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Factors that Influence Infant Feeding Options of HIV-Positive Mothers in Urban and Rural Communities in South-East, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author LNI designed the study. Authors LNI, NDU and EDA wrote the protocol. Authors ECA and NDU wrote the first draft of the manuscript. Authors LNI and EDA managed the literature searches. Author ECA did data analyses of the study. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Infant feeding method decision making is a very vital aspect of child care. This study compares the factors influencing infant feeding options of HIV-positive mothers in urban and rural communities in southeastern Nigeria.
Methods: It was a comparative cross-sectional study involving HIV-positive mothers whose babies were HIV-negative, and below 24 months using systematic sampling method. Questionnaires and Focused Group Discussion (FGD) guide were used.
Results: About 123(54.7%) urban and 142(64.1%) rural dwellers intended exclusively breastfeeding (p = 0.150), however 88(39.1%) urban and 122(54.2%) rural dwellers actually

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exclusively breastfed (p = 0.001). The commonest reason for breastfeeding was belief that breast feeding was best for their babies (p = 0.003) while for formula feeding was that it protects the baby from HIV infection (p = 0.044). Family income with occupation for rural communities (p = 0.01, and p = 0.03 respectively) and family income for urban (p = 0.01) were significantly associated with infant feeding options.
The FGD identified that disclosure of their HIV status to their husbands or relations helped the mothers in both communities maintain their feeding options.
Conclusions: Infant feeding practices differed significantly between communities. Family incomes and occupation were factors influencing feeding options.

Keywords: Infant feeding options; HIV positive mothers; urban; rural.

1. INTRODUCTION

The Word Health Organization updated guideline on infant feeding for HIV-positive mothers in 2010. An HIV infected mother should either exclusively breastfeed for six months and add complementary foods until baby is one year while either she or her baby remains on antiretroviral drugs throughout the period, or avoid breastfeeding completely and exclusively give formula milk [1]. Countries were advised to choose one method to advocate for HIV- infected mothers in their country based on local conditions [1].

The alternative to breastfeeding which is formula feeding is very costly and difficult to maintain especially among the very poor. Its practice could eliminate the risk of HIV transmission, but could also enhance the risk of diseases like malnutrition, diarrhea, and respiratory tract infection among the infants [2]. It also required certain home conditions like; assurance of safe water supply and sanitation at household and community levels, reliable supply of sufficient infant formula to support normal growth and development of the infant, ability of mother or caregiver to prepare the formula cleanly and frequently enough so that it carries low risk of diarrhea and malnutrition, ability of mother or caregiver to give the formula exclusively in the first six months, the family's support of the practice, and ability of mother or caregiver to access health care facility that offers comprehensive child health services [1].

Decision making on infant feeding is a very vital aspect of child care but continue to pose a challenge to HIV positive mothers. Very often women breastfeed their infants to avoid the stigma associated with not breastfeeding, high cost of alternative feeding methods, or lack of access to safe water [2].

Studies revealed that the method primarily intended by HIV-positive mothers to feed their babies is often not what they end up doing [3-5]. The influence of the education gained during counseling in the prevention-of-mother-to-child-transmission of HIV (PMTCT) program very often remolds the intention of the mothers [3-5].

Some other personal and environmental factors also hinder the mothers from carrying out the practices of their choice and occasionally force them to practice mixed feeding. While breastfeeding is the best for the baby, most HIV-positive mothers would prefer formula feeding in order to protect their babies from HIV infection through breast milk [6-9]. The risks associated with formula feeding depend on the environment and the individual circumstances of the women including their education and economic status [9].

In a study carried out in Jos, Nigeria, it was revealed that women who primarily gave formula milk complained of family pressure as their reason for breastfeeding [8]. In Zaria, mothers that practiced formula feeding complained of feelings of anger and guilt as well as inadequacy for not being able to play their motherly role of breast-feeding their babies. They also complained of high cost of formula, the fear of stigmatization and social discrimination These often force them to breast-feed [4]. Factors that supported formula feeding include active coping ability, disclosure of status to spouse or important family members, household income, educational status of mother, occupation of mother and mode of delivery especially by caesarian section [10].

A study among ante-natal attendees on the prevention of mother to child transmission of HIV infection in a tertiary health facility in Maiduguri, Nigeria showed that the dominant practice is breastfeeding, with their reason being the high

premium people placed on breast milk as well as spouse dislike for formula milk [11]. In Zambia, exclusive breast-feeding is also dominant, but the influencing factors are quite different [3]. Findings further revealed that the practice of HIV-positive mothers did not follow national nor international guidelines [3]. Women of low socio-economic status and those that do not meet the criteria for replacement feeding commence exclusive breastfeeding, continue breastfeeding after 6 months until they can afford formula. The major identified factor influencing the choice of infant feeding options among HIV infected mothers was poverty [3].

This study was then aimed at determining the personal and environmental factors that influence the choice of infant feeding option among HIV-positive mothers in Anambra State, Nigeria, and to compare these factors and their effects between urban and rural communities. Useful information from this study can be employed in counseling HIV-positive mothers from different backgrounds on infant feedings options and help in reducing HIV transmission.

2. METHODOLOGY

2.1 Study Sites/Area

The study took place at the Paediatric and adult HIV clinics of Nnamdi Azikiwe University Teaching, Nnewi, and outreach centre for Community Medicine and Primary Healthcare, Ukpo both in Anambra state, Nigeria.

2.2 Study Design

This was a comparative cross-sectional study among HIV-positive mothers in rural and urban communities in Anambra State of Nigeria.

2.3 Study Population

This comprised of 550 (225 each) HIV-positive mothers from the two study sites whose babies were HIV-negative or who had nursed their HIV-negative babies in the last two years. Such mother should have been educated on Prevention of Maternal to Child Transmission (PMTCT) programme.

2.4 Procedure

The sites for the research were purposively selected for easy access to the HIV-positive mothers who have also been educated on PMTCT. Participants for the FGDs in both urban and rural settings were purposively selected among eligible mothers. (different from those that responded to questionnaires). Included were those mothers who can understand and speak English. Systematic sampling method was used in recruiting respondents for questionnaire. Two FGDs involving ten (10) participants each for rural and urban communities were conducted. The unstructured FGD guide and semi-structured interviewer administered questionnaire used to collect data were derived by adopting and adapting relevant and standard questions from UNAID's HIV/PMTCT programme evaluation for the Ministry of Health of Thailand [12] after which they were equally pretested in a centre different from ones used for study. Some of the interview questions include; Did you disclose your status to anyone? What was the major hindrance/s to your infant feeding options? Who has been supporting you to cope with your status? What were your fears to continuing or completing infant feeding options?

2.5 Data Analysis

2.5.1 Qualitative data

Responses documented by an assistant and also recorded with a tape were transcribed verbatim. The data were organized in themes in line with Gibbs methods [13]. The responses in each theme from the different communities were then juxtaposed for easy comparison.

2.5.2 Quantitative data

Data was analysed with the statistical package for social sciences (SPSS-20). Chi-square test was used for comparison and associations for categorical or qualitative variables like socio-demographics, mothers' infant feeding intentions and actual practice, reasons for choice of feeding option as well as association between socio-demographic variables and infant feeding options. Student T-test was used for comparison of continuous variables like mean total income. Level of significance was at ≤ 0.05.

2.6 Ethical Considerations

The study was approved by the Health Research and Ethics Committee of Nnamdi Azikiwe University Teaching Hospital, Nnewi. Informed verbal consent was obtained from respondents.

Confidentiality was assured and maintained throughout the study.

3. RESULTS

3.1 Quantitative Data

Table 1 shows the distribution of socio-demographic characteristics of respondents in both communities. Majority 94(41.8%) and 74(32.9%) were in age group 26-30 years, 172(76.4%) rural and 184(81.8%) urban were married, 135(60.0%) rural and 147(65.3%) urban had secondary education, 88(39.1%) rural and 89(39.6%) urban were traders. There were no significant difference between communities; age groups (p = 0.279), education (p = 0. 539), occupation (p = 0.818) and marital status (p = 0.593). The mean monthly family income between the two communities was statistically significant (p < 0.001).

Table 1. Socio-demographic characteristics

Variable	Communities		X^2 test	p-value
	Rural (N=225) n (%)	Urban (N=225) n (%)		
Age (years)				
≤25	21(9.4)	37(16.4)	10.95	0.279
26-30	94(41.8)	74(32.9)		
31-35	64(28.4	58(25.8)		
≥36	46(20.4)	56(24.9)		
Mean Age ± SD	***31.29±4.44***	***31.12±5.32***		
Marital status				
Single	11(4.9)	16(7.1)	14.080	0.593
Married	172(76.4)	184(81.8)		
Others	42(18.6)	25(11.2)		
Educational status				
Primary education	50(22.2)	39(17.3)	3.111	0.539
Secondary education	135(60.0)	147(65.3)		
Tertiary education	40(17.8)	39(17.3)		
Occupation				
Student	12(5.3)	14(6.2)	28.256	0.818
Artisan	37(16.4)	25(11.1)		
Government employee	23(10.2)	35(15.6)		
Private employee	27(12.0)	24(10.7)		
Trading	88(39.1)	89(39.6)		
Jobless	38(16.9)	38(16.9)		
			T-test	
Mean monthly income	₦41,943.40	₦94,755.73	9.641	0.000

Table 2. Mothers' infant feeding intentions prior to delivery and mothers' actual practice following delivery

Variables	Communities		x^2	p value
	Urban (N=225) n (%)	Rural (N=225) n (%)		
Intended feeding options				
Intended exclusive Breast feeding	123(54.7)	142(64.1)	3.784	0.150
Intended exclusive Formula feeding	100(44.4)	80(35.6)		
Intended mixed feeding	2(0.9)	3(1.3)		
Actual feeding options				
Exclusive breast feeding	88(39.1)	122(54.2)	10.321	0.001
Exclusive formula feeding	137(60.9)	103(45.8)		

Table 2 shows mothers' Infant feeding intentions prior to delivery and mothers' actual practice following delivery. Most of the respondents in the urban 123(54.7%) and rural 142(64.1%) rural intended to exclusively breastfeed. Only 2(0.9%) of the urban and 3(1.3%) of the rural respondents intended to mix feed their babies. There was no statistically significant difference in the intentions of the respondents from the different communities (p = 0.150). One hundred and thirty seven (60.9%) urban and 103(45.8%) rural respondents practiced exclusive formula feeding. Mixed feeding was not reported among any of the groups. The difference was statistically significant (p=0.001).

Table 3 shows reasons respondents from both communities gave for their infant feeding choices. The reasons given for their choice of infant feeding varied The belief that breastfeeding was the best for their babies was the commonest reason among those that opted to breastfeeding and was more frequently reported by rural women. The difference was statistically significant (p=0.003). However the commonest reason given by those that chose formula feeding was that it protects their baby against HIV infection. The difference between the communities was equally statistically significant (p=0.044).

Table 4 shows association between socio-demographic variables and infant feeding options of the respondents in both communities It was found that total monthly family incomes were significantly associated with infant feeding options in both communities (p = 0.034 rural, and 0.013 urban). Equally occupation was significant for rural community (p = 0.034).

3.2 Qualitative Data

On FGD, revealing their HIV status to their husband and very close, important relations helped the mothers in both communities to maintain their feeding options especially in adverse conditions.

Mrs. B, a 32 year old secondary school teacher in the city said; *"My mother, mother-inlaw, and my younger sister took care of me and baby for up to five months after delivery because they know my status. If they didn't know my status it would have been too difficult for me to maintain exclusive breastfeeding especially when I resumed duty."*

Main hindrance to exclusive formula feeding was poverty. Mrs. G a petty trader and a widow in the village that finished senior secondary school said, "*I like to give my baby milk but I am a widow and cannot buy milk enough, so I give breast. In fact I think it was for me that those people came to teach about feeding options".*

Being members of the support groups, "onye – aghana – nwanne – ya " (i.e. do not forsake your brother), and "Living Again", in the urban and rural communities respectively boosted the women's morale and encouraged them to adjust their lives and cope with their status and also overcome stigmatization.

Table 3. Factors that influenced the infant feeding choices of the respondents

Variable	Communities		X^2	p-value
	Urban (N=225) n (%)	Rural (N=225) n (%)		
Reasons for breastfeeding				
Nurses' advice	24(10.67	29(12.89)	0.472	0.492
Cannot maintain formula	12(5.33)	13(5.78)	0.040	0.842
Culture of my people	18(8)	22(9.78)	0.400	0.527
Best option for baby	67(29.78)	106(47.11)	8.792	0.003*
Mothers' advice	3(1.33)	0(0)	3.020	0.088
Reasons for formula feeding				
Protect baby from HIV infection	134(59.5)	103(45.8)	4.055	0.044*
Nurses' advice	23(10.22	16(7.11)	1.256	0.262
Mothers' convenience	17(7.56)	27(12)	2.273	0.132
Husbands' choice	15(6.67)	16(7.11)	0.032	0.858

Note; Multiple responses allowed

Table 4. Association between socio-demographic characteristics of respondents and infant feeding practices in both communities

Variables	Urban		X2 (p value)	Rural		X2 (p-value)
	Feeding options			Feeding options		
	Breast feeding (N=88) N (%)	Formula feeding (N=137) N (%)		Breast feeding (N=88) N (%)	Formula feeding (N=137) N (%)	
Age						
≤25	18 (20.45)	19 (13.87)		14(11.48)	7 (6.80)	
26-30	29 (32.96)	45 (32.85)	2.397	49 (40.16)	45 (43.69)	1.913
31-35	19 (21.59)	39 (28.47)	(0.494)	36 (29.51)	28 (27.18)	(0.591)
≥36	22 (25.00)	34 (24.81)		23 (18.85)	23 (22.33)	
Education						
Primary	17 (19.32)	22 (16.06)	3.651	29 (23.77)	21 (20.39)	0.378
Secondary	61 (69.32)	86 (62.77)	(0.161)	72 (59.02)	63 (61.17)	(0.828)
Tertiary	10 (11.36)	29 (21.17)		21 (17.21)	19 (18.44)	
Marital status						
Single	9 (10.23)	11 (8.03)	1.130	6 (4.92)	8 (7.77)	1.085
Married	69 (78.41)	115 (83.94)	(0.568)	93 (76.23)	79(76.70)	(0.581)
Widowed	10 (11.36)	11 (8.03		23 (18.85)	16 (15.53)	
Occupation						
Jobless	19 (21.59)	19 (13.87)		26 (21.31)	12 (11.65)	
Student	6 (6.83)	8 (5.84)		8 (6.56)	4 (3.88)	
Artisan	10 (11.36)	15 (10.95)	6.797	23 (18.85)	14 (13.59)	12.035
Government employee	12 (13.63)	23 (16.79)	(0.236)	13 (10.66)	10 (9.71)	(0.034)*
Private employee	13 (14.77)	11 (8.03)		8 (6.56	19 (18.45)	
Trading	28 (31.82)	61 (44.52)		44 (36.06)	44 (42.72)	
Total monthly income						
1000-50 000	38(43.18)	44(32.12)	8.748	100(81.97)	72(69.90	4.513
51 000-100 000	38(43.18)	51(37.33)	(0.013)*	22(18.03)	31(30.10)	(0.034)*
≥101 000	12(13.64)	42(30.65)				

Mrs. H, a 28 years old trader from the urban community who completed secondary school said; *"Na the support group wey help me. Na dem tell me make I no dey fear to feed my pikin anywhere say many people get HIV. So now if my pikin cry I go just carry am go somewhere go feed am.*

The hindrances to exclusive feeding noted among the mothers from the two communities were similar. Major hindrances to exclusive breastfeeding were the fear that someone might give their babies food in their absence and diseases of the breast especially soreness of the nipple.

Mrs. E above from the city liked to breastfeed but had to stop breastfeeding when she resumed duty because she feared that somebody might give her baby something in her absence. And Mrs. B, the 27 years old teacher in the village said; "*Sometimes when you go out to work or for something, someone could feed your baby any other thing. Because of this, one must stop breastfeeding once she is due to start work*"

Mrs. A from the urban community said that a woman could develop an ulcer in the nipple and that would prevent her from breastfeeding. "*Sometimes an HIV-positive mother may have sore on the nipple. She has to stop breastfeeding so that baby will not suck blood from her breast and get infected*."

4. DISCUSSION

In 2010, the WHO updated its guideline on infant feeding options for HIV positive mothers and advised countries to choose one method [14]. HIV-positive mothers can either exclusively

formula feed, or exclusively breastfeed for six months and introduce complimentary foods while breastfeeding continues till baby is twelve months old. Mother and/or baby shall remain on anti-retroviral therapy or prophylaxis throughout the breastfeeding period.

The respondents' ages ranged from 18-43 years. These are normal childbearing ages of women. The age ranges were similar to age ranges in similar studies done in Ibadan[4], Enugu [15], Kano [16], and Ethiopia [17]. Most of the mothers were married and had education up to secondary school. This is similar to findings in other studies carried out in Nnewi [18] and Maiduguri [11] both in Nigeria, in Zimbabwe [19] and Zambia [20].

Statistically significant differences was detected in the actual infant feeding practices of the respondents where greater number of the urban dwellers practiced formula feeding, while slightly higher proportion of rural dwellers practiced exclusive breastfeeding. This was supported by FGD findings where almost all the mothers in the FGD in the rural area upheld breastfeeding and believed that breastmilk was the best for their babies. The finding that revealing their status to their husbands or important relations and by their participation in their support groups assisted the women in both communities to overcome the effects of family pressure and stigmatization was contrary to what was seen in some other places like Ile-Ife [21], Abuja [9], and Ethiopia [22] where unavailability of resources, fear of stigma and family pressure were hindering factors to exclusive formula feeding.

Greater numbers of the high income earners prefer formula milk from this study. This finding agreed with the finding in Abuja which demonstrated replacement feeding under the PMTCT programme seemed to be feasible in the urban areas of Nigeria [9]. Similar studies carried out differently in a rural district of Kwazulu Natal [23] and in Pretoria [24] both in South Africa obtained different prevalence of exclusive breastfeeding of 18% and 11% respectively supporting a higher prevalence of breastfeeding in the rural communities. Other Studies reported affluence and perception as hindrance to exclusive breastfeeding [25,26]. In Southern Sudan it was discovered that the mothers could not afford to maintain formula milk; their best option was therefore exclusive breastfeeding [27].

Rural–urban differences in breastfeeding practice also exist in the general population. In some areas like Mongolia [24] 46.7% of the rural mothers were more likely to breastfeed exclusively compared to only 27.4% of the urban counterparts. Similar results were obtained in studies in other places like Vietnam [28], Varanasi [29], Nsukka Nigeria [30] and Sudan [31]. In contrast, studies carried out in Dar es Salam [32], Malawi [33], and Imo state, Nigeria [34], showed that exclusive breast feeding was more commonly practiced in urban than rural communities among the general population.

Inability to carry out infant feeding as intended was recorded in both the rural and urban communities was not surprising. The discovery that one was HIV infected was the commonest reason for change of infant feeding plan from breastfeeding to formula feeding in both areas. This reason most probably was to protect their babies from getting infected with the disease. Inability to sustain formula milk due to poverty was commoner in the rural community, while inability to sustain exclusive breastfeeding while working was commoner among urban working class. This is not good for the PMTCT programme as this may increase the vertical transmission of HIV to the babies and ultimately increasing prevalence of the disease in the society with its associated burden.

5. CONCLUSION

Infant feeding practices differed significantly between the communities. Majority of the rural mothers practiced exclusive breast feeding, while the urban counterparts mainly practiced exclusive formula feeding. The major reason for choosing breastfeeding as an option was that the women felt that breast milk was the best for their babies. Those that opted for formula feeding did so mainly to protect their babies from being infected with HIV. It was however discovered that the family income significantly influenced the infant feeding choices of the respondents such that majority of the richer ones preferred to use formula in both communities.

6. RECOMMENDATION

Based on findings from this study, these are suggested:

1. Government should extend the period of maternity leave up to six months or establish crèches in ministries and parastatals to enable the working mothers,

including HIV-positive mothers, to complete full course of EBF.

2. Education on the benefits of exclusive breastfeeding should be emphasized on during antenatal care and PMTCT programme so that the mothers, especially HIV-positive mothers, will be encouraged to breastfeed and not see it as a practice for the poor and less privileged. This will also help to reduce mixed feeding.
3. Information on the current National Policy and Guidelines on infant feeding for HIV-positive mothers should be disseminated to all relevant authorities especially health facilities for onward communications to mothers through programmes like organized seminars for mothers, Health talks in women's gatherings, workshops e.t.c.
4. HIV-positive mothers should be encouraged to continue with the Support groups in the health institutions where they access care and to encourage others that have not joined to do so. This will assist them to overcome the fears and stigma associated with the disease.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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