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Levels and determinants of exclusive breastfeeding (EBF) in Malawi

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LEVELS AND DETERMINANTS OF EXCLUSIVE BREASTFEEDING (EBF) IN MALAWI

BY

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A RESEARCH REPORT SUBMITTED TO THE FACULTY OF HUMANITIES, SCHOOL OF SOCIAL SCIENCES, UNIVERSITY OF THE WITWATERSRAND, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN DEMOGRAPHY AND POPULATION STUDIES

Declaration

I, Nomthandazo Jane Gama, hereby declare that this work is my own and has not been submitted before to the university or any other institution for examination or for any other degree. This research is being submitted as part of the requirements for a Masters in Demography and Population Studies.

_____(Signature)

Day of 20

Dedication

I would like to dedicate this research to my heavenly Father, God and my family.

Acknowledgements

I would like to first and foremost dedicate this research to God. For the strength you have given Lord to see it through even after all the hurdles I came across. To come this far could not have been possible without the Lord. I Love you.

I would secondly love to thank my family. Mum for your endless support and prayer Dlamini wena wekunene ngiyabonga Hlubi lomuhle. Thank you to my sister who has encouraged me even when I doubted myself, you have been a pillar and a reminder constantly of why this journey was pursued, thank you Mbokane. To my brothers thank you for the laughter's that made the journey easier, you guys are the best. To my dad for being a hard worker and always encouraging us to get educated, thank you Mbokane.

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List of Acronyms and Abbreviations

ANC	Ante-Natal Care
CEB	Children Ever Born
EBF	Exclusive Breastfeeding
WHO	World Health Organisation
UNICEF	United Nations Children's Fund
MDHS	Malawi Demography and Health Survey
SDG	Sustainable Development Goals
OR	Odds Ratio
CI	Confidence interval
Non-EBF	Non-Exclusive Breastfeeding
IYCF	Infant and Young Child Feeding

Definition of Terms

- **Exclusive breastfeeding** - Is a feeding practice in which a child is solely fed breastmilk alone for the first 6 months with an allowance of drops and syrups (WHO, 2003)
- **Complementary feeding** - This is the introduction of foods (semi-solid, solid) additional to breastmilk to meet child nutritional needs (WHO, 2015)
- **Stunting** – Is a growth and development defect that is due to inadequate nourishment and reinfections in children. It is measured in standard deviation according to the WHO measurements (WHO, 2015).
- **Malnutrition** – Is when someone suffers from inadequate or disproportions in dietary and energy intake (WHO, 2016)

Abstract

Background: Exclusive breastfeeding (EBF) for the first 6 months of a child's life is a WHO recommendation. EBF can prevent 13% of under-five mortality and increase child survival. It is, therefore, essential for countries with high under 5 and infant mortality to practice exclusive breastfeeding. This is specifically true of countries in Sub-Saharan Africa that suffer from malnutrition, high levels of infant and under 5 mortality and morbidity. However, in Africa only 25% of children are exclusively breastfed for first 6 months. Malawi faces major challenges in child malnutrition and under-5 mortality. Understanding the levels and determinants of EBF will help the country better address the low levels of EBF and, as a result, decrease malnutrition and under-5 mortality in the country.

Methodology: The study used a secondary data acquired from the Malawi Demographic and Health Survey 2015/16 with a total number of 1487 mothers who are between 15-49 with children 0-<6. In addressing the objectives of the study there were 3 phases. First a descriptive analyses was conducted for the levels of EBF in Malawi. Results were displayed using frequency tables and graphs. For the bivariate analysis determining the relationship between EBF and each independent variable a chi square test was used. Lastly, to determine the association between the selected variables and EBF two binary logistic regressions were run.

Results: EBF in Malawi was 62% among mothers 15-49 with children 0- < 6 months. Majority of the respondents in this study were married (80%), and majority had no education (69%). A large number (85%) received counselling on breastfeeding, and 82% had at least 1-4 ANC visits. The rates of EBF among respondents was highest among non-educated women as well as women who attended ANC. When assessing for the association with EBF results revealed postnatal counselling, ANC, education, religion, region, ethnicity and infant age had an influence on EBF. A negative association was found for counselling and EBF, with 0.71 decreased odds of mothers EBF their babies. This was a surprising result found. For ANC the more visits mothers had the higher the odds of EBF. Mothers who were protestant had higher odds of EBF compared to mothers affiliated under catholic. Muslim mothers were also found have increased odds of EBF. Mothers with an education also had higher odds of EBF compared to mothers with no education, except for mothers with a primary education. Interestingly mothers with a primary education had decreased odds of practising EBF. Also alarming about this is that a large number (968) of mothers had a primary education as their highest educational

attainment. Mothers from the central region of Malawi had 1.91 increased odds of EBF compared to mothers from the Northern region. Additionally, mothers from the Ngoni ethnic group had 1.76 increased odds of EBF their babies. Lastly, child age had a negative association with EBF. Babies 2-3 had 0.53 odds of EBF and babies 4-5 had 0.14 odds of EBF.

Conclusion: This research will contribute to literature on EBF in Malawi and through further investigation of the determinants found to have an association with EBF in this study, this research can be utilised as a valuable source of information. From this research a conclusion can be drawn that maternal health seeking behaviours and some socio-demographic determinants have an association with EBF. Although EBF in Malawi has decreased, Malawi has in the past been able to increase the level of EBF. Therefore by focusing and monitoring counselling sessions, this could yield to more mothers EBF their children. ANC visits had a positive influence on EBF therefore a continuation in promoting ANC visits must continue in order to yield better levels of EBF. More campaigns should be aimed in the Northern region as the other regions had higher odds of EBF, this will ensure that there is an increase all over Malawi. Postnatal counselling outside the hospital could also help improve breastfeeding practices when people are back in their communities. This will can aid as a form of support, in cases where negative impacts of counselling after delivery are observed (as found in this study). However, in the meantime further campaigns should target everyone in communities and families as literature shows that EBF is also highly dependent on support.

Key words: Exclusive breastfeeding, Malawi, infants 0-to <6 months

Chapter 1: Introduction

1.1. Introduction

This chapter presents the background of the study which highlights the importance of exclusive breastfeeding (EBF) as well as the effects associated with the of EBF practice. This chapter further presents the problem statement and justification of the study.

1.2 Background

EBF which is defined as a baby receiving no other form of food or liquid besides breast milk, is a worldwide recommendation for the first 6 months of an infant's life (WHO, 2003). WHO recommends complementary feeding be introduced after 6 months of EBF (WHO, 2003). Predominant feeding is the combination of feeding in which an infant receives breastmilk and other liquids (WHO, 2010). Predominant fed children had an increased mortality of 27% when compared to children who were EBF (Sankar et al., 2015). Ensuring that babies EBF also means that they receive colostrum which is the first liquid produced by mothers within in the first 3 days after giving birth (Kuruto-Niwa et al., 2007). Colostrum provides children with adequate nutrition and strengthens a child's immune system (Joshi et al., 2012). EBF also protects children against diseases and decreases the risk of deaths among newly born babies by 22% (Mgongo et al., 2014; Mututho et al., 2017). Breastmilk has been proven as the most cost-effective intervention in reducing the number of deaths among neonates, infants and under 5 (U5) children (Bhale, 2016; Sefene et al., 2013; Fombong et al., 2016). Breastmilk not only prevents deaths but also decreases the risks of babies having any acute and chronic diseases (Al-Sahab et al., 2010).

High rates of breastfeeding does not equate to high levels of EBF, countries such as Cameroon and Ethiopia have high levels of breastfeeding however have low levels of EBF (Sefene et al; Fombong et al., 2016). Levels of EBF are relatively low. Less than 40% of children below 6 months were found to be EBF in third world countries (Olatubi & Olufarati, 2016). There are wide differences in EBF durations, with some countries having higher rates of EBF in the first few months and some less than a month, these differences also differ within a country (Kafulafula et al., 2013; Siziba et al., 2015). In Lusaka (Zambia) only 47% of babies were EBF at 6 months from an initial 86% at birth (babies exclusively breastfed) (Nchimunya et al., 2015). Variations in EBF have been found to be associated with certain determinants such as

employment status, education, marital status and wealth status (Lande et al., 2003; Muchacha & Mtetwa, 2015). These factors have an influence on mothers practicing EBF. Lack of EBF and incorrect feeding practices are also linked to child malnutrition (Kuchenbecker et al., 2014).

Malnutrition among infants has been linked to infant feeding practices and effective breastfeeding can decrease the number of malnourished infants (Zhou et al., 2012; Anazonwu et al., 2018). Malnutrition among children is a huge challenge globally, but especially in developing countries. Global malnutrition reached staggering numbers were 178 million children U5 were stunted, 112 million children underweight, 55 million experiencing severe acute malnutrition and 13 million unborn babies experiencing poor growth development. All together these numbers made up 21% of all U5 deaths (Akhtar et al., 2013; Fekadu, et al., 2015). In developing countries, 10.4 million children U5 die from avoidable diseases such as diarrhoea, pneumonia, and half of the children U5 die from malnutrition (Zhou et al., 2012). The lack of EBF among infants < 4 months who are underweight was 5 times higher than children who were breastfed (Zhou et al., 2012).

1.3 Problem Statement

EBF is essential for child development and health. Studies have shown the association between EBF and a reduction in morbidity and mortality among children (Zhou et al., 2012; (Sankar et al., 2015; Wolf & Adlerberth, 2002). Although EBF is readily available and can avoid over 10% of U5 child deaths, it is still not a common feeding practice and varies in sub-Saharan Africa (Sankar et al., 2015). An example is South Africa, which had a low rate of EBF of 25% of babies not breastfed at all and 51% of babies were complementary fed (Martin-Wiesner, 2018; NDoH, 2016). Another example is seen in Nigeria where levels of EBF in the year 2017 were about 25% (Agunbiade & Ogunleye, 2012; Anazonwu et al., 2018). The lack of nutritious food and inadequate feeding prevents children from leading a healthy life and places infants at risk of disability and even death. Additionally, undernutrition also hinders normal child intellectual development and growth (Morris et al., 2008). This risk can be reduced and prevented by mothers who EBF their babies from birth.

EBF can also prevent and reduce child morbidity. Gastrointestinal diseases and other infectious diseases such as respiratory disease, acute otitis media, urinary tract infection, can be prevented by EBF (Jones et al., 2014; Wolf & Adlerberth, 2000). In particular, when infants are not exclusively breastfed there is an increased risk of diarrhoea related morbidity and mortality

especially in developing countries (Lamberti et al., 2011). Study conducted in Malawi revealed that infants who were introduced early to liquids or solid feeding had a higher risk developing infectious diseases (Vaahtera et al., 2001). Further another study found that chronic infant malnutrition in Malawi was associated with exclusive breastfeeding (Kuchenbecker et al., 2014). The Minister of Health in Malawi raised concerns with the decrease of EBF (10%) which occurred between the years 2010-2015/16 (Kalimira, 2017). In addition to this drop Malawi faces challenges with malnutrition and under-five mortality which is currently at a rate of 55 deaths per 1000 live births in the year 2018 (UNICEF, 2018). The need to understand and address EBF challenges in Malawi is essential due to the implications of non EBF especially after the decline. Therefore, understanding factors that affect the practice of EBF in Malawi is detrimental in addressing malnutrition among children under 5, which is also associated to U5 mortality.

1.4 Justification

This study is important as it will contribute to the current policies and programmes that aim to address child mortality, poverty and child health among women in Malawi. During the Conference on Sustainable Development that took place in Rio de Janeiro 9 years ago 17 Sustainable Development Goals (SDGs) were created to improve lives through addressing economic, political, societal and environmental difficulties encountered globally (UNDP, 2019). By attaining the SDG goals (such as goal 3) countries work towards decreasing preventable deaths and a decline in infant and under five mortality (You et al., 2015). The global aim is to reduce neonatal deaths to 12 deaths per 1000 births and under 5 mortality should decrease to 25 deaths per 1000 live births (UNDP, 2019).

Through national policies and programmes countries such as Malawi are able to meet the SDG's. Malawi faces health challenges in malnutrition where almost 40% of children were chronically stunted according to the MDHS 2015/16 (NSO & ICF, 2017). Inadequate child feeding practices were among the reasons identified for under 5 child undernutrition (USAID, 2014). THE INFANT AND YOUNG CHILD NUTRITION POLICY AND GUIDELINE 2003-2020 of Malawi aims to ensure progress in infant and child nutritional development and growth (Ministry of Health and Population, 2003). Breastfeeding is easily accessible and provides all nutrition's a child needs and can address the issue of malnutrition among children and address the challenge of child and infant mortality. Therefore, this research will contribute towards policies and programs that address malnutrition in Malawi.

Inequality of employment among sexes still exists regardless of progress acquired over the years in Malawi, with poverty being higher among the female population when compared to their counterparts (Mussa, 2016; Kimani & Kombo, 2009). In 2013 the unemployment rate for males and females was 14% and 26% respectively in Malawi (Mussa, 2016). EBF can be used as a cost-effective nutritional supplement as it is readily available and can assist in alleviating a financial burden of breast milk substitutes. Therefore, this study will contribute towards campaigns and policies that address poverty challenges among mothers in Malawi.

Inadequate nutrition has detrimental consequences in child development and can have future cognitive challenges even in the future (Jones et al., 2011). Children in all societies represent the future and their health should be a priority in all countries. If nutrition is not addressed children are at risk of growth impairment, decrease in learning capacity and productivity as they grow older. Stunting is a huge challenge in Malawi with 37 percent stunted children (WHO, 2015; USAID, 2018). Stunting has long term effects such as poor educational and economic performance and a study revealed that stunting decreases as children are exclusively breastfed (Dewey & Begum, 2011; Paudel et al., 2012). Therefore this research is critical as it focuses on children under 5 and through understanding factors that hinder or promote EBF among children, this research will contribute towards child health programs, policies and campaigns. The drop in EBF in Malawi needs investigating and this research will allow for addition in literature in highlighting key findings of any factors found to have an association with EBF. This study is therefore essential.

1.5 Research Question

What are the levels and determinants of the practice of exclusive breastfeeding among women aged 15-49 years in Malawi with infants 0- to <6 months in Malawi?

1.5.1 Sub Questions

1. What are the levels of the practice of EBF among women 15-49 with infants 0- to <6 months in Malawi?
2. What are the maternal health seeking behaviours and socio-demographic determinants that affect the practice of EBF among women 15-49 with children 0- to <6 months in Malawi?

3. What is the association between maternal health seeking behaviours and socio-demographic determinants on the practice of EBF among women 15-49 with children 0- to <6 months in Malawi?

1.6 General Objective

To determine the levels and determinants of exclusive breastfeeding among women 15-49 with infants 0 to <6 months in Malawi.

1.6.1 Specific Objectives

1. To determine the levels of the practice of exclusive breastfeeding among women 15-49 with children 0 to <6 months in Malawi.
2. To identify maternal health seeking behaviours and socio-demographic determinants that influence the practice exclusive breastfeeding among women 15-49 with children 0 to <6 months in Malawi.
3. To assess the association between maternal health seeking behaviours and socio-demographic determinants on the practice exclusive breastfeeding among women 15-49 with children 0 to <6 months in Malawi.

Chapter 2: Literature Review

2.1 Introduction

Chapter 2 presents a review of the past literature on the topic of exclusive breastfeeding (EBF) as well as the chosen theoretical and conceptual framework that underpins this study. The chapter begins with the literature review, which is divided into 3 sections; the first section looks at the different literature on EBF. This is followed by the theoretical and conceptual framework, and the study hypothesis.

2.2 Importance of EBF

Proper feeding practices are essential for a child's development, for a healthy life and for maintaining good nutrition (Roy et al., 2009; Saha et al., 2008; WHO, 2015). Exclusive breastfeeding, according to the World Health Organisation (WHO), is essential for the first six months of a child's life, after which a continuation of breastfeeding up to 24 months with an introduction of appropriate complementary feeding is encouraged in order to provide for the dietary needs required for infant growth (Fekadu et al., 2015). Concerns have been raised on whether or not breast milk alone is enough to provide an infant with the required energy and micro-nutrition needed for an entire six months. However, there is sufficient evidence of the health benefits of EBF that have been well documented (Al-Sahab et al., 2010; Wolf & Adlerberth, 2002; Rollins et al., 2016). Such evidence is seen in literature that, a study found that EBF decreased the likelihood of children being overweight and developing diabetes later in life (Victora et al., 2016). Additionally a study found an association between infants that had not been exclusively breasted for even just two months had a heightened chance of infant mortality and this was found for developing countries (Nduna et al., 2015). A study adds that from successions of maternal and child under nutrition over 1million child deaths were linked to non-EBF in the first 6 months (Muchacha et al., 2015).

With all this evidence however, studies indicated that early introduction of liquids and solids can be traced to as early as 0-3 months of infants' lives (Nduna et al., 2015; Siziba et al., 2015). Therefore, this shows how early introduction of complementary food can cause serious health effects in children; therefore, it is essential that feeding practices are adhered to according to the WHO feeding recommendations. EBF is not beneficial to the baby only but it is also beneficial to the mother, as well as to the country's economy (Victora et al., 2016). It has been documented

that EBF decreases heart diseases, and cancers such as breast and cervical cancer, and also reduces the risk of getting diabetes among mothers (Afaya et al., 2017).

Additionally benefits of breastfeeding also include economic benefits such as reduced costs of purchasing formula milk as well as decreased or no medical costs due to the health benefits acquired from breast milk that reduces health risks among children (Weimer, 2001.). Breastfeeding also promotes intelligence scores, improves academic productivity and betters the chances for adult earning which is necessary for alleviating poverty in society. However, although there are a number of benefits that are known that come from exclusive breastfeeding, there has been a decline across countries.

2.3 Prevalence of EBF

EBF differs across and within countries. A target was set by the WHO during the World Health Assembly Conference held in 2012 to have a global rate of 50% in EBF by 2025 (Gupta et al., 2013). Variation on the levels of EBF is seen across Africa. A study revealed that some countries that have had low levels in EBF within Africa including Chad, Cote d'Ivoire, and Gabon with relatively low percentages of EBF (2%, 4%, 6%, respectively) (Idris et al., 2015). Contrary, to these low rates there were countries that have had over 50% rates in EBF such as Bangladesh 64%, Ghana 63% and Ethiopia 52% (Idris et al., 2015; Sonko & Worku, 2015). In 1992 the EBF rate in Malawi was 4% this then increased to 44% in 2000. From 2000 to 2010 there was a 28% increase followed by a decline of 11% (NSO, 2015/16).

A number of factors contribute to an increase or decrease of the practice EBF. These include maternal age, education, religion, place of location, health systems in place, counselling and support, employment, parity, and infant age (Idris et al., 2015; Setegn et al., 2012. Understanding these factors assists countries in making the right strategies can be implemented and policies that encourage mothers to EBF can be adjusted.

2.4 Determinants of exclusive breastfeeding

Background

The decline in breastfeeding occurred after the 19th century in first world countries, and then trends started within developing countries where women who were more educated, and with higher economic status started finding alternatives to breastfeeding. This trend was enhanced by

the fact that breastfeeding was looked down upon and was associated with poverty (Rollins et al., 2016). However, WHO in the year 2001 set the standard that every child should be exclusively breastfed for 6 months and this led to countries finding means of encouraging EBF for every child (Coutinho et al., 2013; Rollins et al., 2016). However, despite the knowledge on EBF there was only a slight increase of 12% between the years 1993 to 2013 among developing countries where statistics on EBF were available (Rollins et al., 2016**)**.

Attempts to improve child nutrition have been made by clinicians, health care specialists and health organisations. This has been done through the promotion of EBF over the years but results have differed across countries (Amir, 2011). WHO has recommended that countries aim to have 90% of children exclusively breastfed for 6 months, however countries are failing to meet this recommendation (Doherty et al, 2011; Mututho et al., 2017). There are a number of factors that affect EBF and these include: The promotion of breast-milk alternatives, health seeking behaviours and socio-demographic determinants.

The Promotion of Breast-milk Alternatives

The promotion of EBF faces opposition from the aggressive promotion on breastmilk substitutes (BMS). Producers of BMS are the leading barrier worldwide that bring about a challenge to EBF(McFadden et al., 2016). BMS makes 10% more sales yearly in low-middle income countries and receives more funding and support from governments when compared to the support and investment given to breastfeeding campaigns by government (McFadden et al., 2016). An example of the use of BMS affecting EBF can be seen in South Africa. South Africa experienced low rates in EBF due to the promotion of free formula milk that was introduced through a scheme set up in response to addressing malnutrition and the increase in HIV among mothers due to concerns of children being infected through breastfeeding (Doherty et al., 2010).

The belief that breast milk substitutes are better and therefore are encouraged by people also decreases the likelihood of mothers EBF. This is seen in a study that found mothers from Medan being discouraged to breastfeed due to popularity of breast milk alternatives (Marzuki et al., 2014).

Health Seeking Behaviours
Ante-Natal Care (ANC) visits and Counselling

There are a number of health seeking behaviours however for this study the two health seeking behaviours were ANC visits and counselling on breastfeeding. Mothers are able to make better decision concerning the babies when they are able to enquire and receive the right information. Access to and the use of health information provides parents with knowledge on health care for their infants and this results on further information on the benefits of EBF and its practice (Jiang et al., 2012; David et al., 2016).

One of the ways in which information is obtained is orally (Mwaisela & Mwantimwa, 2018). Examples of information provided orally include ANC and any form of counselling such as postnatal. Information on breastfeeding that is derived from the community, family can impede the practice of EBF and this can be resolved by support and information gathered during ANC sessions and any other counselling offered by health professionals (Østergaard & Bula, 2010).

WHO recommends that mothers should at least have 4 ANC visits which have been seen to increase the likelihood of mothers EBF (WHO, 2012). ANC visits increase odds of mothers EBF compared to mothers who do not attend any sessions (Tariku et al., 2017; Bhaale, 2014; Boakye-Yiadom et al., 2010). Early initiation has been found to promote EBF and this is information that is provided during ANC visits (Mannan et al., 2008). 47% of mothers who attended ANC visits practiced EBF and 38% did not in a study conducted in Uganda (Bhaale, 2014). There are still a number of mothers who do not attend ANC visits, and this affects the rates of EBF. The number of ANC visits also has an effect on EBF; a study reveals that mothers with less than 3 ANC visits resulted in 57 mothers who weaned their child before 6 months compared to 56 mothers who did not. For mothers with 3+ ANC visits 212 mothers did not wean their child and 173 mothers did (Chadusama et al., 2009).

Counselling during and after pregnancies is seen to have an association with EBF. The advantages of counselling are that it creates self-assurance in mothers to exclusively breast feed. Counselling offered by health workers has a positive effect on mothers EBF compared to mothers who got advice from family and friends (Østergaard & Bula, 2010). A study that measured the effectiveness of breastfeeding advice and self-efficacy in a maternity hospital revealed that most mothers had a high sense of belief that they could breastfeed and this was due to receiving advice from health workers (Koskinen et al., 2014). Mothers said information given was comprehensible, encouraging, precise and individual (Koskinen et al., 2014). Self-efficacy

increases from the effectiveness of counselling which results in increased levels of EBF. However, the opposite can be seen when health workers lack correct information. A study conducted in Malawi shows how 43.9% of mothers believed 6 months was too long to EBF and this was because health workers thought it was (Kamudoni et al., 2010).

Early post-partum visits by health facilitators after mothers leave the hospital is another area where counselling can be effective. These visits are able to reduce incorrect beliefs and psychological challenges mothers have as well as add support that encourages them to exclusively breast feed (Mannan et al., 2008). However, a study relates that this at times is due to mothers actually failing to position their child right, and, that mothers who are taught on a one to one basis on how to handle and position their baby when breastfeeding have a change in the perception and start believing that their milk is sufficient (Mannan et al., 2008).

Mother's age

Age is another variable that has been linked to EBF. Different age groups show different effects on the practice of EBF. This may be due to working opportunities, experience, social surroundings. Although mothers age isn't always statically significant (Tampah-Naah & Kumi-Kyereme, 2013), it is however an important variable as it does explain the variations of EBF across different age groups. A study revealed that older mothers were less likely to exclusively breastfeed their babies compared to younger mothers (Kandeel et al., 2018). A study in Malawi conducted interviews which showed that young mothers had little influence on child feeding and mother in-laws introduced liquids and foods. The same study further indicated that older mothers had a greater influence on the practice of EBF, and they did not believe in its benefit (Kerr et al., 2007).

Education

The education determinant has been seen to have a positive association with EBF and the wellbeing of a child. Some studies have indicated that educated mothers have higher chances of exclusively breastfeeding compared to non-educated mothers (Kafulafula et al., 2013; Acharya & Khanal, 2015). However, the disparity of women versus men in terms of the level of education received is of concern in developing countries, despite improvements statistics still show that men are more likely to acquire higher levels of education compared to their female counterparts (Acharya & Khanal, 2015; Berhanu et al., 2015). Therefore, majority of women are

either illiterate or have low levels of education; as seen in a study in Ethiopia, over 50% are illiterate, less than 15% have secondary and above education.

With increase in education there is an increase in knowledge. Studies have shown an increase of EBF practice is associated with education. Having a primary education compared to no education increases the chances of EBF (Tariku et al., 2017). A study done in Malawi also showed that mothers with a higher education had higher odds of EBF (Kuchenbecker, 2014). Therefore, there is evidence that education is essential in promoting EBF (Tariku et al., 2017). However, there are some studies that found no association of EBF and education (Boakye-Yiadom et al., 2016; Radhakrishnan and Balamuruga, 2012).

Religion and Culture

Religion and culture have great inference on the practice of EBF. The introduction of traditional substances, fluids and solids are related to cultural beliefs (Kerr et al., 2007; Desai et al., 2014). Cultural beliefs such as a child needing certain antidotes provided by traditional doctors as well as giving babies water to drink, due to the belief that babies get thirsty are highly prevalent in Africa (Kumudomi et al., 2009; Desai et al., 2014; Kerr et al., 2007). Religion is another determinant that shapes a mothers choice on when or whether she should exclusively breastfeed or not.

In a study conducted in Turkey, researchers found that Turkish Muslim mothers complementary feed their children too early (Demirtas et al., 2011). Results from this study showed that although EBF was low the practice of breastfeeding was high. The Muslim religion teaches women to breastfeed for approximately 2 ½ years, it is seen as a gift from their god to the child (Demirtas et al., 2011). This creates pressure on women who are Muslims to breastfeed however not exclusively.

A study in Malawi also revealed the power culture has on EBF (Piwoz et al., 2006). Although mothers believe they have insufficient milk which led to the discontinuation of EBF, the study revealed that although nurse wives knew milk was sufficient some admitted that due to cultural beliefs 6months is seen as too long (Onah, 2014).

Employment

In a study conducted in Indonesia by Februhartanty et al. (2012) revealed that besides parity, and education there are certain internal aspects such as, motivation, support and confidence that push working moms to practice EBF. According to Hector et al. (2004) there are external and internal factors that influence EBF. Of which the inner aspect includes motivation, self-efficacy and a mother's confidence whilst the external includes health amenities, employment, residence and the community. When mothers have enough motivation and confidence, there is an increase in them breastfeeding their children (Koskinen et al., 2013). Factors such as knowledge on when to introduce fluids and solids and support contributed to mothers EBF even whilst they worked (Koskinen et al., 2013). The study by Koskinen et al (2013) further shows that information acquired prior to giving birth and support boosts their self-confidence in the decision they make concerning EBF. Mothers are able to find ways of expressing milk even in the midst of some people criticizing their decision of EBF in the work place (Februhartanty et al., 2012).

Although some mothers are able to EBF whilst working some however are not. In Indonesia another study found that mothers who were more likely to EBF were non-working mothers compared to employed mothers (Sari, 2016). Challenges that arise from the workplace include the limited or lack of adequate spaces where mothers are able to express milk, leaving bathroom areas, corridors and at times mother's vehicles as the only available location (Sari, 2016). Therefore, a number of working mothers opt to stop EBF upon returning back to work. Some mothers however stop EBF earlier, before returning to work (Guendelman et al., 2008). Laws have been amended in countries to enforce companies to accommodate and support breastfeeding mothers in order to address the high rates of NON-EBF (Sari, 2016). Moreover, the study adds that the workplace setting and environment can affect mother's intention and desire to EBF which in turn leads to the discontinuation of EBF (Sari, 2016). Another factor of the workplace is the type of employment. A study in Malawi identified the type of location where mothers worked as having an influence on EBF (Kamudoni et al., 2007). The study further revealed that mothers who worked in farms were able to take their children with, therefore there was no interference with them EBF their child. Lastly, is the factor of time, the more hours a mother is away from her child due to job hunting or working hours the less likely EBF is practiced (Sonko & Worku, 2015; Sari, 2016).

Wealth status

A study showed that mothers who had an average and above income were more likely to practice EBF than mothers with an average and below income (Sonko & Worku, 2015). Sonko and Worku (2015) explain their findings as wealthier mothers being more prone to visiting health centres as they can afford these visits and therefore are further exposed to hearing EBF being promoted. Another study finds the opposite to be true, where mothers with better socioeconomic status were found to have higher levels of non-exclusive breastfeeding (Sari, 2017). The explanation given is that mothers are able to purchase breastmilk substitutes, whereas, women of lower economic status cannot afford, therefore rely on breastmilk.

Another finding found that mothers who are in extreme poverty in non-urban areas tend to have low rates of EBF, they relay how they have insufficient milk. (Muchacha & Mtetwa, 2015).

Ethnicity and region

The location and ethnic group in which mothers belong plays a significant role on the practice of EBF. Different religions and ethnic groups have different practices and beliefs that either deter or encourage the practice of EBF. 26% of babies not EBF in a study in a sub-location in Kenya was due to cultural beliefs, and 6% of mothers did not feed child colostrum due to having no knowledge of its importance (Karigi et al., 2016). Some babies are breastfed two days later due to the belief that colostrum is bad for the baby (Karigi et al., 2016). Trends of EBF differ within countries due to different practices. The Volta region had higher odds of mothers EBF compared to other regions in Ghana (Tampah-Naah & Kumi-Kyereme, 2013). Another study found that the central region had mothers EBF less, and supposedly this could be due to mothers working and therefore no longer EBF (Bbaale, 2014). In study conducted in Malawi family members had an influence in what a baby was eating (Kerr et al., 2007; Cernadas et al, 2002). An introduction of liquids (herbal infusion, water) due to cultural practices and beliefs was noted Vaahtera et al., 2001; Kerr et al., 2007).

Children Ever Born (CEB)

Studies have shown a positive association between parity and EBF (Radhakrishnan and Balamuruga, 2012; Kornides & Kitsantas, 2013; Tan, 2011; Kristiansten et al., 2010; Islam et al., 2008). Some studies have shown that mothers with more than one child are more likely to

exclusively breastfeed compared to mothers with one (Kornides & Kitsantas, 2013; Tan, 2011; Kristiansten et al., 2010; Islam et al., 2008; Koskinen et al., 2014). This finding is also supported by a study in India and Bangladesh that found primiparity as a risk factor to early introduction of foods and liquids in children (Chudasama et al., 2009; Perera et al., 2012). About 70% of mothers with more than one child exclusively breastfed their child in a study conducted in India (Chudasama et al., 2009). On the contrary a study identified no association between the number of children and EBF (Adams et al., 2001)

There are a number of contradicting finding with EBF among primipara and multipara mothers, however a study conducted in China found that it was not necessarily the number of children a mother has but rather her previous breastfeeding practices that contributed to the length of her exclusively breastfeeding (Bai et al., 2015). Therefore explaining research findings where primipara mothers had same levels as multipara mothers in some instances, meaning multipara mothers could have had a negative experience of breastfeeding in the past and therefore have shorter durations of EBF which then amounts to the same rate as primipara mothers.

Some studies show that primipara mothers tend to give babies formula food compared to multipara mothers who practice EBF (Kandeel et al, 2018; Chudasama et al., 2009). This explained by authors Kandeel et al (2018) who suggest that this may be due to insufficient knowledge on the benefits of EBF or the erroneous information on body changes caused by EBF (Kandeel et al, 2018). Conversely, a study in Ethiopia found that first time moms had higher odds of EBF compared to multipara mothers and this was explained by the possibility of first time moms being mainly young in the study and hence more knowledgeable by acquiring the right information through media (Sefene et al., 2013)

Infant's Sex

Infant sex is a determinant that is not always significant in some studies although some have found an association between EBF and infant sex such as Radhakrishnan and Balamuruga (2012). Their study revealed that male babies are less exclusively breastfed compared to female infants. Study conducted in India revealed that girls were exclusively breastfed less than boys (Fledderjohann et al., 2014). Gender inequalities was seen as a possible reason where households treated boys better than girls. Another study done in Ethiopia although found that girls were exclusively breastfed more than boys this was not statically significant.

Duration of EBF

A mother's choice on EBF and the duration of exclusive breastfeeding is influenced by a number of things including beliefs about EBF, cultural practices, mother's knowledge on EBF and the people advising mothers such as health care workers, parents and grandparents (Marzuki et al., 2014). A study identified that one of the reasons why mothers EBF for short periods was due to the belief that breast milk was insufficient and that it was for some mothers and not all. 6 months was considered too long to exclusively breastfeed (Marzuki et al., 2014). This is concurred by another study conducted by Mutsuyama et al (2013) revealing that some mothers with children under 6 months introduced porridge and water at two months, with majority introducing porridge at 4 months. Some mothers although knowing that babies should be exclusively breastfed for 5-6 months did not believe in the benefits of EBF (Mutsuyama et al., 2013). In Malawi early introduction to solids and liquids is a norm. Babies are seen as being hungry when they cry, and are therefore fed other foods (Vaahtera et al., 2001; Kuchenbecker et al., 2014).

Literature has shown that there are different levels and determinants that cause EBF practices to differ across countries and regions, therefore, there is no one solution that works across all countries in addressing EBF. Countries and regions have to consider their own social, cultural and economic differences when addressing the issue of low EBF rates.

2.5 Theoretical Framework

In investigating the determinants that have an influence on EBF a model of child nutrition and care was utilised. This framework was originally created by United Nations Children's Fund (UNICEF) and was then further extended by Engle et al., (1999). In the UNICEF and Engle et al. framework "care" is defined as "the behaviours performed by caregivers that affect nutrient intake, health and the cognitive and psycho-social development of the child, including maternal health" (Engle et al., 1999).

The lack of resources such as mother's education, employment, and knowledge, results in restrictions of caregiving (Engle et al., 1999). The framework looks at child survival and the factors that have an impact, firstly nutritional intake and health have a direct influence, and then

other determinants have an indirect influence on child survival/health. These include, but are not limited to, household, care giving behaviours, health care services and the environment (Engle et al., 1999). According to this framework there are a number of resources required for care behaviours to occur. Basic determinants or the more distal factors which have an indirect influence on child survival (social context, cultural, political) have an influence on caregiver resources, which then the lack or surplus in these resources affects caregiver behaviour (Engle et al., 1999). Under caregiving resources there are individual and community levels which include, health, nutritional status, mental health, time, support and economic resources. The caregiving behaviours then have an impact on child health and nutritional intake (immediate determinants) which then affects the outcome (child survival) (Engle et al., 1997).

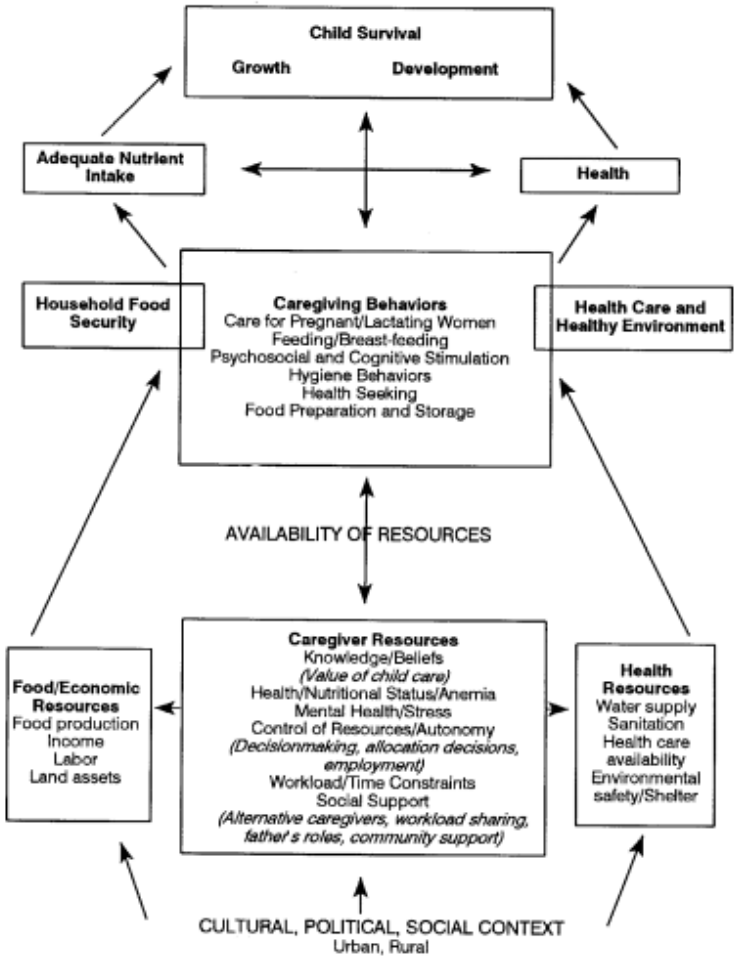


Fig. 2.5 The Extended Model of Care by Engle et al., 1999

2.6 Conceptual Framework

The model in figure 2.5 above has been modified for the purpose of this study. In the adapted framework two levels lead to care giving behaviour, which in this case is "exclusive breastfeeding". For the first level (basic/distal determinants) caregiver resources included socio-demographic factors. These were divided into maternal determinants (age, education, religion, region, ethnicity, wealth status, marital status, employment and CEB) and chid characteristics (sex and age). For the second level (immediate determinants) this category was designated as maternal health seeking behaviours and included ANC visits and counselling. These maternal health seeking behaviours according to the adapted framework below have a direct influence on EBF.

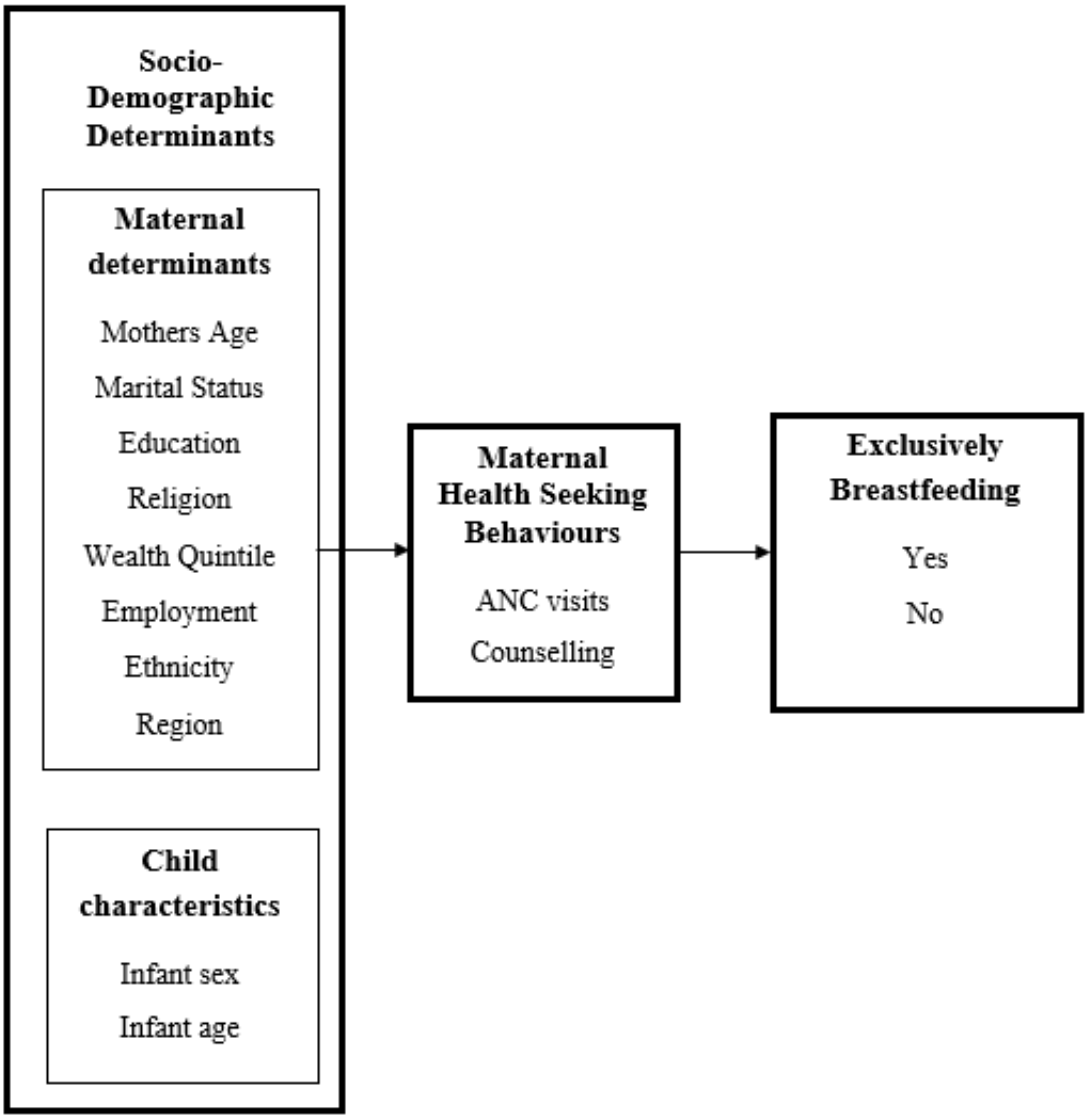


Fig. 2.6 Conceptual framework adapted from the extended model of care by Engle et al., 1999)

2.7 Hypothesis

- H_0 – Maternal health seeking behaviours and socio-demographic determinants have no effect on exclusive breastfeeding levels
- H_1 – Maternal health seeking behaviours and socio-demographic determinants have an effect on exclusive breastfeeding levels.

Chapter 3: Methodology

3.1 Introduction

This chapter presents the description of the study area as well as the data and methods that were utilised in this study. Specifically, this chapter comprises information on the study area, data source, study design, study population, sample size, study variables, data analysis and ethical issues.

3.2 Description of Study Area

Malawi is a sub-Saharan African country located in the South-eastern region of Africa and bordered by Tanzania (on the northeast), Mozambique (on the east, south and west) and Zambia (on the northwest) (NSO, 2011). Malawi is a landlocked country with a population of over 17 million people and is mostly rural than urban (NSO, 2017). Malawi has 3 regions, the Northern region, Southern region and the central region (NSO, 2011). Malawi adopted the Baby Friendly Hospital Initiative in 1993 that was introduced by the WHO in response to a decrease in EBF (Kavle et al., 2017). Before the report release that showed a decline in EBF Malawi has made improvements in decreasing non EBF. Breastfeeding in Malawi just like other sub-Saharan African countries is a norm however the challenge of EBF for 6 months is a huge challenge (Kafulafula et al., 2013). EBF is essential in Malawi as it is a low-income country that struggles with infant and under 5 mortality as well as poverty.



Fig 3.1 Map of Malawi obtained from the MDHS 2015/16 survey report.

3.3 Data Source

Data for this research was acquired from the Malawi Demographic and Health Survey 2015/16 (MDHS). This survey was employed on the 19th of October 2015 to the 17th of February 2015 by the National Statistical Office, Ministry of Health and the Community Health Services Unit (NSO, 2017). The survey was conducted 4 times prior to 2015/16 making it the 5th DHS survey conducted in Malawi. Information covered ranges from under 5 mortality, fertility, child nutrition and feeding practices, human immune-deficiency virus (HIV) and sexually-transmitted diseases (STD's). The MDHS has mainly 4 questionnaires which include household questionnaire, man's questionnaire, woman's questionnaire and biomarker questionnaire. The woman's questionnaire which was used for his research asked specific information from women 15-49 years collected information such as background information, maternal information and marital information. The women questionnaire gave information on child feeding practices and all maternal information used in this study. The dataset that was used in this study was the child recode.

3.4 Survey Design

The Malawi Demographic and Health Survey 2015/16 is a cross sectional survey. The Malawi Population and Housing Census 2008 frame was utilised in acquiring a sampling frame for the MDHS. The MDHS is therefore a national representative sample of Malawi. The frame created from the 2008 census has about 235 households represented in the standard enumeration areas (SEA's) (NSO, 2017). Sample method that was used was stratification, which was done by dividing Malawi into urban and rural and conducted in 2 phases. A total of 56 sampling strata was obtained through stratifying urban and rural areas. First phase of stratification encompassed a total of 850 SEA's, 173 SEA's were in urban areas and the remainder were in rural areas (NSO, 2017). Household listing was used as a sampling outline and was simplified by segmenting any area with 250 or more households. The second phase had 30 households for each urban group and 33 for each rural group, these were elected by using a systematic selection where there were equal chances of households being chosen from the listing that was created (NSO, 2017). Women 15-49 who were eligible to participate in the survey were either permanently residing in the chosen households or were there the night prior to the interview.

3.5 Study Population

The study population was derived from a total population of 6361 mothers aged 15-49 who had infants aged 0-24 months. The age group was focused on because mothers who were interviewed on feeding practices were only mothers who had given birth in the years 2013-2015 prior to the survey.

3.6 Sample Size

The population of interest for the study were mothers with infants aged 0-to <6 months. The WHO indicates that children should be complementary fed alongside breastmilk from 6-23 months, this is also the requirements speculated in the Malawi INFANT AND YOUNG CHILD POLICY GUIDELINE. Additionally, the WHO indicator of Infant and Young Child Feeding practices groups age for EBF from 0-5 and indicates EBF as group 0- to <6 months (WHO, 2018; Victora et al., 2016). The WHO recommends timing introduction of foods to infants therefore complementary foods should be introduced inclusive of breastmilk at 6 months therefore it is unclear where the cut off is for EBF if 6 months is also used for complementary feeding as well (WHO, 2019). Therefore to tackle this challenge and eliminate confusion the

study sample chosen for this research were mothers with children 0-to <6 months. Thus, mothers with children 6-24 months were also excluded from the study. Mothers who had missing information on feeding practices and who had children who died were excluded. Further only the last-born child of the mothers who were living with the mother were selected and the rest were dropped. The study population came to a total of 1487 mothers with infants 0-to <6 in Malawi.

3.7 Study Variables

3.7.1 Dependent variable

The dependant variable for this study is EBF. This variable was derived from the definition of EBF according to the WHO. EBF is defined as mothers who only fed their infants only breastmilk and no other liquid or solids (except drops, syrups of medication or vitamins) 24hrs before the survey (WHO, 2003). In order to get the outcome variable EBF which is categorised as No and Yes (coded 0 and 1 as shown in the table below table 3.1) a 24-hour recall was used in obtaining information on feeding practice. The outcome was derived from gathering information of feeding practices provided by mothers. All mothers who answered giving their child any liquids, semi solids or solids in the last 24hrs prior to the survey as well as never breastfed fell under "No" for exclusive breastfeeding (WHO, 2003). This is according to the WHO recommendation in acquiring the rate of EBF (WHO, 2003). Therefore, all mothers who gave their child only breast milk and no other form of food or liquid (except syrup and drops) for 0 to <6 months was placed under "Yes" for EBF. Variables where respondents answered "don't know" when asked if they fed their babies specific liquids or solids were dropped. Mothers were asked "Did (Name from 649) drink or eat: x "X" indicates different liquids and solids (NSO, 2017).

A weight variable was generated and children 2 years were kept and the rest dropped. Child age was measured in months. Children alive were kept. Then age groups were generated in groups (0/1=1 "0-1")(2/3=2 "2-3")(4/5=3 "4-5")(6/8=4 "6-8")(9/11=5 "9-11")(12/17=6 "12-17")(18/23=7 "18-23"). Youngest child was selected living with mother. After which feeding status was created, mothers who breastfed only were separated from mothers who said yes to "no breastfeeding", bottle feeding, feeding baby any liquids or solids. Mothers who didn't remember or said don't know to feeding child any liquids or fruits was dropped. This then created the dichotomous variable EBF. When running the different tests in STATA the command ended with "if age<6 [iw=v005/1000000]" in order to get babies 0-to <6. There are a number of studies

that have used EBF as a dichotomous variable as opposed to other research that have more than two categorical outcomes (Hunegnaw, Gezie, & Teferra, 2017; Joshi et al., 2014). According to the DHS methodology respondents who said "don't know" were taken as having not EBF. In this study they were dropped and this could have yielded the 2% difference.

Table 3.1 Dependant variable for this study, definition and coding.

Variable name	Definition	Coding
Excusive Breastfeeding	Breastfed child 0 to-<6 months with no other liquids or solids	(0) No (1) Yes

3.7.2 Independent variables

The independent variables for this study include maternal health seeking behaviours and socio-demographic determinants. These variables were selected through the review of literature and have been shown to have an association with EBF (Alemayehu et al., 2009; Chudasama et al., 2009). In a study conducted in Ethiopia predictor variables that were seen to have an association with EBF were occupation and counselling on breastfeeding (Hunegnaw et al., 2017). A study conducted in Nairobi showed that marital status, education and residence were factors associated with EBF (Kimani-Murage et al., 2011). However the opposite is also true where there is no association found. This can be seen in a study in Bangladesh that found no significant association between EBF and education (Joshi et al., 2014).

The independent variables created include maternal health seeking behaviour variables which were counselling and ANC visits age. As well as socio-economic variables which were; mother's age, marital status, education, religion, wealth status, employment, ethnicity, region, infant sex and age for socio-demographic. For counselling mothers were asked "During the first two days after (NAME)'s birth, did any health care provider Counsel you on breastfeeding?" which was mothers who said they don't know were dropped leaving the variable as yes and no. This was followed by antenatal visits during pregnancy, these were grouped as non, 1-4 and 5+ visits from the original count of non, 1-10, 15,20 and don't know (which was dropped). Some of the selected variables were reconstructed and this was also guided by literature. Mothers age which was categorised as 15-19, 20-24, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49 and was regrouped to 15-19, 20-29, 30-39, 40-49. For education the variable v106 was used (no

education, primary, secondary and higher) this was not regrouped. Initial group were Catholic, CCAP, Anglican, seventh day Baptist /Baptist, other Christian, Muslim, no religion and other. For this study these were grouped as follows; Catholic, Protestant (which included CCAP, Anglican, and Baptist), Non-Christian which included no religion, Muslim and lastly Other Christian. For wealth status initial category was "poorest, poorer, middle, richer, richest" this was regrouped to "poor, average, rich".

Marital status was recoded as single and married from the original category of "never in union, married, living with partner widowed, divorced and no longer living together/separated". All variables were put together accept for married to create the category "single". Employment is another variable that was selected which was either employed yes or no. This was not changed. Children ever born to mothers was another essential variable used and was originally categorised in a count form 1-12 and this was categorised into 2 groups as follows; 1, 2+. For the region category it was originally comprised of 3 locations. Namely, Northern, Central and Southern region, this was not regrouped. For ethnicity there were 11 categories, the last one being "other", however, for this study these were regrouped and a total of 7 groups were created. These groups include Chewa, Tumbuka, Lomwe, Yao, Sena. Ngoni and other. Therefore all 4 groups (Nyanga, Mang'anja, Tonga, Nkhonde, other) were placed in other as they had a small number of respondents. Infant sex is dichotomous variable and is categorised as male female. Therefore, needed no change. Lastly, infant age originally number 0-5 months and for this research was grouped as follows, 0-1, 2-3, 4-5 months. Below is a table showing the variables used in the study and original codes and the new codes created due to regrouping variables. Respondents who responded with "don't know" were dropped.

Table 3.2 Independent variables for this study, original and new codes created.

Variable name/code	**Original coding**	**Recoding done for study**
Community care variables		
Number ANC visits	(0) No Count 1-20 (98) Don't know	(1) Non (2) 1-4 (3) 5+
during first two days: counselling on breastfeeding (m78d)	(0) No (1) Yes	(0) No (1) Yes
Socio-demographic determinants determinants		
Mothers age (v013)	(1) 15-19 (2) 20-24 (3) 25-29 (4) 30-34 (5) 35-39	(1) 15-19 (2) 20-29 (3) 30-39 (4) 40-49

	(6) 40-44 (7) 45-49	
Marital status (v501)	(0) Never in union (1) Married (2) Living with partner (3) Widowed (4) Divorced (5)No longer living together/separated	(0) Single/divorced/widowed (1) Married/cohabiting
Region (v024)	(1) Northern (2) Central (3) Southern	(1) Northern (2) Central (3) Southern
Ethnicity (v131)	(1) Chewa (2) Tumbuka (3) Lomwe (4) Tonga (5) Yao (6) Sena (7) Nkhonde (8) Ngoni (9) Mang'anja (10) Nyanga (96) Other	(1) Chewa (2) Tumbuka (3) Lomwe (4) Yao (5) Sena (6) Ngoni (7) Other
Employment (v732)	(1) Yes (2) No	(1) Yes (2) No
Wealth status combined (V190)	(1) Poorest (2) Poorer (3) Middle (4) Richer (5) Richest	(1) Poor (2) Average (3) Rich
Highest Educational level (v106)	(0) No education (1) Primary (2) Secondary (3) Higher	(0) No education (1) Primary (2) Secondary (3) Higher
Religion (v130)	(1) Catholic (2) CCAP (3) Anglican (4) Seventh day Baptist/Baptist (5) Other Christian (6) Muslim (7) No religion (96) Other	(1) Catholic (2) Protestant (3) Other Christian (4) Muslim (5) Non- Christian
Children ever born	Count 1-12	(1) 1 (2) 2+
Infant sex	(1) Male (2) Female	(1) Male (2) Female
Infant age	Count 0-24	(1) 0-1 (2) 2-3 (3) 4-5

3.10 Data Analysis

In addressing the research questions, the MDHS 2015/16 data was analysed and conducted in 3 phases using the following statistical methods.

Objective 1: To determine the levels of the practice of exclusive breastfeeding among mothers 15-49 with infants 0 to <6 months in Malawi

Firstly, the levels of EBF were examined among mothers 15-49 in Malawi with infants 0-<6 months. Through descriptive analyses levels of EBF in Malawi among mothers 15-49 with children below <6 months were displayed through graphs and tables followed by discussions.

Objective 2: To identify which maternal health seeking behaviours, socio-demographic determinants on the practice of exclusive breastfeeding among mothers of children 0 to <6 months in Malawi

The bivariate relationship between EBF and each independent variable was examined using a chi square test. This chi test was chosen because of the categorical nature of the outcome variable and the selected independent variables (Ugoni & Walker, 1995). The chi square test was used to detect the significance between outcome category and each independent variable and the level of significance that was used was $\boldsymbol{\alpha} = 0.05$ (Ugoni & Walker, 1995). Results were shown in table form.

Objective 3: To assess the association between maternal health seeking behaviours socio-demographic determinants on the practice exclusive breastfeeding among women 15-49 with children 0- to < 6 months in Malawi

Lastly a binary logistic regression model was used to examine the association between EBF and independent variables. This method was adopted because the outcome variable is nominal in nature and has two categories (Exclusive breastfeeding: 0 = Yes, 1= No) (Tranmer & Elliot, n.d.). In order to determine if each variable had an association with the outcome variable an unadjusted logistic regression was run, for each model. For the multivariate analysis an adjusted logistic regression ran all variables against the outcome to assess association. All variables were run in the bivariate and unadjusted analysis were also run in the multivariate analysis. The multivariate logistic regression model ran all independent variables simultaneously and this indicated all the variables that were significant and had an effect on EBF.

The adopted equation for binary logistic regression is as follows:

$$Ln\left(EBF/EBF\text{-}1\right) = \beta o+\beta_1 X_1+ \beta_2 X_2+\ldots..+ \beta_k X_k$$

Where:

EBF = probability of occurrence of the outcome

EBF-1 = probability of non-occurrence

Xi = are the independent variables utilized in the study

βo = is the coefficients

Weighting was conducted for responses using 'survey weights' to minus sampling error and to ensure that the sample is a true representation of the Malawian population. The level of significance was set at $p< 0.05$ (Figueiredo Filho et al., 2013). Data were weighted using the svy set command in STATA to correct for survey design sampling errors and to ensure that the sample represents the population of Malawi.

Multicollinearity

Vif was conducted to check for multicollinearity. In order to ensure that there are no 2 or more variables that form high correlation, which increases the alteration of 1 estimated regression (Institute of Digital Research and Education, 2019). When VIF is over ten then there is a high possibility that there is collinearity (Institute of Digital Research and Education, 2019). For this study VIF was below 10. The results are presented as appendix A.

3.11 Ethical Issues

This study uses secondary data obtained from the Malawi Demography and Health Survey; the questionnaires were reviewed and approved by ICF Institutional Review Board (IRB). The researcher has no information on the identification on any of the respondents. The DHS Program ensures that all participants are protected through the removal of their identification and the

program maintains strict standards in ensuring the protection and privacy of respondents and household members in all DHS surveys. Therefore, there was no ethical clearance needed.

Chapter 4: Results

4.1 Introduction

This chapter represents the results acquired from the study. The first results presented are the descriptive results which shows frequency distribution of selected variables for this study. After which the bivariate analysis results are presented in table form and for the immediate variables in this study, results, are presented in a graph. Lastly the results represented are the multivariate results which are presented in tables showing association on the outcome variable.

4.2 Levels and determinants of EBF

For the univariate analysis, levels and frequencies are presented and explained. A total of 1487 mothers with babies less than six months made up the study population. Firstly the rate of EBF for mothers in Malawi aged 15-49 years is reported. After which all frequencies of independent variables are reported.

4.2.1 Levels of EBF in Malawi 2015/16 among respondents 15-49years.

The rate of EBF for mothers in Malawi aged 15-49 years was 63% and 37% respondents had not practiced EBF.

Health seeking behaviour determinants and socio-demographic determinants by the practice of EBF in Malawi

Results presented below (fig 1) show a small number (2%) of respondents who did not have any ANC visits during their pregnancy. Majority (82%) of respondents had either 1 to 4 ANC visits during their pregnancy, whilst about 16% of the mothers had more than 5 ANC visits during their pregnancy.

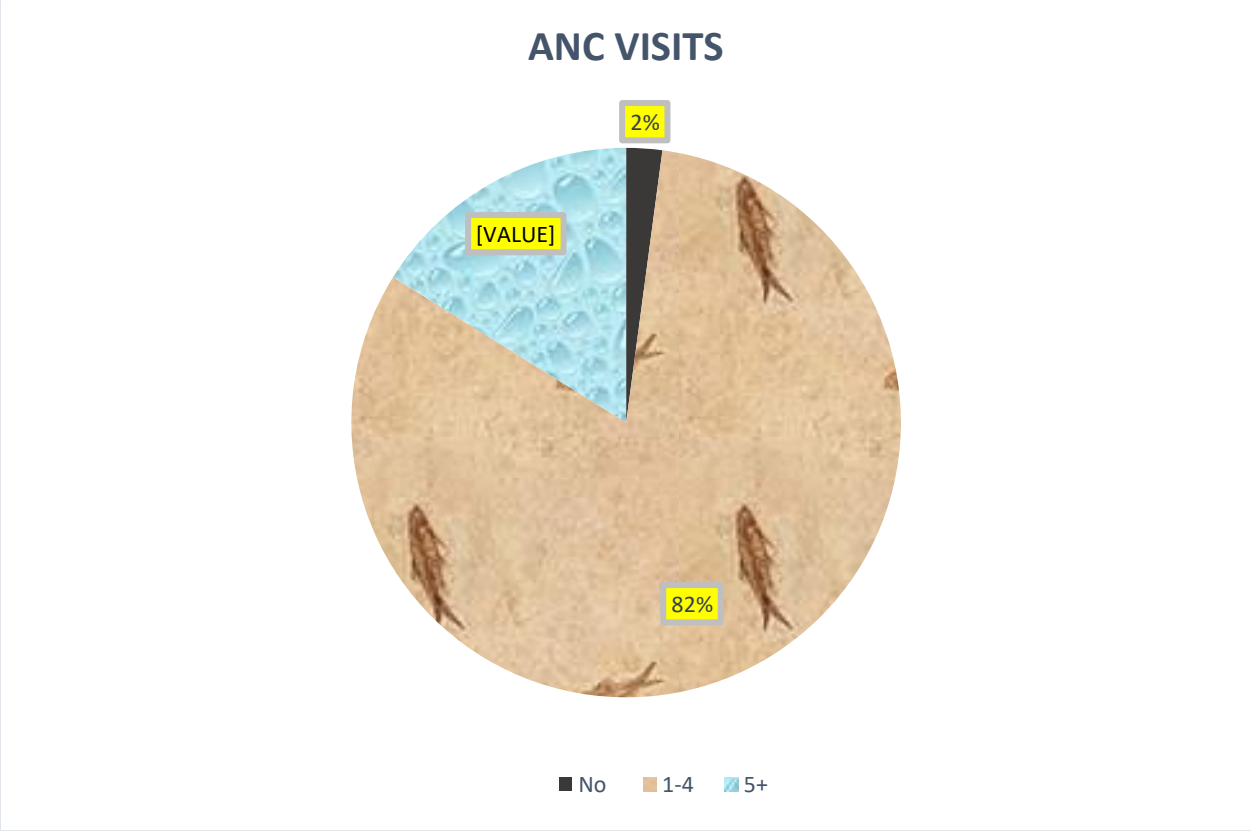


Fig.4.1 Percentage distribution of ANC visits by respondents

For counselling as shown in fig.2 a high percentage of (85%) respondents received counselling on breastfeeding which was provided two days after delivery and only 15% of mothers did not receive counselling.

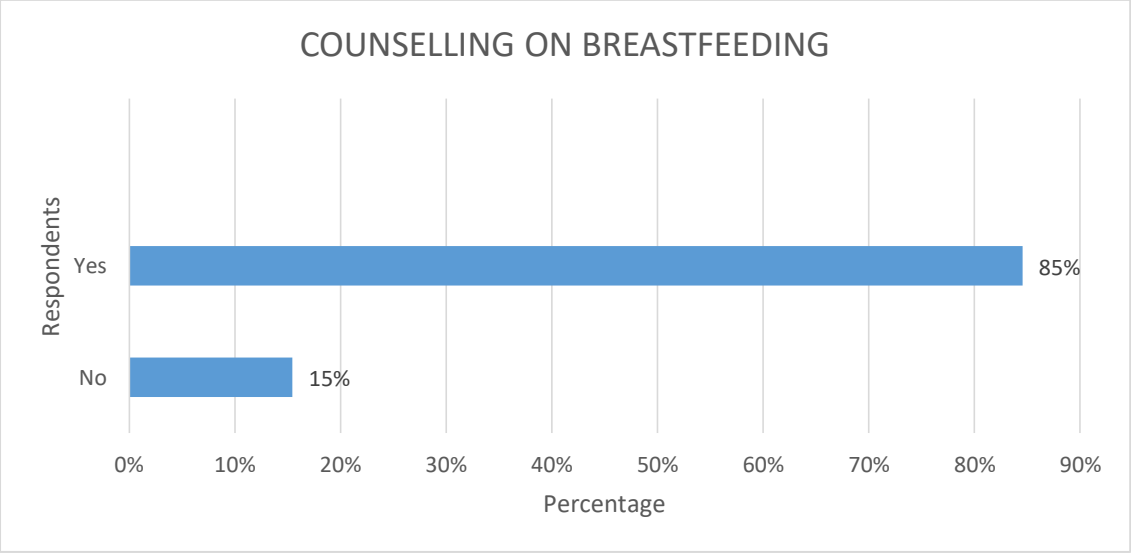


Fig 4.2 Percentage distribution of Postnatal Counselling two days after delivery

Presented below (table 1) are the frequencies of socio-demographic determinants of the respondents in this research. Looking at the different age groups it can be noted that respondents aged 20-29 made over half of the respondents (n=783; 53%). The least number of respondents can be seen among respondents 40-49 (5%). Respondents aged 30-39 were 377 (25%) leaving 250 (17%) adolescent respondents. The mean age for mothers who participated in this research was 26 years. Education among mothers in this study reveals that more than half (69%) of mothers had primary education. With 12% having no education. Mothers with secondary education made up 20% of the respondents. Resulting in a mere 2% of mothers with a higher education.

For religion, a large percentage (43%) of respondents were affiliated under Other Christian. Followed by Protestants (26%), Catholics (17%), Muslims (14%) and lastly Other (0.61%). For mother's employment findings show that 45% of mothers were unemployed, and 55% of mothers were employed. Respondents who were categorised as single made up 14% of the respondents, subsequently, married mothers made up 86%. Referring to wealth status, results show that nearly half (45%) of mothers fell within the poor quintile, and only 35% of mothers fell under the rich wealth status. Leaving only 20% of mothers who fell within the average wealth status. Additionally, table 4 shows that majority (49%) of respondents came from the Southern region, with the least (18%) coming from the Northern region. Therefore 33% of respondents resided in the central region of Malawi.

Mothers from the Chewa ethnic group made up the highest number of respondents (444), followed by the Lomwe group (238). Respondents from Yao made up 14%, followed by other ethnicity groups (12%), Ngoni (12%), Tumbuka (11%), and lastly respondents from Sena which made up 6%. Over half (74%) of mothers had 1 child, and the rest had 2 or more (26%). Results for the child's demographic determinants (table 1) show that there was slightly more respondents with female babies (51%) compared to male babies (49%). Large number (36%) of babies were aged 2-3 months, 35% of babies were aged 0-1 month and 29% of babies were aged 4-5 months.

Table 4.1 Frequency and percentage distribution of maternal socio-demographic determinants of all 1487 respondents in Malawi

Demographic and Socio-Economic Characteristics	***Frequency Distribution***	***Percentage Distribution***
Mothers Age		
15-19	250	16.81
20-29	783	52.66
30-39	377	25.35
40-49	77	5.18
Mean Age=26		
Education Attainment		
No Education	184	12.37
Primary	968	65.10
Secondary	303	20.83
Higher	32	2.15
Religions		
Catholic	251	16.88
Protestant	387	26.03
Other Christian	635	42.70
Muslim	205	13.79
Non-Christian	9	0.61
Employment		
No	659	44.32
Yes	828	55.68
Wealth status		
Poor	668	44.92
Average	292	19.64
Rich	527	35.44
Marital Status		
Single	203	13.65
Married	1284	86.35
Region		
Northern	267	18.08
Central	483	32.54
Southern	737	49.38
Ethnicity		
Chewa	436	29.32
Tumbuka	161	10.83
Lomwe	230	15.47
Yao	202	13.58
Sena	96	6.46
Ngoni	177	11.90
Other	185	12.44
Children Ever Born		
1	385	25.89
2+	1102	74.11
Child sex		
Male	747	49.11
Female	774	50.89
Infant age in Months		
0-1	516	34.70
2-3	539	36.25
4-5	432	29.05

4.3 results from

Figures and the table presented below (fig 4.3-4.5 and table 4.3) illustrate findings from the chi square test that was done.

4.3.1 Maternal health seeking behaviours, socio-demographic determinants by EBF

Maternal health seeking behaviours and socio-demographic determinants were cross tabulated with EBF. The results presented in table 2 show that 9 variables were statically significant. These variables include ANC counselling, mothers and infants age, education, religion, wealth status, marital status, religion, CEB.

Fig 4.3 below shows that over half of mothers (56%) who did not attend any ANC visits did not practice EBF compared to their counterparts 44% of mothers (who did not attend ANC visits) practiced EBF. Mothers who had 1-4 antenatal visits had 63% of mothers practice EBF and 37% did not. Mothers who had 5 or more ANC visits had 65% of mothers practice EBF and 35% of mothers did not. The association between ANC visits during pregnancy and the outcome variable was significant at a p-value of 0.01.

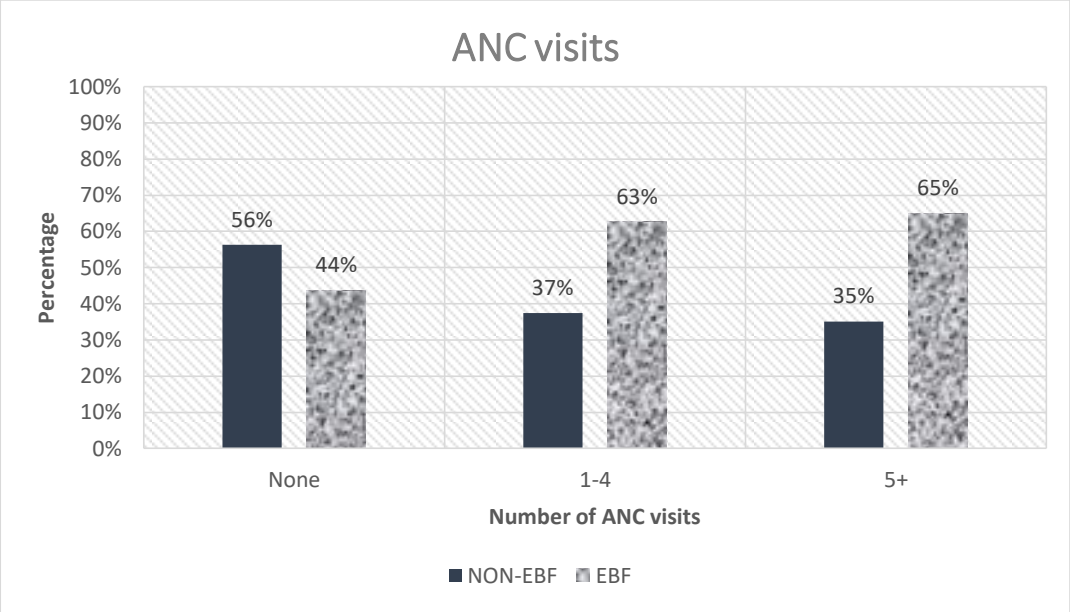


Fig.4.3 Summary of percentage distribution showing EBF by ANC visits (P-value 0.01 and Pearsonchi2(3)=12.57)

Respondents who received counselling from a health professional 2 days after delivery resulted in 61% of the respondents practicing EBF and 39% did not. For the respondents who did not receive counselling 69% practiced EBF and 31% of them did not. The association between

counselling on breastfeeding and the outcome variable was seen to be significant at a p-value of 0.03.

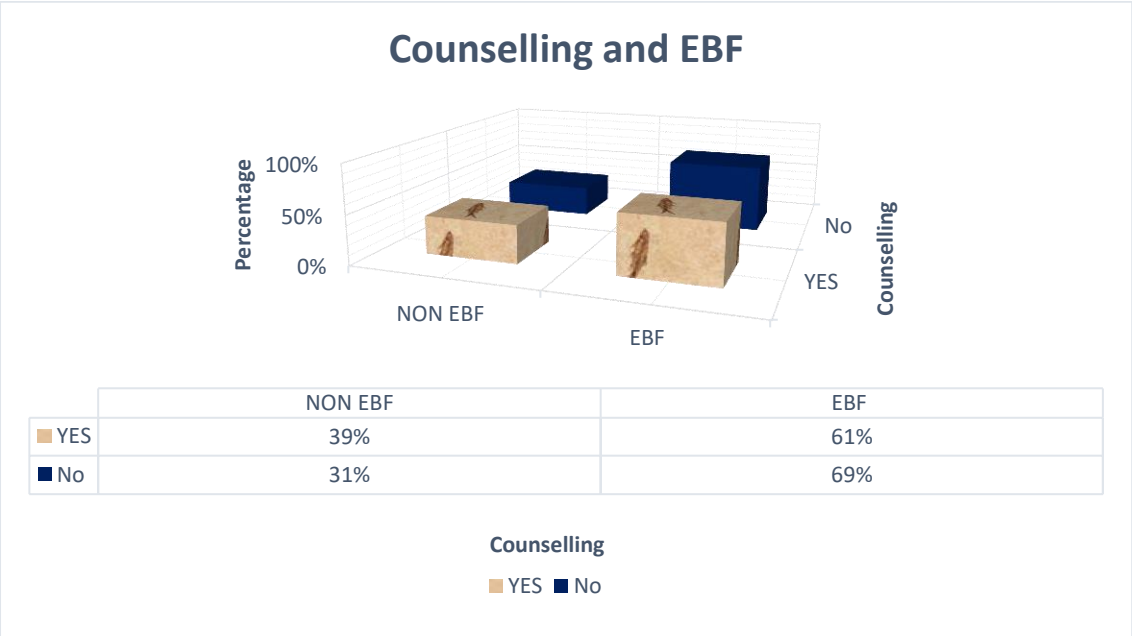


Fig. 4.4 Summary of percentage distribution showing EBF by Postnatal Counselling (P-value 0.03 and Pearsonchi2(1)=4.99)

The figure (4.5) below shows a declining trend of EBF with an increase in infant age. EBF was as high as 80% for infants 0-1 months and declined drastically to 37% by the age group 4-5months. Also noted in figure 4 there is an increasing trend of non-EBF with infant age. With 20% of babies who were not exclusively breastfeed at 0-1 months and by 4-5 months over 40% increase is observed for non-EBF. The association between age in months and the outcome variable was seen to be significant at a p-value of 0.00.

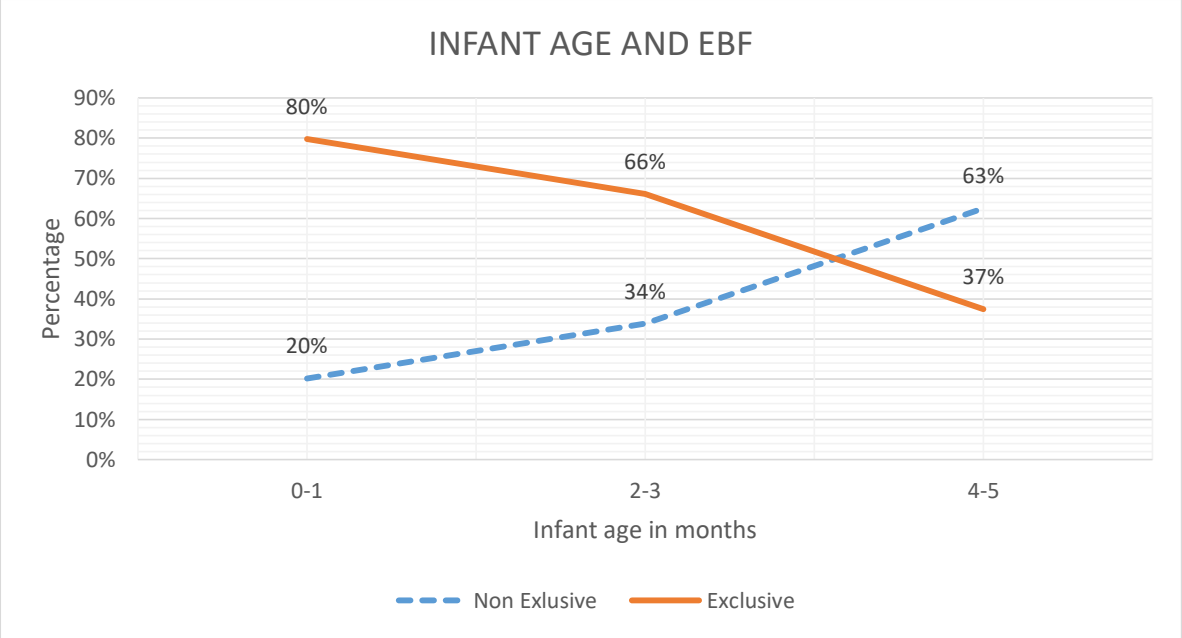


Fig. 4.5 Results displaying the outcome by infant age in months (P-value <0.001 and Pearsonchi2 (2)=187.66)

The results below (table 4.2) show that for adolescent mothers (15-19), 56% practiced EBF and 44% did not. For mothers ages 20-29 results show that 62% practiced EBF and 38% did not. For mothers ages 30-39 results show that 66% practiced EBF and 34% did not. Lastly for mother's ages 40-49 results show that 75% practiced EBF and 25% did not. The relationship between age and the outcome variable the practice of EBF was found to be significant (p-value 0.01).

With regards to education, surprisingly among respondents with no education there was a higher percentage (60 %) of respondents who practiced EBF compared to those who did not exclusively breastfeed (40%). Among respondents who had a primary education approximately 60% exclusively breastfed and 40% did not exclusively breastfeed. Among respondents who had a secondary education approximately 70% practiced EBF compared to 30% of mothers who did not practice EBF. For mothers with higher education a large percentage (81%) practised EBF and 19% didn't. The results above show that the association between age and the outcome variable was significant (p-value <0.001).

Focusing on religion it is noted that 60% of other Christians practiced EBF and 40% did not. Among Protestants 69% practiced EBF and 31% did not exclusively breastfeed their babies. 59% of Catholics practiced EBF and 41% of Catholics did not. Of the respondents who were non-Christian, 67% practiced EBF and 33% did not. Lastly, mothers who were Muslim had 64%

practice EBF and 36% didn't. The association between religion and the outcome variable (EBF) was significant at a p-value of 0.02.

About 65% of respondents who were not employed practiced EBF and 35% of these non-employees did not exclusively breastfeed. Of the employed respondents 61% practiced EBF and 39% did not. However, this association was not significant p-value of 0.13.

Respondents who fell under the poor wealth status had a high (60%) number of mothers who practiced EBF compared to those who did not practice EBF (40%). Among mothers who fell within the average wealth status 67% exclusively breastfed and 33% did not exclusively breastfeed. For mothers who fell within the rich wealth status 63% practiced EBF and 37% did not. The association between EBF and wealth status was significant (p-value of 0.02).

When looking at marital status, over 57% of mothers who were single practiced EBF compared to their counterparts (43%). Among mothers who are married 64% practiced EBF and 36% did not. The association between EBF and marital status was not significant (p-value 0.08).

In the Northern region 57% of respondents practiced EBF and 43% did not practice EBF. From the Central region 69% of respondents practiced EBF and 31% did not exclusively breastfeed. For the Southern region 61% practiced EBF and 39% did not. The results show that the relationship between region and EBF is significant with a p-value of 0.00.

For each ethnic group it is noted that there are higher numbers of respondents who practiced EBF compared to those who did not. About 64% of respondents from the Chewa ethnic group practiced EBF. Respondents from the Lomwe ethnic tribe had 60% of mothers practice EBF and 40% who did not. Respondents from the Tumbuka tribe had 61% respondents who practiced EBF and 39% who did not. Among respondents from Other ethnic groups 58% of mothers practiced EBF. For the Ngoni tribe 70% practiced EBF and 30% did not. The association between ethnicity and the outcome variable was not significant at a p-value of 0.12.

385 respondents reported having 1 child and of this total 59% practiced EBF and 41% did not. Of the respondents with 2 or more children 64% practiced EBF and 33% did not exclusively breastfeed. The association between children ever born and the outcome variable was not significant at a p-value of 0.06.

About 64% of mothers with female infants practiced EBF and 36% did not. For mothers with male infants 61% practiced EBF and 39% did not. The association between sex of child and EBF was not significant (p-value 0.29).

Table 4.2 Results showing EBF by socio-demographic determinants (P-value <0.001)

Socio-demographic determinants characteristics	**Exclusive Breastfeeding**		
	No N/ (%)	Yes N/ (%)	
Age			
15-19	111 (44.40)	139 (55.60)	250 (100)
20-29	297 (37.93)	486 (62.07)	783 (100)
30-39	128 (33.95)	249 (66.05)	377 (100)
40-49	19 (24.68)	58 (75.32)	77 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
p=0.01 *Pearsonchi2(3)=37.32*			
Education			
No Education	73 (39.67)	111 (60.33)	184 (100)
Primary	386 (39.88)	582 (60.12)	968 (100)
Secondary	90 (29.70)	213 (70.13)	303 (100)
Higher	6 (18.75)	26 (81.25)	32 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
P=0.00 *Pearsonchi2(3)=15.37*			
Religion			
Catholic	104 (41.43)	147(58.57)	251 (100)
Protestant	119 (30.75)	268 (69.25)	387 (100)
Other Christian	256 (40.31)	379 (59.69)	635 (100)
Muslim	73 (35.61)	132 (64.39)	205 (100)
Non-Christian	3 (33.33)	6 (66.67)	9 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
p=0.02 *Pearsonchi2(4)=11.71*			
Employed			
No	232 (35.20)	427 (64.80)	659 (100)
Yes	323 (39.01)	505 (60.99)	828 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
p=0.13 *Pearsonchi2(1)=2.27*			
Wealth status			
Poor	265 (39.67)	403 (60.33)	668 (100)
Average	118 (40.41)	174 (59.59)	292 (100)
Rich	172 (32.64)	355 (67.36)	527 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
p=0.02 *Pearsonchi2(2)=7.71*			
Marital Status			
Single	87 (42.86)	116 (57.14)	203 (100)
Married	468 (36.45)	816 (63.55)	1284 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**

p=0.08 *Pearsonchi2(1)=3.01*			
Region			
Northern region	114 (42.70)	137 (57.30)	267 (100)
Central Region	152 (31.47)	331 (68.53)	483 (100)
Southern Region	289 (39.21)	457 (60.79)	737 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
p=0.00 *Pearsonchi2(2)=11.49*			
Ethnicity			
Chewa	161 (35.55)	281(64.45)	436 (100)
Tumbuka	65 (39.13)	98 (60.87)	161 (100)
Lomwe	95 (40.00)	133 (60.00)	230 (100)
Yao	73 (35.15)	131 (64.85)	202 (100)
Sena	43 (44.79)	53 (55.21)	96(100)
Ngoni	53 (29.94)	124 (70.22)	177 (100)
Other	80 (42.16)	107 (57.67)	185 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
p=0.12 *Pearsonchi2(6)=10.18*			
Children Ever Born			
1	159 (41.30)	226 (58.70)	385 (100)
2+	396 (35.93)	706 (64.07)	1102 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
p=0.06 *Pearsonchi2(1)=3.51*			
Sex of chid			
Male	280 (38.67)	444 (61.33)	724 (100)
Female	275 (36.04)	488 (63.96)	763 (100)
Total	**555 (37.32)**	**932 (62.68)**	**1487 (100)**
p=0.29 *Pearsonchi2(1)=1.10*			

4.4 Inferential statistic results showing the association between EBF and health seeking behaviours, socio-demographic determinants

The unadjusted and adjusted (multivariate) models aided in determining whether there was an association between predictor variables and the outcome as well as examine the likely predictor of EBF in Malawi.

4.4.1 *Bivariate Unadjusted Binary Logistic Regression model results*

The table below shows results of the unadjusted binary logistic regression of EBF and each socio-demographic variables individually. The results show that ANC visit, education, religion, wealth status, region, ethnicity and infant age were significant and have an influence on EBF.

Although not significant it worth noting that mothers who attended counselling had a lesser odds (OR: 0.90) of practicing EBF compared to mothers who did not attend [CI: 0.68-1.22]. Mothers who had 1-4 ANC visits had increased odds of 2.36 of practicing EBF compared mothers who had no visitations [CI: 1.21-4.61]. Mothers who had 5 or more visitations had an increased odds of 2.56 of practicing EBF compared to mothers who had no visitations [CI: 1.26-5.23].

Mothers who were 20-29 years had an increased odds of 1.35 to practice EBF compared to mothers aged 15-19 [CI: 1.01-1.80]. Mothers who were aged 30-39 had an increased odds of 1.46 to practice EBF compared to adolescent mothers [CI: 1.05-2.04]. Mothers who were 40-49 had an increased odds of 1.97 to practice EBF compared to adolescent mothers [CI: 1.12-3.46]. These were all significant p-value of 0.04, 0.03, and 0.02 respectively. Mothers with a primary education had 0.91 less odds of practicing EBF compared to mothers with no education. This was not significant with a p-value of 0.57 [CI: 0.66-1.26]. Mothers with a secondary education had 1.77 more odds of practicing EBF compared to mothers with no education with a p-value of 0.01 [CI: 1.19-2.63]. Additionally, mothers with a higher education had 1.58 more odds of practicing EBF compared to mothers with no education with a p-value of 0.31 [CI: 0.65-3.81]. Being a protestant increased mother's odds of practicing EBF by 1.92 and this was a significant with a p-value of 0.00 [CI: 1.37-2.70]. Although the other religious groups were not significant, mother who were Other group had an increased the likelihood of practicing EBF by 1.54 odds [CI: 0.22-10.82]. Mothers who were Muslim had an increased the likelihood of practicing EBF by 1.29 odds more of EBF compared to catholic mothers [CI: 0.22-10.82]. Lastly under religion mothers under Christian religious group had an increased likelihood of practicing EBF by 1.15 odds [CI: 0.86-1.54].

Employed mothers had a decreased odds of 0.97 of practicing EBF compare to unemployed mothers, although this was not statistically significant with a p-value of 0.79 [CI: 0.78-1.20]. For wealth status, mothers who fell within the rich quintile had an increased odds of 1.44 to exclusively breastfeed their child when compared to mothers who were in the poor quintile [CI: 1.13-1.83] and this was significant (p-value 0.00). For wealth status, mothers who fell within the average quintile had an increased odds of 1.08 to exclusively breastfeed their child when compared to mothers who were in the poor quintile [CI: 0.82-1.44]. Although not significant married people had increased odds of 1.12 of exclusively breastfeeding their infants compared to non-married mothers [CI: 0.82-1.53]. For region only the central region was found significant at a p-value of 0.01. Mothers from the Central region had higher odds of 1.62 [CI: 1.13-2.32] to

exclusively breastfeed their infants compared to mothers from the Northern region. Among all the ethnic groups the only significant one was the Ngoni group (p-value 0.01), and mothers from this tribe had an increased odds of 1.62 to exclusively breastfeed their infant compared to mothers from the Chewa tribe [CI: 1.09-2.40].

Children who were 2-3 months had lesser odds of being exclusively breastfed when compared to children 0-1 month [OR=0.52, CI: 0.39-0.69]. Moreover, children who were 4-5 months had lesser odds of being exclusively breastfed when compared to children 0-1 month [OR=0.14, CI: 0.11-0.19].

Table 4.3 Bivariate unadjusted binary logistic regression model results model results of EBF by health seeking behaviours and socio-demographic determinants

	Odds Ratio	**P-value**	**[95% Conf.**	**Interval]**
Postnatal Counselling				
Yes	RC			
No	0.90	0.52	0.68	1.22
ANC visits				
None	RC			
1-4	2.36	0.01*	1.21	4.61
5+	2.56	0.01*	1.26	5.23
Age				
15-19	RC			
20-29	1.35	0.04*	1.01	1.80
30-39	1.46	0.03*	1.05	2.04
40-49	1.97	0.02*	1.12	3.46
Education				
Non	RC			
Primary	0.91	0.57	0.66	1.26
Secondary	1.77	0.01*	1.19	2.63
Higher	1.58	0.31	0.65	3.81
Religion				
Catholic	RC			
Protestant	1.92	0.00*	1.37	2.70
Other Christian	1.15	0.36	0.86	1.54
Muslim	1.29	0.17	0.90	1.86
Other	1.54	0.67	0.22	10.82
Employment				
No	RC			
Yes	0.97	0.79	0.78	1.20
Wealth status				
Poor	RC			
Average	1.08	0.57	0.82	1.44
Rich	1.44	0.00*	1.13	1.83
Marital Status				
Single	RC			
Married	1.12	0.47	0.82	1.53
Region				

Northern	RC			
Central	1.62	0.01*	1.13	2.28
Southern	1.24	0.22	0.88	1.76
Ethnicity				
Chewa	RC			
Tumbuka	1.03	0.86	0.71	1.51
Lomwe	0.91	0.54	0.67	1.23
Yao	1.03	0.86	0.75	1.42
Sena	0.75	0.26	0.46	1.24
Ngoni	1.62	0.02*	1.09	2.40
Other	0.92	0.71	0.60	1.41
Children Ever Born				
1	RC			
2+	1.24	0.08	0.97	1.57
Sex of child				
Male	RC			
Female	1.13	0.19	0.92	1.40
Infant age in Months				
0-1	RC			
2-3	0.52	0.00*	0.39	0.69
4-5	0.14	0.00*	0.11	0.19

**RC=Reference Category; p< 0.05 = * (Category significance)*

4.3.2 Adjusted Binary Logistic Regression model results

The multivariate logistic regression model ran all independent variables concurrently and the table below (table 4.4) shows the results found from running this analysis. The adjusted multivariate results of the health seeking behaviour variables and socio-demographic variables were able to show if the reported unadjusted model and bivariate results remained the same as the adjusted regression model.

For the multivariate adjusted analysis showed a few significant variables (p-value <0.05). These were counselling, ANC visits, education, religion, region, ethnicity and infant age. Mothers who received counselling 2 days after delivery had a decreased odds of 0.71 of practicing EBF when compared to mothers who did not have counselling, whilst controlling for other variables [CI: 0.51-0.99]. Mothers who had 1-4 ANC visits had increased odds of 2.56 to practicing EBF when compared to those that had no visitations, whilst controlling for other variables [CI: 1.23-5.36]. Mothers who had 5 or more ANC visits had higher odds of 3.05 of practicing EBF when compared to those that had no visitations [CI: 1.38-6.74], whilst controlling for other variables.

Mothers who were 20-29 had decreased odds of 0.98 of practicing EBF compared to mothers aged 15-19 [CI: 0.65-1.49]. Mothers who were 30-39 had decreased odds of 0.96 of practicing

EBF compared to mothers aged 15-19 [CI: 0.58-1.58]. Mothers who were 40-49 had increased odds of 1.63 of practicing EBF compared to mothers aged 15-19 [CI: 0.79-3.35]. However none of these were significant. Mothers who had a primary education had lesser odds of EBF compared to mothers who had no education [OR=0.92, CI: 1.31-2.52], whilst controlling for other variables. Mothers who had a secondary education had higher odds of EBF compared to mothers who had no education [OR=1.70, CI: 1.04-2.80], whilst controlling for other variables (this was significant p-value 0.04). Mothers who had a higher education had higher odds of EBF compared to mothers who had no education [OR=2.10, CI: 1.04-2.80], whilst controlling for other variables. For religion only protestant and non-Christian were found to be significant (p-value 0.00 and 0.04, respectively). Mothers who were Protestant had 1.79 times more odds practicing EBF compared to Catholic mothers. Mothers who were Muslim had 1.78 times more odds to EBF compared to Catholic mothers [CI: 1.02-3.10]. Mothers who were non-Christian had increased an increased odds of 1.34 of EBF their infant when compared to Catholic mothers, whilst controlling for other variables, however not significant.

Although not significant mothers who were rich within the wealth status had an increased odds to practiced EBF compared to poor mothers [OR=1.12, CI: 0.82-1.51]. For mothers within the average quintile status there was a decreased odds of 0.94 to practicing EBF compared to poor mothers, whilst controlling for other variables. For region only the central region was found to be statistically significant (p-value 0.03]. Mothers from the Central region had an increased odds of 1.91 of practicing EBF compared to mothers from the Northern region, whilst controlling for other variables [CI: 1.06-3.46]. For the tribes only the Ngoni tribe was significant (p-value 0.01). Mothers from the Ngoni ethnic group an increased odds of 1.76 to practice EBF compared to mothers from the Chewa group [CI: 1.12-2.76], whilst controlling for other variables.

Mothers with babies 2-3 months had a lessor odds of 0.53 of practicing EBF compared to mothers with babies 0-1 month, whilst controlling for other variables. This was statistically significant (p-value 0.00]. Mothers with babies 3-4 months had lesser odds of practicing EBF compared to mothers with babies 0-1 month [OR=0.10, CI: 0.10-0.19] whilst controlling for other variables and this was statistically significant (p-value 0.01).

***Table** 4.4 Multivariate binary logistic regression model results of EBF by health seeking behaviours and socio-demographic determinants*

Variables	Odds Ratio	P-value	[95% Conf.	Interval]
Postnatal Counselling				
No	RC			
Yes	0.71	0.05*	0.51	0.99
Antenatal Care visits				
None	RC			
1-4	2.56	0.01*	1.23	5.30
5+	3.05	0.01*	1.38	6.56
Age				
15-19	RC			
20-29	0.98	0.92	0.65	1.49
30-39	0.96	0.87	0.58	1.58
40-49	1.63	0.18	0.79	3.35
Education				
Non	RC			
Primary	0.92	0.67	0.63	1.34
Secondary	1.70	0.04*	1.04	2.80
Higher	2.10	0.15	0.76	5.83
Religion				
Catholic	RC			
Protestant	1.79	0.00*	1.21	2.60
Other Christian	1.19	0.29	0.89	1.66
Muslim	1.78	0.04*	1.02	3.10
Non-Christian	1.34	0.79	0.16	11.30
Employment				
No	RC			
Yes	0.93	0.93	0.77	1.27
Wealth status				
Poor	RC			
Average	0.94	0.66	0.68	1.29
Rich	1.12	0.26	0.82	1.51
Marriage				
Single/cohabiting/widowed/separated	RC			
Married	0.94	0.74	0.67	1.35
Region				
Northern	RC			
Central	1.91	0.03*	1.12	3.64
Southern	1.40	0.19	0.82	2.67
Ethnicity				
Chewa	RC			
Tumbuka	1.25	0.31	0.62	3.84
Lomwe	1.02	0.86	0.51	1.80
Yao	0.82	0.44	0.36	1.52
Sena	0.93	0.42	0.28	1.77
Ngoni	1.76	0.01*	1.12	2.77
Other	1.04	0.37	0.65	2.92
Children Ever Born				
1	RC			
2+	1.32	0.14	0.91	1.92
Sex of child				

Male	RC			
Female	1.06	0.63	0.84	1.34
Infant age in months				
0-1	RC			
2-3	0.53	0.00*	0.39	0.71
4-5	0.14	0.00*	0.10	0.19

**RC=Reference Category; p< 0.05 = * (Category significance)*

Chapter 5: Discussion

5.1 Introduction

The aim of the study was to determine whether maternal health seeking behaviours and socio-demographic determinants such as ANC visits, counselling, infant's sex and age, religion, education, wealth status, employment, region, ethnicity, CEB and mothers age have an effect on the practice of EBF. In order to conduct this research EBF was obtained through the use of the 24-hour recall among mothers with babies 0-<6 months. 3 objectives were addressed in this research; firstly, was to determine the levels of EBF among mothers 15-49 in Malawi with children 0-<6 months. Secondly, was to examine the maternal health seeking behaviours and socio-demographic determinants on the practice EBF among mothers 15-49 in Malawi. Thirdly was to assess the association of EBF and maternal socio-demographic determinants. Below is a detailed discussion on the results found in this study. In addressing the third objective a binary logistic regression was run and both health seeking behaviour variables and education, religion, region, ethnicity, CEB, child's age wealth (unadjusted model) had an association with the practice of EBF in Malawi:. And the following variables were found to have no influence on the practice of EBF: maternal age, infant sex, employment and wealth status (on the adjusted model).

5.2 Discussion on Findings from Results

Results show that 63% of Malawian mothers practiced EBF and 37% do not. The MDHS 2015/6 records EBF rate at 61%, the difference in rates can be attributed to the way in which EBF was obtained in this study as discussed in chapter 3. Malawi's EBF rate is nearly similar to results found in studies conducted in Ethiopia 62%, Kenya 61%, Ghana 63% and Burundi 69% (Tampah-Naah and Kumi-Kyereme, 2013; UNICEF, 2010; Adugna et al., 2017). Although these rates were well above 50% they are still below the 90% rate required by WHO. Although Malawi has experienced a decline in EBF since 2010, Malawi was able to increase its rate of EBF between the years 2000 (45%) and 2010 (71%), therefore by focusing on the determinants that both positively and negatively affect EBF in Malawi, this could aid in Malawi re-establishing its once observed increase in trend of EBF (seen from 2000-2010).

Counselling Received after Delivery

All results from the chi-square test and multivariate binary logistic regression model show that counselling offered two days after delivery on breastfeeding is among the variables that were statistically significant in this study. The practice of EBF among mothers who had postnatal counselling was slightly lower compared to mothers who did not. Further the multivariate analysis shows decreased odds of mothers EBF. This was not an expected result. A study conducted in Tanzania found an increased likelihood to EBF among mothers who received counselling after delivery as compared to receiving advice from family (Mgongo et al., 2014). Additionally, another study also found that information provided by health care workers increased the practice of EBF (Desai et al., 2014).The anticipated result for this variable was a positive influence on EBF, however, this research revealed that counselling had a negative association on EBF. Kafulafula et al (2013), say the way patients relate with health workers plays a great role in patients adhering to advice. This could possibly be an explanation to the results found. A friendly rapport is essential in order for patients to adhere to the information being shared. Another factor that could explain these results could be the lack of continuous support on breastfeeding after these sessions. A study conducted in Malawi revealed that although mothers had information on EBF the use of difficult medical terms resulted in inadequate understanding of information shared (Levi et al., 2010). Additionally mothers shared that there was poor communication when seeking advice. Therefore this may still be the issue Malawi faces. A study conducted by Hernandez et al (2018) and Haider et al (1997) highlight support as essential in ensuring mothers EBF after leaving the health centre. All these issues mentioned enable mothers, the ability to acquire information that could be very erroneous from sources such friends and community members.

Another reason that could explain this result is the unsuccessful implementation of the Baby Friendly Hospital Initiative that was introduced in Malawi. This initiative was introduced by WHO and UNICEF to offer support and advice mothers to EBF in all health centres as well outside health facilities (UNICEF, 2002). Although due to funds being depleted and the program losing momentum (Kavle et al., 2019), it did not need to prevent the continuation of ensuring that support and information was still being given to patients and health workers. This could explain the the negative association of counselling as there is a high possibility that health workers were either no longer being trained or supported. Lastly, since the program came to a halt before being revitalised this would mean a number of health centres were not certified as

Baby Friendly (Kavle et al., 2019). Therefore, this could explain the decreased odds of EBF among women who received.

ANC Visits

ANC was another variable that was found statically significant throughout the study. Mothers who attended ANC visitations in Malawi had higher the odds of EBF as seen in table 3 and 4. Studies that found an association between ANC visits and EBF noted that the more visitations the higher likelihood in EBF compared to mothers with less or no visitations (Agho et al., 2011; Olatub, 2016). A study done in Dilla Zuria District in Ethiopia found that mothers who had ANC visits had over 5 times more odds of EBF compared to mothers who had never attended ANC (Reddy and Abuka, 2016). The world health organisation recommends at least 4 ANC visits throughout a mother's pregnancy (Tariku et al., 2017; WHO, 2016). ANC visitations offer mothers all required information and support on pregnancy and breastfeeding (Tariku et al., 2017). Therefore, making health facilities that offer ANC services excellent sources of EBF information.

Education and EBF

Education was also among the variables that were statically significant in all tests run in this research. Therefore this study shows that education is also an influential variable to the practice EBF. A high number (65%) of mothers in the study were found to have primary education as their highest educational attainment. However, this study showed a negative association of EBF among mothers who had a primary school attainment. This was also a surprising result. The results revealed that mothers with an education had increased odds of practicing of EBF compared to those with no education. This corresponds with results found from a study conducted in Cameroon, where mothers who had no education were less likely to practice EBF (67%) compared to mothers with an education (Fombang et al., 2016). This shows that education in Malawi is a vital component in addressing low practices of EBF. However, for some other countries the opposite is true. Other studies found education didn't increase the odds of EBF instead educated mothers were less likely to practice EBF compared to non-educated mothers (Sefene et al., 2013: Agho et al., 2011; Issaka et al, 2016). These results could be due to educated mothers needing to go back to work sooner and therefore shortening the duration of exclusively breastfeeding. Looking at education it can be noted that different locations will inhibit different results.

Religion

For religion protestant and Muslim respondents were found significant. Certain religious groups are known for teachings which encourage healthy living, this could explain why religion is associated with EBF as some religious groups are known to help share information around family planning (Doctor, 2013). These meetings could therefore explain why religion could have a positive influence on EBF as discussions around breastfeeding could possibly arise in such settings. Muslims through the Koran are encouraged to breastfeed their children therefore this could encourage EBF as the Koran already identifies the breastmilk as a gift for the child (Demirtas et al., 2011). Another study revealed that a Christian man believed that breastmilk was all a baby needed for the first 6 months and not milk substitutes. Therefore showing how religion has an influence on the practice of EBF (Reinsma et al., 2012).

Culture, Region, Ethnicity and EBF

The prevalence of EBF differs by culture, region and country. A study conducted in Nigeria also found that regions were significantly associated with EBF (Agho et al., 2011). There are number of myths and cultural beliefs across countries that result in low rates of EBF within the first 6 months of a child's life. In Malawi a study conducted by Kerr et al., 2007 in a village in the Northern region identified the cause of early introduction of fluids (mainly milk and soft porridge) as being due to the belief that the child is hungry and therefore feeding them water gives them a sense of satisfaction. This is congruent with another study conducted in Malawi in 2015 where 57% of the children below 6 months were given liquids, which was due to Malawian mothers believing that children needed water and this was a norm (Kuchenbecker et al., 2015). Concurring with these findings are Tampah-Naah and Jumi-Kyereme (2013) who observed that cultural beliefs within Ghana's regions, led mothers and relatives administering water and other fluids to babies before 6 months.

A study conducted in Northern Malawi identified that grandmothers have an influence on the practice of EBF. Due to the northern region being an area of agricultural practices there are many extended families in the region. Findings from the study can possibly explain the results found in the study. Therefore, this could possibly explain why mothers from Central and Southern region had a higher odds EBF in the when compared to the Northern. Northern region have low odds of practicing EBF as cultural beliefs conducted in Northern region may discourage EBF more than the Southern and central region. This also explains why ethnicity has

an association with EBF as different ethnic groups have different practices and beliefs. A study revealed that the community and practices (within the community) in which a mother finds herself in affects her practice of EBF (Reinsma et al., 2012).

The Southern region in Malawi is known as the central hub of the country with a number of economic and industrial activities occurring within this region (Doctor, 2013). The Central region mostly operates administrative activities as well as foreign political tasks. The Northern region is known to operate small scale mines and agricultural activities (Doctor, 2013; Kerr et al., 2007). A possible reason to the association of EBF and region could also be that information on EBF could be promoted more in the country's Central region where administrative tasks occur.

Infant Age and EBF

Infant age is another statically significant variable that was found in all tests run. The results on infant age noted that rates of practicing EBF was highest among babies 0-1 when compared to babies 4-5 years. This was an expected outcome and is supported by studies conducted in Africa showing that mothers exclusively breastfed for the 1st month, and then introduced fluids and complementary foods (Mgongo et al., 2014; Agho et al., 2011). As the infant age increased, the rate of EBF decreased significantly, with an increase in age leading to a decrease in likelihood of babies being exclusively breastfed. Older infants (4-5 months) had lesser odds of being EBF compared to younger infants (0-1 months) (Onah et al., 2014; Puapornpong et al., 2014; Fombong et al., 2016). As depicted in fig4, the rate of EBF declined significantly after ages 0-1 month, from 80% to 37%. This is due to the large number of babies being introduced to solids and liquids after 0-1 month. Cultural beliefs in Malawi can explain these findings as discussed in regions and ethnicity above.

Lastly, the discussion above confirms that the UNICEF model of care extended by Engle that was used in this study was appropriate, as majority of determinants selected in this study had an association and influence on the practice of EBF. The theoretical framework selected for this study indicated that caregiver (in this study mothers) behaviours affected child nutrition (in this study EBF). Results presented and discussed show that caregiver's behaviour which were two maternal health seeing behaviours affected mother's decision to EBF or not. Both these were associated with EBF. For the more distal factors which were termed socio-demographic

determinants, mother's maternal determinants (education, religion, ethnicity, and region) and child characteristics only age had association with the practice of EBF. Through the unadjusted and adjusted model we also note that variables do not operate alone however different factors work together in influencing the practice of EBF.

5.3 Limitations

Due to this study being a cross sectional causality could not be identified. Although association was determined however why it's there cannot be determined. However the study did enable the identification of the determinants that are associated with low levels of EBF in Malawi.

Variables were limited to the ones offered by the MDHS 2015/16, therefore for example effect on social media networks on EBF could not be determined in this study. Questions that were related to the radio, TV asked if mothers listened to messages on family planning. It therefore cannot be assumed that breastfeeding practices are discussed. As the technological sphere is expanding and social media is becoming more easily accessible, there is a need to understand how much influence this is having on mothers and EBF in Malawi.

The MDHS 2105/6 conducted a 24hr recall in order to attain information on feeding patterns. This was the only information taken on what infants were fed. There are two possibilities that could arise from such a method, firstly some mothers could have been administering foods and liquids prior to the 24hr recall. Hence, affecting the accuracy of obtaining the levels of EBF in Malawi. The second issue is social desirability from mothers. Mothers know the requirements for EBF and hence can give false information on practices and food administered to children in the last 24hrs.

Chapter 6: Conclusion and Recommendations

6.1 Conclusion

The aim of this study was to determine the levels and determinants of the practice of EBF EBF among mothers aged 15-49 years with children 0-<6. Malawi has had a drastic decline in EBF since the 2010 MDHS. EBF is essential and every child has the right to be exclusively breastfed as this provides the child with required nutritional needs. With health benefits for babies, mothers and society it is of outmost importance that EBF is promoted and increased especially within low income countries such as Malawi. The importance and benefits of EBF is widely documented but disappointingly there are very high percentages of non-EBF practices noted in many parts of the world including Malawi. EBF differs within countries and between countries due to the different determinants associated with EBF within that context (country, region).

The results found from this study indicated that maternal health seeking behaviours have an effect on mothers EBF their babies. Postnatal counselling had an influence on EBF, however the effect is a negative one on EBF, therefore there is a crucial need for this area to be monitored in Malawi. ANC visits must still be encouraged so that all mothers attend these sessions as this had a positive impact on EBF. Other determinants that had an influence on the practice of EBF in Malawi were education, religion, ethnicity, region, infant age. An alarming factor is the drastic decrease of EBF with infant age, meaning early introduction of foods and liquids is still an issue Malawi is faced with. In order to reach the SDG goal 3 in ensuring healthy lives through the decrease in infant and under 5 mortality, as well as to address the concerns of the decrease in EBF in Malawi related by the minister of health, there is a need to look into the findings presented in this study.

6.2 Recommendations

Research Implications

This study was a quantitative study and utilised secondary data; however, further studies need to be conducted that have a mixed method approach (both qualitative and quantitative). This approach will allow for a clearer explanation to the results obtained in this research. The research could conduct interviews asking questions that could give more information on better understanding the reasons why statically significant variables have an influence on the practice

of EBF. Besides the mixed method approach a longitudinal study could be conducted and mothers be followed for the required duration of EBF, this would yield more accurate results.

Policy Implications

There is a need to scale up EBF in Malawi. The percentage is still below the required percentage requested by WHO and mortality rates are still high in Malawi. Therefore, the need to scale up EBF is very crucial. The IYCF policy aims to better child growth survival and nutrition therefore more awareness is needed and especially in the northern region and different ethnic groups to better understand the inhibiters of EBF. More training should be given to health care professionals on counselling so mothers are encouraged to EBF through counselling. The lancet series conducted in 2016 revealed that policies can be used to empower women and can also make breastfeeding a standard in society (Rollins et al, 2016). Policies on EBF should be promoted so that it is known throughout the country.

Policies should also be created that will assist facilities to continue offering a Baby Friendly hospital standard at all times, so that even when the program faces financial challenges, monitoring and support will still continue.

Counselling in communities on EBF

Results presented in this study revealed that postnatal counselling had a negative association on EBF, therefore another recommendations is counselling must be offered more than once after delivery. Counselling should not only be given 2 days only but also after mothers leave the hospital. In a meta-analysis that was conducted found that counselling provided in different periods and not just one had a positive influence (Rollins et al, 2016). A continuation of support on EBF is very imperative in areas with strong cultural beliefs.

Campaigns

EBF campaigns should look more into correcting cultural and ethnic differences and practices that hinder mothers EBF their babies especially in the Northern region in Malawi. Studies conducted in Malawi have revealed that cultural practices and family beliefs hinder EBF therefore this may explain results found in this study (Kerr et al., 2007; Vaahtera et al., 2001; Kuchenbecker et al., 2014). Therefore, campaigns should raise awareness on EBF and should target not only mothers but everyone. As mentioned in the literature review of this study mothers

also face discouragement of EBF after they have left the health centre. Therefore it is essential that campaigns are run in communities so mothers get support from family members and community. This can dispel all possible myths and concerns raised from different cultural beliefs that discourage EBF.

Training of health personnel giving counselling

With the negative association counselling had on EBF, there is a need to scale up training for health personnel. A study conducted in Malawi revealed that although mid wife's knew the benefits of EBF they were still doubtful of practice of EBF (Kerr et al., 2007). The influence of their culture on EBF practice also made it questionable if they would give mothers the correct information. As mentioned in the study that a number of mothers had a primary education thus it is essential to ensure that practitioners are trained in order to address these cultural ideas that inhibit the promotion of EBF. Additionally practitioners should also avoid medical terms that may be confusing to mothers as this may also be the reason for the negative association.

Education

An increase in education among mothers is needed. The government and education department in Malawi needs to create strategies that will address the large numbers of mothers with a primary education as their highest attainment. Education as shown in the literature review has a positive impact on the practice of EBF, with secondary education having a positive and statically significant impact it should therefore be an objective for the government to ensure mothers reach higher educational attainments. Taking in to note that primary education had a negative association, this shows that mothers need higher educational attainments as positive association were seen for secondary and higher education.

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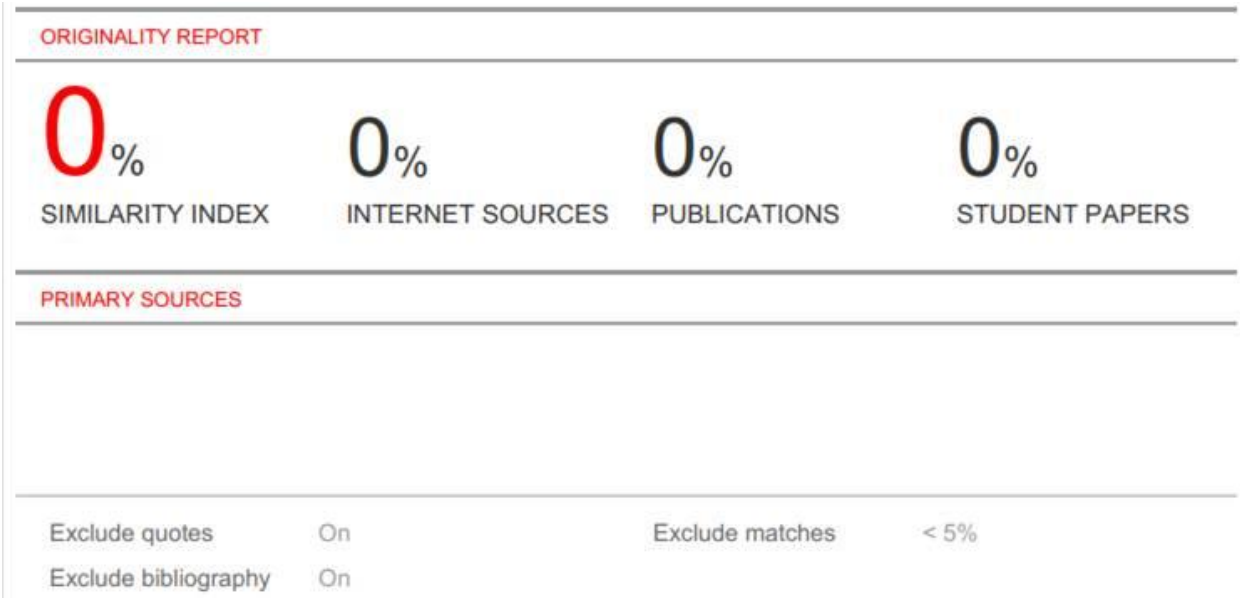
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Appendix 1

TURN IT IN REPORT

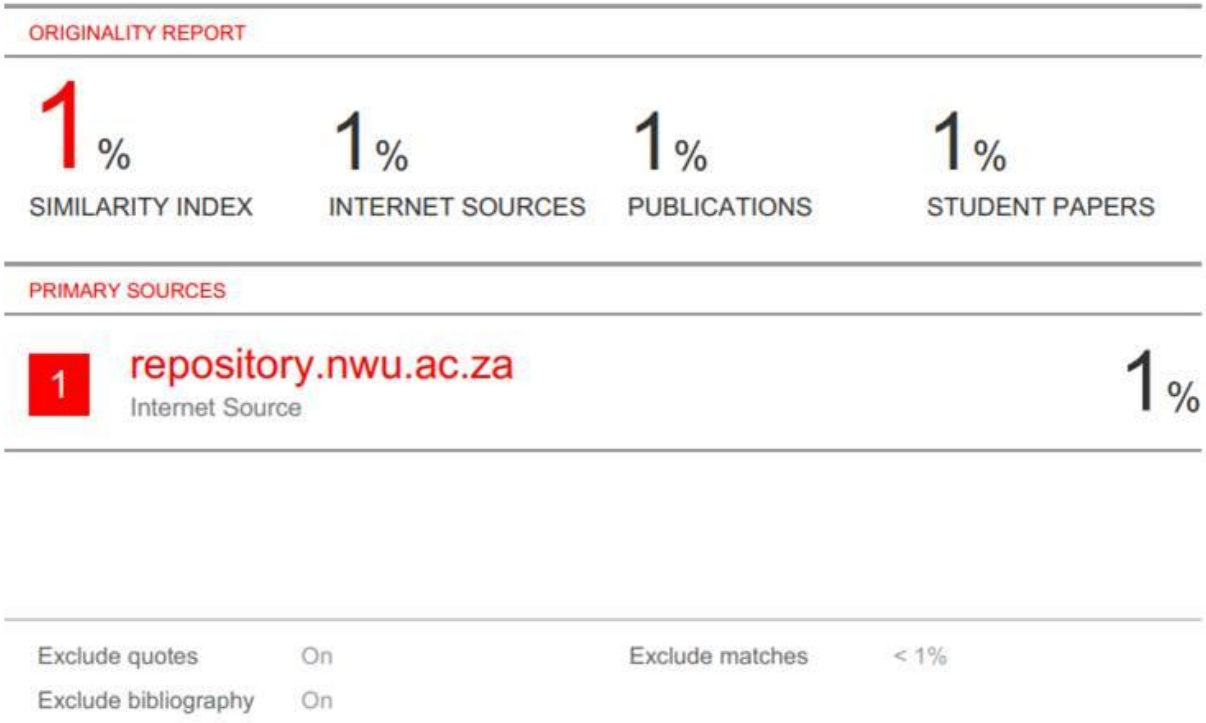


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