Exercise-Based and Associated Factors Breastfeeding on HIV-Infected Mothers for Children Age 1-24 Months in Central Zone, Tigray, North Ethiopia, 2019.

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Research

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Abstract

**Background:** Breastfeeding exposed to HIV is a major factor in the spread of HIV, but breastfeeding alone poses a significant risk to the baby's health because breastfeeding can reduce the impact of many infections and support some chronic diseases. Therefore, this study was aimed to assess exercise-based and associated factors breastfeeding on HIV-infected mothers for children age 1-24 months in the central zone, Tigray, north Ethiopia.

**Methods:** A Facility-based Cross-Sectional study was conducted from March to April 2019. A systematic random sampling method was used to select study participants. Information was collected using a structured, pre-tested questionnaire. The data is coded, cleaned, copied and entered EPI-info 7 and finally export to SPSS version 22.00 for analysis. Association between independent and dependent variables was first analyzed using binary logistic regression analyses. An alternative bivariate logistic regression analyzes of less than 0.2 were entered in multivariable logistic regression analysis. The statistical association between variance dependent and independent variables was measured using an OR, AOR, 95% CI, and a p-value less than 0.05.

**Result:** 239 HIV-positive mothers participated in this study. Approximately 204(85.4) are favorable attitude in the practice of exclusive breastfeeding. The majority of mothers 206 (86.7%) experienced good breastfeeding. Mothers with Information while exclusive breastfeeding (AOR, 2.57, 95%CI: 1.03- 6.4) and age at first birth (AOR: .247, 95%: (.106- .578) had a significant collaboration on exclusive breastfeeding practice among HIV-infected mothers. Several ANC visits have had a significant collaboration on exclusive breastfeeding practice among HIV-infected mothers (AOR; 3.726 95%CI; 1.055-13.154).

**Conclusion:** The study found that HIV positive mothers attending health care facilities had a favorable attitude but practiced on EBF is still low. Therefore, train health professionals especially health extension workers to raise awareness education, enhance information, regarding EBF and strength counseling in ANC service is better to improve the HIV positive mother level of attitude and practice to EBF.

**Background**

Breastfeeding exposed to HIV is a major factor in the spread of HIV, but breastfeeding alone poses a significant risk to the baby's health because breastfeeding can reduce the impact of many infections and support some chronic diseases and breastfeeding. Diet exercise is generally the best baby diet choice for all women(1).

Globally, over 10 million children under five die each year and 40% of diseases under the age of two are associated with inappropriate breastfeeding, 34% of which occur in South Asia and 41% in sub-Saharan Africa (2).In addition to breastfeeding, 300,000 HIV infections occur annually, while at the same time the United Nation Children Emergency Fund (UNICEF) is not responsible for the deaths of 1.5 million children in one year, and the biggest burden of this infection, Sub-Saharan Africa (3).
In the first year of the world, two-thirds of all deaths in the world often follow appropriate nutritional practices, especially due to unspecified breastfeeding activities(4). In the developing world, including Ethiopia, 3000-4000 infants per day die from diarrhea and respiratory infections associated with high levels of disease(5).

In Ethiopia, 321,000 children under five years of age die from malnutrition, with 57% of death each being primarily prevented by breastfeedings, such as diarrhea and pneumonia. (6).

About 40% of the world population, 47% in Africa, and 58% in Ethiopia, according to Ethiopian demographic and health survey (EDHS) 2016, have increased the number of children under 0-6 months. (7, 8).

Study show’s in India 30.6% (9) southern Ethiopia, Mekelle and central zone Tigray show that attitude towards exclusive breastfeeding about 56.7%, 81.6% and 82.6% of HIV mothers had favorable attitudes towards EBF (10-12).

Study in Botswana 20%(13), southwestern Nigeria 61%(14), Burkina Faso52.5% (15), Kenya40.6%(16), Southern Ethiopia 82.8%(17), in Bahir Dar75.2% (18), Gondar 89.5%(19) and west oromia72%(20) and central zone, Tigray about 90% (21) shows that mothers who are HIV positive breastfed were practiced exclusively breastfeeding for the first 6 months respectively.

Recent study identified that predictor for attitude and practice exclusives breastfeeding among mothers living with HIV/AIDS were mother’s occupation, residence, knowledge on EBF practice, ANC service, counseling on EBF practice during ANC visit, insufficient breast milk, husband imposition, mother’s illness and both mother’s and infant’s illness, income, maternal choice of maternal-infant feeding practice and cultural (10-21) Therefore, this study was aimed at assessing attitude, practice and determinant factors affecting exclusives breastfeeding among mothers living with HIV/AIDS have children age 0-24 months in central zone Tigray.

**Methods**

A facility-based cross-sectional study was conducted from March to April 2019, at Central zone Tigray regional state of Ethiopia. The central zone is 1024km from Ethio-capital, Addis Ababa, 240 km from the capital city of Tigray. The central zone was divided into 12weredas, of which 631,972 were female and 613,251 were males. The total number of people living with HIV was 4841, the reproductive-age women who are HIV positive were 2028 and HIV positive mothers who have an infant less than or equal to 24 months were 485. There were 72 health centers (20 of them have ART service), 6 primary hospitals, 3general hospitals, and 1 referral hospital.

All HIV positive mothers with children younger than or equal 24 months were recruited as a study group within the designated public health facility’s central zone. All HIV-positive mothers who gave birth within
24 months before the study were included, excluded, had no mental illness or had several mental illnesses during data collection.

Considering 82% of exclusive breastfeeding rate for children under six months of age (21), 95% confidence level, 5% tolerable margin of error, 5% unresponsive, a total sample of 239 were considered. to test the consistency of sample size, Epi-info was considered to be the only breastfeeding practice considering the relevant aspect of the observation. It was larger than the Epi-info by comparing a sample size based on a population. Therefore, the largest sample size of 239 was determined.

Considering all public health institutions in the Tigray region of the Central Zone, the sample size visited all public health institutions based on the number of children under or equal the age of 24 months who were HIV positive mother, round up. Participants in the study were selected for each of the 2 HIV-infected mothers of a randomized random sampling method, equal to 24 months.

Attitude and practice Exclusive Brest feeding was considered as the dependent variable. Socio-demographic and Reproductive characteristics, knowledge exclusive breastfeeding, Institutional and source of information related factors were considered as the independent variable.

The attitude of exclusive breastfeeding – Good (Positive) attitude (scores >60%) on the overall attitude question (17).

Good practice of exclusive breastfeeding - mothers answer (score > 60%) on the overall practice question (17).

Keble: A small administrative unite consisting of 20,000 population.

The information was collected using the questionnaire and a structured questionnaire from a variety of similar research (15, 17, 19) if there was a change in the context of the study. Face-to-face breastfeeding alone was tested during a panel discussion with 12 women and one of the women in questionnaire accuracy and translation quality questionnaire. A few questions for language transparency and information were reviewed and the questionnaire was completed for the study. The applicant includes a source of social and demographic, reproductive history, institutional and informational sources.

Five health care professionals and two supervisors were recruited from the health center and trained for one day. Supervisors follow a daily data collection process and communicate with investigators every day to check the consistency of the data.

The data is coded, cleaned, copied and entered EPI-info 7 and finally export to SPSS version 22.00 for analysis. A simple descriptive summary was made. Table, diagrams, descriptions, charts, and graphs were used to produce the result of the analyzed data. After that, you can combine the filters into the corresponding catalogs using a chi-square test variable with small cell size. An alternative bivariate logistic regression analyzes of less than 0.2 were entered in multivariable logistic regression analysis. Appropriate fitness testing done well more than 0.2 predicted variants and a multiple-choice test between
Hosmer and Lemeshow test P-value to assess model performance. The statistical association between various independent variables was measured using an OR, AOR, 95% CI, and a p-value less than 0.05.

Results

Socio-demographic characteristics of mothers

A total of 239 HIV positive mothers participated in a response rate of 100%. Out of the total participated mothers, 175(73.5%) were with an age range of 25-35 years. The majority of the participants 177(73.8%) were married (Table 1).

Health institutions related factors and source of information

Three fourth of the respondents (75.8%) reported that they had to get information about EBF from health professionals. Among them, 97.9% of these respondents had availability of health care facilities in your area. (Table 2).

Reproductive characteristics of mothers

The majority of the respondent's 74.4% mother's age at marriage was 18-24 years. Among them, 54.2% of mothers their child age from 6 months up to 12 months. From total respondents, about 95.8 % attended ANC follow and about 76.6 % were from 3-4 ANC follow up (Table 3).

Knowledge of EBF among HIV positive mothers

In our study majority respondents, 93.7% heard about exclusive breastfeeding, among this 92.4% knew the importance of exclusive breastfeeding for child health. About knowledge on EBF HIV positive mother, 88.2% of the respondents know HIV seropositive mother can breastfeed, 90.8% know foods or fluids recommended to under 6-month child is only breast milk and about 35.6% know times baby breastfeeding per day were from 8-10 times (Table 4).

The attitude of EBF among HIV positive mothers

In our study more than three fourth respondents, 78.6% believed that breast milk was free from any contamination; among this 86.6% believe that EBF is better than artificial feeding.80.9% of HIV seropositive mothers strongly recommended breastfeeding, and 10% of participants believe that is important to eat food six months ago. Of the total respondent, 83.6% had a positive attitude about EBF for up to six months. (Table 5).
EBF practice among HIV-positive mothers

Most, 214(89.5%) of mothers feed their last baby on the mother's breast. The majority of the participants reported that 194(90.6%) of mothers started breastfeeding immediately within one hour after birth. 102(42.5%) of all breastfeeding was 8-10 times a day. Most mothers reported 74.6% of explicit breastfeeding exercises for your baby up to six months, 20.8% of respondents had 6 to 12 months and 1.3% of mothers over 12 months. It was 86.2% of all positive experiences. (Table 6).

Factors associated with the attitude of EBF among HIV positive mothers

In bivariate analysis, maternal educational status, mothers who had Information on the term of EBF, types of health care facility available, age at first birth and numbers of postnatal care visits were significant association with exclusive breastfeeding attitude among HIV positive mothers. In multivariate analysis, mothers who had information on the term of EBF and age at first birth had significantly associated with an attitude of HIV positive mothers on EBF (AOR: p<0.05). HIV positive mothers who had Information on the term of EBF 2.57 more likely favorable attitude than mothers who had no information on the term of EBF (AOR,2.57,95% CI: 1.03- 6.4). HIV positive mothers whose age at first birth 24 and above were 0.247 times less likely had favorable attitude than HIV positive mothers whose age at first birth were 18-24 years (AOR.247, 95% : (.106- .578). (Table 7)

Factors associated with the practice of EBF among HIV positive mothers

In bivariate analysis, maternal educational level, number of gravidities, number of ANC visits, types of health care facility available and Income had a significant association with exclusive breastfeeding practice among HIV positive mothers and those candidate variables for multivariate logistic regression. In a multivariate analytical number of ANC visit only had a significant association with exclusive breastfeeding practice among HIV positive mothers, mothers were 3-4 numbers of ANC visit had 3 times more likely practice on exclusive breastfeeding than mothers were ANC visits' less than or equal 2 ( AOR; 2.981,95%CI;1.113-7.983). (Table 8).

Discussions

This study was a case study of cognitive functioning and corresponding breastfeeding status among HIV-infected mothers who participated in PMTCT and ART services in selected health education of the central zone, Tigray, Ethiopia. In this study, two hundred five (85.4) of the HIV infected mother reported the mother had a positive attitude towards the EBF experience. This source study conduct in Botswana 56.3% (13), is higher than a study. This may be the single most effective and effective treatment for children.
under six months of age. This finding is higher than another study conducted in southern Ethiopia (56.7\%) and central zone Tigray 82.6\% respectively. This difference may be due to health services and health education\(^{(17,21)}\).

In this study, the mother, who had information about EBF status and age at first birth, had played a significant role in the attitudes toward EBF on the HIV positive mothers. HIV positive mothers who have had information on the term of EBF three times more likely favorable attitude than mothers who had no information on the term of EBF. This may be due to poor information or poor advice on dietary options for children under six months. HIV positive mothers whose age at first birth 24 and above was 24\% times less likely had favorable attitude than HIV positive mothers whose age at first birth were 18-24 years. This may be due to poor advice on the risk of HIV transmission to your baby and breastfeeding alone.

In this study, the mother, who had information about EBF status and age at first birth, had played a significant role in the attitudes toward EBF on the HIV positive mothers. HIV positive mothers who have had information on the term of EBF three times more likely favorable attitude than mothers who had no information on the term of EBF. This may be due to poor information or poor advice on dietary options for children under six months. HIV positive mothers whose age at first birth 24 and above was 24\% times less likely had favorable attitude than HIV positive mothers whose age at first birth were 18-24 years. This may be due to poor advice on the risk of HIV transmission to your baby and breastfeeding alone.

In this study, two hundred six (86.2) of HIV positive mothers had good practice towards EBF practice. This finding is higher than the study conducted in India 30.6\% (9), Tanzania ilala municipality dares salaam46\% (22), Botswana 20\% (13), western Nigeria 61\% (14) and in Burkina Faso, 52.5\%(15) of HIV positive mothers were practice exclusively breastfed to their children. This discrepancy might be due to socio-demographic characteristics and the availability of health services.

In this study, about 85 \% of HIV positive mothers initiated breastfeeding within the recommended first hour of birth. this result was higher than the study conducted in Oromia regional 69.3\% and Southern Ethiopia shows that 51.5\% initiated breastfeeding within the recommended first hour of birth\(^{(20,17)}\).

In this study, HIV positive mothers practiced complementary feeding at 6 months of life were 53.3 \%.this finding is lower than the study done in Southern Ethiopia that 77.2 \% mothers practiced complementary feeding at 6 months of life \(^{(17)}\).

This study also found out that 86.7 \% of HIV positive mothers were practiced exclusive breastfeeding. This finding was higher than from a study done in Bahir Dar 75.2\% and west Oromia 72\% practiced exclusive breastfeeding\(^{(17,20)}\). However, this study finding is lower the study done Gondar town 89.5\% and Mekelle town, 90 \% of HIV positive mothers had practiced exclusive breastfeeding \(^{(11,18)}\). In this finding number of ANC visits had a significant association with exclusive breastfeeding practice among HIV positive mothers, mothers were 3-4 numbers of ANC visits had 37\% more likely practice on exclusive breastfeeding than mothers were ANC visits' less than or equal 2. This may be to increasing contact with the health care provider and to provide information on breastfeeding practices, particularly in EBF practice.

**Conclusion**

The study found that HIV positive mothers attending health care facilities in the central zone, the Tigray region had a favorable attitude but practiced on EBF is still low. Factor such as Information on the term of EBF and age at first birth was associated with attitude toward EBF and the Number of ANC visits was
associated with practice on EBF. Therefore, train health professionals especially health extension workers to raise awareness education, enhance information, regarding EBF and strength counseling in ANC service is better to improve the HIV positive mother level of attitude and practice to EBF.

**Declarations**

**Ethics approval and consent to participant**

Ethical clearance was obtained from the Institutional Review Committee (IRC), College of Medicine and Health Sciences, University of Aksum. Permission letter was received from those administrative bodies of the Central Tigray Health Department and each health facility’s verbal and written consent was obtained from all participants after they informed on the purpose of the study.

**Consent for publication**

Not applicable

**Availability of data and materials**

All relevant data are within the manuscript and its Supporting Information files.

**Computing interest**

The authors declare that they have no competing interests.

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**Authors’ contributions**

HM and TG designed the study, performed the statistical analysis, drafted the paper, data analysis and read and approved the final paper.

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Tables

Table 1: Socio-demographic characteristics of HIV positive mothers on EBF in a public health facility central zone, Tigray, Ethiopia, 2019.
| Variables                     | Response          | Frequency | percent |
|-------------------------------|-------------------|-----------|---------|
| Maternal age                  | From 15-24 year   | 6         | 2.5     |
| From 25-35 year               | 175               |           | 73.5    |
| Above 35 year                 | 58                |           | 24.2    |
| Total                         | 239               |           | 100     |
| Ethnicity                     | Tigray            | 230       | 96.2    |
| Amhara                        | 8                 |           | 3.3     |
| Oromo                         | 1                 |           | 0.4     |
| Religion                      | Orthodox          | 217       | 90.8    |
| Protestant                    | 2                 |           | 0.8     |
| Muslim                        | 20                |           | 8.4     |
| Residence                     | urban             | 205       | 85.5    |
| rural                         | 34                |           | 14.2    |
| Education states of mothers   | Illiterate        | 95        | 39.7    |
| Literate                      | 144               |           | 60.3    |
| Total                         | 239               |           | 100     |
| mothers occupation            | Nonemployee       | 119       | 49.8    |
| Employed                      | 120               |           | 50.2    |
| Total                         | 239               |           | 100     |
| marital status                | Married           | 177       | 73.8    |
| never married                 | 21                |           | 8.8     |
| Divorced                      | 34                |           | 14.2    |
| Widowed                       | 8                 |           | 3.3     |
| husband’s educational level   | Illiterate        | 72        | 30.1    |
| Literate                      | 116               |           | 48.5    |
| Total                         | 188               |           | 78.7    |
| husband’s occupation          | Nonemployee       | 80        | 33.5    |
| Employed                      | 108               |           | 45.2    |
| Total                         | 188               |           | 78.7    |
| average monthly income of your family | Less than 1000 birr | 39 | 16.3 |
| From 1000-1500                | 54                |           | 22.6    |
| Above 1500                    | 146               |           | 61.1    |

Table 2: Health Institutions related factors and source of information on EBF among HIV positive mothers in public health facility central zone, Tigray, Ethiopia 2019.
| Variables                                      | Response | Frequency | percent |
|-----------------------------------------------|----------|-----------|---------|
| heard of any those EBF                       | Yes      | 194       | 81.2    |
|                                               | No       | 45        | 18.2    |
| Sources of information about EBF?             | Health professionals | 182 | 75.8 |
|                                               | Media    | 28        | 11.7    |
|                                               | Reading  | 2         | 0.8     |
|                                               | books    | 3         | 1.3     |
|                                               | Family/ Friend | 1 | 0.4 |
|                                               | Magazines|           |         |
| type of media use                             | Television | 156 | 65 |
|                                               | Radio    | 50        | 20.8    |
|                                               | Newspaper| 2         | 0.8     |
|                                               | Magazine | 10        | 4.2     |
| Availability of health care facility in your area | Yes | 234 | 97.9 |
|                                               | No       | 5         | 2.1     |
| Type of health facilities in your area        | Health post | 19 | 7.9 |
|                                               | health center | 105 | 43.8 |
|                                               | hospital  | 116       | 48.3    |
|                                               | private clinic |     |         |
| The distance of health facilities from your home on foot. | Less than 30 minute | 129 | 53.8 |
|                                               | 30 minute to one hour | 93 | 38.8 |
|                                               | One hour to two hour | 14 | 5.8 |
|                                               | More than two hour | 4 | 1.7 |
| Cost of care influence your services          | yes      | 31        | 13      |
|                                               | no       | 208       | 87      |
| Healthcare staffs have a good approach for you where you have utilized healthcare services | Yes | 226 | 94.6 |
|                                               | No       | 13        | 5.4     |

Table 3 Reproductive characteristics of HIV positive mothers on EBF in public health facility central zone, Tigray, Ethiopia 2019.
| Variables                                      | Response                | Frequency | percent |
|-----------------------------------------------|-------------------------|-----------|---------|
| age at marriage                               | From 18-24 years        | 221       | 92.5    |
|                                               | Greater than 24 year    | 18        | 7.5     |
| age at first birth                            | From 18-24 years        | 191       | 79.9    |
|                                               | Greater than 24 year    | 48        | 20.1    |
| Age of the child in the month                 | Less than 6 month       | 38        | 15.8    |
|                                               | 6-12 month              | 130       | 54.2    |
|                                               | Greater than 12 month   | 72        | 30      |
| Sex of the child                              | male                    | 127       | 52.9    |
|                                               | female                  | 113       | 47.1    |
| Gravidity                                     | Primi gravida           | 141       | 59.0    |
|                                               | multigravida            | 77        | 32.2    |
|                                               | grand multigravida      | 21        | 8.8     |
| Parity                                        | Primi Para              | 188       | 78.7    |
|                                               | multi Para              | 42        | 17.6    |
|                                               | grand multi Para        | 9         | 3.8     |
| ANC service pregnancy                         | Yes                     | 229       | 95.8    |
|                                               | No                      | 10        | 4.2     |
| Numbers of ANC follow up                      | 1-2                     | 32        | 13.4    |
|                                               | 3-4                     | 184       | 76.6    |
|                                               | Above 4                 | 23        | 10      |
| given HE on BF during the ANC                 | Yes                     | 214       | 89.2    |
|                                               | No                      | 25        | 10.2    |
| Place of birth to this child                  | HC                      | 58        | 24.2    |
|                                               | Hospital                | 179       | 74.6    |
|                                               | Home                    | 3         | 1.3     |
| PNC service                                   | Yes                     | 192       | 80.4    |
|                                               | No                      | 47        | 19.6    |
| Numbers of PNC                                | One visit               | 204       | 85.4    |
|                                               | 2-3 visit               | 28        | 11.4    |
|                                               | >3 visit                | 7         | 2.9     |
| HE on BF during PNC                           | HC                      | 53        | 22.1    |
|                                               | Hospital                | 142       | 59.2    |
|                                               | Home                    | 1         | 0.4     |

Table 4: Knowledge of HIV positive mothers on EBF in public health facility central zone, Tigray, Ethiopia 2019
| Variables                                                                 | Response                     | Frequency | percent |
|---------------------------------------------------------------------------|------------------------------|-----------|---------|
| Ever heard the term EBF                                                  | Yes                          | 224       | 93.7    |
|                                                                           | no                           | 15        | 6.3     |
| infant feeding per day                                                    | As needed                    | 103       | 42.9    |
|                                                                           | From 8-10                    | 85        | 35.6    |
|                                                                           | Above 10                     | 11        | 4.8     |
|                                                                           | Less than 8                  | 40        | 16.9    |
| The right time to give breast milk to the child after birth               | After giving some better     | 8         | 3.3     |
|                                                                           | Within one hour              | 205       | 85.6    |
|                                                                           | After one hour               | 23        | 9.8     |
|                                                                           | After 24 hours               | 3         | 1.3     |
| breastfeeding important for child health                                  | Yes                          | 221       | 92.4    |
|                                                                           | No                           | 18        | 7.6     |
| Importance of breastfeeding                                               | Prevent diarrhea             | 96        | 40      |
|                                                                           | Minimize cost                | 18        | 7.5     |
|                                                                           | Sterile                      | 14        | 5.8     |
|                                                                           | Growth and development       | 89        | 37.1    |
|                                                                           | Increases bonding            | 4         | 1.7     |
| Duration of newborns be fed breast milk only                              | Less than 6 month            | 169       | 70.4    |
|                                                                           | 6-12 month                   | 49        | 20.4    |
|                                                                           | Above 12 month               | 18        | 7.5     |
| Age of complementary feeding be initiated                                 | At 6 month                   | 137       | 57.3    |
|                                                                           | Less than 6 month            | 34        | 14.2    |
|                                                                           | 6-12 month                   | 95        | 39.6    |
|                                                                           | Above 12 month               | 7         | 2.9     |
| Duration of breastfeeding be continued                                    | Less than 6 month            | 15        | 6.3     |
|                                                                           | 6-12 month                   | 45        | 18.5    |
|                                                                           | Above 12 month               | 179       | 75.2    |
| Foods or fluids recommended to under 6-month child                        | Only breast milk             | 217       | 90.5    |
|                                                                           | Breast milk and/or water or sugar formula | 11 | 4.7 |
|                                                                           | Others                       | 10        | 4.3     |
|                                                                           |                               | 1         | 0.5     |
| pre-lacteal feeding needed for an infant before starting breast milk      | Yes                          | 14        | 5.8     |
|                                                                           | No                           | 189       | 78.8    |
|                                                                           | I do not know                | 36        | 15.4    |
| Is BM alone is enough for an infant< 6 month of life                      | Yes                          | 216       | 90.1    |
|                                                                           | No                           | 11        | 4.6     |
|                                                                           | I do not know                | 12        | 5.3     |
| EBF for the first 6 months used to prevent diarrhea and Respiratory disease for the infant | Yes | 199 | 82.9 |
|                                                                           | No                           | 7         | 2.9     |
|                                                                           | I do not know                | 33        | 14.2    |
| HIV seropositive mother breastfeed                                        | Yes                          | 211       | 88.2    |
|                                                                           | No                           | 28        | 11.8    |
| HIV positive mother knowledge of EBF                                       | Good Knowledge               | 211       | 88.4    |
|                                                                           | Poor Knowledge               | 28        | 11.6    |

Table 5: Attitude of HIV positive mothers on EBF in public health facility central zone, Tigray, Ethiopia 2019
| Variables                                                                 | Response | Frequency | percent |
|--------------------------------------------------------------------------|----------|-----------|---------|
| Breast milk is free from any contamination.                              | strong   | 75        | 31.3    |
|                                                                          | Agree    | 113       | 47.4    |
|                                                                          | Agree    | 41        | 17.1    |
|                                                                          | Disagree | 1         | 0.4     |
|                                                                          | strong   | 7         | 3.8     |
|                                                                          | disagree | 31.3      | 47.4    |
|                                                                          | Not sure | 17.1      | 0.4     |
| Giving breast milk for a baby immediately within an hour after birth is important | strong   | 77        | 32.5    |
|                                                                          | Agree    | 151       | 62.9    |
|                                                                          | Agree    | 4         | 1.7     |
|                                                                          | Disagree | 7         | 2.9     |
| EBF is better than artificial feeding                                     | strong   | 62        | 25.8    |
|                                                                          | Agree    | 152       | 63.7    |
|                                                                          | Agree    | 12        | 5       |
|                                                                          | Disagree | 3         | 1.2     |
|                                                                          | strong   | 3         | 4.1     |
|                                                                          | disagree | 10        | 1.2     |
| Discarding colostrums is important before giving breast milk to a newborn | strong   | 4         | 1.7     |
|                                                                          | Agree    | 36        | 15      |
|                                                                          | Agree    | 139       | 58.3    |
|                                                                          | Disagree | 28        | 11.7    |
|                                                                          | strong   | 32        | 13.3    |
|                                                                          | disagree | 32        | 13.3    |
|                                                                          | Not sure | 32        | 13.3    |
| Giving a child of three months only breast milk may not be sufficient and a child needs water and other fluids to prevent thirst | strong   | 2         | 0.8     |
|                                                                          | Agree    | 13        | 5.4     |
|                                                                          | Agree    | 182       | 75.9    |
|                                                                          | Disagree | 25        | 10.4    |
|                                                                          | strong   | 17        | 7.5     |
|                                                                          | disagree | 17        | 7.5     |
|                                                                          | Not sure | 17        | 7.5     |
| Starting complementary foods to a child before six months is important    | strong   | 4         | 1.7     |
|                                                                          | Agree    | 20        | 8.3     |
|                                                                          | Agree    | 195       | 81.7    |
|                                                                          | Disagree | 12        | 5       |
|                                                                          | strong   | 8         | 3.3     |
|                                                                          | disagree | 8         | 3.3     |
|                                                                          | Not sure | 8         | 3.3     |
| Only breastfeeding is enough for the baby for up to six months.          | strong   | 62        | 25.8    |
|                                                                          | Agree    | 141       | 58.8    |
|                                                                          | Agree    | 25        | 10.4    |
|                                                                          | Disagree | 1         | 0.4     |
|                                                                          | strong   | 10        | 4.6     |
|                                                                          | disagree | 10        | 4.6     |
|                                                                          | Not sure | 10        | 4.6     |
| Breast milk contains all the nutrients necessary for the infant for up to 6 months. | strong   | 52        | 21.7    |
|                                                                          | Agree    | 155       | 64.6    |
|                                                                          | Agree    | 13        | 5.4     |
|                                                                          | Disagree | 3         | 1.3     |
|                                                                          | strong   | 16        | 7       |
|                                                                          | disagree | 16        | 7       |
|                                                                          | Not sure | 16        | 7       |
Breast milk provides the infant with the immunity to disease.

| Opinion    | Strong | Agree | Disagree |
|------------|--------|-------|----------|
| Sure       | 67     | 151   | 8        |
| Strong     | 27.6   | 63    | 3.3      |
| Agree      | 8      | 1     | 0.4      |
| Disagree   | 12     |       | 5.7      |

Mixed feeding is always necessary for infants

| Opinion    | Strong | Agree | Disagree |
|------------|--------|-------|----------|
| Strong     | 8      | 26    | 157      |
| Agree      | 3.3    | 10.8  | 65.5     |
| Disagree   | 32     | 16    | 13.3     |
| Strong     | 7.1    |       | 7.1      |
| Agree      | 27.6   | 63    | 3.3      |
| Disagree   | 8      | 1     | 0.4      |
| Not sure   | 12     |       | 5.7      |

Dealing with breastfeeding is always time-consuming.

| Opinion    | Strong | Agree | Disagree |
|------------|--------|-------|----------|
| Strong     | 1.3    | 14.2  | 75.8     |
| Agree      | 15.8   | 56.3  | 24.5     |
| Disagree   | 3.3    | 13.3  | 1.3      |
| Strong     | 7.1    |       | 7.1      |
| Agree      | 27.6   | 63    | 3.3      |
| Disagree   | 8      | 1     | 0.4      |
| Not sure   | 12     |       | 5.7      |

Breastfeeding affects the health of the mother negatively.

| Opinion    | Strong | Agree | Disagree |
|------------|--------|-------|----------|
| Strong     | 5      | 20    | 171      |
| Agree      | 2.1    | 8.3   | 73.8     |
| Disagree   | 8.3    | 73.8  | 2.1      |
| Strong     | 15     | 56.3  | 24.5     |
| Agree      | 13.3   | 1.3   | 4.6      |
| Disagree   | 1.3    |       | 4.6      |
| Not sure   | 2.9    |       | 2.9      |

HIV seropositive mother recommend breastfeeding

| Opinion    | Strong | Agree | Disagree |
|------------|--------|-------|----------|
| Strong     | 58     | 135   | 32       |
| Agree      | 24.5   | 56.3  | 13.3     |
| Disagree   | 1.3    | 4.6   | 1.3      |
| Strong     | 7.1    |       | 7.1      |
| Agree      | 27.6   | 63    | 3.3      |
| Disagree   | 8      | 1     | 0.4      |
| Not sure   | 12     |       | 5.7      |

Table 6: Practice of HIV positive mothers on EBF in public health facility central zone, Tigray, Ethiopia 2019.
| Variables                                                                 | Response                      | Frequency | percent |
|--------------------------------------------------------------------------|-------------------------------|-----------|---------|
| Breastfeed your last-child                                               | Yes                           | 214       | 89.5    |
|                                                                           | No                             | 25        | 10.5    |
| Initiation of breastfeeding for your last child after delivery           | Immediately within 1 hour     | 194       | 90.6    |
|                                                                           | Between 2 and 24 hrs          | 17        | 8       |
|                                                                           | After 24 hr                    | 3         | 1.4     |
| Mothers colostrum feed                                                  | Yes                           | 224       | 93.5    |
|                                                                           | No                             | 15        | 6.5     |
| Giving anything within 3 days Other than breast milk feeding             | Yes                           | 24        | 10.1    |
|                                                                           | No                             | 215       | 89.9    |
| what was given                                                           | Cow and breast milk           | 7         | 2.9     |
|                                                                           | Breast milk only              | 2         | 0.8     |
|                                                                           | Formula                        | 15        | 6.3     |
| Reasons for pre-lacteal feeding                                          | Milk did not come in yr       | 9         | 6.4     |
|                                                                           | I was ill                     | 12        | 5       |
|                                                                           | Baby was ill                  | 3         | 1.25    |
| Dose Still breastfeeding                                                 | Yes                           | 200       | 83.7    |
|                                                                           | No                             | 39        | 16.3    |
| Frequency of breastfeeding                                               | Less than 8 times             | 38        | 16.2    |
|                                                                           | 8-10 times                    | 102       | 42.5    |
|                                                                           | Frequent and on-demand        | 81        | 33.8    |
|                                                                           | Greater than 10 times         | 18        | 7.5     |
| Exclusive breastfeeding practice to your child                           | 0-6 months                    | 162       | 67.5    |
|                                                                           | 6-12 months                   | 50        | 20.8    |
|                                                                           | Above 12 months               | 3         | 1.3     |
|                                                                           | Not yet started               | 24        | 10.4    |
| Type of complimentary food started                                       | Fluid                         | 47        | 19.6    |
|                                                                           | Simi fluid                    | 91        | 37.9    |
|                                                                           | family food                   | 52        | 21.7    |
|                                                                           | Not yet started               | 6         | 2.5     |
|                                                                           | Other                         | 44        | 18.3    |
| Starting age of complementary feeding                                    | At 6 months                   | 128       | 53.6    |
|                                                                           | After 5 months                | 7         | 2.9     |
|                                                                           | 2-4 months                    | 27        | 11.3    |
|                                                                           | After 6 month                 | 68        | 28.5    |
|                                                                           | Underage                      | 8         | 3.3     |
|                                                                           | Not yet started               | 1         | .4      |
| Who supports you during breastfeeding?                                   | Husband                       | 88        | 36.7    |
|                                                                           | Another family member         | 78        | 32.7    |
|                                                                           | No one                        | 73        | 30.6    |
|                                                                           | Good practice                 | 206       | 86.2    |
|                                                                           | Poor practice                 | 33        | 13.8    |
Table 7: Factors associated attitude of HIV positive mothers on EBF in a public health facility in the central zone, Tigray, Ethiopia 2019.

| Variables                      | Knowledge | Good | Poor | COR (95% CI) | AOR (95% CI) |
|-------------------------------|-----------|------|------|--------------|--------------|
| **Rural Urban**               | Rural     | 27(12.9) | 7(25) | 1            | 2.259 (.877 - 5.819) | 1            | 2.96 (.948-9.29) |
| **Illiterate Literate**       | Illiterate | 80(38.1) | 15(51.7) | 1            | 1.74 (.736-3.586) | 1            | 1.37 (.564-3.34) |
| **>=1500birr 1000-1500birr**  | 126(60)   | 19(67.9) | 3(10.7) | 1            | 2.56 (.72-9.041) | 1            | 5.57 (1.176-26.38)* |
| **Health facility able**      | Health post | 14(6.7)  | 5(17.9) | 1            | 3.32 (.98-11.15) | 1            | 2.77 (.712-10.7) |
| **>=18-24 24 and above**     | 172(81.9) | 18(64.3) | 10(35.7) | 1            | .398 (.170-.930) | 1            | .339 (.133-.863)* |
| **1 visit 2-3 visit Above 3 visit** | 180(85.2) | 25(89.3) | 1(3.6) | 1            | 3.63 (.472-27.9) | 1            | 5.2 (.559-49.4) |
| **Health center Hospital**    | Health post | 93(44.3) | 10(35.7) | 1            | 3.32 (.98-11.15) | 1            | 2.77 (.712-10.7) |

Note: *-significant results, 1-reference category **p-value<0.001, *p-value≤0.05

Table 8: Factors associated practice of HIV positive mothers on EBF in a public health facility in the central zone, Tigray, Ethiopia 2019.
| Variables                        | Practice | COR (95%CI) | AOR(95%CI) |
|---------------------------------|----------|-------------|------------|
|                                 | Poor practice % | Good practice % |            |            |
| Maternal educational statues    | Illiterate | 38(39.6) | 38(26.4) | 1.828(1.052-3.174) | 1.351(.626-2.916) |
|                                 | Literate  | 58(60.4) | 105(73.6) |                       |               |
| Income                          | <1000     | 22(22.9) | 17(11.8) | 1.744(.759-4.006) | .625(.235-1.66) |
|                                 | 1000-1500 | 23(24)   | 31(21.5) | 2.436(1.88-4.996) | 1.322(.530-3.294) |
|                                 | >1500     | 51(53.1) | 96(66.7) | 1                       | 1               |
| Types of health care facility   | Health post | 5(5.2)  | 14(9.7)  | 1.495(0.166-1.476) | .499(.141-1.766) |
|                                 | Health center | 44(45.8) | 61(42.4) | .524(0.177-1.554) | .427(.12-1.527) |
|                                 | Hospital  | 47(49)   | 69(47.8) | 1                       | 1               |
| No of gravidity                 | Primi gravid | 71(74)  | 117(81.9) | 1.066(.290-1.056) | .619(.289-1.328) |
|                                 | Multi gravid | 20(20.8) | 22(15.3) | .4854(0.161-2.068) | 1.055(.246-4.519) |
|                                 | Grandmultigravia | 5(5.2)  | 4(2.8)   | .619(.289-1.328) | 1.055(.246-4.519) |
| No of ANC visit                 | 1-2       | 71(74)   | 21(14.6) | 1                       | 1               |
|                                 | 3-4       | 20(20.8) | 11(77.1) | 2.176(971-4.8981) | 2.981(1.113-7.983) |
|                                 | >4        | 5(5.2)   | 12(8.3)  | 2.543(895-7.239) | 3.726(1.055-13.154) |

Note: *significant results, 1-reference category **p-value<0.001, *p-value≤0.05