

# Infant Feeding Practice and Associated Factors among HIV Positive Mothers Enrolled in Governmental Health Facilities in Mekelle Town, Tigray Region, North Ethiopia

Yonas Girma<sup>1\*</sup>, Alemseged Aregay<sup>2</sup>, Gebrezgabiher Biruh<sup>2</sup>

<sup>1</sup>Department of Nursing Avicenna Medical College

<sup>2</sup>Department of Nursing, Mekelle University

\*Corresponding author: Yonas Girma, Department of Nursing Avicenna Medical College; E-mail: yonastile@gmail.com

Received Date: September 01, 2014, Accepted Date: September 16, 2014, Published Date: September 19, 2014

Citation: Yonas Girma, et al. (2014) Infant Feeding Practice and Associated Factors among HIV Positive Mothers Enrolled in Governmental Health Facilities in Mekelle Town, Tigray Region, North Ethiopia. J HIV AIDS Infect Dis 2: 1-8.

## Abstract

**Background:** The transmission of HIV through breastfeeding has created a dilemma for public health programs and for mothers and families affected by the disease. The benefits of breastfeeding for mother and infant have been well documented. The increased risks of infant morbidity and mortality associated with artificial feeding in resource poor settings are also well known. Although World Health Organization global public health recommendation for Mothers known to be HIV-infected should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter, and continue breastfeeding for the first 12 months of life.

**Objective:** The objective of this study was to assess Infant feeding practice and associated factors on HIV positive mothers.

**Method:** Institutional based cross sectional study was conducted in governmental health facilities

**Result:** A total of 207 HIV positive mothers participated in the study making the response rate of 100%. Of all respondent, More than 90% of HEIs were exclusively breastfed; 6.3% were mixed fed' and 3.4% were exclusively replacement fed. In multivariate analysis, attitude of infant feeding option and those who receive education & counselling on infant feeding option during pregnancy in ANC were found to be independently associated (p-value of < 0.05) with Exclusive breast feeding ways of infant feeding practice.

**Conclusion and recommendation:** Exclusive breast feeding was the leading proportion of feeding practice and exclusive replacement feeding was small proportion. This could be an advised way of infant feeding practice by World Health Organization and Ethiopia Minister of Health. Finally it is recommended that all HIV positive mothers should be provided with adequate information to enable them to select the best feeding option for their babies and to successfully carry out their infant feeding decisions.

**Keywords:** HEIs; HIV; Exclusive breast feeding; Ethiopia

**Acronyms and abbreviations:** AIDS: Acquired Immune Deficiency Syndrome; ART: Anti-Retroviral Therapy; EDHS: Ethiopia Demographic Health Survey; ERF: Exclusive Replacement Feeding; EBF: Exclusive Breast Feeding; HANS: Highly Anti-retroviral Nurse Specialist; HEI: HIV-Exposed Infants; HIV: Human Immune-Deficiency Virus; IYCF: Infant and Young Child Feeding; IFO: Infant Feeding Options; MF: Mixed Feeding; MTCT: Mother-To-Child-Transmission; MUCHS: Mekelle University College of Health Science; MSG: Mother Support Group; OR: Odds Ratio; PEPI: Post-Exposure Prophylaxis of Infants; PMTCT: Prevention of Mother to Child Transmission; PNT: Postnatal HIV Transmission ;RF :Replacement Feeding ;TASO :The AIDS Support Organisation; UN:United Nation; UNAIDS: United Nation joint program on HIV/AIDS; UNICEF: United Nation Children's Fund; WHO: World Health Organization

©2014 The Authors. Published by the JScholar under the terms of the Creative Commons Attribution License <http://creativecommons.org/licenses/by/3.0/>, which permits unrestricted use, provided the original author and source are credited.

## Background

Globally HIV/AIDS is the extreme health crisis currently facing not only health but also it affected food security, nutrition and overall socioeconomic development in the countries that have been greatly affected by the disease [1]. However Food and nutritional intake can affect adherence and effectiveness of antiretroviral drugs (ARVs). Food insecurity and inadequate awareness of good nutrition can thus delay management of the disease, particularly in resource-constrained settings where HIV is prevalent and health care services remain insufficient [2,3].

Consequently, Mother-To-Child-Transmission (MTCT) of HIV, which can occur during pregnancy, labour, delivery and breastfeeding, accounts for more than 90% of pediatric HIV infections. Prolonged breastfeeding improves child survival, but accounts for 30–40% of postnatal HIV transmission (PNT) [4]. On the hand, replacement feeding (RF) prevents all PNT, but is associated with higher infant morbidity and mortality. National or sub-national decision making on how to counsel and support mother's feeding options must take into account the risk of PNT of HIV, child mortality and under-nutrition in the HIV-exposed infants (HEIs), among others[5].

WHO's global public health recommendation for all infants is to breastfeed exclusively for the first six months and then introduce nutritionally adequate and safe complementary foods while breastfeeding continues, for up to 2 years of age or beyond, except in extremely difficult circumstances, including HIV infection of the mother [6]. Mothers known to be HIV-infected (and whose infants are HIV uninfected or of unknown HIV status) should exclusively breastfeed their infants for the first 6 months of lifethereafter bring together proper complementary foods and continue breastfeeding 12 months of life. Breastfeeding should then only discontinue once a nutritionally sufficient and safe intake without breast milk can be delivered [5]. However, the WHO criteria are rarely met in developing countries and mixed feeding is common [7].

The estimated risk transmission during breast feeding, overall without breastfeeding, overall with breastfeeding to six months and overall with breastfeeding to 18-24 months ranges from 5-20%, 15-25%, 20-35% and 30-45% respectively. Several factors put a woman at a higher risk of transmitting HIV to her child. This includes maternal factors such as high viral load, low CD4 count, advanced maternal disease, placental infections (during pregnancy, labour and delivery), maternal malnutrition (including iron and folate, vitamin A and zinc deficiencies) and breast conditions (fissures, cracks, mastitis and breast abscess); infant factors include preterm low birth weight, oral diseases in child, mixed feeding, and duration of breastfeeding etc. [8,9].

Appropriate Infant and Young Child Feeding (IYCF) practices include timely initiation of feeding of solid and semi-solid foods from age 6 months and improving the quality of foods consumed as the child gets older, while maintaining breastfeeding [10].

## Methods

### Study design, area and period

Institutional based cross-sectional study was conducted in Mekelle Town Governmental health facility which provides ART and PMTCT service from June to Dec, 2013. Mekelle is found in Tigray region, the northern part of Ethiopia. The total population of the area is 233,000, with 112,250 males and 119,800 females and Health service coverage of Mekelle Town was 90% [11]. Tigre is the dominant ethnic group in Mekelle. In Mekelle town the administration is divided in to districts (locally known as Ketena).

### Target population and study population

All HIV positive mothers with less than two years old child enrolled in HIV exposed infant clinics in Mekelle Town governmental health institutions.

### Sampling procedures

A total of 207 HIV positive mothers with less than two years old child enrolled in HIV exposed infant clinics in Mekelle Town governmental health institutions were participated in the study. To determine the sample size we used single population proportion formula with the assumption of 95% confidence level, margin of error of 5% and the proportion of recommended infant breastfeeding (either Exclusive replacement feeding (ERF) or Exclusive Breast Feeding (EBF) was 77.4% from Addis Ababa [12]. 10% of the sample was added to compensate the non-response rate.

Systematic random sampling technique was employed to select the study participant. Since there are 3 hospitals and 3 health center currently provided HEIs clinic for the community all the health institution was included in the study. First of all sampling frame of the patient who attend HEIs clinic was obtained from registration book of the health facility. There are a total of 632 HEIs were found in the respective health institution. Before conducting the study case load of the facility was obtained from each facility for one months since the time of data collection for this study was one months. Proportion to size allocation was carried out to allocate the total sample size for the respective health institution. Finally systematic random sampling technique was employed to approach the study participant. Sampling interval was calculated for each health facility based on the number of case load which were carried out for one month. In addition; lottery method was used to select the random number from the sampling interval.

### Method of data collection

A structured questioner was used by selecting and adapting relevant questions from Integrated PMTCT of HIV and Support for Infant Feeding of Health Providers Course (questionnaires) of LINKAGES and a study reports on infant feeding practices in the context of HIV / AIDS in Tanzania [13,14]. The questions and statements was grouped and arranged in to socio demographic, Maternal Reproductive Experiences, Knowledge and attitude on infant feeding options and knowledge on MTCT (PMTCT), Infant feeding practices and other factors related to mother health was assessed. After extensive revision, the final version of the English questionnaire was developed. An individual who had a very good ability of both English and Tigrigna languages translated the English version to Tigrigna. Another individual of similar ability then trans-

lated the agreed Tigrigna version of the questionnaire back to English to check for any inconsistencies or distortion in the meaning of words.

Before the actual data collection, the questionnaire was pre-tested on 5% (10 women) in Wukro town which is 45 km north from Mekelle. Based on the pretest, the time needed for the complete interview and the number of data collectors in need was estimated. Six female diploma clinical nurses and they should speak local language and also experience in collecting data in that area was employed. One BSc HANS nurse was selected as a supervisor. Both the interviewers and supervisors were given two days training before the actual work by the principal investigator regarding the objective of study and data collection tools. The interview was conducted in a place where the woman feels free to express her feelings and ideas.

### Data analysis

The collection data was completed the data were categorized and coded on a well-drafted coding book (sheet) and the data was checked for consistence and completeness using logic checks. The collected data was entered into a computer using SPSS Version 20.0. Inconsistent values were double checked against the filled questionnaire and corrected as necessary. Frequencies were used to see the overall distribution of the study subjects with regard to the variables under the study. A Proportion was calculated to explore the magnitude of infant feeding practice. Bivariate Logistic regression was used to assess the crude association and to select important variables included in the model. Finally, multivariate-logistic regressions were used to control possible confounders and identify independent predictors of infant feeding practices and also from the model OR and their 95% CI was used to measure the association. A significance level of 0.05 was used to decide the significance of statistical tests. Finally the results were presented in text, table and graphs.

### Ethical considerations

Ethical approval to carry out the study was sought from Mekelle University college of Health Science (MUCHS) ethical committee and official letter of co-operation was given to Tigray regional health bureau and management of the respective health facilities. Written informed consent was sought from the respondents before participation. Confidentiality was assured throughout the study by use of code numbers instead of individual names for identification.

## Results

### Socio-demographic and Economic characteristics

A total of 207 HIV positive mothers who had infants less than two years of age were interviewed and with a response rate of 100% were participated in the study. The mean age of mothers and their infants were 28.86 (SD+ 4.04) years and 7.84(SD+ 4.2) months respectively. Majority of the respondents 168(81.2%) were urban, Orthodox 182(87.9%) and married 157 (75.8%) respectively. More than half (51.7%) the infants were male and the rest 100 (48.3%) were females. More than one third, 79(38.2%) mother had followed primary education and 56(27.1%) mothers were no formal education. With

Variables	Frequency	(%)
<b>Age of mothers</b>		
18-24	29	14
25-29	82	39.6
30-34	70	33.8
35+	26	12.6
<b>Age of infants</b>		
<6 Month	83	40.1
6-12 Month	92	44.4
>12 Month	32	15.5
<b>Infants gender</b>		
Male	107	51.7
Female	100	48.3
<b>Residence</b>		
Urban	168	81.2
Rural	39	18.8
<b>Religion</b>		
Orthodox	182	87.9
Muslim	19	9.2
Others*	6	2.9
<b>Ethnic group</b>		
Tigray	194	93.7
Amhara	9	4.3
Afar	4	1.9
<b>Marital Status</b>		
Single	16	7.7
Married	157	75.8
Divorced	15	7.2
Others**	19	9.2
<b>Educational Status of Mothers</b>		
No formal education	56	27.1
Read and write	31	15
Primary education(1-8)	79	38.2
Secondary education(9-12)	36	17.4
Tertiary education Diploma and more than	5	2.4
<b>Mothers occupations</b>		
Employers	21	10.1
Merchants	21	10.1
House wives	111	53.6
Daily laborer	40	19.3
Others***	14	6.8
<b>Main Source of Water</b>		
Pipe/tap	184	88.9
Open well/spring	14	6.8
Covered well/spring	6	2.9
River/pond	3	1.4
<b>Monthly income Categories</b>		
<500	53	25.6
500-1000	86	41.5
>1000	68	32.9

\* Protestant, Catholic \*\*Separated, Widow \*\*\*Students, Soldier, Farmers

**Table 1:** Socio-demographic and Economic characteristics of HIV positive mothers enrolled in HEIs clinics in Mekelle town governmental health institution from June to Dec,2013.(n=207)

Variables	Infant Feeding Practice		OR (95%CI)		P-value
	Exclusive Breast Feeding n=187 (%)	Non-Exclusive Breast Feeding n=20 (%)	Crude	Adjusted	
Attitude on infant feeding option					0.039
Unfavourable Attitude	30(16.0%)	8(40.0%)	.287(.108-.761) *	.315(.105-.944) *	
Favourable Attitude	157(84.0%)	12(60.0%)	1	1	
Receiving education & counseling on IFO during pregnancy in ANC					0.004
Yes	127(70.9%)	6(33.3%)	4.88(1.74-13.706) *	4.69(1.62-13.55) *	
No	52(29.1%)	12(66.7%)	1	1	
Infant's Current age					
> 12 months	26(13.9%)	6(30.0%)	3.60(1.014-12.78)	4.82(0.89-26.22)	
6 - 12 months	83(44.4%)	9(45.0%)	1.69(.54-5.26)	1.59(0.39-6.50)	
< 6 months	78(41.7%)	5(25.0%)	1	1	

Note: 1- reference group

\* Statistically significant (p-value < 0.05)

**Table 2:** Predictors on infant feeding practice of HIV positive mothers attending HEIs in Mekelle Town governmental health institution from Jun-Dec, 2013.

respect to their occupation out of the total study participants, more than half (53.6%) of the respondents were housewives and 40 (19.3%) HIV positive mothers were daily laborer. The dominant ethnic groups were Tigre 197(93.7%). Majority of respondents 183 (88.4%) used pipe as source of drinking water. Majority of the participants 86 (41.5%) earn a monthly income between 500-1500 Ethiopian birr (Table1).

From the total 207 mothers, 197(95.2%) mothers were attending antenatal follow up, of whom majority of mothers attended during the first trimester, 125(63.5%). Among this 126(60%) were at list four times visit ANC clinics. The majority 201 (97.1%) of the respondents gave birth between thirty eight and forty two weeks of gestational age (term) and Most, 180(87.0%) mothers delivered at governmental hospital and health center. From the total respondents, 171 (82.6%), 22 (10.6%), 12 (5.8%) and 2 (1.0%) had spontaneous vaginal delivery, Cesarean section delivery, Episiotomy and instrumental delivery respectively. The average numbers of children in the house hold was 2.01 (SD+ .906) and the large proportion of mothers, 199(96.1%) had postnatal follow up.

From the total 207 mothers, Majority 199 (96.1%) of HIV positive mothers were sufficient knowledge on infant feeding options, 169(81.6%) had favorable attitude towards infant feeding options and also 172 (83.1%) HIV positive mother had sufficient knowledge towards MTCT (PMTCT)

Among 207 of the respondents 155 (74.9%) are on ART, Majority of the respondent's 106(68.4%) had start ART before pregnancy followed by 40(25.8%) start ART during pregnancy. Of the 52 respondents mothers who were not on ART, 44(84.6%) had took PMTCT prophylaxis. Immediately after delivery 186(89.9%) infants had took ART prophylaxis. This study also shows, large proportion 187(90.3%) of HIV positive mothers disclose their sero-status, of whom most 165 (79.7%) of them disclose to their husband. After telling HIV status 75(36.2%) respondent mothers had stigmatized. From the total 207 HIV positive mothers, Majority 199(96.1%) had test HIV before delivery, 7(3.4%) had test after delivery and 1(0.5%) had test during delivery.

### Infant feeding practices

Majority HIV positive mothers responded 187(90.3%) were

practice 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.

From the total 207 HIV positive mothers, Majority 95.2% of mothers educate & Counseled on Infant feeding options of this most of the respondents were 133(67.5%) receiving counseling during pregnancy followed by 40(20.3%) after delivery. The main reason cited by HIV positive mothers for choosing Exclusive Breast feeding were more than three fourth (76.3%) were availability, 141(68.1%) were affordability and 135(65.2%) were advised by health worker respectively.

Among mothers practiced mixed feeding the commonest reasons were, 9(69.2%) mothers reported neighbor advice, 7(53.8%) insufficient breast milk, 3(23.1%) mothers illness, 2(15.4%) husbands imposition and 2(15.4%) infants illness. Among the mothers who practice EBF and MF number of breast feeding per day were 174(87%) greater than 8 times. From the total 207 HIV positive mothers, 177(85.5%) had initiated infant feeding after delivery within 1 hours, nearly to half (47.0%) totally 7-12 months of breast feeding and One hundred ninety seven (95.2%) of the respondents stated that they had got the information about infant feeding options from health service providers. No one of the respondents said that they had never got advice on infant feeding at all.

A total of 207 respondents on current infant feeding practice above half (50.7%) mothers chosen by her and above one fourth (25.6%) had influenced by MCH clinics. The rest had been influenced by Relatives 48(23.2%), Husbands 22(10.6%) and friends 4(1.9%) respectively.

Eighteen (8.7%) had face constraints on infant feeding practices 10(55.6%) were face Insufficient breast milk due to poor health status of mother, 8(44.4%) had face Women workload, 6(33.3%) had face Low income for purchasing cow's milk and other food, 5(27.8%) had face Infants refusal to eat other foods, 2(11.1%) had Lack of infant feeding education and 1(5.6%) had also unreliable source of cow's milk. No one report on infant poor weight gain and other constraints.

Out of 207 respondent mothers, 22(10.6%) face problem when they Breast feed from this 14 (63.6%) not enough milk, 4

(18.2%) Nipple problem, 3(13.6%) mother's illness, 3(13.6%) infant's illness and 1 (4.5%) infants mouth Soreness respectively.

One hundred ninety nine (96.1%) HIV positive mother had Good feeling of current infant feeding options and 8(3.9%) also Bad feeling on current feeding. Frequent ways of feeding from 6-12 months of infant by spoon 129(62.3%), by cup 113(54.6%) and by hand 75(36.2%) respectively. Majority, 206(99.5%) infants were taken immunization against the six target disease.

### Factors Affecting Exclusive Breast Feeding

Factors affecting infant feeding practice .The Bivariate logistic regression analysis revealed that Exclusive Breast Feeding practice had significant association with Attitude on Infant Feeding option with and Receiving education & counseling on infant feeding option during pregnancy in ANC.

In the Multivariate Analysis, mother's attitude towards IFO and Receiving infant feeding education & counseling on infant feeding option during pregnancy in ANC were found to be significantly affected Infant feeding practice. Those HEIs born to mothers with unfavorable attitude towards Infant feeding options were 68.5% times less likely to practice Exclusive Breast feeding as compared to HEIs born to mothers with favorable attitude [AOR=.315(95%CI=.105-.944)].

Mothers who receive infant feeding education &counseling on infant feeding option during pregnancy in ANC were 5 times more likely to practice exclusively breastfeed way of infant feeding practice as compared to mothers who did not receive counseling on infant feeding option during pregnancy [AOR=4.69( 95% CI=1.62-13.55)] (Table 2).

### Discussion

This study investigated infant feeding practices in Mekelle Town governmental health facility. The study revealed that more than 90% of HEIs were exclusively breastfed; 6.3% were mixed fed' and 3.4% were exclusively replacement fed.

In this study, the proportion of mothers practicing EBF (90.3%) were for the first 6 months of age were comparatively higher than the findings reported from Eastern Uganda (24%) Ghana (62%), Lusaka (70.4%), Zambia (35%) and India (44%) [15-19]. This might be due to the cultural preference of breast feeding of the Ethiopian mothers than giving replacement feeding as well as the availability of resources to practice exclusive breast feeding. A study report from Addis Ababa the proportion of practicing exclusive breast feeding in 2008(30.6%) was comparatively lower than from this study [12]. This might be due to change in guide line the Ethiopian Ministry of Health guideline on infant feeding recommendations of HIV exposed infants recommends exclusive breast feeding for the first 6 months and introducing complementary feeding at 6 months and continues breastfeeding until 12-18 months [9] and Gondar (83.8%) had almost comparable with this study, this might be due to they are using the same PMTCT guide lines [20].

According to WHO guide lines, Breast feeding with other foods

or liquids in the first six month constitutes mixed feeding. The proportion of mixed feeding in this study was 6.3% which is lower than a study done in Ghana (40%), Lusaka(24.1%) and India (29%) [17-19] and also study report in Addis Ababa, Ethiopia (15%), Gondar, Ethiopia (10.5%) [12, 20]. This might be indicating that the effectiveness of new PMTCT programs. In the current study the reason for practicing mixed feeding were, 69.2% mothers reported neighbor advice, 53.8% insufficient breast milk, 23.1% mothers illness, 15.4% husbands imposition and 15.4% infants illness. Similar study Addis Ababa [12] has identified the same reasons for the practice of mixed feeding by HIV positive mothers. By tradition, mothers may consider breast milk is not enough for child growth and intend to use mixed feeding even though they have been educated. It has been documented that mixed feeding of infants will predispose them to increased risk of mother to child transmission [5]. Mixed feeding was also observed to result in higher rate of mortality due to diarrheal diseases [22].

The rate of exclusive replacement feeding was 3.4%. These finding was lower than compared to a study done in South Africa(60%) of the HIV positive mothers practiced exclusive replacement feeding [21]. This might be most of the mothers had low socio economic status so that cannot afford to buy the formula food & they are difference national PMTCT guide lines. The proportion of ERF was also lower than study conducted in Addis Ababa 46.8%, Ethiopia it might due to difference in infant feeding recommendations [12]. And comparable with Gondar 5.7%, Ethiopia it might be due to using the same guidelines [20].

On the other hand another finding shows that, there was no proportion of HIV positive mother who used expressed heat treated breast milk, wet-nursing and modified animal milk in this study, which is similar what was reported from Addis Ababa and Gondar [12, 20]. This might be due to low cultural acceptability of this infant feeding options, in addition counselor might not discuss these infant feeding options. In line to this idea, the study done in Southern Ghana[17], mothers who were not practicing wet nursing, expressed heat-treated breast milk and modified animal milk were neither well understood, accepted nor regarded as feasible options by all individual women interviewed. They also reported in the FGDs that during counseling, some of these options were mentioned briefly since emphasis was on exclusive breastfeeding and exclusive replacement feeding. Therefore, their knowledge and understanding of these options was poor due to lack of counseling on these options.

In this study, 172 (83.1%) of women knew that mother to child transmission of HIV virus can occur during pregnancy, delivery and breast milk feeding which is similar with percentage compared to the findings 193(92.3%) from a study done in Gondar (Ethiopia), 85% Lusaka (Zambia), 33(83%) Ghana [20,16,17]. This might be achieved due to the availability of mother support groups (MSG) and it organized by I-Tech Ethiopia so the mother meet every month for coffee ceremony simultaneously they discussed the issues of HIV transmission, prevention and infant feeding practice etc.

According to the FMOH, in Ethiopia all HIV-infected mothers should receive counseling which includes provision of general

information about the risks and benefits of various infant feeding options [9]. However, the percentage of women who received counseling on infant feeding options were 197(95.2%) which is comparable with study done in South Africa, where 82% mothers received information about different feeding options [22].

Another finding from this study, 81.6 % of HIV positive mothers had favorable attitude towards feeding options comparable with a study done in Addis Ababa (87.2%) [12]. These might be full information regarding advantage and disadvantage of different feeding options as well accessibility of mother support groups by preparing coffee ceremony for mothers in every month interval which is organized by NGO [I-Tech].

Knowledge of mothers on breastfeeding is very important factor for the mother to make a decision on infant feeding option. Majority 199(96.1%) of HIV positive mothers were sufficient knowledge and 8(3.9%) insufficient knowledge towards infant feeding options. In normal circumstances, we expected that HIV+ mothers in PMTCT would be more knowledgeable than the rest. In these study HIV positive mothers the duration of exclusive breastfeeding of 6 months was practice 90.3%. This implies that the knowledge of exclusive breastfeeding duration among mothers is still infant feeding practices in the context of HIV/AIDS limited. This also applies on the advantage of exclusive breastfeeding especially the nutrition part. This situation calls for a need to intensify education on breastfed including exclusive breastfeeding among community members particularly the mothers. This finding was comparable with study done in Addis Ababa (92.2%). These might also be full information regarding advantage and disadvantage of different feeding options as well as accessibility of mother support groups by preparing coffee ceremony for mothers in every month interval which is organized by NGO [I-Tech].

This study also shows, large proportion (90.3%) of HIV positive mothers disclose their sero-status, of whom most (79.7%) of them disclose to their husband, which is similar with a study done in India (67%).

Higher percentage (36.2%) of study participants complained that stigmatized after telling to HIV status to others although the percentage was higher than studies conducted (13%) in Gondar [20]. It is difficult to reason out; it may need further research to find the reason of this discrepancy.

The main reason cited by HIV positive mothers for choosing Exclusive Breast feeding were include availability by 76.3%; affordability (68.1%); advised by health worker (65.2%); and acceptable to the community (51.70%) respectively. The participants of this study, like the results from other developing countries, mentioned multiple criteria to stick to infant feeding options. In the study conducted in Addis Ababa, the vast majority mentioned the single criteria to stick to infant feeding option were affordability and not the availability, acceptability. It was mentioned that, this might be due to almost all counsellors focused on only the affordability issue of mothers for replacement feeding during infant feeding counselling [12]. In that case, the results of this study might reflect the presence of better understanding of the mother on choosing infant feeding options and the effectiveness of PMTCT program, particularly,

health education and counselling on IFP. This could also partly explain the higher prevalence of EBF in this study. Across many developing countries, many HIV-positive women do not have the resources to prepare replacement feeds in an acceptable, feasible, affordable, sustainable and safe manner [17]. Thus, mothers who choose ERF based on only single criteria, without considering the others might thus fail to adhere to ERF and might tend to practice MBF.

On the other hand, to assess the role of society members, mothers were asked about who influenced on their choice of IFP. Majority (50.7%) of the mothers reported that chose infant feeding option by herself, 25.6% were advised by MCH clinics, 23.2% been influenced by relatives; 10.6% by their husbands; 1.9% by their friends. This discussion reinforces the difficulty that women with HIV face in adhering to infant feeding in the face of the often over-whelming pressures that they face from their partners and families in patriarchal societies. The roles of these individuals have also been reported in other studies. In an in-depth interview shows how HIV-positive women face challenges by relatives and husbands. Besides, resistance of mothers to sticking to safer infant feeding options because of the counter information forwarded by some neighbours and from close family members [12].

The barriers to EBF were assessed in two different ways. Either study participants were asked directly about the perceived barriers to non-EBF or, through multivariate analysis, the investigators identified the correlates associated with non-EBF. The most common barriers to EBF that were mentioned by participants included neighbor's advice, insufficient breast milk, mothers illness, husbands imposition and infants illness .

The factors associated with non-EBF that was assessed through multivariate analysis included receiving infant feeding education and counseling during pregnancy and attitude towards IFOs.

Among mothers who practiced mixed feeding the commonest reasons were, neighbor advice (69.2%) insufficient breast milk (53.8%), mothers illness 3(23.1%), husbands imposition (15.4%) and 2(15.4%) infants illness . These reasons were also mentioned in various literatures conducted in developing countries. In Addis Ababa, among mothers who practiced mixed feeding, the commonest reasons cited were neighbour's advice in 40%; while insufficient breast milk, husband imposition, mother's illness and both mother's and infant's illness were mentioned by 26%, 14%, 8% and 6.0% respectively [12]. In another study in Gondar, Ethiopia, 12.9%, and 9.6% of the respondents said that insufficient breast milk and husband opposition had affected their infant feeding option, respectively [20].

Results of the multivariate logistic regression in this study showed that, receiving infant feeding education and counseling during pregnancy in ANC & attitude towards IFOs. HEIs born to mothers who received infant feeding education and counseling during pregnancy in ANC were 5 times more likely to practice Exclusive Breast feeding as compared to HEIs born to mothers with who did not received infant feeding education and counseling during pregnancy in ANC. This finding was consistent with study done in Addis Ababa, Ethiopia

and South Africa [12, 21].

Attitude towards Infant feeding option was another independent factor affecting the feeding practice of HEIs. HEIs born to mothers with favorable attitude towards Infant feeding option are more likely to practice Exclusive Breast feeding as compared to HEIs born to mothers with unfavorable attitude. This finding was consistent with study done in Addis Ababa. In Addis Ababa, mothers who had positive attitude towards infant feeding were 69% less likely to practice mixed feeding than those who didn't have such attitude (OR=0.31, 95%CI=0.1-0.8)[12]. Though majority of mothers (81%) have favorable attitude towards EBF, significant number of mothers still have unfavorable attitude towards EBF. Thus, efforts must be done to improve the attitude of these mothers by the health workers providing HEI services.

A key finding of this study is that, health care workers, friends, neighbours, relatives, husbands and other community members play a leading role in infant feeding practices of HEIs. In addition, ANC visit during pregnancy & mother's attitude towards IFOs of the mother independently affect infant feeding practice of the HEIs. This demands the need for a multi-dimensional behavioural change strategy involving mothers, family members and significant community members.

### Limitation

Overall generalization due to the small study sample size and it was health institution based. There is a possibility that study participants who received counseling on exclusive breast feeding practice way of infant feeding practice may simply answer questions correctly. This bias may underestimate the proportion of non-exclusive breast feeding practice and also Maternal since-birth recall of feeding patterns was also used which has its own limitations of long recall.

### Conclusion

The present study showed and identified that higher proportion (90.3%) of the respondents was practices exclusive breast feeding. Small proportion (6.3%) of HIV positive mothers had practice of mixed feeding, but very small proportion (3.4%) practiced exclusive replacement feeding. Major determinants of infant feeding practice were found to be favorable Attitude on infant feeding practice and education & counseling on infant feeding option during pregnancy in ANC and HIV-positive mothers faced various obstacles (socio-economic, familial and stigma) in carrying out replacement feeding. Health care workers, friends, neighbours, relatives, husbands and other community members play a leading role in infant feeding practices of HEIs. Finally, we recommend for health worker to provide information on the involvement of male partner in antenatal care is integrated into the public health system. This is important if the disclosure of HIV status is to be promoted since non-disclosure to partners often encourages mixed feeding and for researchers investigating infant feeding practices amongst HIV-positive and -negative mothers (0-9 months postpartum) and describe the association between infant feeding practices and HIV-free survival.

### Acknowledgements

I am very grateful to Mekelle, Ayder, Quiha hospitals and Mekelle, Semen and Kasech health center staffs and data collec-

tors and the people of the study area for consenting, participation and cooperation in this study. Last, but not list i would like to acknowledge all staff members of Avicenna Medical College for stationery material support.

### Authors' contributions

YG, AA and GB: initiation of the study, design, implementation, analysis and writing. All authors read and approved the final manuscript.

### References

- 1) UNAIDS (2010) The Global Aids Epidemic: Joint United Nations Programme on HIV/AIDS Geneva. Switzerland.
- 2) WHO, FAO (2009) Nutritional care and support for people living with HIV/AIDS: a training course: Geneva, Switzerland.
- 3) WHO, UNAIDS, UNICEF (2011) Global HIV/AIDS Response. Epidemic update and health sector progress towards Universal Access: Geneva, Switzerland.
- 4) FHAPCO, FMOH (2007) Guidelines for paediatric HIV/AIDS care and treatment in Ethiopia: Federal HIV/AIDS Prevention and Control office, Federal Ministry of Health.
- 5) WHO (2010) Guidelines on HIV and infant feeding: principles and recommendations for infant feeding in the context of HIV and a summary of evidence. Geneva, Switzerland.
- 6) WHO (2005) Micronutrients and HIV infection: a review of current evidence. Durban, South Africa.
- 7) WHO, UNICEF, UNFPA, UNAIDS (2006) HIV and Infant Feeding: New evidence and programmatic experience: Geneva, Switzerland.
- 8) FMOH (2011) Accelerated Plan for Scaling Up Prevention of Mother to Child Transmission (PMTCT) Services in Ethiopia. Addis abeba, Ethiopia.
- 9) FHAPCO, FMOH (2007) Guideline for prevention of mother to child transmission of HIV in Ethiopia: Federal HIV/AIDS Prevention and Control office, Federal Ministry of Health.
- 10) Mukuria AG, Kothari MT, Abderrahim N (2006) Infant and Young Child Feeding Update; UNAIDS.
- 11) Genessa Giorgi, Kripa Krishnan (2009) MCI: Health Needs Assessment for Mekelle Town, ETHIOPIA.
- 12) Maru Y, Haidar J (2009) Infant feeding practice of HIV positive mothers and its determinants in selected health institutions of Addis Ababa, Ethiopia. Ethiopian Journal Health Development 23:107-114.
- 13) The LINKAGES project (2004) Integrated Prevention of mother-to-child transmission of HIV and support for infant feeding. Health Providers Course.
- 14) TFNC (2005) A Study Report On Infant Feeding Practices In The Context Of HIV / AIDS.
- 15) Fadnes LT, Engebretsen IM, Wamani H, Wangisi J, Tumwine JK, et al. (2009) Need to optimise infant feeding counselling: a cross-sectional survey among HIV-positive mothers in Eastern Uganda. BMC Pediatr 9:2.
- 16) Kaliwile C, Michelo C (2010) Determinants of Adherence to the Exclusive Breastfeeding Option among HIV Positive Mothers in Eight Selected Health Centres in Lusaka District. 37.
- 17) Suuk Alexander Laar, Veloshnee Govender (2012) Factors influencing the choices of infant feeding of HIV positive mothers in Southern Ghana: The role of counsellors, mothers, families and socio-economic status. Journal of AIDS and HIV Research 3: 129-137.

- 18) Omari AA, Luo C, Kankasa C, Bhat GJ, Bunn J (2003) Infant-feeding practices of mothers of known HIV status in Lusaka, Zambia. *Health Policy Plan* 18:156-162.
- 19) Suryavanshi N, Jonnalagadda S, Erande AS, Sastry J, Pisal H, et al. (2003) Infant feeding practices of HIV-positive mothers in India. *J Nutr* 133:1326-1331.
- 20) Muluye D, Woldeyohannes D, Gizachew M, Tiruneh M (2012) Infant feeding practice and associated factors of HIV positive mothers attending prevention of mother to child transmission and antiretroviral therapy clinics in Gondar Town health institutions, Northwest Ethiopia. *BMC Public Health* 12:240.
- 21) Ladzani R, Peltzer K, Mlambo MG, Phaweni K (2011) Infant-feeding practices and associated factors of HIV-positive mothers at Gert Sibande, South Africa. *Acta Paediatr* 100:538-542.
- 22) Iliff PJ, Piwoz EG, Tavengwa NV, Zunguza CD, Marinda ET, et al. (2005) Early exclusive breastfeeding reduces the risk of postnatal HIV-1 transmission and increases HIV-free survival. *AIDS* 19: 699-708.

**Submit your manuscript to a JScholar journal and benefit from:**

- ¶ Convenient online submission
- ¶ Rigorous peer review
- ¶ Immediate publication on acceptance
- ¶ Open access: articles freely available online
- ¶ High visibility within the field
- ¶ Better discount for your subsequent articles

Submit your manuscript at  
<http://www.jscholaronline.org/submit-manuscript.php>