HARAMAYA UNIVERSITY

SCHOOL OF POSTGRADUATE STUDIES

Exclusive Breastfeeding Practice and associated factors among mothers of infants aged under six months in rural kebeles of Boke district, West Hararghe Zone, Eastern Ethiopia

MPH THESIS

Jemal Husein (BSc)

April 2018

Haramaya University, Harar

Exclusive Breast Feeding Practice and associated factors among mothers of infants aged under six months in rural kebeles of Boke district, West Hararghe Zone, Eastern Ethiopia

A Thesis Submitted to school of Post Graduate Studies,
Haramaya University

In Partial Fulfillment of the Requirements for the Degree of
Masters in General Public Health

Jemal Husein

College:	**Health and Medical Sciences**
School:	**Public Health**
Program:	**General Public Health**
Major Advisor:	**Negga Baraki (MPH, Assistant Prof.)**
Co-Advisor:	**Firehiwot Mesfin (PhD, Assistant Prof.)**

April 2018
Haramaya University, Harar

APPROVAL SHEET

HARAMAYA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

I hereby certify that I have read and evaluated this thesis entitled "Exclusive breastfeeding practice and associated factors among infants aged under six months in rural kebeles of Boke district, West Hararghe zone, Eastern Ethiopia" Prepared under my guidance by Jemal Husein. I recommend that it be submitted as fulfilling thesis requirements.

Mr. Negga Baraki (MPH, Assistant Prof.) _____ _____

Major Advisor Signature Date

Dr. Firehiwot Mesfin (PhD, Assistant Prof.) _____ _____

Co-Advisor Signature Date

As a member of the Board of Examiner of MPH Thesis Open Defense Examination, I certify that I have read and evaluated the Thesis prepared by Jemal Husein and examined the candidate. I recommend that the thesis be accepted as fulfilling the Thesis requirements for the degree of Masters of General Public Health.

_____ _____ _____

Chairman Signature Date

_____ _____ _____

Internal Examiner Signature Date

_____ _____ _____

External Examiner Signature Date

Final approval and acceptance of the Thesis is contingent upon the submission of its final copy to the Council of Graduate Studies (CGS) through the candidate's Department or School of Graduate Committee (DGC/SG).

STATEMENT OF THE AUTHOR

By my signature below, I declare and affirm this thesis entitled "Exclusive breastfeeding practice and associated factors among infants less than six months of age in the rural kebeles of Boke district, west Hararghe zone, eastern Ethiopia" is my own work. I have followed all ethical and technical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis.

This thesis is submitted in partial fulfillment of the requirement for MPH degree from the School of Graduate Studies at Haramaya University. The thesis is deposited in the Haramaya University Library and is made available to borrowers under the rules of the library. I solemnly declare that this thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

Brief quotations from this thesis may be used without special permission provided that accurate and complete acknowledgement of the source is made. Requests for permission for extended quotations from, or reproduction of, this thesis in whole or in part may be granted by the Head of the School or Department or the Dean of the School of Graduate Studies when in his or her judgment the proposed use of the material is in the interest of scholarship. In all other instances, however, permission must be obtained from the author of the thesis.

Name: _____ Signature: _____

Date: _____

School/Department: _____

BIOGRAPHICAL SKETCH

I was born on January 4, 1990 in Shanan kolu woreda, East Arsi Zone, Oromia Regional State, Ethiopia. I have attended my elementary school at Dumuga; secondary and preparatory school in Mechara secondary school. I graduated from Haramaya University, College of Health and Medical Science in 2010 by degree of Bachelor Science (BSc) in Nursing. Since then I worked in Boke Woreda Health Office as a generic BSc Nurse until I joined Haramaya University Post Graduate Program Directorate in July 2016 to pursue study leading to Master of Science degree in Public Health.

ACKNOWLEDGEMENTS

First of all, I would like to express my Special appreciation to my advisors: Mr. Negga Baraki (MPH, Asst. Prof.) and Dr. Firehiwot Mesfin (Ph.D, Asst. Prof) for their supportive comments and guidance starting from title selection through all the time of research and writing of this thesis.

My deepest gratitude also goes to thank Oromia Regional Health Bureau, for giving me the chance and providing finance for research work and allocating free time to study and for the thesis write up.

I would like to thank Boke District Health Office administration with all stuff members and Health extension workers for their cooperation and assistance during data collection. I would also like to thank to the study participants, data collectors, supervisors and data clerks for their great contribution for the completion of this study.

Special thanks to my family next to God and my colleague Umar Shamsadin and Gebeyehu Mumme for their great contribution for the completion of the study.

Last but not the least; I would thank all my friends those support me, by giving constructive ideas, contributions and supports throughout this study.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figures Page

ABBREVIATIONS AND ACRONMS

AOR	Adjusted Odd Ratio
ANC	Antenatal Care
CI	Confidence Interval
COR	Crude Odd Ratio
CSA	Central Statistical Agency of Ethiopia
EBF	Exclusive Breastfeeding
EDHS	Ethiopian Demographic and Health Survey
HEW	Health Extension Workers
HSDP	Health Sector Development Plan
IHRERC	Institutional Health Research Ethics Review Committee
IYCF	Infant and Young Child feeding
PI	Principal Investigator
PNC	Postnatal Care
SRS	Simple Random Sampling
SS	Systematic Sampling
SSA	Sub-Saharan Africa
SPSS	Statistical Software Package for Social Sciences
UNICEF	United Nations Children's Fund
WHO	World Health Organization

ABSTRACT

Background: Exclusive breastfeeding is the best and cost effective intervention to prevent childhood morbidities and mortalities. It prevents 13% of childhood mortality, and it is estimated that the lives of at least 1.4 million deaths worldwide among children under five would be saved every year. Globally 36% and about 39% of infants in the developing countries are exclusively breastfed even though 90% and above are recommended to benefit from the practice. Moreover, there are inconsistencies among estimates in different regions and districts of the country and there was no study conducted on similar topic in the study area.

Objective: To assess the prevalence of exclusive breastfeeding practice and associated factors among mothers of infants less than six months of age in rural kebeles of Boke district, West Hararghe Zone, Eastern Ethiopia.

Method and Materials: Community based cross-sectional study was conducted in rural kebeles of Boke District, West Hararghe on 393 mothers having infants aged less than six months. Systematic random sampling technique was used to recruit study participants. Structured and pretested questionnaire was used to collect the data. Data were collected by trained nurses after two days training prior to data collection. The collected data were entered in to EPiData version 3.1 computer software and then exported to SPSS statistical software version 20.0 for data analysis. Bi variable logistic regression was performed to assess the association between each independent and dependent variable and Variables with p-value< 0.25 were taken in to multivariable logistic regression models. Multivariable analyses were performed to identify factors associated with the outcome variable along with 95% Confidence intervals and control possible confounding. Level of statistical significance was declared at p value less than 0.05.

Results: The total prevalence of exclusive breastfeeding practice in the last 24 hours preceding the survey was 55.9% [95% CL: 50.7%, 60.8%]. Mothers age 15-24years [AOR= 3.58 (95% CI: (1.06, 11.95)] and 25-34 years [AOR=3.49 (95% CI: 1.08, 11.28)], delivering at a health facility [AOR=1.96 (95% CI: 1.24, 3.12)], having good Knowledge on breastfeeding[AOR=1.82 (95% CI: 1.16, 2.86)] and educated mothers [AOR=2.98 (95% CI: 1.92, 4.62)] were found to be significantly associated with exclusive breastfeeding practice.

Conclusion: The prevalence of exclusive breastfeeding in this study area was low. Exclusive breastfeeding practices were significantly associated with age of the mothers, Place of delivery, Knowledge status of mothers and educational status of mother's. Strengthening maternal education, promoting institutional delivery and improving maternal knowledge through behavior change communication were recommended to increase the proportion of women practicing exclusive breastfeeding.

Key words: Prevalence, Associated Factors, EBF, Infants aged under six months, Boke district.

1. INTRODUCTION

1.1. Background

Exclusive breastfeeding (EBF) is defined as an infant has received only breast milk from his/her mother or a wet nurse, or expressed breast milk and no other liquids, or solids, not even water, with the exception of oral rehydration solution, drops or syrups consisting of vitamins, minerals supplements or medicines (WHO, 2009). Breast milk is the one and only natural, complete and complex nutrition for human infants. It is superior to any product given to a baby and it is immediately available, fresh, temperature always correct and constant, economically inexpensive food for babies (Klieg man RM. et al., 2007).

The WHO and UNICEF recommend that mothers put newborns to the breast within one hour of birth, breastfeed infants exclusively for the first six months and starting soft foods at sixth months and continue to breastfeed for two years. For the first six months of life, breast milk alone is providing all of the nutrients, including vitamins and minerals, an infant needs, meaning that no other liquid or food is needed. In addition, breast milk carries antibodies from the mother that help combat disease, protecting babies from diarrhea and acute respiratory infections (Hanson LA, 2004).

EBF is the optimal feeding practice to achieve infants' growth and development. It is one of the strategies to improve nutritional status and growth in children. EBF can avert the major causes of neonatal death such as acute respiratory tract infections, diarrhea, sepsis and meningitis (UNICEF/WHO, 2010). Delayed early initiation of breastfeeding, non-exclusive breastfeeding, and early complementary infant feeding are practices associated with high rates of child morbidity and mortality in developing countries (UNICEF, 2014). The risk of death from infectious diseases in the first two year of life and suffering from non-communicable disease later in life is lower for infants who have been breastfed optimally, and positive outcomes associated with breastfeeding are well-established (WHO, 2014). Exclusive breastfeeding is also beneficial for mothers by improving maternal survival rate and lowering the risk to non-communicable diseases (Nabulsi, 2014).

The global public health recommendation is that infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health (WHO, 2011). Exclusive breastfeeding in the first six months of life stimulates babies' immune systems and protects them from diarrhea and acute respiratory infections, two of the major causes of infant mortality in the developing world and improves their responses to vaccination (UNICEF, 2006).

Exclusive breastfeeding of infants for the first six months of life is globally recognized as the most effective preventive intervention for ensuring child survival and continues to serve as an appropriate method through which newborns are offered essential nutrients necessary for optimal growth and intellectual development. Breast milk is regarded as perfect, natural and protective food for newborns. prolonging people's lives by reducing mortality and preventing disease by reducing morbidity are some of the goals of public health (Klieg man RM. et al., 2007; Brulde, 2011).

1.2. Statement of the problem

Globally only 36% of infants less than six months of age are exclusively breastfeed, about 39% in the developing countries and 35% in Africa are exclusively breastfeed for the first six months, even though 90% and above is recommended to benefit from the practice. Majority of mothers started to exclusively breastfed their infants at birth and the rate declined greatly about two or more months even though optimal breastfeeding is intervention with the highest life-saving potential that can avoid 13% of child deaths worldwide (UNICEF, 2009; Chola L. et al., 2011; Yadavannavar and Patil, 2011; Cai et al., 2012; Alakour et al., 2014).

Over two-thirds deaths occurring worldwide during children's first year of life are often associated with inappropriate feeding practices, especially due to poor EBF practices (WHO, 2011). High infant mortality rates associated with diarrhea, acute respiratory infections and poor responses to vaccinations result from lack of EBF (UNICEF, 2006).

Approximately 1.5 million young infants die each year as a result of lack of knowledge about EBF benefits and improper infant and young child feeding practices (Nguyen, 2009). Global risk assessment of suboptimal breastfeeding indicates that 96% of all infant deaths in developing countries are attributable to inappropriate breastfeeding occurring during the first six months of

life which is much higher in Asia and Africa. It accounts 55% of diarrheal deaths and 53% of acute respiratory deaths in the first six months of life (Lauer et al., 2006).

Exclusive breastfeeding is the most widely known and cost effective intervention for preventing early-childhood deaths. Optimum Exclusive breastfeeding practices can prevent 1.4 million deaths worldwide among children under five every year. Lack of exclusive breastfeeding contributes to 45% of neonatal infectious deaths, 30% of diarrheal deaths and 18% of acute respiratory deaths among children under five in developing countries and It also accounts for 10% of the disease burden in children less than five years old (WHO, 2009). EBF can significantly reduce the burden of under-five death in Africa especially Sub-Saharan Africa (SSA) where 41% of global under five death occur mainly due to inadequate breastfeeding practices and high levels of disease (Amsalu and Tigabu, 2008).

Infants when exclusively breastfed for the optimal duration of six months are significantly protected against the major childhood diseases conditions such as: diarrhea, gastrointestinal tract infection, allergic diseases, diabetes, obesity, childhood leukemia and lymphoma, inflammatory, bowel disease and improves their responses to vaccination (WHO, 2012; American Academy of Pediatrics, 2012). Those infants who are exclusively breastfed have less chance of becoming ill or dying from diarrhea and other infections. During the first two months of life, infants who are not breastfed are nearly six times more likely to die from infectious diseases than infants who are breastfed; between 2 and 3 months, non-breastfed infants are 4 times more likely to die compared to breastfed infants (WHO, 2010, 2014).

In Ethiopia suboptimal breastfeeding practices are the major contributor to an estimated 70,000 infant deaths per year which is 24% of the total infant death annually and nearly 321,000 under five children die each year from which malnutrition is the cause for about 57% of deaths primarily through the exacerbation of other major causes, such as diarrhea and pneumonia death from which can be significantly prevented by nutrition interventions such as exclusive breast feeding (Atindanbila S. et al., 2014; EFMHR, 2015).

Many factors have found to affect EBF practice such as; Societal beliefs favoring mixed feeding, age, education, residence, marital status, occupation, the household's socio-economic position, lack of adequate support in health facilities and in the community, antenatal care

attendance, place of delivery, mode of delivery, postnatal care attendance, knowledge about EBF, the household food security status, aggressive promotion of infant formula through medias, inadequate maternity leave legislation, accessibility to health facility(Seid el at., 2013; Egata el at., 2013; Ayele Lenja el at., 2016; Sorato, 2017; Tilahun el at., 2017).

To strengthen the effort in reducing child mortality, the Ethiopian Ministry of Health had targeted an increase in the proportion of exclusively breastfed infants under age 6 months to 72 percent by 2019/20 as one strategy to improve child health (HSTP, 2015). The 2016 Ethiopian Demographic and Health Survey showed the proportion of infants received EBF were 58% which improved slightly only 6% compared to preceding survey. Contrary to recommendation by WHO those infants under 6 months should be exclusively breastfed, 17% of infants 0-5 months consume plain water, 11% consume complementary foods in addition to breast milk and 5% of infants under age 6 months are not breastfed at all (CSA, 2016).

Although breastfeeding is one of the components of Primary Health Care in Ethiopia, a wide range of harmful infant feeding practices are documented in the country including the study area even after implementation of infant and young child feeding recommendations. The factors associated with the exclusive breastfeeding may differ among Regions, Zones, and Communities and there is no study conducted with similar topic in the study area, so identifying factors associated with EBF practices has much importance especially in rural areas of the district. Therefore, this study was designed to identify factors associated to exclusive breastfeeding practices among mother-infant pairs in rural communities of Boke district.

1.3. Significances of the Study

There is a need for greater efforts to promote and support the healthy practice of exclusive breastfeeding. The planning of public health interventions to promote longer and more exclusive breastfeeding practice requires an understanding of the factors that hinder the practice. Even though, it has significant impact on infant and child morbidity and mortality, exclusive breastfeeding practice is still got little concern by health care providers and less actual practice at ground level in the community.

Therefore the findings of this study will have an input for health office of the Boke district, health department of the West Hararghe zone and program managers to implement intervention and concerned in solving factors associated with exclusive breast feeding practice in order to direct for better planning, implementation and monitoring of EBF to provide attention and efforts by all concerned bodies and create awareness to reduce child mortality and morbidity. The different stakeholders working on breast feeding at study setting could use the result from this research as a baseline in their planning and implementing intervention on the exclusive breastfeeding practice for the first six months of infant life and strengthen the good practices. Moreover, the finding of this study will also help as a baseline data for others who are interested in carrying out further studies in this regard.

1.4. Objective

1.4.1. General objective

- To assess prevalence of exclusive breastfeeding practice and associated factors among mothers of infants aged less than six months in rural kebeles of Boke district, West Hararghe Zone, Eastern Ethiopia.

1.4.2. Specific objectives

- To estimate the prevalence of exclusive breastfeeding practice among mothers of infants aged less than six months in rural kebeles of Boke district.
- To identify factors associated with exclusive breastfeeding practice among mothers of infants aged less than six months in rural kebeles of Boke district.

2. LITERATURE REVIEW

2.1. Prevalence of exclusive breastfeeding practice

Globally, it is estimated that only 36% of infants worldwide, 39% of infants in the developing countries and 31% infants in sub-Saharan Africa are exclusively breastfed during the first six months of life (WHO, 2009; Wardlaw et al., 2012). Recent analysis on the global prevalence of EBF across 140 countries, also reported an increase in the developing world from 33% in 1995 to 39% in 2010 among infants aged 0-5 months. Increases from West and Central Africa were more than twofold i.e. from 12% in 1995 to 28% in 2010. There had also been considerable improvements from 35% in 1995 to 47% in 2010 among countries in Eastern and Southern Africa whereas those in South Asia witnessed a modest surge from 40% in 1995 to 45% in 2010 (Wardlaw et al., 2012).

Descriptive community-based cross-sectional study conducted in Kingdome of Saudi Arabia from January to March 2016 shows exclusively breastfeeding practice for full six months were (29.5%), for four months are the majority (64.5%) while only (6.0%) breastfeed for two months (Abdulaziz and Kamal, 2016). Similarly Cross-sectional study conducted in Rural Uttar Pradesh shows the prevalence of exclusive breastfeeding practice was only 24.8% of the total while the rest were not fully practices it (Verma and Dixit, 2016).

Another study conducted in Sagamu Southwest Nigeria, 2015 revealed that from all respondents 43.9% practiced predominant breastfeeding and mixed feeding; while 56.1% practiced exclusive breastfeeding (Oluwafolahan et al., 2015). In addition the descriptive cross-sectional study done in low income settlement of kangemi, Nairobi from October-December, 2014 showed that overall, almost a half (45.5%) of mothers were exclusively breastfeeding their infants and the median duration of exclusive breast feeding was two months (Ayisi et al., 2014).

A secondary data analysis insight from the 2008 Ghana Demographic and Health Survey(GDHS) was shows the prevalence of exclusive breastfeeding at 6 months age of infants in the country was 64% (Anthony and Akwasi , 2013) and the rate of exclusive breastfeeding based on 24 hour recall was 56.7% in Molo district of Kenya (Mututho, 2012).

In Ethiopia national level Ethiopian Demographic Health Survey (2016) shows, 58% of infants less than six months are exclusively breastfed. The percentage of exclusively breastfed practice decreases sharply with age from 74% of infant's age 0-1 month to 64 % of those age 2-3 months and to 36 % of infant's age 4-5 months. 9% of infants less than six months use a bottle with a nipple a practice which is discouraged because of the risk of illness to the child (CSA, 2016).

According to the study conducted in Mecha District, North West Ethiopia in April 2012 the prevalence of exclusive breastfeeding at 6-months age of infants was 47.13% and the median duration of exclusive breastfeeding was five month (Woldie el at., 2014). Other community-based cross-sectional study conducted from March to February 2010 involving both quantitative and qualitative data at Goba District, south east Ethiopia was revealed that the prevalence of exclusive breastfeeding for infants' aged less than six months was 71.3% and median duration of exclusive breastfeeding for infants less than six months was three months while median frequency of exclusive breastfeeding for infants less than six months per day was six (Setegn at el., 2012).

According to community based cross-sectional study done from February to April in 2015 at rural communities of Offa district, Southern Ethiopia showed that proportion of exclusive breastfeeding was 78.0% (Ayele L el at., 2016). Another study conducted between November 2013 and January 2014 among women with infants aged less than 6 months in Halaba special woreda, SNNPR reported that prevalence of exclusive breastfeeding practice was 70.5 %(Asrat S. and Amare W., 2015), and study conducted from April 7 to May 7, 2015 in Motta town East Gojjam reported that Prevalence of EBF practice was 50.1% (Tilahun T el at., 2017)

A community based cross sectional survey conducted from September 15 to October 15, 2016 at Chencha district, Gamo Gofa Zone to assess Levels and Predictors of Exclusive Breast Feeding among Rural Mothers shows that the prevalence of exclusive breast feeding was 40.7% (Sorato, 2017). In study done from 10 to 25 June 2012 in Bahir Dar city, Northwest Ethiopia, the rate of exclusive breastfeeding appropriate to the infant's age was 50.3% (Seid et al., 2013). Other Community based study conducted from June to August 2014 in Dilla Zuria District, Gedeo Zone, SNNPR, Ethiopia reported 57.6% of mothers practiced exclusive breastfeeding for six months and Mothers who practiced EBF for only one, two-three and four-five were, 2.9%,

12.7% and 26.8% respectively (Reddy and Abuka, 2016) and A study conducted from 1-20 March, 2016 in Gozamin district shows the prevalence of exclusive breastfeeding among mothers was 74.1%(Melkamu et al., 2017).

According to the study done to identify determinants of exclusive breastfeeding practices in Ethiopia from April 27 to August 30, 2005 reported that, the proportion of women who practiced EBF and predominant breast-feeding were 49.0% and 19% respectively making the overall rate of full breastfeeding's (both EBF and PBF) 68.2% and the proportion of women who gave pre-lacteal feeding within the first three days of life and used bottle-feeding were 13% and 28.5% respectively. Moreover, the percentage of women who had never breast-fed was only 0.6% (Tewodros el at., 2009).

A community cross-sectional study conducted on associated factors with timely initiation and EBF among mothers of Axum town from May 10-26, 2013 indicated that, prevalence of timely initiation and exclusive breastfeeding was 41.6% and 40.9%, respectively, while 45% of mothers squeezed out and throw away the colostrums and only 17.2% of the mothers were giving the child other than breast milk in the first three days after delivery, from which out of this 33.3% mothers gave cow milk. Only 34% mothers got support from their husband while they breastfeed their child (Alemayehu et al., 2014).

2.2. Factors associated with exclusive breastfeeding practice

2.2.1. Socio-demographic characteristics

According to cross-Sectional Study done in Hosanna town, southern Ethiopia, 2015 shows that, age group of the mothers from 15-24 were three times more likely to practice exclusive breast feeding than age group 35-49years (Earsido el at.,1017). Another Cross-Sectional Study done in rural Chencha district, in January 2016 shows Mothers15-24 years old were 12 times more likely to exclusively breastfeed their baby than those in age range 35-44 years (Sorato, 2017) and study in Dilla Zuria District from June to August 2014, were revealed, those mothers aged 20-29 were 6.5 times higher EBF practices as compared to aged 30-39(Reddy and Abuka, 2016).

A Cross-Sectional Study done in Debre Tabor Town, Northwest Ethiopia in April 2014 shows that mothers' occupation or being a housewife was associated with exclusive breastfeeding being a housewife in occupation were 2.4 times higher to practice. On the other hand, mothers were more likely employed and thus spend less time with the child to give the breast milk consistently (Getachew and Haileyesus, 2016). Similar study in Bahir Dar city from 10 to 25 June 2012, being housewives had adjusted odds of 2.2 of practicing EBF compared to other occupations (Seid el at., 2013). Moreover, study done in Goba district, south east Ethiopia from March to February 2010 was revealed Unemployed mothers practiced relatively better EBF than their counter parts (Setegn el at., 2012).

According to the cross-sectional study conducted from February to April in 2015 at rural communities of Offa district, Southern Ethiopia mothers who attended formal education were four times more likely to exclusively breastfeed their children than their counterparts (Ayele Lenja el at., 2016) and Similar study conducted in Halaba special woreda, SNNPR, from November, 2013 to January, 2014 shows that Children from mothers who attended formal school/education were six times more likely to practice exclusive breast feeding to those mothers who were not attended (Asrat S. and Amare W., 2015).

As study conducted from September 15 to October 15, 2016 at Chencha district, Gamo Gofa Zone among rural mothers, were reported that mothers with family size 3 were 2 times more likely to exclusively breastfeed their baby than those with family size of six(Sorato, 2017) and similar study conducted in Dilla Zuria District, Gedeo Zone from June to August 2014 also indicates mothers belongs to family of 4 and less family size were 2.25 times higher to practices EBF as compared to family size above 4 members(Reddy and Abuka ,2016).

Descriptive cross sectional study conducted from April 7, 2015 to May 7, 2015 in Motta town, East Gojjam revealed that mothers earning less money per month (<1000 birr/month) were 3.6 times more likely to practice exclusive breastfeeding than mothers whose average monthly household income was 2001birr/month and above(Tilahun T el at., 2017). In similar, other study done in Ethiopia from April 27 to August 30, 2005 revealed women in the wealth index ranking middle and above were two times more likely to exclusively breastfeed than the reference category (Tewodros el at., 2009) and A community based cross-sectional study

conducted in Azezo District, Northwest Ethiopia, from May–June 2014 indicate mothers earning ≤1000 birr (US $47.62) monthly were 77 % less likely to practice EBF than their counter parts (Mulusew Andualem, 2016).

2.2.2. Maternal characteristics

A cross sectional study finding in Tanzania from March to May 2010 reported that mothers who have adequate knowledge of EBF were 5.4 times more likely to exclusively breast feed than mothers those who have not adequate knowledge (Nkala and Msuya, 2011). Another study conducted in Mecha District, Amhara Region in April 2012,were indicated that mothers who have adequate knowledge on breastfeeding were 2.06 times more likely to practice exclusively breast feed than mothers who have inadequate knowledge (Woldie el at., 2014). Moreover, according to study conducted from September 15 to October 15, 2016 at Chencha district, Gamo Gofa Zone, Southern Ethiopia, reported that mothers with good knowledge on breastfeeding were 1.2 times more likely to exclusively breast feed their baby than those with poor knowledge (Sorato, 2016). Other study done in Jimma Town, Southwest Ethiopia, from January to February, 2013 were revealed that having good knowledge on breast feeding were 2 times more likely to practice exclusive breast feeding than their counterparts (Seifu el at., 2014).

According to cross-sectional study conducted in Bahir Dar city from 10 to 25 June 2012, mothers who received counseling/advice on infant feeding had adjusted odds of 5.2 of practicing EBF than those who had not (Seid el at., 2013). In addition study done from 1 March to 20 March 2016 in Gozamin district, northwest Ethiopia indicated mothers who did not receive breastfeeding counseling after delivery were 0.43 times less likely to practice exclusive breastfeeding compared with mothers who received the services (Melkamu el at., 2017) and Similar study done in Debre Tabor Town, Northwest Ethiopia in April 2014 revealed those mothers receiving counseling/advice on infant feeding was practiced EBF about two times more likely than those who did not get counseling about EBF (Getachew and Haileyesus, 2016).

Parity of mother was significantly associated with practice of EBF as evidenced by studies in Bahir Dar city from Jan to Feb 2013, mothers who are primipara were two times higher to practice EBF than those who were multipara mothers (Sefene el at., 2013) and Similar study conducted from June to August 2014 in Dilla Zuria District, Gedeo Zone reports mothers who

have birth order 1st and 2nd to 3rd were 9.8 times and 11 times higher EBF practice respectively as compared to 4th and above birth order(Reddy S and Abuka T ,2016).

As study done in April 2012 at Mecha District, North West Ethiopia, timely initiation of breastfeeding had significant association with EBF practice. Infants who is initiated BF with in the first one hour of birth are 2.98 times more likely to exclusively breast feed than those who did not initiated BF immediately after birth (Woldie el at., 2014). This is in accordance with finding from Egypt that conducted in 2010 which revealed infants who initiated BF immediately were 2.2 times more likely to exclusively breast feed than those who initiated BF after 24 hours (Ghwass and Ahmed, 2011).

In other study conducted on associated factors with timely initiation and EBF among mothers of Axum town from May 10-26, 2013 indicated that, mothers who didn't give colostrums to their newborn within an hour after birth were less likely to practice exclusive breastfeeding than mothers who gave colostrums within an hour after delivery AOR=0.13 (95%CI: 0.08, 0.21)(Alemayehu el at., 2014). As study conducted in Azezo District, Northwest Ethiopia, from May-June 2014 indicate mothers not practicing prelacteal feeding were 2.16 more likely to exclusively breastfeed compared with mothers practicing prelacteal feeding (Mulusew Andualem, 2016).

As study done in Brazil among mother-child pairs since 2004 in order to assess the incidence and risk factors of lactation mastitis indicates that maternal illness like crackled nipples negatively affected the practice of exclusive breast feeding (Vieira GO, 2010). Moreover, in other cross-sectional study conducted in Tanzania ,2010 reported that women who had no problems related to breasts like engorgement/cracked nipples were more likely to exclusively breastfeed compared to others (Nkala and Msuya, 2011) and cross sectional study conducted from March to October 2013 at Rawal institute of health sciences (RIHS) also support this (Yaqub and Gul, 2013).

A cross-sectional survey conducted in Dare salaam,2012 showed that exclusive breastfeeding practice was influenced mainly by mothers perception that breast milk is not sufficient for infant's body requirements for the first six months of life (Saka F, 2012).In addition, study conducted from March 24-April 14, 2013 among employed and unemployed mothers in Injibara Town, Awi Zone, North West Ethiopia reported exclusive breastfeeding practice was

influenced mainly by mothers perception that breast milk is not sufficient for infant's (Taddele el at., 2014).

2.2.3. Healthcare service characteristics

According to a cross sectional study done in Mecha District, North West Ethiopia in April 2012 Antenatal care and Postnatal care had an association with higher chance of exclusively breast feeding; mothers who had three and more Antenatal care visit were 1.7 time more likely to exclusively breast feed for 6 months as compared to those who have no Antenatal care visit during pregnancy and mothers who got Postnatal care counseling on infant feeding were 2.27 more likely to practice EBF as compared to those who did not get the counseling (Woldie el at., 2014). Similar study conducted from September 15 to October 15, 2016 at Chencha district, Gamo Gofa Zone among rural mothers shows that mothers with no Antenatal care follow-up history were 0.037 less likely to exclusively breast feed their baby than those Antenatal care follow-up (Sorato, 2017) and study done in Goba town from March to February 2010 reveals mothers who received antenatal and postnatal care had better rates of EBF (Setegn el at., 2012).

Study from Debre Tabor Town in April 2014 indicated that infants who are born in health institutions were about four times more likely to be exclusively breastfed than those who are born at home (Getachew and Haileyesus, 2016) and Similar study done in Azezo District, 2014 shows the exclusive breastfeeding practice of mothers who delivered at healthcare facilities was double compared with mothers who delivered at home (Mulusew Andualem, 2016). According to other study done from 1 March to 20 March 2016 in Gozamin district, northwest Ethiopia the odds of EBF for mothers who delivered at the government hospital was two-fold compared to mothers who delivered at home (Melkamu el at., 2017). Another cross-sectional study conducted in Bahir Dar city from 10 to 25 June 2012 revealed mothers who delivered their last child at a health facility had an adjusted odds 3 to practice EBF compared to those who delivered at home, whereas those mothers who gave birth vaginally had an adjusted odds of 2.3 of practicing exclusively breastfeeding (seid el at., 2013).

A community-based analytical cross-sectional study conducted in East Ethiopia from July to August 2011 indicated that Children of mothers who had little access to a health facility were found to be nearly 3 times more likely not to be exclusively breastfed compared with their

counterparts. This might be explained by the fact that pregnant mothers could get information on EBF from health care providers during their contact for antenatal care services. In the principle of primary health care, accessibility refers to the availability of health service rendering institutions within 10 km radius (Egata el at., 2013)

2.2.4. Infant characteristics

A cross-sectional study done in Goba district from March to February 2010 shows infants in the age group < 2 months were about 6 times more likely to be exclusively breastfed when compared to infants in the age group 4-5 months and infants in the age group 2-3 months were 2 times more likely to breastfeed exclusively when compared to those infants in the age group 4-5 months (Setegn el at., 2012). Besides, a cross-sectional survey conducted from April 7, 2015 to May 7, 2015 in Motta town, East Gojjam shows an infant who is 0-1 month old was 4 times more likely to feed exclusively on breast milk than infants aged 4-5 months. Infant between 2-3 months old were almost 2 times higher to feed exclusively on breast milk than 4-5 months old infant (Tilahun el at., 2017) and other cross-sectional study conducted in Bahir Dar city from 10 to 25 June 2012 indicate Children with an age interval of 0-1 month and 2-3months had an adjusted odds ratio of about 3.8 and 2.8 respectively of receiving EBF compared to children aged 6 months and above (seid el at., 2013).

According to community based cross sectional study conducted at Aksum town from May 10-26, 2013 shows that regarding to sex of the child female child had higher chance to exclusively breastfed for the first six months of life (Alemayehu el at., 2014), in contrast according to community survey conducted from Jan to Feb 2013 in Bahir Dar city administration, male infants were almost two times more likely to feed exclusively than female infants (Sefene el at., 2013). Another study conducted from March to October 2013 at Rawal institute of health sciences to assess the reasons of failure of exclusive breastfeeding founded that failure of exclusive breastfeeding was illness of baby (Yaqub and Gul, 2013).

2.3. Conceptual Framework

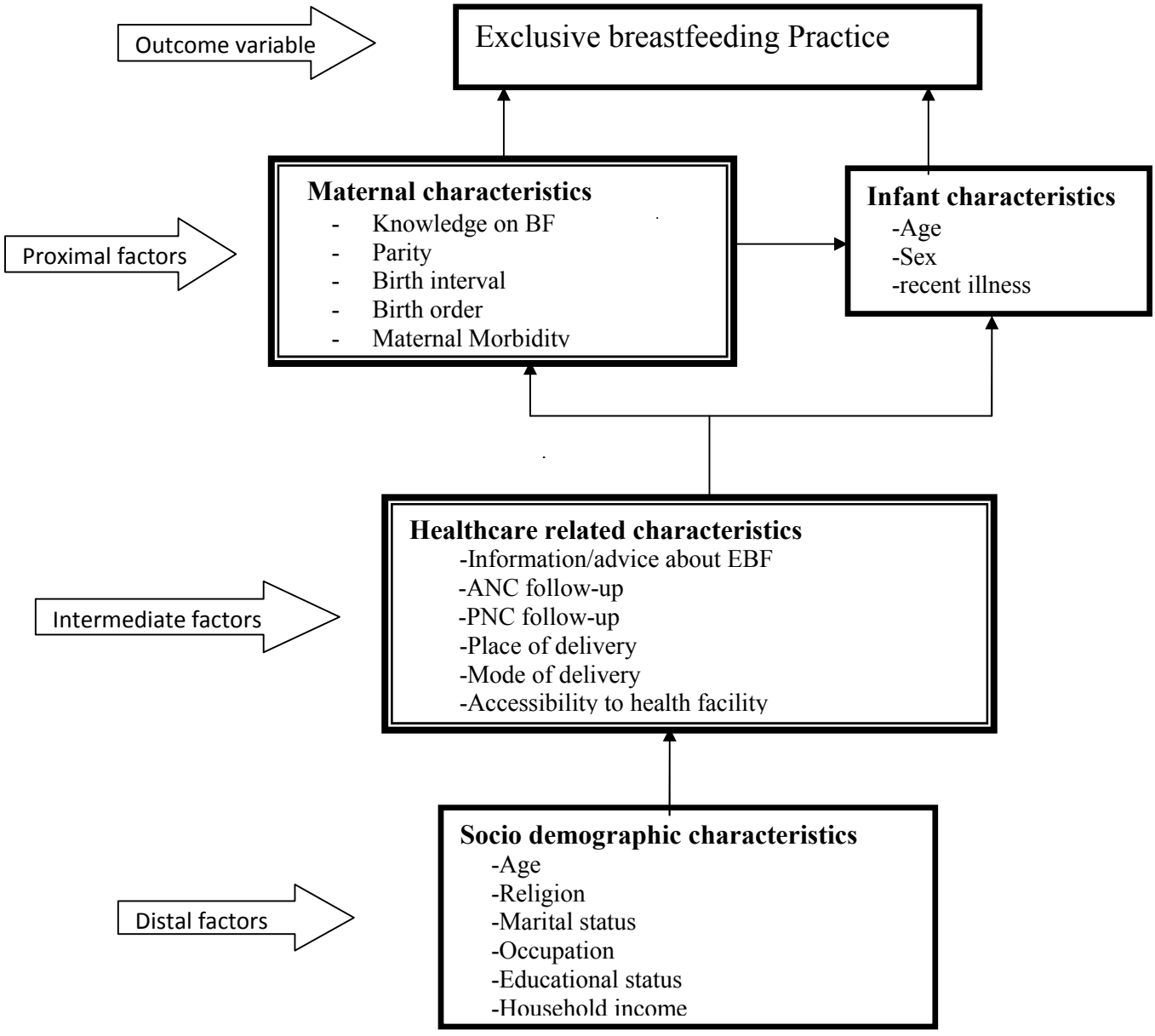

Figure 1: Conceptual framework for factors associated with Exclusive breastfeeding practices among mothers of infants aged less than six months in rural kebeles of Boke district, West Hararghe Zone, Eastern Ethiopia, 2018.

Source: Adapted from different literature by the researcher.

3. Methods and Materials

3.1. Study Area and Period

The study was conducted in Boke district of West Hararghe Zone in Oromia region at rural eastern Ethiopia from February 1-30, 2018. The Woreda located at 388 KM distance from Addis Ababa; capital city of Ethiopia and 78 KM from Chiro capital city of Zone. Boke district is bounded by Oda bultum from east, Burka dhintu from south, Daro labu from west and Habro district from north. The weather condition of the district is characterized by 32% Weyna dega and 68% Kolla. The district has 22 Rural Kebeles and one urban kebele which are 23 kebeles in total. Based on the 2007(1999E.C) census population projection, the total populations of the district are estimated 141907 out of which 71473 are females and 70434 are males. Moreover the total population found in rural kebeles of Boke District is 132963. Total numbers of women of reproductive age group are 31404, pregnant women are 4924, children under five year are 23315, surviving infants are 4569 and the estimated number of infants aged less than six months in rural community are 2260 (1.7%) as reported by the Woreda Health Office in 2017/18. Around 94% of the district is rural population (CSA, 2007). District has five Government health center, 22 health posts, 10 private clinics and 4 private drug shop. Concerning to human resources the district has 68 health workers and 43 health extension (Boke Woreda Health Office, 2018).

3.2. Study Design

A community based cross-sectional study design was applied.

3.3. Source and Study population

3.3.1. Source Population

-All mothers who had infant less than 6 months old living in rural kebeles of Boke district.

3.3.2. Study Population

-All systematically selected mothers of infants aged less than six months from selected kebeles of Boke district.

3.4. Inclusion and Exclusion criteria

3.4.1. Inclusion criteria

- Mothers who had infant less than 6 months.
- Mothers who were residents of district for at least 6 months.

3.4.2. Exclusion criteria

- Mothers who were unable to communicate/respond during the time of data collection.

3.5. Sample Size Determination

The sample size was calculated by using single population proportion formula based on the following assumption:

P=58%, prevalence EBF for infants aged 0-6 months

95% confidence level

5% precision and 5% non-response rate

$$n = \frac{z\,(\alpha/2)^2 p\,(1-p)}{d^2}$$

Where:

n= the desirable sample size

Z (α /2) =the critical value at 95% level of significance (1.96)

P= prevalence of EBF for infants aged 0-6 months of which was 58%(CSA, 2016).

d=precision of measurement (acceptable marginal error)

p=0.58

d=0.05

$$n= \frac{(1.96)^2 \times 0.58 \times 0.42}{(0.05)^2} = 374$$

After adding a 5% non-response rate 19, the total sample size was 393.

Sample size calculation for the second objective (factors associated with exclusive breast feeding practice) obtained from different literatures by using statcalc of EpiInfo statistical software version 7 with the following assumption: Confidence level=95% and Power=80% .

Table 1: Sample size calculation for different factors associated with exclusive breastfeeding practices among mothers of infants aged less than six months in rural kebeles of Boke district, West Hararghe Zone, Eastern Ethiopia, 2018.

Variable	Effect on exclusive breastfeeding practice		Sample size plus 5% non response	Reference
	Exposed	Non exposed		
Maternal education	61%(primary level and above)	39%(un able to read and write)	187	Ayele Lenja el at., 2016
Place of delivery	53.2%(at health facility)	22.1%(at home)	92	seid el at., 2013
Exposure to counseling/ advise on breast feeding	63% (Exposure to advise on breast feeding)	37% (Not exposure to advise on breast feeding)	137	Sorato, 2017

Generally, sample size was calculated for the first and second objectives and the large sample size were found to be 393 from the first objective. Thus, data were collected from 393 mothers who had infants aged 0-6 months.

3.6. Sampling procedure

First, seven rural kebeles were randomly selected from 22 rural kebeles by using simple random sampling technique. All mother-infant pairs having child less than 6 months from health extension registration in each kebele was enumerated. The eligible mother-infant pairs in those selected kebeles including their identification numbers and contact addresses was identified and proportional to size allocation were done to get the required sample from each Kebeles. The registration of mothers who had a child age less than 6 months by the local health extension workers were used as a sampling frame. Thus, using a registered list of family with infant <6

months at the health posts, individual mothers who had an infant <6 months was selected using systematic random sampling technique. The sampling interval was two for each Kebeles. The first household was selected randomly and every second household was selected until the required numbers of mothers were achieved (Figure 2).

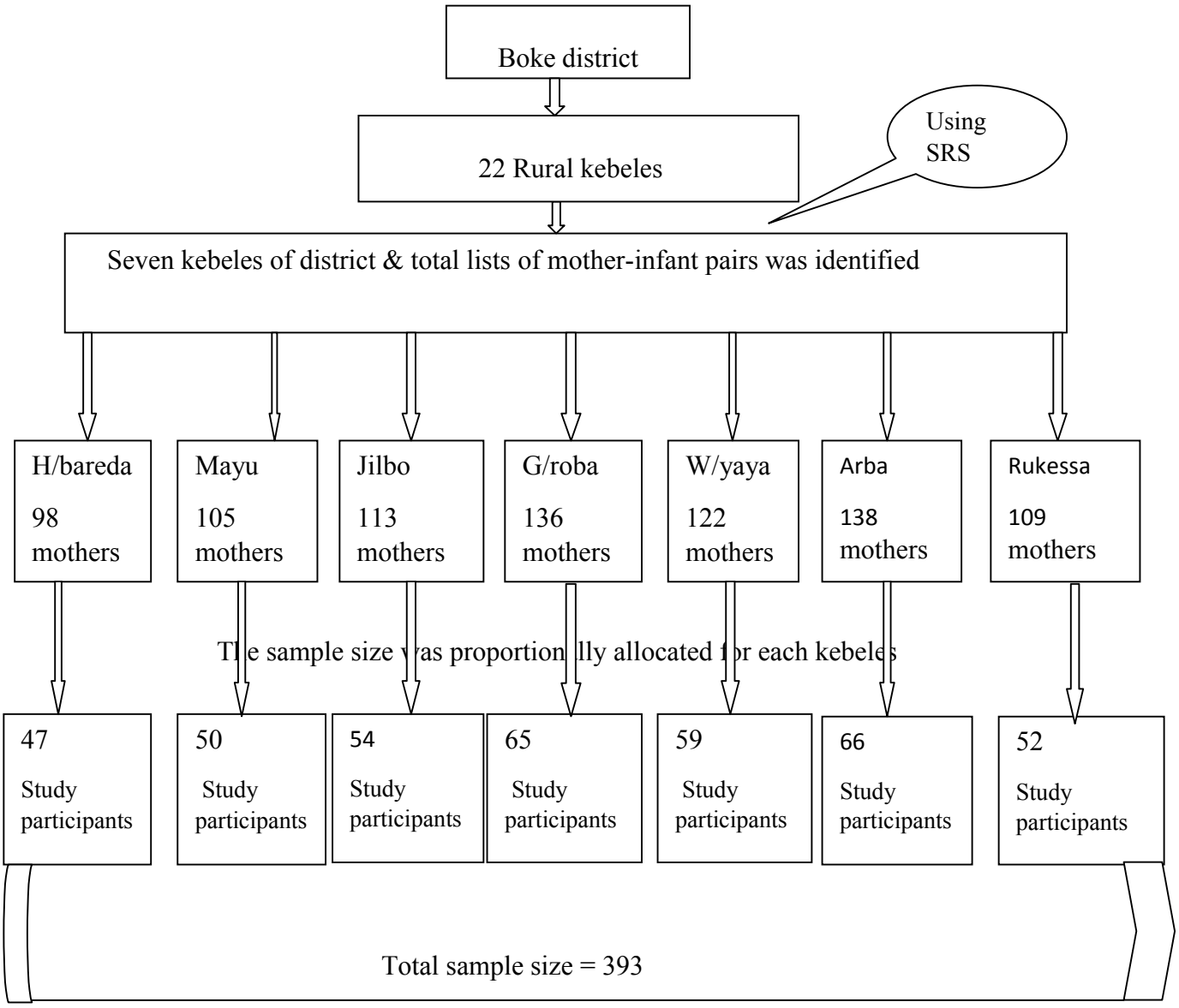

Figure 3: Diagrammatic scheme of sampling procedure for the study done on factors associated with Exclusive breastfeeding practices among mothers of infants aged less than six months in rural kebeles of Boke district, West Hararghe Zone, Eastern Ethiopia, 2018.

3.7. Data Collection Methods

3.7.1. Data Collection Instrument

Structured interviewer administered questionnaire was used to collect data from mothers paired with infants. It was constructed by adapting and modifying from Ethiopia Demographic and Health Survey 2016 and adapted from previous research done on similar topic in Motta town, East Gojjam, Ethiopia (Tilahun T. el at., 2017) with some modification to fit with context. Then, the questionnaire was further developed to include important predictors of this study. A one day infant diet recall method was used for assessing exclusive breastfeeding.

3.7.2. Data Collectors

Interview data was performed by 7 diploma nurses who were fluent in the local language and familiar with the local customs. They were trained for two days on how to fill questionnaires and on ethical consideration. The two BSc. Nurses were assigned as a supervisor to check for the daily activity, consistency and completeness of the questionnaire and to give appropriate support during the data collection process.

3.7.3. Data Collection Procedures

Data were collected using structured questionnaire and a face-to-face interviewing technique from selected participants or mothers of an infant by home visits. The questionnaire included information on Socio demographic/economic factors, maternal factors, Health service related factors, Infant related factors and Exclusive breast feeding practices. Structured questionnaire was prepared in English and translated to Afan Oromo and then translated back to English for checking consistency. During data collection if the eligible mother with an infant was absent from home, the household was revisited for at least three times and a mother who was absent at third visit were considered as non-respondent. Local guiders were used to show the selected households for data collectors.

3.8. Study Variables

3.8.1. Dependent Variable

- ✓ Exclusive breastfeeding practice

3.8.2. Independent Variables

- ✓ **Socio demographic factors**
  - Age**,** Religion, Marital status**,** Occupation, educational status, monthly income.
- ✓ **Maternal factors**
  - Knowledge on breast feeding
  - Parity, Birth interval, Birth order and maternal illness.
- ✓ **Health service related factors**
  - ANC and PNC follow up**,** Place of delivery, Mode of delivery**,**
  - Exposure to information/ counseled on BF, Accessibility to health facility
- ✓ **Infant related factors**
  - Age, Sex**,** Infant illness

3.9. Operational Definitions

Exclusive breastfeeding- this means an infant is fed only on breast milk (including milk expressed from a wet nurse) and allows for medicine, oral rehydration, drops or syrups (vitamins and syrups) 24 hours prior to the Survey (WHO,2008).

Predominant breastfeeding: an infant receives breast milk (including milk expressed from a wet nurse) as the predominant source of nourishment and allows water and water based drinks, fruit juice, oral rehydration salts, drops or syrups (vitamins, minerals and medicine) one day (24hrs) before the survey was conducted (WHO, 2008).

Mixed breastfeeding: if an infant took breast milk with addition of liquid foods like cow milk and formula milk and soft foods like mashed potatoes/meat, porridge, egg, butter one day (24hrs) before the survey was conducted (WHO, 2008) .

Infant: A child from birth to 12 months of age; in this study children aged under 6 months were considered as infants.

Knowledge on BF: Those mothers who scored above the average (mean) point in knowledge assessing questions were categorized as knowledgeable and those who score below the average (mean) were considered to have poor knowledge on breastfeeding practice.

3.10. Data Quality Control

The questionnaire was prepared in English and translated to Afan Oromo for data collection and then translated back to English. Two days training were given to data collectors and supervisors on the data collection tool and data collection procedure. Then the questionnaire was pre-tested on 5% sampled mother-infant pair's in Qersa kebeles witch was out of the study area to ensure its validity and necessary corrections was made based on the results of pretest before the actual data collection. The supervisors and investigators were monitored the data collectors closely and check completeness of each questionnaire on daily basis. Double data entries were done and consistencies of the entered data were cross checked by comparing the two separately entered data on EpiData.

3.11. Data Processing and Analysis

The collected data were entered by two data clerks in to EPiData version 3.1 software and then exported to SPSS statistical software version 20.0 for further data analysis. Descriptive statistics was run to check for any missing values. Summary of descriptive statistics such as frequencies, percentages, means, standard deviation and median were used to describe socio demographic characteristics, maternal and health care characteristics, infant characteristics, breastfeeding practice and maternal knowledge and information on breastfeeding.

During bi-variable analysis, crude odds ratio with 95% CI was used to see the association between each independent variable and the outcome variable by using binary logistic regression model. Independent variables with p-value of < 0.25 were included in multi-variable analysis to control for all possible confounders. Multi-collinearity was also checked to see the linear correlation among the independent variables by using standard error and variance inflation factor. The Hosmer-Lemeshow goodness of fit tests with backward stepwise method was used to test for model fitness. The continuous variables such as maternal and child age were tested using the normal curve with a histogram.

Adjusted odd ratios along with 95% confidence interval was estimated to measure the strength of association between dependent and independent variable and thus identify factors associated

with exclusive breastfeeding practice among mothers of infants aged less than six months. In this study level of statistical significance was declared at p-value < 0.05.

3.12. Ethical Considerations

The study was carried out after the proposal got approval by the Institutional Health Research Ethics Review Committee of Haramaya University College of Health and Medical Sciences and an official letter was written from Department of Public Health to Boke District Health office for cooperation. Permission to collect data was obtained from district administrative health office and the Kebele leader.

Informed voluntary, written and signed or thumb print consent were required from the respondents who were selected to take part in the study. Data collectors were explained to the respondents the target of the study and that the information obtained would be kept confidential and would be used for research purposes only. A written consent was obtained from the respondents before the interview. The respondents were explained that; the risk of being participating in this study was very minimal, but only taking 30 minutes from their time; there would not be any direct payment for participating in this study; the findings obtained from the study is useful for planning intervention programs; and also it would be assured that their participation in the study was volunteer and they had the right to discontinue their participation at any time if they were uncomfortable with the study. Moreover, confidentiality and privacy of participants were maintained throughout the research process.

4. RESULTS

4.1. Socio-demographic characteristics

Out of a total of 393 eligible mother-infant pairs, 390 infant-mother pairs were participated in the study with 99.2% response rate. The age range of mothers considered in the study was 15-49 years, which is a childbearing age range. More than half 217(55.6%) of mothers were aged 25-34 years with 26 years median age (SD±4.8) and one hundred fifty three (39.2%)) of their infants were aged 2-3 months with median ages of 3 months (SD±1.4). Majority (363, (93.1%) and (341 (87.4%)) of participants were Oromo and Muslim in religion and ethnicity. Two hundred seventy seven (71.0%) of mothers were house wife/unemployed while 85(21.8%) were farmers by occupation. Concerning to educational status, 177(45.4%) of mothers and 146(37.4%) of fathers were unable to read/write at all respectively. Regarding to average monthly income of the participants 184(47.2%) of the households earn less than 1000 Ethiopian Birr and Two hundred forty-nine (63.8%) of study participants possess Livestock, while 141(36.2%) of them were not have any livestock (Table 2).

Table 2**:** Socio-demographic characteristics of mothers with infants aged less than six months in rural kebeles of Boke district of West Hararghe Zone, Eastern Ethiopia, 2018 (n=390).

Variables	Category	Frequency (No)	Percentage (%)
Age of infant in months	0-1	88	22.6
	2-3	153	39.2
	4-5	149	38.2
Sex	Male	198	50.8
	Female	192	49.2
Age of mother (in complete years)	15-24	152	39.0
	25-34	217	55.6
	35-44	21	5.4
Marital status	Married	367	94.1
	Others*[a]	23	5.9
Religion	Muslim	341	87.4
	Orthodox	49	12.6
Ethnicity	Oromo	363	93.1
	Amhara	27	6.9
Education of mother	Unable to read/write	177	45.4
	Able to read/write	116	29.7
	Primary school	77	19.8
	Secondary and above	20	5.1
Education of father (n=372)	Unable to read/write	146	39.3
	Able to read/write	99	26.6
	Primary school	95	25.5
	Secondary and above	32	8.6
Main occupation of mother	House wife	277	71.0
	Farmar	85	21.8
	Others*[b]	28	7.2
Main occupation of father (n=372)	Farmer	293	78.7
	Merchant	59	15.9
	Others*[c]	20	5.4
Average monthly income of family(in ETB)	< 1000ETBr	184	47.2
	≥ 1000ETBr	206	52.8

a=Single/Divorced/Widow, b= student/employee, c= Employee/others

4.2. Maternal and healthcare characteristics

The majority; 324 (83.5%) of mothers were multiparous and sixty six (16.5%) of infants were first in birth order. Three hundred two (77.4%) of mothers were ever attended ANC follow up in their last pregnancy and one hundred thirty three (37.4%) of them attended at least fourth ANC visit. Slightly more than half, 222(56.9%) of mothers delivered their last infant at Health facility and the majority 376 (96.4%) of mothers delivered vaginally and the remaining 14(3.4%) had delivered by cesarean section (Table 3).

Table 3: Maternal and healthcare characteristics of mothers with infants aged less than six months in rural kebeles of Boke district of West Hararghe Zone, Eastern Ethiopia, 2018 (n=390).

Variables	Category	Frequency (No)	Percentage (%)
Total number of previous births	<2	66	16.9
	2-3	191	49.0
	>3	133	34.1
Birth order of infant	First	66	16.9
	Second/third	191	49.0
	Fourth/Above	133	34.1
Inter-birth intervals (n=324)	<2 Years	34	10.5
	>=2 Years	290	89.5
Having ANC follow up	Yes	302	77.4
	No	88	22.6
Place of last delivery/birth	Health Facility	222	56.9
	Home	168	43.1
Having PNC follow up	Yes	240	61.5
	No	150	38.5
Ever heard/counseled about BF	Yes	262	67.2
	No	128	32.8
Accessibility to health facility	Yes	244	62.6
	No	146	37.4
Knowledge on breastfeeding	Good	225	57.7
	Poor	165	42.3
Having any breast related problems	Yes	31	7.9
	No	359	92.1

Mothers were assessed whether they had adequate knowledge about breastfeeding or not based on eight knowledge related questions. The aspects of knowledge that were investigated included: breast milk should be baby's first feed, timely initiation of breastfeeding, feeding of colostrums, breast milk alone can sustain a baby for 6 months, breastfeeding protects a baby from illness, expressed breast milk should be fed to the baby, breastfeeding protects mother from getting pregnant and Semi-solid/solid food to be introduced at six months with continues breast feeding. After summary of scores was calculated the mean score for benefits of breastfeeding knowledge was found to be 5.09(SD±1.5). Based on this only 225(57.7%) of mothers had good knowledge on breast feeding practices.

About two-third 262(67.2%) of mothers had exposure to advise/information on exclusive breast feeding and the major source of information/advice were Health extension worker 123(46.9%), Health worker 118(45%) and others 21(8.1%) (Figure 3).

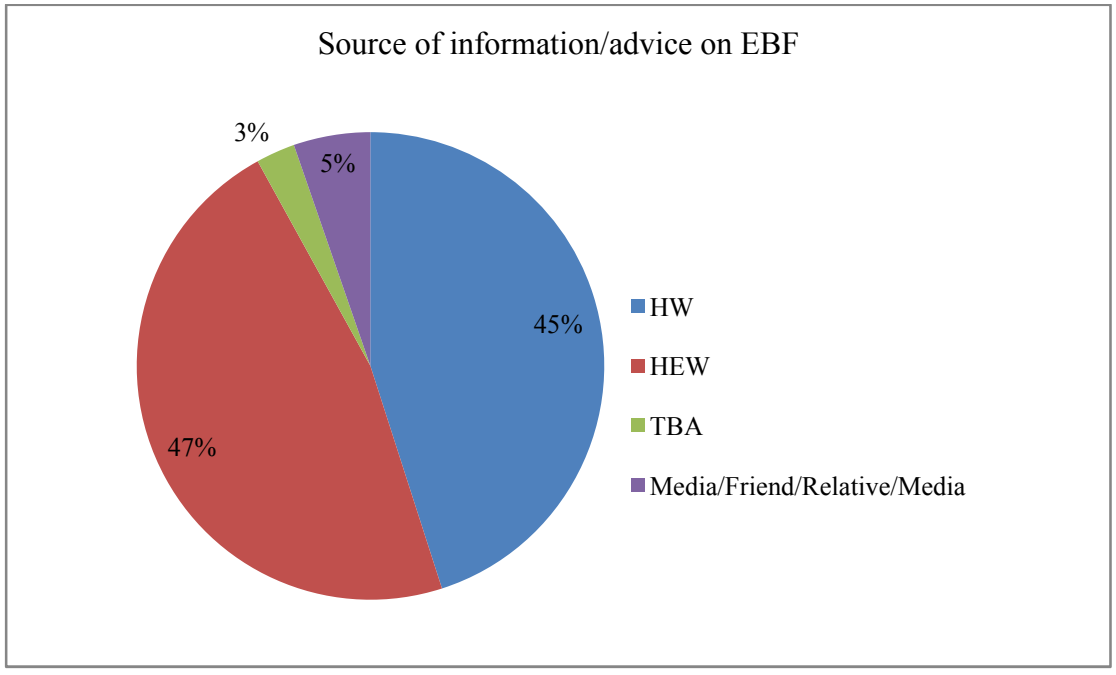

Figure 3:Sources of information for mothers about exclusive breast feeding practice who have infant less than six months in rural kebeles of Boke district of West Hararghe Zone, Eastern Ethiopia, 2018 (n=84).

4.3. Infant characteristics

A total of 390 infants were included in the study. The age range of infants considered in this study was 0-6 months. One hundred fifty three (39.2%) of infants were aged 2-3 months with median ages of 3 months (SD±1.4). Male and female gender was almost equally represented in the study with 198(50.8%) of infants being males and 192(49.2%) females. Infant morbidity status was determined based on a two week- recall. Slightly less than one third 84 (21.5%) of the infants were reported to have been sick. Of those infants reported to have been sick, 20(23.8%) suffered from acute respiratory infections characterized by common cold and cough; 25(29.8%) had fever , while 18(21.4%) and 21(25%) had diarrhea and vomiting respectively.

4.4. Breastfeeding practice characteristics

Prevalence of exclusive breastfeeding practice of infants during previous 24 hours (one day) prior to the study was 55.9% [95% CL: 50.7% - 60.8%]. Of mothers who did not exclusively breast feed their infants, 117(30.0%), 52(13.3%) and 3(0.8%) of them were practiced predominantly, mixed and replacement breastfeeding respectively. Similarly, 70(40.7%), 50(29.1%), 23(13.4%) and 29(16.9%) of those mothers justified breast milk alone is insufficient for infant, decreased breast milk secretion, lack of adequate time and other reasons for their malpractices respectively. The highest rates of exclusive breastfeeding were observed at youngest age and decline at 5 months (Figure 4).

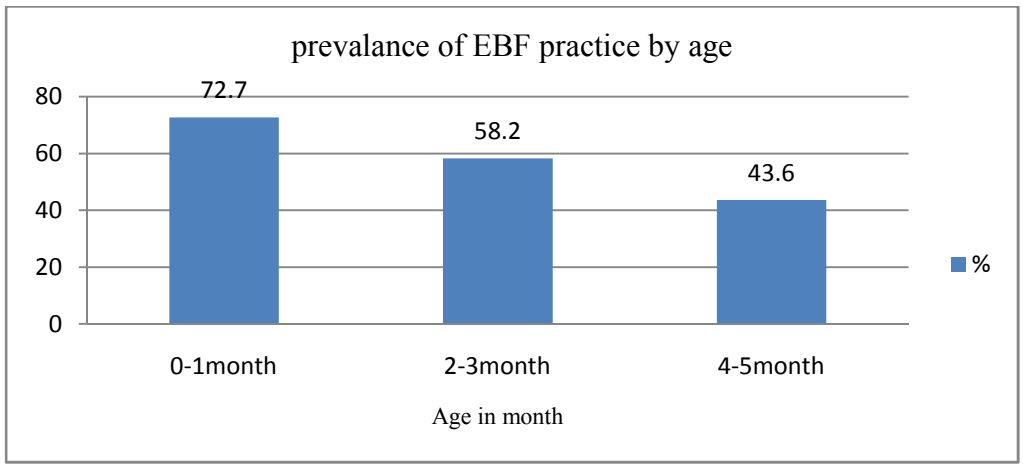

Figure 4: Distribution of exclusive breastfeeding practice among mothers of infants aged less than six months in Boke district of West Hararghe Zone, Eastern Ethiopia, 2018 (n=390).

4.5. Factors associated with exclusive breastfeeding practice

4.5.1. Results of Bivariable Analysis

To identify factors associated with exclusive breastfeeding practice, each variable were assessed independently whether they were predictor of EBF practice or not using bivariable analysis. During crude analysis, Age of mothers, antenatal care follow up, place of last delivery, postnatal care follow up, mothers' knowledge on breastfeeding, birth order of infant, sex of infants, accessibility to health facility, educational status of mothers and average monthly income of household were significantly associated with exclusive breastfeeding practice (Table 4).

Table 4: Results of bivariable logistic regression analysis on factors associated with EBF practice among mothers with infants aged less than six months in rural kebeles of Boke district of West Hararghe Zone, Eastern Ethiopia, 2018 (n=390).

Variables		EBF Practice		COR (95%CI)	P-value
		YES: No (%)	NO: No (%)		
Sex	Female	115(59.9)	77(40.1)	1.38 (0.92, 2.06)	0.120
	Male	103(52.0)	95(48.0)	1	
Age of mother (in complete years)	15-24	97(63.8)	55(36.2)	7.50(2.40, 23.40)*	0.001
	25-34	117(53.9)	100(46.1)	4.97(1.62, 15.26)*	0.005
	35-44	04(19.1)	17(81.9)	1	
Mather's education	Educated	147(69.0)	66(31.0)	3.33 (2.19, 5.05)**	0.000
	Uneducated	71(40.1)	106(59.9)	1	
Average monthly income (in ETB)	≥ 1000 ETB	122(59.3)	84(40.7)	1.33(0.89, 1.99)	0.162
	<1000 ETB	96(52.2)	88(47.8)	1	
Birth order of infant	First	46(68.3)	21(31.3)	2.75(1.48, 5.13)*	0.001
	Second/Third	114(59.4)	78(40.6)	1.84(1.17, 2.88)*	0.008
	Fourth/Above	58(44.3)	73(55.7)	1	
ANC follow up	Yes	183(60.6)	119(39.4)	2.33 (1.43, 3.78)**	0.001
	No	35(39.8)	53(60.2)	1	
Place of last delivery	Health Facility	145(65.3)	77(34.7)	2.45(1.62, 3.70)**	0.000
	Home	73(43.5)	95(56.5)	1	
PNC follow up	Yes	153(63.8)	87(36.2)	2.30(1.56, 3.49)**	0.000
	No	65(43.3)	85(56.7)	1	
Accessibility to health facility	Yes	144(59.0)	100(41.0)	1.40(0.93, 3.12)	0.109
	No	74(50.7)	72(49.3)	1	
Knowledge on breast feeding	Good	112(67.9)	53(32.1)	2.37(1.56, 3.61)**	0.000
	Poor	106(47.1)	119(52.9)	1	
Significant at P<0.01=** and at P<0.05=*, COR=Crude OR and CI= Confidence Interval					

4.5.2. Results of Multivariable Analysis

In the bivariable analysis any possible confounders were not controlled and assessing the independent effects of the covariates was difficult. So, to assess the independent effect of explanatory variables on exclusive breastfeeding multivariable logistic regressions model was used. After adjusting for potential confounders in multivariable logistic regression analysis; age of mother's, place last of delivery, knowledge of mother's on breastfeeding and educational status of mother's were remained significant in the final model. But all the other variables were lost their significances.

Odds of exclusive breastfeeding practice were significantly higher among mothers aged 15-24 and 25-34 years compared to their counterparts (35-44years) [AOR= 3.58 (95% CI: (1.06, 11.95) and AOR=3.49 (95% CI: 1.08, 11.28)] respectively.

Maternal education was positively associated with EBF practice. Those mothers who have/attended formal education were 2.98 times more likely to practice exclusively breastfed than their counterparts [AOR=2.98 (95% CI: 1.92, 4.62)].

Compared to mothers who gave last birth at home, mothers who delivered at health facilities were significantly associated with higher odds of exclusive breastfeeding practice [AOR=1.96 (95% CI: 1.24, 3.12)].

Infant's of mothers who have good knowledge on the practices of breastfeeding were 1.82 times more likely to be exclusively breastfed [AOR=1.82 (95% CI: 1.16, 2.86)] compared to infant's of mothers who have poor knowledge on practices of breastfeeding (Table 5).

Table 5: Multivariable logistic regression of factors associated with EBF practice of participants/ mothers with infants aged less than six months in rural kebeles of Boke district of West Hararghe Zone, Eastern Ethiopia, 2018 (n=390).

Variables		**EBF Practice**		**COR (95%CI)**	**AOR (95%CI)**
		YES: No (%)	**NO:** No (%)		
Sex	Female	115(59.9)	77(40.1)	1.38 (0.92, 2.06)	1.31 (0.85, 2.00)
	Male	103(52.0)	95(48.0)	1	1
Age of mother (in years)	15-24	97(63.8)	55(36.2)	7.50(2.40,23.40*	**3.58(1.06, 11.95)***
	25-34	117(53.9)	100(46.1)	4.97(1.62,15.26*	**3.49(1.08, 11.28)***
	35-44	04(19.1)	17(81.9)	1	1
Mather's education	Educated	147(69.0)	66(31.0)	3.33(2.19,5.05)**	**2.98 (1.92, 4.62)****
	Uneducated	71(40.1)	106(59.9)	1	1
Average monthly income (in ETB)	≥1000ETB	122(59.3)	84(40.7)	1.33(0.89, 1.99)	0.78(0.49, 1.24)
	<1000ETB	96(52.2)	88(47.8)	1	1
Birth order of infant	First	46(68.3)	21(31.3)	2.75(1.48, 5.13)*	1.35(0.57, 3.10)
	Second/Third	114(59.4)	78(40.6)	1.84(1.17, 2.88)*	1.41(0.81, 2.45)
	Fourth/Above	58(44.3)	73(55.7)	1	1
ANC follow up	Yes	183(60.6)	119(39.4)	2.33(1.43,3.78)**	1.13 (0.61, 2.08)
	No	35(39.8)	53(60.2)	1	1
Place of last delivery	Health Facility	145(65.3)	77(34.7)	2.45(1.62,3.70)**	**1.96(1.24, 3.12)****
	Home	73(43.5)	95(56.5)	1	1
PNC follow up	Yes	153(63.8)	87(36.2)	2.30(1.56,3.49)**	1.12(0.58, 2.17)
	No	65(43.3)	85(56.7)	1	1
Accessibility to health facility	Yes	144(59.0)	100(41.0)	1.40(0.93, 3.12)	0.89(0.55, 1.46)
	No	74(50.7)	72(49.3)	1	1
knowledge on breast feeding	Good	112(67.9)	53(32.1)	2.37(1.56,3.61)**	**1.82(1.16, 2.86)****
	Poor	106(47.1)	119(52.9)	1	1

Statistically significant at P<0.01=**, and at P<0.05=*, AOR=Adjusted OR and CI= Confidence Interval

5. DISCUSSION

In this study the prevalence of exclusive breastfeeding practice of infants during previous 24 hours (one day) prior to the study was 55.9% [95% CL: 50.7%, 60.8%]. The finding of the study was consistent with similar studies done in: Sagamu south west Nigeria (56.1%), Molo district Kenya (56.7%), Rural community of Arba Minch Zuria (55.6 %), EDHS report (58.7%), Debre Markos town, North West Ethiopia (55.3%) and Bahir Dar city (50.3%); (Oluwafolahan et al., 2015; Mututho, 2012; Dessalegh and Shikur, 2013; CSA, 2016; Yeshamble S. et al., 2015 and Seid el at., 2015). The reason for this consistency may be similarity of study design.

This study finding is higher compared to similar studies conducted in different areas particularly in Review of studies from developing country(39%), at Saud Arabia(29.5%), Rural utterparadish in India (24.8%), Mecha district(47.1%), Gamogofa zone(40.7%), Ethiopia(49%) and Axum town (40.9%), (WHO, 2009; Abdulaziz and Kamal, 2016; Verma and Dixit, 2016; Woldie el at., 2014; Sorato, 2017; Tewodros el at., 2009; Alemayehu et al., 2014).This significance deference might be attributed that in our study majority(71%) of study participants were house wife's where by the probability of exclusive breastfeeding practice which expected to be higher. Other possible explanation for these differences among studies may be governmental focuses increasing from year to year in order to reduce children and infant morbidity and mortality.

The finding was relatively lower than a similar study done in Ghana demographic survey (64%), Goba district, southwest Ethiopia (71.3%), Offa district (78%), Halaba special zone (70.5%) and Gozamin district (74.1) (Anthony and Akwasi, 2013; Setegn el at., 2012; Ayele Lenja el at., 2016; Asrat S. and Amare W., 2015; Melkamu et al., 2017). The difference might be due to methodological variations between studies, dissimilarities in infant and maternal socio-demographic characteristics like age of infant and maternal age, knowledge and other differences in socio cultural, health and health service utilization characteristics between respondents of the referenced areas and the study place.

In this study, age group of the mothers/respondents from 15-24 and 25-34 age were 3.58 and 3.49 times more likely to practice exclusive breastfeeding than age group of 35-49 age respectively. This finding was consistent with studies done in, Chencha, Gamo Gofa Zone (Sorato, 2017); Hosanna Town, Southern Ethiopia (Earsido el at., 2017) and Dilla Zuria district

(Reddy and Abuka, 2016). The possible reason for this, younger mothers might be eager and willing to apply information that they got from different sources about exclusive breastfeeding. Another explanation might be younger mothers may love more their children than the elders/who have more children. Since study was conducted in the rural area where most of the household activities are carried out by mothers. When age of mothers increased burden to care household activities increased. This might limit their utilization of health care and information that enable them to practice exclusive breastfeeding.

This study finding shows that mother's knowledge on breastfeeding was 225(57.7%) and mothers with good knowledge on breastfeeding practice were 1.82 times more likely to practice exclusively breast feed their infants than those who didn't have adequate knowledge about breastfeeding. This is in line with study conducted in Tanzania (Nkala and Msuya, 2011), Debre Markos, Northwest Ethiopia (Mekuria and Edris, 2015), Mecha district, North West Ethiopia (Woldie el at., 2014), Chencha district, Gamo Gofa Zone (Sorato, 2016) and Jimma Town, Southwest Ethiopia (Seifu el at., 2014). This could be that those who have not adequate knowledge on breast feeding tend to introduce other feedings in early age of infants and mothers do not understand benefits of exclusive breastfeeding to infants, they might be poorly motivated to give exclusive breastfeeding.

Mothers who delivered their last child at health institution were 1.96 times more likely to practice exclusive breastfeeding compared to those who delivered at home. This result was in accordance with other studies from Azezo district, northwest Ethiopia (Mulusew Andualem, 2016), Debre tabor town, northwest Ethiopia (Getachew and Haileyesus, 2012) and Gozamin district, northwest Ethiopia (Melkamu et al., 2012). This might be due to the postpartum breastfeeding counseling and advice/support provided when they give birth at the health facility as part of discharge practices by health workers. The other reason might be the result of increased expansion of health facilities with trained health professionals especially midwives who teach mothers appropriate infant and young child feeding practices.

Children from educated/literate mothers were 2.98 more likely to practice exclusive breast feeding to those mothers who were not have education. This is in line with another study conducted in Offa district, Southern Ethiopia (Ayele Lenja el at., 2016); Halaba special woreda,

Southern NNPR/, Ethiopia (Asrat S. and Amare W., 2015); the United Arab Emirates (Radwan H, 2013) and Democratic Republic of the Congo (Sarita D. el at., 2017). This can be explained by the mother who have education has the opportunities to exposed herself for information related to exclusive breast feeding through different kinds of media channel like: posters, family health cards and other electronic information and education martial's that might be influence the exclusive breast feeding practice. But contradict with the study finding in the Gurage zone, SNNPR (Bisrat Z. el at., 2017) were maternal education is negatively associated with rate of exclusive breastfeeding.

This study also has its own limitations: Since the study was in rural kebeles of district, the findings of this study cannot be generalize to urban population. Social desirability bias due to mother's intention to report what is right regarding EBF not their actual feeding practice.

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

The prevalence of exclusive breastfeeding practice in this study area was low. The highest rates of exclusive breastfeeding were observed at youngest age of infants and decline at 5 months. Among different socio-demographic, maternal factors, health service and infant related factors studied only age of the mothers, Place of last delivery, Knowledge status of mothers on breastfeeding and educational status of mother's were found to be predictors of exclusive breastfeeding practice in the studied community.

6.2. Recommendations

Based on the finding of this study, the following recommendations were made:

For Boke district HEWs and Other health care providers:

- Strengthening and promoting institutional delivery with adequate discussion about breastfeeding issues focusing on EBF for the first six months.
- Improving women's knowledge through Behavior Change Communication at community level on infant and young child feeding, particularly on exclusive breastfeeding.
- Health information dissemination/educate mothers to bring behavioral change about EBF practice using appropriate IEC materials both at health facility and community level.

For Boke district health office:

- Strengthening education as whole and women's educations in particular to improve EBF.
- Strengthening the capacity of health professionals to have accurate and up-to-date information on IYCF in general and exclusive breast feeding practice in particular.
- Should work to promote and strengthen maternal and child health services.

For researchers:

- Researchers should conduct further studies which are supported by qualitative studies.

7. REFERENCES

Abdulaziz Saleh Aljohani and Kamal Abdulkarim Alnazzawi, (2016) Factors Associated with Breastfeeding Practices among Mothers in Primary Health Care Sitting: A Cross-sectional Study *Journal of US-China Medical Science*, 13 (20): 213-219.

Alakour N, Okour A. and Aldebes R. (2014) "Factors associated with exclusive breastfeeding practices among mothers in Syria: a cross-sectional study." *British journal of medicine & medical research* 4(14):2713-2724.

Alemayehu, K.Abreha, H.Yebyo, K. Zemichael and H. Gebremichael, (2014)"Factors associated with timely initiation and exclusive breast feeding among mothers of axum town, northern Ethiopia " *science journal of public health* 2(5):394-401.

American Academy of Pediatrics/APA, (2012) Policy statement Breastfeeding and the use of Human milk. *Pediatrics,* 129(3): 827-837.

Amsalu S, Tigabu Z, (2008). Risk factors for severe acute malnutrition in children under the age of five: A case-control study Ethiop *J Health Dev;* 22(1):21-5.

Anthony M and Akwasi K, (2013) Determinants of exclusive breastfeeding among mothers in Ghana: a cross-sectional study: *International Breastfeeding Journal*, 8:13.

Asrat S. and Amare W., (2015) Prevalence and predictors of exclusive breastfeeding for the first six months of life among women in Halaba special woreda, SNNPR, Ethiopia: a community based cross-sectional study *Archives of Public Health 73:53.*

Atindanbila et al., (2014). "Attitudes and practices associated with exclusive breastfeeding of nursing mothers in bolgatanga municipality." *International journal of humanities social sciences and education* (IJHSSE) 1(7): 114-120.

Ayele L, Tsegaye D, Bereket Y and Mulugeta Y, (2016)Determinants of exclusive breastfeeding practice to infants aged less than six months in Offa district, Southern Ethiopia:a cross-sectional study *International Breastfeeding Journal* 11:32.

Ayisi R., Thuita F., Njeru E.& Wakoli A.,(2014) Factors associated with exclusive breastfeeding among infants aged 0-6 months in Peri-Urban low incame settlement of kangami,Nairobi *G.J.B.A.H.S.,Vol.3(4):180-187 ISSN: 2319 – 5584*.

Bisrat Z, Kenzudine A, Bossena T, (2017) Factors Associated with Early Initiation and Exclusive Breastfeeding Practices among Mothers of Infant's Age Less Than 6 Months. *J Pediatr Neonatal Care 7(3): 00292. DOI: 10.15406/jpnc.2017.07.00292.*

Boke Woreda Health Office, (2018). Boke Woreda Administration Health Office Report.

Brulde B, (2011) Health, disease and the goal of public health. In Dawson, A. ed., Public health ethics: key concepts and issues in policy and practice (pp. 20-45).

Chola L.et al, (2011) Cost of individual peer counseling for the promotion of exclusive breastfeeding in Uganda." *Journal of Cost Effectiveness and Resource Allocation*, 9(1):11-23.

CSA, ICF Ethiopia demographic and health survey, (2016).Addis Ababa, Ethiopia and Calverton, Maryland. USA: central statistics agency and ICF international.

Dessalegh T and Shikur M, (2013) Maternal Knowledge of Optimal breastfeeding practices and associated factors in rural communities of Arba Minch Zuria, International Journal of Nutrition and Food sciences. 2(3), 122-129

Egata G, Yemane B. and Alemayehu W, (2013) Predictors of non-exclusive breastfeeding at 6 months among rural mothers in east Ethiopia: a community-based analytical cross-sectional study *International Breastfeeding Journal*, 8:8.

Earsido A, Abebe W. and Dereje N, (2017) Prevalence and Determinants of Exclusive Breastfeeding Practices among Infants in Hosanna Town, Southern Ethiopia: A Community Based Cross-Sectional Study. *EC Gynecology 4.3(2017):69-79.*

EFMHR (Ethiopian Federal Ministry of Health, (2015). National Strategy for child survival. Addis Ababa, Ethiopia.

Getachew A and Haileyesus, (2016) Exclusive Breastfeeding Practice and Its Associated Factors among Mothers of Infants Less Than Six Months of Age in Debre Tabor Town, Northwest Ethiopia: A Cross-Sectional Study *Hindawi Publishing Corporation Advances in Public Health*, Article.

Ghwass A, Ahmed D, (2011). Prevalence and Predictors of 6-Month Exclusive Breastfeeding in a Rural Area in Egypt. *International breastfeeding medicine Journal*; 6(4):191-6.

Hanson L, (2004): Immunobiology of Human Milk.1st edition. Pharmasoft Publishing; Amarillo, Texas, USA.

HSTP, (2015). Federal Ministry of Health: Health Sector Transformation Plan V woreda based annual core plan. Addis Ababa, Ethiopia; 2015/16-2019/20.

Kliegman R, Behrman R, Jenson H, Stanton B, (2007) Nelson Textbook of Pediatrics18th ed. USA: Saunders, an imprint of Elsevier Inc.

Lauer JA, Betran AP, Barros AJ, de Onis M, (2006).Deaths and years of life lost due to suboptimal breast-feeding among children in the developing world: a global ecological risk assessment. *Public health nutrition*; 9(06):673-85.

Mekuria G and Edris M, (2015) Exclusive breastfeeding and associated factors among mothers in Debre Markos, Northwest Ethiopia: a cross-sectional study *International Breastfeeding Journal 10:1 DOI 10.1186/s13006-014-0027-0*

Melkamu Tamir Hunegnaw, Lemma Derseh Gezie and Alemayehu Shimeka Teferra, (2017) Exclusive breastfeeding and associated factors among mothers in Gozamin district, northwest Ethiopia: a community based cross-sectional study *International Breastfeeding Journal* 12:30 DOI 10.1186/s13006-017-0121-1.

Mulusew Andualem Asemahagn, (2016). Determinants of exclusive breastfeeding practices among mothers in Azezo district, northwest Ethiopia *International Breastfeeding Journal* 11:22 DOI 10.1186/s13006-016-0081-x.

Mututho Leah Njeri, (2012). Factors influencing exclusive breastfeeding among infants less than six months in Kasarani Informal settlement, Molo District, Kenya. *Global Journal of biology, agriculture and health sciences. ISSN: 2319 – 5584.*

Nabulsi M., Hamadeh H., Tamim H., Kabakian T., Charafeddine L., Yehya N., & Sidani S, (2014). A complex breastfeeding promotion and support intervention in a developing country: study protocol for a randomized clinical trial. *BMC Public Health*, 1436.

Nkala, Msuya, (2011). Prevalence and predictors of exclusive breastfeeding among women in Kigoma region, Western Tanzania: a community based cross-sectional study. *International Breastfeeding Journal*. ; 6(17): doi: 10.1186/746-4358-6-17.

Oluwafolahan O. Sholeye, Olayinka A. Abosede, Albert A. Salako, (2015) Exclusive Breastfeeding and Its Associated Factors among Mothers in Sagamu Southwest Nigeria *Journalof Health Science* 5(2): 25-31DOI: 10.5923/j.health.20150502.01.

Radwan H, (2013).Patterns and determinants of breastfeeding and complementary feeding practices of Emirati mothers in the United Arab Emirates.*BMC Public Health. 13:17.*

Reddy S, and Abuka T, (2016) Determinants of Exclusive Breastfeeding Practice among Mothers of Children Under Two Years Old In Dilla Zuria District, Gedeo Zone, Snnpr, Ethiopia, 2014. *J Preg Child Health* 3: 224. doi:10.4172/2376-127X.1000224.

Saka FJ, (2012). Factors influencing exclusive breastfeeding among HIV positive mothers at Ilala municipality -Dares Salaam, Tanzania. *Journal of Health Science,5(2):25-31.*

Sarita D, Tae Ho L and Eun Woo, (2017) Exclusive Breastfeeding Practice and Its Association among Mothers of under 5 Children in Kwango District, DR Congo. *Int. J. Environ. Res. Public Health, 14, 455; doi: 10.3390/ijerph14050455*

Sapna S, Ameya A, Rooma S, Parmar A, Rashid K, Narayan A, (2009):Prevalenceof exclusive breastfeeding and its correlates in an Urban Slum inWestern India.Int e-*journal Sci, Med Educ,3(2):14–18.*

Seifu W, Assefa G, Egata G (2014) Prevalence of Exclusive Breast Feeding and its Predictors Among Infants Aged Six Months in Jimma Town, , Southwest Ethiopia. *J Pediatr Neonatal Care,* 1(3): 8-17.

Sefene A, Birhanu D, Awoke W, Taye T., (2013). Determinants of Exclusive Breastfeeding Practice among Mothers of Children Age Less Than 6 Month in Bahir Dar City Administration, Northwest Ethiopia. *Science Journal of Clinical Medicine* 2(6):1539.

Seid A, Melkie E and Digsu N, (2013) Prevalence of Exclusive Breastfeeding Practices and associated factors among mothers in Bahir Dar city, Northwest Ethiopia: a community based cross-sectional study*, 8:14 http://www.International breastfeeding journal.*

Setegn T, Tefera B, Mulusew G, Kebede D, Amare D and Sibhatu B, (2012) Factors associated with exclusive breastfeeding practices among mothers in Goba district, south east Ethiopia: a cross-sectional study *International BreastfeedingJournal*,7:17http://www.

Sorato Mende Mensa, (2017).Levels and Predictors of Exclusive Breast Feeding among Rural Mothers with Children age 0-12 Months in Rural Kebeles of Chencha District, Gamo Gofa Zone, Ethiopia. *I Journal of Pediatrics and Neonatal Health* 1(3): 77-90.

Taddele M., Abebe L., Fentahun N., (2014). Exclusive breastfeeding and maternal employment in Ethiopia: A comparative cross- sectional study, *International Journal of Nutrition and Food Sciences 3(6): 497-503.*

Tewodros A, Jemal H, Dereje H, (2009). Determinants of exclusive breastfeeding practices in Ethiopia; *Journal of Health Development 23(1):12-18.*

Tilahun T, Alemnesh M, Tenaw G, Girma A, Getnet M and Haymanot Z, (2017). Assessment of exclusive breastfeeding practice and associated factors among mothers in Motta Town, East Gojjam Zone, Amhara Regional state, Ethiopia. *International Breastfeeding Journal, 12:12 DOI 10.1186/s13006-017-0103-3.*

UNICEF, (2006).Progress for children: A report card on Nutrition Number 4. UNICEF. New York. Available online at: *http:// www.unicef.org/ nutrition/files/scientific _rationale _for_benefits_of_breastfeeding.pdf* . Accessed on November 20, 2017.

UNICEF, (2009).Tracking Progress on Child and Maternal Nutrition: New York. Available on line:*http://www.unicef.org/gambia/improving_child_nutrition_the_achivable_imperative_for_global progress.pdf.* Accessed on November 22, 2017.

UNICEF/WHO, 2010, "Indicators for assessing infant and young child feeding practices, part 3.Countryprofiles,"http://www.unicef.org/nutrition/files/IYCFIndicators partIII country profiles.pdf. Accessed on November 22, 2017.

UNICEF, (2014) Breastfeeding: Impact on child survival and global situation. New York. Available online at: *http://www.unicef.org/Nutrition/index_24824.html.* Accessed on October 22, 2017.

USAID, IYCN, Literature Review, (2011). Prepared for the Message and Materials Development Workshop. ADISS ABABA. *http://www.who.int/child_adolescent _health/documents/ 9789241596596/ en/index. html.* Accessed on January 10, 2018.

Verma A, Dixit P, (2016). Knowledge and Practices of Exclusive Breastfeeding among Women in Rural Uttar Pradesh. *J Neonatal Biol5*: 228. Doi: 10.4172/2167-0897.1000228.

Vieira GO, Martins CDC, Vieira TdO, Oliveira NFd, Silva LR, (2010). Factors predicting early discontinuation of exclusive breastfeeding in the first month of life, in the city of Feira de Santana, Brazil. Pediatr (Rio J); 86(5):441-4.

Wardlaw T, Cai.x, and David W, (2012). Global trends in exclusive breastfeeding. *International Breastfeeding Journal* 7:12.

Woldie T, Addisu W, Melkie E ,(2014) Assessment of Exclusive Breastfeeding Practice and Associated Factors in Mecha District, North West Ethiopia. *SJPH*. 2(4) 330-336.

WHO, (2008).indicators for assessing infant and young child feeding practices. available on line at*http://www.unicef.org/nutrition/files/IYCF_indicators_part_III_country_profile.* Accessed on November 15, 2017.

WHO, (2009) Infant and Young Child Feeding Model Chapter for Textbooks for Medical StudentsandAlliedHealthProfessionals.*Availableathttp://www.who.int/nutrition/publicatios/infant feeding/9789241597494/en/index.html.* Accessed on October 8, 2017.

World Health Organization, (2010). Early Initiation of Breastfeeding: Geneva. *http://www.who.int/childhealth/documents/9789241599535/en/index.html.* Accessed on November 15, 2017.

WHO, (2011) Exclusive Breastfeeding for Six Months Best for Babies. Geneva. Available online *http://www.whqlibodoc.who.int/publications/9241562110.pdf.* Accessed on November 26, 2017.

WHO, (2014). Maternal, newborn, child and adolescent health at the sixty ninth session of the UN General Assembly. *http://www.who.int/mediacentere/factsheets/fs342/en/*. Accessed on November 25, 2017.

World Health Organization, (2012).10 facts on child health. Geneva. *http://www.unicef.org/nutrition cluster/files/IYCFE_WHO_Part1_eng.pdf.* Accessed on November 20, 2017.

Yadavannavar M. and Patil S, (2011) Socio cultural factors affecting breast feeding practices and decisions in rural women. *International journal of plant, animal and environmental sciences,* 1(2):46-50.

Yaqub A, Gul S (2013) Reasons for failure of exclusive breastfeeding in children Less than six months of age. *J Ayub Med Coll Abbottabad*.; 25(1-2).

Yeshamble S, Kassahun K, Mulugeta T, (2015). Exclusive Breast Feeding Practice and Associated Factors Among Mothers in Debre Markos Town and Gozamen District, East Gojjam Zone, Ethiopia. Journal of Food and Nutrition Sciences,3(5)174-179.

8. APPENDICES

8.1. Participant information sheet and informed voluntary consent form

My name is ---------- I am working as a data collector for the study being conducted in this community by **Jemal Husein**, who is studying for his Masters degree at Haramaya University, college of medical and health sciences. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

The study/ project title

To assess the prevalence of exclusive breastfeeding practice and associated factors among mothers of infants aged less than six months in rural kebeles of Boke District, West Hararghe, Eastern Ethiopia.

Purpose/aim of the study

The findings of study can be a paramount importance for the district health office to plan intervention programs to prevent factors that influence exclusive breast feeding practice in rural kebeles of Boke district. There by improve exclusive breast feeding practices. More over the aim of the study is to write a thesis as a partial fulfillment of a master's program in public health for the principal investigators.

Procedure and duration

I will be interviewing you using questionnaire to provide me with pertinent data that is help full for the study. There are 40 questions to answer where I fill questionnaire by interviewing you. The interview will take about 25-30min, so I kindly request you to spare me this time for the interview.

Risk and benefit

The risk of being participating in this study is very minimal, but only taking few minutes from your time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for the local health planners.

Confidentiality

The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study community and will not reflect any thing particular of individual persons or housing. The questionnaire will be

coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights

Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits witch you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address

If there is anything unclear or you need further information, please contact:

Name of PI- **Jemal Husein** phone No.**0922009228**

Email address-- Jemalhusein2@gmail.com

If you have any doubt about this research you can contact the responsible Institutional Health research Ethics Review Committee (IHRERC) Haramaya University, college of health and medical science; office phone **0254662011** or P.O.Box 235,Harar.

Declaration of informed voluntary consent

I have read/was read to me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risk and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to withdraw from the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to participate in this study with my signature as indicated below.

Name and signature of participant: ----------date------/-----/------

Name and signature of data collector: ----------date------/-----/------

N.B: This is signed face to face in the presence of the data collector.

8.2. English Version Questionnaire

Questionnaires on the prevalence of exclusive breastfeeding practice and associated factors among mothers of infants aged under six months in the Boke District of West Hararghe, Eastern Ethiopia. Interviewer must circle interviewee's answer or write short description if necessary.

Name of the Kebele ……..…… Questionnaires ID NO……

Name of the interviewer …… Date of interview……

Checked by supervisor; Name …… Signature……..

Part I: Socio-economic and demographic factors

No	Questions	Coding category	Skip to/Remark
001	Age of the infant(in month)	--------month	
002	Sex of the infant	1. Male 2. Female	
003	How old are you? (complete in years)	----------yrs	
004	What is your current marital status?	1. Married 2. Single 3. Divorced/ Separated 4. Widowed	
005	what is your religion?	1. Muslim 2. Orthodox 3. Protestant 4. Others (specify)----------	
006	What is your ethnicity?	1. Oromo 2. Amhara 3. Somale 4. Others (specify)----------	

007	What is your educational status?	1. Can't read and write 2. Read and write 3.Primary school (1-8) 4. Secondary School(9-12) 5. Collage level and above	
008	What is your husband's educational status?	1. Can't read and write 2. Read and write 3.Primary school (1-8) 4. Secondary School(9-12) 5. Collage level and above	
009	What is your occupation?	1. Housewife 2. Farmer 3. Student 4. Government employee 5. Other (specify)---------	
010	What is your husband's occupation?	1. Farmer 2. Merchant 3. Government employee 4. Other (specify)---------	
011	How much is your household average monthly income?	----------ET Birr.	
012	Do you possess the following live stock?	1. Cows/ Goats/Sheep/other 2. No one	

Part II. Maternal and health service related questions

013	How many children do you have Currently?	In No.---------	
014	What is the birth order of this infant?	1. First 2. Second 3. Third 4. Four and above	If ans.1 skip to Q.016
015	If the birth order of this infant is not the		

	first, how much is the birth interval from the preceding birth?	In Months----------	
016	Did you get antenatal care service during your pregnancy?	1. yes 2. No	
017	How many times did you get antenatal care service?	1. One time 2. Two times 3. Three times 4. Four times	
018	Where did you give birth to your baby?	1. Health facility 2. Home	
019	What was your mode of delivery?	1. Normal/vaginal 2. Cesarean section	
020	Did you get postnatal care after your last birth within 42 days?	1. Yes 2. No	
021	How far from here is the nearest health facility?	Distance in KM…	

Part III: Source of breastfeeding information/ counseling

022	Did you receive any information /counseling/advice about breast feeding/infant feeding?	1. yes 2. No	If ans. Is no-2 skip to Q.024
023	If yes, what was the source of the Information/counseling?	1. Health worker(HW) 2. HEW 3. Traditional birth attendant 4. Family/friends/relatives 5. Media	

Part IV: Maternal knowledge on breastfeeding

024	Do you know an infant should be put to breast immediately after birth within one hour?	1. Yes 2. No	
025	Do you know the first yellowish milk /colostrums should be given to an infant?	1. Yes 2. No	

026	Pre-lacteal feeding is needed for an infant before starting breast milk?	1. Yes 2. No	
027	Is breast milk alone without water and other liquids enough for an infant during the first 6 months of life?	1. yes 2. No	
028	Breastfeeding protects the baby from Illnesses?	1. Yes 2. No	
029	Expressed breast milk should be fed to the baby when the mother is away?	1. Yes 2. No	
030	Breast feeding helps the mother not to get pregnant?	1. Yes 2. No	
031	Starting from 6 month an infant should be Start Semi-solid/solid foods and continued breastfeeding up to 2 years and beyond?	1. Yes 2. No	

Part V. Breastfeeding practice and related questions

032	What was your infant feeding during yesterday day and night?	1. Breast milk only 2. Mainly breast milk but additionally fluids like water, tea, juice, sugar solution 3. Breast milk but start to take foods like mashed potatoes/meat, fruits, porridge, egg, butter and liquids like cow/formula milk. 4. Soft foods without breast milk like mashed potatoes/meat, fruits, porridge, egg, butter and liquids like cow/formula	If Ans.1 skip to Q.034

		milk, water, tea, sugar solution	
033	If the answer to the above question is not breast milk only, what is the reason?	1. Decreased milk secretion 2. Breast milk only not sufficient 3. Infant is thirsty 4. Lack of time 5. Illness/weakness of mother 6. Nipple/breast problem 7. Others (specify)-------	

Part VI: Infant and maternal health

034	Has the baby been sick in the last two weeks?	1. Yes 2. No	
035	If yes, what condition was the baby suffering from?	1. Vomiting 2. Diarrhea 3. Fever 4. Cough 5. Others (list)…….	
036	Did you experience any breastfeeding problems (Abscess, Mastitis Sore/cracked nipples)?	1. Yes 2. No	

8.3. Afan Oromo version of informed consent

Odeeffannoo warra hirmatanii

Seensa:-Akkam jirtu ani maqaan Koo obbo _____Jedhama. Yeroo amma kana obbo Jamaal Husseen wajjiin Odeeffannoo fuudhaa taheen hojacha jira. Obbo Jamaal Husseen digrii Lammaffaadha argachuuf yuniversity Haramaya irra qoranno gaggeessa jira, Odeeffannoon kunis kanumaaf fayada. Atis qoranno kana keessatti akka hirmattuf Haawwan daa'imman ji'a jaha gadii qaban keessaa tokko taate carraan waan filatamteef yaada armaan gaditti tarreefaman erga dhageefatte booda qoranicha keessatti hirmachu keetii fi dhiisu kee akka murteesitu kabajaan si gaafadha.

Mata duree qoranichaa:-Daa'imman harma haadha qofa hoosisaa jiraachuu fi danqaawwan isaan walqabatan Haawwan daa'imman ji'a jaha gadii qaban irratti akka baadiyyaa aanaa bookeetti qorranna taasisudha.

Kaayyoon qoranichaa: - kayoon qoranna kanaa qorannoo eebaaf tahu qophessuufi qorannoon ol immo namoota isaan ilaalatu erga odefannon Kun gahe booda bu'a qoranno ilaalani karoora irratti akka karoorfataniif gargaara.

Akkaata adeemsa qoranicha:-Gaafiwwan qorannoof tahu dandahan qophahe jira.gaafiwwan kana deebisuuf tilmaamaan daqiiqa 25-30 fudhata, kanaaf irra deebi'e yeroo keessan akka naaf kennitan kabajaan isin gaafadha.

Miidha: - Qorannoo kana irratti hirmaachuu keessaniin miidhaan isin irra gahu tokkollen hin jiru, yeroo gabaabdu isin jalaa fudhatu malee.

Faayda:-Yeroo amma qoranno kana irratti hirmachu keessaniin faaydaan argatan hin jiru, garuu qorannaa kana irraa odeeffannoon argamu abboota dhimmi ilaaluuf karoora akka irratti baafataniif faayda guddaa qaba.

Iciitii qabachuu;-odeefanno kannitan hundaaf iciitiin isaa kan eegamuu fi wanti maqaa keessan ibsu tokkolleen hin jiru.kanaaf bu'aan qoranno argamu dhunfaan oso hin taane akka walii galaatti kan ibsamuudha.

Mirga Hirmaataa:-Qorannoo kana irratti hirmachuuf fedhinnaa guutuu barbaachisa, kanaaf qorannaa kana irratti hirmachuuf ykn hirmachu dhabuuf mirga guutu qabdan. Hirmaachuu yoo hin barbaadin yeroo barbaadanitti qoranicha addaan kuttanii dhiisuu ni dandeessu. Yoon dhiisee bu'aan narraa hafa jettanii hin qaana'ina gaaafi deebisu hin barbaannes dhiisu dandeessu.

Teessoo:-Waa'ee qoranichaa irratti gaafii tahan hunda ykn waan isin yaadessu yoo jiraate teesso armaan gadii kanaan yeroo barbaadanitti argachu ni dandeessu.

Abbaa qorannoo Maqaa:-Jamaal Husseen Lakk. Mob.0922009228

Email address -------Jemalhusein2@gmail.com

Haramaya University Lakk.wajjira- **0254662011** or Lakk.posta- 235, Harar. Kanaan bilbiluun argachu dandeessan.

Walii galtee:-waa'een haala hirmaanna qorannoo erga naaf dubbifame booda kaayyoon qorannaa, bu'aan qorannaa, miidhaan qorannoon qabu, haalli eegumsa iciitii, mirgi hirmaachuu fi hirmachu dhiisuu fi tessoon naaf ibsamee jira. Gaafii yoon qabaadhe gaafachuuf carraan naaf kenname jira, gidduttis dhiisu yoon barbaade yeroon barbaadetti hirmaachuu dhiisu akka dandahu gatii deebisuu kan hin barbaachifne tahuu mirga guutuu akkaan qabu ergaan hubadhee booda fedhinnaa guutuun qorannoo kana irratti hirmaachuu kaniin murtesse tahu kiyya maqaa fi mallattoo kiyyaanin mirkaneessa.

Maqaa fi mallattoo odeefanno kennaa:

Maqaa_____

Mallattoo_____

Guyyaa_____

Maqaa fi mallattoo odeefanno sassaaba:

Maqaa_____

Mallattoo_____

Guyyaa_____

Galatoma!!!

8.4. Gaafii Afaan Oromiffaa

Maqaa Araddaa …… Lakkofsa eenyumma gaaffii……

Maqaa gaafataa …… Guyyaa…….

Maqaa to'ataa mirkaneesse …… Mallattoo----------

Kutaa I: Gaafilee Hawaasummaa fi Diinagdeen wal qabatan

Lak	Gaafilee	Deebii	Irra dabri/Yaada
001	Umrii daa'imaa(Ji'aan)	Ji,a----------	
002	Saala daa'imaa	1. Dhiira 2. Dhalaa	
003	Umriin kee waggaa meeqa?	Waggaa----------	
004	Haalli gaa'ila kee yeroo amma maali?	1. Heerumera 2. Hin heerumne 3. Kan hiikte/ addaan bahani 4. Kan jalaa boqate	
005	Amantaan kee maali?	1. Muslima 2. Ortodoksii 3. Protestantii 4. Kan biro (ibsi)----------	
006	Sabni kee maali?	1. Oromoo 2. Amhara 3. Somaalee 4. Kan biroo (ibsi)----------	
007	Sadarkaan barnoota kee maali?	1. Barreessu fi dubisuu hin danda'u 2. Barreessu fi dubisuu ni danda'a 3.Sadarka 1ffaa (1-8) 4. Sadarkaa 2ffaa(9-12) 5. Collejii fi isa ol	

008	Sadarkaan barumsaa abba manaa kee maali?	1. Barreessu fi dubisuu hin danda'u 2. Barreessu fi dubisuu ni danda'a 3.Sadarka 1ffaa (1-8) 4. Sadarkaa 2ffaa(9-12) 5. Collejii fi isa ol	
009	Yeroo ammaa hojiin/dalagaan kee maali?	1. Haadha manaa 2. Qonnaan bultu 3. Barattuu 4. Hojattu mootummaa 5. Kan biraa (ibsi)---------	
010	Hojiin Abbaa manaa kee ho maali?	1. Qotee bulaa 2. Daldalaa 3. Hojataa mootummaa 4. Kan biraa (ibsi)---------	
011	Galiin maatii jiddugalaan ji'atti meeqa?	----------ET Birr.	
012	Duniya kana ni qabdaa?	1. Looni/ Re'ee/ Hoolaa/kan biraa 2. homaa hin qabu	

Kutaa II. Gaafilee Haadholii fi kenninsa tajaajila fayyaan walqabatan

013	Hanga ammatti ijoolle meeqa qabda?	Lakk.---------	
014	Daa'imni kun isa meeqaffaadha?	1. Kan duraati/jalqabaati 2. Lammaffaadha 3. Sadaffadha 4. Afraffaa fi isaa ol	Deebi,1 yoo tahe 016 derbi
015	Yoo daa'imni kun isa jalqbaa hin taane, isa duraa irraa hangam takka addaan fageesitee deesse?	Ji'aan ---------	
016	Yeroo ulfaa tajaajila da'umsa duraa argattee?	1. Eeye 2. Miti	
017	Yoo argatte tahe yeroo meeqa?	1. yeroo tokko 2. yeroo lama 3. yeroo sadii	

		4. yeroo afur	
018	Daa'ima kana eessatti deesse?	1. Dhaabata fayyaa 2. Mana	
019	Haalli da'umsa akkam ture?	1. Nagaan(kara nafa saalan) 2. Garaa dhoofadheeti	
020	Tajaajila da'umsa booda ho argatte beekta yoo xiqaate guyyaa 42 keessatti yeroo tokko?	1. Eeye 2. Miti	
021	Dhaabanni fayyaa dhaluun hagam isin irraa fagaata?	Fageenya KM……	

Kutaa III: Gaafilee Waa'ee madda odeefanno/gorsa Harma hoosisaa

022	Waa'ee harma hoosisa daa'immanii irratti odeefanno/gorsa argatte beekta?	1. Eeye 2. Miti	Deebi,2 yoo tahe 024 derbi
023	Eeye yoo ta'e, eessaa dhageesse?	1. Ogeessa fayya 2. Ekstenshini fayyaa 3. Deessiftu aadaa 4. Maatii/Hiriyaa/Ollaa/Midia	

Kutaa IV:Gaafilee waa'ee beekumsa haadholiin harma hoosisuu irratti qabdu

024	Daa'ima akkuma dhalatteen sa'aa tokko keessatti harma hoosisuun barbaachisaa akka tahe beekta?	1. Eeyye 2. Miti	
025	Aannan inni jalqabaa keelloon/silgi daa'imaaf ni kennamaa?	1. Eeyye 2. Miti	
026	Harma haadha osoo hin eegalchiifne daa'imaaf waan biraa kennuun barbaachisaadha?	1. Eeyye 2. Miti	
027	Hanga ji'a jahatti harmi haadha qofti daa'ima jiraachisuuf gahaadha?	1. Eeyye 2. Miti	
028	Harma hoosisuun dhibee daa'imarraa ni ittisaa?	1. Eeyye 2. Miti	

029	Harmi haadha elmamee yoo haati fagoo deemte daa'imaaf ni kennamaa?	1. Eeyye 2. Miti	
030	Harma hoosisuun haadha ulfa irraa ni ittisaa?	1. Eeyye 2. Miti	
031	Ji'a jaha irra eegalee daa'maaf nyaanni dabalataa kennamee fi harmi haadhas hanga waggaa lamatti/sana olitti waliin itti fufaa?	1. Eeyye 2. Miti	

Kutaa V. Gaafilee harma hoosisuun walqabatan

032	Daa'ima kee kaleessa guyaa fi galgala maal soorte?	1. Harma haadha qofa 2. Irra caalatti harma haadhati garu dabalataan dhangala'a akka bishaani, shayi, juusii, bulbula sukara 3. Harma haadhaa garuu nyaataa akka dinnicha/foon sukkumame, kudura, marqaa, killee, Dhadhaa, fi Aannan horii/formula milki eegalchiseen jira . 4. Nyaata lallaafa harma haadhatiin alatti kan akka dinnicha/foon sukkumame, kudura, marqaa,killee, Dhadhaa fi dhangala'a akka Aannan horii/formula milki bishaani, shayi, bulbula sukara	Deebi,1 yoo tahe 034 derbi

033	Gaafii lakk.032 irratti harma haadha qofa hin hoosifne yoo ta'e maali sababni isaa?	1. Harmi haadha bahuu (cobuu) waan hirdhatefi 2. Harmi haadha qofti gahaa waan hin taaneef 3. Daa'imni waan dheebatuuf 4. Sa'aa waan hin qabneef 5. Haati waan dhukkubsatteef 6. Rakkoon harma waan mudateef 7. Kan biraa(ibsi)-------	

Kutaa VI: Gaafilee fayyummaa daa'imaa fi haadhaan walqabatan

034	Daa'imni kee torbaan lamaan darbe kana keessa dhukubsatte beekti?	1. Eeye 2. Miti	Miti yoo tahe G36
035	Eeye yoo tahe maal dhukubsattee turte?	1. Ni deebisiisa 2. Garaa teechisa 3. Hoo'a qaama qabdi 4. Qufaa 5. Kan biro (ibsi)……..	
036	Harma hoosisuun wal qabatee rakkoon si mudatee beekta (Wanti akka malaa mulachu, Harmi dhiita'u, Fixi harma madaawu)?	1. Eeye 2. Miti	

8.5. Curriculum vitae

1. Personal identification:

Full name: Jemal Husein Ahmed

Address: Boke Woreda, west Hararghae

Mobile: 0922009228

Email: jemalhusein2@gmail.com

Date of Birth: 04 January 1990 E.C

Place of Birth: Arsi Zone, Shanan kolu Woreda

2. Educational Background:

Elementary School: Dumuga Elementary School

High School and Preparatory School: Mechara Secondary School

University: Haramaya University, graduate in BSc. Nursing

Haramaya University, Attending MPH in (GMPH) Currently

3. Work Experience: work at Health Center for two years and currently, I am working as Boke Woreda health office MCH Coordinator Expert

4. Reference: a. Bereda Seketa - Head of Boke Woreda Health Office

- phone -0920470002

b. Berhan Ketema –Boke Woreda Planning Coordinator

-phone -096171523

- Email: berhanketema786@yahoo.com

5. Language Proficiency: Afan Oromo (mother tongue)

: Very good in English and Amharic