

Full Length Research Paper

Assessment of factors associated with infant and young child feeding practices of human immunodeficiency virus (HIV) positive mothers in selected hospitals of Southern Nations, Nationalities, and Peoples' Region (SNNPR) Ethiopia

Astewaya Mengstie^{1*}, Tirhas Tadese² and Bogale Tessema³

¹Higher Education Relevance and Quality Agency, Senior Accreditation Department, Addis Ababa, Ethiopia.

²Yekatit 12 Hospitals, Department of Public Health, College of Medicine, Addis Ababa, Ethiopia.

³Nutrition Technical officer, Alive and Thrive Project FHI360, Addis Ababa, Ethiopia.

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Mother-to-child transmission is the largest source of human immunodeficiency virus (HIV) infection in children. About one third of children are believed to be infected vertically through breast-feeding. Infant feeding in the context of HIV is complex. HIV positive women are confused about feeding methods and mixed feeding continued to be widespread. However, there are few studies on the practice of HIV positive mothers and counseling message of health workers in Ethiopia (Maru and Haidar, 2009). Objective: The objective of this study was to assess magnitude and factors associated with infant and young child feeding practice of HIV positive mothers in selected hospitals of Southern Nations Nationalities and Peoples of Region, 2011. An institution based cross sectional study was conducted using both quantitative and qualitative methods. A total of 201 HIV positive mothers with children less than two years of age were purposively selected at morning time in order of arrival. Health workers working on anti-retroviral therapy and prevention of mother to child transmission clinics were taken for in-depth interview in Hawassa, Yirgalem and Dilla Hospitals. Of all respondent, 87 (47.5%) HIV positive mothers had children with the age of less than 6 months, among 87 (47.5%) HIV positive mothers, 56.3% had experience of exclusive breast feeding, 13 (35.6%) of the mothers mix fed their babies while 8.1% exclusive replacement feeding. Regarding issues discussed during counseling time by health workers, from total of 183 HIV positive mothers, 78.7% mothers received counseling on different feeding options. Most, 96.2 and 76.0% of mothers received counseling on advantages and disadvantages of breast feeding respectively, and 67.8 and 71% disadvantages of replacement and mixed feeding respectively. Mother's who had antenatal follow up and favorable attitude towards feeding options were more likely to practice exclusive breast feeding and less likely to practice mixed feeding. More than half of the mothers practiced exclusive breast feeding and very small proportion of HIV positive mothers chose replacement feeding, but still greater than one third of HIV positive mothers practiced mixed feeding. In general, infant and young child feeding practices observed in this study fall short of the World Health Organization (WHO) recommendations, so 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.

Key words: Infant and young child, feeding practice, HIV.

INTRODUCTION

Mother-to-child transmission of (MTCT) human immunodeficiency virus (HIV) has become a rare event in well resourced settings with the widespread access to effective antiretroviral treatment. In 2008, around 370,000 children worldwide were newly HIV infected with 90% of these in sub-Saharan Africa. Based on single point HIV prevalence estimate, in 2010, Ethiopia adult (15 to 49 years) HIV prevalence was 2.4% (urban 7.7% and rural 0.9%) while HIV positive births were 14,276 (FDRE and FHAPCO., 2010). Southern Nations, Nationalities, and Peoples' Region (SNNPR) is one of the regions in Ethiopia which has a high rate of HIV prevalence, with adult HIV prevalence of 2.3% (10.2% in urban areas and 1.5% in rural areas) (NGO, 2008).

MTCT is by far the largest source of HIV infection, with 90% of the cases infected during pregnancy, birth or breast-feeding (Groves, 2004). About 10 to 20% of the babies acquire the virus from their mothers during breast-feeding for the first 24 months (Preble et al., 2001; Preble et al., 2002). Infant feeding in the context of HIV is complex because of the major influence that feeding practices and nutrition have on child survival. HIV positive women were confused about feeding methods and mixed feeding continued to be widespread (WHO, 2010).

WHO/UNAIDS guidance states that when replacement feeding is acceptable, feasible, affordable, sustainable, and safe, avoidance of all breastfeeding by HIV infected mothers is recommended to prevent postnatal transmission of HIV infection. Otherwise, it is recommended to follow exclusive breast feeding during the first 6 months of life. The recommendation further state that HIV infected mothers should receive counseling on the risks and benefits of different infant feeding options and be given guidance and support to choose the most appropriate option for their situation (UNAIDS and WHO, 2004).

As key gatekeepers in influencing mothers' decisions on infant feeding, health workers can help to reduce rates of postnatal transmission of HIV by providing HIV-infected mothers with accurate information on infant feeding that captures the risks and benefits of different feeding options. Studying what health workers currently believe and practice regarding infant feeding for HIV infected women is an important concern because attitudes and cultural beliefs may affect their counseling behavior (Coutsoudis et al., 2002; Seidel et al., 2000).

In Ethiopia, there are few studies which address the challenges in fulfilling feeding practice of HIV positive mothers and counseling practice of health workers on infant and young children feeding practice. Hence the proposed study will help to fill an important information

gap to PMTCT program which can be used to inform policy and practice in Ethiopia sitting.

METHODOLOGY

The study was conducted from December, 2010 to May, 2011 in Hawassa, Yirgalem and Dilla hospitals. Hawassa referral and teaching hospital is located in Hawassa which is 275 km south of Addis Ababa, the capital city of Ethiopia. Currently, 1000 HIV positive women are on antiretroviral therapy (ART) of which 126 women have children less than two years old. Yirgalem Hospital is located in Yirgalem town in southern Ethiopia, located 315 kilometers South of Addis Ababa and 40 kilometers south of Hawassa. Currently, 732 HIV positive women are on ART of which 121 women had children less than two years old, and also Dilla referral hospital is located 365 km south of Addis Ababa in Gedeo Zone of SNNPR. Currently, 612 HIV positive women are on ART of which 104 women with children less than two years of age. The SNNPRS consists of 13 zones and 104 'woredas'. The region has an estimated 15,042,531 (20.4% of the national estimate) people. Close to 90% of the population are estimated to be rural inhabitants, while 1,545,710 or 10.3% are urban; this makes the SNNPR Ethiopia's most rural region.

A cross sectional study design, both quantitative and qualitative methods were used. The source of population was HIV positive mothers with children less than 2 years old and who had follow-up in Hawassa, Yirgalem and Dilla hospitals for the quantitative and Health workers in ART/PMTCT service in Hawassa, Yirgalem and Dilla hospitals for the qualitative one. 201 sample size was calculated using single population proportion formula by taking 46.8% which is exclusive replacement feeding rate of HIV positive mothers (Maru and Haidar, 2009), and using finite population correction formula to estimate final sample size (n) from a finite target population (N) =351 and by adding 10% non response rate. For the in-depth interview, seventeen health workers were selected purposively. Data was collected using pretested structured questionnaire adopted and adapted from different studies (UNAIDS and WHO, 2004). The questionnaire adopted was modified depending on the local situation and research objective.

The questionnaire contains six parts which include students' socio-demographic status, obstetric history, awareness and attitude of HIV positive mothers towards infant feeding, feeding practice of HIV positive mothers, cessation of breast feeding and assessment of counseling practice of health workers. For qualitative, data were carried through in-depth interviews with an already prepared interview guide using tape recorder. Binary logistic regression analysis was carried out to see the association between each independent variable with outcome variable and then variables that showed significant associations were included in a single model and multiple logistic regressions were performed to identify the most significant predictors. 95% CI and P-value (0.05) were used to assess the degree of statistical significance.

In the three closed ended attitude questions with Likert scales, five options were mentioned ranging from 1= strongly disagree to 5=strongly agree, and a total score was calculated. For the qualitative data, The tape recorded data was transcribed and translated .The translated data was transported to Open Code software and analyzed using thematic analysis.

*Corresponding author. E-mail: astu7298@gmail.com

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Questionnaire was prepared first in English language and later translated in to Amharic language. Another translator translated the Amharic version back into English version. Comparison was made on the consistency of the two versions. Written permission was obtained from the Hospitals administration. Each woman was informed about the purpose of the study and the right of the women not to participate in the study was respected. Confidentiality of the respondents was respected. Informed consent was obtained from HIV positive mothers and health workers. After data collection, necessary advice on different feeding options as well as side effects of mixed feeding were explained to HIV positive mothers. The dependent variable of this study was feeding practice (EBF, ERF, MF) and the independent variable includes socio demographic characteristics and maternal related factors (awareness and attitude, disclosure of HIV status, place of delivery, mode of delivery, antenatal follow up and time of first antenatal visit).

Operational definitions and measurements

Breast feeding: Refers to the child receiving breast milk direct from the breast or expressed.

Exclusive breastfeeding under 6 months: Proportion of infants 0 to 6 months of age who are fed exclusively with breast milk.

Infants 0 to 5.9 months of age who received only breast milk during the previous day

Infants 0 to 5.9 months of age

Early/Timely initiation of breastfeeding: Proportion of children born in the last 23 months who were put to the breast within one hour of birth

Children 0 to 23.9 months of age who were put to the breast within one hour of birth

Children 0-23.9 months of age

Mixed feeding: Feeding both breast milk and other foods or liquids less than six months.

Complementary foods: Introduction of solid, semi-solid or soft food in addition to breast milk.

Complementary feeding: Proportion of infants 6 to 9 months of age who receive complementary foods.

Infants 6 to 9 months of age who received solid, semi-solid or soft foods during the previous day

Infants 6 to 9 months of age

Exclusive replacement feeding: Feeding a child who is not receiving breast milk with diet that provide all the nutrients to the child needs until the child fully fed on family foods.

Cessation of breastfeeding: Completely stopping breastfeeding, including suckling.

Awareness of HIV positive mothers towards the recommended feeding options: Mothers who responded at least one correct recommended feeding options considered to be having awareness about it.

Attitude of HIV positive mothers: An opinion, outlook or idea towards recommended feeding options for HIV positive women. Three closed ended questions were applied and the response option was Likert scale ranging from strongly agrees to strongly

disagree. This scoring with the mean and above was considered to have favorable attitude.

Counseling practice of health workers: Health workers who apply recommended options during counseling of HIV positive mothers.

RESULT

A total of 183 HIV positive mothers with infants and young children 0 to 23.9 months of age from three selected hospitals of SNNPR were included in the study making the response rate 91%. The rest 9% did not respond because they were absent on their follow up date. The mean age of the mothers and their children were 26 (SD±5.5) years and 7.8 (SD±5.6) months respectively. The majority of mothers, 155 (84.7) were married. One third, 51 (27.9%) mothers had no formal education and 81 (44.3%) of husbands completed elementary school (1 to 8 grade). Eighty seven (47.5%) of respondents were Orthodox followed by Protestant, 77 (42.1%) in religion, and the dominant ethnic groups were Amhara and Sidama with 47 (25.7 %,) and 44 (24.0%), respectively. More than half, 119 (65%) mothers were house wives. But, 91 (50.5%) husbands were employed. Regarding mothers duration of living with the husband, 72 (39.3%) mothers lived 1 to 5 years. Majority of respondents, 157 (86.3%) used pipe as source of drinking water, 16 (8.8%) and 9 (4.9%) used spring and well water respectively. One third of 73 (39.9%) of respondents had monthly income of less than 400 br (Table 1).

Obstetric history and ART prophylaxis of HIV positive mothers

From the total of 183 mothers, 151 (82.5%) mothers were attending antenatal follow up, of whom majority of mothers attended during the first trimester, 108 (71.5%) followed by second trimester, 43 (28.5). Most, 155 (84.7%) mothers delivered at governmental hospital and health center followed by 19 (10.4%) delivered at home. Among those who delivered at health institution, 139 (84.7%) respondents delivered with Singular Value Decomposition (SVD) followed by Cesarean section, 15 (9.2%). The largest proportion of mothers, 111 (60.7%) and their children 148 (80.9) took prophylaxes on the onset of labor and within 72 h of birth respectively (Table 2).

Awareness and attitude towards the recommended feeding options and disclosure status of HIV positive mothers

Large proportion, 174 (95.1%) respondents heard about feeding options. Many of them 162 (93.6%) received from

Table 1. Socio demographic characteristics of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals of SNNPR, 2011, (n=183).

Variable	Frequency	Percent (%)
Age of mothers		
15-24	70	38.3
25-34	93	50.8
35-49	20	10.9
Age group of children		
<6months	87	47.5
6-11months	52	28.4
>11 months	46	25.1
Marital status		
Marred	155	84.7
Divorce	20	10.9
Widowed	3	1.7
Separated	5	2.7
Education of mothers		
No formal education	51	27.9
Write and read	20	10.9
Grade 1-8	48	26.2
Grade 9-12	50	27.3
>grade 12	14	7.7
Religion		
Orthodox	87	47.5
Protestant	77	42.1
Muslim	16	8.7
Catholic	3	1.6
Ethnic group		
Amhara	47	25.7
Sidama	44	24.0
Oromo	23	12.6
Gedeo	22	12.0
Welyta	21	11.5
Guragie	14	7.7
Others*	9	4.8
Occupation of mothers		
Employed	38	20.8
house wife	119	65.0
Merchant	18	9.8
Others**	8	4.3
Income		
<400birr	73	39.9
401-800birr	62	33.9
>800birr	48	26.2

*Others= silitie, Tigre, gamo; **others=student, supported by NGO, house maid, daily labor.

Table 2. Obstetric histories of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals, SNNPR, 2011.

Variable	Number	Percent (%)
ANC follow up (n= 183)		
Yes	151	82.5
No	32	17.5
Place of delivery (n= 183)		
Government hospital and health center	155	84.7
Private hospital and clinic	9	4.9
Home	19	10.4
Types of institutional based delivery (n=164)		
SVD	139	84.7
SVD with episiotomy	9	5.5
C/S	15	9.2
Forceps	1	0.6
Ever started ART (n=183)		
Yes	111	60.7
No	72	39.3
ART prophylaxis given to the mother during pregnancy (n=72)		
Yes	47	65.3
No	25	34.7
ARV prophylaxis given to the child(n=183)		
Yes	148	80.9
No	35	19.1

health professionals. One hundred sixty four (89.6%) HIV positive mothers had awareness towards recommended feeding options. Majority, 175 (95.6%) of HIV positive mothers had disclosed their sero status, and most, 131 (75%) of them disclosed to their husband. Regarding attitude of mothers towards feeding options, three closed ended questions using Likert scale were applied ranging from 1= strongly disagree to 5=strongly agree and the total sum score was calculated and those who scores above the mean considered have favorable attitude. Of all respondents, 94 (51.4%) have favorable attitude towards recommended feeding options (Table 3).

Feeding practice of HIV positive mothers

From the total of 183 HIV positive mothers, 87 (47.5%) HIV positive mothers had children with age less than 6 months. Out of 87 (47.5%) HIV positive mothers, 49 (56.3%) mothers exclusively breast fed their children, 31 (35.6%) mothers practiced mixed feeding and 7 (8.1%) mothers practiced exclusive replacement feeding (Table

4). From the total of 183 HIV positive mothers, 172 (94%) mothers ever breast fed their children of whom, 98 (57%) mothers initiated the first milk less than one hour after birth. Sixteen infants (9.3%) received food/fluid before the first breast milk. Among mothers who practiced mixed feeding the commonest reasons were, 13 (41.9%) of mothers reported it was due to infant sickness, 8 (25.8%) influenced by people advice and 7 (22.5%) conform to had custom (Figure1).

Of 87 HIV positive mothers with children with age less than 6 months, 8 (10.0%) respondents ever expressed their breast milk of whom, 1 (12.5%) feed the expressed breast milk without treating with heat. One third, 3 (37.5%) of the respondents used bottle and spoon followed by 2 (25%) bottle only for feeding the expressed milk. Six (75%) of the mothers used the expressed milk for the sake of relieving breast engorgement while 1 (12.5%) because child was unable to breast feed.

From those who ever gave replacement feeding half, 4 (50%) of mothers used home prepared food and 2 (25%) used commercial formula as replacement food. Five (62.5%) mothers had not seen demonstration how to

Table 3. Awareness and attitude towards recommended feeding options and disclosure status of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals, SNNPR, 2011.

Variable (n=183)	Number	Percent (%)
Heard about feeding options		
Yes	174	95.1
No	9	4.9
Source of information about feeding options*		
Neighbors	16	9.2
Health professionals	162	93.6
Husband	3	1.7
Mass media	4	2.3
Awareness about recommended feeding options		
Aware	164	89.6
Not aware	19	10.4
Disclosure status of mothers		
Yes	175	95.6
No	8	4.4
Attitude		
Favorable	101	55.2
Unfavorable	82	44.8

*= more than one answer is possible.

prepare the infant formula food. Majority, 7 (87.5%) mothers had no refrigerator and some 3 (13%) of mothers did not boil water for washing utensil. Half, 92 (50.3%) respondents started complementary food, out of which, 145 (79.2%) mothers started when the children age was 6 to 9 months and 31 (16.9%) mothers started when the children age was <6 months of age (Table 4 and Figure 2).

Cessation of breast feeding practice of HIV positive mothers

From the total of 131 (71.6%) respondents who ever breast feed their children, 61 (46.5%) respondents were who would like to stop breast feeding within 6 to 12 months followed by 28 (21.4%) who would like to stop <6 months. Fifty two (28.4%) respondents ceased breast feeding at the time of data collection. From those who ceased BF at the time of data collection, 42 (84%) respondents ceased breast feeding while the child age was 6 to 12 months followed by 10 (16%) ceased breast feeding while the child age was less than 6 month. More than half, 34 (68%) of respondents ceased breast feeding due to fear of transmission of HIV followed by 18 (36%) for encouraging the child to eat solid foods. Of them who

ceased breast feeding, 31 (58.5%) of them faced different types of problems after stopping breast feeding (Table 5).

Counseling practice of health workers

Out of 183 respondents, 129 (70.5%) respondents were counseled by female health workers. During counseling sessions health workers discussed different points regarding feeding options for HIV positive mothers. Of all, 144 (78.7%) mothers received counseling on different feeding options. Most mothers received counseling on advantages 176 (96.2%) and disadvantages 144 (78.7%) of EBF. One hundred thirty six (74.3%) and 124 (67.8%) mothers received counseling on advantages and disadvantages of ERF respectively and 130 (71.0%) mothers received counseling on risk of mixed feeding. Majority, 156 (85.2%) respondents replied that they were shown demonstration on how to use the chosen feeding options.

Determinants of exclusive breast feeding

Bivariate logistic regression analysis revealed that antenatal follow up and attitude of mothers towards

Table 4. Feeding practice of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals, SNNPR, 2011.

Variable	Number	Percent (%)
Ever breast feed (n=183)		
Yes	172	94.0
No	11	6.0
Time of first initiation of birth milk (n=172)		
first 1 h	98	57.0
first 8 h	56	32.6
after 8 h	18	10.5
Infant received any food or fluid before breast milk (172)		
Yes	16	9.3
No	156	90.0
Expressed breast milk (n= 80)		
Yes	8	10.0
No	72	90.0
Ever gave the expressed milk (n=8)		
Yes	1	12.5
No	7	87.5
Ever replacement feed your child (n= 87)		
Yes	8	9.1
No	79	90.9
Kind of food used for replacement feeding (n= 8)		
Commercial formula	2	25.0
Home prepared	4	50.0
Both	2	25.0
Seen demonstration for preparation of RF (n= 8)		
Yes	3	37.5
No	5	62.5
Refrigerator (n= 8)		
Yes	1	12.5
No	7	87.5
Start complementary food (n=183)		
Yes	92	50.3
No	91	49.7

feeding options were significantly associated with exclusive breast feeding practice ($p < 0.05$), (Table 6). In multivariate analysis, attitude of mothers towards feeding option and ANC follow up were retained as determinant factors for EBF (Table 8). The odds of practicing exclusive breast feeding was 11 times more likely in women who had favorable attitude towards feeding options with AOR (95% CI) : 11[3.5-35.5] and the probability of practicing

exclusive breast feeding was 4.6 times more likely to mothers who had ANC follow up with AOR (95% CI): 4.6[1.3-16.6].

Determinants of mixed feeding

Among the variables of infant feeding practice, exclusive

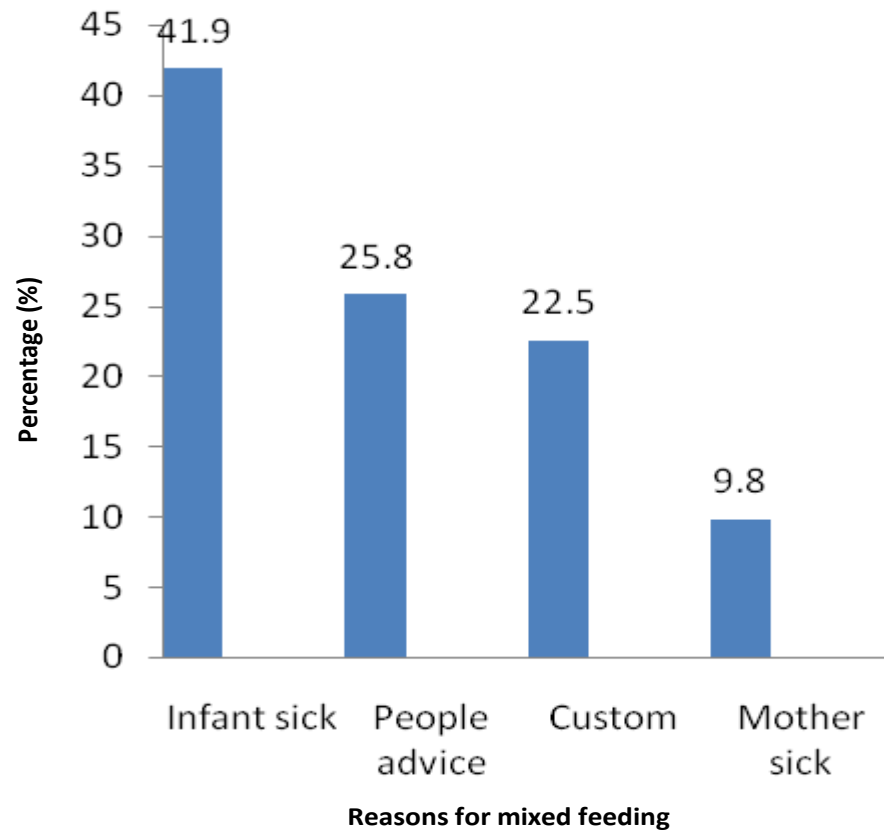


Figure 1. Reasons for mixed feeding of HIV positive mothers in selected hospitals of SNNPR, 2011.

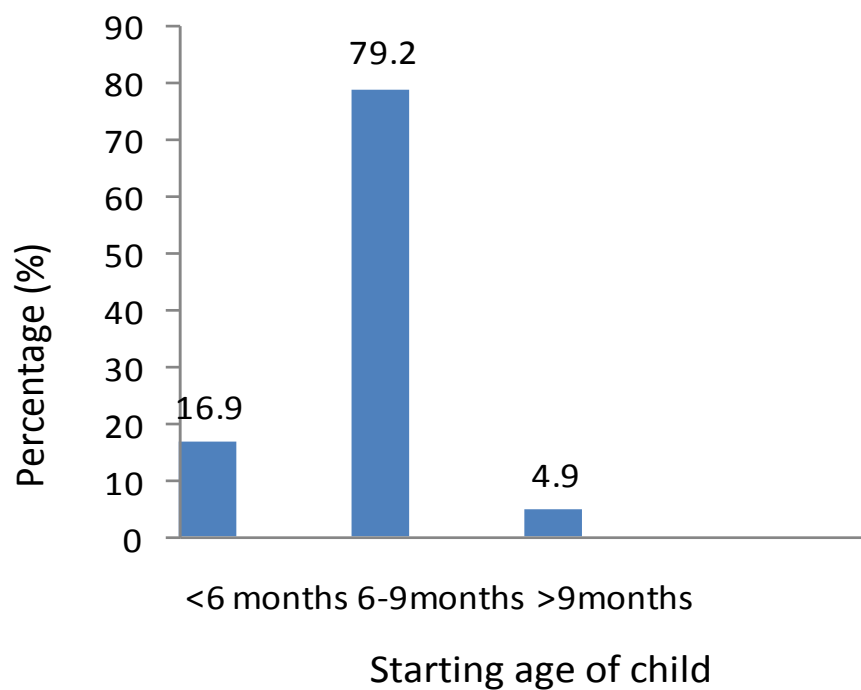


Figure 2. Starting age of complementary feeding of infants and young children in selected hospitals of SNNPR, 2011

Table 5. Cession of breast feeding practice of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals, SNNPR, 2011.

Variable	Number	Percent (%)
Currently breast feeding		
Yes	131	71.6
No	52	28.4
Age of child when stop breast feeding(n=52)		
<6months	10	16
6-12months	42	84
Reasons for cessation of breast feeding (n= 52)*		
To encourage child to eat solid foods	18	36.0
Fear of transmission of HIV	34	68.0
Advice by health professionals	8	16.0
Others	9	18.0
Faced problem after stopping BF(52)		
Yes	31	58.5
No	21	41.5

Others= Infant sick to breast feed, mother sick to breast feed, advice by husband, mother can afford to buy replacement feeding.

replacement feeding was practiced by very few numbers (7) of mothers. As a result, the numbers/proportions related to it were found to be too little for any cross tabulation or statistical test, and hence excluded from such further statistical analysis. The Bivariate logistic regression analysis revealed that mixed feeding has significant association with antenatal follow up and attitude of mothers towards feeding options, ($p < 0.05$) (Table 7). Multivariate analysis also shows attitude of mothers towards feeding options and ANC follow up retain as determinant factors for mixed feeding, (Table 9). The odds of practicing mixed feeding was 11 times more likely in unfavorable attitude towards feeding options with AOR (95% CI) : 11[1.1-15.9], and mother who had not ANC follow up was 4.2 times more likely to practice mixed feeding with AOR (95% CI) : 4.2 [1.1-15.9].

DISCUSSION

The present study investigated infant and young child feeding practices in selected SNNPR hospitals. The study revealed that more than half of HIV positive mothers experienced exclusive breast feeding, some practiced mixed feeding and very small proportion had experience of exclusive replacement feeding.

The percentage (56.3%) who practiced exclusive breast feeding in this study was higher than the figure from a study done in Addis Ababa, Ethiopia (30.6%), Kenya (35%) (Bii et al., 2008; Maru and Haidar, 2009).

This may be the comparative study areas may relied on replacement feeding (rate of RF for Kenya was 50% and Addis Ababa, 46.8%) and this shows the participants in this study area had low socio economic status to buy formula food compared to the above study areas which leads relay on easily accessible and affordable feeding option, breast feeding.

This study also identifies, from those mothers who ever breast feed, 57% of mothers timely initiated the first breast milk. This is less than a study done in Eastern Uganda (91.5%) (Fadnes et al., 2009). This may be due to socio cultural difference of the two countries. The rate of mixed feeding in the present study was 35.6% which is higher than a study done in Addis Ababa, Ethiopia (15%) and Kenya (14%), but lower than the figure from rural Uganda (61.5%) (Babirye et al., 2009; Bii et al., 2008; Maru and Haidar, 2009).

The main reason why mother gave this fluids/food other than breast milk before 6 months was; due to infant sickness (41.9%), people advice (25.8%) and custom (22.5%). Similar study in Addis Ababa (Maru and Haidar, 2009), has identified the same reasons for the practice of mixed feeding by HIV positive mothers. The rate of exclusive replacement feeding was 8.1%. Similarly, a qualitative result shows most mothers did not use replacement feeding only when mothers have the economic means to purchase formula food. These finding was lower than compared to a study done in Addis Ababa (46.8%) and Kenya, 50% of the mothers practiced exclusive replacement feeding (Maru and Haidar, 2009;

Table 6. Bivariate logistic regression analysis showing relation between exclusive breast feeding practice and selected variables of HIV positive mothers in selected hospital of SNNPR, 2011.

Variable (n=172)	EBF		COR (95%CI)
	Yes N (%)	No N (%)	
Age of mother			
15-29	34 (56.7)	26 (43.3)	1
30-49	15 (75.0)	5 (25.0)	2.3 (0.7-7.1)
Educational status of mother			
</=8 grades	34 (57.6)	25 (42.4)	1
>8grade	15 (71.4)	6 (28.6)	1.8 (0.6-5.4)
Occupation of mother			
Employed	10 (83.3)	2 (16.7)	3.7 (0.8-18.2)
Unemployed	39 (57.4)	29 (42.6)	1
Income			
<400Ebr	21 (67.7)	10 (32.3)	1
401-800Ebr	15(55.6)	12 (44.4)	0.6 (0.2-1.7)
>800Ebr	13 (59.1)	9 (40.9)	0.7 (0.2-2.1)
ANC follow up			
Yes	45 (67.2)	22 (32.8)	4.6 (1.3-16.6)*
No	4 (30.8)	9 (69.2)	1
Disclosure status of mother			
Yes	48 (62.3)	29 (37.7)	3.3 (0.3-38.1)
No	1 (33.3)	2 (66.7)	1
Attitude of mothers towards feeding options			
Favorable	38 (82.6)	8 (17.4)	9.9 (3.5-28.3)**
Unfavorable	11(32.4)	23 (67.6)	1
Awareness of mothers towards feeding option			
Awareness	47 (66.2)	24 (33.8)	6.8 (1.3-35.6)*
unaware	2 (22.2)	7 (77.8)	1
Discussion about d/t feeding option during counseling session			
Yes	22 (68.8)	10 (31.2)	1.7 (0.7-.3)
No	27 (56.2)	21 (43.8)	-

*= $P < 0.05$, **= $P < 0.01$.

Bii et al., 2008). The reason may be most mothers in this study area coming from rural sites have low access to information as well as formula food. The other reason may be as counselors said most of the mothers had low socio economic status so they cannot afford to buy the formula food. Another finding shows that, only one mother practicing expressed but not heat treated breast-milk feeding, as well as no proportion of mother used wet-nursing by HIV negative mother which is similar with

what was reported from Addis Ababa (Maru and Haidar, 2009).

This study shows that, most (79.2%) mothers started complementary food for child at age of 6 to 9 months and Small proportion (16.9%) of mothers started complementary food for child age before 6 months. This finding is almost similar with a study done in Addis Ababa (79.1 and 20.4% respectively) (Maru and Haidar, 2009). This study also shows, large proportion (95.6%) of HIV

Table 7. Bivariate logistic regression analysis showing association between mixed feeding practice and selected variables of HIV positive mothers in selected hospital of SNNPR, 2011.

Variable (n=172)	MF		COR (95%CI)
	Yes N (%)	No N (%)	
Age of mother			
15-29	26 (43.3)	34 (56.7)	1
30-49	5 (25.0)	15 (75.0)	2.3 (0.7-7.1)
Educational status of mother			
</=8 grades	25 (42.4)	34 (57.6)	1.8 (0.6-5.4)
>8grade	6 (28.6)	15 (71.4)	1
Occupation of mother			
Employed	2 (16.7)	10 (83.3)	1
Unemployed	29 (42.6)	39 (57.4)	3.7 (0.8-18.2)
Income			
<400Ebr	10 (32.3)	21 (67.7)	0.7 (0.2-2.1)
401-800Ebr	12 (44.4)	5 (55.6)	1.2 (0.4-3.6)
>800Ebr	9 (40.9)	13 (59.1)	1
ANC follow up			
Yes	22 (32.8)	45 (67.2)	1
No	9 (69.2)	4 (30.8)	4.6 (1.3-16.6)*
Disclosure status of mother			
Yes	29 (37.7)	48 (62.3)	1
No	2 (66.7)	1 (33.3)	3.3 (0.3-38.1)
Attitude of mothers towards feeding options			
Favorable	8 (17.4)	38 (82.6)	1
Unfavorable	23 (67.6)	11(32.4)	9.9 (3.5-28.3)**
Awareness of mothers towards feeding option			
Awareness	24 (33.8)	47 (66.2)	1
unaware	7 (77.8)	2 (22.2)	6.8 (1.3-35.6)*
Discussion about d/t feeding option during counseling session			
Yes	10 (31.2)	22 (68.8)	1
No	21 (43.8)	27 (56.2)	1.7 (0.7-3]

*= $P < 0.05$, **= $P < 0.01$.

positive mothers disclose their sero-status, of whom most (75.1%) of them disclose to their husband, which is similar with a study done in India (67%) (Suryavanshi et al., 2003). One of the influencing factors on the current recommended infant feeding practice among HIV positive mothers would be due to appropriate and good quality of

infant feeding counseling in the PMTCT (Newell, 2005). According to the Federal Ministry of Health (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 (FMOH, 2007).

Table 8. Results of multivariate logistic regression showing determinants of exclusive breast feeding practice of HIV positive mothers in selected hospitals of SNNPR, 2011. (n=172).

Variable	Exclusive breast feeding		AOR(95%CI)
	Yes (%)	No (%)	
Attitude of mothers towards feeding options			
Favorable	38 (82.6)	8 (17.4)	11 (1.1-15.9)**
Unfavorable	11 (32.4)	23 (67.6)	1
ANC follow up			
Yes	45 (67.2)	22 (32.8)	4.2 (1.1-15.9)*
No	4 (30.8)	9 (69.2)	1

*= $P < 0.05$, **= $P < 0.01$.**Table 9.** Results in multivariate logistic regression showing determinant of mixed feeding, practice of HIV positive mothers in selected hospitals of SNNPR 2011. (n=172).

Variables	Exclusive breast feeding		AOR (95%CI)
	Yes (%)	No (%)	
Attitude of mothers towards feeding options			
Favorable	8 (17.4)	38 (82.6)	1
Unfavorable	23 (67.6)	11 (32.4)	11 (1.1-15.9)**
ANC follow up			
Yes	22 (32.8)	45 (67.2)	1
No	9 (69.2)	4 (30.8)	4.2 (1.1-15.9)*

*= $P < 0.05$, **= $P < 0.01$.

However, the percentage of women who received counseling on infant feeding options were 78.7% which is comparable with study done in South Africa, where 82% mothers received information about different feeding options (Ladzani et al., 2010). Majority (96.2%), of mothers received counseling on advantage of exclusive breast feeding during counseling session, which is much higher compared to a study done in four African countries, where 25.7% of mothers received counseling on advantage of exclusive breast feeding (Chopra and Rollins, 2007). It is difficult to reason out, it may need further research to find the reason of this much discrepancy. Most (78.7%), mothers received counseling on disadvantage of exclusive breast feeding, which is similar with what was reported by the study done in four African countries (76.0%) (Chopra and Rollins, 2008).

Several (78%) respondents said they received information on the risk of mixed feeding, which is almost similar to a study done in South Africa (85%) (Ladzani et al., 2010). Another finding from this study, 55.2% of HIV positive mothers had favorable attitude towards feeding options lower than a study done in Addis Ababa (87.2%) (Maru and Haidar, 2009). The reason may be lack of full information regarding advantage and disadvantage of

different feeding options. Concerning determinant factors, mothers who had favorable attitude towards feeding options and mothers with ANC follow up were more likely to practice exclusive breast feeding but less likely to practice mixed feeding. As a study from Addis Ababa (Maru and Haidar, 2009), the present study also stated that mothers who had unfavorable attitude towards feeding options were more likely to practice mixed feeding. In agreement with finding from South Africa study (Ladzani et al., 2010), having had ANC visits was a protective factor for mixed feeding. Qualitative findings show that most health workers unable to estimate risk of HIV transmission was also reported in a studies done in Malawi (Piwoz et al., 2006).

As reported by researcher from Malawi (Piwoz et al., 2006), this study also state that majority of health workers believed that HIV-infected mothers should breastfeed exclusively; on the other hand, some health workers believed that HIV-infected women should not breastfeed because of the risk involved in transmitting the virus to the infant. Even if breast milk contains HIV virus the majority of health worker attitude incline to EBF. This may be in resource limited countries (developing countries) because the formula food does not fill full AFASS criteria.

Only few health workers believed that infant formula is preferable to exclusive breastfeeding because of the risk of contracting HIV through breastfeeding. They explained that the mothers should choose infant formula to reduce the chances of her infant contracting the disease which is in contrast from finding from Cote d'Ivoire (Becquet et al., 2003), most health workers believed that infant formula is preferable to exclusive breastfeeding. The reason may be as most of counselors reported; most mothers were unable to buy formula food.

The first strength of this study was the use of both qualitative and quantitative methods, and triangulation of finding from mothers and health workers. This study had several limitations. First, its cross-sectional design was limited in evaluating cause-and-effect associations. Second, it may be the possibility of recall bias for questions regarding time of initiation of breastfeeding, and complementary feeding

CONCLUSION AND RECOMMENDATION

More than half of HIV positive mothers had experience of exclusive breast feeding. Small proportion of HIV positive mothers had practice mixed feeding, but very small proportion practiced exclusive replacement feeding. In general, infant and young child feeding practices observed in this study fall sort of the WHO recommendations. And half of mothers had favorable attitude towards feeding options. Majority of health workers believed that HIV-infected mothers are better to breastfeed exclusively. Based on this finding, the following recommendations were forwarded first, the health worker should provide adequate information to enable HIV positive mothers select the best feeding options for their babies, and to successfully carry out their infant feeding decisions. Secondly, the regional health office should have a follow up training schedule which should be given to counselors working in PMTCT /ART sites. Thirdly, further research should be conducted by including more study sites to allow a more robust analysis.

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Conflict of Interests

The authors have not declared any conflict of interests.

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