

Infant feeding practice of HIV positive mothers and its determinants in public health institutions in central zone, Tigray Region, Northern Ethiopia.

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Abstract

Background: Vertical transmission is the major route of HIV transmission in infants. Thus, Infant feeding practice of HIV positive mothers needs to balance the risk of mother to child transmission through breast feeding with meeting the nutritional requirements and protection of infants against non-HIV morbidity and mortality.

Objective: To assess infant feeding practice and its determinants among HIV positive mothers having infants enrolled in ART clinics of public institutions.

Methods: Institution based cross sectional study was conducted in selected health facilities. Multi stage sampling technique was used to select the study population considering a design effect of 1.5. Data was analyzed using SPSS version 16.0. Multivariate logistic regression at 95% CI was used to indentify determinant variables. A p value < 0.05 was considered as statistically significant.

Result: 209 HIV positive mothers were included in the study. Majority of the HIV positive mothers, 198 (90.40%) practiced Exclusive Breast Feeding. The rest, 13(5.9 %) and 8(3.7%) of mothers were practicing Mixed Feeding and Exclusive Replacement Feeding, respectively. In multivariate analysis residence, occupational status, Antenatal care and counseling were found to be independently associated (p-value < 0.05) with the recommended way of infant feeding practice (EBF and ERF) AOR = 11.06 (95% CI = 1.45-104.4), AOR = 0.07 (95%CI = 0.006-0.954), AOR = 17.12 (95%CI = 1.28-228.42) and AOR= 43.02(3.51-526.38) respectively.

Conclusion: Majority of mothers followed the recommended way of infant feeding practice. Residence, ANC visits, counseling and occupational status of mothers were found to be major determinants.

Key words: HIV, EBF, ERF and MF

Introduction

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 [1]. To achieve this, prioritization of prevention of HIV transmission needs to be balanced with meeting the nutritional requirements and protection of infants against non-HIV morbidity and mortality [1].

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 [2].

In light of previous findings, WHO recommends that HIV-infected mothers should breastfeed exclusively for 6 months unless replacement feeding is Acceptable, Feasible, Affordable, Sustainable, and Safe (AFASS), in which case avoidance of all breastfeeding is recommended. At six months, if replacement feeding is still not AFASS, 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 [3, 4]. The Ministry of Health (MOH) of Ethiopia has been adopting these recommendations and promoting their implementation in the health institutions throughout the country [5]. Strengthening this concept, exclusive Breast Feeding (EBF) by HIV-infected mother, when compared to partial breastfeeding or mixed breast feeding (MBF), has been shown to be associated with a reduced risk of transmission in the early months of postpartum [3,6]. Similarly, 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 [5].

Despite few local studies conducted in different parts of the country, there is no sufficient study that has tried to identify the infant feeding practice and its determinants among HIV positive mothers in the study area. Thus, the purpose of this study was to assess the existing infant feeding practices and its determinants among HIV positive mothers in ART services sites.

Objectives

General objective

- To assess infant feeding practice and its determinants among HIV positive mothers attending public antiretroviral therapy clinics in Central Zone, Tigray region, Northern, Ethiopia.

Specific objectives

- To assess infant feeding practices of HIV positive mothers.
- To identify factors affecting infant feeding practice of HIV positive mothers.

Methods and Materials

Study design

Institutional based cross sectional study.

Population

Source population

All HIV positive mothers having infants in the sampled health institutions

Study population

All HIV positive mothers having infants in the randomly selected health institutions.

Inclusion

Inclusion criteria

All HIV positive mothers who gave birth in the past 12 months prior to the study period, as reported by the respondents, were included in the study.

Sample size determination

The sample size for this particular study was calculated using the formula for a single population proportion by considering the following assumptions:-

Assumptions: A 95% confidence level, margin of error (5 %), prevalence of exclusive breastfeeding under six months of age among HIV positive mothers ($p = 0.84$) is substituted in the following single population proportion formula.

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

$$= \frac{(1.96)^2 (0.84) (0.16)}{(0.05)^2} = 207$$

Where n = required sample size

Z = critical value for normal distribution at 95% confidence level which is equal to

1.96 (z value at $\alpha = 0.05$)

P = (Proportion of exclusive breast feeding among HIV positive mothers (84%))

d = 5% margin of error;

Using the correction formula to estimate final sample size (n_f) from total of (N) = 366 HIV positive mothers with infants = 132

Design effect (D): 1.5 (because of two stage sampling) = 199

Adding 10% non-response rate give the required minimum sample size of 219.

Sampling technique

Multi stage sampling technique was used to select the study population by considering a design effect of 1.5. 5 Health facilities were selected from the available 14 health facilities in the zone by simple random sampling. An initial survey on case load of ART patients at the selected health facilities was done and sampling frame obtained from each. Number of study units to be sampled from each ART clinic was obtained using proportional

allocation to their case load and systematic random sampling was employed to select each study subjects. The sampling fraction (K^{th}) was determined separately for the selected health facilities.

Data collection procedure

Exit face to face interview was conducted on the selected study units using the structured questionnaire by five nurses with diploma qualification in the selected health facilities. The questionnaire comprises of four parts; socio demographic and economic characteristics of mothers and children, maternal health related factors, knowledge, attitudes towards infant feeding practices and infant feeding practices.

Study variables

Dependent variable

- Infant feeding practice of HIV positive mothers.

Independent variables

- Knowledge
- Attitude
- **Socio-demographic variables**- Age, marital status, occupation, maternal educational status, religion, monthly income, information access, drinking water source, sex of the child and age of child
- **Health service related factors**- Attendance of antenatal care services, number of antenatal visits, being counseled on infant feeding during antenatal follow-ups and postnatal care service.
- **Obstetrics and Medical variables**- Place of delivery, birth attendance, mode of delivery, number of live births and number of children.

Quality assurance

To guarantee the quality of the study; questionnaire was properly designed by the principal investigator and pretested prior to the actual data collection. It was translated to Tigrigna (local language) and back translated to English by translators who were blind to the original questionnaire. Data collectors were trained for 2 days using the final version. The data was checked for its completeness daily. Finally it was coded, entered, cleaned and statistically treated with appropriate tools.

Data analysis

Data was analyzed using SPSS for windows version 16.0. Frequencies and proportions were calculated to all variables related to the objective. The association between variables (association between single explanatory variable and dependent variable) were examined through bivariate analysis, by computing odds ratio at 95% confidence level. To identify determinant or predictor variables for the outcome variables, multivariate logistic regression at 95% CI was used. A p value < 0.05 was considered as statistically significant.

Ethical consideration

The study was conducted after getting ethical clearance from Mekelle University, College of Health Sciences, ethical review board. Permission from Tigray Regional Health Bureau, the respective health facilities and written informed consent from the study participants were also secured. Moreover, confidentiality was maintained throughout the study.

Results

Socio-demographic characteristics of the study population

A total of 219 HIV positive mothers who had children less than two years of age with a response rate of 100 % participated in the study. The mean age (\pm SD) of mothers and their infants were 30.68(\pm 4.3) years and 9.68(\pm 4.70) months, respectively. 156(71.2%) were urban dwellers, 208(95%) were Orthodox and 140 (63.9%) were married. 118 (53.9%) of the infants were male and 101 (46.1%) were females. 118 (53.9 %) of the mothers were literate and 101 (46.1%) were illiterate. With respect to their occupation, out of the total study participants about 130 (59.4%) of them were housewives, 20 (9.1%) were governmental employee and 17(7.8%) were daily laborer. Regarding drinking water source, large majority, 212 (88.4%) of the study participants got drinking water from pipe/tap.

Obstetric history of HIV positive mothers

From the total of 219 mothers, 209(95.4%) of them had antenatal follow up, of whom 166 (75.8%) attended ANC more than 4 times in their full pregnancy. 202(92.20%) of the mothers gave birth at governmental hospitals and health centers. (Table 1)

Table 1: Health related factors among infant feeding HIV positive mothers enrolled in ART clinics of public health institutions.

Variables	Frequency	Percentage (%)
Number of live births		
• ≤ 4 children	195	89
• ≥ 5 children	24	11
• Mean	2.66 (±1.373)	
Number of children		
• ≤4 children	204	93.2
• ≥5 children	15	6.8
• Mean	2.42 (± 1.262)	
ANC follow in their last pregnancy		
• Yes	209	95.4
• No	10	4.6
Number of ANC visits		
• No visit	10	4.6
• One visit	33	15.1
• Two visit	4	1.8
• Three visit	6	2.7
• Four visit	166	75.8
Place of delivery		
• Home	17	7.8
• Governmental Hospital	174	79.4
• Governmental Health center	28	12.8
Birth attendant of the last child		
• TBA	7	3.2
• Health extension worker	3	1.4
• Health professional	202	92.2
• Relatives	7	3.2
Mode of delivery		
Vaginal delivery	197	92.6
Caesarean section	15	7.4
ARV prophylaxis for mothers		
• Yes	198	90.4
• No	21	9.6
Attended PNC		
• Yes	214	97.7
• No	5	2.3

Knowledge on infant feeding options among HIV positive mothers

HIV positive mother's knowledge on infant feeding options was measured based on their correct response to 7 items on knowledge with a minimum score of 0 and maximum of 7. Total score was calculated and those mothers whose scores were above the mean were considered as having sufficient knowledge on infant feeding options and below the mean were considered as having insufficient knowledge. Accordingly, 193(88.1%) had sufficient knowledge and 26 (11.9%) had insufficient knowledge on infant feeding options for HIV positive mothers.

Attitude of HIV positive mothers on infant feeding options for HIV positive mothers

Regarding the attitude of the HIV positive mothers on infant feeding options, five closed ended questions were prepared and the total score was calculated and those whose scores above the mean was considered to have favorable attitude and those scores below the mean was consider as having un favorable attitude toward infant feeding options. Accordingly, 181(82.6%) of the study subjects have favorable attitude and 38 (17.4%) have unfavorable attitude on infant feeding options for HIV positive mothers.

Infant feeding practices in the context of HIV/AIDS

Majority, 217 (99.1%) of the mothers received counseling on infant feeding options. Of these, 161(74.2%) received during pregnancy and the remaining after delivery. Accordingly, 198(90.40%) were practicing Exclusive Breast Feeding (EBF) where as 13(5.9 %) and 8(3.7%) were practicing Mixed Feeding (MF) and Exclusive Replacement Feeding (ERF), respectively. No one reported practicing expressed breast milk and others options. In those mothers practicing EBF, being advised by health workers, easily availability of breast milk and wide community acceptability breast feeding practice were among their main reasons (fig 1).

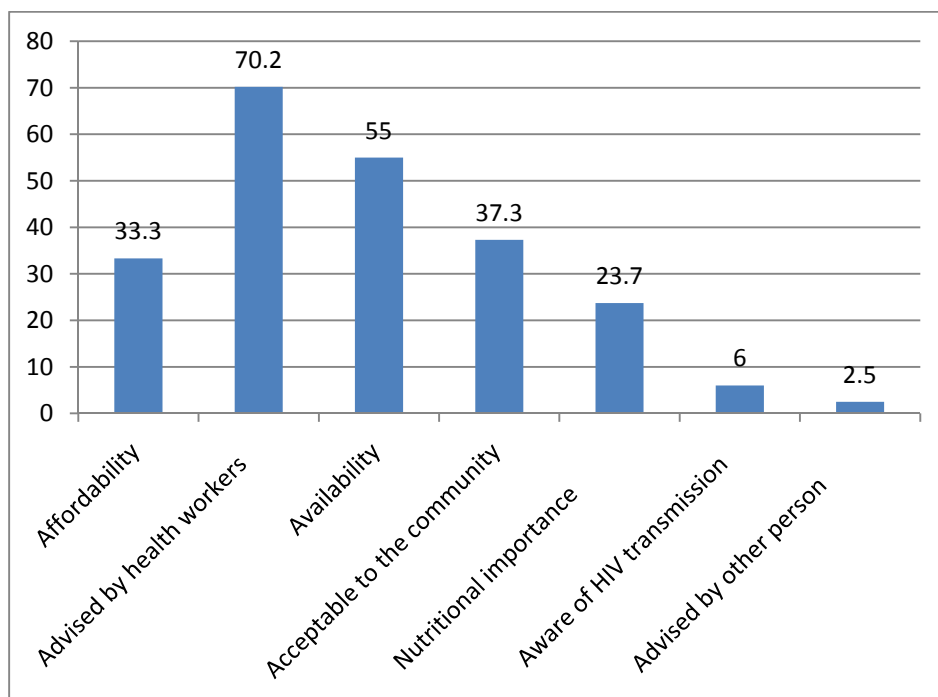


Figure 1: Reasons for practicing Exclusive Breast Feeding (EBF) by HIV positive mothers attending ART clinics in public institutions.

Among mothers practicing MF, the commonest reasons for practicing MF, 12(92.3%) were mother illness and insufficient breast milk, husbands imposition and infants illness, accounts 1(7.7%). Majority of the respondents, 92 (55.7%) use spoon for feeding mashed or fluid foods, while others 64 (38.7%), 6 (3.6%) and 3 (1.8%) use cup, bottle and by hand for feeding mashed or fluid foods for their child respectively.

Factors affecting infant feeding practice

In bivariate logistic regression; residence, educational status, maternal occupation, ANC visit, knowledge of mothers on infant feeding options, attitude of mothers on infant feeding options, counseling in infant feeding options were found to have association (p -value < 0.20) for those who practiced recommended way of infant feeding practice (EBF and ERF) with $COR = 2.17(95\% CI = .67-6.96)$, $COR = 2.87(95\% CI = .83-9.34)$, $COR = .3(95\% CI = .05-1.68)$, $COR = 8.52(95\% CI = 1.91-38)$, $COR = 2.38(95\% CI = .61-9.31)$, $COR = 2.24(95\% CI = .65-7.72)$ and $COR = 5.31(1.27-22.13)$ respectively.

Table 2: Factors associated with recommended infant feeding practice among HIV positive mothers attending ART clinics in public health institutions.

Variables	Infant feeding practice		OR (95%CI)	
	Recommended N (%)	Not recommended N (%)	Crude	Adjusted
Residence				
• Rural	46(90.2)	5(9.8)	1	1
• Urban	160(95.2)	8(4.8)	2.17(.67-6.96)	11.06(1.45-104.40)*
Educational status				
• Illiterate	92(91.1)	9(8.9)	1	1
• Literate	114(96.6)	4(3.4)	2.87(.83-9.34)	2.68(.42-16.75)
Occupation				
• Housewife	125(96.2)	5(3.8)	1	1
• Government employee	19(95.0)	1(5.0)	.76(.08-6.86)	.10(.006-1.74)
• Private Organization	14(82.4)	3(17.6)	.187(.04-.86)	.15(.015-1.476)
• Business women	14(93.3)	1(6.7)	.56(.06-5.14)	.51(.014-18.50)
• Daily laborer	15(88.2)	2(11.8)	.3(.05-1.68)	.07(.006-.954)*
ANC				
• Yes	199(95.2)	10(4.8)	8.52(.191-38.02)	17.12(1.28-228.42)*
• No	7(70.0)	3(30.0)	1	1
Knowledge on infant feeding options				
• Poor knowledge	23(88.5)	3(11.5)	1	1
• Good knowledge	183(94.8)	10(5.2)	2.38(.61-9.31)	3.38(.467-24.59)
Attitude on infant feeding options				
• Favorable	172(95)	9(5)	2.24(.65-7.72)	1.35(.159-11.642)
• Unfavorable	34(89.5)	4(10.5)	1	1
Counseled on infant feeding				
• Yes	195(95.1)	10(4.9)	5.31(1.27-22.13)	43.02(3.51-526.38)*
• No	11(78.6)	3(21.4)	1	1

*Significant association at p.value < 0.05

In multivariate analysis, residence, maternal occupational, ANC visit and counseling were found to be independently associated (p -value < 0.05) with the recommended way of infant feeding practice (EBF and ERF) AOR = 11.06 (95% CI = 1.45-104.4), AOR = 0.07 (95%CI = 0.006-0.954), AOR = 17.12 (95%CI = 1.28-228.42) and 43.02(3.51-526.38) respectively. ANC flow up and urban residence were 17.12 and 11.06 times more likely to have recommended way of infant feeding practice than the reference group respectively and counseling in infant feeding options were 43.02 times more likely to have recommended way of infant feeding practice than non counseled mothers. Daily laborers were 93% times less likely to have recommended way of infant feeding practice than housewife mothers.

Discussion

This study was designed to assess infant feeding practice of HIV positive mothers in governmental health institutions, Central Zone, Tigray Region. The proportion of mothers practicing recommended infant feeding options, 94% in this study is in line with findings in Gonder, Ethiopia, 89.5 % [7] but a bit higher than those from Addis Ababa, Ethiopia (77.4 %) [8].

In this study, the proportion of mothers practicing, EBF (90.4%) for the first 6 months of age was comparatively higher than the findings reported from Zambia (35%), India (44%), Ghana (62%), Lusaka (70.4%), and Eastern Uganda (24%) [9, 10, 11&12]. But it is almost similar with that revealed by study conducted in Gonder, 83.8 % [7]. This difference may be due the socio demographic and the emphasis given to counseling process among the different countries.

According to WHO guideline, feeding both breast milk and other foods or liquids (with the exclusion of medicine) constitutes mixed feeding [10]. The proportion of HIV positive mothers practicing mixed feeding in the present study (5.9%) is lower than that observed in studies done in India (29%), Lusaka(24.1%), Ghana (40%) as well as reports from Addis Ababa, Ethiopia (15.3%), Gondar, Ethiopia (10.5%) [8, 9, 7, 11 &112]. This might be due to the effectiveness of new PMTCT program and also cultural difference on infant feeding habit.

Our findings indicated that 3.7 % of the respondents practice ERF. The proportion of mothers practicing ERF in this study was in congruence with that reported from Gonder, (5.7%) [7]. But it is much lower than that obtained in Addis Ababa, Ethiopia (46.8%) [8]. The difference may be due to economic difference for affordability of ERF options among HIV positive mothers. This result is also in agreement with study findings from Eastern Uganda where 8.5% of HIV positive mothers practice exclusive replacement infant feeding [10]. However, it is again by far lower than study results from South Africa, in which 60% of the mothers practiced exclusive replacement feeding [13]. This may be due to differences in the national PMTCT guidelines.

Counseling on infant feeding practice is very important for all mothers regardless of their HIV status. Our findings show that 217 (99.1%) of the mothers were counseled on infant feeding options. Of these, 161(74.2%) respondents received counseling during pregnancy and the remaining after delivery. The proportion of mothers who received counseling on infant feeding options in this study was comparable with South African study, where 82% of the mothers counseled about the different feeding options [13]. This result is also in agreement with study reports from Gonder, Ethiopia, where they found that 98.1% of the respondents being counseled about [7].

Having favorable attitude toward infant feeding options makes HIV positive mother feel energetic to select and practice the safest infant feeding method for herself and her baby. The current study revealed that, 82.6 % of the HIV positive mothers had favorable attitude toward infant feeding options. A finding that is comparable with a study done in Addis Ababa, Ethiopia (87.2%) [8].

In multivariate analysis; residence, occupational status, ANC visit and counseling on infant feeding options were found to be independently associated (p -value < 0.05) with the recommended way of infant feeding practice (EBF and ERF) AOR = 11.06 (95% CI = 1.45-104.4), AOR = 0.07 (95%CI = 0.006-0.954), AOR = 17.12 (95%CI = 1.28-228.42) and AOR 43.02(3.51-526.38) respectively. Counseling on infant feeding options was 43.02 times more likely to have recommended way of infant feeding practice and ANC follow up and urban residence were 17.12 and 11.06 times more likely to have recommended way of infant feeding practice. This may be because of the fact that counseled mothers gained different information regarding the different infant feeding options in the context of HIV positive mothers and during ANC visit, they may get knowledge and information on infant feeding options in the context of HIV/AIDS positive mothers and urban residents have more information on infant feeding options from different sources of information than rural residents. Daily laborers were 93% times less likely to follow the recommended way of infant feeding practice, because mothers were engaged in their daily activities than being housewife.

Conclusion

Higher proportion, 94% of the respondents used the recommended way of infant feeding practice. Major determinants of infant feeding practice were found to be place of residence, ANC visit, counseling and occupational status of mothers.

Competing interest

The authors declare that they have no conflict of interest.

Author's contribution

AG, KH designed the study, AG, KH, GM engaged in the data collection, data entry and cleaning, AG, KH, GM, HA, AD performed the data analysis and interpretation, HA drafted the manuscript and all authors reviewed and approved the final manuscript.

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