

# Infant Feeding Practice and Associated Factors among HIV Positive Mothers Attending ART Clinic in Governmental Health Institutions of Bahir Dar Town, Amhara Regional State, Ethiopia, 2017

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## Abstract

**Objective:** This study aimed to assess infant feeding practice and associated factor among HIV positive mothers attending ART service in governmental health institutions of Bahirdar town, Ethiopia, 2017.

**Methods:** Institution based cross-sectional study was conducted in 3 Health centers and 1 Hospital which provides ART service in Bahirdar town from March to April, 2017. A total of 230 mother-infant pairs attending ART were selected by systematic random sampling technique. Structured interview was used to gather data on feeding practices. The data were coded, entered, cleaned and analyzed by SPSS software version 23. Bivariate and multivariate models were run to assess any relationship between each independent variable and outcome variables. Crude and adjusted odds ratios were used to ascertain for any association between the dependent and predictor variables while significance was determined using 95% confidence intervals.

**Results:** The majority 173 (75.2%) practiced exclusive breast feeding up to six months of age. 13.9% and 10.9% of mothers practiced exclusive replacement feeding and mixed feeding, respectively. In multiple logistic regressions, Attended postnatal care (AOR (95% CI: 6.69 (1.647-27.178))), Time of initiation of first breast feeding after delivery (AOR (95% CI: 13.94 (2.98-65.05))), awareness of mothers on mother to child transmission of HIV via breast feeding was significantly associated with infant feeding practice (AOR (95% CI: 0.004 (0.00-0.05))).

**Conclusion:** The study revealed that majority of the mothers' experienced exclusive breast feeding (75.2%), postnatal care, time of initiation of first breast feeding after delivery and knowledge of MTCT during breast feeding were independent predictors of infant feeding practice.

**Keywords:** HIV; Exclusive breast feeding; Exclusive replacement feeding; Mixed feeding; Bahirdar

## Introduction

Acquired immunodeficiency syndrome is a pattern of devastating infections caused by the human immunodeficiency virus (HIV). The main causes of HIV infection in children is mother-to-child transmission during pregnancy, labour, delivery or after the child's birth during breast feeding. Without any interventions, 20-45% of infants had born with HIV-infection and with an estimated risk of 5-20% through breastfeeding [1].

Infant feeding practice is the important modifiable factor influencing the health of children born from HIV-positive mothers [2]. Breastfeeding is best for infants and is an effective method of reducing the risk of common childhood morbidity, particularly gastro intestinal and respiratory infections, and of promoting child survival and maternal health through child spacing [2,3]. While breastfeeding carries significant health benefits to infants and young children, it can transmit HIV virus from an infected mother to her infant. In African settings, breastfeeding can be responsible for 1/3-1/2 of HIV infections in infants [3]. The risk of HIV infection in breastfeeding infants can be decreased by shorten the duration of breastfeeding, breastfeed exclusively in the early months, prevent and treat breast problems, prevent HIV infection during breastfeeding, and treat sores or thrush in the infant's mouth early [4].

Infant feeding practices recommended to mothers known to be HIV-infected should support the greatest likelihood of HIV-free survival of their children and not harm the health of mothers [4]. Infant feeding in the context of HIV is complex because of the major influence that feeding practices exert on child survival. The dilemma is to balance

the risk of infants acquiring HIV through breast milk with the higher risk of death from causes other than HIV, in particular malnutrition and serious illnesses such as diarrhea, among non-breastfed infants [5].

World health organization (WHO) recommended that HIV-infected mothers should breast feed exclusively for the first six months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe for them and their infants before that time. At six months, if replacement feeding is still not acceptable, feasible, affordable, sustainable and safe, continuation of breastfeeding with additional complementary foods is recommended, while the mother and baby continue to be regularly assessed. All breastfeeding should stop once a nutritionally adequate and safe diet without breast milk can be provided [5]. Ethiopia has been adopting these recommendations and promoting their implementation in the health institutions throughout the country [1].

Globally 36.7 million people are living with HIV; 3.2 million are

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under the age of 15 years. In 2015, 2.1 million people were newly infected with HIV, 240,000 were under the age of 15 years [5,6]. Every day about 5,600 people contract HIV more than 230 every hour. In the same year, 1.1 million people died from AIDS and out of this 190,000 were children under the age of 15 years [5]. Ninety seven percent people living with HIV reside in low- and middle-income countries, in which 70% burden is in Sub-Saharan Africa (SSA), out of the total 88% are children in this area [6].

The overall adult prevalence of HIV in Ethiopia estimates 1.1% in 2016 from 1.5% in 2011. In 2016, there were an estimated 671,941 people living with HIV including 109,133 children [7]. According to 2011 Ethiopia demographic health survey (EDHS), due to its large population size Amhara region has largest people living with HIV. Thus, although this region has lower HIV prevalence (1.6%), it still bears a significant proportion of the epidemic burden [8].

More than 95% of HIV infection in children is acquired by mother to child transmission (MTCT). Depending on the presence and duration of breast feeding, the risk of MTCT ranges from 15% to 45%. Globally, the rate was 4.7% at six weeks, but this was increased to 8.9% at the end of breast feeding in 2015. Such differentials reflect reduced retention during the breastfeeding period, resulting in many new pediatric HIV infections [9]. According to 2011 EDHS, the prevalence of mother to child transmission of HIV after the breast feeding period was 25% [8]. Poor breastfeeding practices especially lack of exclusive breastfeeding during the first 6 months of life and inadequate complementation were found to be substantial risk factors for infant and childhood morbidity and mortality [10].

WHO recommended for preventing MTCT of HIV and in particular, to prevent postnatal transmission through breastfeeding [5]. They also considered the experiences of countries in implementing the current recommendations on HIV and Infant Feeding. Mothers known to be HIV-infected should be provided with lifelong antiretroviral therapy (ART) or antiretroviral prophylaxis (ARP) interventions to reduce HIV transmission through breast feeding; mothers should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter, and continue breast-feeding for the first 12 months of life. When mothers decide to stop breastfeeding at any time, infants should be provided with safe and adequate replacement feeds to enable normal growth and development [2,11].

Studies in Ethiopia have indicated that HIV is endemic with regional variation. However there is a scarcity of information on the prevalence of infant feeding practice among HIV positive mothers in the study area. This research was tried to identify current status of infant feeding practices and factors associated with infant feeding practice of HIV positive mothers attending ART services in Bahirdar town. The reason why conducting this research at this particular location is that the prevalence of HIV in the study area is high (prevalence of 4.2). The study findings will also help to recommend infant feeding practice in the context of HIV positive mothers for the policy makers in order to plan necessary programs. Provision of adequate information on existing knowledge and practices on infant feeding for mothers, caretakers, families, communities and other key actors at different levels will be prioritize.

## Materials and Methods

### Study design, area and period

The study was conducted in Bahirdar town, Amhara regional state, Ethiopia ART service providing governmental health institutions.

Bahirdar is located in North West part of Ethiopia which is the capital city of Amhara regional state having a total population of 311,724 and is found at a distance of 565 km from Addis Ababa, capital city of Ethiopia. There are 2 governmental hospitals and 10 health centers in the town, among these 2 hospitals and 5 health centers provide ART service [12]. The study was carried out from March to April, 2017. Institution based cross-sectional study was conducted.

### Study population

All mothers who have a child and attending ART services in Health Institutions of Bahir Dar City during the study period were the source population. HIV positive mother with a child less than 1 year of age who had follow-up and present on the time of data collection in all ART service providing governmental institutions were included to the study.

### Ethical consideration

The study protocol was approved by the institutional review board of Addis Ababa University, college of health science (IRB no 149/2017). Informed consent was confirmed by the IRB. Ethical clearance was obtained from Addis Ababa University ethical review committee. Official letter of permission from the department was submitted to Bahirdar town health institutions which provide ART service, and then verbal consent was obtained from the mothers of the child under study and confidentiality of the information given by the respondent maintained.

### Sample size determination

Sample size were determined by using single population proportion formula at 95% confidence interval and 5% margin of error as well as the prevalence of infant feeding practice 83.8% (Prevalence of EBF, MF and ERF were 83.8%, 10.5% and 5.7%, respectively, from the research done in the same title in Gondar, 2012) [13-15]. The total sample size were 230 HIV positive mother with a child less than 1 year of age who have follow-up and present on the time of data collection in four randomly selected ART service providing governmental institutions.

### Sampling technique

From all governmental health institutions in Bahirdar, the 2 hospitals and 5 health centers actively provide ART service, and then by using simple random sampling (lottery method) one hospital and 3 health centers were selected. The sample size was selected from the selected ART service providing centers by using systematic random sampling method. Proportional allocation of the number of cases to participate in the study from each health facilities was considered. The sampling interval (K) was determined by dividing population size,  $N=550$ , by required sample size,  $n=230$  ( $k=550/230=2.4$ ).

### Data collection methods

Data was collected by using pre-tested structured questionnaire adapted from different literatures after being modified to the local context and to the research objective by the investigator. The questionnaire was translated into local language, then it translated back into English by language professionals, and consistency between the original and the back translated versions was checked by the investigator to keep the reliability and validity. Data was collected by four health workers (data collectors) working from other health institutions at the ART unit by using a structured interviewer administered questionnaire for the study participants. Continuous supervision of the data collectors was made by one supervisor and principal investigator. A one day training and orientation was given by principal Investigator for 4 data collectors

and 1 supervisor on the objective and significance of the study, how to collect and record the appropriate information, procedures of data collection techniques, the whole contents of the questionnaire and to keep confidentiality. And pre-test was done on 5% of the samples in Addis Alem Hospital before the actual survey and important modification was made on the basis of the findings. At the end of each day, the collected data was checked for its completeness and logical consistency by supervisor and principal investigator and corrective discussion were under-taken for the next day data collection with all the data collectors and the supervisor.

### Independent and outcome variables

Infant feeding practices is the outcome variable for this study. The independent variable or predictors are Obstetric conditions like Place of delivery, Mode of delivery, Antenatal follow up, time of first antenatal visit, Post natal service and socio demographic variables like maternal age, marital status, occupation, educational status, religion, monthly income, sex, PMTCT Knowledge, Disclosure of HIV status, Stage of HIV, CD4 Count and Breast condition.

### Data processing and analysis

Data was entered, cleaned and analyzed by SPSS software version 23. Descriptive statistics was carried out using table and figure in order to investigate the association of independent variables with infant feeding practice. Both bivariate and multivariate analysis was used. The variables that showed an association with the outcome variable at the bivariate analysis with  $p$  value  $< 0.25$  was entered into the final multivariable logistic regression to control for potential confounders using step wise modeling. Adjusted odds ratio (AOR) with 95% confidence interval was estimated to assess the strength of the association and  $P$  value  $< 0.05$  was considered to declare the statistical significance in the multivariable analysis.

## Results

### Socio-demographic characteristics

A total of 230 HIV positive mothers having infants from three ART service providing health centers and one hospital under Bahirdar town were included in the study making the response rate of 100%. The mean age of mothers and infants were  $(28.49 \pm 4.44)$  years and  $(7.67 \pm 2.9)$  months, respectively. One hundred seventeen (50.9%) of mothers had male child and majority of the mothers 174 (75.7%) were married. Regarding to maternal education, about One-third of the mothers was 1-8 grade attended and 69 (30%) of the respondents were unable to read and write. Concerning their religion, ethnicity and occupation, majority (73.9%) of respondents were Orthodox Christian, (97%) Amhara and (45.2%) mothers was house wife, respectively.

### Obstetric history

Out of 230 mothers, 117 (50.9%) and 74 (32.2%) had 1 and 2 children, respectively. Almost all 228 (99.1%) of them attended ANC follow up in the last pregnancy and out of them 158 (68.7%) mothers had four ANC visits. The majority 228 (99.1%) of the mothers were counseled on infant feeding options, of which, 190 (82.6%), 93 (40.4%), 116 (50.4%) and 195 (84.8%) were counseled during ANC, Delivery, PNC and ART visits respectively. All of the mothers 230 (100%) delivered at the health institutions and 51.3% delivered via spontaneous vaginal delivery.

### HIV disclosure

Most of 131 (57%) the mothers knew their HIV status before this

pregnancy. 183 (79.6%) of the mothers disclosed their HIV status out of which, majority of mothers 132 (57.4%) disclosed to their husband.

### Feeding practice of HIV positive mothers

Most of the mothers 201 (87.4%) had given breast to their child, out of them 182 (90.5%) gave breast with in first hour of the child's birth, while 8 (4%) children receive food or drink before the first breast, some of the infants 57 (24.8%) were given foods/fluids other than breast milk until six months of age.

The majority 173 (75.2%) practiced exclusive breast feeding up to six months of age and 71 (30.9%) and 66 (28.7%) practiced the feeding option they counseled by health professional, fear of MTCT of HIV/AIDS and thinking it is safe for the baby respectively. While 32 (13.9%) of the respondents practiced exclusive replacement feeding. The reason for making this feeding option is fear of MTCT of HIV/AIDS. Seventeen (53.1%) of the mothers gave commercial infant formula. A total of 178 (74.4%) of the mothers started complementary food for their child, 153 (86.0%) of the mothers who started at the age of 6 months, while the rest (14%) started before the age of 6 months.

### Knowledge of HIV positive mothers towards infant feeding option

Almost all 228 (99.1%) of the mothers knew that HIV could be transmitted from mother to child, Out of which 191 (83.8%), 207 (90.8%) and 159 (69.7%) mothers were answered that it could be transmitted during pregnancy, delivery, and breast feeding respectively. The majority 228 (99.1%) of them heard about infant feeding options recommended for HIV positive mothers of which, 225 (98.7%) heard from health professionals.

### Mothers health condition

Majority, (60.9%) of mothers had a CD4 count of  $> 500$  cell/mm<sup>3</sup> and more than half of the mothers 206 (89.6%) were on stage 1 of HIV disease progress, and most of them 182 (79.1%) had not encounter any breast problem and 204 (88.7%) of mothers had no any long term illness.

### Infant health condition

Almost all 225 (97.8%) of the infants had not encountered any oral ulcer and 98 (42.6%) mothers knew the HIV status of their child. Only 3 (1.3%) of them were positive. From 230 infants, 51 (22.2%) were developed illness, out of which 17 (7.4%) encountered diarrhea.

### Counseling practice of health workers

Almost all 225 (97.8%) of the mothers get counseling from health workers about different feeding options. 228 (99.1%) of mothers get information about advantages of breast feeding and 198 (86.1%) stated that they were counseled on disadvantages of breast feeding, while 205 (89.1%) of the mothers were told about advantages of replacement feeding. Some 206 (89.6%) of them had been told on disadvantages of replacement feeding. Regarding the safety of the feeding options, 200 (87.0%) of the mothers were informed about the risk of mixed feeding, and 165 (71.7%) of the mothers stated that the health care provider explained about how to practice the chosen feeding choice.

### Factors affecting infant feeding practice

In the bivariate analysis; maternal education, Counseling on infant feeding options during delivery, Counseling on infant feeding options during Postnatal care, Attended postnatal care, infant given any food/

fluid before first breast feeding, Time of initiation of first breast feeding after delivery, Awareness of mothers on mother to child transmission of HIV via breast feeding, being counseled by health workers on advantage of replacement feeding were found to be significantly associated with Infant feeding practice; However, in the multiple logistic regression, postnatal care, Time of initiation of first breast feeding after delivery and Awareness of mothers on mother to child transmission of HIV via breast feeding were significantly associated with infant feeding practice. HIV positive mothers who attended postnatal care services and had Awareness on mother to child transmission of HIV via breast feeding were 6.69 and 13.94 times more likely to practice safe infant feeding practice as compared to their counter parts (AOR (95% CI: 6.69 (1.647, 27.178), 13.94 (2.98, 65.05))), respectively. However, those HIV positive mothers who initiated the first breast feeding after delivery for their infant were 99.6% less likely to safely practice infant feeding (AOR (95% CI: 0.004 (0.00, 0.05))) as compared to those who did not (Tables 1-7).

Variable	Category	Frequency	Percent (%)
Age of the mother (n=230)	18-24	41	17.8
	25-34	163	70.9
	35-49	26	11.3
Age of the child (n=230)	≤ 6 months	69	30.0
	7-11.9 months	161	70.0
Sex of the child (n=230)	Male	113	49.1
	Female	117	50.9
Marital status (n=230)	Single	21	9.1
	Married	174	75.7
	Divorced	28	12.2
	Widowed	7	3.0
Mother's education (n=230)	Unable to read and write	69	30.0
	Grade 1-8	79	34.3
	Grade 9-10+2	36	15.7
	10+2 and above	46	20.0
Religion (n=230)	Orthodox Christian	170	73.9
	Catholic	6	2.6
	Protestant	8	3.5
	Muslim	46	20.0
Ethnic group (n=230)	Amhara	223	97.0
	Oromo	7	3.00
Mother's occupation (n=230)	Government employee	34	14.8
	Private employee	19	8.3
	Daily laborer	33	14.3
	House wife	104	45.2
	House servant	2	0.9
	Merchant	35	15.2
	others*	3	1.3
Husband's education (n=174)	Unable to read and write	21	9.1
	Able to read and write	17	7.4
	Grade 1-8	29	12.6
	Grade 9-10+2	43	18.7
	10+2 and above	64	27.8
Husband's occupation (n=174)	Government employee	47	20.4
	Private employee	38	16.5
	Daily laborer	27	11.7
	Merchant	50	21.7
	others**	12	5.2

**Table 1:** Socio-demographic characteristics of HIV positive mothers in 4 health facilities in Bahirdar town, 2017, (n=230).

Variables	Category	Frequency	Percent (%)	
Number of children m (± s.d) (n=230)	1.74 ± 0.94			
Attending ANC (n=230)	Yes	228	99.1	
	No	2	0.9	
ANC visits m (± s.d) (n=228)	3.89 ± 0.811			
Counseled on infant feeding (n=230)	Yes	228	99.1	
	No	2	0.9	
During ANC (n=228)	Yes	190	82.6	
	No	38	16.5	
During delivery (n=228)	Yes	93	40.4	
	No	135	58.7	
During PNC (n=228)	Yes	116	50.4	
	No	112	48.7	
During ART visits (n=228)	Yes	195	84.8	
	No	33	14.3	
Place of birth (n=230)	Health institution	230	100	
Mode of delivery (n=230)	SVD	118	51.3	
	CS	26	11.3	
	Instrumental	86	37.4	
Attending PNC (n=230)	Yes	217	94.3	
	No	13	5.7	
The time HIV status is known (n=230)	Before pregnancy	131	57.0	
	During this pregnancy	96	41.7	
	During delivery	1	0.4	
	After delivery	2	0.9	
Disclosed your HIV status (n=230)	Yes	183	79.6	
	No	47	20.4	
For whom your HIV status disclosed (n=183)	Husband			
	Yes	132	57.4	
	No	51	22.2	
The time HIV status is known (n=230)	Sister/brother	Yes	44	19.1
		No	139	60.4
	Family	Yes	63	27.4
		No	120	52.2
	Friend	Yes	29	12.6
		No	154	67.0
The time HIV status is known (n=230)	Before pregnancy	131	57.0	
	During this pregnancy	96	41.7	
	During delivery	1	0.4	
	After delivery	2	0.9	
Disclosed your HIV status (n=230)	Yes	183	79.6	
	No	47	20.4	
For whom your HIV status disclosed (n=183)	Husband			
	Yes	132	57.4	
	No	51	22.2	

**Table 2:** Obstetric history and disclosure status of HIV positive mothers attending ART services at 4 health institutions in Bahirdar town, 2017, (n=230).

## Discussion

The aim of this study to assess infant feeding practice and associated factors of HIV positive mothers that were attending in governmental health institutions of Bahirdar town, Amhara region, Northwest Ethiopia. This study revealed that the prevalence of HIV positive mothers practicing exclusive breast feeding (EBF) for the first six months is 75.2% which is higher than the study done in Nigeria (14.8%), South Africa (5%), Kenya (40.6%), Addis Ababa, Ethiopia (30.6%) and southern nations, nationalities and peoples' region (56.3%). But, it is in line with Cameroon (70%) and Debre Markos (77.3%) [11,13-17]. This may be due to mothers thinking EBF is safe

Variables	Category	Frequency	Percent (%)
Ever breast feed (n=230)	Yes	201	87.4
	No	29	12.6
Time of first initiation of breast milk (n=201)	Within first hour	182	90.5
	After first hour	19	9.5
Infant received any food or fluid before breast milk (n=201)	Yes	8	4.0
	No	193	96.0
What food or fluid (n=8)	Butter	2	25.0
	Water	1	12.5
	Water and sugar	4	50.0
	Other***	1	12.5
Ever given food/fluid other than breast milk before 6 months (n=230)	Yes	57	24.8
	No	173	75.2
What food or fluid (n=57)	Milk powder	39	68.4
	Cow milk	1	1.75
	Porridge	3	5.3
	Adult food	14	24.6
Other person breast feed your child (n=230)	Yes	2	0.9
	No	228	99.1
Why (n=2)	Mother sick	1	50.0
	Breast problem	1	50.0
Ever given expressed milk (n=230)	Yes	18	7.8
	No	212	92.2
Utensil used to feed (n=18)	Bottle	15	83.3
	Cup	3	16.7
Ever treated expressed milk with heat (n=18)	Yes	0	
	No	18	100
Why you express (n=18)	To relive crackle nipple	3	16.7
	To separate from the infant	11	61.1
	Infant unable to suck	4	22.2
Feeding options you practiced (n=230)	Exclusive breast feeding	173	75.2
	Exclusive replacement feeding	32	13.9
	Mixed feeding	25	10.9
Feeding practice (n=230)	Safe feeding	205	89.1
	Unsafe feeding	25	10.9
Reason for the feeding option (n=230)	Thinking it is safe for the baby	66	28.7
	Can't afford cost of replacement feeding	4	1.7
	Fear of MTCT of HIV	66	28.7
	No counseling was done	1	0.4
	Health professional counseling	71	30.9
		3	1.3
		17	7.4
	2	0.9	
Practiced replacement feeding (n=230)	Yes	32	13.9
	No	198	86.1
Reason for choosing replacement feeding (n=32)	Fear of MTCT of HIV	28	87.5
	Mother sick during delivery	4	12.5
Frequency of replacement feeding per day (n=32)	<8 times	1	3.1
	≥ 8 times	31	96.9
Started complementary feeding (n=230)	Yes	178	74.4
	No	52	22.6
Age complementary feeding started (n=178)	<6 months	25	14.0
	≥ 6 months	153	86.0

**Table 3:** Infant feeding practice of HIV positive mothers attending ART services at 4 health institutions in Bahirdar town, 2017, (n=230).

for the baby and majority of the respondents were counseled by health professionals.

The prevalence of HIV positive mothers practicing exclusive replacement feeding(ERF) for the first six month was 13.9% which is higher than that of Kenya (0.4%), southern nations, nationalities and peoples' region (8.1%), Shashemene (2.7%), Mekelle (3.4%) and Debre Markos (8.5%) [15,18-23]. The reason for the difference in this study may be fear of mother to child transmission of HIV (87.5%) and mother was sick. However, the result is lower than the study done in Nigeria (26%), South Africa (38.7), Kenya (41%), Addis Ababa, Ethiopia (46.8%) and south and north Wollo, Ethiopia (95.1%), [17,19,23-25]. This discrepancy may be due to the current WHO guide-line on

infant feeding practice on the context of HIV/AIDS had inclined to Exclusive breast feeding than Exclusive replacement feeding, so that the counselors also highly recommend EBF than ERF. Also the current cost inflation might have part for this minimal ERF practice because they cannot afford to buy formula food.

In this study 10.9% of the respondents were practiced mixed feeding. This is lower than the study done in South Africa (30.5%), Kenya (42.2%) and SNNPR (35.6%) [14,26,20]. The reason may be in this study majority of the respondents counseled about different recommended feeding options during ANC, delivery, PNC and ART follow up. It was however higher than 4%, 7.8%, 0.7% and 6.3% reported in Kenya, Addis Ababa, Shashemene and Mekelle, respectively

Variables	Category	Frequency	Percent
Knowledge on MTCT (n=230)	Yes	228	99.1
	No	2	0.9
During when (n=228)	<b>Pregnancy</b>		
	Yes	191	83.8
	No	37	16.2
	<b>Delivery</b>		
	Yes	207	90.8
	No	21	9.2
Heard about recommended infant options for HIV positive mothers (n=230)	Yes	228	99.1
	No	2	0.9
Heard from (n=228)	Health professional	225	98.7
	Other****	3	1.3
Knowledge on recommended infant feeding options for HIV positive mothers (n=228)	<b>EBF</b>		
	Yes	206	90.4
	No	22	9.6
	<b>ERF</b>		
	Yes	158	69.3
No	70	30.7	

Other\*\*\*\*- husband, neighbors

**Table 4:** Knowledge on recommended infant feeding options of HIV positive mothers attending ART services at 4 health institutions in Bahirdar town, 2017.

Variables	Category	Frequency	Percent (%)
CD4 count (cell/mm <sup>3</sup> ) (n=230)	<200	3	1.3
	200-500	87	37.8
	>500	140	60.9
Disease progress (n=230)	Stage 1	206	89.6
	Stage 2	24	10.4
Ever encountered breast problem (n=230)	Yes	48	20.9
	No	182	79.1
Type of breast problem (n=48)	Breast engorgement	33	68.8
	Sore nipples	11	22.9
	Cracked nipples	2	4.2
	Burning and tingling	2	4.2
Any long term illness (n=230)	Yes	26	11.3
	No	204	88.7
Type of long term illness (n=26)	Tuberculosis	7	26.9
	Diabetic mellitus	11	42.3
	Hypertension	4	15.4
	Cardiac problem	4	15.4
Infant's mouth ulcer (n=230)	Yes	5	2.2
	No	225	97.8
Do you know HIV status of your child (n=230)	Yes	98	42.6
	No	132	57.4
HIV status of your child (n=98)	Negative	95	96.9
	Positive	3	3.1
Infant ever been diseased (n=230)	Yes	51	22.2
	No	179	77.8
Disease type (n=51)	Diarrhea	17	33.3
	Common cold	13	25.5
	Pneumonia	12	23.5
	Vomiting	9	17.7

**Table 5:** Health condition of HIV positive mothers attending ART services at 4 health institutions in Bahirdar town, 2017.

[13,16,22,25]. The major reason for this study is the mother expected that breast milk is insufficient for the infant and fear of stigma and discrimination.

The study revealed that majority of the mothers experienced exclusive breast feeding (75.2%) followed by 13.9% exclusive replacement feeding. This could be an advised way of infant feeding

practice by World Health Organization and Ethiopia Minister of Health. Mixed feeding was still prevalent (10.9%) among the mothers which still increased the risk of mother to child transmission of HIV. Post-natal care, time of initiation of first breast feeding after delivery and knowledge of MTCT during breast feeding were independent predictors of infant feeding practice. The regional health office should have a follow up training schedule which should be given to counselors

Variables	Category	Frequency	Percent (%)
Health care provider explain different feeding option (n=230)	Yes	225	97.8
	No	5	2.2
Health care provider tells about advantage of breast feeding (n=230)	Yes	228	99.1
	No	2	0.9
Health care provider tells about disadvantage of breast feeding (n=230)	Yes	198	86.1
	No	32	13.9
Health care provider tells about advantage of replacement feeding (n=230)	Yes	205	89.1
	No	25	10.9
Health care provider tells about disadvantage of replacement feeding (n=230)	Yes	206	89.6
	No	24	10.4
Health care provider tells about risk of mixed feeding (n=230)	Yes	200	87.0
	No	30	13.0
Health care provider explain how to practice the chosen feeding options (n=230)	Yes	165	71.7
	No	65	28.3

**Table 6:** Counseling practice of health workers on infant feeding options among HIV positive mothers attending ART services at 4 health institutions in Bahirdar town, 2017.

Variable	Category	Infant Feeding Practice		COR (95% CI)	AOR (95% CI)
		Unsafe	Safe		
		No (%)	No (%)		
Maternal Education status	Unable to read and write	9 (13.0)	60 (87.0)	0.342 (0.1, 1.164)	0
	Primary	12 (15.2)	67 (84.8)	0.286 (0.088, 0.930)*	0
	Secondary and above	4 (4.9)	78 (95.1)	1.00	1.00
Counseling on infant feeding options during delivery	Yes	3 (3.2)	90 (96.8)	5.21 (1.5, 18.11)**	0
	No	20 (14.8)	115 (85.2)	1.00	1.00
Counseling on infant feeding options during Postnatal care	Yes	5 (4.3)	111 (95.7)	4.25 (1.52, 11.88)**	0
	No	18 (16.1)	94 (83.9)	1.00	1.00
Attended postnatal care	Yes	18 (8.3)	199 (91.7)	12.89 (3.91, 42.498)***	6.69 (1.647, 27.178)**
	No	7 (53.8)	6 (46.2)	1.00	1.00
Was your infant given any food/fluid before first breast feeding	Yes	7 (87.5)	1 (12.5)	0.015 (0.002, 0.126)***	0
	No	18 (9.3)	175 (90.7)	1.00	1.00
Time of initiation of first breast feeding after delivery	Within 1 <sup>st</sup> hour	15 (8.20)	167 (91.8)	12.37 (4.355, 35.14)***	0.004 (0.00, 0.05)***
	After 1 <sup>st</sup> hour	10 (52.6)	9 (47.4)	1.00	1.00
Awareness of mothers on mother to child transmission of HIV via breast feeding	Yes	6 (3.8)	153 (96.2)	9 (3.389, 23.903)***	13.94 (2.98, 65.05)**
	No	18 (26.1)	51 (73.9)	1.00	1.00
Had you been counseled by health workers on advantage of replacement feeding	Yes	19 (9.3)	186 (90.7)	3.09 (1.101, 8.678)*	0
	No	6 (24.0)	19 (76)	1.00	1.00

Significant at \*P value <0.05, \*\*P value <0.01 and p\*\*\* value<0.001

**Table 7:** Association of deferent variables on infant feeding options among HIV positive mothers attending ART services at 4 health institutions in Bahirdar town, 2017.

working in PMTCT/ART sites. The health worker should provide adequate information to enable HIV positive mothers select the best feeding options for their babies, and to successfully carry out their infant feeding decisions. Mother to mother support group advice/ service on infant feeding practice in relation to prevention of MTCT of HIV should be availed and sustained in all health care facilities. Further research should be conducted by including more study sites to allow a more robust analysis.

## Conclusion

The study revealed that majority of the mothers experienced exclusive breast feeding (75.2%) followed by 13.9% exclusive replacement feeding. This could be an advised way of infant feeding practice by World Health Organization and Ethiopia Minister of Health. Mixed feeding was still prevalent (10.9%) among the mothers which still increased the risk of mother to child transmission of HIV. Attended PNC, time of initiation of first breast feeding after delivery and knowledge of MTCT during breast feeding were independent predictors of infant feeding practice.

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