



## Infant Feeding Practices among HIV-Positive Women in Enugu, Nigeria

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### Authors' contributions

This work was carried out in collaboration between all authors. Author LCI designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors HUE and MIN managed the literature searches, analyses of the study performed the spectroscopy analysis while authors ENI and TCO carried out the statistical analysis. All authors read and approved the final manuscript.

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## ABSTRACT

**Background:** Preventing transmission of HIV from mother to child after birth is one of the greatest challenges in HIV prevention.

**Aim:** To evaluate the infant feeding practices among HIV-positive mothers and the factors that influenced their decisions at the University of Nigeria Teaching Hospital, Enugu, Nigeria.

**Methods:** This was a questionnaire based cross-sectional study carried out at the paediatric HIV follow-up clinic between 1<sup>st</sup> January and 31<sup>st</sup> March 2014. Analysis was carried out using SPSS version 10.0 (Chicago IL, USA). P values less than 0.05 were considered significant.

**Results:** Fifty four HIV-Positive mothers were evaluated. The mean (standard deviation) for age of the respondents was 29.7 (4.2) years. Thirty two respondents (59.3%) practiced replacement feeding, 14(29.9%) practiced mixed feeding while 8(14.8%) practiced exclusive breast feeding. Of the mothers that practiced mixed feeding, 10(71.4%) did not receive counseling on infant feeding practices. Replacement feeding was adopted by 27 (84.4%) of respondents for fear of transmission of HIV to their children. Disclosure of status and counseling were independently significantly

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associated with the adoption of recommended infant feeding methods (EBF and RF)  $P < 0.05$ .

**Conclusion:** Exposure to counseling on infant feeding methods was low. Current guidelines on infant feeding methods should be disseminated through structured counseling sessions at Maternity care centres for HIV-positive mothers.

*Keywords: Infant feeding; practice; HIV-positive mothers; counseling.*

## 1. INTRODUCTION

HIV/AIDS remains one of the greatest burdens in the world today. Sub-Saharan Africa, with a prevalence of 5.0%, still accounts for over two-thirds (68%) of infections [1]. About 600,000 children are infected with the HIV virus each year through mother-to-child transmission (MTCT) and the majority of these cases are in Africa [2].

Nigeria currently has the largest burden of paediatric HIV in the world [3]. In a study in Ibadan, Nigeria a paediatric seroprevalence of 10% was reported and MTCT accounted for 93.3% of the cases [3].

Without intervention, about 35% of HIV-positive pregnant women will pass on the infection to the babies during pregnancy, delivery and postnatal through breast feeding [4]. In the absence of interventions, about 10-20% of infants born to infected mothers will contract the virus through breast milk if breastfed for two years [4]. Avoidance of breastfeeding therefore would eliminate the risk of postnatal HIV infection from the breast milk. Breastfeeding however, is an important pillar of child survival and a part of a mother's womanhood [5]. Not breastfeeding during the first two months of life is associated with six-fold increase in mortality due to infectious disease [6].

Hitherto, ways to reduce or prevent postnatal transmission of HIV included the avoidance of all breastfeeding through the use of replacement feeds (RF), or exclusive breastfeeding (EBF) for a limited period with early or rapid cessation of breastfeeding as soon as it is feasible [7]. A study in Mozambique highlighted the dangers inherent in early cessation of breastfeeding under conditions of underlying poor socio-economic status as most of the locally available food stuffs do not meet the nutritional needs of non-breastfed infants between 6-12 months of age [8].

RF means feeding an infant a diet that provides the necessary nutrients while receiving no breast

milk [9]. Replacement feeding can reduce HIV transmission but is also associated with morbidity related to diarrhea and respiratory infections [4]. There is also the social stigma of not breastfeeding which will immediately identify a woman as HIV-positive. Additional set back of RF include the possibility of increased fertility and population growth if the contraceptive effects of breastfeeding were no longer available to the African woman [10].

A study in South Africa showed that infants fed with both breast and milk at age twelve weeks were twice as likely as exclusively breastfed infants to be infected [11]. It is generally accepted that mixed feeding (MF), defined as giving the infant breast milk in addition to any other fluids or feeds, may damage the bowel and facilitate transmission of HIV [4].

The World Health Organization (WHO) 2010 guidelines on infant feeding recommend EBF with antiviral (ARV) treatment intervention for the first six months of a child's life to reduce transmission, and continued breastfeeding with complimentary feeding until the child is at least a year old [12]. A large African study showed that giving HIV-positive mothers a combination of three ARV's during pregnancy, delivery and breastfeeding cuts HIV infections in infants by 43% by the age of 12 months and reduces transmission by 54% compared to where ARV drug regimens ended at delivery [13]. Although most developing countries have revised guidelines to comply with WHO, the latest guidelines on infant feeding options for HIV-positive mothers in Africa have not been well disseminated leaving women confused about the best way to protect their children from contracting HIV [14]. HIV-positive mothers have faced the dilemma of either giving their children all the benefits of breastfeeding but exposing them to the risk of HIV infection or avoiding all breastfeeding and increasing the risk of death from diarrhea and malnutrition [14].

Due to poor follow up of parturient HIV-positive women through routine public health services, very little is known about this actual feeding

practice of this group in our area where breastfeeding is the cultural norm. It is against this background that this study was undertaken to evaluate the infant feeding practices among HIV-positive women in Enugu, Nigeria.

## 2. SUBJECTS AND METHODS

This was a questionnaire based cross-sectional study carried out over period of three months, 1<sup>st</sup> January to 31<sup>st</sup> March, 2014 at the University of Nigeria Teaching Hospital (UNTH), Enugu. Enugu is an old regional capital situated in the South Eastern part of Nigeria.

The study was approved by the Ethics Committee of the University of Nigeria Teaching Hospital, Enugu. Mothers who agreed to participate in the study were either asked to sign or thumb print the inform consent form depending on the level of literacy. Participation was therefore entirely voluntary.

### 2.1 Sample Size

The sample size was determined using the prevalence of HIV among females reproductive age, 3.5% [5] in Enugu since no data was available. The sample size was calculated using the formula for estimated population size of less than 10,000 [15].

$$N = Z^2 p(1-p)/d^2.$$

Where;

N=minimum sample size,  
Z=1.96 at 95% confidence limit;  
d= margin of error tolerated=5%;  
p=prevalence of HIV among females of reproductive age in Enugu=3.5%;  
 $N = 1.96^2 \times 0.035 \times 0.965 / 0.05 \times 0.05$   
Minimum sample size=52

### 2.2 Data Collection

A pre-tested structured questionnaire designed by the authors and administered by four trained nurses was used for data collection. Appropriate corrections were made after analyzing the pretest result before the actual data collection.

Variables such as age, place of residence (rural or urban), employment status, level of education, marital and socio-economic status were documented. Others include infant feeding choices and reasons for the choice, counseling on infant feeding as well as disclosure of status.

Social status was established using, Olusanya and Okpere [16] formula for calculating social class. The woman's educational level and the spouse's/partner's income are used to calculate social class. The woman's educational level is scored 0, 1 and 2 for tertiary, secondary and primary/no formal education respectively. Her spouse's/partner's income is assigned scores of 1, 2 and 3 for high, middle and low incomes respectively. The social status is calculated by the addition of the woman's educational score to the score of her spouse/partner. The scores are graded thus for the purpose of this study; 1-2 is regarded as high, 3 as middle and 4-5 as low social class.

The questionnaire was administered to consecutive HIV-positive mothers who brought their children to the paediatric HIV follow-up clinic. Recruitment continued until the required sample size was obtained.

Inclusion criteria were HIV-positive mothers and age of baby twelve months and below. Mothers and infants who were ill were excluded. Mothers HIV status was confirmed against clinical records.

### 2.3 Data Analysis

Data were analyzed using the SPSS software for windows (version 10.0) (SPSS Inc, Chicago, IL).

Chi-square test was used to compare categorical data. Odds ratio with 95% confidence interval was generated to quantify the degree of association between variables. Logistic regression model was used to determine variables associated with choice of infant feeding methods while controlling for confounding factors. P-values less than 0.05 were considered statistically significant. Results were expressed in tables, bar charts and simple percentages.

## 3. RESULTS

Out of seventy three HIV-positive mothers who brought their babies to the paediatric HIV follow-up clinic during the period of study, 60 (82.2%) gave consent while 13 (17.8%) declined. Fifty four (90%) of those who gave consent completely filled their questionnaires while 6 (10%) did not and they were discarded.

Table 1 shows the socio-demographic characteristic of the respondents.

The mean (standard deviation) for age of the mother was 29.7(4.2) years (range 15-45 years)

while that of the infants was 6.3(2.1) months (range 0-12 months) twenty four (44.4%) of the respondents were within the age bracket 25-34 years. Twenty eight (51.9%) were employed while 26(48.1%) were not. Twenty eight (51.9%) were urban dwellers while 26(48.1%) came from the rural areas. Twenty six (48.1%) respondents were married while 28(51.9%) were either single or cohabiting.

All were Christians. Twenty eight (51.9%), 16(29.6%) and 10(18.5%) belonged to the low, middle and high socio-economic levels respectively. Eight (14.8%) of the respondents had primary education, 35(64.8%) had secondary education while 11(20.4%) had tertiary education. Forty eight (88.9%) were on first line Zidovudine (AZT), Lamuvidine (3TC) and Nevirapine (NVP) combination of Highly Active Antiretroviral Therapy (HAART) while 6(11.1%) were on second line HAART therapy, Lopinavir/Retonavir (Alluvia).

**Table 1. Socio-demographic characteristics**

Variable	N=54 No (%)
<b>Age (years)</b>	
15-24	12(22.2)
25-34	24(44.4)
35-44	13(24.1)
>45	5(9.3)
<b>Place of residence</b>	
Urban	28(51.9)
Rural	26(48.1)
<b>Employment Status</b>	
Employed	28(51.9)
Unemployed	26(48.1)
<b>Educational level</b>	
Primary	8(14.8)
Secondary	35(64.8)
Tertiary	11(20.4)
<b>Marital status</b>	
Married	26(48.1)
Single/Cohabiting	28(51.9)
<b>Socio-economic level</b>	
Low	28(51.9)
Medium	16(29.6)
High	10(18.5)

Fig. 1 shows reasons for infant feeding method.

Thirty two (59.3%) of the respondents practiced RF, 14(25.9%) applied MF, while 8(14.8%) used EBF. Among the mothers who practiced mixed feeding, the reasons given were stigma and discrimination 6(42.9%), insufficient breast milk 2(14.3%), opposition by husband/ family

2(14.3%) and AFASS (available, affordable, feasible, safe, sustainable), 4(28.6%).

Twenty seven (84.4%) respondents adopted RF because it reduces the risk of transmission of HIV to the child.

EBF was practiced by 3(37.5%) of the respondents owing to opposition by husband/family 3(37.5%), AFASS 2(25%) and stigma and discrimination 2(25%).

Table 2 shows the association between the socio-demographic/clinical variables and adopted infant feeding method.

Disclosure of status, counseling, married, having at least secondary education and high socio-economic status were significantly ( $P < 0.05$ ) associated with the adoption of recommended infant feeding method (EBF and RF). The association between age ( $p = 0.201$ ), place of residence ( $p = 0.132$ ) and employment status ( $p = 0.109$ ) and adoption of recommended infant feeding method did not attain statistical significance ( $P > 0.05$ ).

In multivariate analysis, counseling and disclosure of status were independently significantly associated with practice of recommended infant feeding method (OR (95% CI) 8.9(1.03 to 29.31), OR (95% CI), 6.2(1.09 to 31.62).

Mothers who were counseled and disclosed their status were 8.9 and 6.2 times respectively more likely to adopt appropriate infant feeding method.

#### 4. DISCUSSION

Although the Nigerian government has revised guidelines in accordance with WHO, consensus did not exist in support of the recommendations, and some clinicians and researchers continued to oppose breastfeeding because they believed it deliberately exposed babies to possible HIV infection [14]. Currently, available evidence indicated that 70-90% of women in prevention of mother-to child transmission (PMTCT) programme opted for replacement feeding [5].

The study showed that 59.3% practiced replacement feeding, 25.9% mixed feeding and 14.8% exclusive breast feeding. The proportion of women practicing EBF, 14.8% was lower than reported in Northwest Ethiopia, 83.7% and Southwest Nigeria, 68.3% [17,18]. A study in Botswana found that less than 1 in 5 (19.5%)

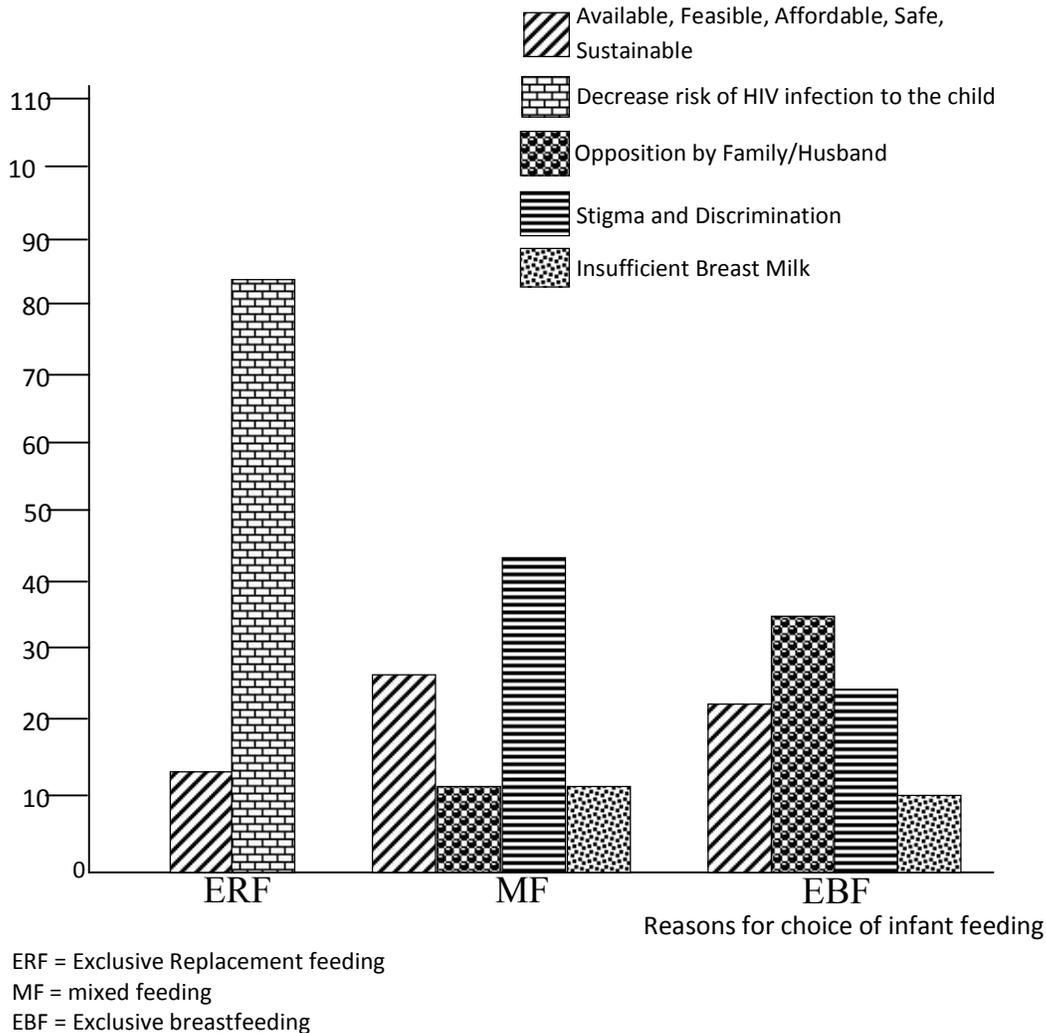
HIV-infected mothers chose exclusive breastfeeding for their babies [19]. The rate of EBF in this study is also lower than the Exclusive Breastfeeding ratio, 33% for infants less than six months in sub Saharan Africa [4]. The proportion adopting RF, 59.3% was remarkably higher than the results from Northwest Ethiopia, 5.7% but agrees with the report from South Africa, 50% [17,20]. The adoption of replacement feeding by a higher proportion of women in this study may be due to the perception that RF reduces the transmission of HIV to the baby as well as the availability of infant formula provided at no cost to the patients in the clinics.

The variations also suggest that other extraneous factors may carry more weight in the decision making process [5]. Buskens et al. [21] observed that within traditional relationships of intimacy, both relatives and breadwinner have influence and even authority over options and modes of infant feeding. This was reflected in this study where opposition by husband and/or family members was instrumental to the adoption of EBF as a method of infant feeding.

In this study, 25.9% of the respondents practiced MF. This is higher than 15.3% and 4.3% reported in Northwest Ethiopia and India respectively [17,22]. It was however lower than the mixed feeding rate 70.45% in the non-PMTCT cohort in Benin City, Nigeria [23]. The major reasons for practice of MF in this study were the fear of stigmatization and discrimination, insufficient breast milk and to avoid the negative consequences by the family and society. In Southern Africa, despite PMTCT programmes very early mixed feeding remain the norm owing to the traditional acceptance of "water as life" with milk considered "liquid drink" rather than 'real' food 21. Anoje et al. [24], however reported that age specific HIV transmission rates were considerably higher for babies who had mixed feeding compared with those who were exclusively breastfed. Employment status was not significantly associated with the likelihood of adopting recommended infant feeding method. Excessive workload and fear of exposure at work place may have resulted in practice of MF.

**Table 2. Association between choice of infant feeding and socio-demographic characteristics**

Variable	Choice of infant feeding			P value
	RF N=32	MF N=14	EBF N=8	
<b>Age (years)</b>				
15-24	6(18.8)	3(21.4)	3(37.5)	0.201
25-34	15(46.9)	8(57.1)	1(12.5)	
35-44	8(25)	1(7.1)	4(50)	
>45	3(9.4)	2(14.3)	-----	
<b>Employment status</b>				
Employed	12(37.5)	10(85.7)	6(75)	0.109
Unemployed	20(62.5)	4(71.4)	2(25)	
<b>Socioeconomic status</b>				
Low	15(46.9)	8(57.1)	5(62.5)	0.001
Medium	10(31.3)	4(28.6)	2(25)	
High	7(21.9)	2(14.3)	1(12.5)	
<b>Educational level</b>				
Primary	6(18.8)	2(14.3)	0(0)	0.001
Secondary	23(71.9)	6(42.9)	6(75)	
Tertiary	3(9.4)	6(42.9)	2(25)	
<b>Marital status</b>				
Married	19(59.4)	2(14.3)	5(62.5)	0.001
Single/Cohabiting	13(40.6)	12(85.7)	3(37.5)	
<b>Counseling</b>				
Yes	32(100)	4(28.6)	6(75)	0.001
No	0(0)	10(71)	2(25)	
<b>Disclosure of status</b>				
Yes	30(93.8)	11(78.6)	6(75)	0.001
No	2(6.2)	3(21.4)	2(25)	
<b>Place of residence</b>				
Urban	18(56.3)	8(57.1)	2(25)	0.132
Rural	14(43.8)	6(42.9)	6(75)	



**Fig. 1. Reasons for choice of infant feeding method**

This study reveals that 100% and 75% of the respondents who practice RF and EBF respectively were counseled on infant feeding options, while 71.4% of those who practiced MF did not receive counseling on infant feeding options. Their choice of feeding was determined by circumstances around [5]. This brings to focus the place of counseling in the choice of infant feeding practice. HIV-positive mothers generally do not have access to quality infant-feeding counseling which is critical to the success of infant survival strategies [14,23]. This may explain the low proportion of mothers practicing MF in this study. There is need for training of health workers particularly infant feeding counselors on the relative risks associated with infant feeding in the context of

HIV as well as provision of culturally sensitive counseling tools [9]. Peer educators recruited from HIV post natal clinics will be an advantage, instead of only health workers [9].

Eighty four percent of the respondents in this study disclosed their status to their spouses. This accords with the work of Muluye et al. [17] who found that 87% and 65.6% of the mothers had disclosed their HIV status to their spouses and family members respectively. In another study in Nigeria 50% of the women to disclosed status to their spouses [18].

In Addis Ababa Ethiopia, more than one third of the mothers did not disclose their HIV status to their spouses because of fear of adverse social

outcomes like divorce and physical violence [25]. In Northern Thailand, many women are quite open about their HIV status despite the societal discriminatory tendencies [26]. When husbands are not aware of the HIV status of their wives, they usually impose inappropriate infant feeding methods. This stresses the need for spousal involvement through partner counseling and testing during antenatal and postnatal care. In this study, 93.8% of respondents who disclosed their status adopted RF. It is likely that the disclosure gave them the psychological leverage such that hiding during formula feeding became unnecessary.

The limitations of this study include the awareness by the respondents that the study sought to examine infant feeding practices and HIV, and this could have influenced their responses. In addition, the recruited women attending the paediatric HIV welfare clinic may have been biased towards formula feeding since hospital based postnatal clinics are distribution centres for formula milk. The small sample size precludes generalization of the results of this study.

## 5. CONCLUSION

In conclusion, this study revealed that exposure to counseling was poor and the level of adoption of EBF, one of the pillars of childhood survival was at its lowest ebb. The essentials of the current 2010 WHO guidelines on infant feeding for HIV-positive mothers, which include EBF with ARV treatment intervention for the first six months of infant's life should be disseminated through structured counseling sessions at maternity care centres for HIV-positive mothers. The need for trained counselors and peer educators is stressed.

## ETHICAL APPROVAL

The study was approved by the Ethics Committee of the University of Nigeria Teaching Hospital, Enugu. (28: 12: 2013, item no 48).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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