

The Influence of Individual Determinants on Adherence to Feeding Guidelines for Infants Born to HIV Positive Mothers in Rakai District

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Abstract

Introduction: In Uganda, Human Immunodeficiency Virus (HIV) was first reported at Kasensero landing site in Rakai district, in the South Western region in 1982. The district has continued to experience high HIV rates at 12% compared to the national average of 7.3% with relatively higher vertical transmission rates. **Objective:** The purpose of this study was to determine the individual determinants of adherence to feeding guidelines for infants born to HIV positive mothers in Rakai District, Uganda. **Methodology:** A descriptive cross-sectional study design was used with a sample size of 138 respondents and employing quantitative method of enquiry. A non-probability sampling strategy called consecutive sampling was used to sample the mothers with HIV. Data were analyzed using SPSS to generate descriptive and bivariate analysis data. **Results:** Individual determinants found to have a statistically significant influence to feeding guidelines for infants born to mothers living with HIV were: Age ($X^2 = 45.967$, P -value = 0.000), Number of children ($X^2 = 93.069$, P -value = 0.000), Number of children given birth to since diagnosis ($X^2 = 18.604$, P -value = 0.000), income per month ($X^2 = 50.477$, P -value = 0.000), ever had breast complication ($X^2 = 15.039$, P -value = 0.000), disclosure of HIV status ($X^2 = 10.740$, P -value = 0.001), quantity of breast milk produced ($X^2 = 10.637$, P -value = 0.0005) and whether mothers attended antenatal care services ($X^2 = 38.613$, P -value = 0.000). **Conclusion:** Age, Number of Children, Number of Children given birth to since diagnosis, breast complications, disclosure of HIV status, quantity of breast milk produced and utilization of antenatal care services were found to have an association with the adherence to feeding guidelines among HIV positive mother and this was statistically significant. **Recommendation:** General improvement of socio-economic status of the mothers should be done and be given priority so that in turn it will enable the women to adequately focus on maintaining optimum and the health

of their children.

Keywords

Rakai, Mothers, Antenatal Services, Children

1. Introduction

In Uganda, Human Immunodeficiency Virus (HIV) was first reported at Kasensero landing site in Rakai district, in the South Western region in 1982 (Ministry of Health, 2011; Serwadda, 1985). The district has continued to experience high HIV rates at 12% compared to the national average of 7.3% with relatively higher vertical transmission rates (MOH, 2017) [1].

In a longitudinal descriptive study done to examine the adherence to infant-feeding choices made by human immunodeficiency virus (HIV)-infected mothers at a Nigerian tertiary hospital, the study was conducted on mother-infant pairs recruited from the elimination of mother-to-child transmission (EMTCT) of HIV program of Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria. Factors found to be significantly associated with adherence to their initial choice included having individual prenatal infant-feeding counselling sessions, being married, having a small number of children, being of higher socio-economic status and the mother's educational status. However, only socio-economic status remained significant after logistic regression analysis was applied. The total MTCT of HIV rate was 1% at six months. In conclusion, the Adherence to either EFF or EBF in this study was low, owing to early breastfeeding cessation and the inability to sustain EFF (Onubogu *et al.*, 2014) [2].

A number of studies have found that women who were financially dependent on a family member were more likely to practice mixed feeding (Desclaux *et al.*, 2009) [3]. Other studies have in the same light reported that women who were financially independent, living within a nuclear family setting or supported by an HIV-positive partner were more likely to exclusively breastfeed (Doherty *et al.*, 2006a) [4]; (Mataya *et al.*, 2013) [5]. The financial vulnerability can result in nondisclosure of HIV status due to fear of stigma and lose social and/or financial support (Hofmann *et al.*, 2009) [6]; (Fadnes *et al.*, 2009) [7]. In a setting of non-disclosure, the practice of EBF would be a greater challenge and perhaps non-negotiable (Østergaard *et al.*, 2010) [8]. This is even more challenging in societies where EBF is known to be a recommended feeding practice for HIV-positive mothers (Thairu *et al.*, 2005) [9]; (Buskens *et al.*, 2007) [10]. Conversely, HIV status disclosure to a partner and/or family members gave women the needed support to practice EBF, whilst non-disclosure was associated with the practice of mixed feeding within 6 months postpartum (Fadnes *et al.*, 2009) [7]; (Marembo *et al.*, 2014) [11]; (Onono *et al.*, 2014) [12].

A number of studies suggest that women may resort to mixed feeding when

they have concerns about insufficient breast milk, or if they perceive practising EBF to be detrimental to their own health (Kimani-Murage *et al.*, 2011) [13]; (Østergaard *et al.*, 2010) [8]; (Webb-Girard *et al.*, 2012) [14]. Women who were food secure were more confident in their breast milk production and were more likely to adhere to EBF than food-insecure women (Østergaard *et al.*, 2010) [8]; (Webb-Girard *et al.*, 2012) [14]; (Mataya *et al.*, 2013) [5]. In Malawi, some women believed practising EBF would improve their own feeding and health status, while other women believed EBF would be detrimental to an HIV-positive mothers' health (Kafulafula *et al.*, 2013) [15]. In Nigeria, participants in one study believed that HIV-positive mothers might be too ill to breastfeed exclusively (Abiona *et al.*, 2006) [16]. Studies from South Africa, Malawi and Kenya, also suggest that many women practiced mixed feeding with solids or semi-solid foods because they do not consider breast milk to be food and therefore question its nutritional value (Buskens *et al.*, 2007) [10]; (Wachira *et al.*, 2009) [17]; (Mataya *et al.*, 2013) [5]. Furthermore, mixed feeding is adopted in some instances when colic is associated with hunger and inadequate breast milk (Thairu *et al.*, 2005) [9]; (Webb-Girard *et al.*, 2012) [14]; (Madiba *et al.*, 2013) [18]. In some parts of Nigeria and Uganda however, breast milk is considered food, however, water is considered a necessary supplement (Abiona *et al.*, 2006) [16]; (Fadnes *et al.*, 2010) [7]. There were similar findings in Kenya where water is considered as “necessary for life” (Webb-Girard *et al.*, 2012) [14]. Studies from South Africa, Burkina Faso, Cameroon, and Ethiopia all reveal that in the context of formula availability and prior knowledge of EFF as a feeding option, mothers preferred EFF due to fear of infecting their infants with HIV (Hofmann *et al.*, 2009) [6]. When mothers perceive their breast milk as “poisonous” due to HIV infection, they wean their infants early postpartum, believing that such a practice would minimize infant exposure to HIV (Thairu *et al.*, 2005) [9]; (Koricho *et al.*, 2010) [19]. However, a study from Nigeria revealed a contrary finding: mothers chose EFF not for fear of HIV transmission, but because of the desire to be identified among the upper socio-economic class who could afford infant formula (Abiona *et al.*, 2006) [16].

On the other hand, previous experience with breastfeeding, being knowledgeable about the nutritional benefits of breast milk and associating infant mortality with formula feeding influenced mothers to choose EBF (Thairu *et al.*, 2005) [9]; (Hofmann *et al.*, 2009) [6]. Mothers with a clear understanding on how EBF may reduce postnatal transmission were more willing to choose and adhere to the practice compared to mothers who did not have such privileged knowledge (Thairu *et al.*, 2005) [9]; (Kafulafula *et al.*, 2014) [15]; (Mataya *et al.*, 2013) [5]. On the contrary, in Zambia, even though mothers understood the dangers of mixed feeding, they found it difficult to avoid the practice (Chisenga *et al.*, 2011) [20]. Similarly, in rural settings of Namibia, Swaziland and South Africa, the lack of pre-existing cultural norms for EBF made its practice for 6 months difficult to accept and sustain (Buskens *et al.*, 2007) [10].

2. Methodology

2.1. Study Design

This study design was a cross-sectional study with quantitative data collection methods. The cross-sectional study enabled the researcher to collect all the required data at a point and survey the problem in a specified period of time; the research objectives *i.e.* the independent and dependent variables was used to design questions that necessitated the collection and analysis of the data (Setia MS, 2016) [21].

2.2. Study Population

The study population was among mothers living with HIV in Rakai district. It was estimated that 1 in every 10 mothers in Rakai district are living with HIV (Rakai district Statistical Abstract, 2009) [22]. In Rakia district 23 of the health centres and two hospitals were offering services for prevention of mother to child transmission (PMTCT) (Kunihira *et al.*, 2010) [23]. The data were collected at the 23 health centre and the two hospitals consecutively.

2.3. Inclusion Criteria

All HIV positive mothers living in Rakai district who are willing to participate in the study.

2.4. Exclusion Criteria

All HIV positive mothers living in Rakai district who were unable to answer the question due to one condition or the other.

2.5. Sample Size Calculation

In a study, an estimate of the number of women living with HIV in Rakia district was available, which was around 10% (Rakai district Statistical Abstract, 2009) [22]. The researcher determined the sample size using Kishi and Leslie formula, this method is used because the actual population of a woman living with HIV in Rakia district is unavailable. This method involves the equation below:

$$N = \frac{Z^2 \cdot p \cdot q}{d} \quad (\text{Kishi and Leslie, 1965}) [24].$$

where

- n = desired sample size,
- Z = standard normal deviate at confidence level of 95% or 1.96,
- P = proportion in the population with (10%),
- $Q = 1 - p$ (P is the proportion of the population),
- D = Degree of accuracy desired at (0.05),
- $N = \frac{Z^2 \cdot p \cdot q}{d} \quad N = \frac{1.96^2 \times 0.1 \times (1 - 0.1)}{(0.05)^2}$.

The n value = 138; thus, the sample size for this study is 138.

2.6. Sampling Procedures

A non-probability sampling technique called consecutive sampling technique was used to assess the woman living with HIV in Rakia district; consecutive sampling technique involves selecting all individuals who agree to participate, provided they meet pre-established criteria until the number of desired subjects is achieved. This enabled the researcher to be more assessable to the respondents and achieve the desired sample size easily. This was done at the HIV clinic and other out-reaches in the district.

2.7. Measurement of Variables

2.7.1. Independent Variable

Individual determinants: Age (15 - 49 yrs.) was grouped into 15 - 19, 20 - 34 and 35 - 49. Number of Parity was grouped into 1 - 3, 4 - 6 and 7 and above. Numbers of children given birth to since diagnosis of HIV were grouped into 1, 2, 3, 4 and above. Experience of breast complications was grouped into Yes or No. Disclosure of HIV status was grouped into "Yes or No". Breast Milk production quantity was grouped into "large or average or small". Anti-natal care attendance was grouped into "Yes or No". Adherence to ART medication was grouped into "Yes or No".

2.7.2. Dependent Variable

Adherence to feeding guidelines for infants of HIV positive mothers: A self-question assessments method was used whereby questions about adherence were asked; the respondents were as well asked if they adhered or not.

2.8. Data Collection and Management Methods

2.8.1. Quantitative Methods

Data was collected using structured questionnaire and with the help of the research assistants. A semi-structured questionnaire was designed that contained all the questions related to the study objectives.

2.8.2. Quantitative Analysis

Data collected were analyzed using the Statistical Package for Social Sciences (version 22.0). Statistical calculations were done using bivariate analysis only. Some of the results were presented in charts, tables and different statistical expressions. The bivariate analysis made use of Pearson's Chi-square to establish the relationship between the independent variables and the dependent variable at an alpha level of 0.05.

2.9. Quality Control (Reliability and Validity)

The following quality control measures were employed in this study:

- At analysis level, a 95% confidence interval was used when performing bivariate and multivariate analysis.
- To ensure validity, the researcher pre-tested the questionnaires prior to data collection.

2.10. Ethical Considerations

A letter of approval was sought from the research and ethics committee of Stafford University Uganda under the department of Public Health in the year 2018. The participants were assured of strict confidentiality of any information they would provide. The entire participants were treated with dignity and respect. Confidentiality and anonymity were assured to the participants by using codes for identification instead of their names. The participants were given the liberty to take part or not in the study and any attempts to opt out of this exercise will not stop them from receiving all services that they normally get.

2.11. Limitation of the Study

The study design (cross-sectional study) used in this study enabled us to collect the data once without follow-ups which may deprive us of some further information about the study. The researcher annulled this limitation by ensuring that the onetime data were collected justly and with proper monitoring.

3. Results

Out of 138 questionnaires that was distributed to the various participants in this research study, a total of 135 agreed to participate; thus making a response rate of 98%.

3.1. The Individual Determinants of Adherence to Feeding Guidelines for Infants Born to Mothers Living with HIV in Rakai District

Age ($X^2 = 45.967$, P -value = 0.000); Number of children ($X^2 = 93.069$, P -value = 0.000); Number of children given birth to since diagnosis ($X^2 = 18.604$, P -value = 0.000); Income per month ($X^2 = 50.477$, P -value = 0.000); ever had breast complication ($X^2 = 15.039$, P -value = 0.000), disclosure of HIV status ($X^2 = 10.740$, P -value = 0.001), quantity of breast milk produced ($X^2 = 10.637$, P -value = 0.0005) and attended antenatal care services ($X^2 = 38.613$, P -value = 0.000) were the individual factors found to be statistically significant with respect to adherence to feeding guidelines for infants born to mothers living with HIV in Rakai district (**Table 1**).

3.2. Discussion

The Individual Determinants of Adherence to Feeding Guidelines for Infants Born to Mothers Living with HIV in Rakai District

This research study found that Age had a statistically significant association with adherence to feeding guidelines for infants born to HIV positive in Rakai district. Age variation between mothers speaks of their maturity which may influence their adherence to feeding guidelines. This is in line with a study by Harvey, N.C., *et al.* (2009) [25] that found a statistically significant relationship between age and adherence to feeding guidelines.

Table 1. Individual determinants of the respondents influencing the adherence to feeding guidelines for infants born to HIV mothers.

Variables	Categories	Adherence to feeding guidelines for infants born to HIV mothers		X ²	P-value
		Adhere	Not-Adhere		
Age	15 - 24 yrs	0	21	45.967	0.000
	25 - 40 yrs	44	45		
	41 - 49 yrs	25	0		
Number of children	1 - 2	0	53	93.069	0.000
	3 - 4	54	13		
	5 - 6	15	0		
	7 and above	0	0		
Number of children given birth to since diagnosis	1 - 3	52	66	18.604	0.000
	4 - 6	17	0		
	7 and above	0	0		
Income per month	Below 200,000Ugx	0	35	50.477	0.000
	200,000 - 500,000 Ugx	48	18		
	Above 500,000 Ugx	21	13		
Ever had breast complications	Yes	0	13	15.039	0.000
	No	69	53		
Disclosure of HIV status	Yes	31	48	10.740	0.001
	No	38	18		
Quantity of breast milk produced	High	21	13	10.637	0.005
	Average	33	21		
	Low	15	32		
Attended ante-natal care service	Yes	69	37	38.613	0.000
	No	0	29		

The variables of number of children and number of children given birth to since diagnosis were also among the individual factors found to have a statistically significant association with the dependent variable *i.e.* adherence to feeding guidelines for infants born to HIV positive mothers. Stress from taking care of too many children may hinder adherence to breastfeeding guidelines and as well taking care of many children might have built too much confidence for the mother. This study is in line with a longitudinal descriptive study done to examine the adherence to infant-feeding choices made by Human Immunodeficiency Virus (HIV)-infected mothers at a Nigerian tertiary hospital.

Income per month was among the individual factors found to have a statistically significant association with adherence to feeding guidelines for infants born to mothers living with HIV in Rakai district. This is in line with studies that found women who were financially dependent on a family member more likely to practice mixed feeding (Desclaux *et al.*, 2009) [3]. Other studies have in the same light reported that women who were financially independent, living within a nuclear family setting or supported by an HIV-positive partner were more likely to exclusively breastfeed (Doherty *et al.*, 2007) [26]; (Desclaux *et al.*, 2009) [3]; (Østergaard *et al.*, 2010) [8] (Mataya *et al.*, 2013) [5].

Ever had breast complication and disclosure of HIV status were among the individual factors found to have a statistically significant association with adherence to feeding guidelines for infants born to mothers living with HIV in Rakai district. When partners understand the health conditions of their partner they will adequately render supports to each other in achieving sustainable healthy life. This is in line with studies which reported that women who were supported by an HIV-positive partner were more likely to exclusively breastfeed (Doherty *et al.*, 2007) [26]; (Desclaux *et al.*, 2009) [3]; (Østergaard *et al.*, 2010) [8]; (Mataya *et al.*, 2013) [5]. The financial vulnerability can result in nondisclosure of HIV status due to fear of stigma and loss of social and/or financial support (Hofmann *et al.*, 2009) [6]; (Fadnes *et al.*, 2009) [7]. In a setting of non-disclosure, the practice of EBF would be a greater challenge and perhaps non-negotiable (Østergaard *et al.*, 2010) [8]. This is even more challenging in societies where EBF is known to be a recommended feeding practice for HIV-positive mothers (Thairu *et al.*, 2005) [9]; (Buskens *et al.*, 2007) [10]. Conversely, HIV status disclosure to a partner and/or family members gave women the needed support to practice EBF, whilst non-disclosure was associated with the practice of mixed feeding within 6 months postpartum (Fadnes *et al.*, 2009) [7]; (Marembo *et al.*, 2014) [11]; (Onono *et al.*, 2014) [12].

The quantity of breast milk produced had a statistically significant association with adherence to feeding guidelines for infants born to HIV positive mothers in Rakai district. The quantity of milk produced will definitely influence the choice of breastfeeding practice among mothers. The finding above is in line with the number of studies that suggest that women may resort to mixed feeding when they have concerns about insufficient breast milk, or if they perceive practicing EBF to be detrimental to their own health (Kimani-Murage *et al.*, 2011) [13]; (Østergaard *et al.*, 2010) [8]; (Webb-Girard *et al.*, 2012) [14].

The variable of antenatal care services was found to have a statistically significant association with adherence to feeding guidelines. Most of the mothers who attended antenatal services will have strong knowledge about feeding guidelines and will understand how it works. This finding is reflective in a study that found that, previous experience with breastfeeding, being knowledgeable about the nutritional benefits of breast milk and associating infant mortality with formula feeding influenced mothers to choose EBF (Thairu *et al.*, 2005) [9]; (Hofmann *et al.*, 2009) [6]. Mothers with a clear understanding on how EBF may reduce post-natal transmission were more willing to choose and adhere to the practice compared to mothers who did not have such adequate and vital knowledge (Thairu *et al.*, 2005) [9]; (Kafulafula *et al.*, 2013) [15]; (Mataya *et al.*, 2013) [5].

4. Conclusion

Age, Number of children, Number of children given birth to since diagnosis, Income per month, ever had breast complications, disclosure of HIV status, quantity of breast milk produced and attended antenatal care services were the individual

factors that were found to have a statistically significant association with the dependent variable which is the adherence to feeding guidelines. The result also portrays a strong relationship between the variables that were associated with the mother's adherence to the stipulated and approved feeding guidelines.

Recommendations

General improvement of socio-economic status of the mothers should be done and be given priority so that in turn it will enable the women to adequately focus on maintaining optimum and the health of their children.

In addition to the above, proper monitoring by the health workers should be encouraged in order to follow up the practices of the mothers that are HIV positive as this will have a positive huge impact on their adherence to the feeding guidelines.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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