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Infant feeding knowledge and practice among HIV positive mothers attending HIV treatment centres in Lagos

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Abstract: *Background:* Twenty-five to forty percent of children will be infected with HIV in the absence of any form of intervention which is Prevention of Mother to Child Transmission (PMTCT).
Objectives: This study determined the infant feeding knowledge and practices among HIV positive mothers attending HIV treatment centers in Lagos.
Methods: A descriptive cross-sectional design was used for the study. A multistage sampling technique was used to select / recruit 290 HIV positive mothers with babies between the ages of 2weeks to 18months, attending PMTCT services into the study Pre-tested interviewer administered structured questionnaire was used to collect data and analysis was done using Epi-info software. Chi-square and Fischer exact tests were used to determine association between the dependent and independent variables. The p-value was set at 0.05.
Results: Majority of the respondents (58.9%) were within the age range of 31 – 40 years and about half had a secondary school level of education. Exclusive formula feeding (40.3%) and exclusive breast feeding (42.4%) were feeding options known by the majority of the respondents. More than half (55.5%) of the mothers had a good knowledge of infant feeding options. Exclusive breastfeeding (EBF) was practiced by majority (55.5%) of the respondents, 21.4% practiced exclusive formula feeding (EFF) while only 6% practiced mixed feeding (MF).
Knowledge of infant feeding options and the attitude towards exclusive breast feeding being enough in the first 6 months of life were associated with infant feeding options practiced; those with good knowledge of infant feeding options did not practice MF (9.7%) ($p = 0.013$).
Conclusion: knowledge of infant feeding options was good and poor knowledge was associated with exclusive formula feeding. Majority practiced EBF.
Educational programmes targeted at improving the knowledge of HIV and infant feeding options as well as strengthening of counseling sessions at PMTCT clinic would help reduce the risk of HIV transmission to the child.

Key Words: Infant feeding practices, exclusive breastfeeding , exclusive formula feeding, knowledge of infant feeding, mothers, HIV Positive.

Introduction

The controversy between the risk of HIV transmission through infant feeding and the lifesaving benefits of optimal feeding option which is exclusive breastfeeding remains a dilemma faced by HIV positive mothers. In view of this, National guidelines recommends that mothers of HEIs breastfeed exclusively for the first six (6) months of life, Complementary feeds in addition to breast milk at 6 months and BF complemented by household foods should be continued till 12 months after which breast milk should be weaned off[8].
Good nutrition is a right of every infant and child according to the convention on the rights of a child[3]. Breast milk plays a significant role in nutrition, development and health of both HIV-exposed, HIV-infected and non- HIV-infected infants, Due to the fact that human milk is the ideal nourishment for infant's growth, development and survival[3].

In Low- and Middle-Income countries, the feeding options are further complicated by financial, social and economic difficulties. The individual and family situation of the mothers, environment, education and economic status of the mothers also plays a role in the morbidity and mortality associated with formula feeding[31].
Under nutrition is associated with 2.7million or 45% of child deaths, Over 820 000 children's lives could be saved every year among children under 5 years, if all children 0–23 months were optimally breastfed[3].
Breastfeeding improves IQ, school attendance, and is associated with higher income in adult life[3], the balance between the risks of transmission of human immunodeficiency virus (HIV) through breastfeeding and its life-saving benefits complicates decisions about infant feeding among HIV-positive mothers but World Health Organization (WHO) recommendations have also been refined over-time to also address the needs of infants born to HIV-infected mothers.

ART use by HIV positive mothers and the use of ARV prophylaxis by the infant is not the only method of PMTCT but optimal infant feeding plays a crucial role and EBF is a beneficial intervention in saving children′s lives[28]
Antiretroviral drugs now allow HIV exposed infants to be exclusively breastfed until they are 6 months old and continue breastfeeding until at least 12 months of age with a significantly reduced risk of HIV transmission[3].
When the infants are exclusively breastfed for the first six months of life, their immune system is stimulated and this goes hand in hand with protecting them from childhood illness/diseases like diarrhoea and acute respiratory infections, which are two of the major causes of infant mortality in the developing counties[3]. When exclusive breast-feeding is practice, there is a lower risk of HIV transmission than mixed feeding[4,5].

Nigeria has the second largest HIV epidemic in the world[7,8,29] making it the home to over 30% of the global burden of HIV infected children[8]. In 2017, 220,000 children between the ages of 0 to 14 years were living with HIV[7]. 110 000 (84 000–130 000) children died of AIDS-related illnesses yearly meaning, 290 children died of AIDS-related illnesses every day[30].
According to the Joint United Nations Programme on HIV/AIDS (UNAIDS) in Nigeria in 2016, an estimated 37 000 (22 000 - 56 000) children were newly infected with HIV due to mother-to-child transmission[7]. About 25 to 40% of children will be infected with HIV in the absence of any form of intervention which is Prevention of Mother to Child Transmission (PMTCT) and as such, it recommended that all pregnant women should be screened for HIV and started on Antiretroviral Therapy when found to be positive[8]. World Health Organization (WHO) and United Nations Children's Emergency Fund (UNICEF) recognized that breast feeding contributed about 300,000 to HIV infections per year worldwide, while at the same time 1.5 million children die each year if the women do not breastfeed[6,9,10] . Breast milk substitute has the benefit of zero HIV transmission but carries the risk of increased morbidity and mortality from malnutrition, diarrhoea and pneumonia[8].
It is recommended that mothers of HIV exposed infant's breastfeed exclusively (estimated that with EBF practice, 13% to 15% deaths of children below 5 years of age could be averted in low and middle-income countries) for the first six months of life due to superior argument that it greatly reduces the risks of enteric infection and of defective nutrition, particularly in resource-poor settings. Complementary feeds should be introduced at six months in addition to breast milk, which is complemented by household food until twelve months after which child should be weaned off breast milk[,12,3,6,8].
This recommendation is given in the wake that Mixed feeding (is giving an infant breast milk with other liquid or food before 6 months of life) involves a four-fold increase in the risk of HIV transmission (because mixed feeding is associated with gastrointestinal ulceration secondary to diarrheal disease[3,6,]. As a result, the virus can quickly enter the infant's bloodstream through the ulcerated gastrointestinal tissue) from an HIV-positive mother to her child during the first six months of life, compared to exclusive breastfeeding.

Without effective preventive measures, the risk of HIV transmission from an HIV infected mother to her child, before or during the child's birth, is 15–25%. If the mother breastfeeds her newborn until 18– 24 months, that risk increases to 30-45%[8]. This underscores the need to prevent HIV transmission in general, and to provide girls and HIV-positive women with better options for avoiding pregnancy[6,8]. Mother to Child Transmission (MTCT) can be nearly fully prevented if both the mother and the baby are provided with (Antiretroviral) ARV drugs as early as possible in pregnancy and during the period of breastfeeding[,8]. Worldwide, Progress has been made in preventing and eliminating mother-to-child transmission and in 2017, 8 out of 10 pregnant women living with HIV, or 1.1 million women, received antiretroviral (ARV).

Despite the importance of breast milk, nationwide only 28 % of infant under-six months were exclusively breastfed, a percentage consistent with the 2014 NNHS findings of 25% but far below the recommended WHO/ UNICEF level of 50%. The NNHS 2014 findings also showed that the proportion of children exclusively breastfed sharply decreases with age from birth to the second to the third month and towards the sixth month of life. This finding is also consistent with NDHS 2013, which indicates that half of all Nigerian infants are not exclusively breastfed not even for a month.
Provision of ART to all pregnant and breastfeeding women living with HIV regardless of their immunological status, has changed the landscape of infant feeding recommendations in the context of HIV. ART protects infants against HIV transmission through breastfeeding even if the infant is breastfed beyond 24 months. Hence HEIs can maximize upon the benefits of exclusive breastfeeding in the first six months and prolonged breastfeeding later on[2].

An estimated 1.6 million children are born to HIV-infected women each year, mainly in low- income countries. The absolute risk of HIV transmission through breastfeeding for more than one year globally is between 10 to 20% which needs to be balanced against the increased risk of morbidity and mortality when infants are not breastfed[18].

Appropriate infant feeding is critical to child survival because the natural food for an infant is breast milk. With maternal HIV infection, infant feeding can become complex. HIV infection may be transmitted through breast milk from mother to child and the risk approaches 5-15% in the absence of any form of intervention. Breast milk substitute has the benefit of zero HIV transmission but carries the risk of increased morbidity and mortality from malnutrition, diarrhoea and pneumonia[8].

Recognizing breastfeeding as a significant and preventable mode of HIV transmission, the Joint United Nations Programme on HIV/AIDS (UNAIDS), with WHO and UNICEF, issued guidelines on HIV and infant feeding, these guidelines have being adopted by the Federal government of Nigeria.

These guidelines call for urgent action to educate, counsel and support HIV positive women in making decisions about how to nourish their infants safely. The guidelines stress that in order for a mother to make an informed decision, she must have access to voluntary and confidential testing and counselling, To HAART with prophylaxis for her infant as well as to information about feeding options and the risks associated with them[8,18,23].

This study assessed knowledge and patterns of infant feeding among HIV positive mothers attending HIV treatment centers in Lagos, Nigeria.

Materials and Methods

It was a descriptive cross sectional study conducted among HIV positive mothers with babies between 2 weeks and 18 months of age attending HIV/AIDS treatment centers (PMTCT clinic) in Lagos . The HIV treatment centers in Lagos cut across, primary, secondary and tertiary institutions. .

Simple random sampling technique was used to select (1) Teaching Hospital, two (2) General Hospitals and four (4) Primary Healthcare Centres in Lagos offering PMTCT care. All babies that were registered in the exposed babies clinic in the selected facilities between September and October 2019 were included in the study to obtain 290 participants.

Pretested interviewer administered questionnaires were used to collect data with the assistance of seven research assistants that were trained for the purpose. The questionnaire was divided into four sections. Section A collected socio demographic data. Section B collected data regarding knowledge of infant feeding options in the context of HIV, section C collected data on infant feeding practices and section D collected data on factors associated and influencing infant feeding.

Ethical approval was obtained from Health Research and Ethics committee of LUTH, permission to conduct the study was obtained from Health Service Commission and Primary Health Care Board A written informed consent was obtained from the mothers, privacy and confidentiality were assured.

Data were analyzed using Epi-info software. Chi square was used to determine associations and p value < 0.05 was considered statistically significant. Fischer's exact values were calculated were chi square was not valid.

Results

The respondents were aged between 18-45 years; the mean age being 32.6 (5.2) years. Most of the respondents (88.2%, n=290) were married. The ages of the babies ranged from 2 weeks to 18months and a mean age of 6.1±3.8SD months. Only 55.5% practiced exclusive breastfeeding and 26.0% exclusively formula fed in the first 6months of the infant's life.

Most of the respondents (99.3%) were on ART at some point during pregnancy, delivery and infant feeding period. Also, 93.4% of the babies were given prophylaxis during their first six weeks of life.

Most mothers are aware of EBF (98.3%) as the preferred infant feeding option. There is a significant association between overall knowledge of infant feeding options and infant feeding practiced, 55.5% practiced EBF.

Challenges faced while practicing EBF and EFF Majority (94.48%) of the respondents received some form of counselling on infant feeding options during pregnancy / immediately after delivery while 54.14% were counseled on both EBF and EFF. Most (79.0%) of the respondents have disclosure their HIV status to their partners and 99.3% of the mothers are on ARV's.

Fig. 2 shows, Less than half (42.8%) of the respondents had good knowledge on infant feeding options (EBF and EFF).

Fig. 2: Worries about transmitting the HIV virus made 23.5% of the respondents not to breastfeed and six of the respondents said they (mother with support of spouse) just did not want to breastfeed

Table 3 shows a significant association between overall knowledge of infant feeding options and infant feeding practiced. Those with good knowledge of infant feeding options did not practice MF (9.7%) ($p = 0.013$).

Mothers who knew that HIV can be transmitted through breast milk practiced exclusive formula feeding more and the difference was statistically significant ($p= 0.003$)

Fig 1: Distribution of respondents according to level of knowledge about Infant feeding options (n=290)

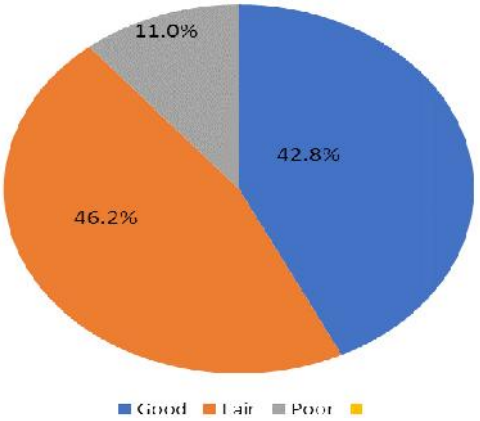

Fig 2: Respondents reasons for not breastfeeding

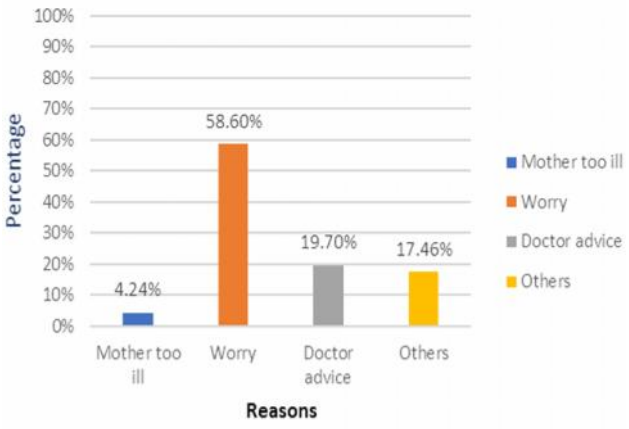

Table 1: Respondents infant feeding practices

Variable	Frequency	Percentage (%)
Feeding in the first 6months(n= 290)		
Breast feeding only	161	55.5
Formula feeding only	75	26.0
Breast feeding, formula feeding and water	54	18.5
Duration of exclusive breast feeding(n=161)		
Still breast feeding	82	50.9
4-6months	57	35.4
2-3 months	17	10.6
Less than 1 month	5	3.1
Age of complementary feeding (n= 290)		
No other feed in the first 6months	152	52.4
From birth	88	30.0
3-4 months	25	8.6
1-2 months	16	6.0
5-6 months	9	3.0
Duration of mixed feeding(n=54)		
Till date	20	37.0
3-4 months	13	24.0
1-2 months	11	20.4
>4 months	9	16.6
Few days	1	2.0

Table 2: Respondents' challenges with infant feeding option

*Problems/Challenges with exclusive formula feeding	Frequency	Percent (%)
No challenge	186	83.0
Expensive cost of purchasing formula	30	13.3
Problem with working and feeding	4	1.8
No regular supply of formula milk	3	1.0
Pressure from relatives/friends	2	0.9
Total	255	100
**Problems/Challenges with exclusive breast feeding*		
No challenge	115	49.2
Breast milk not enough for child	49	20.9
Pressure from relatives to give formula or water or adult diet	32	13.7
Crack/ sore nipples/ ill mother	23	9.8
Others e.g. problem with working and feeding	15	6.4
Total	234	100.0

*multiple response

Table 3: Association between knowledge of infant feeding options and infant feeding practice

Knowledge	EBF Frequency (%)	Mix feeding Frequency (%)	EFF Frequency (%)	Total (%)	χ2	df	p value
Overall knowledge							
Good	76(61.3)	12(9.7)	36(29.0)	124(100)	12.76	4	0.013
Fair	71(53.0)	34(25.4)	29(21.6)	134(100)			
Poor	14(43.8)	8(25.0)	10(31.2)	32(100)			
Total	161(100)	75(100)	54(100)	290(100)			
Knows that HIV can be transmitted through breast feeding							
No	66(62.8)	24(22.9)	15(14.3)	105(100)	11.71	2	0.003
Yes	95(51.3)	30(16.2)	60(32.4)	185(100)			
Total	161(100)	54(100)	75(100)	290(100)			

X^2 = Chi-square df= Degree of freedom
EBF- exclusive breastfeeding
EFF- exclusive formula feeding
MF- mixed feeding

Discussion

Respondents' ages ranged from 18 to 45 years, the mean age was 32.7years of age. This is similar to an earlier study conducted in Lagos and Kano where the mean age of mothers was also 32.2 and 32.5 years of age (46.5%) [4,21.]

This study shows that having good knowledge on infant feeding options among HIV positive mothers plays a role in their feeding practice which is also similar to what was found in other studies done in South Africa, Botswana, Ibadan and Lagos[17,22,22]

In this study 78.97% of the respondents disclosure their HIV status to their spouse/partner which is similar to that found in a previous study done in Burkina Faso where 2/3rd of the mothers have disclosed their status[18]. , despite recent progress in HIV treatment disclosure of HIV status to partners is still a major challenge in PMTCT programs, Non-disclosure of HIV status to partner has implications in all stages of PMTCT cascade and particularly during breastfeeding[8,18].

This is in accordance to WHO and National guidelines as this will enable HIV positive mothers to avoid mix feeding their infants as they will have their spouse support to adhere to their choice of IFO[8] and this study found a significant association between disclosure and infant feeding practice ($P< 0.01$)

In previous studies done in Lagos, Oyo and Kano, majority of the mothers received counselling on infant feeding options and were asked to make a choice based on the information and education given during antenatal / PMTCT clinic[5,4,21] This is similar to findings in this current study in which most of the respondents (94.48%) received a form of counseling on infant feeding options during their pregnancy or immediately after delivery.

This is a great step in the right direction as it has been shown to aid good infant feeding practice among HIV positive mothers[8,12.] The basic ethical principle of informed choice requires that HIV-positive mothers are provided with adequate information about their IFOs in the framework of PMTCT of HIV[6,13]. The National PMTCT guideline recommends that all pregnant mothers be counselled on infant feeding in order to make choices[8].

The proportion of mothers who practiced EBF within the first six months was 55.52% and comparable with the study done in southwestern Nigeria where EBF was 61.0%[5,] slightly higher than southern Ethiopia at 48.20% [10] and 23.06% in Northwest Ethiopia[20] but the rate is lower than 85.5%[2], 88.8%[19] and 91.7%[23]. This finding aligns with the culture of breastfeeding new born in most societies and an improvement from exclusive formula feeding 73.5% and 86.4% that was predominant in two previous studies done in Lagos state[4,26] This is a move in the right direction towards achieving WHO/ UNICEF recommendation for exclusive breastfeeding , which is also better than the National rate of EBF at 28%[15].

The proportion that practiced mixed feeding (MF), which is an inappropriate infant feeding option (IFO) in the first six month (13.45%) is similar to reports from Southwestern Nigeria (12.9%)[5]. Rate lower than South Africa (19.4%)[27] and higher than Northern Ethiopia (6.6%)[19,] Majority of those who practiced MF did so on basis that breast milk was not enough while others yielded to the pressure from family, friends and others who were not aware of their HIV status and feeding options for HEI on time[16,5 ,14]. Inappropriate infant feeding options (IFO) especially MF has been proven to increase the tendency of damaging the intestinal lining of the gut in infants particularly in the first six months, leading to an increased risk of HIV transmission through breast milk[3,6] by as much as 3 to 4 fold increase.

In order to avert or reduce the risk of HIV transmission through mixed feeding or abrupt stop of breastfeeding among HIV positive mothers, The World Health Organization strongly recommends that mothers of HIV exposed infant's breastfeed exclusively for the first six months of life due to superior argument that it greatly reduces the risks of enteric infection and of defective nutrition, particularly in resource-poor settings where AFASS may be a challenge. Complementary feeds should be introduced at six months in addition to breast milk, Breastfeeding complemented by household foods should be continued until twelve months after which child should be weaned off breast milk[12,3,6,8]

Majority of the mothers, who chose to practice EFF, did so because they were worried of transmitting the HIV virus to their babies during breastfeeding. This is similar to other studies in Botswana[17], Uganda[22] , South Africa[24] and Nigeria[21,25] the findings in this study shows that most of the mothers choose not to breastfeed as a way of preventing HIV transmission. The major drawback among these mothers who practiced EFF was the challenge with high cost of purchasing formula milk, this will led to over dilution of the milk which would compromise the nutritional status of the child and lead to morbidity and mortality. Mothers may have erroneously endangered their babies' health by practicing EFF in an attempt to prevent HIV transmission through breast milk[2,8]

A large proportion of the respondents who practiced EFF used bottled/ tap/sachet water in the preparation of the milk, no one used well water and they also agreed that it has to be boiled before use which is in agreement with a study in Lesotho[16] and another in Lagos[4]. This is to ensure that the milk at the point of feeding is warm, this finding shows that mothers have been educated on the importance/ implication of clean water and hygienic method of feeding. Unfortunately, 68.27% used feeding bottle while 13.01% fed their babies with cup and spoon, which is the recommended practice.

In this study 78.97% of the respondents disclosed their HIV status to their spouse/partner which is similar to that found in a previous study done in Burkina Faso where 2/3rd of the mothers have disclosed their status[18] , despite recent progress in HIV treatment disclosure of

HIV status to partners is still a major challenge in PMTCT programs, Non-disclosure of HIV status to partner has implications in all stages of PMTCT cascade and particularly during breastfeeding[8,18].

In a similar study done in Lagos about 9 years ago, the findings were that EFF was practiced by majority (73.5%), 18.5% practiced EBF while 8% practiced MF and it was noted that poor knowledge of infant feeding options and feeling that EBF was not enough in the first six months of life also contributed to EFF[4]. While in this current study there are some improvement from the above such as 42.8% had good knowledge of infant feeding options, 72.4% had a positive attitude to EBF being enough in the first 6 months of life and EBF was practiced by majority (55.5%) has recommended by the National guideline.

Findings from a similar study done in Nnewi showed that EFF was the commonest infant feeding practiced in their setting which was linked to use of HAART and the reduction in MTCT achieved in 2010 with the assisted free formula feed that was provided by the government[31] then but this differs from EBF practiced by most participants in this study. This shows that HIV positive mothers are more receptive to considered EBF as a preferred feeding option keeping in mind the benefit of EBF, use of ART by mothers and ART prophylaxis by their infants.

The factors that played a role in the IFOs of HIV positive mothers are disclosure of their status to their partners / spouse and this is supported by studies done in Lesotho[27] and South Ethiopia[10]. And the information/ education/ counselling given during before, during pregnancy and after delivery which helps the mothers to make an informed decision on the optimal feeding option for their babies in the presence of HIV.

Thus, the need to provide mothers with adequate information to enable them understand the consequences of mixed feeding in HEIs.

Conclusion

Conclusion Many participants (42.8%) had a good knowledge of infant feeding options and poor knowledge was associated with practice of EFF. Specific knowledge on HIV transmission through breast feeding was associated with infant feeding option practiced by the respondents with 55.5% and 26.0% for EBF and EFF respectively. Majority of the respondents (72.4%) had positive attitudes to exclusive breast feeding being enough in the first 6 months of life and this was associated with exclusive formula feeding.

Exclusive breastfeeding was the infant feeding option practiced by 55.5% of the respondents, 26.0% and 18.5% practiced exclusive formula feeding and mixed feeding respectively. Poor knowledge of infant feeding options was associated with EFF

Disclosure of HIV status to spouse was found to have influence positively the infant feeding practiced by the respondents in this study. The respondents whose spouses were not aware of their HIV status practiced mixed feeding more with a statistical significant difference ($p<0.001$).

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