

# Adherence to WHO breastfeeding guidelines among HIV positive mothers in Southern Ethiopia: implication for intervention

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**Background:** Breastfeeding reduces major causes of infant mortality and morbidity. On the other hand, it is a major mode of vertical HIV transmission. In developing countries like Ethiopia, HIV positive mothers are advised to continue breastfeeding up to 12 months. But there is scarce literature regarding the mothers' adherence to continued breastfeeding recommendations. Therefore, the objective of this study is to assess HIV positive mothers' adherence to the infant feeding recommendations of the new World Health Organization (WHO) guidelines for HIV-exposed infants aged  $\geq 6$  months.

**Methods:** A cross-sectional study was conducted in health institutions with antiretroviral therapy and prevention of mother to child transmission facilities in Sidama Zone, Southern Ethiopia. Health institutions were considered as clusters and cluster sampling technique was employed. A total of 184 HIV positive mothers with their infants registered at respective health institutions were recruited and assessed for their infant breastfeeding practices. Descriptive statistics (frequency, mean, median, and standard deviation) were computed to describe the breastfeeding practices of HIV positive mothers.

**Result:** Almost all (181 [98.4%]) of the HIV-exposed infants were "ever breastfed". Among those mothers who had ever breastfed, 158 (87.3%) initiated breastfeeding within an hour of delivery and 157 (85.8%) had fed their babies colostrum while 31 (16.8%) gave pre-lacteal food to their infants. The prevalence of continued breastfeeding at 1 year was (54.5%) (46.9% for urban mothers and 75% for rural mothers). Seventy-one percent (70.9%) of HIV positive mothers practiced "on demand" breastfeeding. Twenty nine percent of infants aged 6–11 months and 47.8% of infants aged  $\geq 12$  months were no longer breastfed. The mean ( $\pm$  standard deviation) duration of breastfeeding was 7.8 ( $\pm 3.1$ ) months (95% confidence interval: 6.9–8.7).

**Conclusion:** The 2010 WHO guidelines and recommendations on breastfeeding duration for HIV positive mothers was not adhered to after 6 months of age. Promotion and counseling of optimal breastfeeding practice for HIV positive mothers based on the updated WHO guideline is an appropriate intervention. However, further research is recommended to evaluate the acceptance of the new 2010 WHO guideline by the health professionals and HIV positive mothers.

**Keywords:** HIV-exposed, infants, breastfeeding, initiation

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## Background

Breast milk remains the best and safest source of nutrition for the vast majority of infants. But in the era of HIV infection, breastfeeding recommendations to HIV positive mothers have changed because of the vertical transmission of the virus through breastfeeding. HIV transmission through breastfeeding could be responsible for over a third of all HIV infections among children. Even if breastfeeding is a major mode

of vertical HIV transmission, it reduces infant mortality from other causes, such as malnutrition and diarrheal diseases.<sup>1-3</sup>

The 2001 and 2006 WHO recommendations and guidelines on infant feeding and HIV emphasized combined promotion of exclusive breastfeeding with early cessation of breastfeeding to reduce mother to child transmission of the virus.<sup>4,5</sup> However, studies among HIV-exposed infants in low income settings have documented that increased morbidity and mortality is associated with earlier cessation of breastfeeding compared to continued breastfeeding.<sup>6-8</sup>

Since the implementation of the 2006 WHO guideline, there were evidences suggesting that giving antiretroviral therapy (ART) to either the HIV-infected mother or HIV-exposed infant can significantly reduce the risk of transmitting HIV through breastfeeding.<sup>9,10</sup> This had recalled the reconsideration of the previous infant feeding guidelines in the context of HIV. In 2010, the new WHO guidelines entitled “Guidelines on HIV and infant feeding principles and recommendations for infant feeding in the context of HIV and a summary of evidence” was produced.<sup>11</sup> Regarding the HIV-exposed infant feeding recommendations, the new 2010 WHO guidelines have differed from its earlier versions. According to the latest guidelines (WHO, 2010) for known HIV positive mothers, whenever antiretroviral drugs are available, exclusive breastfeeding for the first 6 months, followed by timely introduction of appropriate complementary foods and continued breastfeeding for the first 12 months are recommended.<sup>11</sup>

In Sub-Saharan Africa, the roll-out of both highly active ART and more limited prenatal ART, as well as improved understanding of risk factors for HIV transmission through breastfeeding have dramatically reduced the number of infants becoming HIV-infected.<sup>12</sup> One of the major changes in the WHO 2010 guidelines is the recommended duration of breastfeeding. HIV positive mothers are now encouraged to breastfeed their HIV-exposed infants for a minimum of 12 months.<sup>11</sup> The Ethiopian national prevention of mother to child transmission (PMTCT) guideline also recommends exclusive breastfeeding for the first 6 months and continued breastfeeding for at least the first 12 months.<sup>13</sup> However, there are limited documents regarding the adherence of HIV positive mothers to the recommendations of breastfeeding practices after the implementation of the new 2010 WHO infant feeding guideline. Therefore, this study aimed to assess HIV positive mothers’ adherence to the infant feeding recommendations of the new WHO guidelines for HIV-exposed infants aged  $\geq 6$  months.

## Methods

### Study setting and sample

A facility based cross-sectional study was conducted in ten randomly selected ART and PMTCT providing government health institutions (three hospitals and seven health centers) in Sidama Zone, Southern Ethiopia. In Sidama Zone, including Hawassa town, there were 18 health institutions which were providing ART and PMTCT services. Four health institutions were excluded because they had no eligible study subjects during the study time. The remaining eligible 14 health institutions were considered as clusters. From the eligible 14 health institutions, ten health institutions (clusters) were selected randomly. All HIV-exposed infants aged  $\geq 6$  months found in randomly selected health institutions were recruited.

### Measurements

The items to measure adherence were developed from the WHO 2010 and national infant feeding recommendations. Timely initiation of breastfeeding (measured by time at which the baby was put to the breast) and current breastfeeding status (measured by a 24-hour breastfeeding practice) were measured based on the WHO and the national infant and young child feeding (IYCF) recommendations.<sup>14</sup> Colostrum feeding practice was assessed by asking the mother what she did with the first milk (colostrum), while prelacteal feeding was assessed by asking the mother what she gave the child to eat or drink in the first 3 days after delivery other than breast milk. To estimate the timely initiation of breastfeeding, the ratio of infants put to the breast within 1 hour of delivery to the total number of infants was used. Breastfeeding status was assessed by asking the mother whether she had breastfed her infant in the last 24 hours. If the mother stopped breastfeeding she was asked to recall when she had stopped breastfeeding in completed months. Mothers were asked to recall frequency of breastfeeding for the previous 24 hours separately for night and day times. Continued breastfeeding practices at 1 year were defined as proportion of breastfed children aged 12–15 months.<sup>14</sup> Adherence to the WHO, 2010 breastfeeding recommendations was measured using proportions for both recommended and non-recommended behaviors.

### Statistical analysis

Data were checked for completeness and consistency, and entered, cleaned, and coded using SPSS for Windows version 20.0. Descriptive statistics (frequency, mean, median, and standard deviation [SD]) were computed for all continuous and categorical variables.

## Ethical consideration

Ethical approval was received from Hawassa University Institutional Review Board. An official letter of cooperation was also obtained from Sidama Zonal Health Department. The purpose of the study, potential risks and benefits of participating in the study were explained and written consent was secured in participants' own language. The information and collected data were kept confidential.

## Results

### Characteristics of the respondents

A total of 184 HIV positive mothers with HIV-exposed infants aged 6–17 months were included in the study. The mean ( $\pm$  SD) age of mothers was 28.85 ( $\pm$ 5.4) years. A total of 114 (61.9%) HIV positive mothers had infants aged 6–12 months. One hundred and one (54.9%) of the respondents were Protestant by religion and 77 (43.0%) were illiterate (Table 1). One-hundred and fifty-four (83.7%) of HIV positive mothers received information about child feeding recommendations from health professionals while about one third of them 62 (33.7%) received information from television. Sixty-seven percent (67.2%) of HIV positive mothers were receiving ART treatment and 32.8% were on ART prophylaxis.

Almost all (181 [98.4%]) of the HIV-exposed infants had ever breastfed in their lifetime. One hundred and fifty-eight (87.3%) breastfeeding mothers had initiated breastfeeding within 1 hour. Although 157 (85.8%) HIV positive mothers had fed their infants colostrum, 31 (16.8%) of them gave prelacteal food to their infants. In this study, 33 (28.9%) of 6–11 month old infants were not currently being breastfed. Similarly, 33 (47.8%) of infants aged  $\geq$ 12 months were not being breastfed currently out of whom 22 (66.7%) had stopped being breastfed before celebrating their first birthday (Table 2).

Among those infants who were not being breastfed currently the mean ( $\pm$  SD) duration of breastfeeding was 7.8 ( $\pm$ 3.1) months (95% confidence interval 6.9–8.7). The prevalence of continued breastfeeding at 1 year was (54.5%) with urban to rural variation (46.9% versus 75%). However, the urban to rural difference in continued breastfeeding was not statistically significant ( $P=0.38$ ). The prevalence of on demand breastfeeding based on the recommended practice was 129 (70.9%) (Table 2).

## Discussion

The 2010 WHO infant feeding guideline has recommended that HIV-infected mothers breastfeed their infants exclusively

**Table 1** Sociodemographic characteristics of HIV positive mothers in Sidama Zone, Southern Ethiopia, 2012

Sociodemographic characteristics	Frequency	Percentage
Age (years), (n=179)		
$\leq$ 24	28	15.6
25–29	73	40.8
$\geq$ 30	78	43.6
Religion (n=184)		
Protestant	101	54.9
Orthodox Christian	64	34.8
Muslim	15	8.2
Catholic	4	2.2
Ethnic group (n=184)		
Sidama	62	33.7
Amhara	37	20.1
Gurage	30	16.3
Oromo	28	15.2
Wolayita	17	9.2
Other*	10	5.4
Current marital status (n=181)		
Married	158	85.9
Not married/widowed	26	14.1
Place of residence (n=184)		
Urban	134	72.8
Rural	50	27.2
Educational status (n=179)		
Illiterate**	77	43.0
Literate	8	4.5
Primary education (1–8 years)	53	29.6
Secondary education (9+ years)	41	22.9
Sex of infant (n=184)		
Male	106	57.6
Female	78	42.4
Monthly income (ETB), (n=116)		
$\leq$ 500	67	57.8
501–1,000	29	25.0
$\geq$ 1,001	20	17.2
Birth order (n=176)		
1	54	30.7
2–3	94	53.4
$\geq$ 4	28	15.9
Family size (n=182)		
$\leq$ 3	50	27.5
4–5	103	56.6
$\geq$ 6	29	15.9
Age of infants (n=184)		
6–8 months	69	37.5
9–11 months	45	24.5
12–17 months	70	38.0

**Notes:** \*Tigre, Kambata and Gamo; \*\*those without any formal education.

**Abbreviation:** ETB, Ethiopian Birr.

for the first 6 months, then introduce appropriate complementary foods and continue breastfeeding for the first 12 months.<sup>11</sup> In the current study, about 28.9% of infants in the age category of 6–11 months were not being breastfed. This finding is consistent with a study done in Uganda which

**Table 2** Breastfeeding patterns and practices of HIV positive mothers in Sidama Zone, Southern Ethiopia, 2012

Variable	Frequency	Percentage
Ever breastfed		
Yes	181	98.4
No	3	1.6
Breastfeeding initiated		
Within 1 hour	158	87.3
After 1 hour	23	12.7
Colostrum fed		
Yes	157	85.8
No	26	14.2
Prelacteal food given		
Yes	31	16.8
No	153	83.2
Breastfeeding stopped (for infants aged 6–11 months)		
Yes	33	28.9
No	81	71.1
Breastfeeding stopped before 12 months (for infants aged ≥ 12 months)		
Yes	22	66.7
No	11	33.3
On demand breastfeeding		
Yes	129	70.9
No	53	29.1
Scheduled breastfeeding		
Yes	26	14.3
No	156	85.7
Breastfeed when child cries		
Yes	30	16.5
No	152	83.5
Breastfeed on convenience		
Yes	11	6
No	171	94.0
Breastfeed when the breast was engorged		
Yes	10	5.5
No	172	94.5

showed that 27% of infants under 12 months had stopped being breastfed.<sup>15</sup> However, the recommendation for HIV positive mothers during the Ugandan study was different from the current one. This study also found that 47.8% of infants aged  $\geq 12$  months were not being breastfed currently. The mean ( $\pm$  SD) duration of breastfeeding among infants who had stopped being breastfed was 7.8 ( $\pm 3.1$ ) months. The Ugandan study reported that median breastfeeding duration among HIV positive mothers was 12 months.<sup>15</sup> Recent studies indicate that for many babies in resource poor homes, stopping breastfeeding carries a higher risk of death (from infection and malnutrition) than continued breastfeeding.<sup>16,17</sup> The breastfeeding practice of HIV positive mothers was not consistent with the current recommendations of WHO regarding breastfeeding. One of the possible reasons for this

high prevalence of inappropriate breastfeeding pattern and practices among HIV-exposed infants could be the implementation of the previous WHO guidelines which recommend total avoidance of breastfeeding if the “acceptable, feasible, affordable, sustainable and safe” (AFASS) criterion is fulfilled. A study from four African countries showed that health workers were found to significantly overestimate the risk of HIV transmission through breastfeeding while the risks of non-breastfeeding were rarely communicated to mothers even though reports of high mortality have been reported among infants who were formula fed.<sup>18</sup> So there is a need for continuous follow-up of the health facilities by respective health program administrators and program evaluators to avoid such inconsistent/inappropriate implementation of the recommendations to avert HIV transmission and making the zero transmission a realistic goal for PMTCT intervention and to adopt the new WHO recommendation to safeguard the health of children.

The prevalence of continued breastfeeding was 46.9% among urban and 75% among rural mothers. But there is no significant difference in the prevalence of continued breastfeeding by place of residence. It is consistent with the global prevalence of continued partial breastfeeding at 1 year which remains relatively high (76%).<sup>19</sup> In fact, this study has a small number of study subjects which might not reflect the prevalence of the actual practice. Prolonged breastfeeding increases the risk for mother to child transmission of the virus. According to 2010 WHO guidelines breastfeeding should only be stopped once a nutritionally adequate and safe diet without breast milk can be provided and should then be stopped gradually within 1 month.

The prevalence of timely initiation of breastfeeding (87.3%) was lower as compared to the findings reported from Tanzania (95.4%) and South Africa (96%).<sup>20,21</sup> Another South African study reported that almost a third of HIV positive women initiated breastfeeding within 1 hour of giving birth.<sup>22</sup> Delayed breastfeeding initiation has been reported to increase the risk of neonatal death.<sup>23</sup> Encouraging earlier breastfeeding initiation could thus increase infant survival.

The prevalence of colostrum feeding in the current study (85.8%) is comparable with the study from South Africa which reported that most mothers (85%) offered colostrum to their babies while 13% of mothers threw it away.<sup>21</sup> This study found low prevalence of prelacteal feeding (16.8%) as compared to a study from Uganda (64%) and South Africa (37%) among HIV positive women.<sup>15,22</sup> This might have resulted from the fact that those mothers



received information promoting colostrum feeding during antenatal visits and delivery services along with other necessary counseling sessions to encourage the pregnant and lactating women.

Despite the fact that on demand breastfeeding is recommended practice according to the Ethiopian IYCF guidelines, only 70.9% of mothers practiced on demand breastfeeding. It is a little higher as compared to a study done in South Eastern Ethiopia, which reported 63.3%.<sup>24</sup> The difference can be explained by the fact that those HIV positive mothers have monthly follow-up visits at the health institutions even after they have given birth and may be receiving more counseling about on demand breastfeeding.

This study has its own limitations including the small sample size, recall bias since the breastfeeding practice happened in the past, and selection bias as the study population was HIV positive mothers who attended health facilities/clinics.

## Conclusion

The breastfeeding practice of HIV positive mothers was suboptimal when it was evaluated according to the updated Ethiopian and WHO recommendations regarding HIV and infant feeding. Promotion of and counseling regarding optimal breastfeeding for HIV positive mothers using the updated national and international recommendations is an appropriate intervention. However, further research is recommended to evaluate the acceptance of the 2010 WHO guidelines on HIV and infant feeding by the health professionals and HIV positive mothers.

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## Author contributions

DH conceived and designed the study and drafted the manuscript. TS assisted in designing the study, result interpretation, and reviewed the manuscript critically. SB assisted in data interpretation and reviewed the manuscript critically. All authors contributed toward data analysis, drafting and critically revising the paper, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

## Disclosure

The authors have no conflict of interest to disclose.

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