

Unsafe Infant Feeding Practice and Associated Factors Among HIV Positive Mothers Attending PMTCT in Ethiopia: A Cross-Sectional Study

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Introduction: Infant feeding practices can have an impact on the health of infants born to HIV-positive mothers. Breastfeeding has significant health advantages for newborns even while it increases the risk of HIV transmission from an HIV-positive mother to her child. One-third to half of child HIV infections in African settings may be linked to breastfeeding. This study was intended to investigate the level of unsafe infant feeding practice and associated factors among HIV positive mothers attending PMTCT at selected governmental hospitals in Afar regional state, Ethiopia, 2022.

Methods: A cross-sectional study was done among 423 HIV positive mothers from February 15 to March 15, 2022 in Afar regional state at selected PMTCT providing governmental hospitals. The proportional allocation was done for samples to be taken from Asayta, Dupti and Mohammed Akle hospitals. A systematic sampling technique was performed to select the study participants. Epidata version 3.1 was used for data entry, and SPSS software version 23 was used for statistical analysis.

Results: The majority, 296 (70.0%), of mothers with HIV-positive were aged between 25 and 34 years. The level of unsafe infant feeding practice among HIV-positive mothers was 153 (36.2%). About 270 (63.8%) mothers exclusively breastfed their infants. In multivariable logistic regression analysis, PNC follow-up (AOR=1.814, 95% CI: (1.127, 2.919)), ART follow-up (AOR=1.987, 95% CI: (1.128, 3.501)), and HIV disclosure status (AOR=2.324, 95% CI: (1.470, 3.673)) were significantly associated with unsafe infant feeding practice among HIV-positive mothers.

Conclusion: The level of unsafe infant feeding practice among HIV-positive mothers was high. PNC follow-up, ART follow-up, and HIV disclosure status were significantly associated with unsafe infant feeding practice among HIV-positive mothers. Comprehensive health educations need to be provided for HIV-positive mothers to reduce this problem.

Keywords: AIDS, infant feeding practice, HIV, Afar regional state, Ethiopia, nutrition

Introduction

A serious infection known as acquired immunodeficiency syndrome (AIDS) is brought on by the virus known as human immunodeficiency virus (HIV). During pregnancy, delivery, and breastfeeding are the main times when the virus is passed from an infected mother to her child. If no precautions are taken, between 20% and 45% of infants would be afflicted. HIV infection risk ranges from 5% to 20% while nursing.¹

Infant feeding practices, which are modifiable, can have an impact on the health of infants born to HIV-positive mothers. Breastfeeding is the most efficient way to lower the risk of developing common childhood morbidities.^{2,3} Breastfeeding has significant health advantages for newborns even while it increases the risk of HIV transmission from mother to child. One-third to almost half of child HIV infections in Africa are brought on by breastfeeding.³ The risk of HIV infection in breastfed children can be reduced by cutting down on nursing time, breastfeeding exclusively for the first six months, and preventing, detecting, and treating oral and breast issues.⁴ HIV-positive women are advised to

practice Exclusive replacement feeding (ERF) and Exclusive breast feeding (EBF) for the first six months to increase the likelihood that their children will be HIV-free.⁴

The World Health Organization's (WHO) 2010 recommendations represent a turning point in terms of policy advances and clarity, and should lead to far fewer HIV infections and deaths in infants and young children. Infant feeding practices recommended to mothers known to be HIV-positive should support the greatest likelihood of HIV-free survival of their children and not harm the health of mothers. Recommendations on infant feeding and HIV and mortality, and at the same time ensuring that the mothers receive appropriate HIV care and support including ARVs. The revisions capitalize on the maximum benefit of breastfeeding to improve the infant's chances of survival while reducing the risk of HIV transmission, and are based on the assumption that HIV-positive mothers will either receive lifelong ARV treatment to improve their own health, or if not eligible for treatment, the mother or infant will take ARVs as prophylaxis while breastfeeding.⁵ According to WHO (2016) recommendations, mothers living with HIV should breastfeed for at least 12 months and may continue breastfeeding for up to 24 months or longer (similar to the general population) while being fully supported for ART adherence if she is receiving ART and there is no evidence of clinical, immune or viral failure.⁶

The mother's knowledge of newborn feeding procedures may have an impact on the transmission of HIV from mother to child.¹ Studies show that HIV is widespread in various parts of Ethiopia. An Ethiopian demographic health survey done in 2016 revealed that Addis Ababa, South Eastern Tigray, the towns of Oromia, regional state around Addis Ababa, and the majority of towns in Afar and Amhara regional states were epidemic areas.² But there is little proof that the practice of newborn feeding contributes to this issue.³

About 18.2 million people have access to ART services, according to the 2021 report on worldwide HIV statistics. In 2020, there were about 37.7 HIV-positive individuals. About 1.5 million people contracted the virus for the first time this year. Between 1.2 million and 2.2 million of those with HIV were children (0–14 years age). By 2020, AIDS had caused approximately 680,000 deaths.⁷ At least two-thirds of all HIV diagnoses and fatalities occur in sub-Saharan Africa, where the pandemic is the most prevalent. Breastfeeding is the main factor in the region for >95% of pediatric HIV infections, which are caused by mother to child transmission (MTCT). The wellbeing of children is often strongly correlated with nursing, according to economic and social circumstances.⁸

Super Fast-Track Framework, a worldwide action plan that was introduced in 2017, proved successful in preventing new pediatric HIV infections. The needs of children and adolescents influenced HIV prevention and therapy.⁹ Breastfeeding offers both potential life-saving benefits and an HIV transmission risk in mothers who are HIV positive. The primary issues that need to be addressed are how to enhance healthy dietary requirements and how to improve baby life.¹⁰

By 2020, roughly 75,000 youngsters in eastern and southern Africa would have been newly infected with HIV.⁷ Without ART, there is a 15% to 45% possibility of transfer from mother to child during pregnancy, delivery, and breastfeeding. ART can reduce the chance of transmission to less than 5%.¹¹ By 2020, about 57% of HIV-infected children in eastern and southern Africa have access to antiretroviral therapy (ART).⁷ It is estimated that 1000 children each day are affected by mother-to-child transmission. According to the United Nations program on HIV/AIDS (UNAIDS), breast milk contributes 15% of HIV transmission, and there are other factors that enhance the risk from 25% to 45%. Age of the infant and mixed feeding before 6 months of age are examples of such influences.¹² The majority of African studies found that breast feeding for lengthy periods of time increased the risk of HIV infection by 4–20.¹³

HIV/AIDS is a major health-care priority in Ethiopia. Despite the fact that the country achieves 97% national PMTCT implementation and gains basic changes at the start of the program, it remains one of the top ten countries in the world with the highest burden of childhood HIV infection due to MTCT, and it remains a major challenge for the country.¹⁴ In Ethiopia, 74% of women are aware that HIV can be transferred through breast milk. Approximately, 58% of infants under the age of six months are exclusively breastfed. Around 17% of infants were breastfed with plain water and there were about 5% infants who never fed breast milk.⁴

Even while PMTCT lessens the risk of transmission, HIV infection can still occur through baby feeding habits, especially mixed breast feeding. All newborn feeding methods were frequently utilized in Ethiopia, including ERF, EBF, and mixed feeding (MF), but there was a gap in safe infant feeding practice. This disparity is primarily attributable to the country's economic situation. The majority of individuals have a low socioeconomic status, making it difficult to obtain

all necessary foods that can be used as a substitute for breast milk. There has been no study done on unsafe infant feeding practice and associated factors among HIV positive mothers attending PMTCT at selected governmental hospitals in the study setting, even worldwide, there is a limitation of the study on this critical problem. This would make information scarcity for the concerned bodies to react up on it and solve it timely as much as possible. Therefore, the findings of this study would fill this gap, providing the insight to all concerned bodies.

Methods

Study Area and Period

From February 15 to March 15, 2022, a study was undertaken in Afar Regional State at selected PMTCT-providing governmental hospitals. The Afar Region, which covers an area of around 94,760 square kilometers, is located in north-eastern Ethiopia. It borders Eritrea in the north, Tigray in the north-west, Oromia in the south, Somalia in the south-east, Amhara in the west, and the Republic of Djibouti in the east. Five zones and thirty-two districts make up the region, which has seven hospitals and 105 health centers.¹⁵ Hotel and home-based female sex workers (FSW) in the Afar Region conduct transactional sex. The majority of adolescent girls engage in sexual encounters with older men, such as migrant laborers and truck drivers. These teenagers have minimum knowledge of HIV/AIDS. Substance usage (khat and shisha) as well as a reduction in the use of preventive measures such as condoms contribute to the spread of HIV/AIDS in the country.¹⁶

Study Design

Institution-based cross-sectional study was conducted.

Source Population

All HIV-positive mothers in Afar Regional State, who have a child under the age of one year and are undergoing PMTCT at governmental hospitals.

Study Population

HIV-positive mothers with children under the age of one year who were followed up on at Afar regional states randomly selected PMTCT service providing governmental hospitals.

Inclusion Criteria and Exclusion Criteria

HIV positive mothers having less than one-year-old child who were attending PMTCT in selected governmental hospitals in Afar regional state, from February 15 to March 15, 2022 were included in this study. Whereas, HIV positive mothers having greater than one-year-old children who were attending PMTCT in the selected governmental hospitals were excluded.

Sample Size Determination

Using a single population proportion formula with a 95% confidence interval, a 5% margin of error, and a 50% proportion of infant feeding practice, the sample size was calculated.

Hence,

$$n = \frac{(Z_{\alpha/2})^2}{d^2} p * (1 - p)$$

$$n = \frac{(1.96)^2}{(0.05)^2} (0.5)(0.5)$$

$$n = 384$$

Where: n = required sample size

$Z_{\alpha/2}$ = critical value for normal distribution at 95% confidence interval which equals to 1.96

P = proportion to be estimated (50%)

d = absolute precision (margin of error 5%)
 n = 384-by adding 10% non-response rate, the sample size was
 n=423

Sampling Technique and Procedure

Three PMTCT-providing hospitals were chosen at random from all governmental hospitals in the Afar Regional state by using simple random sampling (lottery method). The hospitals chosen are Asayta, Dupiti and Mohammed Akle. The Sample frame was a card number from an appointment book belonging to HIV positive mothers. The mothers for the interview were chosen through a systematic sampling process. The sample size was computed using PMTCT providing hospitals that was chosen at random. A proportional allocation of the number of cases from each hospital to participate in the study was evaluated. Proportional sample size allocation = $\frac{nf * nj}{N}$ was used. The proportional allocated samples for Asayta, Dupiti and Mohammed Akle are displayed in figure below (Figure 1).

where N = total number of HIV positive mothers
 nf = final sample size of the study, which is 423
 nj = number of HIV positive mothers in each hospital

Study Variables

Dependent Variables

- Infant feeding practices

Independent Variables

- Socio demographic variables: Maternal age, marital status, occupation, religion, ethnicity, educational status, monthly income, age of child.
- Maternal related factors: Disclosure status of HIV, antenatal care (ANC) follow up, postnatal care (PNC) follow up, ART follow up, place of birth, type of delivery.
- Maternal and infant health condition: Infant mouth ulcer, mother's breast problem.
- Health workers related factors: Counseling by health worker.

Operational Definition

Infant feeding practices: a collection of guidelines for the proper feeding of newborns and infants in order to avoid HIV transmission from mother to child. It could be safe or unsafe.

Safe infant feeding practice: Up to six months, the percentage of mothers who exclusively breastfed their infants.

Unsafe infant feeding practice: Proportion of mothers who practiced mixed feeding up to six months. Unsafe infant feeding practice can be associated with infant health issues like diarrhea and malnutrition.¹⁷

Exclusive breast feeding: Giving the infant no other food or drink, including water, other than breast milk (including expressed breast milk), with the exception of drops or syrups containing vitamins, mineral supplements or prescribed medicines.

Exclusive replacement feeding: feeding a kid who is not receiving breast milk with infant commercial or home produced milk for the first six months, or until the child is fully nourished on family foods, whichever comes first, or the infant if younger than six months. This should be done with an acceptable breast-milk substitute, such as a commercial formula or a home-made formula supplemented with micronutrients.

Mixed breast feeding: Breastfeeding with non-human milk, fluids, water, solid feeds for the first 6 months of life or until the day of the interview if the infant is less than six months. They began supplementing the infant's diet when he or she was less than six months old.

Tools for Data Collection

Data were collected using a pretested structured questionnaire adapted from a review of relevant literatures.¹⁷ The questions and statements were sorted and ordered based on the goals that could be addressed. The questionnaire was

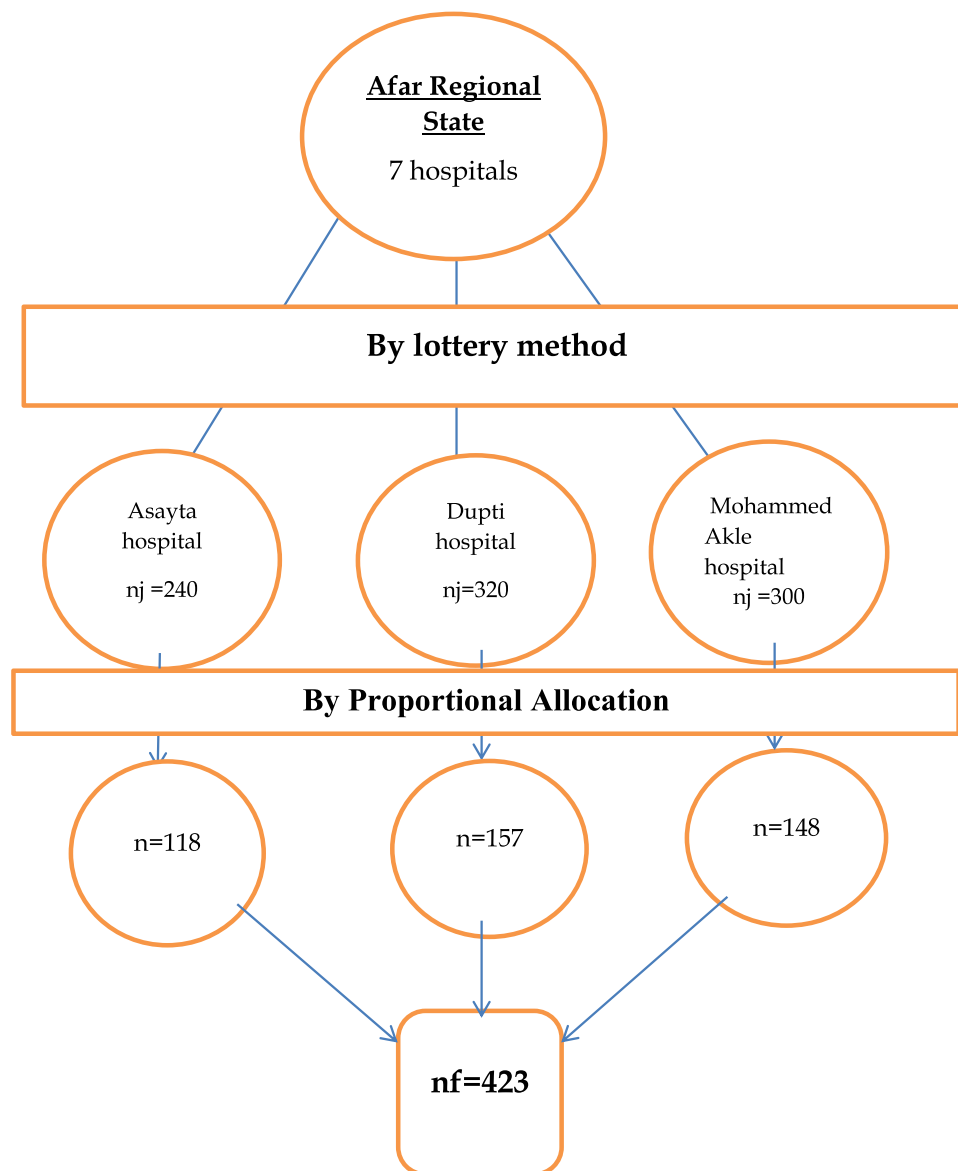


Figure 1 Sampling Procedure of a study on infant feeding practices of HIV positive mothers attending PMTCT services in selected governmental hospitals in Afar regional state, Ethiopia, 2022.

content validated by experts after being modified to the local context and the research objective by the investigator and translated into Amharic language and Amharic version was back translated into English. The investigator verified for consistency between the original and back translated versions to ensure dependability and validity.

Data Quality Control and Collection Process

Before the real survey, a pretest was performed on 5% of the samples at Logya hospital and Samara health center, and significant changes were made based on the results. Many redundant and undesirable variables were eliminated. Cronbach's alpha was used to verify the tool's reliability after it had been validated and pretested (0.76).

Three BSc Nurses conducted face-to-face interviews and observations at PMTCT providing units to collect data. The principal investigator gave data collectors a one-day training and orientation on the study's purpose and relevance, how to gather and record the relevant information, data collection methodologies, the entire content of the questionnaire, and maintaining confidentiality. One supervisor (MSc Nurse) and the primary investigator were in charge of the data

collectors at all times. The collected data was reviewed for completeness at the end of each day, and a corrective discussion was held with all data collectors for the next day's data collection.

Statistical Analysis

Epidata version 3.1 was used for coding and data entry. SPSS software version 23 was used to clean and analyze the data. Descriptive statistics was performed. Bivariable and multivariable logistic analyses were utilized to evaluate the relationship between independent variable and infant feeding practice. To control for potential confounders, the variables that indicated a connection with the outcome variable in the Bivariable logistic analysis with a p value <0.25 were moved into the final multivariable logistic regression model. The Hosmer and Lemeshow test was used to determine model fitness, not significant (p value = 0.17). To examine the strength of the link, an adjusted odds ratio (AOR) was calculated with a 95% CI, and a p value <0.05 was considered significant. Tables and figures were used to display the result.

Result

Sociodemographic Characteristics

The study included a total of 423 mothers who were HIV positive and had children under the age of one year. There was a 100% response rate. Three hundred twenty-four mothers (76.6%) who reported their marital status were married. About 35.5% of mothers were grade 1–8 educated in terms of maternal education (Table 1).

Table 1 Sociodemographic Characteristics of HIV Positive Mothers Attending PMTCT at Selected Governmental Hospitals in Afar Regional State, Ethiopia, 2022 [N = 423]

Variables	Category	Frequency	Percent
Age of mother in years	15–24	114	27.0
	25–34	296	70.0
	35–44	13	3.0
Age of child in months	0–6	134	31.7
	7–12	289	68.3
Marital status	Single	87	20.6
	Married	324	76.6
	Divorced	12	2.8
Educational status	Illiterate	130	30.7
	Grade 1–8	150	35.5
	Grade 9–10	101	23.9
	Grade 10+	42	9.9
Husband educational status (n=324)	Illiterate	12	3.7
	Grade 1–8	94	29
	Grade 9–10	62	19.2
	Above grade 10	156	48.1

(Continued)

Table 1 (Continued).

Variables	Category	Frequency	Percent
Religion	Muslim	237	56.0
	Orthodox	131	31.0
	Protestant	54	12.8
	Catholic	1	0.2
Ethnicity	Afar	238	56.3
	Amhara	95	22.4
	Tigre	80	18.9
	Oromo	10	2.4
Occupation	Government employee	60	14.2
	Private employee	206	48.7
	House wife	141	33.3
	Student	16	3.8
Husband's occupation (n=324)	Government employee	163	50.3
	Private employee	87	26.9
	Daily laborer	4	1.2
	Merchant	70	21.6
Family monthly income in Ethiopian birr	<1500	75	17.7
	1501–3000	141	33.3
	3001–4500	126	29.8
	4501–6000	62	14.7
	>6000	19	4.5

Maternal Related Factors

More than half (60%) of the 423 respondents, or 254, attended ANC follow-up during their recent pregnancy. Of the mothers, 272 (64.3%) made their HIV status known. Only 7.5% of mothers went for a fourth ANC visit (Table 2).

Mother and Infant Health Conditions

Less than half (173, 40.9%) of the mothers had encountered breast problems. Majority 352 (83.2%) of the infants had not encountered an oral ulcer (Table 3).

Counseling Practice of Health Workers

Most (318, 75.2%) of the mothers answered that the health worker explained to them about different feeding options (Figure 2).

Table 2 Maternal-Related Factors of HIV Positive Mothers Attending PMTCT at Selected Governmental Hospitals in Afar Regional State, Ethiopia, 2022 [N = 423]

Variable	Category	Frequency	Percent
ANC follow up	Yes	254	60
	No	169	40
Number of visit (n=254)	One	146	57.5
	Two	45	17.7
	Three	44	17.3
	Four	19	7.5
Place of birth	Health institution	420	99.3
	Home	3	0.7
Type of delivery	Spontaneous vaginal delivery	335	79.2
	Cesarean section	72	17.0
	Instrumental	16	3.8
PNC follow up	Yes	307	72.6
	No	116	27.4
ART follow up	Yes	240	56.7
	No	183	43.3
Disclosure of HIV status	Yes	272	64.3
	No	151	35.7

Table 3 Health Condition of Mother and Infant Among HIV Positive Mothers Attending PMTCT at Selected Governmental Hospitals in Afar Regional State, Ethiopia, 2022 [N = 423]

Variable	Category	Frequency	Percent
Breast problem	Yes	173	40.9
	No	250	59.1
Type of problems ever encountered (n=173)	Engorgement	94	54.3
	Sore nipples	55	31.8
	Cracked nipples	24	13.9
Infant's mouth ulcer	Yes	71	16.8
	No	352	83.2

Level of Infant Feeding Practice

The majority of respondents, 270 (63.8%), exclusively breastfed their infants for the first six months, which is a safe feeding technique, whereas just 153 (36.2%) mothers mix breast milk with other foods (Figure 3). A total of 423 women (100%) had ever breastfed their child. None of the mothers who responded used replacement feeding exclusively.

Counseling by health workers

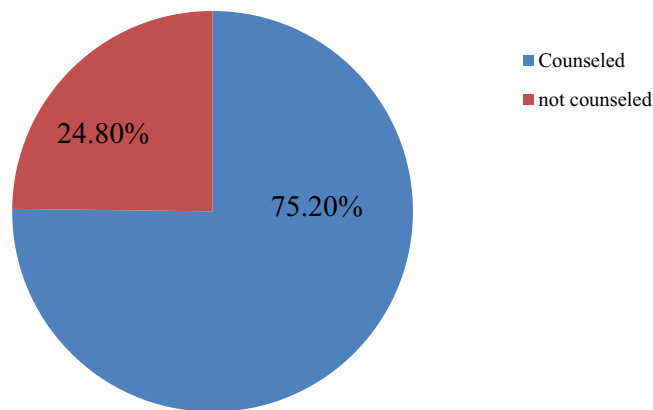


Figure 2 Counseling practice of health workers on infant feeding options among HIV positive mothers attending PMTCT at selected governmental hospitals in Afar regional state, Ethiopia, 2022 [n= 423].

Level of Infant Feeding practice

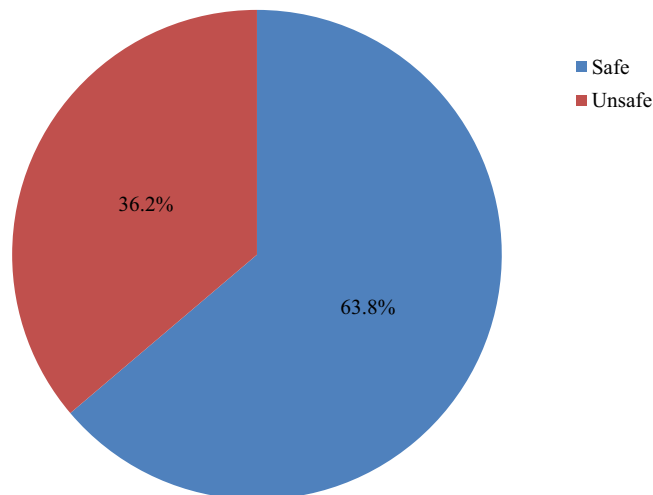


Figure 3 Level of infant feeding practices among HIV positive mothers attending PMTCT at selected governmental hospitals in Afar regional state, Ethiopia, 2022 [n= 423].

Factors Affecting Infant Feeding Practice

Bivariable logistic analysis revealed significant relationship between infant feeding practice and maternal education, ANC follow-up, ART follow-up, revelation of HIV status and health-care provider advice on various feeding alternatives. However, PNC follow-up, ART follow-up and disclosure status of HIV were found to be substantially linked with unsafe infant feeding practice in the multivariable logistic regression.

When compared to their counterparts, HIV-positive women who did not receive PNC follow-up were two times more likely to practice unsafe feeding practices (AOR = 1.814, 95% CI: 1.127–2.919). When compared to other HIV-positive women, those who did not receive ART follow-up were two times more likely to practice unsafe feeding practice (AOR = 1.987, 95% CI: 1.128–3.501). HIV positive mothers who did not disclose their HIV status to others were 3 times more likely to practice unsafe infant feeding (AOR = 2.324, 95% CI: 1.470–3.673) as compared to mothers who did disclose their HIV status (Table 4).

Table 4 Bivariable and Multivariable Logistic Regression of Factors Associated with Unsafe Infant Feeding Practice Among HIV Positive Mothers Attending PMTCT at Selected Governmental Hospitals in Afar Regional State, Ethiopia, 2022 [N = 423]

Variables	Category	Infant Feeding Practice		COR (95% CI)	AOR (95% CI)	p-value
		Unsafe	Safe			
Maternal educational level	Illiterate	50 (38.5%)	80 (61.5%)	1.00		
	Grade 1–8	55 (36%)	95 (64%)	0.930 (0.571–1.513)	1.059 (0.628–1.786)	0.830
	Grade 9–10	46 (44.6%)	55 (55.4%)	1.328 (0.783–2.254)	1.385 (0.779–2.462)	0.268
	Grade 10+	5 (11.9%)	37 (88.1%)	0.223 (0.082–0.607)*	0.487 (0.170–1.395)	0.180
ANC follow up	Yes	69 (27.2%)	185 (72.8%)	1.00		
	No	84 (49.7%)	85 (50.3%)	2.650 (0.1.760–3.989)*	1.126 (0.640–1.981)	0.682
PNC follow up	Yes	93 (30.3%)	214 (69.7%)	1.00		
	No	60 (51.7%)	56 (48.3%)	2.465 (1.591–3.821)*	1.814 (1.127–2.919)**	0.014
ART follow up	Yes	60 (25%)	180 (75%)	1.00		
	No	93(50.8%)	90 (49.2%)	3.100(2.054–4.678)*	1.987 (1.128–3.501)**	0.017
Disclosure of HIV status	Yes	70 (25.7%)	202 (74.3%)	1.00		
	No	81 (53.6%)	70 (46.4%)	3.364(2.212–5.116)*	2.324 (1.470–3.673)**	0.001
Counseling about different feeding options	Yes	103 (32.4%)	215(67.6%)	1.00		
	No	50 (47.6%)	55(52.4%)	1.800(1.149–2.822)*	1.554 (0.944–2.560)	0.083

Notes: Significant at *p < 0.25 and **p < 0.05, Bold value refers to statistically significant level.

Discussion

In 2021, the estimated figure of children aged 0–19 who were living with HIV were 2.73 million worldwide. Daily, around 850 children became infected with HIV and about 301 children died from AIDS-related causes, such as insufficient access to HIV prevention, care and treatment services.¹⁸ The objective of this study was to investigate unsafe infant feeding practices and associated factors among HIV positive mothers undergoing PMTCT in selected governmental hospitals in Afar Regional state, Ethiopia.

The finding of this study showed that 63.8% of HIV-positive mothers exclusively breastfed their infants for the first six months. This study finding is greater than the study report of SNNPR regional state, Ethiopia 56.3%.¹ This might be because the majority of the respondents received advice regarding the benefits and drawbacks of EBF as a safe feeding technique from health-care professionals. But practicing EBF is not that much excellent. This might be related to that all mothers who were counseled about different feeding options did not feed their child as they had counseled.

This study finding is consistent with the study conducted in southern Ghana (62%).¹⁹ However, the finding of this study is lower than the that study conducted in Nigeria (91.4%), Mekele (90%), Jigjiga (93.6%), and Shashemene (96.6%).^{8,20–22} These major differences might be the result of cultural differences in feeding practice and economic potential; most of mothers have poor economic status and for life they had gone out of home immediately after giving birth to work any job and separated from their infant for several hours. By this reason, an infant is obligated to feed any food/cereals which are found in the house. For the first six months, none of HIV-positive mothers had engaged in exclusive replacement feeding. This might be due to current cost inflation and almost all mothers cannot afford to buy the formula food.

About 36.2% of respondents in the study had experienced mixed feeding. The result was consistent with research done in SNNPR (35.6%),¹ and southern Ghana (40%).¹⁹ However, it was greater than studies conducted in Kenya, Addis Ababa, Bahir Dar, and Debre Markos, 18.2%, 23%, 10.9%, and 14.2%, respectively.^{4,10,11,17} The majority of mothers'

expectations that breast milk alone is not sufficient for the infant might be the main causes of this disparity. In this study, 72.6% of mothers had PNC follow-up, which is less than the studies done in Shashemene (100%), Bahir Dar (94.3%) and Mekele (96.1%).^{17,21,22} This might be due to health extension workers and other health professionals might not have enough house-to-house visits after the mother returned to her home as a result of the challenging weather condition.

In this study, 56.7% mothers of them had ART follow-up, which is less than the studies conducted in Debre Markos (70.8%), Shashemene (97.9%) and Mekele (76.3%).^{10,21,22} Besides, it was lower than the study done in SNNPR, which reported ART follow-up (60.7%).¹ This might be because mothers are more aware of the value of ART in preventing HIV transmission from mother to child. This might also be connected to various pharmacological adverse effects and insufficient rehabilitative health worker education. In this study, 64.3% of mothers had disclosed they were HIV positive. This finding was lower than the studies done in Bahir Dar (79.6%), Debre Markos (88.8%), Mekelle (90.3%) and SNNPR (95.6%).^{1,10,17,21} This might relate to fear of stigma and discrimination.

When compared to their counterparts, HIV-positive women who did not receive PNC follow-up were two times more likely to practice unsafe feeding practices (AOR = 1.814, 95% CI: 1.127–2.919). This might be due to that HIV-positive woman who did not receive ART follow-up missed the information about infant feeding, which would be provided at the PNC follow-up.

When compared to other HIV-positive women, those who did not receive ART follow-up were two times more likely to practice unsafe feeding practice (AOR = 1.987, 95% CI: 1.128–3.501). According to the WHO suggestion, all HIV-positive mothers should receive life-long ART to encourage health and infants.²³ The possible justification could be that HIV-positive women who did not receive ART follow-up have no insight about the disease since they did not attend the ART follow-up. In fact, this would lead to unsafe infant feeding practice.

HIV positive mothers who did not disclose their HIV status to others were 3 times more likely to practice unsafe infant feeding (AOR = 2.324, 95% CI: 1.470–3.673) as compared to mothers who did disclose their HIV status. This might be due to that HIV-positive woman who did not disclose their HIV status did not get essential support from the health-care professional. Thus, this would lead to unsafe infant feeding practice.

Limitations of the Study

Cause and effect relation was not assured, because the study design is cross-sectional. The other limitation was that there is a scarcity of the study that has addressed this critical topic. This made the comparison of associated factors very challenging. Therefore, hopefully, this study will be the baseline for the future researchers who need to conduct their study on this serious topic.

Conclusion

The level of unsafe infant feeding practice among HIV-positive mothers was high. Prevalence of mixed feeding is also high in the area. This showed that there is a greater chance of HIV infection, particularly in all exposed infants. Multivariable logistic regression showed that PNC follow-up, ART follow-up, and HIV disclosure statuses were significantly associated with unsafe infant feeding practice among HIV-positive mothers.

We suggest that all the concerned bodies should develop effective programs and plans to enhance safe feeding practice among mothers who were HIV positive. Comprehensive health educations need occur among HIV-positive mothers to reduce this problem. To enhance and sustain the recommended infant feeding practice among HIV-positive women, health professionals working at PMTCT are advised to provide health education and counseling in a more thorough manner. Health extension workers should persuade HIV-positive women to give birth in medical facilities so that their child can receive crucial new-born care. It is advised that all HIV-positive mothers carefully attend their ANC, ART follow-up appointments and implement any potentially safe feeding recommendations made at these appointments. Finally, we recommend the researchers to conduct the study on this topic including different predictors of unsafe infant feeding.

Data Sharing Statement

The data used to support the findings of this study are included within the article.

Ethics Approval and Consent to Participate

Ethical clearance was gained from institutional review board (IRB) of Addis Ababa University, College of Health Sciences, and School of Nursing and Midwifery. Then, the official letter of permission was sent to selected governmental hospitals that provide PMTCT in Afar Regional State. Permission was obtained from those concerned bodies. Participated mothers were informed about the objectives and significance of the study and about the confidentiality issues prior to data collection. To secure the privacy and confidentiality of the participants, personal identifiers were not used. The mothers were also informed that they have full right to withdraw from this study at any phase. There were no any samples taken from the participants which could harm them. Thus, since there were no potential risks that may cause any harm to the study participants, a verbal informed consent was obtained from all mothers prior to the commencement of this study and their parents were contacted for the participants under the age of 18 years. This was approved by IRB of Addis Ababa University, College of Health Sciences, and School of Nursing and Midwifery. During this study, all human procedures were performed as per the Declaration of Helsinki. However, no animals were considered for this study.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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