Awareness, Attitude and Practices of Postnatal Mothers Attending Mbagathi District Hospital on Infant Feeding Options for HIV Positive Mothers

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Summary

Effective infant feeding makes an important contribution to the good health and development of children with effects reflecting up to adulthood. Among many cultures and diverse populations traditionally, infants are fed through breast milk and later given complementary foods while continuing with breastfeeding. Mother to child transmission is a well established mode of HIV transmission and infection may occur during pregnancy, labour, delivery and breastfeeding. The objective of this study was therefore to determine the awareness, attitude and practices of postnatal mothers attending Mbagathi District Hospital on infant feeding options for HIV positive mothers. This was a descriptive cross-sectional hospital based study that utilized both quantitative and qualitative methods. It was conducted among postnatal mothers attending the hospitals Maternal and Child Health and Nutrition clinics. Systematic sampling was used to select the participants and data was collected using structured questionnaire and key informant interviews. Quantitative data was analyzed using statistical computer software (SPSS version 16.0) while transcripts from interviews were manually analysed based on themes developed from the study objectives and are presented verbatim. A total of 384 respondents were interviewed for a period of three months. Overall 45.5% of the respondents were adequately aware of the infant feeding options for HIV+ mothers, 83.9% had a positive attitude towards the infant feeding options for HIV+ mothers and 85.9% applied appropriate feeding option for age. The predictors of adequate awareness of recommended feeding for infants were number of births ($p \leq 0.001$) and level of education attained ($p \leq 0.001$) while predictors of appropriate attitude towards recommended feeding for infants born to HIV+ mothers were religion ($p=0.010$) and education ($p=0.013$). Number of births was the only socio-demographic characteristic ($p=0.015$) having an association with feeding practice. In conclusion, most postnatal mothers were aware of the infant feeding options for HIV positive mothers they embraced well the infant feeding options, though among the younger mothers the findings showed that they were not much concerned with the infant feeding options. The younger mothers need encouragement to understand and embrace awareness of the Recommended Infant Feeding Options in both HIV+ and HIV-.

Key words: Awareness, post natal mothers, Attitude and Practices, Infant Feeding, HIV Positive Mothers.

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Introduction

Infant feeding continues to be one of the most important practices influencing child survival and development and is also recognized as a critical component of care and support during the prenatal period for women [5]. The discovery that HIV can be transmitted through breast milk has precipitated a public health dilemma, particularly in countries where HIV affects significant proportions of the population and where breastfeeding is the cultural norm. Without intervention to prevent mother-to-child transmission, 30-45% of infants born to HIV-positive mothers in developing countries become infected during pregnancy, delivery and breastfeeding [4].

Breastfeeding has been recommended by WHO and UNICEF as the exclusive source of nutrition for infants during the first six months of life. Infants should start breastfeeding within one hour of life, should be exclusively breastfed for six months, with timely initiation of adequate, safe and proper complementary foods while continuing breastfeeding for two years or beyond [15]. In the context of HIV, infant feeding guidelines recommend that HIV infected mothers be counseled about the risks of breast milk in transmission of HIV and be given three options for feeding (a) exclusive breastfeeding for six months and abrupt cessation (b) replacement feeding with commercial infant formula if AFASS(Acceptable, Feasible, Affordable, Sustainable and Safe) (c) replacement with home modified formula (cow, goat, camel milk or soy protein) if AFASS [7].

An estimated 700,000 children are infected with HIV each year. About 44 % of this transmission is through breastfeeding [8]. A woman infected with HIV can transmit the virus to her child during pregnancy, labour or delivery, or through breastfeeding. A mother who has recently been infected with HIV has a higher chance of transmitting the virus to the baby through breastfeeding and the longer a child is breastfed by an HIV-infected mother, the higher the child's risk of HIV infection. In countries where breastfeeding continues to the second year, 30-50% of all mother to child transmission is estimated to occur through this route [4]. Infants who breastfeed for six months face a lesser risk of HIV infection than those who breastfeed for two years in situations where the mothers are HIV positive [10].

It is an established fact that breastfeeding is by far the best and safest way of feeding infants but the emergence of HIV has complicated this picture because the virus can be transmitted through breast milk. Exclusive breastfeeding for up to six months is associated with a 3-4 fold decreased risk of HIV transmission as compared to mixed feeding. It is believed that mixed feeding in the first six months carries a greater risk of transmission because the other liquids and foods given to the infant alongside the breast milk can damage the already delicate and permeable gut wall of the small infant and allow more viruses to be transmitted. Mixed feeding also increases the risks of food contamination during preparation, and child morbidity and mortality rates [11].

Given the risk of HIV transmission associated with breastfeeding current international guidelines on infant feeding advocate for only using replacement feeding when AFASS taking into account local circumstances, individual woman situation and risks of replacement

feeding [14]. Unfortunately mixed feeding is still the norm for many infants less than six months old in many countries with high HIV prevalence. Thus HIV transmission through breastfeeding can be reduced if HIV-positive women breastfeed exclusively for six months rather than practicing mixed feeding [12].

Studies done have shown that age, family and culture influence on infant feeding options. The older people at home wish to see the baby eating every time, believing that if the baby is crying it should be given something to eat [9]. On the other hand, adolescent mothers frequently receive advice from their families to practice mixed feeding and may hesitate to contradict families' opinions regarding infant feeding, especially if they are financially and emotionally dependent upon the family. Some mothers may also be inexperienced and insecure about their own beliefs therefore turn to their families, particularly their mothers and grandmothers, for parenting help [2].

In as much as there is an option of replacement feeding with commercial infant formula, poor economic status poses a challenge in decision making with regards to HIV infant feeding. Some of the infected mothers and their husbands may not afford to buy formula milk. Breastfeeding is highly valued and in many areas of sub-Saharan Africa, it is culturally normative. Women know that breast milk has the potential to infect their child with HIV, and they also know that breast milk protects children and is superior to formula. Thus, in as much as they are HIV+ they will insist on breastfeeding to meet their cultural norms [9].

Methods

Study area

The study was conducted at Mbagathi District Hospital, the largest district hospital in Nairobi, Kenya. It is located in Dagoretti Division, Nairobi West District approximately 3 kilometers from Nairobi city centre and about 1 km away from Kibera slum. It serves as a referral hospital for the health centres and dispensaries in Nairobi Province.

Design and sample size

This was a descriptive, cross sectional hospital based study conducted in Mbagathi District Hospital. Sample size was derived at using formula for sample size determination with a 95% confidence interval. Awareness, Attitude and Practice of mothers on infant feeding options available for HIV+ was not known and was assumed to be 50%.

$n = Z^2 \times pq / d^2$ (*Fischer et al., 1998*)

Where: n = required sample size (if target population is greater than 10,000)

Z = confidence interval at 95% (standard value of 1.96)

p = proportion (0.5)

q = 1 – p

d = level of precision at 5% (standard value of 0.05).

Sample size calculation; $n = 1.96^2 \times [0.5 \times (1-0.5)]/0.05^2$

$= 3.8416 \times 0.25 / 0.0025$

$= 384.16$ $n = 384$

Systematic sampling technique of postnatal mothers who met the inclusion criteria was used to sample participants until the desired sample size was achieved.

Study procedures

Approval to conduct the study was obtained from KEMRI Ethical Review Committee before study commencement. The selected mothers were contacted during clinic days for consent and subsequent interviews. This was done after they were through with postnatal services at the clinic. They were directed to the interview room by the health worker and interviewed individually by the principal investigator while ensuring that privacy was maintained. The researcher identified herself, participants were asked to give signed informed consent before participating in the study. The objectives of the study were clearly stated and participation was strictly on a voluntary basis. Privacy and confidentiality were assured at all times, and participants had the right to withdraw from the study anytime, even after consenting to participate.

Data management

Qualitative data was captured through key informant interviews. The interviews were transcribed and stored in word format. All completed questionnaires were checked, numbered, filed and kept safely. Quantitative data from the field was double entered into a computer database designed using MS-Access application. Data cleaning and validation was performed in order to achieve a clean dataset that was then exported into a Statistical Package format (SPSS). A clean dataset was stored in a computer hard drive for analysis. Back up files were stored in CDs and flash disks, this was done regularly to avoid any loss or tampering. The researcher ensured that confidentiality of the respondent was maintained by using numbers on the questionnaire other than actual names. All the questionnaires and interview forms were stored in a lockable drawer.

Data analysis

Data from structured questionnaires were analyzed using Statistical Packages for Social Scientists (SPSS version 16) statistical software. Exploratory data techniques were used at the initial stage of analysis to uncover the structure of data and identify outliers or unusual entered values. Frequencies and proportions were used to summarize categorical variables while measures of central tendency for continuous variables.

Pearson's Chi-square test or fisher exact test was used to test for the strength of association between categorical variables. All exposure variables (Independent factors) were associated with the dependent variable (*awareness of infant feeding options for HIV positive mothers*) to determine which ones had significant association. Odds Ratio (OR) and 95% Confidence Interval (CI) were used to estimate the strength of association between independent variables and the dependent variable. The threshold for statistical significance was set at $\alpha = 0.05$

and a two-sided p value at 95% confidence intervals (CI) reported for corresponding analysis.

All independent variables identified to significantly associate with *'awareness of infant feeding options for HIV positive mothers'* at bivariate analysis were considered together in a Multivariate analysis. Binary logistic regression was used where backward conditional method was specified in order to identify confounders and effect modifiers. Adjusted odds Ratios (AOR) together with their respective 95% Confidence Interval (CI) were used to estimate the strength of association between the retained independent predictors and *'awareness of infant feeding options for HIV positive mothers'*.

Tape recorded information from key informant interviews was transcribed verbatim striving to accurately reflect words, phrases, tones and effect of statement and was translated to English. This was sorted into coding categories and manually analyzed based on themes developed from the study objectives. Data was presented verbatim.

Results

The questionnaires were administered to a total of 384 of postnatal mothers visiting Mbagathi District Hospital (MDH). Information on socio-demographic characteristics and their awareness, attitude and practice on infant feeding options in HIV was collected. The respondents mean age was 26.49 (standard deviation + 5 years) with minimum of 14 and a maximum of 46 years.

The highest proportion of the mothers (38.3%) were aged between 21 and 25 years, with a small proportion (7.8%) aged less than 21 years as shown in table 4.1.
Christianity was the predominant religion accounting for 96.1% of the participants. Most (84.9%) of the participants were married, 14.3% were single and only 0.8% were separated.
The level of education showed that the highest proportion of the mothers (39.6%) had achieved secondary education, with 25.3% having attained college education.
In terms of occupation, the highest proportion of the participants (44.5%) were housewives, with only 13.3% having formal employment. The remaining proportion (42.2%) ran small income generating activities. Majority of the participants had given birth once or twice at 44.5% and 33.1% respectively where as 49.2% had one child and 32.3% had two children.

Table 1a: Socio-demographic and economic characteristics of respondents

Variables	N=384	%
Age in years		
<21	30	7.8
21 – 25	147	38.3
26 – 30	135	35.2
>30	72	18.8
Religion affiliation		
Christian	369	96.1
Muslim	10	2.6
Traditional	5	1.3
Marital status		
Single	55	14.3
Married	326	84.9
Separated	3	0.8
Highest level of education attained		
None	1	0.3
Primary	134	34.9
Secondary	152	39.6
College	97	25.3
Occupation		
Housewife	171	44.5
Casual worker	35	9.1
Formal employment	51	13.3
Business	111	28.9
Farmer	4	1.1
Other	12	3.1

Table 1b: Socio-demographic and economic characteristics of respondents

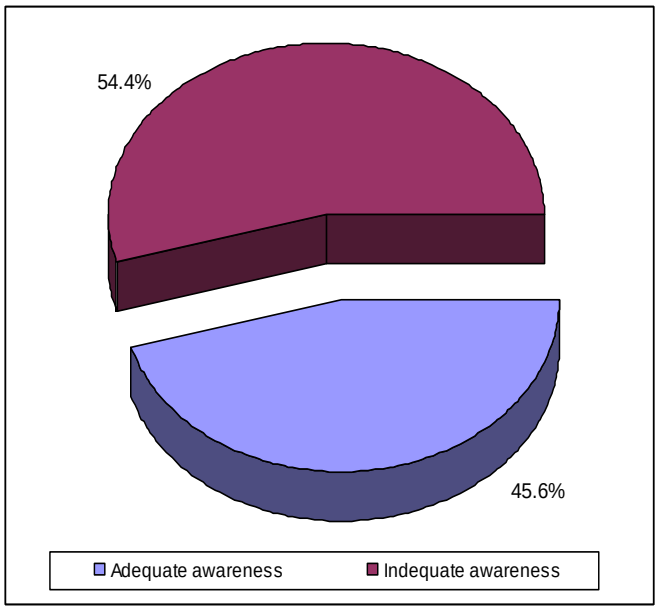
Number of births		
One	171	44.5
Two	127	33.1
Three	55	14.3
Four and above	31	8.1
Number of children		
One	189	49.2
Two	124	32.3
Three	49	12.8
Four and above	22	5.8

Awareness of recommended feeding

Approximately half the population of the mothers (47.9%) reported to be aware of feeding options recommended for infants born to HIV+ mothers. The most commonly mentioned sources of information included, Hospital/Health worker s (47.1%), Mass media (21.4%) and Friends (19.3%). When requested to mention main infant feeding options to HIV+ mothers, 22.7% correctly mentioned replacement infant formula, 20.3% correctly mentioned replacement home milk (cow) while the majority (47.4%) correctly mentioned exclusive breastfeeding for 6 months. Approximately one-quarter of the mothers (23.2%) correctly indicated that apart from breast milk, medicine is given to infants at 0 - 6 months. More than half of the participants (51.3%) correctly indicated that total breastfeeding period for HIV+ mothers should be 6 months. Similarly, more than half the participants (54.9%) correctly indicated that introduction of complementary foods to infant born to HIV+ mothers should be done after 6 months.

Approximately 40.0% of the participating mothers did not agree to the statement that it is a problem if HIV+ mother exclusively breastfeeds her infant. These were classified as having a positive attitude on this aspect. Out of 206 mothers who indicated exclusive breastfeeding for HIV+ mother as a problem, 91.7% mentioned that if they practice exclusive breastfeeding the infant might get HIV. About 40.0% of the mothers did not agree to the statement that breastfeeding of HIV+ mother always results in HIV transmission to infant, and were deemed to have a positive aspect on this aspect. Overall assessment of awareness score reveal that 45.6% of the mothers were adequately aware of recommended feeding for infants born to HIV+ mothers (with minimum score of 50% or 4/7) constituted by 18.2% that scored>50-75% and 27.4% that scored >75-100% (Figure 1)

Figure 1: Awareness of recommended feeding



Awareness of recommended feeding for infants born to HIV+ mothers

Relationship between awareness of recommended feeding for infants born to HIV+ mothers and selected social demographic and economic characteristics was analyzed as presented in Table 2. Out of seven selected factors, five emerged to relate with awareness of recommended feeding for infants born to HIV+ mothers.

Age of the mother was related to awareness of recommended feeding for infants born to HIV+ mothers. A significantly higher proportion of the mothers aged 21 – 25 years was adequately aware of the recommended feeding for infants born to HIV+ mothers (43.5%) compared to those aged <21 years (20.0%), (OR=3.08; 95% CI: 1.19 – 7.99; p=0.020). Similarly, a higher proportion of mothers aged 26 – 30 years were adequately aware of the recommended feeding for infants born to HIV+ mothers (50.4%) compared to those aged <21 years (20.0%), (OR=4.06; 95% CI: 1.56 – 10.56; p=0.004). Similarly, a higher proportion of mothers aged >30 years was adequately aware of the recommended feeding for infants born to HIV+ mothers (51.4%) compared to those aged <21 years (20.0%), (OR=4.23; 95% CI: 1.54 – 11.57; p=0.005).

Number of children per mother was related to awareness of recommended feeding for infants born to HIV+ mothers. A significantly higher proportion of the mothers who indicated that they had two children was adequately aware of the recommended feeding for infants born to HIV+ mothers (55.6%) compared to those who indicated that they had one child (36.5%), (OR=2.18; 95% CI: 1.37 – 3.46, p=0.001). Similarly, a high proportion of mothers who indicated that they had three children were significantly more adequately aware of the recommended feeding for infants born to HIV+ mothers (55.1%) compared to those who indicated that they had one child (36.5%), (OR=2.13; 95% CI: 1.13 – 4.03; p=0.019).

A similar trend was observed for number of births per mother. A high proportion of mothers who indicated that they delivered two times were significantly more adequately aware of the recommended feeding for infants born to HIV+ mothers (55.1%) compared to those who ever delivered once (35.1%), (OR=2.27; 95% CI: 1.42 – 3.64; p=0.001). Similarly, a high proportion of mothers who ever delivered three times was significantly

more adequately aware of the recommended feeding for infants born to HIV+ mothers (52.7%) compared to those who ever delivered once (35.1%), (OR=2.06; 95% CI: 1.12 – 3.82; p=0.021).

Level of education attained was related to awareness of recommended feeding for infants born to HIV+ mothers. A significantly higher proportion of the mothers who attained college education was more adequately aware of the recommended feeding for infants born to HIV+ mothers (58.8%) compared to those who attained primary education (39.3%), (OR=2.20; 95% CI: 1.30 – 3.75; p=0.004).

Occupation was related to awareness of recommended feeding for infants born to HIV+ mothers. A significantly higher proportion of the mothers with a formal employment was more adequately aware of the recommended feeding for infants born to HIV+ mothers (62.7%) compared to those who were housewife (43.9%), (OR=2.16; 95% CI: 1.13 – 4.10; p=0.019).

Table 2a: Awareness of recommended feeding for infants born to HIV+ mothers vs social demographic factors

Variables	Adequate awareness (n=175)		Inadequate awareness (n=209)		OR$^{\Psi}$	95% CI		p value*
	N	%	N	%		Lower	Upper	
Age in years								
<21	6	20.0	24	80.0	Reference			
21 – 25	64	43.5	83	56.5	3.08	1.19	7.99	**0.020**
26 – 30	68	50.4	67	49.6	4.06	1.56	10.56	**0.004**
30 and above	37	51.4	35	48.6	4.23	1.54	11.57	**0.005**
Marital status								
Currently not married	29	50.0	29	50.0	1.23	0.70	2.16	0.463
Currently married	146	44.8	180	55.2	Reference			
Number of children								
One	69	36.5	120	63.5	Reference			
Two	69	55.6	55	44.4	2.18	1.37	3.46	**0.001**
Three	27	55.1	22	44.9	2.13	1.13	4.03	**0.019**
Four and above	10	45.5	12	54.5	1.45	0.60	3.53	0.414
Number of births								
One	60	35.1	111	64.9	Reference			
Two	70	55.1	57	44.9	2.27	1.42	3.64	**0.001**
Three	29	52.7	26	47.3	2.06	1.12	3.82	**0.021**
Four and above	16	51.6	15	48.4	1.97	0.91	4.27	0.084

Table 2b: Awareness of recommended feeding for infants born to HIV+ mothers vs social demographic factors

Religion								
Christian	171	46.3	198	53.7	2.38	0.74	7.60	0.134
Non Christians	4	26.7	11	73.3	Reference			
Level of education attained								
Primary	53	39.3	82	60.7	Reference			
Secondary	65	42.8	87	57.2	1.16	0.72	1.85	0.547
College	57	58.8	40	41.2	2.20	1.30	3.75	**0.004**
Occupation								
Housewife	75	43.9	96	56.1	Reference			
Small income generation activities	68	42.0	94	58.0	0.93	0.60	1.43	0.728
Formal Employment	32	62.7	19	37.3	2.16	1.13	4.10	**0.019**

* Significant at p<0.05 bolded; Ψ Odds ratio; φ 95% Confidence Interval

Predictors of adequate awareness of recommended feeding for infants born to HIV+ mothers

Multivariate analysis was performed in order to identify independent predictor(s) of adequate awareness of recommended feeding for infants born to HIV+ mothers among the participating mothers. Five factors associated with adequate awareness of recommended feeding for infants born to HIV+ mothers at P<0.05 during bivariate analysis were considered for multivariate analysis. They include; (1) Age in years (2) Number of children per mother, (3) Number of births (deliveries) per mother, (4) Level of education attained, and (5) Occupation. Upon fitting the factors using Binary logistic regression and specifying *'backward conditional'* method with removal at P<0.05, two factor were retained in the final model as shown in Table 3.

Table 3: Predictors of adequate awareness of recommended feeding for infants born to HIV+ mothers

Variables	AOR[ψ]	95% CI[φ] Lower	95% CI[φ] Upper	p value[*]
Number of births				
One	Reference			
Two	2.46	1.52	4.00	**<0.001**
Three	2.61	1.38	4.94	**0.003**
Four and above	2.39	1.08	5.26	**0.031**
Level of education attained				
Primary	Reference			
Secondary	1.25	0.77	2.03	0.366
College	2.72	1.55	4.76	**<0.001**

[*] Significant at p<0.05 bolded; [ψ] Adjusted odds ratio; [φ] 95% Confidence Interval

Adjusting for other factors and keeping them constant, having delivered twice was associated with adequate awareness of recommended feeding for infants born to HIV+ mothers (AOR=2.46; 95% CI: 1.52 – 4.00; p<0.001). A mother with an experience of two deliveries is 2.46 times more likely to be adequately aware of recommended feeding for infants born to HIV+ mothers compared to a mother with an experience of one delivery. Having delivered thrice was associated with adequate awareness of recommended feeding for infants born to HIV+ mothers (AOR=2.61; 95% CI: 1.38 – 4.94; p=0.003). A mother with an experience of three deliveries is 2.61 times more likely to be adequately aware of recommended feeding for infants born to HIV+ mothers compared to a mother with an experience of one delivery. Similarly, having delivered four or more times was associated with adequate awareness of recommended feeding for infants born to HIV+ mothers (AOR=2.39; 95% CI: 1.08 – 5.26; p=0.031). A mother with an experience of four or more deliveries is 2.39 times more likely to be adequately aware of recommended feeding for infants born to HIV+ mothers compared to a mother with an experience of one delivery.

Attaining college level of education was associated with adequate awareness of recommended feeding for infants born to HIV+ mothers (AOR=2.72; 95% CI: 1.55 – 4.76; p<0.001). A mother who attained college level of education is 2.72 times more likely to be adequately aware of recommended feeding for infants born to HIV+ mothers compared to a mother who attained primary level.

Qualitative Results

The qualitative information was collected from key informant interviews in order to explore deeper the postnatal mothers awareness, attitude and practice and factors affecting them. It came out that most key informants were aware of exclusive breastfeeding for six months (ii) Avoiding breastfeeding and giving formula milk or cow's milk. (iii) Mixed feeding was available with the new 2010 infant feeding guidelines in HIV. Respondents also noted that few women were aware of Infant feeding options for HIV positive. It was estimated that only 30% were not aware of the available options. Ignorance and lack of concern was the reason behind the postnatal mothers not being aware since they think being HIV negative infant feeding options awareness doesn't concern them. However some informants thought that upto 70% were aware since they attend health talks and leaflets are distributed at OPD and MCH. If they have access to the leaflets and health talks they should be aware. The 30% are not aware because maybe they came in late when talks were over. They may also not be aware due to lack of access to media, some ignore the information because they are not infected, and they think the information is only for the HIV positive

Discussions

Awareness of recommended Infant feeding options

Awareness and attitude about infant feeding options in HIV is the most important weapon in the fight against further spread of the virus through breastfeeding. The findings of this study showed that approximately half of the postnatal mothers 47.9% were aware of the Infant feeding options for HIV+ mothers while 45.1% were not sure. This is in contrast with another study conducted in Gurage zone, south Ethiopia where 84% of the respondents were aware of the recommended infant feeding options for HIV+ mothers [1]. A case study done in western Kenya on knowledge, attitude and practices of infant feeding in the context of HIV found that there was lack of knowledge about the range of infant feeding options, limiting their choices and hence preferences, respondents were hypothetically asked what they would recommend for their infants in the event of HIV infection. Only 3.6% (3.1% of the women and 4.1% of the men) would discourage breastfeeding, because they believed infection would have already occurred in the mothers womb. Merely 1% of the respondents were not sure what they would do [13]. This would be attributed to the fact that about half of the respondents at 45.1% were not sure if they were aware or not of the infant feeding options, so they could have been aware of the feeding options but not exactly sure. It could also be due to the fact that these infant feeding options are further emphasized only to the HIV positive mothers during immunization as a health worker said:

Every morning we organize health talks for postnatal mothers at the clinic on different topics infant feeding in general and in HIV being one of the topics. Also during immunization of the infants the information is enhanced but to the HIV+ mothers only (KI female 36years).

Above half of the respondents mentioned hospital and mass media 47.1% and 21.4% respectively as their source of information on infant feeding options. This could be attributed to the study having been done in an urban set up and respondents being well versed with the infant feeding options. Being in the urban dwelling they have access to the health care facilities where health education is received and there are various educative materials and posters pasted in the hospital that provide information on HIV and infant feeding. They also have access to media where promotion of health education is done through radio and television. This was in agreement with a study done by Belachew ($p<0.05$) whereby it concurs that respondents from the urban areas 1.82 (1.12-2.96) were more aware of the infant feeding options due to accessibility to information via mass media and other sources of information however it differs from what was observed in study in Nigeria where 94% of the respondents said the source of their information on infant feeding options was hospital. [1][6]. When asked about the main infant feeding option for HIV+ mothers 47.4% mentioned exclusive breastfeeding for six months, this showed good understanding of the Recommended Infant Feeding Options (RIFO) for HIV+ mothers though it still needs public health intervention to increase their awareness as reported by one mother.

> *What I know about the available infant feeding options for HIV+ mothers is that a HIV+ mother is to breastfeed exclusively for six months and give no other foods (KI female 32 years).*

This did not agree with a study from Uganda where more than half the participants 63% reported exclusive breastfeeding for six months and another study from south Ethiopia where 16% mentioned exclusive breastfeeding as an option for feeding infants below six months born to HIV+ mothers. [3][1]. These results may be explained by the fact that there is a gap in education given to the postnatal mothers regardless of HIV status about infant feeding options for HIV+ mothers. During the interviews some of the mothers gave responses related to infant feeding options for the HIV negative mothers or mothers of unknown status. Average awareness on exclusive breastfeeding as the main infant feeding option could be explained by the fact that the health workers do not fully emphasize on exclusive breastfeeding to all the infants below six months.

When asked what else could be given to infants born to HIV+ mothers other than breast milk at 0-6 months only 23.2% correctly indicated medicine while 63% did not know. Some of the responses included water 3.9%, cow's milk 6.3%, and porridge 3.6%. This clearly indicated that the mothers were not sure or did not know that only medicine can be given to an infant born to HIV+ mother apart from breast milk. This could have further implications should these postnatal mothers 13.8% (water 3.9%, cow's milk 6.3%, porridge 3.6%) or their relatives find themselves in such a situation.

About half of the mothers were aware of the total breastfeeding period for HIV+ (51.3%) but on rewording

the same question and asking for the time of introduction of complimentary foods to infants born to HIV+ mothers, 54.9% gave an answer of six months which showed the postnatal mothers were not sure. This could be explained by the fact that the mothers get insufficient information or the information is given hastily hence unable to interject with questions where they do not understand. Over half of the mothers (53.6%) perceived a problem if HIV+ mother exclusively breastfeeds her infant with (91.7%) of them further giving reason that if HIV+ mother exclusively breastfeeds then the infant might get the HIV virus. One respondent noted;

> *HIV+ mothers are not allowed to breastfeed at all at all, they are only supposed to give the infant packeted milk, the infant should never be near the breast because if she does and breastfeeds she will be infected with HIV disease (KI female 26years).*

The overall awareness score among the postnatal mothers was 45.6%. The maximum attainable score was 7 which implied a percentage score of 100%. The criterion to this study was to take correct replies to a percentage score of 50% or 4/7 and above of the questions asked as adequate awareness. This score (45.6%) was expected since the respondents were all postnatal mothers irrespective of their HIV status and could be concluded that postnatal mothers who are HIV negative and those who do not know their status might ignore the infant feeding options education thinking that it does not concern them not realizing that every mother is at risk of HIV.

Age of the mother was significantly associated with the postnatal mothers awareness of HIV infant feeding options (p=0.020).The older the postnatal mothers the more likely they were to be aware. Mothers aged 26-30 years p=0.004 and those aged above 30 years p=0.005.This was contrary to a study done in south Ethiopia that found that age advancement was not associated with awareness of infant feeding options for HIV+ mothers [1]. This may be explained by the fact that these older mothers were more attuned than the younger mothers through the health education given at the clinic and mass media whereby they are likely to pay more attention and embrace the health education than the younger mothers. This finding indicates the importance of empowering mothers and the need of targeting the young mothers for interventions and education.

Another socio demographic variable that showed significant association with awareness of infant feeding options for HIV+ was the number of children a respondent had. Mothers having either two or three children were two times more likely to be aware at (p=0.001) and (p=0.019) respectively. This could therefore be postulated that a mother with more than one child is eager to be conversant with health issues that affect infants thus taking keen interest on education given at the hospital thereby becoming more aware of infant feeding options in HIV cases.

Number of births/deliveries was more significantly associated with awareness of RIFO for HIV+ mothers whereby having more than one child a mother was adequately aware of the recommended infant feeding options for infants born to HIV+ mothers. [3] established that those with three or more pregnancies were three times likely to have good knowledge and be aware about exclusive breastfeeding as an infant feeding option. This could be due to their previous pregnancy interactions with the healthcare systems which exposed them to information on RIFO in HIV and its benefits during the morning health education at the hospital.

Awareness of RIFO was highest amongst older mothers and those of higher parity, it is probable that mothers acquire experience and confidence in good child care practices with time; this is supported by the fact that older women probably know more about awareness of RIFO and have more realistic outcome expectations.

The level of education attained by the mothers also was significantly associated with awareness of RIFO for HIV+ mothers. Postnatal mothers who had attained college education ($p=0.004$) were 2.2 times more likely to be aware of the RIFO for HIV+ postnatal mothers. This differed from the findings of a study conducted in south Ethiopia where educational status was not associated or rather significant with awareness of RIFO [1] but was supported by Byamugisha in Uganda that found having completed secondary school or more was 2.5 times more likely to be associated with awareness of RIFO especially knowledge of exclusive breastfeeding. This could be due to the fact that the educated have better access to health information since it helps the mothers understand health communication messages, moreover such mothers have better chances to come across considerable knowledge about RIFO for HIV in the media.

Occupation was another socio demographic variable that was significantly associated with awareness of RIFO, a significantly higher proportion of postnatal mothers with formal employment ($p=0.019$) were 2.1 times more likely to be aware of the RIFO. This finding contradicted with a study done by Belachew in Ethiopia that found no significant association between occupation and awareness of RIFO.

Binary logistic regression was computed after adjusting for the identified independent variables. The predictors of adequate awareness of RIFO for infants born to HIV+ mothers among the postnatal mothers were number of births having delivered twice was associated with awareness of the RIFO (AOR=2.46;95% CI: $1.52-4.00$; P<0.001) while having delivered three times made a postnatal mother 2.61 times more aware (AOR=2.61; 95% CI: $1.38-4.94$; P<0.003). This could be due to the fact that having delivered more than once routinely exposed the mother to the health education given at the clinic on RIFO thereby making mother aware.

The level of education attained by the postnatal mothers was associated with adequate awareness with college attained education having 2.72 times adequate awareness of RIFO (AOR=2.72;95% CI: $1.55-4.76$; P=0.001). Byamugisha from Uganda in his study found out that predictors for knowledge of exclusive

breastfeeding as one of the measures for prevention of mother to child transmission of HIV were having three or more pregnancies (OR=2.5, CI: 1.4-4.5) and having completed secondary school (OR: 2.5, CI:1.3-4.9) [3].

Findings of this study showed that marital status and religion were not significantly associated with awareness of infant feeding options, which is in consonance with what was observed in a study in Ethiopia that found no association between marital status and awareness of recommended infant feeding options [1].

Conclusion

Although the majority (90.4%) of the postnatal mothers mentioned the feeding options for infants below six months born to HIV+ mothers, less than half (47.4%) were aware of the main infant feeding option for a HIV+ mother. Almost half of the mothers (47.7%) were inadequately aware of the recommendations by WHO on infant feeding in HIV. This was due to the fact that these mothers do not have sufficient and up to date information on feeding these infants depending on the HIV positive mothers' current situation or position in terms of economic status, viral load count and AFASS criteria.

The study revealed that the number of deliveries a mother had gone through increased the odds of her being aware of the HIV+ infant feeding options. Higher number of births helps the mothers to be aware of the infant feeding options as they have been exposed to routine education of these feeding options in the clinic. Level of education attained by the postnatal mothers had an influence on the awareness of RIFO while age, number of children, as well as occupation does not have an influence on awareness of RIFO for infants born to HIV+ mothers. Religion and level of education attained by the mother had an influence on their attitude towards RIFO for infants born to HIV+ mothers. Education proves to be proxy for adequate awareness and appropriate attitude towards the RIFO set by WHO. Positive attitude or perception towards exclusive breastfeeding in infant feeding despite the HIV status is greatly beneficial to the infants because that is the best and important intervention for child survival.

Recommendations

From the findings of this study the following recommendations emanate to be undertaken by the government and interested stakeholders in line with awareness, attitude and current feeding options of postnatal mothers on recommended infant options for HIV + mothers.

- ✓ Inadequate awareness of RIFO at 54.4%, Inappropriate attitude of RIFO at 16.1% and bad feeding practice of 26.8% calls for public health intervention, to ensure that RIFO education and practice for both infected and uninfected mothers with emphasis on benefits of exclusive breastfeeding is covered at the antenatal clinics, media and also hold campaigns.

- ✓ There is need to provide a program not only at the clinic but also countrywide to promote awareness on IYCF both in HIV infected or non HIV infected mothers.
- ✓ Advice to encourage antenatal and postnatal mothers to be arriving early to the clinic in order to participate in the health education given by health workers.
- ✓ Frequent trainings should be given to all health workers to ensure that all health facilities relay the same information to antenatals, postnatals and all members of the society.
- ✓ Further research needs to be focused on the WHO 2010 HIV guidelines to generate more current information on the postnatal mothers awareness, attitude and practice on RIFO.

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Conflict of interest

We declare that there is no conflict of interest in the work presented in this manuscript whatsoever.

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