Infant Feeding Practice and Associated Factors Among HIV Positive Mothers at Health Institution of Shashemene Town, South Ethiopia

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Abstract
Objective: To assess infant feeding practice and associated factors among HIV positive mothers at health institution of Shashemene town, South Ethiopia.

Materials and methods: Facility based cross sectional study was conducted. The study used all the study population as source of data since they are small in number hence sample size calculation was not needed. This study was conducted at health institutions which provide ART and PMTCT service at Shashemene town. Structured questionnaires were developed by reviewing different literatures. Data collectors were trained and data were collected from February to March 2018. The data were analyzed using statistical package for social science (SPSS) version 20, descriptive statistics as well as bivariate and multivariate analysis were computed to identify the independent predictor of infant feeding practice and to control effect of confounders.

Results: On this study majority 175 (90.7%) of respondent breast feed their infants. Regarding feeding option about 154 (79.8%) chose EBF followed by complementary feeding. Concerning feeding practice majority of respondent 172 (89.1%) utilize safe feeding practice. On multivariate analysis only Counseling provided by health professional on infant feeding option was found as independent predictors of infant feeding practice with [AOR = 4.538 (CI = 1.099, 18.736)].

Conclusion: Higher proportion of HIV positive mothers follow safe infant feeding practice. Counseling by health professional was found as independent predictors of infant feeding practice. Further counseling by health professional needed to discourage mixed feeding practice.

Keywords: Infants; Exclusive Breast Feeding; Exclusive Replacement Feeding; Complementary Feeding; Safe Infant Feeding; Unsafe Infant Feeding

Introduction
Globally estimated 36.7 million (ranges from 34.0 million–39.8 million) people were living with HIV worldwide and Sub-Saharan Africa accounts for 71% of the global burden of HIV infection. The gains in treatment are largely responsible for a 26% decline in AIDS-related deaths globally since 2010, from an estimated 1.5 million [1.3 million–1.7 million] in 2010 to 1.1 million [940,000–1.3 million] in 2015 (1).

According to the federal HIV/AIDS prevention and control office of Ethiopia (FHAPOC), there were a total of 433763 HIV positive females and 65088
HIV positive children 0-14 years. When we see the regional figure, Oromia is the highest, having a total number of 111,053 female HIV positives and 9,540 women who are in need of PMTCT (2).

Breastfeeding by HIV-positive mother is means of HIV transmission, but not breastfeeding carries significant health risks to infants and young children. At the same time breastfeeding is vital to the health of children, reducing the impact of many infectious diseases, and preventing some chronic diseases. In the face of this dilemma, the objective of health services is to protect, promote and support breastfeeding as the best infant-feeding choice for all women in general, while giving special advice and support to HIV positive women and their families so that they can make decisions about how best to feed their infants in relation to HIV. In southern and eastern Africa, where child mortality rates are among the highest in the world, HIV infection is common and a leading cause of death. In these settings, use of commercial breast-milk substitutes and other replacement feeds among HEI is associated with significantly increased morbidity and mortality (2).

In Ethiopia, about 58% of infants less than 6 months are exclusively breastfed which is Contrary to infant feeding recommendation that states children under age 6 months should be exclusively breastfed, 5% of infants under age 6 months are not breastfed at all and 9% of infants under 6 months use a bottle with a nipple, a practice that is discouraged because of the risk of illness to the child (3).

Study done at Gondar town, south Ethiopia in 2012 states that, among all respondent hundred eighty-seven (89.5%) of the study participants had followed Exclusive breast feeding (EBF) and Exclusive replacement feeding (ERF) practice while significant percentage (10.5%) of the study participants had practiced mixed feeding. Among all respondents One hundred seventy-two (82.3%) of the respondents had initiated breast feeding within an hour of delivery and 37 (17.7%) of the respondents had not initiated breast feeding within one hour of delivery. Similarly about 138 (66%) of the respondents use cup for infant feeding while others 57 (27.3%) and 14 (6.7%) use bottle feeding and spoon feeding respectively (4).

According to the study done at Tigray in 2014, majority HIV positive mothers responded 187(90.3%) were practiced Exclusive Breast Feeding (EBF), 13(6.3%) were practice Mixed Feeding (MF), 7(3.4%) were practice Exclusive Replacement Feeding (ERF) and no one was reported to practice Expressed breast milk and others (5).

Studies conducted in different part of the country concerning infant feeding practice shows as there is variation regarding feeding practice across and within the regions. However, there is shortage of information regarding infant feeding practice and associated factors among HIV mothers in study area. Therefore, in order to know the prevalence of safe and unsafe feeding practice and factors associated with it research evidence has peerless role. Thus, this study was assessed infant feeding practice and its associated factors among HIV positive mothers at health institution of Shashemene town.

Materials and methods
This study was conducted in Oromia regional state Shashemene town, South Ethiopia 250 KM from Addis Ababa. According to the 2007 Ethiopian Housing and Population census, the town has an estimated total population of 264, 780 in 2018. There are three public health center and one public referral hospital and one district hospital in the town, with a total number of health care providers working on ART 15. There are about 2,445 female of reproductive age group & 268 children on ART respectively. Among HIV positive mothers of reproductive age group about 207 they have infants. There are seven public & private health institution which provide ART and PMTCT service free of charge at Shashemene town.

A facility based cross sectional study design was conducted from February 1 to March 31st using quantitative data collection method on all ART mothers with child less than one year. Data was collected by using a structured and pre-tested interviewer administered questionnaire. Data were checked for completeness, cleaned, coded and entered into epidata version 3.1, and then exported to SPSS version 20.0 for further analysis. Frequencies were used to summarize descriptive statistics. Binary and multiple logistic regression analysis analysis were used to assess variables that have association with utilization of family planning services among ART clients. Ethical clearance was obtained from the Ethical review committee of College of Health Sciences of Madda Walabu University after assessing the study against Ethical standard under CHSERC/0124/2018 code, verbal consent was obtained from each study participants.

Results
Socio demographic factors: One hundred ninety-three mothers participated in this study. The mean ± SD age of mothers and infants were (29.55 ± 4.08)
years and (6.63 ± 2.94) months, respectively. Majority of mothers 158 (81.9%) were married. Regarding to maternal education, religion, ethnicity and occupation, about 70 (36.3%) of the mothers were attended grade 1-8, 81 (42%) of them were Orthodox, 92 (47.7%) them were Oromo and 86 (44.6%) housewife, respectively (Table 1).

**Table 1:** Sociodemographic characteristics of HIV positive mothers at health facilities of Shashemene town, in 2018

| Variable               | Category       | n (%)          |
|------------------------|----------------|----------------|
| Mother Age (year)      | 16-20          | 5  2.6         |
|                        | 21-25          | 30 15.5        |
|                        | 26-30          | 94 48.7        |
|                        | 31-35          | 53 27.5        |
|                        | 36-40          | 11  5.7        |
| Infant Age (Year)      | < 6 month      | 76 39.4        |
|                        | 6 to 12 month  | 117 60.6       |
| Marital status         | Single         | 4  2.1         |
|                        | Married        | 158 81.9       |
|                        | Divorced       | 23 11.9        |
|                        | Widowed        | 8  4.1         |
| Mother Education       | Uneducated     | 33 17.1        |
|                        | Read & write   | 48 24.9        |
|                        | Grade 1-8      | 70 36.3        |
|                        | Grade 9-12     | 36 18.7        |
|                        | Above Grade 12 | 6  3.1         |
| Religion               | Orthodox       | 81 42.0        |
|                        | Muslim         | 67 34.7        |
|                        | Protestant     | 43 22.3        |
|                        | Catholic       | 2  1.0         |
| Ethnicity              | Oromo          | 92 47.7        |
|                        | Amhara         | 48 24.9        |
|                        | Walaita        | 29 15.0        |
|                        | Gurahe         | 23 11.9        |
|                        | Others*        | 1  0.5         |
| Occupation             | Government Employee | 12  6.2    |
|                        | Private Employee | 25 13.0        |
|                        | Daily laborer   | 37 19.2        |
|                        | House wife      | 86 44.6        |
|                        | House made      | 10  5.2        |
|                        | Merchant        | 23 11.9        |
| Husband Education      | Uneducated     | 6  3.8         |
|                        | Read & write   | 32 20.3        |
|                        | Grade 1-8      | 64 40.5        |
|                        | Grade 9-12     | 47 29.7        |
|                        | Above Grade 12 | 9  5.7         |
| Husband Occupation     | Government Employee | 25 15.8    |
|                        | Private Employee | 43 27.2        |
|                        | Farmer          | 44 27.8        |
|                        | Daily laborer   | 10  6.3        |
|                        | Merchant        | 34 21.5        |
|                        | Others**        | 2  1.4         |
| Area of Residence      | Urban          | 153 79.3       |
|                        | Rural          | 40 20.7        |
| Monthly Income         | < 500 birr     | 18  9.3        |
|                        | 500-1000 birr   | 69 35.8        |
|                        | 1000 birr and above | 106 54.9    |

| Hadiya, **Driver       |

**Obstetric related characteristics:** Among 193 respondents, 81 (42%) them have 2 children and the mean ± SD number of children was (2.58 ± 1.1). Regarding ANC visit, 192 (99.5%) of them has ANC follow up during their last pregnancy, 129 (67.4%) of mothers had above four ANC visits. Concerning place of delivery and PNC visit majority: 175 (90.7%) of them delivered at the government institution and the remaining 14 (7.3%) and 4 (2%) attended at private health facility and home respectively. Only 31 (16.1%) of them attended PNC visit.

**HIV status awareness and disclosure issue:** One hundred forty-one (73.1%) of respondents knew their HIV status before their last pregnancy while the remaining 44 (22.8%) and 8 (4.1%) know their status during last pregnancy and last delivery respectively. One hundred seventy-eight (92.2%) of them disclosed their HIV status and among those disclosed, about 144 (80.9%) of them disclosed their status to their husband, followed by sisters/brothers 17 (9.6%), Mother/Father 13 (7.3%) and friends 3 (1.6%).

**Infant feeding related characteristics:** Concerning to infant feeding related issue, majority 175 (90.7%) of respondent breast feed their infants and about 153 (87.4%) them initiated breast feeding within one hour delivery. Regarding feeding option for their infants about 154 (79.8%) chose EBF followed by complementary feeding. Among all respondents, about 114 (59.1%) initiated complementary feeding, majority 99 (86.8%) of them initiated complementary feeding at age of six month and 52 (45.6%) them use separate dish to feed their infants. Regarding their plan for future breast feeding, about 117 (66.9%) planned to be breast feed their infants up to 18 months. On the topic of infant feeding practice about 172 (89.1%) utilize safe infant feeding practice (Table 2).

**Health condition of the mother and the infant:** Regarding health condition of the mother and infant, only 20 (10.4%) have breast problem and 15 (75%) of them has breast engorgement. Among all respondents about 11 (5.7%) has mouth ulcer. Regarding HIV status 162 (83.9%) them has negative HIV result on their last pregnancy and last delivery respectively. Concerning NVP provision almost all infants 189 (100%) were initiated on ART and 162 (83.9%) of them was initiated on ART for than one year and above. (100%) of them has breast engorgement. Among all respondents about 11 (5.7%) has mouth ulcer. Regarding HIV status 162 (83.9%) them has negative HIV result on their last pregnancy and last delivery respectively. Concerning NVP provision almost all infants 189 (100%) were initiated on ART and 162 (83.9%) of them was initiated on ART for than one year and above. (100%) of them was provided NVP suspension (Table 3).

**Health workers related characteristics:** Regarding counseling by health professional among 193 respondents about 159(82.4%) of them counseled about feeding option and among those counseled about 91 (57.2%) of them were attended at private health facility and home respectively. Only 31 (16.1%) of them attended PNC visit.
Table 2: Infant feeding related characteristic of HIV positive mothers at health institution of Shashemene town, in 2018

| Variable                                                                 | Category                                                                 | n  | (%)  |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------|----|------|
| Breast feed (n = 193)                                                    | Yes                                                                      | 175| 90.7 |
|                                                                          | No                                                                       | 18 | 9.3  |
| Time breast feeding initiated after birth (n = 175)                      | Within One hour                                                         | 153| 87.4 |
|                                                                          | After One hour                                                          | 22 | 12.6 |
| Breastfed by other person (n = 193)                                     | No                                                                       | 193| 100  |
| Ever provided expressed breast milk (n = 193)                           | Yes                                                                      | 17 | 8.8  |
|                                                                          | No                                                                       | 176| 91.2 |
| Is the expressed breast milk treated with heat? (n = 17)                 | No                                                                       | 17 | 100  |
| Reason for providing expressed breast milk (n = 17)                     | For work                                                                 | 13 | 76.5 |
|                                                                          | Due to maternal illness                                                  | 3  | 17.6 |
|                                                                          | Not to mix other food when the mother is not at home                    | 1  | 5.9  |
| Infants feeding option (n = 193)                                         | EBF for the first 6 months followed by complementary feeding in addition to the breast feeding starting from 6 months | 154| 79.8 |
|                                                                          | ERF for the first 6 months followed by complementary feeding starting from 6 months | 18 | 9.3  |
|                                                                          | Breast milk and other foods(mixed feeding)                              | 21 | 10.9 |
| Reason for ERF (n = 18)                                                  | Fear of HIV transmission                                                | 13 | 72.2 |
|                                                                          | Due to maternal illness                                                 | 5  | 27.8 |
| Kind of ERF (n = 18)                                                     | Commercial infant formula                                               | 18 | 100  |
| Frequency of ERF (n = 18)                                                | ≥ 8 times                                                               | 18 | 100  |
| Is the formula is available at market any time you want? (n = 18)        | Yes                                                                     | 18 | 100  |
| Do you get clear water to prepare the formula? (n = 18)                  | Yes                                                                     | 18 | 100  |
| Practice of mixed feeding (n = 193)                                      | Yes                                                                     | 21 | 10.9 |
|                                                                          | No                                                                      | 172| 89.1 |
| Reason for mixed feeding (n = 21)                                        | No enough milk                                                          | 17 | 81   |
|                                                                          | Maternal health problem                                                 | 3  | 14.2 |
|                                                                          | The will thirsty                                                        | 1  | 4.8  |
| CF initiated (n = 193)                                                   | Yes                                                                     | 114| 59.1 |
|                                                                          | No                                                                      | 79 | 40.9 |
| Age of CF initiation (n = 114)                                           | At six month                                                            | 99 | 86.8 |
|                                                                          | After six month                                                         | 15 | 13.2 |
| Utensil for CF (n = 114)                                                | Bottle                                                                  | 18 | 15.8 |
|                                                                          | Cup with spoon                                                          | 44 | 38.6 |
|                                                                          | Separate dish                                                          | 52 | 45.6 |
| Plan for breast feeding (n = 175)                                        | Up to one year                                                          | 58 | 33.1 |
|                                                                          | Up to one year and six month                                            | 117| 66.9 |
| Feeding practice (n = 193)                                               | Safe                                                                    | 172| 89.1 |
|                                                                          | Unsafe                                                                  | 21 | 10.9 |

One hundred eighty-seven (96.9%) counselled on advantage of breastfeeding, and 161 (83.4%) counselled on risk of using mixed feeding.

Factors affecting infant feeding practice: On bivariate analysis, educational status of the mother with [COR = 1.0 (CI = 0.26,3.95)], number of ANC visit with [COR = 3.6 (CI = 1.27,9.99)], time aware of HIV status [COR = 0.168 (CI = 0.04,0.78)], presence of breast problem with [COR = 2.3 (CI = 0.69,7.65)], infants HIV status on first DBS result with [COR=3.9 (CI = 0.51,30.59)].Counseling on infant feeding option by health professional with [COR = 3.5 (CI = 1.30,9.16)], counseling by health professional about advantages of breast feeding [COR = 4.4 (CI = 0.76,25.76)], counseling by health professional about risk of mixed feeding with [COR = 2.9 (CI = 1.07,7.95)], have association with infant feeding practice at P-value < 0.25.
Table 3: Health condition of HIV mothers and infants

| Variable                                                   | Category                        | n   | (%) |
|------------------------------------------------------------|---------------------------------|-----|-----|
| Have you ever encountered breast problem?                  | Yes                             | 20  | 10.4|
| (n = 193)                                                  | No                              | 173 | 89.6|
| Which breast problems you have encountered?                | Engorgement                     | 15  | 75  |
| (n = 20)                                                   | Sore/cracked nipples            | 5   | 25  |
| Have the infant had mouth ulcer?                           | Yes                             | 11  | 5.7 |
| (n = 193)                                                  | No                              | 182 | 94.3|
| What is the first HIV result of your child?                | HIV negative                    | 162 | 83.9|
| (n = 193)                                                  | HIV positive                    | 2   | 1.1 |
| | Unknown                                                    | 29                             | 15.0|
| Are you on ART?                                            | Yes                             | 193 | 100 |
| (n = 193)                                                  | No                              | 0   | 0.0 |
| Duration of ART                                            | < One year                      | 31  | 16.1|
| (n = 193)                                                  | ≥ One year                      | 162 | 83.9|
| Did you child provided NVP syrup?                          | Yes                             | 189 | 97.9|
| (n = 193)                                                  | No                              | 4   | 2.1 |

However, on multivariate analysis only counseling on infant feeding option by health professional with [AOR = 4.5 (CI=1.09, 18.74)] was found to be independent predictors of infant feeding practice at statically significant P-value < 0.05. HIV positive mothers who counseled by health professional were 4.5 times more likely to practice safe feeding than their counterpart (Table 4).

Discussion

The aim of this study was to assess infant feeding practice and associated factors among HIV positive mothers who were attending ART and PMTCT service at candidate health institutions of Shashemene town. This study revealed that majority 154 (79.8%) of HIV positive mothers were practicing EBF for the first six month followed by complementary feeding when, 18 (9.3%) and 21 (10.9%) of them were practicing ERF and Mixed feeding respectively. Concerning feeding practice greater part of the respondent 172 (89.1%) were practicing safe infant feeding when few of them 21 (10.9%) were practicing unsafe feeding.

Table 4: Factors affecting infant feeding among HIV positive mothers at health institution of Shashemene town

| Variable                                                   | Category                        | Infant feeding practice | COR (95% CI) | P-value | AOR (95% CI) | P-value |
|------------------------------------------------------------|---------------------------------|-------------------------|--------------|---------|--------------|---------|
| Educational status of the mother                           | Uneducated                     | 3                       | 1.0 (0.26,3.95)** | 0.98    | 0.3 (0.023,2.980) | 0.6     |
|                                                            | Read and write but has no formal education | 8                       | 2.0 (0.75,5.54)** | 0.16    | 0.9 (0.149,4.907) | 0.2     |
|                                                            | Educated                       | 10                      | 102          | 1.00    |               |         |
|                                                            | Time awarded of HIV status     | Before this Pregnancy   | 13           | 129     | 0.2 (0.04,0.78)** | 0.02    | 0.15 (0.02,1.09) | 0.06    |
|                                                            | During this pregnancy          | 5                       | 38           | 0.22 (0.04,1.21)** | 0.08    | 0.16 (0.02,1.34) | 0.09    |
|                                                            | During Delivery                | 3                       | 5            | 1.00    |               |         |
|                                                            | Number of ANC Visit            | One ANC visit           | 0            | 2       | NA           | 0.99    | NA         | 1.0     |
|                                                            | Two ANC Visit                  | 0                       | 3            | NA      | 0.99        | NA      | 1.0     |
|                                                            | Three ANC Visit                | 4                       | 16           | 3.3 (0.92,12.09)** | 0.07    | 1.4 (0.28,6.86) | 0.69    |
|                                                            | Four ANC Visit                 | 8                       | 30           | 3.6 (1.27,9.99)** | 0.02    | 3.5 (1.12,11.03)* | 0.03    |
|                                                            | Above Four ANC Visit           | 9                       | 120          | 1.00    |               |         |
|                                                            | Presence of breast problem     | Yes                     | 4            | 16      | 2.3 (0.69,7.65)** | 0.18    | 3.4 (0.89,13.30) | 0.07    |
|                                                            | Infants HIV result on first DBS result | Negative       | 20           | 142     | 3.9 (0.51,30.59)** | 0.19    | 5.6 (0.49,63.55) | 0.16    |
|                                                            |                                 | Positive               | 0            | 2       | NA           | 1.0     | NA         | 1.0     |
|                                                            | Unknown                        | 1                       | 28           | 1.00    |               |         |
|                                                            | Counseling on infant feeding option by health professional | Yes            | 13           | 146     | 1.00       | 1.00    | 1.00     |
|                                                            |                                 | No                      | 8            | 26      | 3.5 (1.30,9.16)** | 0.01    | 4.5 (1.09,18.74)* | 0.04    |
|                                                            | Counseling by health professional about advantages of breast feeding | Yes          | 18           | 169     | 1.00       | 1.00    |         |
|                                                            |                                 | No                      | 2            | 4       | 4.4 (0.76,25.76)** | 0.09    | 5.8 (0.56,58.54) | 0.14    |
|                                                            | Counseling by health about risk of mixed feeding | Yes            | 13           | 148     | 1.00       | 1.00    |         |
|                                                            |                                 | No                      | 7            | 25      | 2.9 (1.07,7.95)** | 0.04    | 0.9 (0.21,3.95) | 0.904   |

COR: Crude odds ratio
AOR: Adjusted odds ratio
*Statically significant at P-value < 0.05
**Statically associated at P-value < 0.25
Breastfeeding is the best option of infant feeding which guarantees the child health, development and survival, especially where diarrhea, pneumonia and under nutrition are common causes of mortality among children younger than five years. Therefore early initiation of breast feeding is good for infant’s growth and development, however in this study among 193 respondents about (90.7%) of them breast feed their infants, about (87.4%) of them initiated breast feeding with first hour of birth and this finding is almost similar with the study done at Bahir Dar city which shows (90.5%) of them timely initiated breast feeding within first hour of delivery. However, this result is better than the study done at Gondar town, which shows about (82.3%) of the respondents had initiated breast feeding within an hour of delivery and this improvement may be due to the study period as that one was done in 2012.

On multivariate analysis counseling on infant feeding option by health professional with [AOR = 4.5 (CI = 1.09, 18.74)] was found to be independent predictor of infant feeding practice at P-value of < 0.05. HIV positive mothers who were counseling on infant feeding were 4.5 times more likely to practice safe infant feeding as compared to their counterpart. Those mothers who were counseled on infant feeding option by health professional were more likely to practice safe infant feeding than those not counseled and this finding agree with the study done at Southern Ethiopia which shows mothers who were counseled on EBF were 2.6 times more likely to practice EBF than the referent group (11) and this may be related to that counseling provided by health professional to HIV positive mothers pave the way to practice safe infant feeding. At the end we recommended the below issues:

1- Health professional providing ART/PMTCT service at Shashemene town need to provide further counseling to discourage mixed feeding practice since it still accounts for significant number.

2- Health professionals at facility and health extension workers at community level of Shashemene town have to encourage all mothers on timely initiation complementary feeding at the age six month.

3- Health professionals at facility and health extension workers at community level of Shashemene town discourage bottle feeding since mothers still practicing it.

4- Health professionals working at labor and delivery room encourage timely initiation of breast feeding within one hour of delivery.
Conclusion
According to this study majority of mothers breast feed their infants. Regarding infant feeding practice higher proportion of them follow safe infant feeding practice. All HIV positive mothers were on ART. Significant numbers of HIV positive mothers still use bottle feeding for their infants. Counseling provided by health professional was found as independent predictors of infant feeding practice.

Conflict of Interests
Authors have no conflict of interests.

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