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SITUATION ANALYSIS OF THE EXISTING INFANT FEEDING PATTERN AT THE COMMENCEMENT OF THE PREVENTION OF MOTHER TO CHILD TRANSMISSION (PMTCT) OF HIV PROGRAMME IN IBADAN

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ABSTRACT

Objectives: To evaluate breastfeeding and weaning practices associated socio-demographic factors and knowledge about mother- to- child transmission of HIV among mothers in Ibadan.

Methods: A cross sectional survey was conducted among 513 mothers of children aged 6- 24 months, attending infant welfare clinics. Data collection was by a structured questionnaire, which was supplemented by focus group discussions to further explore some of the issues covered in the survey.

Results: Breast-feeding rate was 99.4%, the duration of which ranged from 1-22 months with a median of 14 months among those who had stopped breastfeeding. Only 145 (28.3%) mothers breastfed their babies exclusively for six months and 259(50.8%) initiated breastfeeding within one hour of birth; both were associated with at least secondary level of education. The main obstacle to exclusive breastfeeding was the belief that water is required to quench thirst in babies. Expression of breast milk was not favoured by majority of the mothers (68%) most of whom felt that the milk would get contaminated. Wet nursing was rarely practiced (0.4%). Most of the mothers, 436 (85%) were aware that HIV could be transmitted through breast milk but the attitude towards a mother who did not breast feed was negative in 96.8% of respondents.

Conclusions: Adherence to recommended infant feeding options for HIV-exposed infants are likely to be faced with challenges in a culture where breastfeeding is the norm and exclusive breastfeeding rate is low. There is need for counseling and health education on prevention of mother- to- child transmission of HIV.

Key words: Exclusive breastfeeding, situation analysis, infant feeding patterns, Ibadan

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INTRODUCTION

Breastfeeding is a cultural norm in most Nigerian communities. It is an important factor in maintaining child health by provision of optimum nutrition, protection against common childhood infections, especially respiratory and diarrhoeal infections, and promotion of child spacing.[1] However, in settings where breastfeeding is the norm, a significant proportion of mother to child transmission of the human immunodeficiency virus (HIV) occurs through breastfeeding. In the absence of any intervention the risk of HIV transmission is 15-30% in non-breastfeeding populations. Breastfeeding by an infected mother increases the risk by 5-20% to a total of 20-45%[2] Consequently, given the need to minimize the risk of HIV transmission to infants of HIV positive mothers while at the same time decreasing their susceptibility to other causes of morbidity and mortality the World Health Organization recommends that exclusive breastfeeding is recommended for HIV-infected women for the first 6 months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS) for them and their infants before that time. When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected women is recommended.[3] These recommended infant feeding options pose important challenges in breastfeeding populations. Women who do not breast feed their infants may be faced with the issue of stigmatization and the fear of ostracism. On the other hand, exclusive breastfeeding may be difficult in environments where breast milk is commonly given along with water or other foods in the early months of life. This is important considering the increased risk of HIV transmission observed with mixed feeding in Durban, South Africa.[4] It is therefore necessary to study the existing infant feeding patterns in any environment in order to identify potential barriers to implementation of infant feeding guidelines for HIV positive mothers and thus provide a lead into seeking means of overcoming the barriers. In addition, when the existing feeding practices are known, appropriate recommendations

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can be made by health care managers and policy makers towards effective counseling and support of mothers for the prevention of transmission of HIV through breastfeeding.The Federal Government of Nigeria has put in place a Prevention of Mother to child transmission (PMTCT) programme that includes provision of free antiretroviral drugs and infant feeding counseling. Since this program is at an early stage, it is important to study the existing infant feeding patterns in the country with a view to providing a background for effective infant feeding counseling. Therefore the objectives of this study were to evaluate breastfeeding and weaning practices, reasons for such practices, associated socio-demographic factors and knowledge about mother- to- child transmission of HIV among mothers in Ibadan.

SUBJECTS AND METHODS

The study was conducted in the year 2004 and carried out in two phases; the first involved the administration of a structured questionnaire to investigate the existing infant feeding patterns in the city of Ibadan. The latter study was cross-sectional in design and was carried out at three infant welfare clinics of three hospitals in different areas of Ibadan. These clinics have representations from the different socio-economic groups in the city. Validation of the questionnaire was carried out by translation to *Yoruba*, the local language and back translation to English. It was then pre-tested on 30 mothers and adjusted where necessary before actual administration to study participants. Informed consent was obtained from the mothers who participated in the study after which they were interviewed by trained interviewers using the questionnaire. Information obtained included socio-demographic characteristics, number of children and place of delivery of the index child. Information was also obtained on breastfeeding and weaning practices. Stratification of educational levels and occupations of mothers was in keeping with that by Oyedeji.[5] Hence educational level ranged from the illiterate (class 5) to university graduates (class 1) while occupation ranged from the unemployed (class 5) to senior public servants, professionals and managers (class 5). The second phase involved focus group discussions that took place at one urban and one rural community to further explore some of the issues covered in the survey. Two focus groups eachcomprising ten mothers with babies less than one year of age were constituted in Apata an urban setting in Ibadan and in Iddo a rural community. Two other groups of 12 grandmothers each were also constituted in each of the two sites. One of the investigators moderated during each of the discussions focused on breastfeeding practices.

Infant feeding terms that were used in this study were those recommended by the World Health Organization. Exclusive breastfeeding was defined as when an infant has received only breast milk or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.[6] Replacement feeding means the process of feeding a child who is not receiving any breast milk with a diet that provides all the nutrients the child needs. During the first six months this should be with a suitable breast-milk substitute commercial formula or home-prepared formula with micronutrient supplements.[7] Bottle-feeding was defined as a child receiving liquid or semi-solid from a bottle with a nipple/teat.

Collected data were entered into the computer and analyzed with the Statistical Package for Social Sciences (SPSS) version 11.0 software. Means, medians and modes were calculated for continuous variables. Standard deviations were computed along with the means and for skewed data, the medians along with the 25^{th} and 75^{th} percentiles computed. Chi-square test was used to test associations between categorical variables and statistical significance set at $p<0.05$.

Ethics and Consent

This situational analysis survey was part of the AIDS Prevention Initiative in Nigeria (APIN), Program for which ethical approval was obtained from the Joint Institutional Review Board of the University of Ibadan and University College Hospital, Ibadan, Nigeria. Informed verbal consent was obtained from participants.

RESULTS

Demographic Characteristics

A total of 513 mothers were interviewed from the immunization clinics of 3 health institutions namely Adeoyo Maternity Hospital (208), Institute of Child Health (ICH) University of Ibadan (185) and the Catholic Hospital, Oke-offa (120). The ages of the mothers interviewed ranged from 16 to 44 years with a mean (standard deviation [SD]) of 28.7(5.3) years. Four hundred and ninety three (96.1%) of the mothers were married, while 15(2.9%) were never married, 4 (0.8%) separated and 1(0.2%) widowed. The level of education and occupations of mothers interviewed are shown in table 1 and reveals that majority of them (72.5%) had at least secondary school education or equivalents.The distributions of age, sex and places of birth of the children are shown in table 2. The ages of the children ranged from 6 to 24 months with a mean [SD] of 10.4[3.2] months and the male: female ratio was 1.07:1. Five hundred and ten (99.4%) of the babies were ever breast-fed and only 3(0.6%) were never breastfed based on advice given by health workers due to health reasons in the

mothers (Table 3). Table 3 also shows the time of initiation of breastfeeding in the babies and indicates that only 50.8% of the babies were first put to the breast within one hour of birth. Out of the 372 mothers with secondary or higher levels of education, only 169 (45.4%) breastfed within the first hour whereas 90(63.8%) of the 141 with lower levels of education first put their babies to the breast within the first hour. Thus mothers with at least secondary level of education were less likely to breastfeed within the first hour (x^2 13.85, df 1, $p < 0.001$). There was no significant association between place of delivery and breastfeeding within one hour of life (x^2 7.178, df 3, p 0.07). Pre-lacteal feeds were given to babies by 104 (20.3%) mothers; these comprised mainly infant formula in 51(9.9%), glucose water in 27(5.3%) and water in 23(4.5%) babies. The remaining 3 (0.6 %) mothers gave traditional medicine and fruit juice.

Exclusive Breast Feeding

When asked if they ever heard of exclusive breastfeeding, 493(96.1%) of women admitted having heard of it and 482 (94.0%) correctly defined it as feeding an infant solely with breast milk without addition of water or other food but only 220 (42.9%) of the 513 mothers included the recommended six months of duration to their definition. Out of the 372 mothers with at least secondary level of education, 180(48.4%) included the recommended six months in their definition of exclusive breastfeeding compared to only 40(28.4%) of the 141 mothers with lower levels of education. Mothers with higher educational levels were therefore more likely to know the recommended duration of exclusive breastfeeding (x^2 16.73, df 1, $p<0.001$).Exclusive breastfeeding of varying durations ranging from one to six months was practiced by 330 (64.3%) of the mothers and the durations of practice are shown in table 3. Out of the 372 mothers who had at least secondary school education, 120(32.3%) exclusively breastfed for six months compared to only 25(21.6%) of the 116 mothers with lower levels of education. A higher level of maternal education was therefore associated with increased rate of exclusive breastfeeding for six months (x^2 10.643, df 1, $p = 0.001$).The reason for not practicing exclusive breastfeeding in the remaining 183 mothers is shown in table 4. The commonest reason for not exclusively breastfeeding was the belief that babies need water to satisfy their thirst followed by obstetric factors such as delivery by Caesarean section and post partum maternal unconsciousness. Out of the 17 mothers who gave herbal teas to their babies, 13 did it as a form of treatment for neonatal jaundice.

Expression of Breast milk

Most mothers were against the idea of expressing breast milk, 349(68%) felt it was not good to express breast milk, 159(31%) felt expression of breast milk was good and the remaining 5(1%) made no response. The main reason for aversion to breast milk expression was the fear of contamination volunteered by 300 (86%) of the 349 mothers who decided against it. For mothers in support of breast milk expression, the main reason given in its support by 97(61%) of them is its usefulness in working class and other mothers whenever they have to be away from their babies. Of all the respondents, only 136 (26.5%) admitted ever expressing breast milk to feed their babies. Among the 372 mothers with at least secondary level of education, 133(35.8%) practiced expression of breast milk in contrast to the 141 mothers with lower levels of education in whom only 3 (2.1%) practiced expression of breast milk. (X^2 59.3, df 1, $p < 0.001$). The use of expressed breast milk in infant feeding was therefore associated with a higher maternal level of education. Mothers gave several reasons for feeding their babies with expressed breast milk but the commonest was the need to be away from their babies for crucial reasons such as going to work in 106(77.9%) mothers followed by the need to relieve breast engorgement in 11(8.1%) of the 136 mothers who expressed breast milk. Amongst the other reasons given were 4 (2.9%) cases of heat-treatment of breast milk based on the advice of health workers to prevent transmission of infection from mother to child through breast milk. The latter mothers were probably HIV positive women although for maintenance of privacy, further questions were not asked to find out the HIV status of the mothers. Wet nursing was quite rare and was reported by only 2(0.4%) of the mothers; one of them admitted her baby was breastfed by a grandmother and the other by her husband's first wife. The predominant mode of feeding with expressed breast milk was by the use of cup and spoon followed by bottle-feeding but feeding modality was often combined i.e. alternating one form with another. Overall, 87 (64%) of mothers used cup and spoon either as the sole utensils or in combination with bottle while 40(29.4%) used bottle-feeding either alone or in combination with other methods. The utensils used in feeding with infant formula are also shown in table 5 and reveal that majority (71.9%) was fed using cup and spoon similar to what is used in feeding expressed breast milk. Over all, bottle-feeding was practiced by 55(10.7%) mothers and out of the 372 mothers with at least secondary level of education, 46(12.4%) bottle-fed their babies compared with only 9(6.8 %) of the 132 mothers with lower levels of education (x^2 3.82, df 1, $p = 0.05$).

Cessation of Breastfeeding

A total of 88 mothers had stopped breastfeeding their babies and the duration of breastfeeding ranging from 1 to 22 months with a median of 14 months and

25th and 75th percentiles of 12 and 15 months respectively. There was no significant correlation between duration of breastfeeding and parity (Pearson's correlation coefficient = 0.07, p =0.493) neither was there any significant correlation between breastfeeding and maternal age (Pearson's correlation coefficient -.085, p=0.435). Median duration of breastfeeding in all the children could not be calculated since less than half the babies had stopped breastfeeding; hence the impact of maternal education on duration of breastfeeding could not be assessed. Among mothers who had yet to stop breast feeding, the intended duration of breastfeeding their babies ranging from 9 to 24 months with a median of 15.0 months and 25th and 75th percentiles of 12 and 18 months respectively.The leading reasons for stopping breastfeeding were the infant being old enough in 42 cases (47.7%), refusal of breast milk by the infants in 10 cases (11.3%), pregnancy in 9(10.2%) cases and attempt to encourage the infants to eat solid food in 7(8.0%). Less important reasons included separation from child due to work or return of mother to school, advice by husband or other persons, poor maternal lactation, painful breasts and death of father. For those who were yet to stop breastfeeding, the leading reasons advanced for intended period of breast feeding were that the baby would have been old enough at that time in 231 (54.9%) cases, baby eating and walking well 69(16.4%), advice by health workers in 29(6.9%) cases and desire to have another pregnancy in 25(6.0%) cases.Of the 88 mothers who had stopped breastfeeding, 28(31.8%) did it abruptly and the remaining 60(68.2%) did it gradually. Only 5 (5.7%) of the mothers had to recommence breastfeeding after initial stoppage comprising 4 who stopped breastfeeding gradually and 1 who stopped suddenly. Gradual stoppage of breastfeeding therefore did not seem to reduce the risk of recommencement of breastfeeding. The main reason for recommencing breastfeeding was excessive crying of the baby and compassion of the mother. For mothers who had stopped breastfeeding, the major methods of stoppage of breastfeeding were administration of drugs to the babies in 25(28.4%) of cases, giving of artificial milk and cocoa beverages in 23(26.1%) and sending the infant to neighbors or relatives in 12(13.6%) cases. Less common practices were preventing access to the breast and the use of bottle-feeding. Fifteen (17%) mothers did nothing special to stop breast-feeding of their infants. The drugs most frequently used for stoppage of breastfeeding were blood tonics accounting for 14(56%) babies followed by vitamin preparations used in 5(20%) and sedatives in 3(12%) of the 25 babies for whom drugs were used. Less frequently used items were paracetamol, fruit juice and an antibiotic used in onecase each. A mother also gave her baby bitter leaves to stop breastfeeding.

HIV and abstinence from breastfeeding

Almost all responding women i.e. 508 (99.2%) had heard about HIV/AIDS. However, only 436(85%) Knew that HIV could be transmitted through breast milk; 31(6%) thought it could not be transmitted through breast milk and 46(9%) were not sure. Concerning the attitude of respondents towards nursing mothers who do not breastfeed; 96.8 % of the respondents condemned such mothers. Only 5(1%) of mothers thought failure to breastfeed may be due to HIV infection or other maternal illness and 3(0.6%) thought it might be as a result of a doctor's advice. Among those who condemned women who do not breastfeed, 298(58%) of them felt that such a mother is either not normal, insane or just wicked. Other major feelings were that such a mother hates the baby in 153 (29.8%) cases or does not want the baby to love her in 23 (4.5%) cases. Nineteen (3.7%) respondents also felt such mothers do not want their babies' brains to develop normally and 4(0.8%) felt the mother is playing with her future. Two (0.4%) mothers felt it is all right if the mother loves it that way and the remaining 6 (1.2%) made no response.

Sources of water for infant feeds

With respect to sources of water used in the preparation of babies' drinks and feeds there were often multiple sources and majority of mothers i.e. 338 (65.9%) used boiled water from wells. Other sources of water were packaged water in bottles 81(15.8%), packaged water in sachets 56(10.9%), untreated well water 5 (1%), tap water 23 (4.5%) and treated borehole water 25(4.9%).

FOCUS GROUP DISCUSSIONS

Most mothers said that health workers told them to initiate breastfeeding one hour after delivery to allow babies and mothers some time to recover from the birth process and that breastfeeding too early may cause vomiting in the baby. Many of them claimed to abide by this recommendation. The time of initiation of breastfeeding is also determined by the mothers' belief that the sequence of initiating breastfeeding should be crying of the baby, followed by bathing of baby and mother before breastfeeding the baby.

Most mothers had heard of exclusive breastfeeding but did not see anything wrong with giving water in addition to breastfeeding because they thought exclusive breastfeeding meant breastfeeding for six months without addition of other food and “water is not food.” They asserted that their mothers i.e. the babies' grandmothers told them that babies do get thirsty and need water and this was confirmed when some grandmothers in their own group said they warned their daughters and daughters-in-law to give water to breastfeeding infants. They believed water is necessary to pacify babies when they cry excessively. Furthermore, breastfeeding babies without adding water makes them cry a lot and if breast milk is given instead of water, they may grow up to be greedy. Only 1 out of 20(5%) practiced exclusive breastfeeding in the rural setting compared to 7 out of 20(30%) in the urban setting. Most grandmothers had heard of the concept of exclusive breastfeeding but did not know what it meant. On refusal of a mother to breastfeed

Her baby in the presence of others, discussants felt this is often due to shyness but nevertheless condemned refusal to breastfeed when advised to do so. Only a few women suggested that women with HIV should not breastfeed to prevent transmission of the infection. Most grandmothers were aware that refusal of a mother to breastfeed may be due to ill health but with awareness of HIV being more in the urban group. They all expressed sympathy and said they would take care of the babies but some grandmothers in the rural group said they would discourage their sons from continuing in the marriage.

Table 3 : **Breastfeeding Practices in Infants.**

Variable	No	%
Ever breast fed (n=513)	510	99.4
Initiation of breast- feeding (n=510)		
Within first hour	259	50.8
Within second hour	143	28.0
Beyond two hours	104	20.3
Pre-lacteal feeds (n=513)	104	20.3
Exclusive breastfeeding (513)		
Ever heard	493	96.1
Practiced for any duration	330	64.3
Practiced for at least four months	247	48.1
Practiced for six months	145	28.3

Table 1: **Educational Status and Occupations of Mothers.**

Parameter	No.	Percent
Educational level		
University graduates or equivalents	82	16.0
School certificate (SSCE/GCE O'Level) holders who also have teaching or other professional training	111	21.6
School certificate or grade II teachers' certificate Holders or equivalents	179	34.9
Modern 3 and primary six certificate holders	129	25.1
Those who can just read and write or the illiterate	12	2.3
Total	513	100
Occupation		
Senior public servants, professionals, managers, Large scale traders, businesswomen and contractors	31	6.0
Intermediate grade public servants, senior schoolteachers	92	17.9
Junior schoolteachers, drivers and artisans	100	19.5
Petty traders, messengers, labourers and similar grades	201	39.2
Unemployed, fulltime housewives, students and Subsistence farmers	89	17.3
Total	**513**	**100**

Table 2: **The Distributions of Age, Sex and Places of Birth of the Children.**

	Frequency	Per cent
Age (months)		
6-12	416	81.1
13-18	80	15.6
19-24	17	3.3
Total	513	100.0
Sex		
Male	265	51.7
Female	248	48.3
Total	513	100.0
Place of birth		
Government health facilities	265	51.7
Private health facilities	173	33.7
Religious mission houses	33	6.4
Home	42	8.2
Total	**513**	**100.0**

Table 4: **Reasons for not Breastfeeding Exclusively.**

Response	Frequency	Percent
Babies need water for thirst	34	20.5
Delivery by Caesarean section	25	15.1
Mother unconscious after delivery	24	14.5
Herbal tea given to baby	17	10.2
Water given for hiccups	17	10.2
Advice by older mothers/friends	17	10.2
Ribena given to baby to enhance suckling	9	5.4
Breast milk insufficient for babies (twins)	6	3.6
Delayed lactation	6	3.6
Baby hospitalized on account of illness	6	3.6
Medical advise	3	1.8
Other reasons	2	1.2
Total	**166**	**100**

Table 5: **Mode of Feeding with Expressed Breast Milk and Infant Formula.**

	Expressed breast milk		Infant formula	
Utensils	**Frequency**	**%**	**Frequency**	**%**
Cup and spoon	74	54.4	46	71.9
Feeding bottle	25	18.4	3	4.7
Cup alone	22	16.2	1	1.6
Cup and spoon/bottle	13	9.6	13	20.3
Cup/bottle	2	1.5		
Syringe and cup	-	-	1	1.6
Total	**136**	**100**	**64**	**100.1**

DISCUSSION

The high rate of breastfeeding observed in our study is in keeping with findings by Osinusi in a previous study in this environment in which all babies were breastfed shortly after birth.[8] More recently, the National Demographic and Health Survey (NDHS) of the year 2003 revealed that 97 percent of babies born in the preceding five years were ever breastfed (NPC [Nigeria] and ORC Macro 2004).[9] These findings allude to the fact that breastfeeding is almost universal in the country. It is therefore not a surprise that failure of a woman to breastfeed her infant is met with some antagonism by most mothers as observed in the present study. The fact that majority of the mothers alluded to the risk of HIV transmission through breastfeeding and yet viewed a non-breastfeeding mother as wicked suggests they do not consider abstinence from breastfeeding as an option for prevention of the spread of the infection to the babies. Nevertheless knowledge of the society about abstinence as an option also carries a risk of stigma as revealed in a report from Zimbabwe in which women noted that not breastfeeding was a clear signal that a woman was either unfaithful or had HIV.[10] Our findings at the focus group discussions suggest that most mothers and grandmothers are likely to be compassionate to a woman who abstains from breastfeeding due to HIV but a few may instigate marital separation. Therefore, a mother who chooses not to breastfeed her infant must have a lot of support in order to weather the criticisms and trauma that may result from her action. Breastfeeding was initiated within the first hour of birth by half of the mothers in our study, which is higher than 32 percent rate in NDHS of Nigeria, 2003.[9] (NPC [Nigeria] and ORC Macro 2004). This difference may be due to the fact that less than half the women in the NDHS study had any formal education and were delivered in a health facility whereas over 85 % of our study patients had at least primary education and were delivered in health facilities; lower educational levels and delivery outside health facilities are associated with late initiation of breastfeeding.[9] (NPC [Nigeria] and ORC Macro 2004).

The allegation by mothers that health workers advised them to initiate breastfeeding after one hour needs investigation and if found true and corrected may improve the rate of initiation of breastfeeding within one hour since mothers who deliver in health facilities claim they abide by the health workers' advice. The median duration of breastfeeding among persons who had stopped breastfeeding in our study was 14.0 months and only slightly less than 15.9 months recorded for southwestern Nigeria in the 2003 NDHS. For those who had yet to stop breastfeeding in our study the median duration of intended breastfeeding was 15 months. The major reason for stopping or intending to stop at a particular age was that "the child is old enough or would have been old enough." Stoppage is gradual in most instances and done through a variety of means some of which are safe and yet others potentially harmful such as the use of drugs and bitter herbs. Early cessation of breastfeeding at age six months or less if replacement feeding becomes AFASS before that time as recommended for HIV positive mothers who chose to breastfeed is therefore likely to be a challenge to the mothers. They will therefore need to be supported and counselled on the right techniques to go through the process successfully without harming their infants.The proportion of babies exclusively breastfed for six months in our study (28.3%) is in keeping with a similarly low rate 23.4% exclusive breastfeeding at six months reported by Lawoyin *et al in* the same city.[11] The main reasons for failing to practice exclusive breastfeeding in our study were the administration of water to infants for thirst and treatment of hiccups as well as delivery by Caesarean section. Other workers have reported the belief in the necessity of giving water to infants in addition to breast milk in Nigeria.[12, 13] There is a need to address these challenges in other not to undermine the benefits of exclusive breast feeding and elective caesarean section in reducing the risk of mother to child transmission of HIV.[4,14] A possible alternative to breast milk is the use of infant formula but has been observed in randomized trial in Botswana to be associated with a higher mortality than breastfeeding at seven months of age (The Mashi Study).[15] In resource constrained settings where safety of infant formula may be uncertain, there is therefore need to consolidate on the benefits of exclusive breast feeding. Health education on exclusive breastfeeding should also be extended to grandmothers to facilitate compliance of their daughters to exclusively breastfeeding.Higher maternal education was associated with exclusive breastfeeding in our study in keeping with studies in both Nigeria and the European Union.[13,16]This highlights the important role of maternal education in the acceptance of new health Knowledge and strategies.

Mothers with low levels of education would therefore need more intense counseling to enable them practice exclusive breastfeeding particularly with respect to feeding of HIV exposed infants as this has again been shown to be associated with a lower risk of mother-to-child transmission of HIV than mixed feeding in recent study by Iliff *et al* in Zimbabwe.[17] Heat treatment of breast milk which kills the human immunodeficiency virus is one of the infant feeding options recommended for prevention of transmission of the infection from mother to child.[18] Three mothers in our study gave their reason for the expression of breast milk to be for the purpose of heat treatment before feeding their babies. This suggests that the modality is a potentially viable option even in Nigeria for HIV positive mothers who opt for breastfeeding of their infants. However before the milk can be heat-treated, it must first be expressed a process that was disliked by most (68%) mothers and practiced by only 26.5% of them in our study. The main reason for aversion to the process was the fear of contamination. The risk of contamination may be compounded by our observation that almost a third (29.8%) of babies fed with expressed breast milk received it through bottle feeding either alone or in combination with cup and spoon. In our study, women with higher educational levels were more likely to feed their babies with expressed breast milk than those with lower educational levels. Health education and counseling on hygienic handling of expressed breast milk paying particular attention to less educated mothers may therefore improve the acceptance of expression of breast milk to facilitate adherence to exclusive breast feeding by all mothers and in particular in HIV positive mothers who opt for breastfeeding of their babies. Encouraging the use of cup feeding with breast milk is likely to be accepted considering our finding that most babies were fed with cup or cup and spoon. Consumption of milk within 24 hours of expression if stored in a refrigerator, within 8hours if kept at room temperature and within an hour of heat-treatment as Recommended by WHO/UNICEF/UNFPA/UNAIDS is likely to reduce the risks of contamination.[18] The present study also shows that wet nursing is not popular in Ibadan as only 2 (0.4%) of the infants were nursed in that manner.With respect to sources of water used for infant feeding, our study revealed that over 70 percent of mothers use well water, which is boiled in most cases. This raises questions such as how many mothers know the expected duration of boiling required and proper subsequent handling, how many have wrist watches or clocks and able to read the time. The risk of diarrhoeal illnesses following the use of unsafe water cannot be overemphasized.

CONCLUSION

Breastfeeding is the norm in Ibadan, Nigeria but the rate of exclusive breastfeeding is low due to socio-cultural barriers. There is need to increase health educational efforts to promote breastfeeding in line with Unicef recommendations. However, for HIV positive mothers infant feeding options remain a challenge. Abstinence from breastfeeding is likely to be met with stigma in a population like Nigeria. Replacement feeding is likely to carry a significant risk of diarrhoeal infections unless mothers have access to safe water as well as realize the danger of bottle-feeding. For mothers who choose to breastfeed their babies they need support to overcome problems such as addition of water, the use of herbs and dangerous methods of stopping breastfeeding. Intense counseling paying particular attention to women with low levels of education is necessary to help mothers choose and practice infant feeding methods that are likely to reduce mother to child transmission of HIV.

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