

**EXCLUSIVE BREAST FEEDING PRACTICE AND ASSOCIATED FACTORS AMONG
HIV POSITIVE MOTHERS ATTENDING GOVERNMENTAL HEALTH FACILITIES
OF JIMMA ZONE, SOUTHWEST ETHIOPIA**



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**THESIS SUBMITTED TO THE DEPARTMENT OF POPULATION AND FAMILY
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PUBLIC HEALTH IN REPRODUCTIVE HEALTH**

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Abstract

Background: Exclusive breastfeeding is a situation where infant feed only breast milk without any other liquid or solid, except prescribed medicines in the first 6 months. Globally, about 3 million infants die in their first month of life of which 11.6 % can be prevented by EBF. The recommended way of feeding for HIV positive mother in the first 6 months of life is either exclusive breast feeding or exclusive replacement feeding. However, replacement and mixed feeding increase the risk of infant mortality and morbidity in developing countries. Exclusive breast feeding offer effective means of reducing HIV transmission than mixed feeding.

Objective: To assess exclusive breastfeeding practice and associated factors among HIV positive mothers attending governmental health facilities of Jimma Zone, Southwest Ethiopia, 2021.

Methods: A facility based cross-sectional study was conducted among 315 HIV positive mothers from April 10 to June 25/2021. Eight health facilities (3 hospitals and 5 health centers) which give PMTCT service to mothers of 6-24 months children were sampled by simple random sampling technique and mothers who visit PMTCT clinics during data collection period were enrolled in the study. The study was also supplemented by qualitative method. The data was entered by Epidata 3.1 and analyzed using SPSS version 23. Logistic regression analysis was carried out to identify factors associated with EBF. Qualitative data was also analyzed by thematic analysis manually and triangulated with the quantitative findings. Finally, the result was displayed by text, table and graphs.

Result: About 78.7 % of the mothers were practiced EBF. Place of residence(AOR=0.41, 95% CI; 0.18-0.94), place of delivery(AOR=6.72, 95% CI; 1.23-36.62), counseling on breast feeding during ANC visit(AOR=3.76, 95% CI; 1.08-13.09), HIV status disclosure (AOR=5.32, 95% CI; 2.32-12.17), knowledge (AOR= 4.94, 95% CI; 2.23-10.94) and attitude towards EBF (AOR=4.07, 95% CI; 1.81-9.12) were significantly associated with EBF practice.

Conclusion: - In this study, majority of the participants practices EBF. Counseling about infant feeding option to make informed decision, encourage the mothers to disclose their HIV status to their spouse, increase awareness of the mothers to improve their knowledge and attitude could boost EBF practice of HIV positive mothers.

Key words: - Exclusive breast feeding, HIV positive mother, Ethiopia

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Abbreviations and Acronyms

AIDS -	Acquired Immune Deficiency Syndrome
ANC -	Antenatal Care
AOR -	Adjusted odds ratio
ART -	Anti-Retroviral Treatment
BF -	Breastfeeding
CI -	Confidence interval
CS -	Caesarean section
EBF -	Exclusive Breast Feeding
EDHS -	Ethiopia Demographic Health Survey
ERC -	Exclusive Replacement Feeding
FMOH -	Federal Ministry of Health
HIV -	Human Immuno compromise Virus
IDI -	In depth interview
IYCF -	Infant and Young Child Feeding
MCH -	Maternal and Child Health
NGO -	Non-Governmental Organizations
PMTCT -	Prevention of Mother to Child Transmission
PNC -	Postnatal Care
SPSS -	Statistical Package for Social Science
SVD -	Spontaneous Vaginal Delivery
TBA -	Traditional Birth Attendant
UNICEF -	United Nations Children's Fund
USAID -	United States Agency for International Development
WHO -	World Health Organization

Chapter 1: Introduction

1.1. Background

Breastfeeding is a natural way of providing infants with nutrients they need for the survival, healthy growth and development (1). Breast milk stimulates the immune system of infants which is essential for protection against malocclusion, childhood infections like diarrhea and acute respiratory infection, prevent early childhood obesity, diabetes and helps to increase intelligence (2). It also helps for uterine contraction, to reduce the risk of ovarian and breast cancer with important implications for maternal health (1, 3).

World Health Organization define exclusive breastfeeding as the situation where the infant feed only breast milk (including expressed breast milk) without any other solids or liquids, even not water, with the exception of oral rehydration solution or drops or syrups consisting of vitamins, mineral supplements or prescribed medicines in the first 6 months of life (4).

Globally, about 38 million people were living with HIV virus at the end of 2019. Out of these, around 48% are females and 1.8 million are children of 0–14 years. In sub-Saharan Africa, women and girls accounted for 59% of all new HIV infections and there are 74000 children(0 to 14 years) infected newly in 2019 (5). In Ethiopia, there are about 379,251 women infected with HIV (62.1 % of total adults) in 2018 and about 3800 children's are newly infected by the end of 2016 (6). Mother-to-child transmission accounts over 90% of HIV infections among children (7).

The HIV transmission rate is estimated to be about 5-10 percent during pregnancy and 10-20 percent at the time of labor and delivery, and an additional 10-20 percent during the postnatal period through breastfeeding (8). The estimated risk of HIV transmission for mothers who do not use Antiretroviral Therapy (ART) was during breastfeeding 5-20 percent (9). Maternal diseases like malnutrition, malaria and anemia have also been shown to increase disease progression in HIV-positive women by increasing the risk of mother to child transmission of HIV (2).

WHO has forwarded recommendations for the way of HIV exposed infant feeding practice to be either exclusive breast feeding with receiving ART drug interventions or exclusive replacement feeding if acceptable, feasible, affordable, sustainable and safe for the first six months of life followed by introduction of complementary foods with breastfeeding up to 12 months. Then breastfeeding should only stop once a nutritionally adequate and safe diet without breast milk

can be provided (4). The decision is based on the socioeconomic and cultural contexts of the population, availability and quality of health services, the local epidemiology including the HIV prevalence among pregnant women, main causes of maternal and child under nutrition and child mortality (10).

1.2 Statement of the Problem

Exclusive breast feeding remains the most appropriate infant feeding way for child growth and survival. Globally, approximately three million babies die every year in their first month of life and when given for six months 22.3% of neonatal deaths and 11.6 % infant death could be prevented by exclusive breast feeding. According to the WHO report, 37 percent of infants aged less 6 months are breastfed exclusively worldwide. In the case of sub Saharan Africa, only one third of less than 6 months of infants breastfed exclusively (7).

According to recent Ethiopian mini EDHS, prevalence of exclusive breastfeeding among children under six months had consistently increased from 49% in 2005 to 59% in 2019. The rate exclusive breastfeeding decreases sharply with age from 73% (in neonates) to 40% (4-5 months). About 14 percent of infants 0-5 months consume plain water, 1% of them consume non-milk liquids, 8% consume other milk, and 13% consume complementary foods in addition to breast milk. About 9 % of infants under 6 months use a mixed feeding that expose the child to different illnesses (11). The national pooled prevalence of exclusive breastfeeding among HIV positive mothers in Ethiopia were 63.4 % (9).

Even though there is 10 to 20% risk of HIV transmission through breast milk, exclusive breast feeding offer affordable, sustainable and effective means of reducing mother to child transmission of HIV and carries a significantly lower risk of HIV transmission than mixed feeding. Because, mixed fed infants can be exposed to HIV due to the damage to the epithelial integrity of the intestine of infants that may enable entry of the virus (4, 12).

The risk of mortality or morbidity due to malnutrition, pneumonia and child hood illnesses is also high if infants are taking replacement feedings. Providing replacement feeding appropriately is unlikely in most developing countries including Ethiopia. In many resource-poor countries, infants who were not breastfed exclusively were up to six times more likely to die from diarrheal illnesses, malnutrition, and pneumonia (13, 14).

Different literatures identify the factors that affect exclusive breast feeding practice of HIV positive mothers. Those are educational status of mother, occupational status of mother, ante natal care visit, counseling about infant feeding choice during ANC, place of delivery, HIV status disclosure to her spouse are some of factors which significantly associated with exclusive breast feeding (13, 15, 16).

Although WHO and FMOH develop guideline to promote exclusive breast feeding for the first six months of life among HIV positive mothers (4, 17), still there is great variability in different parts of the country on the prevalence exclusive breast feeding practice among HIV positive mothers (highest in Tigray Region, Mekelle town which is 90 % (18) and the lowest is 23.9% in Oromia region, west shoa zone (13)). Most of the studies done by quantitative method only and they recommend for researchers to mix both quantitative and qualitative methods. So this study tried to triangulate quantitative data with qualitative data by incorporate all possible variables that were not assessed by previous studies to explore more factors associated with exclusive breast feeding practice of HIV positive mothers and associated factors in governmental health institution in Jimma zone, Southwest Ethiopia.

1.3 Significance of the Study

There were limited studies conducted in this area that focus on exclusive breastfeeding practices and factors associated with exclusive breast feeding practice of HIV positive mothers in this area. The findings of this study might have vital input to provide evidence based information for improving and enhancing exclusive breast feeding practice of HIV positive mothers in the study setting and other localities.

The study provides the key to vital body of knowledge that guides the HIV positive mothers to practice exclusive breastfeeding which prevent morbidity and mortality of their children. It will also important for policy makers, program designers and different stake holders to made evidence based decision and improve the interventions.

Chapter 2: Literature Review

2.1 Magnitude of Exclusive Breast Feeding Practice among HIV positive Mothers

A country based cross-sectional study on Exclusive breastfeeding practice during first six months of an infant's life in Bangladesh reveals that the prevalence of exclusive breastfeeding for first six months of an infant's life in Bangladesh was 35 % (19).

Study conducted on infant feeding practices among HIV-infected mothers in urban Kano, Nigeria reveals that 73.9% breastfed exclusively their index infants for the first six months. Approximately 7.4% of respondents practiced mixed feeding (20). A finding from the study conducted on Exclusive breastfeeding and HIV/AIDS: a cross sectional survey of mothers attending PMTCT clinics in southwestern Nigeria shows that 61 % of HIV positive mothers infant feeding choices were exclusive breast feeding (21).

A systematic review and meta-analysis study done in Ethiopia on Infant feeding practices of HIV Positive mothers and its association with counseling and HIV disclosure status revealed that the national pooled prevalence of exclusive breastfeeding and mixed feeding practices among HIV positive mothers were 63.43% and 23.11%, respectively (9).

The findings from study done in Northern Ethiopia on Exclusive breastfeeding and associated factors among HIV positive mothers showed that, 88.8% of mothers practiced exclusive breastfeeding for the first six months of life (16). Similarly, cross-Sectional study done in Gondar city showed that the proportion of HIV-positive women practicing exclusive breastfeeding, exclusive replacement feeding and mixed infant feeding were 73.8%, 4.5%, and 21.6%, respectively (22).

The study done on Exclusive Breast Feeding Status and its determinant among HIV Positive Women in West Showa Zone Oromia Region Ethiopia reveals that, the prevalence of exclusive breast feeding was 23.98% (13).

2.2 Factors Affecting Breast feeding practice of HIV Positive Mothers

Studies done on factors associated with exclusive breast feeding practice among HIV positive women in the world. Some of the categories of factors are socio demographic variable, obstetrics

and health service related factors, knowledge and attitude towards exclusive breast feeding and clinical related factors mentioned by previous studies.

2.2.1 Socio Demographic Factors

A cross-sectional study on Exclusive breastfeeding practice during first six months of an infant's life in Bangladesh shows that relatively less educated mothers were more likely to exclusively breastfeed their children than higher educated mothers. Housewife mothers were more likely to be EBF than their counterparts (19).

Study conducted in Addis Ababa on Infants and young children feeding practice and associated factors among HIV positive mothers of children 0–23 months in health centers showed that, head of family being father, family support, information on HIV Exposed infant feeding practice are statistically significant correlates of HIV exposed infant feeding practice of mothers (23).

The study done on Exclusive Breast Feeding Status and its Determinant among HIV Positive Women in West Showa Zone Oromia Region, Ethiopia reveals that mothers who had secondary educational status were 3 times more likely to give exclusive breast feeding than those who had no formal education. Compared to government employee women those who have self-employee were 3.5 times more likely to practice EBF(13).

According to study done in the western Oromia on exclusive breastfeeding practices of HIV positive mothers and its determinants in selected health institutions, HIV positive mothers who work far from their home were 0.348 times less likely to practice EBF than those mothers who work near their home (12).

A case control study conducted on determinants of none-exclusive breast feeding practice among HIV positive women at selected Health Institutions in Ethiopia showed that being employed, home delivery and secondary education are significantly associated with non-EBF (24).

2.2.2 Obstetrics and Health Service Related Factors

A qualitative study conducted on Knowledge, attitudes, and practices regarding exclusive breastfeeding among HIV-positive mothers in Uganda showed that the main barriers to HIV-positive mothers practicing EBF include a lack of infant feeding counseling, fear of HIV

transmission through breast milk, returning to work, and breastfeeding difficulties (25).

There is strong evidence which reveals that getting ANC service during pregnancy, Infant feeding counseling during antenatal care of last pregnancy, place of delivery and disclosure status to spouse are strongly associated with breast feeding practice of HIV positive mothers (9, 12, 16, 20, 26). Furthermore, the odds of practicing EBF were more than fivefold among mothers attended by health care provider than those who were attended by traditional birth attendants/relatives and mothers who had reported PNC service utilization were 82% more likely to practice EBF as compared to those mothers who did not received (27).

The study conducted in Gondar city on mixed infant feeding practice and associated factors among HIV-positive women under care in public health facilities within two years postpartum revealed that, mixed infant feeding practice was independently predicted by lack of antenatal care and home delivery (22).

The study done on inappropriate infant feeding practices of HIV positive mothers attending PMTCT services in Oromia regional state: Ethiopia showed that, the mothers who had received antenatal and postnatal visits, received infant feeding counseling and disclosed their HIV status to their partners showed a reduction of practicing inappropriate infant feeding (26).

A result of study done in the western Oromia on showed that, the possible reasons for delayed and/or no initiation of breastfeeding were claimed 51.4% delivery by caesarian section, 5.7% baby was sick, 14.3% mother was sick and 28.6% delayed milk secretion (12).

2.2.3 Knowledge and Attitude of Mothers on Breast Feeding

Study conducted on determinants of infant feeding practices among HIV-infected mothers in urban Kano, Nigeria reveals that 37.4% of the participants were aware of the risk of HIV transmission through breastfeeding. The proportion of participants with good, fair, and poor knowledge of recommended feeding options for HIV-exposed infants was 4.4%, 73.4%, and 22.2%, respectively (20).

Study conducted in Calabar, Nigeria on Maternal knowledge of effective breastfeeding and its benefits, as potential determinant of attitudes to infant feeding stated that, 43.2% of respondents had unsatisfactory levels of knowledge (28).

A study done on knowledge, attitude, and practice of HIV positive mothers on Antiretroviral Treatment towards infant feeding in Gondar town health institutions, North West Ethiopia, showed that 68.91 % and 75.87 % of participants had good knowledge and favorable attitude towards recommended infant feeding respectively (29).

The findings from study done in Northern Ethiopia on Exclusive breastfeeding and associated factors among HIV positive mothers showed that, knowledge on exclusive breastfeeding and attitude towards exclusive breastfeeding had significant association with exclusive breastfeeding practice (16).

2.2.4 Clinical Factors

The finding of the study conducted on HIV sero-status and disclosure: implications for infant feeding practice in rural south Nyanza, Kenya reveals that, HIV positive women who disclose their HIV status were 3 times more likely to breast fed exclusively than their counterparts (30).

Study done on Challenges and opportunities of optimal breastfeeding in the context of HIV option B+ guidelines shows that mothers faced challenges in complying with exclusive breastfeeding practices owing to lack of community support systems and breast infections (31). The study done on inappropriate infant feeding practices of HIV positive mothers attending PMTCT services in Oromia regional state: Ethiopia showed that, mothers having breast problems 5 times more likely and infants with mouth ulcers were 6 times more likely to practice inappropriate feeding when compared to their counterpart (26).

Generally, despite different literature tried to assess exclusive breast feeding practice, knowledge and attitude of HIV positive mothers, but still there are very limited information on exclusive breast feeding practice of HIV positive mothers. To fill this gap, this study is aimed to assess exclusive breast feeding practice and associated factors among HIV positive mothers in governmental health facilities of Jimma Zone, southwest Ethiopia.

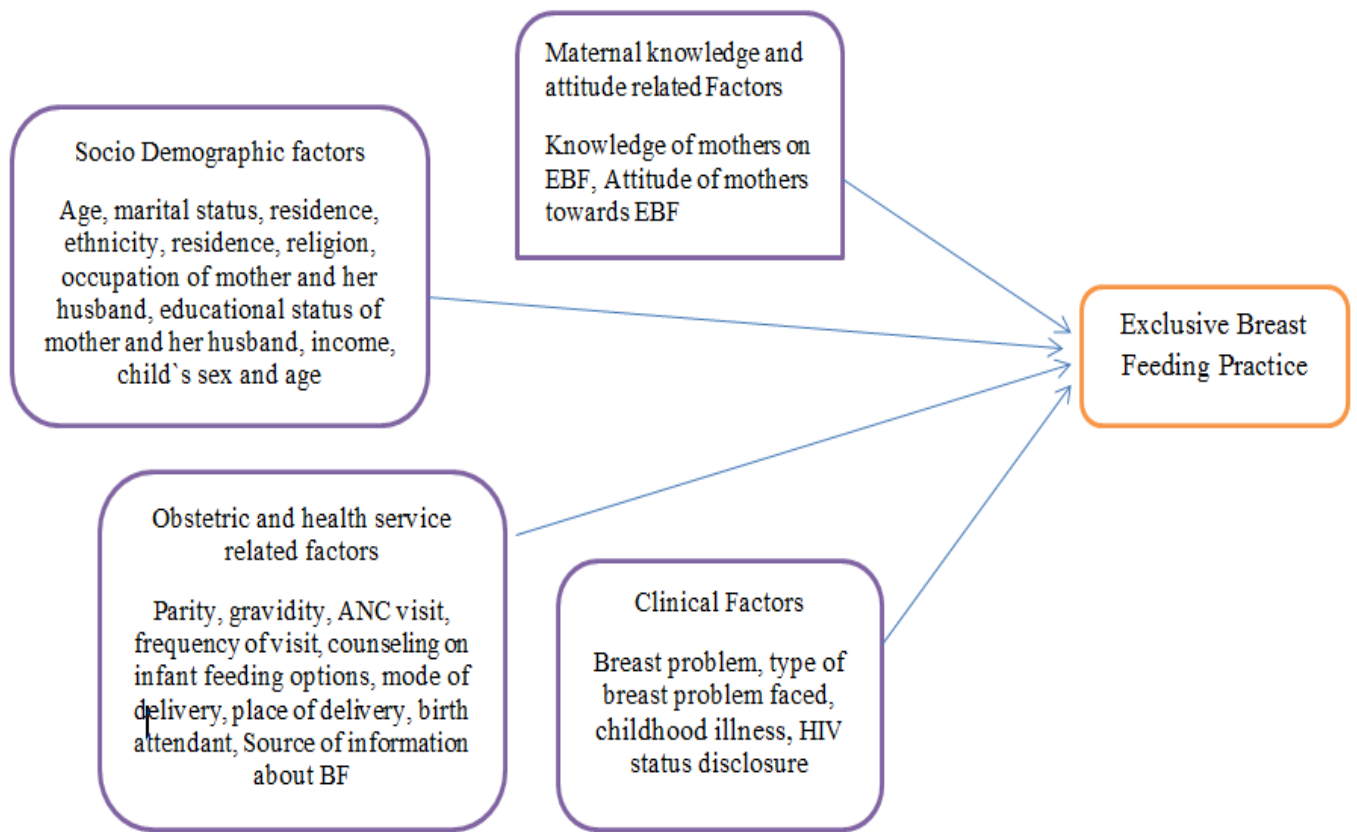


Figure 1:- Conceptual Framework of Exclusive Breastfeeding Practice and associated factors among HIV positive mothers attending governmental health facilities of Jimma Zone, Southwest Ethiopia, 2021.

(Developed after different literature review (12-16))

Chapter 3: Objectives

3.1 General Objective

- To assess exclusive breast feeding practice and associated factors among HIV positive mothers attending governmental health facilities of Jimma Zone, Southwest Ethiopia, 2021.

3.2 Specific Objective

- ✓ To determine exclusive breastfeeding practice of HIV positive mothers attending governmental health facilities of Jimma Zone, Southwest Ethiopia, 2021.
- ✓ To identify factors associated with exclusive breastfeeding practice of HIV positive mothers attending governmental health facilities of Jimma Zone, Southwest Ethiopia, 2021.

Chapter 4: Methods

4.1 Study Area and Period

The study was conducted in Jimma Zone which is located in Oromia regional state, Southwest Ethiopia. It is bordered on the south by the Southern Nations, Nationalities and Peoples region, on northwest by Buno Bedele zone, on the north by East Welega zone, and on the northeast by West Shewa zone. Jimma town is the capital and administrative center of the Zone and is located at a distance of 356 km away from the capital of Ethiopia- Addis Ababa with astronomical location of 7° 4' North Latitude and 36° 5' East Longitude.

According to 2007 the Ethiopia census reports, a projected total populations of Jimma zone were 3,425,206. Among those 757,998 women in reproductive age (15-49 years) and 1,630,398 were children <15 years. According to Jimma zonal health office report of 2020/21, the zone has 1 tertiary hospital, 3 general hospitals, 4 primary hospitals, 122 health centers, 512 health posts and in those facilities there are 9 VCT sites, 125 PICT sites, 125 VCT + PICT sites, 21 ART sites and 48 PMTCT sites. The study was conducted from April 10 to June 25, 2021.

4.2 Study Design

- ✚ A facility based cross-sectional study was employed through both quantitative and qualitative methods.

4.3 Population

Quantitative

4.3.1 Source Population

- All HIV positive mothers of children aged 6–24 months who attend PMTCT clinics in governmental health facility of Jimma zone.

4.3.2 Study population

- All HIV positive mothers of children aged 6–24 months who attend PMTCT clinics in randomly selected governmental health facility during the study period.

Qualitative

- Purposively selected PMTCT service providers and mother supporting group were included in this study.

4.4 Inclusion and Exclusion Criteria

4.4.1 Inclusion Criteria

- All HIV positive mothers of children aged 6-24 months and visit PMTCT clinics of randomly selected health facilities during the data collection period were included in the study.

4.4.2 Exclusion Criteria

- HIV positive mothers who were critically ill and unable to make interview were excluded from the study.

4.5 Sample size and Sampling Technique

4.5.1 Sample Size Determination

- For Quantitative Study

The sample size was determined for different objectives of this study by using Epi-info version 7 based on the following assumptions. 95% level of confidence, 5% margin of error and 10 % nonresponse rate was considered. As the total number of HIV positive mothers who have 6 to 24 months children attending PMTCT clinic of governmental health facilities in the zone was 597 (< 10,000), finite population correction was considered (**Table 1**).

Table 1:- Sample size determination for different study objectives on exclusive breastfeeding practice and associated factors among HIV positive mothers attending governmental health facilities of Jimma zone, Southwest Ethiopia, 2021.

Population	Variables	Proportion of mothers practicing EBF (%)		Design effect	Sample size	10 % non-response rate	Final sample size (n)	Reference	
Single Population (for first objective)	EBF practice	23.98		1.5	287	28	315	(13)	
Sample size calculation for factors affecting exclusive breast feeding practice of HIV positive mothers									
	Variables	Proportion of mothers practicing EBF (%)		Power (%)	Ratio (unexposed:exposed)	Sample size	10 % non-response rate	Final sample size (n)	Reference
Double	Disclos	Yes	65.2						(12)

populati on (for the second objectiv e)	ure of HIV status	(P1)		80	1:1	64	6	70	
		No (P2)	16.4						
	Matern al Occup ation	Self- employ ee (P1)	3.5	80	1:1	232	23	255	(13)
		Govern ment employ ee (P2)	20.4						
	Head of family	Father (P1)	31	80	1:1	92	9	101	(21)
		Parents (P2)	0.5						

P1: proportion of exposed

P2: proportion of unexposed

Therefore, the maximum final sample size for this study was **315**.

➤ For Qualitative Study

In-depth interview was conducted with five PMTCT health service providers and six mother supporting group until saturation of idea attained.

4.5.2 Sampling Techniques and Procedure

First list of 22 health facilities (8 Hospitals and 14 Health centers) providing PMTCT service for mothers of 6 to 24 months children identified. Then, more than 30 % of each (3 Hospitals and 5 Health centers) were selected by simple random sampling technique. Based on number of HIV positive mothers who have 6-24 months children and attend PMTCT clinic of sampled facility, the sample size was allocated proportionally to each facility and all eligible mothers who visit PMTCT clinics of sampled facility during data collection period were included in the study (**Figure 2**).

For qualitative study, purposive sampling technique was used to identify the participants.

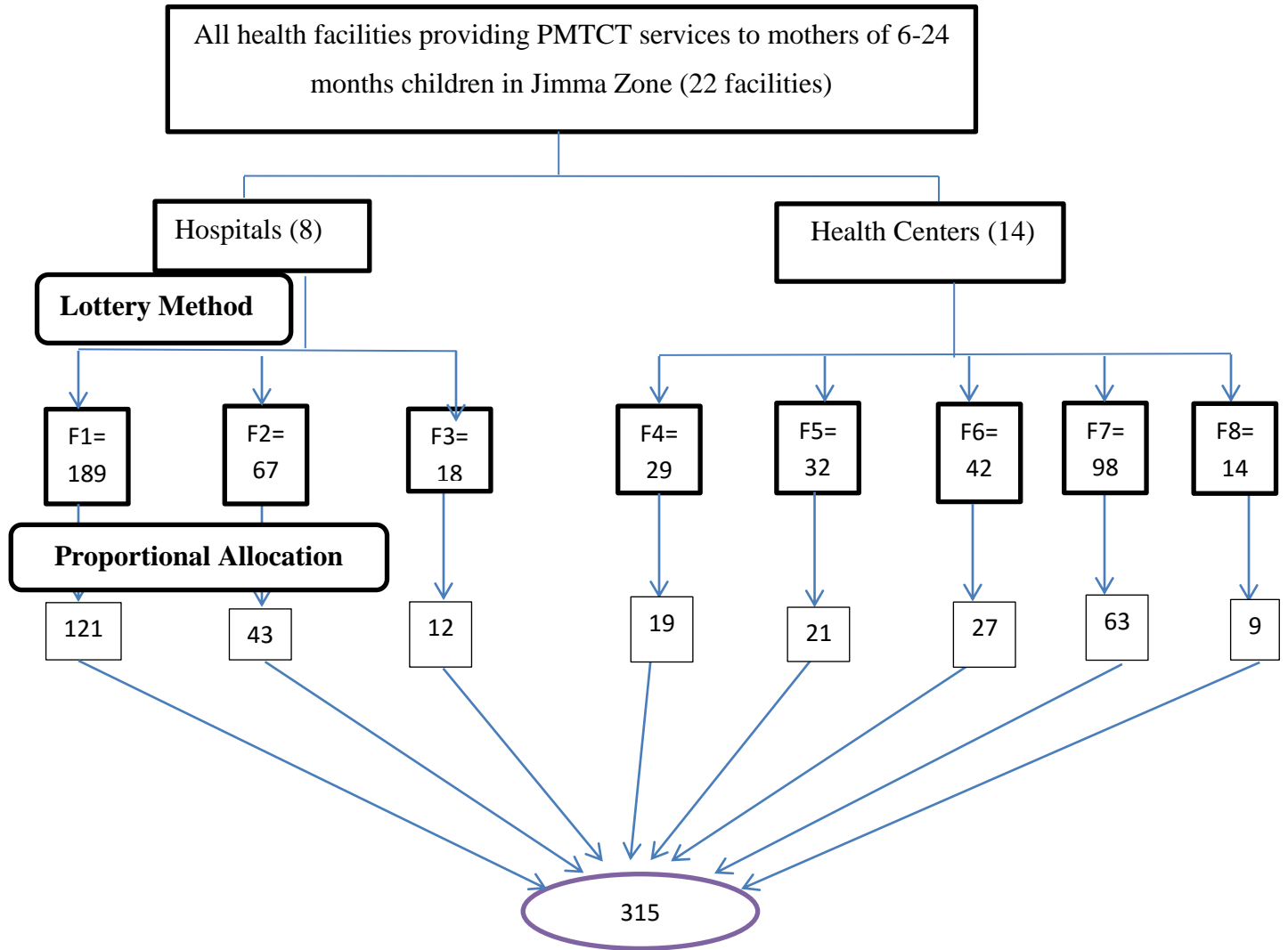


Figure 2:- Schematic diagram showing sampling procedure for exclusive breastfeeding practice of mothers attending governmental health facilities of Jimma Zone, South west Ethiopia, 2021.

Key: F1: Jimma University Medical Center

F5: Asendabo Health Center

F2: Agaro Hospital

F6: Nono Benja Health Center

F3: Seka Chekorsa Hospital

F7: Agaro Health Center

F4: Seka Chekorsa Health Center

F8: Dimtu Health Center

4.6 Study Variable

4.6.1 Dependent Variable

- Exclusive breast feeding Practice

4.6.2 Independent Variable

- Socio-demographic characteristics (Age, marital status, residence, occupation of mother and her husband, educational status of mother and her husband, ethnicity, religion, income)
- Obstetrics and health service related factors (Parity, gravidity, visit antenatal care services, frequency of ANC, counseling on infant feeding options, place of delivery, mode of delivery ... etc)
- Maternal knowledge and attitude related factors (knowledge of mothers about exclusive breast feeding, attitude of mothers towards exclusive breast feeding)
- Clinical factors (Breast infection, childhood illness, HIV status disclosure)

4.7 Operational Definition and Definition of Terms

- ✚ **Exclusive breastfeeding:** - HIV exposed infant receiving only breast milk and no other liquids or solids, not even water, except for oral rehydration solution or drops or syrups of vitamins, mineral supplements or prescribed medicines in the first six months (4).
- ✚ **Exclusive Replacement Feeding:** Mothers known to be living with HIV who only give commercial infant formula milk as a replacement feed to their HIV exposed infants when the AFASS (Acceptable, Feasible, Affordable, Sustainable, and Safe) criteria fulfilled (4).
- ✚ **Mixed Feeding-** HIV exposed infant who feed other liquids or foods together with breast milk within the first six months of life (23).
- ✚ **Knowledge of HIV positive mothers on exclusive breast feeding:** Respondents who score greater than or equal to the mean score from total of 12 knowledge related questions were labeled as having good knowledge and participants those score below the mean of knowledge of HIV positive mothers on breast feeding related questions were considered as having poor knowledge (16).
- ✚ **Attitude of HIV positive mothers on exclusive breast feeding:** - Attitude of mothers measured by 5- point Likert scale by employing six questions. The order of scoring for

positive statements was (strongly agree = 5, agree = 4, neutral = 3, disagree = 2, strongly disagree = 1) and vice versa for negative statements. The total score was obtained and computed for mean so as to categorize it in to `favorable attitude` if score greater than or equal to the mean score and if score below mean it was taken as `unfavorable attitude` (15).

✚ **Timely initiation of breast feeding**- putting the neonate on the mother's breast to suckle within one hour (4).

✚ **On demand breast feeding**- breastfeeding greater than or equal to 8 times per 24 hours (4).

4.8 Data Collection Procedure and Tool

Quantitative data

The instrument was adapted from different previous literatures (9, 13, 15, 16). A structured, pretested questionnaire was used to collect the data through face to face interview. The quantitative data was collected by eight bachelor degree holder midwives who are not working on PMTCT and supervised by two public health officers. The quantitative data collected includes socio demographic characteristics, Obstetrics and health service related, knowledge and attitude of HIV positive mothers towards EBF, and clinical factors.

Qualitative data

The qualitative data were collected by one experienced masters of public health holder and the principal investigator by using interview guide which developed after reviewing different literatures.

4.9 Data Quality Assurance

To ensure the quality of data, two days training was given for data collectors and supervisors on the objective of the study, contents of the questionnaire, and confidentiality of information before actual data collection. Pretest was also done on 5 % of the sample size (15 mothers) in a facility which not included in the study (at Yebu health center) and possible amendment measures were taken. The English version questionnaire was translated to local language (Afan Oromo) and translated back to English by to check its consistency. Respondents were assured about the confidentiality and privacy of their responses. The collected data were also checked

daily for completeness and consistency by the supervisors. Data entry was also done by Epidata version 3.1 to control for legal values and skip patterns.

The qualitative data were collected by one interviewer and one note taker. Audio record was taken after consent in order not to miss important points.

4.10 Data processing and Analysis

Quantitative data: The data were checked, coded and entered into Epi data version 3.1 and exported into SPSS version 25.0 for cleaning and analysis.

Descriptive statistics followed by bivariable logistic regression analyses was computed. Factors associated with EBF practice was selected in bivariable analysis with a p-value of < 0.25 for further analysis in multivariable regression analysis to adjust the effects of cofounders on the outcome variable. Statistical significance was declared at $p < 0.05$ and Odds ratio with 95% confidence interval was computed to identify the presence and strength of associations. Model fitness was checked by Hosmer and Lemeshow test. Multicollinearity between different independent variables was checked by using variance inflation factors (VIF). Finally, the result was displayed by using text, table and graphs.

Qualitative data: The qualitative data were analyzed using thematic analysis manually. The analysis was started by transcribing from records then translated to English language. Transcripts was systematically read and re-read the entire body of data to ensure familiarity with the content before the thematic analysis was conducted. Organization of the data systematically was done to coding for reducing a lot idea in to small chunks of meaning, then collect similar codes into one theme. Finally, the findings were narrated and triangulated with quantitative data.

4.11 Ethical Consideration

Ethical clearance was obtained from the Institution Review Board (IRB) of institute of health of Jimma University. Written permission letter was obtained from the Jimma Zone Health Office. Then, heads of hospitals and health centers was communicated through formal letters in addition to personal communication by the investigator. Participants were informed about objective of the study, right to discontinue or refuse to participate in the study, confidentiality of their response and consent was assured from each study subjects.

4.12 Dissemination Plan

The result will be presented and submitted to Jimma University, Public Health faculty, Department of Population and Family Health. Summary of the finding will be shared for Jimma Zone health office and other stakeholders. The effort will be made to present the results on scientific conferences and to publish on peer-reviewed scientific journals.

Chapter 5: Result

5.1 Socio-demographic Characteristics of Respondents

A total of 315 HIV positive mothers were participated in the study with a response rate of 100%. The mean age (SD) of the respondents was 31.5 (4.6). Majority 264 (83.8%) of participants were married while 167 (53%) were urban residents. In this study, about half 152 (48.3%) of mothers attained primary level education and also 131 (41.6%) of them were merchants followed by 128 (40.6%) housewife. Similar to the mother's, half 158 (50.2%) and 129 (41%) of their husbands were merchants and attained primary education level respectively. Out of the total respondents, 133 (42.2%) and 160 (50.8%) of infants were aged between 12 to 18 months and male respectively. One hundred thirty nine (44.1%) of participants earn monthly 500-1500 ETB (**Table 2**).

Table 2:- Socio-demographic characteristics of HIV positive mothers attending governmental health facilities in Jimma Zone, Southwest Ethiopia, 2021 (n=315).

Variable	Categories	Frequency	Percent
Mother's age	20 – 24	16	5.1
	25 – 29	93	29.5
	30 – 34	120	38.1
	35 ⁺	86	27.3
Residence	Urban	167	53
	Rural	148	47
Marital status	Single	18	5.7
	Married	264	83.8
	Widowed	12	3.8
	Divorced	21	6.7
Religion	Muslim	182	57.8
	Orthodox	104	33
	Protestant	29	9.2
Ethnicity	Oromo	232	73.3
	Amhara	56	17.8
	Kafa	23	7.3
	Other*	4	1.3
Mother`s education	No formal education	41	13
	Primary (1-8 grades)	152	48.3
	Secondary (9-12 grades)	73	23.2

	Collage and above	49	15.6
Father`s education	No formal education	26	8.3
	Primary (1-8 grades)	129	41
	Secondary (9-12 grades)	86	27.3
	Collage and above	74	23.5
Mother`s occupation	Housewife	128	40.6
	Merchant	131	41.6
	Government employee	50	15.9
	Other**	6	1.9
Father`s occupation	Merchant	158	50.2
	Farmer	64	20.3
	Government employee	71	22.5
	Other***	22	7
Sex of last child	Male	160	50.8
	Female	155	49.2
Age of last child	6-12	126	40
	12-18	133	42.2
	18-24	56	17.8
Monthly income (ETB)	<500	70	22.2
	500-1500	139	44.1
	>1500	106	33.7

Other*= Gurage, Silte, Kembata Other**= Daily laborer, Beauty salon

Other***= Driver, Garage worker, Daily laborer

5.2 Obstetrics and Health Service Related Characteristics

Out of 315 participants, majority 283 (89.8%) had less than or equal to three children. Two hundred ninety six (94%) of the study participants have attended ANC follow-up, of which majority of them 138 (46.6%) had attended four times ANC visits and about half 163 (51.7 %) of them delivered at a hospital. The highest proportion 278 (93.9%) of the mothers reported that they had received counseling about infant feeding methods during their ANC visits (**Table 3**).

The qualitative finding of this study also supports this finding.

Most of the respondents (4 out of 5 PMTCT service providers and 4 out of 6 mothers supporting group) reported that counseling from health professionals about infant feeding options and mothers understanding about benefit of exclusive breast feeding help HIV positive mothers to practice exclusive breast feeding by increasing awareness of the mothers on the recommended way of feeding HIV exposed infant up to 6 months of life.

A 30 years old PMTCT service provider of one hospital explained that, “Most of the mothers are not interested to breast feed their child due to fear of HIV transmission through breast feeding. They think that saving of their child by any way they can do from HIV infection. But some of the mothers who received the counseling service about infant feeding options during their ANC visit were relief from their fear and practice exclusive breast feeding in the first six months of life.”

A 32 years old mother supporting group of one hospital said; “Even if they visit ANC clinic and get counseling service, some of the mothers become confused about HIV transmission to their child through breast feeding. But when they explore and discuss with us about their fear, we counsel them again by easy and understandable manner. When they understand well about advantage and disadvantage of each and every infant feeding option, they decide to breast feed exclusively for the first six months of life.”

Table 3:- Obstetrics and health service related characteristics of HIV positive mothers attending governmental health facilities in Jimma zone, Southwest Ethiopia, 2021.

Variable (n=315)	Categories	Frequency	Percent
Gravidity	<= 3 pregnancy	256	81.3
	>=4 pregnancy	59	18.7
Parity	<= 3 children	283	89.8
	>=4 children	32	10.2
Visit ANC clinic during last pregnancy	Yes	296	94
	No	19	6
Number of ANC visit (n=296)	<= 2 times	20	6.8
	3 times	76	25.7
	4 times	138	46.6
	Greater than 4 times	62	20.9
Place of delivery of this child	Home	18	5.7
	Hospital	163	51.7
	Health Center	134	42.5
Route of delivery	Vaginal delivery	286	90.8
	Caesarean section	29	9.2

Help during delivery	Traditional birth attendant	11	2.5	
	Health professional	297	97.1	
	Relatives	7	0.3	
Source of information about breast feeding	Mass media	32	10.2	
	Health professionals	251	79.7	
	Relatives	32	10.2	
Receive counseling on BF at ANC visit (n=296)	Yes	278	93.9	
	No	18	6.1	
Type of information acquired (more than one answer is possible)	Feeding of colostrum protect infants from infectious disease	Yes	173	62
		No	106	38
	Initiation of breastfeeding immediately within 1 hour of birth	Yes	117	41.9
		No	162	58.1
	EBF should be practiced for the first six months	Yes	224	80.3
		No	55	19.7
	Complimentary feeding with breast feeding should continue until 2 years	Yes	159	57
		No	120	43

5.3 Knowledge of HIV Positive Mothers about Exclusive Breast Feeding Practice

In this study, More than half 195 (61.9 %) of the respondents had good knowledge about exclusive breast feeding (**Figure 3**). All of the participants 315 (100%) know that HIV infected mother can breast feed her child and also about three fourth 235 (74.6%) of them reported that the time of initiation of breast feeding to be less than one hour after birth. Regarding to colostrum feeding, most of the respondents 273 (86.7%) knows that HIV positive mother can feed the colostrum, whereas 282 (89.5%) of the participants knows that feeding only breast milk in the first six months of life was the recommended way of feeding HIV exposed infants. Majority 261 (82.9%) of the mothers knows that other food with breast milk started at 6 months. About 220 (69.8%) of the respondents know that HIV can transmitted from mother to child through breast feeding (**Table 4**).

Table 4:- Knowledge about EBF of HIV positive mothers attending governmental health facilities of Jimma Zone, Southwest Ethiopia, 2021 (n=315).

Variable	Categories	Frequency	Percent	
HIV infected mother can breast feed her child	Yes	315	100	
When to initiate breast feeding after birth	Less than 1 hour	235	74.6	
	2 to 24 hour	41	13	
	After 24 hour	8	2.5	
	Don't know	31	9.8	
HIV positive mother can feed foremilk (colostrum)	Yes	273	86.7	
	No	42	13.3	
HIV positive mother can give water, butter and other fluid before the first breast milk	Yes	22	7	
	No	293	93	
Recommended way of feeding HIV exposed infants in the first 6 months of life	Breast milk only	282	89.5	
	Both breast milk and additional food	24	7.6	
	Formula (purchased) milk only	9	2.9	
Time to start other food with breast milk	At 4 th month	38	12.1	
	At 6 th month	261	82.9	
	At 8 th month	16	5.1	
Time to stop breast feeding completely	< = 23 months	29	9.2	
	At 24 months	283	89.8	
	> 24 months	3	1	
HIV transmitted from mother to child by breast feeding	Yes	220	69.8	
	No	95	30.2	
Way to reduce the risk of HIV transmission from mother to the child (more than one answer is possible)	Continue maternal ART and prophylaxis for the child	Yes	189	85.9
		No	31	14.1
	Give purchased milk only	Yes	45	20.5
		No	175	79.5
	Feed only breast milk up to 6 months	Yes	100	45.5
		No	120	54.5

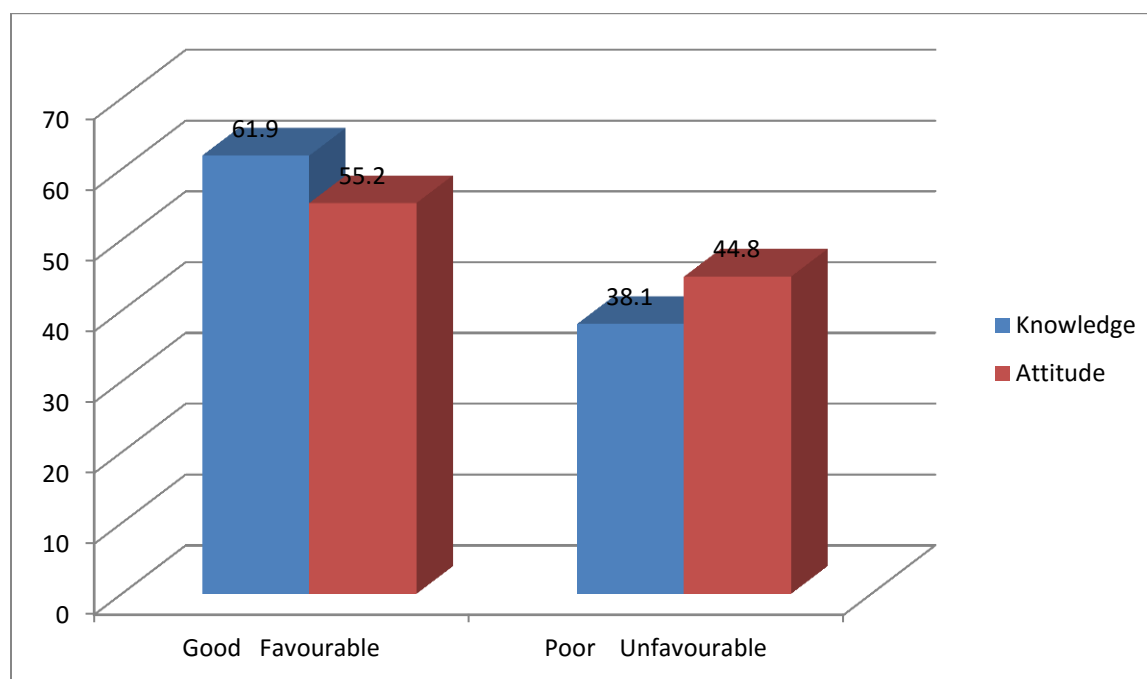


Figure 3:- Knowledge and attitude towards EBF practice of HIV positive mothers attending governmental health facilities of Jimma Zone, Southwest Ethiopia, 2021.

5.4 Attitude of HIV Positive Mothers towards Exclusive Breast Feeding Practice

In this study, 174 (55.2 %) of the participants had favorable attitude towards exclusive breast feeding practice (**Figure 3**). One hundred ninety seven (62.5%) and 166 (52.7%) of the respondents strongly agree with initiation of breast feeding within one hour of delivery and feeding of colostrum respectively. About 110 (34.9%) of HIV positive mothers disagree with starting of complementary foods before 6 months of life (**Table 5**).

Table 5:- Attitude towards exclusive breast feeding practice of HIV positive mothers attending governmental health facilities of Jimma Zone, South west Ethiopia, 2021 (n=315).

Variable	Categories	Frequency	Percent
Giving breast milk within 1 hour is important*	Strongly agree	197	62.5
	Agree	84	26.7
	Neutral	34	10.8
Feeding the first milk (colostrum) is	Strongly agree	166	52.7

important	Agree	132	41.9
	Neutral	10	3.2
	Disagree	4	1.3
	Strongly disagree	3	1
Water, butter or fluid should be given to newborn before breast milk	Strongly agree	8	2.5
	Agree	17	5.4
	Neutral	59	18.7
	Disagree	128	40.6
	Strongly disagree	103	32.7
Do you think only breast milk is sufficient up to 6 months of the child life?	Strongly agree	125	39.7
	Agree	105	33.3
	Neutral	41	13
	Disagree	32	10.2
	Strongly disagree	12	3.8
Starting complementary foods before 6 months is important	Strongly agree	15	4.8
	Agree	36	11.4
	Neutral	66	21
	Disagree	110	34.9
	Strongly disagree	88	27.9
Mother to child transmission of HIV is unlikely to occur during breastfeeding*	Agree	1	0.3
	Neutral	67	21.3
	Disagree	124	39.4
	Strongly disagree	123	39

**have less than 5 point because zero cells are not mentioned*

5.5 Clinical Factors

According to this study, 69 (21.9 %) of the participants face breast problem after delivery typically 34 (10.8 %) of them reported breast engorgement. After birth, about half 150 (47.6%)

of respondent`s child face illness. About 125 (39.7%) of the respondents were not disclose their status to their spouse (**Table 6**).

This finding was also supported by in-depth interview result of this study.

Majority of the participants (3 out of 5 PMTCT service providers and 4 out of 6 mother supporting group) responded that HIV positive mothers do not disclose their status due to fear of divorce, lack of social support, stigma and discrimination. As a result to keep secret their status they feed their child locally available foods with breast milk.

A 34 years old health care worker working on PMTCT at one of the hospitals reported that;

“The main challenge to not practice EBF is non-disclosure of HIV status to their spouse. The mothers who not disclose their HIV status have fear of divorce, stigma and discrimination. Because they think that if their husband didn`t accept their status conflict may occur in the home, which lead them to marriage disharmony. As a result they may face economic crisis, discrimination and stigma from the society. So they choose to keep secret their status and feed her child according to infant feeding culture of that society.”

A 37 years old mother supporting group of one health center explained that;

“Most of the time the mothers who not disclose their HIV status feed their infants according to common feeding style of that community. They give to their child locally available foods with breast milk. Since they have fear of lack of social support, family disintegration, social discrimination and stigma they want to live as any person by keeping their HIV status secret.”

Another 32 years old mother supporting group responded as;

“I know a mother who work full day far away from her home to get income for food, house rent and other materials which are mandatory for survival. She had no husband who can support her. During her waiting at work place, her child waits at home with his older sister. His sister feed him a food which is available at home. She breast feed her baby morning and at night only.”

Table 6:-Clinical related characteristics of HIV positive mothers attending governmental health facilities of Jimma zone, Southwest Ethiopia, 2021.

Variable	Categories	Frequency	Percent
Breast problems during post natal	Yes	69	21.9
	No	246	78.1
Type of breast problem faced (n=69)	Inverted nipple	20	6.3
	Crackled nipple	15	4.8
	Breast engorgement	34	10.8
Disclosure of status to spouse	Yes	190	60.3
	No	125	39.7
Child illness since birth	Yes	150	47.6
	No	165	52.4

5.6 Exclusive Breast-feeding Practice of HIV Positive Mothers

Out of 315 study participants, 248 (78.7%) of the respondents practiced exclusive breastfeeding, whereas 60 (19%) and 7 (2.3%) of the respondents had been using mixed feeding and replacement feeding respectively (**Figure 4**).

Majority 308 (97.8%) of the study participants ever breast fed their child, of which 247 (80.2%) of them timely initiate breast feeding and 14 (4.5 %) of them give pre-lacteal feeding such as water, butter or other fluid. Regarding to frequency of breast feeding per day only 82 (26.6 %) of the participants fed on a demand per day (**Table 7**).

Most of mother supporting groups (4 out of 6 participants) who participated in in-depth interview of this study reported that neighbor's and family's pressure hinder HIV positive mothers from practicing exclusive breast feeding. Society around them had a culture of giving liquid or semi-solid foods before first milk which help to easily digestion of any food after breast feeding.

A 29 years old mother supporting group of one health center responded as;

“Most of the mothers get counseling on infant feeding options. But some of them can't practice it due to family and social factors which people live around them think that giving butter before first breast feeding is important to soften newborn's intestine and easy digestion. So they accept this belief and give butter before first breast feeding”

Table 7:- Exclusive Breast feeding practice of HIV positive mothers attending governmental health facilities of Jimma zone, Southwest Ethiopia, 2021.

Variable	Categories	Frequency	Percent
Ever breast fed (n=315)	Yes	308	97.8
	No	7	2.2
Reason for not breastfeeding (n=7)	Breast milk is not adequate	1	14.3
	Fear of HIV transmission	5	71.4
	Breastfeeding is painful	1	14.3
Time of first initiation of breast feeding (n=308)	Timely initiated	247	80.2
	Late initiated	61	19.8
Reason for delay initiation of BF (n=61)	Baby`s sickness	19	31.1
	Mother`s recovery from anesthesia	22	36.1
	Delayed milk secretion	20	32.8
Colostrum feeding (n=308)	Yes	300	97.4
	No	8	2.6
Pre-lacteal feeding (n=308)	Yes	14	4.5
	No	294	95.5
Reason for giving pre-lacteal feeding (n=14)	Milk did not come in yet	4	28.6
	Maternal illness	2	14.3
	Child`s illness	1	7.1
	Influence from family	7	50
Age of introduction of semi-solid (solid) food (n=315)	<=5 months	60	19
	>=6months	255	81
Frequency of BF per day (n=308)	<= 7 times	226	73.4
	>= 8 times (On demand)	82	26.6

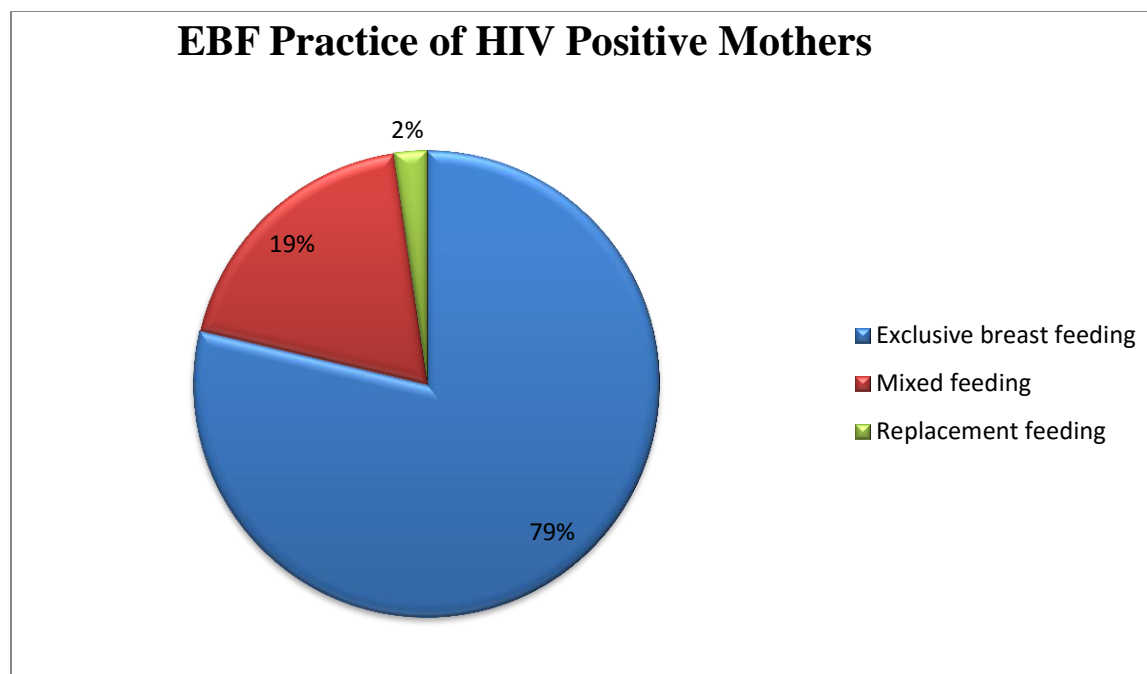


Figure 4:- EBF practice of HIV positive mothers attending governmental health facilities of Jimma zone, Southwest Ethiopia, 2021.

5.7 Factors Associated with Exclusive Breast Feeding Practice

Bi-variable and multivariable logistic regressions were done to assess the variables which were significantly associated with exclusive breast feeding. Accordingly, the bivariable analysis showed EBF to have significant association with place of residence, sex of last child, visit ANC during last pregnancy, frequency of ANC visit, place of delivery of last child, route of delivery, counseling on breast feeding, HIV status disclosure, breast problem, childhood illness, knowledge and attitude towards EBF. In multivariable analysis, place of residence, place of delivery of last child, counseling on breast feeding during ANC visit, disclosure of HIV status to spouse, knowledge and attitude towards exclusive breast feeding were significantly associated with EBF practice (**Table 8**).

Practice of exclusive breast feeding among urban residents were 59% less than rural residents [AOR=0.41, 95% CI; 0.18-0.94]. The respondents who were delivered their last child at health facility were more than six times more likely to breast feed exclusively than who give birth at home [AOR=6.71, 95% CI; 1.23-36.62]. The participants who were counseled on breast feeding options during ANC visit of last pregnancy were around four times more likely to practice

exclusive breast feeding than those their counterparts [AOR=3.76, 95% CI; 1.08-13.09]. The respondents who were disclose their HIV status to their spouse were five times more likely to practice exclusive breast feeding than those who hide their HIV status [AOR=5.32, 95% CI; 2.32-12.17]. The mothers who had good knowledge on exclusive breast feeding were about five times more likely to practice exclusive breast feeding than their counterparts [AOR= 4.94, 95% CI; 2.23-10.94]. The participants who had favorable attitude towards exclusive breast feeding were four times more likely to practice exclusive breast feeding than those who had unfavorable attitude [AOR=4.06, 95% CI; 1.81-9.12] (**Table 8**).

Table 8:- Factors associated with EBF practice of HIV positive mothers attending governmental health facilities in Jimma Zone, Southwest Ethiopia, 2021.

Variables		EBF Practice		COR (95% CI)	AOR (95% CI)
		Yes (%)	No (%)		
Residence	Urban	127 (76)	40 (24)	1.41 (0.82-2.45)	0.41(0.18-0.94)*
	Rural	121 (81.8)	27 (18.2)	1	1
Sex of last child	Male	119 (74.4)	41 (25.6)	0.59 (0.34-1.02)	0.54 (0.26-1.14)
	Female	129 (83.2)	26 (16.8)	1	1
Visit ANC during last pregnancy	Yes	239 (80.7)	57 (19.3)	4.66 (1.81-11.99)	1.39 (0.62-2.87)
	No	9(47.4)	10 (52.6)	1	1
Frequency of ANC visit	<= 3 times	69 (71.9)	27 (28.1)	0.45 (0.25-0.81)	0.75 (0.35-1.62)
	>= 4 times	170 (85)	30 (15)	1	1
Place of delivery of last child	Health facility	243 (81.8)	54 (18.2)	11.70 (4.01-34.21)	6.71 (1.23-36.62)*
	Home	5 (27.8)	13 (72.2)	1	1
Route of delivery	Vaginal	228 (79.7)	58 (20.3)	1.76 (0.77-4.09)	1.29 (0.43-3.84)
	C/S	20 (69)	9 (31)	1	1
Counseling on BF	Yes	233 (83.8)	45 (16.2)	10.36 (3.69-29.03)	3.76 (1.08-13.09)*
	No	6 (33.3)	12 (66.7)	1	1
Face breast	Yes	47 (68.1)	22 (31.9)	0.48 (0.26-0.87)	0.70 (0.32-1.57)

problem	No	201 (81.7)	45 (18.3)	1	1
HIV status	Yes	164 (86.3)	26 (13.7)	3.08 (1.76-5.38)	5.32 (2.32-12.17)*
disclosure	No	84 (67.2)	41 (32.8)	1	1
Child illness	Yes	110 (73.3)	40 (26.7)	0.54 (0.31-0.93)	0.48 (0.22-1.02)
	No	138 (83.6)	27 (16.4)	1	1
Knowledge about EBF	Good	173 (88.7)	22 (11.3)	4.72 (2.65-8.41)	4.94 (2.23-10.94)*
	Poor	75 (62.5)	45 (37.5)	1	1
Attitude towards EBF	Favorable	155 (89.1)	19(10.9)	4.21 (2.33-7.59)	4.06 (1.81-9.12)*
	Unfavorable	93 (66)	48 (34)	1	1

**statistically significant variables*

Chapter 6: Discussion

WHO recommends that HIV infected mother whose infants are unknown HIV status should practice either exclusive breast feeding or exclusive replacement feeding for the first 6 months of life, then introduce complementary foods thereafter. Breastfeeding should then only stop when safe and nutritionally adequate without breast milk can be provided (4). However, in this study, about three fourth (78.7%) of HIV positive mothers breast feed their infants exclusively in the first six months of life. This finding is comparable with findings of the studies conducted in Addis Ababa, Ethiopia in 2014 (77.8%) (32), in Southern Ethiopia in 2020 (81.6 %) (15) and in Nyanza, Kenya in 2014 (79 %) (30).

However, the finding of this study is higher as compared with the findings of the other studies done in West Showa Zone, Oromia region, Ethiopia in 2016 (23.98%) (13), in Southern Ethiopia in 2015 (48.2 %) (33) and other countries like the study conducted in South-western Nigeria in 2015 (61%) (21), Bangladesh, India in 2018 (35.9 %) (19). The deference may be due to the progress of improvement in PMTCT service provision from time to time. The possible reasons for the difference from other countries finding might be due to the difference in health care system, service use behavior of HIV positive mothers and socio-demographic difference of the population.

On the other hand, the finding of this study is lower than the finding of the study conducted in Tigray region, Ethiopia in 2019 (88.8 %) (16), in Debre Berhan town, Ethiopia in 2020 (89.8 %) (34) and in Mekelle, Ethiopia in 2016 (90 %) (18). The difference may arise from difference in culture of feeding habit from place to place.

In this study, HIV positive mothers who live in urban were 59% less to practice exclusive breast feeding than rural residents. This finding has also been reported in finding of the study conducted in Debre Berhan, Ethiopia (34). The possible explanation for this might be most of the mothers who reside in urban area work far apart from their home. So they face difficulty to get their child on time and breast fed exclusively in the first six months of life.

The finding of this study shows that the mothers who deliver their child at health facility were more than six times more likely to breast-feed exclusively for the first six months of life than their counterparts. Similar finding has been reported in a study done in Dessie city, Ethiopia (24).

This may be explained by health information and counseling about the benefit of EBF and infant feeding options were given for the mothers who deliver at health facility. This helps them to decide informed infant feeding option.

According to this study, the mothers who counseled on breast feeding options during ANC visit of last pregnancy were about four times more likely to practice exclusive breast feeding than those who were not counseled. This finding also reported in findings of previous studies conducted in western Ethiopia (35), in Southern Ethiopia (33) and a systematic review and meta-analysis study done in Ethiopia (2). The possible explanation for this finding might be that the mothers who get information about infant feeding options during their ANC visit may know and practice more EBF than their counterparts.

Regarding to HIV disclosure status, a respondents who were disclose their HIV status to their spouse were five times more likely to adhere to EBF for the first six months of life than those who were not disclose their HIV status. This finding is also supported by qualitative finding of this study. This finding is consistent with the findings of the studies done in Oromia regional state, Ethiopia (26), a systematic review and meta-analysis studies done in Ethiopia (2, 9) and in Nyanza, Kenya (30). This may be explained by the reason that the mothers who disclose their HIV status to their spouses may get relief and psychological support from their husbands who help them to reduce fear of stigma and discrimination. So the mothers can practice EBF for the first six months of life without any fear.

This study reveals that mothers who had good knowledge and favorable attitude towards exclusive breast feeding five and four times more likely to practice exclusive breast feeding, respectively. This finding has been also reported in the studies conducted in Northern Ethiopia (16), Southern Ethiopia (15) and Addis Ababa, Ethiopia (23). The possible explanation for this may be arise from more knowledgeable mothers have favorable attitude and more likely to understand easily the advantage and disadvantage of exclusive breast feeding in the first six months of life and to practice it.

Strength and Limitation of the Study

Strength of the study

- The findings were triangulated by qualitative findings.

Limitation of the study

- Social desirability bias might be there due to data collectors are health professionals. Intensive training was given for data collectors to ensure that the finding from this study had no direct impact on their work and also data collectors are from other ward rather than PMTCT.
- Recall bias was also one of the limitations of the study. Because the respondents were expected to remember about past history of child feeding pattern after birth. Effort was taken to minimize it by asking probing questions in different way to assess one variable.
- Using convenient sampling method:- Since the source population is small in number, the study participants may not differ even if using probability sampling method.

Chapter 7: Conclusion and Recommendation

7.1 Conclusion

This study revealed that majority of the study participants were practice exclusive breast feeding. Although the risk of HIV transmission is high, mixed feeding was also practiced considerably. Place of residence, place of delivery, counseling on breast feeding during ANC visit, disclosure of HIV status to spouse, knowledge and attitude of HIV positive mothers towards exclusive breast feeding had significant association with EBF practice.

7.2 Recommendation

Exclusive breast feeding is relatively less costly and more practical option in resource constrained countries.

Health Professionals should

- Strengthen information provided on advantage and disadvantage of infant feeding options during their visit to decide informed infant feeding option and improve knowledge of mothers on infant feeding options.
- Encourage HIV positive mothers to disclose their HIV status to their spouses.

Jimma Zone Health Office

- ✓ Behavioral change communication is essential to improve mother`s knowledge and attitude towards EBF.
- ✓ In this study, the main reason why mothers give pre-lacteal feeding to their child was because of influence from their family and community. So, increase awareness of family and the community on safe infant feeding options is important.
- ✓ For the mothers whose work place is far apart from their home, it is good to prepare children`s waiting area around the work place of the mothers which help them to breast feed at their work place between their work.
- ✓ Develop a strategy for promoting male participation in the program.

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ANNEXES

A. English Version Questionnaire

Title: Exclusive Breast feeding practice and associated factors among HIV positive mothers of children 6-24 months, in Jimma Zone, southwest Ethiopia, 2021.

Name of Investigator: Chaltu Takele

Research Advisors: Dr. Gurmesa Tura and Mrs. Birtukan Edilu

Information and Consent Sheet

Greeting:

This is study on **Exclusive breast feeding practice and associated factors among HIV positive mothers of children 6-24 months, in Jimma zone**, being conducted by **Chaltu Takele** for partial fulfillment of master's degree in Jimma University, institute of health science, public health faculty, department of population and family health. I request you to take part in this study and to respond genuinely. Your cooperation and willingness is greatly helpful in identifying problems related breast feeding practice in infants and young children. The study will be conducted through interviews which may take about 20 min, to help us in this study. All information given by you will be kept strictly confidential and won't be accessible to any third party. Your participation in the study will be totally based on your agreement and you have right not to or may stop participating at any time after starting participation and will not be forced to give information that you does not know. If you have questions regarding this study or would like to be informed of the results after its completion, please feel free to contact the principal investigator. Finally, I would like to thank you in advance for all your contribution.

Are you willing to participate in this study?

1. Yes Continue to the next page

2. No Skip to the next participant

Jimma University, faculty of public health, department of population and family health
Questionnaire for assessment of Exclusive breast feeding practice and associated factors among
HIV positive mothers of children 6-24 months, in Jimma town, Southwest Ethiopia, 2021.

Instruction: Please indicate the response by circling the number of respondent choice or by writing the response in the space provided accordingly.

General Information

Code No: _____

Name of health facility _____ Date ____/____/2013

PART I: Socio-demographic Characteristics of the Respondents

S.N	Question	Response	Remark
001	Mother's age	_____ Years	
002	Residence	1. Urban 2. Rural	
003	Marital status	1. Single 2. Married 3. Widowed 4. Divorced	
004	Religion	1. Muslim 2. Orthodox 3. Protestant 4. Other (Specify) _____	
005	Ethnicity	1. Oromo 2. Amhara	

		3. Kafa 4. Other (specify) _____	
006	Mother`s education	1. No formal education 2. Primary (1-8 grades) 3. Secondary (9-12 grades) 4. Collage and above	
007	Father`s education	1. No formal education 2. Primary (1-8 grades) 3. Secondary (9-12 grades) 4. Collage and above	
008	Mother`s occupation	1. Housewife 2. Merchant 3. Government employee 4. Other (specify) _____	
009	Father`s occupation	1. Merchant 2. Farmer 3. Government employee 4. Other (specify) _____	
010	Sex of last child	1. Male 2. Female	
011	Age of last child	_____ Months	
012	Monthly income	1. <500 2. 500-1500 3. >1500	

Part II: Obstetrics and Health Service Related Factors

014	Gravidity (Total number of pregnancy)	_____	
015	Parity (Total number of live birth)	_____	
016	Did you visit health	1. Yes	

	facility for ANC during your pregnancy for this child?	2. No	
017	If yes to Q.103, how many times did you receive ANC service?	1. <= 2 times 2. 3 times 3. 4 times 4. > 4	
018	Place of delivery of this child	1. Home 2. Hospital 3. Health center 4. Other (specify)____	
019	The route of delivery	1. Vaginal delivery 2. Caesarean section	
020	Who helped you during delivery?	1. TBA 2. Health professional 3. Relatives 4. Other (specify)____	
021	Source of information about breast feeding	1. Mass media 2. Health professionals 3. Relatives 4. Other (specify) _____	
022	Source of information about breast feeding	5. Mass media 6. Health professionals 7. Relatives 8. Other (specify) _____	
023	Did you receive counseling on BF at any of your ANC visit?	1. Yes 2. No	If No skip to next part
024	What information you acquired during your visit	1. Feeding of colostrum protect infants from infectious disease	More than one response is

		<p>2. Initiation of breastfeeding immediately within 1 hour of birth</p> <p>3. EBF should be practiced for the first six months</p> <p>4. Complimentary feeding with breast feeding should continue until 2 years</p> <p>5. Other (specify) ____</p>	possible
Part III: Knowledge of HIV Positive Mothers on Exclusive Breast Feeding			
101	Can an HIV-infected woman breastfeed her child?	<p>1. Yes</p> <p>2. No</p>	
102	When to initiate breastfeeding after birth?	<p>1. Less than 1 hour</p> <p>2. 2 to 24 hour</p> <p>3. After day</p> <p>4. Don` t know</p>	
103	HIV positive mother can give foremilk to her child (Thick and yellowish substance at the beginning of breastfeeding)	<p>1. Yes</p> <p>2. No</p>	
104	HIV positive mother can give water, butter or any other fluid before the first breast milk?	<p>1. Yes</p> <p>2. No</p>	
105	Which is recommended way of feeding for HIV exposed infants at < 6	<p>1. Breast milk only</p> <p>2. Both breast milk and additional food</p> <p>3. Formula (purchased) milk only</p> <p>4. Other (specify) ____</p>	

	months?		
106	When to start other food with breast milk?	At _____ months	
107	When to stop breast feeding completely?	_____ months	
108	Does HIV transmitted from mother to child by breast feeding?	1. Yes 2. No	If No skip to next part
109	How to reduce the risk of HIV transmission from mother to the child?	1. Continue maternal ART and prophylaxis for the child 2. Give purchased milk only 3. Give only breast milk up to 6 months 4. Other (specify)_____	More than one response is possible

Part IV: Attitude of HIV Positive Mothers towards Exclusive Breast Feeding

S. N	Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Remark
20	Giving breast milk within an hour is important						
20	Feeding the first milk (colostrum) is important						
20	Giving water, butter or fluid before breast milk is important						
20	Do you think only breast milk is sufficient up to 6 months of child`s life						
20	Starting complementary foods before 6 months is important						
20	Mother to child						

6	transmission of HIV is unlikely to occur during breastfeeding						
PART VI:-Exclusive Breast Feeding Practice Related Factors							
401	Have you ever breast fed your child?	<ol style="list-style-type: none"> 1. Yes 2. No 					If Yes, skip to 403
402	If No why did you not breastfed your child?	<ol style="list-style-type: none"> 1. Breast milk is not adequate 2. Fear of HIV transmission to my child 3. Breastfeeding is painful 4. Other (specify) _____ 					
403	When did you first put the child to breast after birth?	<ol style="list-style-type: none"> 1. Immediately within 1 hour 2. 1hr - 24hr 3. After 24 hr 					If Immediately within 1 hr skip to 405
404	Why you delay initiation of breast feeding?	<ol style="list-style-type: none"> 1. Baby`s sickness 2. Mother`s recovery from anesthesia 3. Delayed milk secretion 4. Other (specify) _____ 					
405	Did you feed fore milk (Thick and yellowish substance at the beginning of breastfeeding)?	<ol style="list-style-type: none"> 1. Yes 2. No 					
406	Did you give water, butter or any other fluid before you giving the first breast milk?	<ol style="list-style-type: none"> 1. Yes 2. No 					If No skip to 408
407	If yes, why did you give for your child?	<ol style="list-style-type: none"> 1. Milk did not come in yet 2. I was ill 3. The baby was ill 4. Influence from family 5. Other (specify) _____ 					
408	What did you feed your	<ol style="list-style-type: none"> 1. Breast milk only 					

	child below 6 months?	2. Both breast milk and additional food 3. Commercial infant formula milk only 4. Other (specify) ____	
409	At what age did you first introduce solid or semi-solid food to your child?	____ months	
410	How many times did you breast feed per day?	____ per day	

B. Gaafannoo Afaan Oromoo

Akkam jirta?

Yuunivarsiitii Jimmaatti Muummee barnoota fayyaa hawaasaa kutaa fayyaa maatii jalatti barattuu digirii 2 ffaa kan taate Barartuu Caaltuu Taakkalaa Qorannoo Gocha harma qofa hoosisuu fi isaan wal qabatan Haadholee HIV qabaatanii daa`ima jia 6 hanga ji`a 24 tti qaban irratti hojjechaa jirti. Gaaffiiwwan armaan gaditti dhiyaatan deebisuun kee rakkoolee harma hoosisuu dhiisuu haadholee HIV qabanii irraa kan ka`e daa`ima isaanii irra gahu furuuf gahee ol`aanaa qaba.

Bu`aan deebii kee kun iccitiin akka eegamun siif mirkaneessa. Hirmaachuu yookin hirmaachuu dhiisuuf akkasumas addaan kutuuf mirga guutuu qabda. Bakka siif hin galletti sodaa tokko malee gaafachuu dandeessa. Daqiiqaa 20 `f fedhii guutuudhaan qorannoo kana keessatti akka hirmaattu eeyyama keen si gaafadha.

Qorannoo kana keessatti hirmaachuuf fedha qabda?

Eeyyee..... Gara gaaffiiwwan itti annutti darbi

Lakki..... Asumatti dhaabii gara hirmaataa itti aanuutti tari

Qajeelfama: Qubee deebii qabatetti mari.

Koodii _____

Maqaa dhaabbata fayyaa: _____ Guyyaa: ___/___/ 2013

Kutaa Iffaa: Ragaa Diimogiraafii Haadhaa

Lak.	Gaaffii	Deebii	Yaada
001	Umurii haadhaa	Waggaa _____	
002	Bakka jireenyaa	1. Magaala 2. Baadiyyaa	
003	Haala gaa`elaa	1. Gaa`ela hin dhaabbanne 2. Abbaa manaa qaba 3. Abbaa manaan du`eera 4. Wal hiikeera	
004	Amantii	1. Islaama 2. Ortodoksii 3. Protestaantii 4. Kan biraa (adda baasi)_____	
005	Gosa	1. Oromoo 2. Amaaraa 3. Kaffaa 4. Kan biraa (adda baasi)_____	
006	Sadarkaa barnoota haadhaa	1. Hin baranne 2. Barnoota sadarkaa tokkoffaa 3. Barnoota sadarkaa lammaffaa	

		4. Koollejii fi isaa ol	
007	Sadarkaa barnoota abbaa manaa	1. Hin baranne 2. Barnoota sadarkaa tokkoffaa 3. Barnoota sadarkaa lammaffaa 4. Koollejii fi isaa ol	
008	Hojii haadhaa	1. Hojjetuu manaa keessaa 2. Hojjetuu mootummaa 3. Daldaltuu 4. Kan biraa (adda baasi)_____	
009	Hojii abbaa manaa	1. Hojjetaa mootummaa 2. Daldalaa 3. Qotee bulaa 4. Kan biraa (adda baasi)_____	
010	Saala mucaa isa boodaa	1. Dhiira 2. Dhalaa	
011	Umurii mucaa isa boodaa	1. Ji`a 6-12 2. Ji`a 12-18 3. Ji`a 18-24	
012	Galii ji`atti argattan	1. 500 gadi 2. 500-1500 3. 1500 oli	
Kutaa 2ffaa: Tajaajila Fayyaa Haadholee irratti			
014	Baay`ina ulfaa	_____	
015	Baay`ina dahumsaa	_____	
016	Yeroo ulfaa tajaajila dahumsa duraa argatteettaa?	1. Eeyyee 2. Lakki	
017	Yoo argatteetta ta`e marsaa meeqa deemtee tajaajila argatte?	1. Lamaa fi isaa gadi 2. Sadii 3. Afur 4. Afurii ol	

018	Mucaa kee kana eessatti deesse?	<ol style="list-style-type: none"> 1. Mana 2. Hospitaala 3. Buufata fayyaa 4. Kan biraa (adda baasi)_____
019	Mucaa kee kana akkamiin deesse?	<ol style="list-style-type: none"> 1. Karaa gadameessaa 2. Baqaqsanii yaaluudhaan
020	Yeroo dahumsaa eenyutu si gargaare?	<ol style="list-style-type: none"> 1. Deessistuu aadaa 2. Ogeessa fayyaa 3. Fira 4. Kan biraa (adda baasi)_____
021	Odeeffannoo waa`ee harma hoosisuu eessaa argatta?	<ol style="list-style-type: none"> 1. Miidiyaa irraa 2. Ogeessa fayyaa irraa 3. Fira irraa 4. Kan biraa (adda baasi)_____
022	Dhaabbata fayyaatti harma hoosisuu irratti gorsa argatteetta?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakki
023	Yeroo argatteetta ta`e odeeffannoo akkamii argattee?	<ol style="list-style-type: none"> 1. Aannan duree hoosisuun daa`ima dhukkuba daddarboorraa ittisa 2. Dahumsa booda sa`aatii 1 gidduutti harma hoosisuu eegaluu 3. Hamma ji`a 6 tti harma qofa hoosisuu 4. Nyaati dabalataa harma waliin hamma waggaa 2 tti akka itti fufu 5. Kan biraa (adda baasi)_____

Kutaa 3 ffaa: Beekumsa Haati Harma Hoosisuu irratti Qabdu

101	Haati HIV qabdu daa`ima ishee hoosisuu dandeessii?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakki 	
102	Dahumsa booda harma hoosisuun yoom jalqabuu qabdi?	<ol style="list-style-type: none"> 1. Sa`aatii 1 gaditti 2. Sa`aatii 2 hanga 24 tti 3. Guyyaa 1 booda 	

		4. Hin beeku	
103	Haati HIV qabdu tokko Aannan duree (waan keelloo jalqaba harmaa ba`u) hoosisuu dandeessii?	1. Eeyye 2. Lakki	
104	Haati tokko bishaan fi nyaata biraa harma dura daa`imaaf kennuu qabdi?	1. Eeyye 2. Lakki	
105	Haati HIV qabdu tokko ji`a 6 gaditti daa`ima ishee maal nyaachisuu qabdi?	1. Aannan harmaa qofa 2. Harmaa fi nyaata dabalataa wal make 3. Nyaata bakka harmaa bu`an qofa 4. Kan biraa (adda baasi)_____	
106	Harma waliin nyaata dabalataa yoom kennamuu qaba?	Ji`a _____	
107	Harma hoosisuun guutummaatti yoom dhaabata?	Ji`a _____ tti	
108	HIV`n harma hoosisuu dhaan haadha irraa gara mucaatti ni darbaa?	3. Eeyyee 4. Lakki	Yoo lakki ta`e kutaa itti aanutti darbi
109	Haadha irraa gara mucaatti daddarbuu HIV akkamiin ittisuu dandeenya?	1. Haatii fi daa`imni qoricha itti fufuu 2. Hamma ji`a 6 tii aannan bitamu qofa kennuu 3. Hamma ji`a 6 tti harma qofa hoosisuu 4. Kan biraa (adda baasi)_____	Deebii tokkoo ol guutuun ni danda`ama.

Kutaa 4ffaa: Ilaalcha Haati Harma Hoosisuu irratti Qabdu (Bakka deebii mallattoo “√” kaa`i)

	Gaaffii	Sirriitti walii gaala	Walii gala	Hin beeku	Walii hin galu	Tasuma walii hin galu	Yaada
201	Aannan harmaa deessee sa`aatii 1 gidduutti kennuun faayidaa qaba						

202	Dhangala`aa keelloo aannan dura dhufu hoosisuun gaarii dha						
203	Bishaan, dhadhaa fi nyaata biraa harma dura daa`imaaf kennuun barbaacisaa dha						
204	Aannan harmaa qofti hanga ji`a 6 tti gahaa dha jettee yaaddaa?						
205	Nyaata dabalataa ji`a 6 gaditti daa`imaaf kennuun gaarii dha						
206	Harma hoosisuu dhaan HIV gara daa`imaatti ni darba						

Kutaa 5ffaa: Tajaajila Fayyaa Haadholee irratti

301	Baay`ina ulfaa	_____	
302	Baay`ina dahumsaa	_____	
303	Yeroo ulfaa tajaajila dahumsa duraa argatteetaa?	3. Eeyyee 4. Lakki	Yoo Lakki ta`e gara 305 deemi.
304	Yoo argatteetta ta`e marsaa meeqa deemtee tajaajila argatte?	5. Lamaa fi isaa gadi 6. Sadii 7. Afur 8. Afurii ol	
305	Mucaa kee kana eessatti deesse?	5. Mana 6. Hospitaala 7. Buufata fayyaa 8. Kan biraa (adda baasi)_____	
306	Mucaa kee kana akkamiin deesse?	3. Karaa gadameessaa 4. Baqaqsanii yaaluudhaan	
307	Yeroo dahumsaa eenyutu si gargaare?	5. Deessistuu aadaa 6. Ogeessa fayyaa 7. Fira	

		8. Kan biraa (adda baasi)_____	
308	Dhaabbata fayyaatti harma hoosisuu irratti gorsa argatteetaa?	3. Eeyyee 4. Lakki	Yoo Lakki ta'e gara kutaa itti aanuutti darbi
309	Yeroo argatteetta ta'e odeeffannoo akkamii argattee?	6. Aannan duree hoosisuun daa`ima dhukkuba daddarboorraa ittisa 7. Dahumsa booda sa`aatii 1 gidduutti harma hoosisuu eegaluu 8. Hamma ji`a 6 tti harma qofa hoosisuu 9. Nyaati dabalataa harma waliin hamma waggaa 2 tti akka itti fufu 10. Kan biraa (adda baasi)_____	Deebii tokkoo ol guutuun ni danda`ama.

Kutaa 6ffaa: Yaalii Fayyaa Waliin Wal qabatee

308	Dahumsa booda rakkoo harmaan wal qabate si mudateeraa?	1. Eeyyee 2. Lakki	Yoo Lakki ta'e gara 310 deemi
309	Yoo si mudateera ta'e rakkoo akkamiitu si mudate?	1. Keessa galuu fiixee harmaa 2. Tatarsa`uu harmaa 3. Dhiita`uu harmaa 4. Kan biraa (adda baasi)_____	
312	Haala fayyaa kee ammaa abbaa manaan kee beekaa?	1. Eeyyee 2. Lakki	
313	Daa`imni erga dhalatee dhukkubsatee beekaa?	5. Eeyyee 6. Lakki	

Kutaa 7 ffaa: Gocha Harma Hoosisuun Wal qabate

401	Daa`ima kee kana harma hoosistee beektaa?	1. Eeyyee 2. Lakki	Yoo 1 ta'e gara 403 deemi
402	Yoo hin hoosisne ta'e maaliifi?	1. Aannan harmaa qofti gahaa miti 2. HIV`n mucaatti darba jedhee sodaadhe	

		<ul style="list-style-type: none"> 3. Hoosisuun nama dhukkubsachiisa 4. Kan biraa (adda baasi) _____ 	
403	Dahumsa booda mucaa kee jalqaba yoom hoosiste?	<ul style="list-style-type: none"> 1. Sa`aatii 1 gidduutti 2. Sa`aatii 1 hanga 24 gidduutti 3. Sa`aatii 24 booda 	yoo 1 ta`e gara 405 deemi
404	Maaliif daftee harma jalqabsiisuu dhiiste?	<ul style="list-style-type: none"> 1. Dhukkubbii mucaa 2. Daftee of baruu dhiisuu Haadhaa 3. Aannan bahuu diduu 4. Kan biraa (adda baasi) _____ 	
405	Dhangala`aa furdaa, keelloo aannan harmaa dura dhufu hoosisteettaa?	<ul style="list-style-type: none"> 1. Eyyee 2. Lakki 	
406	Harma dura bishaan, dhadhaa fi nyaata biraa mucaaf kenniteettaa?	<ul style="list-style-type: none"> 1. Eeyyee 2. Lakki 	Yoo Lakki ta`e gara 409 deemi
407	Yoo kenniteetta ta`e maalif kennite?	<ul style="list-style-type: none"> 1. Harmi dafee hin bane 2. Dhukkubbii haadhaa 3. Dhukkubbii daa`imaa 4. Dhiibbaa maatii 5. Kan biraa (adda baasi)_____ 	
408	Daa`ima kee ji`a 6 gaditti maal nyaachisaa turte?	<ul style="list-style-type: none"> 1. Aannan harmaa qofa 2. Aannan harmaa fi nyaata dabalataa wal make 3. Aannan bitamu qofa 4. Kan biraa (adda baasi)_____ 	
409	Nyaata dabalataa daa`ima keef ji`a meeqatti kennuu eegalte?	Ji`a _____tti	
410	Guyyaatti marsaa meeqa daa`ima kee hoosista?	_____	

C. In-depth Interview Guide

1) Guiding questions for the In-depth interview with PMTCT service provider

My name is _____ and this is my partner _____. We came from Jimma University and researching the Exclusive breast feeding practice and associated factors among HIV positive mothers of 6-24 months children in Jimma Zone, Southwest Ethiopia. Here you invited to interview freely issues what we are going to pose. The points are simple and understandable. Whatever you feel and believe in the raised idea is allowed since there is no right or wrong answer. We are going to audiotape your discussion but know that it is confidential and used only for research purposes. Any personal identification will not pass to anybody. We are going to stay about 20 minutes interviewing in an ordered manner.

Thank you for giving us your time!!

Health facility name: _____

Sex of Respondent _____ Age of respondent _____ Profession _____

Name of Data Collector: _____ Signature _____ Date _____

1. What are the key factors that determine the infant feeding choice of HIV positive mothers?

2. In your opinion, what would you say hinder/encourage the HIV positive mothers to breast fed exclusively for the first six months of life?

3. What reasons were reported by clients on why they use mixed feeding before 6 months of child`s age?

4. What are the challenges you face in providing advice on breast feeding during PMTCT service?

5. What do you suggest to address these challenges and improve breast feeding practice of HIV positive mothers in your area?

2) Guiding questions for the In-depth interview with Mother Supporting Groups

My name is _____ and this is my partner _____.

We came from Jimma University and researching the Exclusive breast feeding practice and associated factors among HIV positive mothers of 6-24 months children in Jimma Zone, Southwest Ethiopia. Here you invited to interview freely issues what we are going to pose. The points are simple and understandable. Whatever you feel and believe in the raised idea is allowed since there is no right or wrong answer. We are going to audiotape your discussion but know that it is confidential and used only for research purpose.

Thank you for giving us your time!!

Age of respondent _____

Name of Data Collector: _____ Signature _____ Date _____

1. Why HIV positive mothers not exclusively breast fed up to 6 month of child`s age?

2. In your opinion, what factors can hinder/encourage the HIV positive mothers to exclusively breast fed their child?

3. Why HIV positive mothers give pre lacteal food for their child?

4. What barriers do HIV positive mothers face to get counseling about breast feeding on PMTCT service?

5. What do you suggest to address these challenges and improve exclusive breast feeding practice of HIV positive mothers?

DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

Name: Chaltu Takele Mule

Signature: _____

Name of the institution: Jimma University, Faculty of Public Health, Department of Population and Family Health

Date of submission: August 17/2021

This thesis has been submitted for examination with my approval as University advisor.

Name and Signature of the first advisor

Name: Dr. Gurmesa Tura

Signature: _____

Name and Signature of the second advisor

Name: Mrs. Birtukan Edilu

Signature: _____