Research Article

Assessment of Knowledge, Attitude, and Practice of HIV Positive Mothers on Antiretroviral Treatment towards Infant Feeding in Gondar Town Health Institutions, North West Ethiopia, 2017

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Introduction. The world health organization recommends feeding practices for infants born from Human Immunodeficiency Virus (HIV) infected mothers to be safe to both the infant and the mother. This includes prevention of mother to child transmission of the virus and at the same time meeting nutritional requirements of the child. This requires prioritizing prevention of HIV transmission through breastfeeding against non-HIV morbidity and mortality especially from malnutrition and serious illnesses such as diarrhea, among nonbreastfed infants. Objective. This study was aimed at assessing knowledge, attitude, and practice of HIV positive mothers on antiretroviral therapy towards infant feeding. Method. Institution based cross-sectional study was conducted among 402 HIV positive mothers at ART clinics of Gondar town from March 1 to April 18, 2017. Systematic random sampling technique was used to select study participants. Data was collected using a structured, pretested, interviewer-administered questionnaire. The collected data was entered into Epi Info version 7 and analyzed using SPSS version 20 software. Result. A total of 402 participants were interviewed with a 100% response rate. The mean age of participants was 29.24 (SD±10.06) years. The overall level of participant good knowledge and favorable attitude was 68.91% and 75.87%, respectively. Only 23.7% of mothers were practicing infant feeding according to WHO recommendation.

1. Background

The world health organization (WHO) recommends feeding practices for infants born from Human Immunodeficiency Virus (HIV) infected mothers to be safe to both the infant and the mother. This includes prevention of mother to child transmission (PMTCT) of the virus and at the same time meeting nutritional requirements of the child. This requires prioritizing prevention of HIV transmission through breastfeeding against non-HIV morbidity and mortality especially from malnutrition and serious illnesses such as diarrhea, among nonbreastfed infants [1].

In light of previous findings, it is recommended that HIV positive mothers use either exclusive breastfeeding (EBF) for 6 months of age or exclusive replacement feeding (ERF) if the latter is Acceptable, Feasible, Affordable, Sustainable, and Safe (AFASS) [2]. At six months of age, continuation of breastfeeding with additional complementary foods is recommended. Choice over breastfeeding or breast milk substitute depends on extended family or community, the nature of work and lifestyle of the mother or family [1]. All breastfeeding should stop once a nutritionally adequate and safe diet without breast milk can be provided [3].

It is estimated that the risk of mother to child transmission of HIV virus is 10–20% for those breastfeeding for two years [4, 5]. But, if exclusive breastfeeding is practiced, it is associated with a reduced risk of HIV transmission...
in the early months of postpartum, compared to mixed breastfeeding [6, 7].

HIV transmission through breastfeeding is pervasive in Sub-Saharan Africa, where mixed feeding is a predominant form of infant feeding as a result of a combination of cultural norms as well as economic conditions [5]. In this region, the majority of HIV positive mothers choose EBF but due to traditional factors and lack of practical support, the majority end up with mixed feeding resulting in high rates of postnatal HIV transmission [6].

In Ethiopia, 58% of children under the age of 6 months are exclusively breastfed regardless of maternal HIV status [8]. Despite few local studies conducted in different parts of the country, there is no literature that has tried to identify infant feeding practice among HIV positive mothers in the study area. Thus, the purpose of this study was to assess the existing infant feeding knowledge, attitude, and practices (KAP) among HIV positive mothers attending antiretroviral therapy (ART) clinics of Gondar town.

2. Methods

2.1. Study Area and Design. Institution based cross-sectional study was conducted from March 1 to April 18, 2017.

2.2. Study Area. This study was conducted in Gondar town government health institutions. Gondar town has eight health centers (clinics rendering service to about 5000 people of the catchment area) and one specialized hospital. These health institutions serve about four million people and have a combined average of 400 visiting patients per day. The number of people on ART in these health institutions is 12,562 and number of pregnant and lactating mothers on ART is 826.

2.3. Sample Size Determination. The sample size for the study was determined using the formula for single population proportion by assuming 5% marginal error and 95% confidence interval (0(alpha)=0.5) and the prevalence (P) for KAP and infant feeding practices 38.8% [9].

\[
\frac{(1.96)^2 \times 0.388(1 - 0.388)}{(0.5)^2} = 365 \tag{1}
\]

By assuming a 10% nonresponse rate, the final sample was 402.

2.4. Sampling Techniques. All health centers and Gondar university specialized hospital were studied. The sample size was allocated to health institutions proportionally based on the number of mothers on ART. Systematic random sampling technique was used for selecting individual participant mothers.

2.5. Inclusion Criteria. All HIV positive mothers on ART with babies aged 6–12 months were included in the study.

2.6. Exclusion Criteria

(i) Mothers who had difficulty of communication.
(ii) Mothers who were severely ill.

2.7. Data Collection and Quality Control. Data quality was maintained by the following data quality control mechanisms; the questionnaire was pretested on 5% of the sample (i.e., 21 mothers on ART) at Felege-Hiwot referral hospital. One-day training was given to data collectors and supervisors. The questionnaire designed in English was translated to Amharic, the local language, and back to English for consistency. As this study used the interviewer-administered questionnaire, to reduce social desirability bias, data collectors who were not working in the respective health institutions were recruited. Strict supervision of the data collection was carried out throughout the data collection period. The collected data was checked for its consistency and completeness before any attempt to enter the code and analyze it.

2.8. Data Processing and Analysis. Raw data was cleaned, coded, entered to EPI Info version 7, and exported to SPSS version 20 for analysis. Frequency tables, means, and standard deviations were used to summarize the data. And finally, the result was interpreted to valuable information and presented using text and tabular form.

2.9. Operational Definitions

(i) Poor knowledge: If the respondent scores below the mean for knowledge questions.
(ii) Good knowledge: If the respondent scores the mean or above for knowledge questions.
(iii) Favorable attitude: If the respondent scores the mean or above for attitude questions.
(iv) Unfavorable attitude: If the respondent scores below the mean for attitude questions.
(v) Good practice: If the respondent complies with WHO recommendation of feeding of infants born to HIV positive mothers [1]. Either

(1) Exclusive breastfeeding, fulfilling: (a) initiating breastfeeding within the first hour of life; (b) exclusive breastfeeding for the first six months of life (infant only receives breast milk without any additional food or drink, not even water); followed by (c) continued breastfeeding for up to two years or beyond (with introduction of appropriate complementary foods at six months); and (d) breastfeeding on demand, that is, as often as the child wants, day and night or

(2) ERF (no breastfeeding at all): Mothers known to be living with HIV should only give commercial infant formula milk as a replacement feed to their HIV-uninfected infants or infants who are of unknown HIV status when specific conditions are met: (A) safe water and sanitation are assured at the household level and in the community; and (B) the mother or other caregiver can reliably provide sufficient infant formula milk to support the normal growth and development of the infant; and (C) the...
mother or caregiver can prepare it cleanly and frequently enough so that it is safe and carries a low risk of diarrhea and malnutrition; and (D) the mother or caregiver can, in the first six months, exclusively give infant formula milk; and (E) the family supports this practice; and (F) the mother or caregiver can access healthcare that offers comprehensive child health services. These descriptions are intended to give simpler and more explicit meaning to the concepts represented by AFASS (Acceptable, Feasible, Affordable, Sustainable, and Safe).

(vi) Poor practice: If the respondent practices neither EBF nor ERF according to WHO recommendation.

3. Result

3.1. Sociodemographic Characteristics. A total of 402 participants were interviewed with a 100% response rate. The mean age of participants was 29.24 (SD ± 10.06) years. More than three-quarters (77.86%), of the participants were Orthodox Christians and 209 (51.99%) were married. The majority (74.44%) were Amhara by ethnicity and 78.36% of the participants were urban residents (Table 1).

3.2. Clinical and Obstetrical Characteristics of Participants. In this study, more than half (55.22%) of the participants were enrolled from health centers. Majority (83.58%) and three-quarters (77.86%), of the participants were Orthodox Christians and 78.36% of the participants were urban residents (Table 1). In this study, 67.16% of the mothers answered “yes” to the question “Does HIV positive mothers transmit the virus to the baby during breastfeeding?” This is in line with 70% result from a similar study conducted in Gert Sibande district, South Africa [14].

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Although there was a very high proportion of mothers who were aware of the possibility of an infected mother transmitting the infection to her child, only 129 (32%) said exclusive breastfeeding can reduce risk of diarrhea. This indicates the potential for introduction of feeding other than breast milk among mothers who do not agree on this statement.

4. Discussion

This study revealed the knowledge, attitude, and practice of HIV positive mothers on infant feeding options to children born from HIV infected mothers.

4.1. Knowledge on Infant Feeding. In this study, the overall level of good knowledge of participants was 68.91% (95% CI, 62.1–74.6%). This study found knowledge levels of participants greater than studies done in Jimma, Ethiopia, which is 38.8% [9], and Gaborone, Botswana [10]. This is encouraging result because, as Health Belief Model [11] described, the higher the perception of a mother about safe infant feeding practices, the more likely to practice it. This in turn reduces the risk of mother to child transmission (MTCT). But the finding of this study is lower than the finding in Hosanna, Ethiopia (92.8%) [12], and Tigray, Ethiopia (88.1%) [13].

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This study also revealed that mothers who mentioned MTCT to be through pregnancy, labor, and breastfeeding were 54.2%. This finding is less than a study done in Gonder referral hospital (92.3%) [15]. This discrepancy could be from the fact that the current study included mothers from health centers and hospital while the former only included mothers who had follow-up in hospital where care and education are provided by better-qualified professionals.

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4.2. Attitude on Infant Feeding. Regarding attitude on infant feeding, 75.87% of the mothers had favorable attitude towards safe infant feeding (95% CI, 69.8–81.7%). This is higher than a study done in southern Ethiopia which is 56.7% [16]. The time and geographical difference between these two studies, which might have effect on the attitude of participants, may justify the difference. On examining the responses of the study participants, nearly all (91.04%) agreed that breast milk is the ideal food for the baby less than six months of age. This is higher as compared to the findings in South Africa and Lesotho where 78.8% and 52% agreed that breast milk is the ideal food for the baby less than six months of age, respectively [17, 18]. This in part could be attributed to the fact that there is a decade time gap between the current study and the one conducted in South Africa. While the study conducted in Lesotho collected data from mothers having children up to six months, the current study collected data from mothers having children up to two years. This may have effect on maternal attitude on the long run with repeated exposure with health professionals.
Table 1: Sociodemographic characteristics of HIV positive mothers attending ART in Gondar town health institutions, northwest Ethiopia, 2017 (n=402).

| Variables               | Frequency | Percent |
|-------------------------|-----------|---------|
| Age                     |           |         |
| < 25                    | 47        | 11.69   |
| 25-35                   | 290       | 72.14   |
| > 35                    | 65        | 16.17   |
| Religion                |           |         |
| Orthodox                | 313       | 77.86   |
| Protestant              | 48        | 11.94   |
| Muslim                  | 41        | 10.20   |
| Marital status          |           |         |
| Single                  | 78        | 19.40   |
| Married                 | 209       | 51.99   |
| Widowed                 | 69        | 17.16   |
| Divorce                 | 46        | 11.45   |
| Ethnicity               |           |         |
| Amhara                  | 301       | 74.88   |
| Oromo                   | 35        | 8.71    |
| Tigre                   | 66        | 16.41   |
| Educational status      |           |         |
| Unable to read and write| 82        | 20.40   |
| Able to Read and write  | 92        | 22.89   |
| Grade 1-8               | 153       | 38.06   |
| Grade 9 -12             | 50        | 12.44   |
| College and above       | 25        | 6.21    |
| Residence               |           |         |
| Urban                   | 315       | 78.36   |
| Rural                   | 87        | 21.64   |
| Occupation              |           |         |
| Government              | 163       | 40.55   |
| employee                | 36        | 8.96    |
| Housewife               | 95        | 23.63   |
| Merchant                | 48        | 11.94   |
| Student                 | 21        | 5.22    |
| Daily laborer           | 39        | 9.70    |
| Nonemployed             |           |         |
| Monthly family income (Ethiopian Birr) | | |
| < 1000                  | 97        | 24.13   |
| 1000-2000               | 194       | 48.26   |
| 2001-3000               | 52        | 12.93   |
| >3000                   | 59        | 14.68   |
| No of children          |           |         |
| < 3                     | 241       | 59.95   |
| ≥ 3                     | 161       | 40.05   |

4.3. Safe Infant Feeding Practice. The overall safe feeding practice consistent with WHO recommendation is 23.7% (95% CI, 17.1–29.7%). This is in line with a study on Ugandan women among whom 29% discussed their feeding to be consistent with WHO recommendations [19].

In this study the overall safe feeding practice based on WHO recommendation was much higher among age groups >35 years of age (76.92%) as compared to age group < 25 years of age (10.64%). This is supported by a study in Nigeria that showed older age was associated with increased rates of safe infant feeding practice [20]. The reason might be that those mothers with age > 35 years may have more children and more experience with infant feeding but young mothers may not be well experienced with regard to infant care including infant feeding options.
The proportion of mothers who practiced safe infant feeding was 27% and 16% among mothers who had good knowledge and poor knowledge about infant feeding, respectively. This is supported by the evidence from health belief model that says the higher the perception of people about health needs, the more likely they make decisions that promote health [11]. In other words, the higher the mother has knowledge about safe infant feeding practices, the more likely she practices them.

Among urban residents, the overall safe infant feeding practice was 26% but it was 12% among rural residents. This could be due to the fact that urban mothers are more informed about infant feeding options through the media and have good knowledge which increases the likelihood of practicing safe infant feeding. When it comes to attitude, 27.87% of mothers who had favorable attitude towards infant feeding practiced safe infant feeding while only 10.31% of mothers with unfavorable attitude practiced safe infant feeding. This finding is supported by a study in Addis Ababa that showed positive parental attitude to be a strong predictor of safe infant feeding practice [21]. This discrepancy can be attributed to the inclination that mothers have an infant feeding practice based on their attitude. In other words, mothers with favorable attitude are more likely to practice breastfeeding according to recommendations by health professionals while mothers with unfavorable attitude towards breastfeeding are less likely to follow recommendations.

Regarding exclusive breastfeeding, 23.06% of the mothers practiced exclusive breastfeeding for the first six months which is in line with a study in Addis Ababa, Ethiopia (30.6%)}
| Variables                                                                 | Frequency | Percent  |
|--------------------------------------------------------------------------|-----------|----------|
| Overall knowledge level                                                  |           |          |
| Good Knowledge                                                           | 277       | 68.91    |
| Poor knowledge                                                           | 125       | 31.09    |
| HIV transmitted through pregnancy, labor and breastfeeding               |           |          |
| Yes                                                                      | 218       | 54.2     |
| No                                                                       | 184       | 45.8     |
| Does HIV mother transmit the virus to her baby during labor              |           |          |
| Yes                                                                      | 205       | 50.99    |
| No                                                                       | 155       | 38.56    |
| Don’t know                                                               | 42        | 10.45    |
| Does HIV mother transmit the virus to her baby during pregnancy          |           |          |
| Yes                                                                      | 177       | 44.03    |
| No                                                                       | 180       | 44.78    |
| Don’t know                                                               | 45        | 11.19    |
| Does breast milk prevent childhood illness                               |           |          |
| Yes                                                                      | 281       | 69.90    |
| No                                                                       | 50        | 12.44    |
| Don’t know                                                               | 71        | 17.66    |
| Feeding only breast milk in the first six months helps boost the child immunity |           |          |
| Yes                                                                      | 292       | 72.64    |
| No                                                                       | 76        | 18.91    |
| Don’t know                                                               | 34        | 8.45     |
| Is it important to initiate breastfeeding within one hour after birth    |           |          |
| Yes                                                                      | 267       | 66.42    |
| No                                                                       | 60        | 14.93    |
| Don’t know                                                               | 75        | 18.65    |
| Can exclusive breastfeeding reduce the risk of diarrhea?                 |           |          |
| Yes                                                                      | 129       | 32.09    |
| No                                                                       | 144       | 35.82    |
| Don’t know                                                               | 129       | 32.09    |
| Growth patterns of exclusively breastfed infant/s differ from nonexclusively breastfed? |           |          |
| Yes                                                                      | 288       | 71.64    |
| No                                                                       | 47        | 11.69    |
| Don’t know                                                               | 67        | 16.67    |
| How long should exclusive breastfeeding be continued?                    |           |          |
| < 6 months                                                               | 60        | 14.93    |
| 6 months                                                                 | 301       | 74.87    |
| > 6 months                                                               | 41        | 10.20    |

Interventions should focus on bridging the gap between having good knowledge and favorable attitude and practicing of the recommendations.

**Acronyms**

- AFASS: Acceptable, Feasible, Affordable, Sustainable, and Safe
- AIDS: Acquired Immune Deficiency Syndrome
- ANC: Antenatal Care
- ART: Antiretroviral therapy
- EBF: Exclusive breastfeeding

%) [20]. But this result is lower than a result of a similar study done in southern Ethiopia where 48.2% of the mothers were practicing exclusive breastfeeding [16]. A study in India also showed that 57% of women practiced exclusive breastfeeding in the first six months of life [22]. This could be justified by the differences in the sociocultural nature of the study areas.

**5. Conclusion**

Even though the knowledge and attitude of participants about infant feeding are higher, the actual practice is low.
Table 4: Attitude of HIV positive mothers attending ART in Gondar town health institutions, northwest Ethiopia, 2017 (n=402).

| Variables                                                                 | Frequency | Percent |
|---------------------------------------------------------------------------|-----------|---------|
| Overall level of attitude                                                |           |         |
| Favorable attitude                                                       | 305       | 75.87   |
| Unfavorable attitude                                                     | 97        | 24.13   |
| EBF (exclusive breastfeeding) for 6 months is the best choice for infant |           |         |
| Agree                                                                    | 366       | 91.04   |
| Disagree                                                                 | 36        | 8.96    |
| EBF is not good since it transmits HIV                                   |           |         |
| Agree                                                                    | 297       | 73.88   |
| Disagree                                                                 | 105       | 26.12   |
| EBF for 6 months is nutritionally complete                               |           |         |
| Agree                                                                    | 344       | 85.57   |
| Disagree                                                                 | 58        | 14.43   |
| Breastfeeding should be continued up to 2 years?                          |           |         |
| Agree                                                                    | 196       | 48.76   |
| Disagree                                                                 | 206       | 51.24   |
| I do not accept EBF for fear of stigma due to HIV                        |           |         |
| Agree                                                                    | 255       | 63.43   |
| Disagree                                                                 | 147       | 36.57   |
| Should breastfeeding be stopped when a child has diarrheal episode       |           |         |
| Agree                                                                    | 88        | 21.89   |
| Disagree                                                                 | 314       | 78.11   |
| Formula feeding better than breastfeeding?                               |           |         |
| Agree                                                                    | 91        | 22.64   |
| Disagree                                                                 | 311       | 77.36   |
| Mixed feeding has a risk of HIV infection to infant/last child           |           |         |
| Agree                                                                    | 177       | 44.03   |
| Disagree                                                                 | 225       | 55.97   |
| Do you believe that breastfeeding causes changes in body shape for the mother? |           |         |
| Agree                                                                    | 232       | 57.71   |
| Disagree                                                                 | 170       | 42.29   |
| Does breastfeeding increases mother-child bonding?                       |           |         |
| Agree                                                                    | 369       | 91.79   |
| Disagree                                                                 | 33        | 8.21    |
| Bottle feeding is a good infant feeding option                            |           |         |
| Agree                                                                    | 95        | 23.63   |
| Disagree                                                                 | 307       | 76.37   |
| Complimentary food after 6 months is the best choice                     |           |         |
| Agree                                                                    | 333       | 82.84   |
| Disagree                                                                 | 69        | 17.16   |

EDHS: Ethiopian Demographic and Health Survey
HIV: Human Immunodeficiency Virus
KAP: Knowledge, attitude, and practice
MBF: Mixed breastfeeding
MTCT: Mother to child transmission
NGO: Nongovernmental Organization
PMTCT: Prevention of mother to child transmission
SPSS: Statistical Package for Social Sciences
UNAIDS: United Nation Program on HIV/AIDS
UNFPA: United Nation Fund population
WHO: World Health Organization.

Data Availability

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

Ethical Approval

The study was approved by University of Gondar College of Medicine and Health Sciences research and ethical review committee. Permission letter was obtained from the head of the health institutions.
Table 5: Feeding practice of HIV positive mothers attending ART in Gondar town health institutions, northwest Ethiopia, 2017 (n=402).

| Variables                                      | Frequency | Percent |
|------------------------------------------------|-----------|---------|
| Overall feeding practice                       |           |         |
| Good practice                                  | 95        | 23.7%   |
| Poor practice                                  | 307       | 76.3%   |
| Do you breastfeed your child                   |           |         |
| Yes                                            | 399       | 99.25   |
| No                                             | 3         | 0.75    |
| Initiation of breastfeeding (n=399)            |           |         |
| Immediately after delivery                     | 67        | 16.79   |
| Within one hour after delivery                 | 247       | 61.90   |
| After one hour of delivery                     | 85        | 21.31   |
| Have you experienced any breastfeeding problem (n=399) | | |
| Yes                                            | 266       | 66.67   |
| No                                             | 133       | 33.33   |
| What was the breastfeeding problem (n=266)     |           |         |
| Not enough milk                                | 240       | 90.23   |
| Nipple crack                                   | 16        | 6.01    |
| Baby mouth ulcer                               | 10        | 3.76    |
| What did you feed your baby within the first three days (n=399) | | |
| Only breastfeed                                | 300       | 75.19   |
| Water and sugar                                | 67        | 16.79   |
| Butter                                         | 32        | 8.02    |
| Duration of breastfeeding (n=399)              |           |         |
| Birth to 6 months                              | 177       | 44.36   |
| 12 months                                      | 106       | 26.57   |
| 18-24 months                                   | 116       | 29.07   |
| Frequency of breastfeeding/day (n=399)         |           |         |
| < 8 times                                      | 271       | 67.92   |
| ≥ 8 times                                      | 128       | 32.08   |
| Duration of Exclusive Breastfeeding (n=399)    |           |         |
| 1-2 months                                     | 100       | 25.06   |
| 3-5 months                                     | 207       | 51.88   |
| 6 months                                       | 92        | 23.06   |

Consent

Each study participant was informed about the purpose, method, expected benefit, and risk of the study. Mothers/guardians were also informed about their full right not to participate or withdraw from the study at any time, and deciding not to participate had no impact on the services rendered to them. Informed verbal consent was obtained from study participants and anonymity was employed for confidentiality purpose.

Conflicts of Interest

The authors of this study declare that they have no competing interests.

Authors’ Contributions

Daniale Tekelila Ekubagewargies wrote the proposal, supervised data collection, analyzed the data, and drafted the manuscript. Habtamu Sewunet Mekonnen and Tsehayu Melak Siyoum approved the proposal with revisions, participated in data analysis, and revised subsequent drafts of the manuscript. All authors read and approved the final manuscript.

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