# Status of Exclusive Breast Feeding Among Children Born to Human Immunodeficiency Virus (HIV) Positive Mothers Attending Public Health Facilities in Western Ethiopia. Cross-Sectional Study.

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# Abstract

**Background**: Only about 39% of infants in the developing countries are exclusively breast-fed for the first six months. Human immunodeficiency virus (HIV) positive women were confused about feeding methods. Exclusive Breastfeeding (EBF) practice of Human immunodeficiency virus (HIV) positive mothers is sub-optimal in Ethiopia. Hence, we want to identify the main factors influencing exclusive breast-feeding among HIV positive breast-feeding mothers. Main aims of the study were to assess the level and factors influencing Exclusive Breastfeeding (EBF) among children born to Human Immunodeficiency Virus (HIV) positive mothers attending public health facilities in western Ethiopia.

**Methods:** A facility based cross sectional study was carried out from September 2017 to June 30, 2018 among Human Immunodeficiency virus (HIV) positive mothers with infants aged 6-23 months. Among public health facilities found in three districts from of West, East and Kellem Wollega Zones; thirteen facilities (i.e. 7 health centers and 6 hospitals) were randomly selected from among proving ART and PMTCT Services. Respondents were recruited by systematic random sampling techniques from these facilities using clients registers as sampling frame. Data were collected using face to face interviewer administered pre-tested questionnaire. The data were entered into computers using EPI info Version 3.5.1 and analyzed with SPSS Version 20 for windows. Candidate variables for the final multi-variable model were selected considering P≤ 0.05 at bivariable analysis. Associations were declared at P≤ 0.05 by assuming Confidence Intervals did not crossed number '1'with corresponding 95%. Results were presented using standard data presentation tools.

**Results**: A total of 218 Human Immune Virus positive mothers were included in this study. Of these, only 122 (56.0%) practiced Exclusive Breast Feeding. The proportion of respondents who initiated Exclusive Breast Feeding within the first hours of delivery were 134 (61.8%). Mean age of the study participants were 28.68 with SD ± 4.2. Mothers' advices on child exclusive breast-feeding [AOR 3, 95% CI (1.2-6.7)], disclosure of HIV status to close friends [AOR 6, 95% CI (1.18-29.64)] and believing HIV can be transmitted during delivery [AOR 5.2, 95% CI (1.10-24.00)] were found to increase the change of exclusive breast-feeding practices among the study participants (P-value ≤ 0.05).

### Conclusion

Slightly more than half of the mothers practiced exclusive breast feeding for the first six months. Care providers should encourage mothers to practice exclusive breast feeding in the first six months and to disclose their test results to their husbands. Efforts should be in place to curb the risk of HIV/AIDS transmission during delivery.


# Background

The risk of mother-to-child transmission (MTCT) of Human Immunodeficiency virus (HIV) through breastfeeding is challenging though it is an accepted traditional way of promoting health for infants and

children in developing countries [1]. Women living with HIV/AIDS were often confused about breast-feeding methods [2].

World health organization (WHO) recommends Exclusive Breast Feeding (EBF) as one of the strategy for the Prevention of Mother to Child Transmission (PMTCT) of HIV during postnatal period [2] for developing countries, mainly due to the high cost of Exclusive Replacement Feeding (ERF) and lack of adequate clean water and poor sanitation [3]. In addition, EBF for up to six months is relatively more effective strategy for reducing the risk of HIV transmission 3–4 fold compared to mixed feeding [3]. The new recommendation from WHO regarding commentary feeding for the first 12 months found to be a better strategy [5] than the earlier versions of the strategy. However, it should be noted here that still there is a controversy over the optimum time to introduce commentary feeding [4].

Studies have revealed that, there is a high rate of early-cessation of breastfeeding because of the fear of transmission of HIV/AIDS to their babies [6, 9, 10] and some mothers shifted to replacement feeding. Such practices been associated with malnutrition, sudden infant death syndrome, other neonatal morbidity and mortality [11, 12, 13, 14]. Such early-cessation is common in the critical period for infant growth (4–6 moths) among HIV/AIDS exposed children [12].

Despite the continued debate on the safety of breast feeding among HIV positive women, there is evidence that EBF indeed decreases the chances of HIV infection in exposed infants. In the developing world, EBF is the best option geared at prevention of HIV transmission and early mortality due to malnutrition and diarrheal conditions due to unsafe water use and poor sanitation in the preparation of replacement feeds. For this reason, HIV positive mothers in resource-constrained areas are advised to practice EBF under the prophylaxis of ARV during this period. This is to lower the chances of transmitting HIV to the infant by reducing the viral load of the mother and promoting optimum health of the mother during this period [2].

However, there is a paucity of studies, which show predictors of breastfeeding cessation among HIV positive mothers in Ethiopia. Identifying factors related to exclusive breastfeeding practices among HIV infected women is important for targeting evidence based intervention, which helps to increased HIV-free survival.

# Methods

### Study setting

The study was conducted from September 2017 to June 2018 in selected health facilities found in East, West and Kellem Wollega districts. In these three districts, there were about 4,322,357 total populations with the mean of 1,440,786 in each districts with 1:1 gender ratio. From these total populations, there were 893,536 women of reproductive age group (15-45 years old) and about 710,163 under five children in these three Districts [18].

From the three districts, Seven health centers and six hospitals having ART and PMTCT clinics were randomly selected for the study. Data were collected by 13 ART nurses from the respective health institutions who were working at ART and PMTCT department. Three supervisors recruited to look after the overall of data collection. In these three selected districts, there were about 2,365 HIV positive women on antiretroviral therapy (ART), where a total number of mothers with HIV/ exposed infants (HEI) were 415.

### Study Design, population and sampling

Cross-sectional study was conducted among randomly selected samples of 219 HIV positive mothers with children under six months and attending PMTCT and ART clinics in those selected public hospitals and Health centers found at East, West & Kellem Wollega Districts. In this study, we used a mixed methods for data collection involving both qualitative and quantitative data. Qualitative data were mainly used to triangulates the quantitative findings.

**Inclusion criteria**: Mothers/guardians living with HIV/AIDS having 6 or less months' children, voluntarily consented to participate in the study were included.

**Exclusion criteria**: Mothers/guardians living with HIV/AIDS having 6 or less months' children, who were not consented to participate and who were seriously ill and unable to provide information were excluded from the study.

### Sample Size Determination

The study was conducted in randomly selected thirteen government owned health institutions (six hospitals and seven health centers) proving ART and PMTCT services for mothers living with HIV/AIDS. These institutions were selected considering availability of the services and adequacy of client flow.

The sample size (n) required for the study was calculated using a single population proportion with assumptions of 95% confidence interval, 5% desired precision, proportion of HIV positive mothers exclusively breast feed their infants 48.2% [13] and considering 10 % for compensation for non-response. The total samples calculated for the study was **219**. These total samples were distributed to each selected health care institutions using probability proportional to size (PPS) and the numbers of HIV positive mothers required for the study in each PMTCT/ART clinics were determined. For each of the selected facility, sampling frame was prepared. Every respondent was selected from his/her respective health facilities by systematic random sampling technique from the sampling frame. Sampling intervals were determined by dividing N/n (415/219), i.e. every second intervals. The first respondent was selected by blindly picking one out of two pieces of paper numbered 1& 2. Mothers visited health facility for collecting their ARV medication and other purposes interviewed at every second interval.

### Data Collection Procedures

An interview questionnaire was prepared from related literatures. Questionnaire was developed in English and translated into the local language then back to English to check for its consistency. Administration was done with “Afaan Oromo” versions. The questionnaire was pretested in similar setting. For qualitative data collection, discussion guide was used to facilitate focus group discussion.

Data were collected by 13 ART nurses from the respective health institutions who were working at ART and PMTCT department. Three supervisors and principal investigator performs overall controlling activities of data collections process.

Two days intensive training was given for data collectors and supervisor regarding the data collection process and tools. Data collection tools were pre-tested on mothers who were not included in the actual study in order to check its language clarity and consistency of questionnaire in similar set up.

## Defining Study Variables

The dependent Variable was Exclusive Breast Feeding (EBF): Exclusive breast-feeding (EBF) is defined as the consumption of only breast milk with no supplementation of any type of food since birth except drops and syrups like; vitamins, minerals or medicines. For this study we have dichotomized EBF into ( ‘Yes’ and ‘No’). Those mothers exclusively breast fed their children for the first six months were labeled as ‘Yes.’ Those mothers who started complementary feeding withing the first six months were labeled as ‘No.’

Independent Variables assessed were: Socio economic status of mothers and households (educational status of mothers, income of mothers, antenatal care attendance, Occupation of mothers, disclosure of HIV status to spouse, age of mothers, Parity and mode of delivery), Mother’s Decision on the choice of infant feeding, Infant illnesses, baby hospitalization, birth weight, Hospital and Health service, Nutritional education, Antenatal Care, Post-Natal Care, Cultural norms on breastfeeding, child feeding practice and feeding system, mixed feeding (Breast -feeding with the addition of fluids, solid feeds and non-human milks in the first 6 months of age).

HIV Exposed Infants (an infant or child born to a mother living with HIV until the infant or child is reliably excluded from being HIV infected). HIV positive mothers (it refers to women belonging to the age group of 15 to 49 years who are on HAART, attending the antenatal and post-natal clinics in the selected hospitals and health centers.

Early termination of breast-feeding (the act of interrupting giving breast milk and making the child accustomed to other food before the child reach the age of two years). Seriously ill (Women who are sick, in bed and fail to give information).

## Data processing and management

Data entered was done using EPI info Version 3.5.1, transferred to SPSS Version 20 for windows statistical package for analysis. Results were reported using standard data presentation techniques like

frequency tables, measures of central tendencies and variations was done to see the nature of the data. Both bi-variable and multivariable logistic regression analysis were used to determine the association of each independent variable with the dependent variable. Candidate variables for multi-variable model were identified by considering P≤0.05 at bi-variable analysis. Multi-variable logistic regression model was used to control for the effects of cofounders on the outcome variable. Associations were declared by assuming P≤0.05 with their 95% confidence intervals and Adjusted Odds Rations (AOR) were reported to show the strength of associations were computed to identify the presence and strength of associations. Qualitative data were analyzed from voice records and the field notes. After checking, organizing, coding, conceptualizing and categorizing responses, then similar ideas were grouped and summarized based on thematic area and the key variables of the study. Concepts extracted from themes were presented in narrative and triangulated with quantitative results. Some quotes were presented in support to the quantitative findings with similar ideas.

Two days intensive training was given for data collectors and supervisors. Pre-testing of the questionnaire was done on mothers from non-selected health facility to test its clarity for both interviewer and respondent and to get experience to be applied with data collectors on actual data collection.

### Ethical Consideration

Ethical clearance was taken from the ethical clearance committee of Wollega University. Letter of clearance was obtained from each districts health office management to get the assurance of the study. Information sheet were attached to each questionnaire explaining the purpose, objectives, of the study were explained and written informed consent was secured from each participant.

Confidentiality was maintained at all levels of the study. Only consented participants were recruited on a voluntary basis. Participants wished to withdraw from the study at any point were informed to do so without any restriction.

## Results

### Socio-demographic characteristics

From 219 randomly selected lactating mothers with children aged ≤6 months, 218 of respondents participated in this study making a response rate of 99.5%**.** Of these, majority of the participants, 184 (84.4%) were married. The average age of the study participants was 28.6 with standard deviation (SD) of 4. Higher proportion, 139 (63.8%) of the respondents were protestant. Around 99 (44%%) had completed grade 1-8. Great majority, 194(89%) were Oromo. More than half, 129 (59.2%) were housewives. The mean age of the infants was 6 months (SD ±2.8) and 113 (51.8%) were males (Table 1).

### Knowledge on Benefit of exclusive Breast feeding among study participants

Regarding respondents' knowledge about MTCT and PMTCT, and benefits of EBF, 179(82%) of mothers think that HIV can be transmitted through breast milk. About 62(28.4%) of mothers did not know that

breast- feeding protect the infant from diarrhea and 50(22.9%)of mothers think that HIV can be transmitted from mother to child during pregnancy, delivery and breast-feeding. Finding from focus group discussion also support this findings. Majority of HIV positive mothers are not willing to exclusively breastfeed their babies because of fear of transmission of HIV through breast milk, but some of them who got advice of health professionals are adhere to EBF (exclusive breastfeeding) is important and helped us to adhere to EBF.

### Obstetric History of respondents

As shown in table 2, the obstetric history of the respondents and type of feeding advices obtained from health workers. More than half, 119 (54.6%) of mothers had more than four times antenatal visits. The great majority 214 (98.2%) of the mothers had delivered at health institutions and their mode of delivery was spontaneous vaginal delivery in 182 (83.5%). The majority 209 (95.9%) had postnatal care (PNC) follow up and 169 (77.5%) of them got advice on infant feeding (Table 2).

### Proportions of HIV positive mothers exclusively breast feeding

Out of the total respondents, only 122 (56.0%) practiced exclusive breast -feeding. The proportion of respondents who initiated EBF within the first hours of delivery was 134 (61.8%) while few 27(12.4%) initialed after twenty -four hours (Table 3).

### Determinants of exclusive breast feeding

The after controlling for the effect of confounders, variables showed statical association favoring exclusive breast feeding practices among HIV positive mothers are were; exposed to feeding advices, disclosure of HIV status to spouse, mothers who believe HIV can have transmitted through delivery (p-value<0.05) than their counter parts.

Mothers' advices on child exclusive breast feeding are three times more likely to practice Exclusive breast feeding than those who were not [AOR 3 (95% CI (1.2-6.7)]. Those who disclose their HIV status to their spouse were six times more likely to adhere to Exclusive breast feeding [AOR 6, 95% CI (1.184-29.644)]. Those who believe that HIV can be transmitted during delivery are more than five times more likely adhering to exclusive breast feeding than who don't know means of transmission [AOR 5.2, 95% CI (1.1-24)].

## Discussions

In this study the status and factors influencing exclusive breastfeeding among children of HIV positive mothers were assessed. The proportion of mothers with children less than six months Exclusively Breast Feeding their children in this study were lower than study conducted in Addis Ababa [7]. This may be probably be because of in Addis Ababa, mothers could be probably exposed to better media coverage promoting Exclusive Breast Feeding, better availability of counseling, MTCT and PMTCT services provided at health facilities than that of our current study settings. Another study conducted in Tigray

region reported overwhelmingly higher (90%), EBF practice by the participants [16], than our current finding. The difference might be due to methodological variations between the studies, socio-cultural, and health service utilization characteristics between respondents of the referenced areas.

This study identified important factors related to exclusive breast feeding. Mothers who got advice on child exclusive breast feeding are three times more likely to Exclusively Breast Feed their children than those who were not. A systematic review from low and middle income countries concluded that improving the counselling skills of health workers to address breastfeeding problems is critical components of infant and young child feeding programming, which will aid in attaining the 2025 World Health Assembly EBF targets [19]. Another systematic review and meta-analysis from Ethiopia reported similar finding [20]. According to the Federal Ministry Of Health, in Ethiopia all HIV-infected mothers should receive counseling which includes provision of general information about the risks and benefits of various infant feeding options [17].

Mothers who disclosed their HIV status to their close friends were 3 times more likely to adhere to EBF for the first six months than their counter parts. This finding is consistent with systematic review and meta-analysis from Ethiopia [20], study from south Ethiopia [15] and the findings of a similar study done in Gondar which showed disclosure of HIV status independently associated with exclusive breast feeding [9)]. The high disclosure rate among HIV positive mothers collaborate the practice of EBF of the mother [8].

Those who believe that HIV can be transmitted during delivery were 5.2 times more likely adhere to exclusive breast feeding than who don't know means of HIV transmission from mother to child. Findings of Focus Group Discussion supported this findings is narrated here below;

A 29 years old HIV positive mother said that; "*The advice of health professionals and the support from their spouses and family, own source of income, understanding of mothers about the benefit of exclusive breast feeding makes easier to HIV positive mothers to exclusively breastfeed their baby.*

# Conclusion

The study reported that only slightly more than halve the mothers living with HIV/AIDS having children aged six months and less practiced EBF in the study area. The major factors identified favoring for practicing EBF in the first six months of life among lactating mothers living with HIV/AIDS were; being advised by Health extension regarding appropriate child feeding practices**,** disclose HIV status to someone close to them, knowing that HIV can be transmitted during delivery.

# Recommendations

Since EBF is a relatively less costly and more practical option in the context of resource constrained countries; Health workers should give advice on MTCT,PMTCT and infant feeding practice during PNC

follow up to improve their knowledge in this area, Encouraging mothers who don't disclose their HIV status, to bring their spouses to health facility and discuss with health care workers.

# Strength

The findings were triangulated by qualitative findings.

# Limitation Of The Study

Since the study design was cross sectional, it only explores the association of breast feeding practices with other explanatory factors. Thus, it does not show the cause effect relation. There might be recall biases.

# Declarations

### Ethics approval and consent to participate

This study was approved by the Wollega University, Institute of Health Sciences, Research Ethics Committee. Letter of permission was also obtained from East, West and kellem wollega zones Health Offices and respective health offices and facilities of the three selected districts and kebeles. Consent form was attached to every questionnaire with a brief information regarding the main aim of the study, benefits, and risks of the study to the participants, explaining their full right to withdraw at any time, skip any question that they don't want to answer. Those who consented participated in the study. Data were collected at each selected health facility (i.e. Hospital or Health centers) level in an area which gives them the maximum privacy, after getting services. We removed an individual identifier to maintain the anonymity of the respondents by assigning each questionnaire a unique number.

### Consent for publication

Not applicable since there is no detail individual data as image or video.

### Availability of data and materials

All data analyzed for this article are available in SPSS readable format and results are presented in tables in the manuscript. The sampling frame with the lists of every respondent is also available in the Excel-readable format. We can share the data but not the sampling frame for ethical reasons.

### Competing interests

The authors declare we have no conflicts of interest.

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Not applicable. The authors did not received any funds for the study.

### Authors' contributions

ET has been involved in conception, writing the study protocol, formulating the study design, training of data collectors, supervising the data collection process at the field, data entry and analysis, interpretation of data and drafting the manuscript.

EM participated in conception, design, acquisition of data, interpretation of data; Drafting the manuscript, reviewing it critically for important intellectual content; and have given final approval of the version for submission.

IF was involved in drafting the manuscript, reviewing it critically for important intellectual content; and have given final approval of the version for submission.

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# Tables

**Table 1:** Socio-demographic characteristics of respondents (n=218), West, East and Kellem Wollega Districts health institution west Ethiopia, September 2017 to June 30, 2018 .

| Variables | Frequency | Percent |
|---|---|---|
| Age of mothers (years) | | |
| 15 -19 | 1 | 0.5% |
| 20- 24 | 32 | 14.7% |
| 25- 29 | 96 | 44% |
| 30- 34 | 66 | 30.3% |
| >35 | 23 | 10.6% |
| Age of child in months | | |
| 6-11 | 185 | 84% |
| 12-18 | 33 | 16% |
| Sex of child | | |
| Male | 113 | 51.8% |
| Female | 105 | 48.2% |
| Marital Status | | |
| Single | 11 | 5% |
| Married (union) | 184 | 84.4% |
| Divorced | 16 | 7.3% |
| Widowed | 7 | 3.2% |
| Educational status | | |
| Unable to read & write | 26 | 11.9% |
| Able to read & write | 48 | 22% |
| Grade 1-8 | 96 | 44% |
| Grade 9-12 | 40 | 18.3% |
| College & above | 8 | 3.7% |
| Religion | | |
| Protestant Christian | 139 | 63.8% |
| Others | 79 | 36.30% |
| Ethnicity | | |
| Amara | 16 | 7.3% |

| | | |
|---|---|---|
| Oromo | 194 | 89% |
| Others | 8 | 3.60% |
| Maternal occupation | | |
| Self Employed | 44 | 20.2% |
| House wife | 129 | 59.2% |
| Merchant | 26 | 11.9% |
| Farmer | 11 | 5% |
| Government employee | 8 | 3.7% |

**Table 2:** Obstetric history of respondents (n=218) West, East and KellemWollega Districts health institutions western Ethiopia, September 2017 to June 30, 2018.

| Variables | Mothers terminate breast feeding | |
|---|---|---|
| | Frequency | Percent |
| No of ANC follow up | | |
| Two | 17 | 7.8% |
| Three | 71 | 33.6% |
| Four and above | 119 | 54.6% |
| Don't remember | 7 | 3.2% |
| Place of delivery | | |
| Home | 4 | 1.8% |
| Health institution | 214 | 98.2% |
| Type of Delivery | | |
| Normal | 182 | 83.5% |
| Caesarian Section | 36 | 16.5% |
| Post-natal follow up | | |
| Yes | 209 | 95.9 |
| No | 9 | 4.1% |
| Feeding advices obtained from HW | | |
| No | 49 | 22.5% |
| Yes | 169 | 77.5% |

**Table 3:** Exclusively breast feeding practice among HIV positive mothers in west, east and kellem Wollega Districts health institutions western Ethiopia, September 2017 to June 30, 2018.

| Variables | Frequency | Percent |
|---|---|---|
| **Exclusive Breast Feeding** | | |
| Yes | 122 | 56% |
| No | 96 | 44% |
| **Do you give colostrum to new Born infant** | | |
| Yes | 168 | 77.1% |
| No | 50 | 22.9 |
| **When starts breast feed** | | |
| Within one hour of birth | 134 | 61.8 |
| Within two hour of birth | 55 | 25.3 |
| Within 24 hours of birth | 27 | 12.4 |
| After one day | 1 | 0.5 |
| **Reason for not giving first milk** | | |
| Her breast has no milk | 26 | 52 |
| The mother is sick | 23 | 46 |
| Health worker advised not to give | 1 | 0.5 |

**Table 4:** Determinants of Exclusive Breast feeding Adherence among HIV Positive Mothers in West, East and Kellem Health institutions, western Ethiopia, September 2017 to June 30, 2018.

| Variables | Exclusive breast feeding status | | COR (95% CI) | AOR (95% CI) |
|---|---|---|---|---|
| **Age of mothers** | **No(n=96)** | **Yes(n=122)** | | |
| 15-19 | 1(0.00%) | 1(0.8%) | 0.86 (0.71-1.56) | 0.41 (0.018-9.47) |
| 20-24 | 21(21.9%) | 11(9.0%) | 0.28(0.09-0.86) | 0.322 (0.011-9.846) |
| 25-29 | 39(40.6%) | 57(46.7%) | 0.78 (0.30-2.02) | 0.547 (0.017-17.92) |
| 30-34 | 28(29.2%) | 38(31.1%) | 0.72( 0.27-1.90) | 0.315 (0.028-3.50) |
| 35≥ | 8(8.3%) | 15(12.3%) | 1 | 1 |
| **Child Feeding advice obtained from HWs** | | | | |
| No | 33(34.4%) | 15(12.3%) | 1 | 1 |
| Yes | 63(65.6%) | 107(87.7%) | **3.74(1.88-7.41)** | **3(1.20-6.70)** |
| **Infant Birth Weight** | | | | |
| >=2.5kg | 3(5.5%) | 4(4.4%) | 1 | 1 |
| <2.5kg | 52(94.5%) | 87(95.6%) | **1.93(1.12-3.32)** | 1.356(0.69-2.64) |
| **HIV disclosure status** | | | | |
| No | 5(5.20%) | 6(4.91%) | 1 | 1 |
| Yes | 91(94.80%) | 116(95.10) | **0.12(0.03-0.53)** | **6 (1.18-29.64)** |
| **When HIV transmitted** | | | | |
| During delivery | 5(5.2%) | 17(13.9%) | **3.15(1.90-11.00)** | **5.2(1.10-24.42)** |
| During pregnancy | 13(13.5%) | 14(11.5%) | 0.79(0.35-1.84) | 0.75(0.30-1.80) |
| During Breast feeding | 62(64.6%) | 50(41.0%) | 2.389(0.90-6.30) | 2.3(0.761 -6.80) |
| I don't know | 2(2.1%) | 5(4.1%) | 1 | 1 |