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FACTORS INFLUENCING ADHERENCE TO EXCLUSIVE BREAST FEEDING AMONG HIV POSITIVE MOTHERS IN KABAROLE DISTRICT, UGANDA
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FACTORS INFLUENCING ADHERENCE TO EXCLUSIVE BREAST FEEDING AMONG HIV POSITIVE MOTHERS IN KABAROLE DISTRICT, UGANDA

A. MATOVU, B. KIRUNDA, G. RUGAMBA-KABAGAMBE, N.M. TUMWESIGYE and F. NUWAHA

ABSTRACT

Objective: **To identify the factors influencing adherence to exclusive breast feeding (EBF) among HIV positive mothers in Kabarole district, Uganda.**

Design: **Cross-sectional study.**

Setting: **Kabarore district, western Uganda.**

Subjects: **HIV infected women attending for psychosocial support that adhered or did not adhere to EBF.**

Main outcome measures: **We compared personal factors, influence from other people, barriers and supports towards adherence to EBF among 139 HIV infected women who adhered and among 139 women who did not adhere to EBF using univariate and multivariate analyses.**

Results: **The independent predictors of adherence to EBF are: having formal education (Adjusted Odds Ratio [AOR] 2.21, 95% confidence interval [CI] 1.01-4.84), knowledge of EBF as a method of preventing mother to child transmission of HIV (AOR 2.53, CI 1.11-5.75), attending at least four antenatal infant feeding counselling sessions (AOR 3.86, CI 1.82-8.19), attending at least six postnatal counselling sessions (AOR 12.52, CI 3.89-40.30), health workers being consulted for breastfeeding problems (AOR 13.11,CI 3.75-45.81), mothers thinking that they are able to produce enough milk (AOR 3.92, CI 1.74-8.84), initiation of breastfeeding within one hour of birth (AOR 10.17, CI 4.52-22.88), getting support from the father to EBF (AOR 5.27, CI 1.87-14.81) and getting support from the family to EBF (AOR 4.54, CI 2.09-9.84).**

Conclusion: **In order to improve adherence to EBF there is need to: involve the family especially fathers in infant feeding counselling and education, target less educated mothers for more intense infant feeding counselling using appropriate methods, intensify education on benefits of EBF and on how to produce enough milk and to encourage mothers to attend regularly for ante-natal and post-natal care.**

INTRODUCTION

While breast feeding (BF) improves child survival especially in resource-poor settings (1-3), BF by HIV-infected women increases the incidence of HIV infection among breast-fed infants (3-7). Mixed feeding (i.e. feeding infants on breast milk and supplements) is more risky for HIV transmission than exclusive breast feeding (EBF). This is partially due damage to the epithelial integrity of the infant intestine that facilitates entry of the HIV virus and because of breast engorgement that increases the

viral load in breast milk (3-6). As a result, WHO, UNAIDS and UNICEF recommend that HIV infected mothers should avoid all BF in settings where replacement feeding is acceptable, feasible, affordable, sustainable and safe (3). If the available replacement feeding methods do not meet these criteria as is the case in most of sub-Saharan Africa including Uganda, EBF is recommended during the first 3-6 months of life but is also recommended to be discontinued abruptly (2). However, these recommendations of EBF and abrupt cessation are commonly not adhered to and mothers more often than not practice mixed feeding. Adherence to EBF has been reported to be between 35-70% in various settings and depending on the age of discontinuation (8-14). Thus an understanding of the factors influencing adherence to EBF is a prerequisite for designing strategies aimed at improving adherence to EBF. The current report describes factors influencing adherence to EBF among HIV infected mothers in Kabarole district of Uganda where adherence to EBF is about 44% (District director of health services Kabarole, personal communication).

MATERIALS AND METHODS

Study area: The study area was Kabarole district in Western Uganda. Kabarole district is administratively composed of three Health Sub-Districts (HSD) of Kibiito, Bukuku and Fort Portal, which are served by three hospitals, and thirty one health centres. The total population of the district (projected from 2002 census) is 383,576 people of whom 88,222 are women of reproductive age. The total fertility rate in Kabarole district is 7.8 per woman and annually 19,178 pregnancies occur. Given that the prevalence of HIV among women attending ante-natal care (ANC) is 11% (15), an estimated 2,110 infants are annually born to HIV-infected mothers. Without any PMTCT intervention, the mother to child HIV transmission rate (MTCT) is about 30% (7) and therefore about 633 infants are expected to be infected with HIV infection in the district during one year.

Prevention of mother-to-child transmission (PMTCT) of HIV services in Kabarole district were started in 2001 with support from the German Technical Cooperation (GTZ). These services are offered in three sites namely: Fort Portal regional referral hospital, Virika hospital and Kibito health centre. PMTCT services offered include HIV counselling and testing of pregnant women including their spouses, provision of single dose nevirapine prophylaxis to the mother at the onset of labour and of single dose syrup nevirapine prophylaxis to the infant within 72 hours of delivery. The nevirapine tablet is given to the mother at about 28 weeks of gestation whereas if delivery occurs outside the health unit, the infant is brought to the health unit within 72 hours to receive the nevirapine syrup. Testing for HIV among mothers is done using three rapid tests in series (for screening, confirmation and as tie breaker) with results given within about one hour. From November 2005, the national PMTCT policy has been modified to include more efficacious drugs for prophylaxis such as dual therapy with nevirapine in combination with zidovidune or even with Highly Active Anti-Retroviral Therapy (HAART) for mothers that are eligible. In 2004, a total of 7,626 women were new ANC attendees at the three PMTCT sites, and of these 4,235 (55.5%) accepted HIV testing with 711 (16.8%) of the 4,235 women testing HIV-positive. Of the male partners who accompanied their wives during ANC, 470 (94%) accepted being tested and out of the 470 (27%) were HIV-positive. Follow-up of mother infant pairs is done until the children are 18 months. The follow-up is done through mothers reporting to health units monthly. Where mothers do not report within one week of appointment, they are visited at their homes. In addition to psycho-social support mothers are given free treatment for opportunistic infections, and those eligible are given free anti-retroviral therapy (ART). These services are also extended to their spouses and other family members.

The HIV positive mothers opt for different infant feeding methods during ante-natal attendance. In Kabarole district, about 90% of the mothers choose EBF with only 10% opting for exclusive replacement feeding mainly based on cow's milk. Evidence from records within the PMTCT programme in the district, indicate that only 44% of the mothers adhere to EBF. Education on infant feeding is initiated during ANC and continued during post natal care by health workers trained in infant feeding. Various methods are used to educate mothers such as video shows, counselling flip charts, question and answer sessions, and use of flyers in both local language and in English. Main topics covered during education

include: exclusive breast feeding, complementary feeding, use of cow's milk, and infant formulae as replacement feeds, maternal nutrition and expressing of breast milk. Major problems with education of mother on infant feeding education include mothers not attending regularly for ANC or PNC, mothers coming late for the infant feeding sessions, shortage of health workers and difficulty of reaching male partners.

Design: We compared 139 HIV-infected women who adhered to EBF to 139 women who did not adhere to EBF. The study population consisted of HIV positive mothers who had opted for EBF and whose children were at least six months old but less than 12 months of age.

Selection of study participants: All mothers who had opted for EBF and reported to study sites during the study period (January to April 2006) were included. At each site, HIV positive mothers who came were enrolled in the study and interviewed consecutively as they came. More than 90% of the mothers come for follow-up probably because of the incentives given such as food supplements for the mothers, treatment of opportunistic infections and of psycho-social support to live positively with HIV. The study was designed to interview an equal number of women who EBF or did not EBF and since non adherence to EBF was more common than adherence to EBF, recruitment of women who EBF took a longer time than those who did not EBF by about two weeks.

Data collection: A pre-coded, pre-tested questionnaire was administered to the mothers between January and April 2006 by trained research assistants closely supervised by one of the principal investigators (AM). The questionnaire was translated into the local language-Rutoro and back into English to ensure that there was no change in meaning of the questions.

Dependent variable: In this study, adherence to EBF was defined as an HIV positive mother who did not give the infant any other food or drink, apart from breast milk, with the exception of drops or syrups consisting of vitamins, mineral supplements or prescribed medicines from the day the child was born up to six months at any of the three PMTCT sites in Kabarole District. Non adherence to EBF was an HIV positive mother who breastfed an infant up to six months and also gave other fluids or feeds, apart from drops or syrups consisting of vitamins, mineral supplements or prescribed medicines.

The independent variables: The independent variables were age, educational level, employment status, source of financial support, marital status, previous feeding practices, knowledge of women on MTCT, awareness of women on PMTCT through breast feeding, knowledge of mothers on benefits of EBF, decision making on infant feeding options, consultation in case of breast feeding problems, and perceived production of enough milk, mode of delivery, place of delivery, number of ANC and post-natal visits, disclosure of HIV status and whether partner or family support EBF.

Data analysis: Data were coded, cleaned and double entered into *Epi Info 2000* computer software (CDC, Atlanta, Georgia) and then exported to *SPSS* 11.5 computer programme (SPSS Inc., Chicago, IL) for analysis. Crude odds ratios (COR) and their 95% confidence interval (CI) were calculated after univariate analysis. To identify independent predictors of adherence to EBF, stepwise multivariate logistic regression was conducted using backward elimination methods. Before the stepwise logistic regression was done, variables that were significant on univariate analysis ($P<0.05$) were assessed for multi-co linearity by calculating their Pearson correlation coefficient (r). Where two variables were high correlated ($r>0.4$, $P<0.05$) only one of them was included in the model. The decision for inclusion of variables in the model was based on which of them appeared logically essential to the model. Adjusted odds ratios (AOR) and their 95% CI were calculated after multivariate analysis.

Ethical consideration: The research was approved by Makerere University, School of Public Health institutional review board and the Uganda National Council for Science and Technology. Permission to collect data was obtained from the district director of health services for Kabarole district. Informed consent was obtained from mothers before interviews took place.

RESULTS

A total of 278 HIV positive women, 139 EBF feeders and 139 non-EBF feeders were enrolled in this study. The prevalence of EBF among mothers in the study population was 139 out of 347 (40%). The study population were mainly married women (62%) who resided in rural areas (77%), and principally dependant on the father of the child (81%) for financial support. Furthermore, the women were mostly peasant farmers or housewives (71%) with little or no education (only 18% had secondary education and above). The mean age of the women was 27 years with a standard deviation of 5.5 years. The mean age of the infants was eight months with a standard deviation of two months.

Demographic characteristics: Table 1 shows the distribution of mothers who adhered to EBF and those that did not adhere to EBF in terms of age, marital status, occupation, level of education, place of residence, and by main income provider. Having formal education and being married favours adherence to EBF. However age, place of residence, occupation and source of financial support did not influence adherence to EBF.

Knowledge and individual factors: The distribution of mother's knowledge regarding benefits of EBF for PMTCT and other individual factors are shown in Table 2. Adherence to EBF is favoured by having knowledge of EBF as a method of PMTCT, consulting health workers when mothers had a problem with

Table 1

Distribution of demographic characteristics by adherence to EBF among HIV positive women in Kabarole district

Variable	EBF (n = 139)		Non-EBF (n = 139)		Odds ratio (95% CI)
	No.	(%)	No.	(%)	
Age (years)					
17-30	113	81.3	109	78.4	1.20 (0.67- 2.15)
> 30	26	18.7	30	21.6	
Educational level					
Formal education	107	77	68	48.9	3.50 (2.08-5.85)*
No formal education	32	32	71	37.1	
Residence					
Rural	110	79.1	103	74.1	1.33 (0.76-2.32)
Urban	29	20.9	36	5.9	
Marital status					
Married	95	86.3	75	54	1.84 (1.13-3.00) *
Not married[1]	44	31.7	64	46	
Occupation					
Peasant farmers	103	74.1	95	68.3	1.33 (0.79-2.23)
Others[1]	36	25.9	44	31.7	
Main income provider					
Father of child	121	80.6	104	70.8	1.39 (0.79-2.47)
Other[2]	27	19.4	35	25.2	

Others[1] –include civil servants, business, students and tailors
Other[2]– include mother of the child and other family members
*Statistically significant results

breast feeding and by mothers who thought they could produce enough milk for their babies. Having a previous child before knowing HIV status did not influence adherence to EBF.

Service delivery factors: The effect of service delivery factors on adherence to EBF is shown in Table 3. Adherence to EBF is favoured by individual pre-test counselling, having attended at least four antenatal counselling sessions, having been satisfied with antenatal counselling, attending at least six postnatal counselling sessions, discussing with health workers on EBF, having had a vaginal delivery and having delivered in a health unit.

Relationship factors: The effect of disclosure and reactions of other people to the mothers HIV status and about EBF are shown in Table 4. EBF is favoured by disclosure of HIV status to anybody, sharing HIV status with the father, having received family support to EBF, and having received support to EBF from the father of the child. However, there was no significant difference between women who adhered and those that did not adhere to EBF regarding sharing of HIV status results with other family members and perceiving EBF as a culturally accepted form of infant feeding.

Independent predictors of adherence to EBF: The following pairs of variables that were significant on univariate analysis were highly correlated and the first one was considered essential for inclusion in the model HIV status shared with father versus disclosed HIV status to anybody, health workers being consulted for breastfeeding problems versus discussion with health workers on BF, and receiving family support to EBF versus share results with other family members. All other variables significant on univariate analysis that were not correlated were included in the multivariate analysis.

Table 2

Association between individual factors and mode of breastfeeding among HIV positive mothers in Kabarole district

Variable	EBF (n = 139)		Non-EBF (n = 139)		Odds ratio (95% CI)
	No.	(%)	No.	(%)	
Knowledge of EBF as a method of PMTCT[1]					
Yes	108	77.7	84	60.4	2.28 (1.35-3.85)*
No	31	22.3	64	39.6	
Person consulted in case breastfeeding problem					
Health worker	34	24.5	16	11.5	2.49 (1.30-4.76)*
Others[2]	105	75.5	123	88.5	
Mother thought she could produce enough breast milk					
Yes	115	82.7	70	50.4	4.72 (2.72-8.20)*
No	24	17.3	69	49.01	
Was any child produced before knowing HIV status?					
No	32	23	24	17.3	1.43 (0.79-2.59)
Yes	107	77	115	82.7	

PMTCT [1]–Prevention of mother-to-child transmission of HIV
Others [2]–includes relative, friend, nobody and no problem got
*Statistically significant results

Table 3

Relationship between service delivery factors and mode of breastfeeding among HIV positive mothers in Kabarole district

Variable	EBF (n = 139)		Non-EBF (n = 139)		Odds ratio (95% CI)
	No.	(%)	No.	(%)	
Mode of counselling					
Individual	47	33.8	18	12.9	3.43 (1.87-6.30)*
Group	92	66.2	121	87.1	
Number of antenatal counselling sessions attended					
At least four	95	68.3	37	26.6	5.95 (3.43-10.36)*
Less than four	44	31.7	102	73.4	
Satisfied with ANC counselling					
Yes	128	92.1	106	76.3	3.62 (1.75-7.51)*
No	11	7.9	33	23.3	
Number of postnatal counselling sessions attended					
At least six	128	92.1	108	77.8	3.34 (1.60-6.96)*
Less than six	11	7.9	31	22.3	
Discussed with health worker on decision making for EBF					
Yes	132	95	110	79.1	4.97 (2.10-11.79)*
No	7	5	32	20.9	
Mode of delivery					
Vaginal	124	89.2	109	78.4	2.28 (1.16-4.45) *
Caesarean section	15	10.8	30	21.6	
Mother delivered in a health unit					
Yes	124	89.2	101	72.7	3.11 (1.62-5.98)*
No	15	10.8	38	27.3	

*Statistically significant results

The independent predictors of adherence to EBF are: having formal education (Adjusted Odds Ratio [AOR] 2.21, 95% confidence interval [CI] 1.01-4.84), knowledge of EBF as a method of preventing mother to child transmission of HIV (AOR 2.53, CI 1.11-5.75), attending at least four antenatal infant feeding counselling sessions (AOR 3.86, CI 1.82-8.19), attending at least six postnatal counselling sessions (AOR 12.52, CI 3.89-40.30), health workers being consulted for breastfeeding problems (AOR 13.11,CI 3.75-45.81), mothers thinking that they are able to produce enough milk (AOR 3.92, CI 1.74-8.84), initiation of breastfeeding within one hour of birth (AOR 10.17, CI 4.52-22.88), getting support from the father to EBF (AOR 5.27, CI 1.87-14.81) and getting support from family to EBF (AOR 4.54, CI 2.09-9.84).

Table 4

Relationship between community factors and mode of breastfeeding among HIV positive mothers in Kabarole district

Variable	EBF (n = 139)		Non-EBF (n = 139)		Odds ratio (95% CI)
	No.	(%)	No.	(%)	
Disclosed HIV status to anybody					
Yes	121	87.1	92	66.2	3.43 (1.87-6.30)*
No	17	12.9	47	33.8	
HIV status result shared with father of child					
Yes	95	68.3	75	54	1.84 (1.13-3.00)*
No	44	37.7	64	46	
HIV status results shared with other family members					
Yes	53	38.1	51	36.7	1.06 (0.65-1.73)
No	86	69.1	88	63.3	
Type of infant feeding culturally accepted					
Exclusive breast feeding	47	33.8	40	28.8	1.26 (0.076-2.10)
Others[1]	92	66.2	99	71.2	
Initiated breastfeeding					
Within at least 1 hour	110	79.1	51	36.7	6.55 (3.83-11.18)*
More than 1 hour	29	20.9	88	63.3	
Received family support to EBF					
Yes	101	72.7	58	42	3.67 (2.22-6.07)*
No	38	27.33	80	58	
Father of child support EBF					
Yes	70	50.4	42	30.2	2.34 (1.43-3.85)*
No	69	49.6	97	69.8	

Others[1]–includes exclusive breast feeding and replacement feeding
*Statistically significant results

DISCUSSION

This study was designed to provide information on the factors influencing adherence to EBF among HIV positive mothers. The independent predictors associated with adherence to EBF can be grouped under three headings namely having formal education, influence from significant others (such as father of the child / family members and from health workers) and having favourable psychosocial beliefs associated with less barriers and more support to EBF (e.g. belief that mother can produce enough milk, early initiation of breast feeding, disclosure of HIV results, and frequent attendance for ANC and post-natal care).

In this study education status of the mother appeared to favour adherence to EBF. Educated mothers are more likely to heed to health education messages and to comply with health advice better than non educated ones; because education leads to empowerment and then self efficacy (16). Also according to the theory of adoption of innovations commonly used in applied social-psychology, educated people are more likely to be innovators or early adopters of new technologies (17). The implication of this finding is that mothers without formal education need intensified counselling regarding adherence to EBF probably using appropriate methods like methods that do no require reading (18).

Our results emphasises that fathers and health workers are extremely important in influencing adherence to EBF. These observations are similar to major findings in most applied social-psychology literature where significant others are determinants of social related behaviour (19-21) such as EBF. Thus our results suggest that in addition to providing the mother with information about EBF, education about EBF should be availed to fathers / spouses as well. On a wider scale, these results tend to emphasize that men need to be involved in reproductive health issues so as to ensure success of the programmes (22).

Favourable beliefs (such as mothers believing that they can produce enough milk and mothers believing that EBF is a method of PMTCT) and mothers with supports that enhance adherence to EBF (such as frequent attendance for ANC and for post-natal counselling, disclosure of HIV status, getting support from the father to EBF and getting support from health workers in case of problem) were very important in favouring adherence to EBF. The implications of these observations for interventions aimed at increasing adherence to EBF are several; (i) more health education that particularly emphasizes the benefits of EBF for PMTCT is needed (23); (ii) there is need to equip mothers with skills to produce enough milk such as increasing frequency and regularity of breast feeding using innovative methods such as use of peer counsellors (24); (iii) regular attendance of ante-natal and post-natal counselling sessions should be encouraged and reinforcement messages regarding infant feeding should be included in ante-natal and post natal sessions (25,26). This is particularly important as the proportion of women who attend ANC for at least four times is only 40%. A much lower percent of women (less than 20%) attend post natal care in Uganda (14); (iv) HIV positive mothers need supported disclosure of their HIV status or disclosure needs to be made easy through encouraging couple counseling and testing (27) and finally (iv), health workers and fathers should be equipped with skills to support mothers in EBF (9-11,28-30).

Limitations of this study include recall and information biases where mothers could have forgotten events that happened in the past and could give answers aimed at pleasing the interviewers. The effect of these limitations was reduced by limiting the recall period to one year (14). Furthermore, the mothers were put at ease during the questioning by introducing the question where non adherence to EBF was regarded as a possibility. The question run thus "it is known that there are problems in adhering to choices made at feeding the infant. In your case did you meet any problems" then the interview continues.

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