	1.132
	(0.077)	(0.400)	(0.453)
Good exclusive breastfeeding knowledge	0.213**	1.246**	3.475**
	(0.090)	(0.513)	(1.783)
Constant	0.474***	-0.204	0.816
	(0.115)	(0.596)	(0.486)
Observations	245	243	243
R-squared	0.210	0.185	0.185
Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1			

The results in Table 16, show that the models are statistically powerful as the OLS model has an R-Square of 0.21 which is very high for cross sectional data. The logistic regressions also have a good explanatory power, with a Pseudo R-Square of 0.185. The OLS and logistic regressions results show that when many other factors that may explain exclusive breastfeeding choice are controlled for, the major factors that determined the exclusive breastfeeding choices in the sample included attitude/confidence towards breastfeeding are education of the mother, occupation of the mother, general knowledge of infant feeding and specific knowledge of exclusive breastfeeding.

The results in Table 16 show that those mothers who reported as having no confidence in breastfeeding were unlikely to choose exclusive breastfeeding as a method for infant feeding (the coefficient for not confident was negative i.e. -0.82) and significant at the 10% level of significance. This significance is robust across both OLS and logistic regression estimation techniques. The Odds Ratio associated with this variable was 0.440 implying that the odds of choosing exclusive breastfeeding for those who are not confident were 0.44 times that of those who were relatively confident. This implies that those who reported that they had no confidence were less likely to choose exclusive breastfeeding. On the other hand, the coefficient (1.384) for those that reported that they were very confident in breastfeeding was positive and significant at the 1% level of significance ($P < 0.01$). This corresponds to an odds ratio of 3.99 which implies that the odds of choosing exclusive breastfeeding for those who were very confident was 3.99, almost 4 times that of those who only had limited confidence in breastfeeding. These results are in line with the study conducted by Jacdonmi et al. (2016).

The education variable was recomputed to divide the sample into those who had education up to primary school and those who were educated beyond primary school. The coefficient for the dummy variable for education was -1.036 and significant at the 5% level of significance. The Odds Ratio associated with this was 0.355 which implies that the odds of choosing exclusive breastfeeding, if a mother had only primary school education, was 0.355 times that of those with better education. This implies that better education improved the odds of choosing breastfeeding, which is useful information because it implies that to enhance adoption of exclusive breastfeeding, health authorities should consider targeting education programs including awareness campaigns among

teenage mothers. This is in line with previous studies including Jacdonmi et al. (2016) who found that education was very important in breastfeeding in Plateau state in Nigeria.

Specific knowledge of exclusive breastfeeding was very important in the choice of exclusive breastfeeding. Those mothers who had prior ample knowledge of exclusive breastfeeding were more likely to choose exclusive breastfeeding (Odds ratio =3.48, $P<0.05$). Specifically, the odds of choosing exclusive breastfeeding were 3.48 times more for those with specific knowledge of exclusive breastfeeding than those without it. This also underscores the importance of information, skills, and knowledge for the choices of infant feeding methods, which corroborates earlier work by Kong & Lee (2004).

The results in Table 16 also show that those mothers who reported having a business as the main occupation had a higher likelihood of adopting exclusive breastfeeding compared to not having such a business (Odds ratio =4.4 and significant). It is possible that incidence of businesses exposes the mothers to better information on better infant feeding choices. Finally, good knowledge of infant feeding was also associated with a high likelihood of choosing exclusive breastfeeding supporting Rollins et al. (2016). The odds of choosing exclusive breastfeeding for those with good knowledge of infant feeding was almost three times (2.93) higher than that of those without knowledge of breastfeeding. This coefficient was also significant at the 5% level of significance, which again underscores the importance of knowledge and skills in order to enhance infant feeding.

4.4 CONCLUSION

This chapter set out to present and discuss results for the dissertation. The key focus was to present the key demographic statistics for the sampled population and more importantly, to present results towards answering questions on factors that determine infant feeding choices among teenage mothers in the Lilongwe district of Malawi. In general, the results indicate that attitude, knowledge, formal education, age and occupation were all important in determining infant feeding choices. Specifically, more educated mothers, more confident ones; mothers that are more knowledgeable were more likely to choose exclusive breastfeeding. These results underscore the importance of awareness, support mechanisms, education and skills in infant feeding decisions.

Chapter 5 presents conclusions from the findings of the study, provides its limitations, proposes recommendations for practitioners, education, and hints on possible future research

CHAPTER 5: CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter presents conclusions from the findings of the study, study limitations and recommendations for strategies to improve infant feeding and future research.

The objectives of this study were:

1. To identify infant feeding practices among teenage mothers with infants aged 0 to 24 months
2. To investigate the level of knowledge of teenage mothers on breastfeeding options for infants aged 0-24 months
3. To assess the attitude of teenage mothers with children of 0-24 months with regards to breastfeeding
4. To assess barriers to breastfeeding among teenage mothers of infants aged 0 -24 months

5.2 SUMMARY OF THE RESEARCH FINDINGS

This section summarizes the main findings.

Teenage mothers Initiate breastfeeding with exclusive breastfeeding following birth:

The study found that many of the mothers (236 representing 85%) chose exclusive breastfeeding and only 15 % chose a mixture of breastmilk and formula milk or water. However, this pattern changed as the infants grew in age and by the 6th month, only 84 mothers (representing 34% of the total) chose and maintained exclusive breastfeeding. In other words, only a small proportion of teenage mothers were able to follow exclusive breastfeeding methods until the 6th month or more. This signals that teenage mothers

faced challenges of knowledge, skills, and support with exclusive breastfeeding and those should be the focus of health policy.

Most mothers introduce breastfeeding immediately after birth, but problems still exist:

It is found that a majority of the mothers breastfeed their infants within 1 hour of birth (115 which is 47%) and the rest breastfed thereafter. It is important to give infants breast milk immediately when they are born not only because they get colostrum through breast milk, but early breastfeeding soon after birth ensures that the baby does not get introduced to formula milk unnecessarily. It may be useful for policy purposes to consider awareness campaigns in these areas.

In some cases complementary feeding was introduced too early:

Some mothers gave their infants complementary foods but a majority did not give any foods. In fact, for the first two weeks, the only substances mentioned as complementary were water (14%) porridge (0.8%) and traditional medicine (10%). Although the proportions of those who gave porridge and traditional medicine is only 11%, there is still a need for awareness creation against poor feeding practices early in infants' lives for better feeding outcomes.

Knowledge from hospital staff, family and the mothers were important for breastfeeding choice:

Many of the mothers (118 representing 48.16% of those who responded) reported that they chose the breastfeeding method they were using because they had decided previously, whereas 44.08% followed advice from hospital staff. About 4% were advised by family and relatives and the remainder cited other reasons. This distribution underscores the importance of knowledge in feeding choice decision-making.

Single motherhood negated mothers' choice of exclusive breastfeeding:

The analysis also indicates that being single pulled away teenage mothers from exclusive breastfeeding. This may be explained by the possibility that single mothers may lack knowledge support systems for carrying on with exclusive breastfeeding. Policies that seek to strengthen exclusive breastfeeding should recognize the differential prevalence of non-exclusive breastfeeding depending on marital status. Single mothers may likely

have to work more hours to make a living which in turn may make exclusive breastfeeding unattainable.

There is a rural-urban divide in exclusive breastfeeding signifying inequality in opportunities and knowledge:

Mothers in rural health centres were less likely to exclusively breastfeed than urban health centres. These differences were likely existing because rural areas had different characteristics and opportunities compared to urban areas. This is also an indication of knowledge and information as important for decision-making. Thus, it is important that exclusive breastfeeding campaigns in rural areas are increased.

Attitude, knowledge, and skills were important in explaining feeding choices:

The mothers who claimed lack of confidence in matters of breastfeeding, 61% chose exclusive breastfeeding, however, an overwhelming percentage (86% i.e. $52/60 \times 100$) of those who were very confident chose exclusive breastfeeding, underscoring the importance of this attitude.

Furthermore, an understanding of mixed feeding and its potential effects on infants appeared to be highly correlated with the choice of exclusive breastfeeding. Of those who did not choose exclusive breastfeeding, 70% had good knowledge of feeding practices and especially mixed feeding, but on the other hand, the percentage of those who chose exclusive breastfeeding but also had good knowledge of feeding practices was an overwhelming 84%. On this, the results from multivariate analysis corroborate the univariate results showing that the Odds Ratio associated with confidence indicator was 0.440 implying that the odds of choosing exclusive breastfeeding for those who are not confident were 0.44 times that of those who were relatively confident. Again, the odds of choosing exclusive breastfeeding for those who were very confident was 3.99 (almost 4) times that of those who only had limited confidence in breastfeeding.

The results also showed that better education improved the odds of choosing breastfeeding, which is useful information as it implies that to enhance adoption of exclusive breastfeeding, health authorities should consider targeting education programs including awareness campaigns among teenage mothers.

Finally, good knowledge of infant feeding was also associated with a high likelihood of choosing exclusive breastfeeding. The odds of choosing exclusive breastfeeding for those with good knowledge of infant feeding was almost three times (2.93) higher than that of those without knowledge of breastfeeding.

It was also found that the odds of choosing exclusive breastfeeding were 3.48 times more for those with specific knowledge of exclusive breastfeeding than those without it. This also underscores the importance of information, skills, and knowledge for the choices of infant feeding methods.

Occupation of teenage mother can influence feeding choices:

Lastly, mothers who reported having a business as the main occupation had a higher likelihood of adopting exclusive breastfeeding compared to not having such a business (Odds ratio =4.4 and significant). It is possible that incidence of businesses exposes the mothers to better information on better infant feeding choices.

5.3 RECOMMENDATIONS

The recommendations below were informed by the findings of this study:

- Since knowledge of breastfeeding is important in the choices for breastfeeding, the Ministry of Health in Malawi and its partners in the Non-government Sector must intensify campaigns aimed at increasing awareness of the benefits of breastfeeding.
- The Lilongwe district health authorities should develop programs for teenage mothers aimed at supporting them in breastfeeding choices. For example, the single mothers were often unable to exclusively breastfeed because they also likely worked more. This means that deliberately targeted support programs for single mothers may provide better jobs for them, which would in turn increase their presence for breastfeeding.
- Establishing teenage literacy programs and peer groups in the area of health and infant feeding would also help reduce the education effect on infant feeding. Many primary school dropouts were found to be unlikely to choose exclusive breastfeeding.
- There is a need to strengthen community and family involvement in infant feeding education, particularly exclusive breastfeeding. Many teenage mothers reported to

have made their infant feeding choices based on advice from family members and significant others from their communities, which means family and community influence have a significant influence on infant feeding choices among teenage mothers.

- There is a need for government and school management to have clear policies regarding being pregnant while schooling and subsequently breastfeeding at school. Teenage mothers should feel supported by the school that they can continue school while taking care of their children at the same time hence this will reduce the rates of school drop-out simply because they are mothers.
- There is a need to provide breastfeeding support sessions as part of antenatal services for specifically teenage mothers who are often first time mothers. This will help to address teenage specific needs and challenges that may lead to poor infant feeding choices.

5.4 RECOMMENDATIONS FOR FURTHER RESEARCH

- Further research in this area should seek to replicate the research in other parts of Malawi in order to understand how the relationship changes from one ethnic group to another. The sample covered predominantly Chewa people of Malawi.
- It would also be important to exploit Demographic Health Surveys to explore related questions on infant feeding and health outcomes of children nationwide.
- Future research should also consider comparing the choices in mothers of 20 years and above with those of teenage mothers in order to understand if there may be cross learning between the two groups.

5.5 LIMITATIONS OF THE STUDY

This research identified the following limitations:

- Although the study was quantitative in design and the results are powerful in explaining feeding choices, some of the results may not be generalized throughout Malawi, as choices may depend on other factors that may not have been important in the Lilongwe District.
- Again, while the cross-sectional design used here is important and useful, it was not possible to study behaviour change of respondents over time owing to the fact that cross sectional data does not offer that opportunity, unlike longitudinal panel data.

5.6 CONCLUSION

The study's goal was to identify infant feeding methods and thereafter to examine determinants of choice of feeding practices. The major focus was on exclusive breastfeeding for the first 6 months and continued breastfeeding up to two years of age, as this has been recommended as an effective method of feeding for better child development.

The findings revealed that the key factors for determining breastfeeding choice were knowledge of exclusive breastfeeding as well as of general breastfeeding, attitude towards breastfeeding, marital status, age and occupation of the teenage mother as well as levels of confidence of breastfeeding. The location of the teenage mother was also an important factor such that rural mothers were less likely to breastfeed than urban-based mothers.

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ANNEXURES

ANNEXURE 1 : UNISA CLEARANCE



RESEARCH ETHICS COMMITTEE: DEPARTMENT OF HEALTH STUDIES
REC-012714-039 (NHERC)

12 August 2019

Dear Emily Matchaya

HSHDC/916/2019

Student: Emily Matchaya

Student No: 57665044

Supervisor: Prof. Risenga

Qualification: PhD

Joint Supervisor:

Decision: Approval

Name: Emily Matchaya

Proposal: Factors Affecting Infant Feeding Choices among Teenage Mothers in Lilongwe District of Malawi

Qualification: MPCHS94

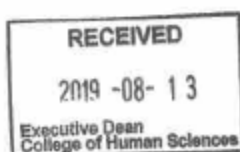
Risk Level: Medium risk

Thank you for the application for research ethics approval from the Research Ethics Committee: Department of Health Studies, for the above mentioned research. Final approval is granted from 12 August 2019 to 12 August 2022.

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the Research Ethics Committee: Department of Health Studies on 06/08/2019.

The proposed research may now commence with the proviso that:

- 1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*
- 2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the Research Ethics Review Committee, Department of Health Studies. An amended application could be requested if there are*



University of South Africa
Pretorius Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4155
www.unisa.ac.za

substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.

- 3) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.*
- 4) You are required to submit an annual report by 30 January of each year that indicates that the study is active. Reports should be submitted to the administrator HSREC@unisa.ac.za. Should the reports not be forthcoming the ethical permission might be revoked until such time as the reports are presented.*

Note:

The reference numbers [top middle and right corner of this communiqué] should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants, as well as with the Research Ethics Committee: Department of Health Studies.

Kind regards,


Prof JE Maritz
CHAIRPERSON
maritje@unisa.ac.za


Prof A Phillips
DEAN OF COLLEGE OF HUMAN SCIENCES

ANNEXURE 2 : NCSRC CLEARANCE



NATIONAL COMMISSION FOR SCIENCE & TECHNOLOGY

Lingadzi House
Robert Mugabe Crescent
P/Bag B303
City Centre
Lilongwe

Tel: +265 1 771 550
+265 1 774 189
+265 1 774 869
Fax: +265 1772 431
Email: directorgeneral@ncst.mw
Website: <http://www.ncst.mw>

NATIONAL COMMITTEE ON RESEARCH IN THE SOCIAL SCIENCES AND HUMANITIES

Ref No: NCST/RTT/2/6

25th November 2019

Mrs Emily Mmendera Matchaya,

Principal Investigator,

800 Highwood Avenue, Faerie Glen,

Pretoria,

South Africa.

Email: emkhombe@yahoo.com

Dear Mrs Matchaya,

RESEARCH ETHICS AND REGULATORY APPROVAL AND PERMIT FOR PROTOCOL NO. P.10/19/431: FACTORS AFFECTING INFANT FEEDING CHOICES AMONG TEENAGE MOTHERS IN LILONGWE DISTRICT OF MALAWI

Having satisfied all the relevant ethical and regulatory requirements, I am pleased to inform you that the above referred research protocol has officially been approved. You are now permitted to proceed with its implementation. Should there be any amendments to the approved protocol in the course of implementing it, you shall be required to seek approval of such amendments before implementation of the same.

This approval is valid for one year from the date of issuance of this approval. If the study goes beyond one year, an annual approval for continuation shall be required to be sought from the National Committee on Research in the Social Sciences and Humanities (NCRSH) in a format that is available at the Secretariat. Once the study is finalised, you are required to furnish the Committee and the

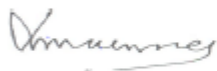
Committee Address:

Secretariat, National Committee on Research in the Social Sciences and Humanities, National Commission for Science and Technology, Lingadzi House, City Centre, P/Bag B303, Capital City, Lilongwe3, Malawi. Telephone Nos: +265 771 550/774 869; E-mail address: ncrsh@ncst.mw

Commission with a final report of the study. The committee reserves the right to carry out compliance inspection of this approved protocol at any time as may be deemed by it. As such, you are expected to properly maintain all study documents including consent forms.

Wishing you a successful implementation of your study.

Yours Sincerely,

A handwritten signature in black ink, appearing to read 'Yalonda I. Mwanza', with a horizontal line underneath.

Yalonda I. Mwanza
NCRSH ADMINISTRATOR
HEALTH, SOCIAL SCIENCES AND HUMANITIES DIVISION

For: CHAIRMAN OF NCRSH

ANNEXURE 3 : DISTRICT HEALTH OFFICER APPROVAL

Ref. No.:
Telephone No.: 265 726 466/464
Telefax No.: 265 727817
Telex No.:
E-Mail: lilongwedho@malawi.



In reply please quote NO DZH/MAL.
Lilongwe District Health O
P.O. Box 1274
Lilongwe
Malawi

COMMUNICATIONS TO BE ADDRESSED TO:

28th October, 2019

National Health Science Research Committee
P/Bag 303
Lilongwe 3
Malawi

Dear Sir/Madam

PERMISSION TO CONDUCT A RESEARCH STUDY IN LILONGWE DISTRICT

Approval has been granted to the bearer of this letter: Emily Machaya, from UNISA to conduct a research study in Lilongwe District.

Research Title:

" Factors affecting infant feeding choices among teenage mothers in Lilongwe District of Malawi "

Any assistance rendered would be appreciated.

Dr. Alinafe Mbewe
ACTING DIRECTOR OF HEALTH AND SOCIAL SERVICES- LL

ANNEXURE 4: CONSENT FORMS

UNIVERSITY OF SOUTH AFRICA, PRETORIA

Legal guardian (Ages 18 AND ABOVE) CONSENT TO PARTICIPATE (FOR THEIR MINORS TO PARTICIPATE) IN RESEARCH

Study Title: Factors affecting infant feeding choices among teenage mothers in Lilongwe District of Malawi

Your dependent is asked to participate in a research study conducted by Emily Matchaya, BSc Nursing- Department of Health Studies at the University of South Africa, Pretoria. Your dependent was selected as a possible participant in this study because *she is a young mother aged between 13 to 17 years with baby aged 0 -24 months*. Her participation in this research study is voluntary.

Why is this study being done?

The purpose of this study is to find out how she feeds her baby and why she feeds the baby the way she does.

What will happen if she takes part in this research study?

If she volunteers to participate in this study, the researcher will ask her to do the following:

- Respond to questions about herself, her baby and how she feeds the baby

How long will she be in the research study?

Participation in the study will take a total of about 10 minutes only.

Are there any potential risks or discomforts that she can expect from this study?

There are no anticipated risks or discomforts in this research, but should there be any, your dependent is encouraged to let the researcher know so that the approach may be changed to suit her circumstances.

Are there any potential benefits if she participates?

She will not directly benefit from the research, but the results may be used to improve strategies for helping teenage mothers and children sooner or later.

Will she receive any payment if she participates in this study?

She will receive no payment for her participation in the study.

Will information about her and her participation be kept confidential?

Any information that is obtained in connection with this study and that identifies her will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of keeping the questionnaires in a lockable, whereas the soft copy data will be kept in password protected computers where only the researchers will have access.

● Withdrawal of participation by the investigator

The investigator may withdraw her from participating in this research if circumstances arise which warrant doing so. If she is not a teen mother or if she is too tired she may have to drop out, even if she would like to continue. The investigator will make the decision and let her know if it is not possible for her to continue. The decision may be made to protect her health and to ensure that the responses reflect the true practices she embraces.

What are her rights if she takes part in this study?

She may withdraw her assent at any time and discontinue participation without penalty or loss of benefits to which she was otherwise entitled.

She can choose whether or not she wants to be in this study. If she volunteers to be in this study, she may leave the study at any time without consequences of any kind. She is not waiving any of her legal rights if she chooses to be in this research study. She may refuse to answer any questions that she does not want to answer and still remain in the study.

Who can answer questions she might have about this study?

If she has any questions, comments or concerns about the research, she can talk the researcher. For any information, please contact the following;

- i. Principle investigator *Emily Matchaya*, Phone, +27845834953.
- ii. National Committee on Research in the Social Sciences and Humanities (NCRSH) on 002651771 550, Email: directorgeneral@ncst.mw

SIGNATURE OF STUDY PARTICIPANT

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to allow my dependent participate in this study. I have been given a copy of this form.

Name of Participant's guardian/parental

Signature of Participant

Date

SIGNATURE OF PERSON OBTAINING ASSENT

In my judgment, the participant is voluntarily and knowingly agreeing to participate in this research study.

Name of Person Obtaining Assent

Contact Number

Signature of Person Obtaining Assent

Date

ANNEXURE 5 CONSENT FORM 18-19 YEARS

UNIVERSITY OF SOUTH AFRICA, PRETORIA

TEENAGE (Ages 18-19) CONSENT TO PARTICIPATE IN RESEARCH

Factors affecting infant feeding choices among teenage mothers in Lilongwe District of
Malawi

You are asked to participate in a research study conducted by Emily Matchaya, student for Masters in Public Health (MPH) at the University of South Africa, Pretoria. You were selected as a possible participant in this study because *you are a young mother of a young baby aged below twelve months*. Your participation in this research study is voluntary.

Why is this study being done?

The purpose of this study is to find out how you feed your baby and why you feed the baby the way you do.

What will happen if I participate in this research study?

If you volunteer to take part in this study, the researcher will expect you to do the following:

- Respond to questions about yourself, your baby and how you feed him

How long will I have to be in the research study?

Participation in the study will take a total of about 10 minutes only. We may follow up with a question later to seek further clarification.

Are there any potential risks or discomforts that I can expect from this study?

There are no anticipated risks or discomforts in this research, but should there be any, let the researcher know so that the approach may be changed to suit your circumstances.

Are there any potential benefits if I participate?

You will not directly benefit from the research, but the results of may be used to improve strategies for helping teenage mothers and children sooner or later.

Will I receive any payment if I participate in this study?

You will receive no payment for your participation in the study.

Will information about me and my participation be kept confidential?

Any information that is obtained in connection with this study and that identify you will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of keeping the questionnaires in a lockable box, whereas the soft copy data will be kept in password protected computers where only the researchers will have access.

● **Withdrawal of participation by the investigator**

The investigator may withdraw you from participating in this research if circumstances arise which warrant doing so. If you are not a teen mother or if you are too tired you may have to drop out, even if you would like to continue. The investigator will make the decision and let you know if it is not possible for you to continue. The decision may be made to protect your health and to ensure that the responses reflect the true practices you embrace.

What are my rights if I take part in this study?

You may withdraw your Consent at any time and discontinue participation without penalty or loss of benefits to which you were otherwise entitled.

You can choose whether or not you want to be in this study. If you volunteer to be in this study, you may leave the study at any time without consequences of any kind. You are not waiving any of your legal rights if you choose to be in this research study. You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can answer questions I might have about this study?

If you have any questions, comments or concerns about the research, you can talk to the researcher. For any information, please contact the following;

- iii. Principle investigator *Emily Matchaya*, Phone, +27845834953.
- iv. National Committee on Research in the Social Sciences and Humanities (NCRSH) on 002651771 550, Email: directorgeneral@ncst.mw

SIGNATURE OF STUDY PARTICIPANT

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Participant

Signature of Participant

Date

SIGNATURE OF PERSON OBTAINING CONSENT

In my judgment the participant is voluntarily and knowingly agreeing to participate in this research study.

Name of Person Obtaining Consent

Contact Number

Signature of Person Obtaining Consent

Date

ANNEXURE 6 : ASSENT FORM

UNIVERSITY OF SOUTH AFRICA, PRETORIA

ADOLESCENT (Ages 13-17) ASSENT TO PARTICIPATE IN RESEARCH

Study title: Factors affecting infant feeding choices among teenage mothers in Lilongwe
District of Malawi

You are asked to participate in a research study conducted by Emily Matchaya, student for Masters in Public health (MPH) at the University of South Africa (UNISA), Pretoria. You were selected as a possible participant in this study because *you are a young mother of a baby aged 0-24 months*. Your participation in this research study is voluntary.

Why is this study being done?

The purpose of this study is to find out how you feed your baby and why you feed the baby the way you do.

What will happen if I take part in this research study?

Please talk this over with your parents before you decide whether or not to participate. We will also ask your parents to give their permission for you to take part in this study. But even if your parents say “yes” you can still decide not to do this.

If you volunteer to participate in this study, the researcher will ask you to do the following:

- Respond to questions about yourself, your baby and how you feed him

How long will I be in the research study?

Participation in the study will take a total of about 10 minutes only.

Are there any potential risks or discomforts that I can expect from this study?

There are no anticipated risks or discomforts in this research, but should there be any, let the researcher know so that the approach may be changed to suit your circumstances.

Are there any potential benefits if I participate?

You will not directly benefit from the research, but the results of may be used to improve strategies for helping teenage mothers and children sooner or later.

Will I receive any payment if I participate in this study?

You will receive no payment for your participation in the study.

Will information about me and my participation be kept confidential?

Any information that is obtained in connection with this study and that identify you will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of keeping the questionnaires in a locked up boxes, whereas the soft copy data will be kept in password protected computers where only the researchers will have access.

● Withdrawal of participation by the investigator

The investigator may withdraw you from participating in this research if circumstances arise which warrant doing so. If you are not a teen mother or if you are too tired you may have to drop out, even if you would like to continue. The investigator will make the decision and let you know if it is not possible for you to continue. The decision may be made to protect your health and to ensure that the responses reflect the true practices you embrace.

What are my rights if I take part in this study?

You may withdraw your assent at any time and discontinue participation without penalty or loss of benefits to which you were otherwise entitled.

You can choose whether or not you want to be in this study. If you volunteer to be in this study, you may leave the study at any time without consequences of any kind. You are not waiving any of your legal rights if you choose to be in this research study. You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can answer questions I might have about this study?

If you have any questions, comments or concerns about the research, you can talk to the researcher. . For any information, please contact the following;

- v. Principle investigator *Emily Matchaya*, Phone, +27845834953.
- vi. National Committee on Research in the Social Sciences and Humanities (NCRSH) on 002651771 550, Email: directorgeneral@ncst.mw

SIGNATURE OF STUDY PARTICIPANT

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Participant

Signature of Participant

Date

SIGNATURE OF PERSON OBTAINING ASSENT

In my judgment the participant is voluntarily and knowingly agreeing to participate in this research study.

Name of Person Obtaining Assent

Contact Number

Signature of Person Obtaining Assent

Date

ANNEXURE 7 :QUESTIONNAIRE

57665044 MATCHAYA

QUESTIONNAIRE FOR QUANTITATIVE PHASE

**STUDY TITLE: FACTORS AFFECTING INFANT FEEDING CHOICES AMONG
TEENAGE MOTHERS IN LILONGWE DISTRICT OF MALAWI**

DEMOGRAPHIC DATA/ PERSONAL INFORMATION

Questionnaire number: -----
Area:-----
District :-----

Introduction

This questionnaire seeks to solicit some information on your child feeding practices and is confidential. The answers to these questions may help us to understand the key challenges and solutions in the area of breastfeeding. No part of this information will be publicly made available to anyone.

1. Which age category best suits your age?

- i. 13 to14 years old
- ii. 15 to 16 years old
- iii. 17 to 18 years old
- iv. Other (please specify)

2. What is your marital status?

- i. Single
- ii. Married
- iii. Boyfriend
- iv. Divorced
- v. Separated

- vi. Widowed
- vii. Other (explain)

3. What religion do you belong to?

- a. Christianity
- b. Islam
- c. Jehovah's witness
- d. Other (please specify)

4. What is your highest level of qualification?

- i. Primary school leaving certificate (PSL)
- ii. Junior certificate of education (JCE)
- iii. Malawi School leaving Certificate (MSCE)
- iv. Tertiary qualification
- v. Other (explain)

5. If still studying, what level of education are you pursuing?

- i. Primary school
- ii. Junior secondary school
- iii. Senior secondary school
- iv. Tertiary qualification
- v. Other (explain)

6. How many children do you have?

- i. One
- ii. Two
- iii. Three
- iv. Other (please specify)

7. What is your main occupation?

- a. Farming
- b. Small scale business owner
- c. Domestic worker
- d. Other (Please specify)

CHILD BIRTH HISTORY

8. How old is your child now?

- a. 0 to 6 months
- b. 7 to 12 months
- c. 13 to 18 months
- d. 19 to 24 months

9. What was the mode of delivery for your child?

- a. Normal Spontaneous Vertex Delivery (SVD)
- b. Breech delivery
- c. Vacuum extraction
- d. Caesarean section
- e. Other (explain)

10. Did you have any child birth complications?

- a. Yes
- b. No

11. If yes, what complications did you have as a result of child birth?

- a. Delayed baby's first cry (low apigar score)
- b. Infection (please specify)
- c. Baby was born with a disability (please specify)
- d. Body injury

- e. Other (please specify)

12. Did the mother suffer any complications that the child has as a result of child birth?

- a. Retained placenta
- b. Severe bleeding
- c. Infection(please specify)
- d. No problems experienced
- e. Other (specify)

13. What infant feeding choice was the child commenced on soon after birth?

- a. Exclusively breast milk
- b. Exclusively formula feeding
- c. Both breast milk and formula milk
- d. Water
- e. Other –specify

14. What was the reason for the feeding choice that the child was commenced on after birth

- a. It was a feeding choice that was planned before birth
- b. It was the feeding choice that was recommended by hospital staff
- c. It was the feeding choice that was recommended by family members
- d. The child was unable to latch and breastfeed
- e. The breast milk was not yet established
- f. Other (explain)

15. What other fluids or feeds were given to the child after birth

- a. Water
- b. Hospital medicine
- c. Glucose

- d. Herbs
- e. Porridge
- f. Other (explain)

16. How long after birth was the child given the first feed?

- a. Within an hour after birth
- b. Between two to four hours after birth
- c. Between three to eight hours after birth
- d. Between nine to twelve hours after birth
- e. After twelve hours after birth

17. How often was the child fed in 24 hours?

- a. Whenever the child cries
- b. At least Four times in 24 hours
- c. At least every three hours
- d. Child was not fed in the first 24 hours
- e. Other (explain)

18. What problems did you experience with breastfeeding your child?

- a. Baby not able to latch
- b. Milk not coming out
- c. Baby not getting enough milk
- d. No problems experienced
- e. Sore nipples
- f. Other (explain)

19. What kind of assistance did you get regarding the problems you experienced with breastfeeding your child?

- a. Nurses demonstrated and guided me
- b. Family provided traditional medicine

- c. Received treatment from the hospital
- d. No assistance given
- e. Other (explain)

20. What chronic problems does the child has in his/her body?

- a. Disability
- b. Chronic illness (please specify)
- c. No any problem
- d. Other (please specify)

KNOWLEDGE OF APPROPRIATE INFANT FEEDING PRACTICE (BREASTFEEDING)

21. What infant feeding practices do you know of?

- a. Exclusive breastfeeding
- b. Breastfeeding
- c. Exclusive formula feeding
- d. Combining both breast feeding and formula feeding
- e. Other (specify)

22. How do you understand exclusive breastfeeding?

- a. Giving child only breastmilk
- b. Breastfeeding only for 6 months
- c. Breastfeeding with water
- d. Breastfeeding from breast only
- e. No bottle
- f. Other (explain)

23. What benefits of breastfeeding do you know of?

- a. Boosts baby's immunity as a result baby doesn't get sick a lot
- b. Baby gain weight very well

- c. Promote bonding of mother and child
- d. It is affordable
- e. It is safe and convenient
- f. Other (explain)

24. How confident are you about your skill in breastfeeding?

- a. Very confident
- b. Relatively confident
- c. Not really confident
- d. Not sure of how good is my breastfeeding skill
- e. Other (explain)

25. What is the reason for your choice of the skill level in breastfeeding?

- a. No one has ever demonstrated to me on how best to breastfeed
- b. Baby never get enough feed
- c. I feel sore during each breastfeeding act
- d. I don't experience any problems
- e. I always have enough supply of breast milk
- f. Other (explain)

26. What do you know about colostrum (the first yellowish and sticky breast milk)

- a. It is rich in antibodies which boosts the baby's immune system
- b. It can make a baby get sick
- c. It brings bad luck on a baby
- d. Its dirty milk which should be thrown away
- e. Other (please specify)

27. What are the sources of information that you use to obtain information regarding infant feeding choices (breastfeeding)?

- a. Health talks from hospitals
- b. Awareness campaigns in the community

- c. Family and friends
- d. Media e.g. radio and tv
- e. other (explain)

28. At what age was the child introduced on solids?

- a. 0 to 1 months
- b. 2 to 3 months
- c. 4 to 5 months
- d. At 6 months
- e. After 6 months

29. What dangers of mixed feeding are you aware of?

- a. Diarrhoea
- b. Baby does not gain weight well
- c. Baby gets tummy ache
- d. It can facilitate the transmission of HIV if the mother is HIV positive
- e. Not aware of any dangers
- f. Other (explain)

ATTITUDE TO BREASTFEEDING (INFANT FEEDING PRACTICES)

30. What was your planned choice of infant feeding before the child was born?

- a. Breastfeeding only up to six months
- b. Formula feeding only up to six months
- c. Combining formula and breastfeeding
- d. I didn't plan at all
- e. other (explain)

31. What was the reason for the planned choice?

- a. It has a lot of benefits for the baby
- b. I wanted to go back to school immediately
- c. It was recommended by nurses

- d. Ill health status determined my feeding choice
- e. Family and friends recommended it
- f. Other (explain)

32. If breastfeeding, what was the planned duration for breastfeeding?

- a. 3 months
- b. 6 months
- c. 12 months
- d. 18 months
- e. 24 months
- f. Other (explain)

33. In what way did the plan change after your child was born?

- a. Exclusively breastfeed the baby for less than 6 months
- b. Stopped breastfeeding by 12 months
- c. Introduced solids before 6 months
- d. Mixed feeding
- e. No changes
- f. Other (explain)

34. What were the reasons for the change of plan?

- a. Going back to school
- b. Going back to work
- c. Breastfeeding was hard
- d. No support with baby when breastfeeding
- e. Baby was not getting enough after feeds
- f. Other (explain)

35. If breastfeeding, how do you breastfeed your child in public?

- a. Cover up the baby with a scarf
- b. Use breastfeeding rooms
- c. Isolate self to breastfeed

- d. Breastfeed baby without covering
- e. Express milk into feeding bottle
- f. I just do not breastfeed the baby in public places

36. What do your friends and other people say when they see you breastfeeding your child?

- a. They make fun of me
- b. They stare at me
- c. They are proud of me and offer encouragement
- d. They stay away from me
- e. They get embarrassed and leave
- f. Other (explain)

37. In what way does breastfeeding affect your relationship with others?

- a. It's hard to socialise with friends when my child is with me to be breastfed
- b. I get embarrassed to breastfeed in front of my friends
- c. My friends tease me when they see me breastfeed
- d. My friends stare at me when they see me breastfeed
- e. My friends don't like to hang out with me because of breastfeeding
- f. Other (explain)

BARRIERS TO PRACTISING APPROPRIATE INFANT FEEDING CHOICES (BREASTFEEDING)

38. When are you planning to stop breastfeeding?

- a. When the child is 3 months
- b. When the child is 6 months
- c. When the child is 12 months
- d. When the child is 18 months
- e. When the child is 24 months
- f. Other (explain)

39. What are your reason/s for your weaning age decision?
- a. To go back to school
 - b. To go to work
 - c. It's the recommended age by the hospital
 - d. It's the recommended age by my family
 - e. Other (explain)
40. At what child's age did you stop breastfeeding your child exclusively?
- a. At 1 month
 - b. At 2 months
 - c. At 3 months
 - d. At 4 months
 - e. At 5 months
 - f. At 6 months
 - g. Other (explain)
41. What challenges do you face with expressing breast milk?
- a. It takes a long time to express enough milk for a feed
 - b. I cannot afford breast pump
 - c. I feel sore when expressing milk
 - d. Nobody has ever demonstrated to me on how best to do it
 - e. Other (explain)
42. What are the school rules regarding having a child while still schooling?
- a. The school allows us back in school any time after child birth
 - b. The school expels girls who fall pregnant at school
 - c. Babies are not allowed in the school environment
 - d. I am not informed of any rules
 - e. Other (explain)

43. What support do you require with regards to breastfeeding your child at school?
- a. Private room to breastfeed the baby
 - b. Breastfeeding breaks so that I can attend to the child
 - c. To allow my parents to bring the child at school for breastfeeding
 - d. School to be teaching about the importance of breastfeeding
 - e. Other (explain)
44. If in school, who takes care of your child in your absence?
- a. My family members
 - b. Child's Father
 - c. Send the child to crèche
 - d. Friend
 - e. Other (explain)
45. How do you manage your child's feeding when you are at school?
- a. Express breast milk to be given to the child while I am away
 - b. Family brings the child to school for feeds
 - c. Formula milk is given to the child when am away
 - d. Child get other feeds when am away. (specify)
 - e. Other (explain)
46. What kind of support do you get from school to breastfeed you child?
- a. I am allowed to breastfeed my child in the school premises
 - b. I am allowed to go out during a class session to feed my baby
 - c. The school does not provide any support
 - d. The teachers intimidate me for having a baby while at school
 - e. Other (explain)
47. What kind of infant feeding support do you get from the government?
- a. Child grant in form of money
 - b. No support from the government
 - c. Free formula milk
 - d. Free porridge flour

- e. Home visits by health care workers
- f. Other (explain)

48. What groups or organisation are available in your community that support infant feeding initiatives?

- a. Breastfeeding support groups
- b. Women groups
- c. Non-governmental organisations initiatives (please specify)
- d. Baby friendly health initiatives
- e. Health talks by community health workers (HSAs)
- f. Other (explain)