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Full Length Research Paper

Newborn feeding preferences and experiences of HIV-positive mothers from two Ghanaian districts

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Documentation of the feeding choices and experiences of HIV-positive mothers is needed to improve infant feeding counselling. The feeding behaviour and experiences of mothers receiving infant feeding counselling at two Ghanaian districts were explored. A postpartum survey involving 128 HIV-positive mothers, and in-depth interviews involving a purposively selected sample of 10 HIV-positive mothers were conducted. Exclusive breastfeeding rate was 62%. About six percent of the infants were given breast milk and infant formula, while 33% received breast milk and other feeds. Perceived stigma of formula feeding (odds ratio [OR] 7.50; $p < 0.05$), and perceived cost of infant formula (OR 0.37; $p < 0.05$) were significantly associated with exclusive breastfeeding for three months. In our multiple regression analysis, perceived stigma of formula feeding (OR 15.62; $p < 0.05$), and perceived cost of infant formula (OR 4.60; $p < 0.05$) were significantly associated with exclusive breastfeeding. Social pressure to mix-feed, local norms and "the baby friendly hospital initiative" also influenced infant feeding implementation efforts of mothers. Mothers face various barriers in implementing their feeding intentions. Policy makers and service providers in these districts need to address these issues in order to improve feeding practice.

Key words: Infant feed choices, infant feeding experiences, HIV-positive mothers, Ghana.

INTRODUCTION

Infant feeding in settings where Human Immunodeficiency Virus (HIV) is a public health problem and especially where breastfeeding is routinely practised is a worrying issue. Not only are health workers expected to counsel HIV-positive mothers on safer infant feeding methods as per national and international guidelines, HIV-positive women are expected to understand complex information provided by health workers, and make informed and healthy choices for themselves and their infants.

In guiding health workers, a series of international guidelines have been developed over time depending on prevailing knowledge. The first generation guidelines informing infant feeding indicated that where it is acceptable, feasible, affordable, sustainable and safe (AFASS), replacement feeding should be adopted and breastfeeding avoided (WHO et al., 2003). However, upon upon reviewing accumulating evidence, a technical consultation convened by WHO on behalf of the Inter-Agency Task Team (IATT) in October, 2006 updated these guidelines (WHO, 2006). The review of substantial body of new evidence and experience regarding HIV and infant feeding since the previous technical consultation in October, 2003 (WHO et al., 2003), and since the Glion (4 UNFPA and WHO. The Glion Call to Action on Family Planning and HIV/AIDS in Women and Children, 3 - 5 May, 2004) and Abuja (5 Call to Action: Towards an HIV-free and AIDS-free Generation. Prevention of mother-to-child transmission. High-level global partners forum, Abuja, Nigeria, December 3, 2005) calls to action on the prevention of mother-to-child transmission (PMTCT) of HIV gave birth to the 14-point second generation guidelines. This includes the following:

1. The most appropriate infant feeding option for an HIV-infected mother depends on her individual circumstances, including her health status and the local situation, but should take consideration of the health services available and the counselling and support she is likely to receive.

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2. Exclusive breastfeeding is recommended for HIV-infected mothers for the first six months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe for them and their infants before that time.
3. When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breast-feeding by HIV-infected mothers is recommended.
4. At six months, if replacement feeding is still not acceptable, feasible, affordable, sustainable and safe, continuation of breastfeeding with additional complement-tary foods is recommended, while the mother and baby continue to be regularly assessed. All breastfeeding should stop once a nutritionally adequate and safe diet without breast milk can be provided.

The principal factor considered in the evolution of the guidelines was the risk of perinatal transmission of HIV. The general range of HIV transmission through breast-feeding of any kind without any interventions is 5 - 20% (WHO et al., 2004). The consultation was also aware of the possible benefits of exclusive breastfeeding in relation to HIV transmission suggested by the work of Coutsoudis and colleagues (Coutsoudis et al., 1999). Since then, other studies have shown that exclusive breastfeeding carries a lower risk of HIV transmission than mixed breastfeeding. A risk of about 4% was re-ported in South Africa (Coovadia et al., 2007) and 1.3% (HIV transmission rate between six weeks and six months) in Zimbabwe (Iliff et al., 2005). Against this background and in the midst of the confusion regarding what HIV-positive mothers should feed their infants, health workers are reminded that exclusive breastfeeding for the first six months is preferred to mix feeding. Mixed feeding carries a higher risk of HIV transmission than exclusive breastfeeding (Coovadia et al., 2007).

Before and after the evolution of the first generation recommendations, some authorities contend that no single guideline can be universally applicable, and that every guideline ought to be implemented taking into consideration individual circumstances (Bobat, 2000; Coutsoudis, 2005; Leshabari et al., 2006; Bland et al., 2007; Leshabari et al., 2007a; Leshabari et al., 2007b).

In 2005, Gara et al. reported that the level of education and employment status as well as the opinions of family members and health care personnel were the major factors that influenced the choice of method for infant feeding (Gara et al., 2005). Other studies on the choice of infant feeding method show that while HIV-positive women commonly make a distinct choice to exclusively breastfeed or exclusively replacement feed during pre-gnancy, they often end up practising mixed feeding early in the baby's life. The multiplicity of factors leading to this behavior have been documented in various studies from non-Ghanaian settings to include social stigma, scorn and suspicion, harsh economic circumstances, technolo-gical barriers (electricity and refrigeration requirements), and more importantly the cultural usages and nuances of any given community (Thairu et al., 2005; Abiona et al., 2006; Leshabari et al., 2007a; Leshabari et al., 2007b; Rollins, 2007; Sadoh et al., 2008).

To date virtually no studies have focused specifically on the choices, experiences and challenges HIV-positive mothers in Ghana face. Working on the assumption that the factors influencing particular feeding choices or the challenges mothers face may show setting specificity, with cultural usages and nuances playing significant roles, this study explored HIV+ women's choices, experiences and practices as it relates to infant feeding in the social and cultural context of the Manya Krobo and Tema areas. The study investigated the following research questions:

1.) What choices do HIV+ women in the Manya Krobo and Tema areas make regarding infant feeding?
2.) What challenges do they face in implementing their feeding options?
3.) What experiences can they share regarding HIV and infant feeding?

METHODOLOGY

The study sites

This study was conducted at three public hospitals in Ghana; the Tema General Hospital in the Tema Municipality, Greater Accra region, Atua Government Hospital and St Martins de Porres Hospital both in the Manya Krobo District, Eastern region. All the three study hospitals provide PMTCT services to both urban and rural populations; such as VCT, and infant feeding counselling. The two sites in the Manya Krobo district were the first national pilot PMTCT sites in Ghana.

Service data on the HIV prevalence rates among pregnant women in the Tema municipality show a range from 2.6% in 1999, 6.5% in 2002, 3.6% in 2006, to 2.2% in 2007 (NACP, 2008). Related service data indicate that the proportion of HIV-infected women accessing postnatal services at the Municipality is 3.6% (Tema- Municipal-Health-Administration, 2002 - 2006). In the Manya Krobo District HIV prevalence rates among pregnant women in the district over the years have consistently been above the national average ranging from 18% in 1992 to 8.9% in 2007 (NACP, 2008). The proportion of HIV-infected women accessing postnatal services at the district is 6.0% (District-Health-Directorate-Manya-Krobo, 2000 - 2006). Between June 2005 and March 2008, a total of 27,000 antenatal clients were registered at the three study hospitals. Of these, 14,367 Number tested for HIV, of which 994 were HIV-positive, giving a combined HIV prevalence of 6.9% (Laar, 2009).

Study design, population and summary of field procedures

The documentation of infant feeding choices, experiences and challenges faced by HIV-positive mothers was part of a prospective study on the influence of HIV and malaria infections on maternal and perinatal health among 443 HIV-positive and 711 HIV-negative antenatal attendees, from three public hospitals in Ghana. At their first antenatal visit, the investigator with assistance from trained nurses and research assistants collected information on the

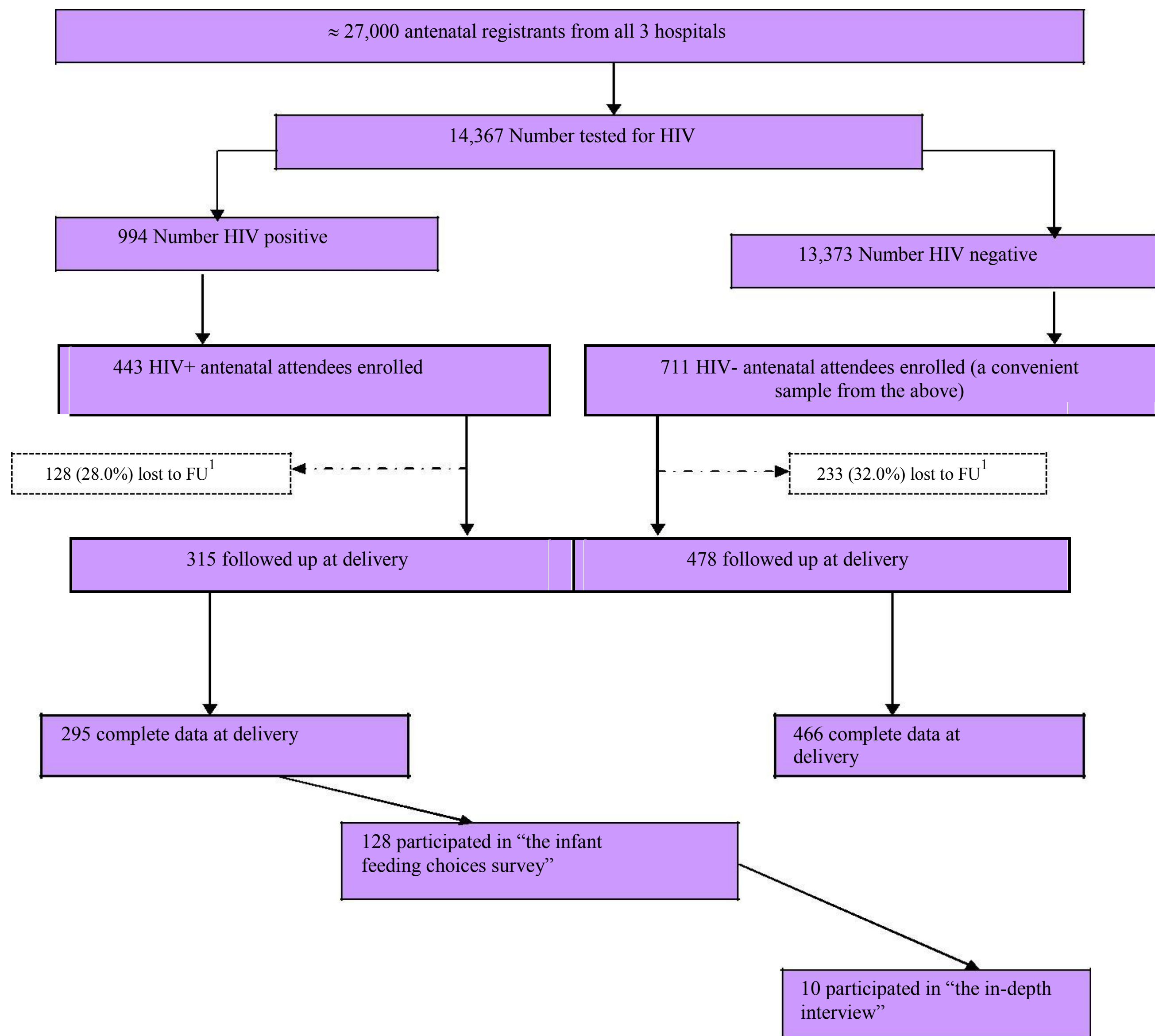

Diagram 1. The study profile: June, 2005 - August, 2008.

background, socio-economic, socio- demographic characteristics, obstetric, and reproductive history of the study participants. Also assessed at this point were the infant feeding intentions of these expectant mothers. All the women were counselled by trained nurse counsellors, who were thoroughly informed about the purpose of the study. Seven hundred and sixty- one (295 HIV-positive and 466 HIV-negative) of the 1154 women who were enrolled had their follow up data at delivery taken. This paper concentrates on the infant feeding choices and experiences of 128 of the 295 HIV-positive mothers who were available for a postpartum interview.

Documentation of infant feeding choices, experiences/challenges

A postpartum survey involving 128 of the 295 HIV+ mothers at practices of these mothers. This took place during their postpartum period (specifically after three months). This phase of the data collection had questions on infant feeding choices/behaviour, breastfeeding and breastfeeding initiation. An exploratory quail-tative study was conducted through in-depth interviews on a sample of 10 HIV-positive mothers (Diagram 1). The in-depth interviews were aimed at eliciting individual experiences on infant feeding practice and experiences. These were conducted by the first author, with support from experienced nurse research assistants. The participants were purposively selected using the maximum variation technique, where person-related homogeneity was maintained but variation in the phenomenon (infant feeding behaviour - exclusive breastfeeding, exclusive formula feeding, and mixed feeding) considered.

In all ten in-depth interviews were held using semi-structured interview guides that covered the following: infant's breastfeeding status, infant's mixed feeding status, reasons for giving other feeds, issues on wet nursing, expressing breast milk for feeding, and influence of social pressure on feeding behaviour. Also explored were the purchasing power of participants, perception of the cost of

infant formula, and disclosure of HIV sero-status to partner or close relative. Five of the ten interviews were conducted in English and the other half in Akan (through competent translators – nurse research assistants). All interviews were recorded in writing.

Ethical issues

The research protocol met the guidelines for research involving human subjects of the Noguchi Memorial Institute for Medical Research (NMIMR). The study protocol was first reviewed and vetted by the Proposal Review Board of the School of Public Health for appropriateness and scientific content. An ethical clearance was afterwards sought from the Institutional Review Board (IRB) of the Noguchi Memorial Institute for Medical Research (*FWA 00001824,NMIMR-IRB CPN 044/04-05, IRB 0001276*).

Written informed consent, for those who were literate and witnessed verbal informed consent, for the illiterate was obtained from each study participant. Subjects were informed about the objectives and methods of the study. They were also assured of strict confidentiality with regards to any information obtained from them.

Data analysis

Statistical analysis was carried out using SPSS Version 15.0 (SPSS, 2007) . Associations between maternal characteristics and infant feeding choice were assessed using Chi Square test (x^2) and the Fishers exact tests as appropriate. Further evaluations of these associations were done using logistic regression technique, where odds ratios (ORs) and their 95% confidence intervals (CI) were computed to measure the strength of the associations.

The data from the in-depth interviews were analyzed manually. This consisted of appraising the jotted notes, and synthesizing them into meaningful themes by the first author. Certain portions of the participants' responses were also reported verbatim where it was deemed necessary. This exercise was edited by the rest of the co-authors with a few modifications to enhance readability.

RESULTS

The background, socio-demographic characteristics, and reproductive history of the 128 mothers are presented in Table 1. The mean age of the participants was 31 years (range 19 - 43 years). All but one of the women had vaginal deliveries. A little over a quarter (28.9%) was primiparous and 46% multiparous, and attended the first antenatal care at 25 weeks gestation (range 4 - 36 weeks). About a quarter did not have formal education. The majority were either married or cohabited with a partner (Table 1).

The ten mothers who constituted the sample for the qualitative investigation were aged between 25 and 43 years. Seven of them were from rural areas in the Manya Krobo District, while three (3) were from Tema Municipal area. Eight (8) of them had no formal education; one had completed Junior High School, and the other a vocational school. One of the 10 was widowed; two were single mothers, and the rest married/cohabiting. Seven of the women were living with extended family members; two were living in a nuclear family, and one living alone. One had a permanent income from self-employment (boutique /hairdressing), another from petty trading. The other eight (8) were not employed. All but two had disclosed their HIV-positive status to either a partner or close relative.

Breastfeeding, breastfeeding initiation and infant feeding behaviour of mothers

Ninety six (96) of the 128 mothers who participated in the postpartum survey had declared their intentions antepartum to breastfeed. The distribution of these participants by time breastfeeding was initiated is presented in Figure 1. About one-third (33.6%) initiated breastfeeding within an hour of delivery. Among the 128 mothers, a questionnaire item explored the practices of seven different kinds of infant feeding behaviours over a three month recall period (Figure 2). These were "ever breastfed" (99.9%), "exclusively breastfed for up to three months" (61.7%), "mixed-fed or infant ever given other foods in addition to breast milk" (38.3%), "ever expressed breast milk with the intention to feed the infant" (14.4%), "ever given formula to infant" (5.5%), "ever heat-treated expressed breast milk" (1.6%), and infant "ever been wet-nursed" (0%).

Perception on cost of replacement feeding was associated with EBF behavior. At a bivariate level analysis, mothers who perceived the cost of replacement feeding to be expensive were almost three-times as likely as those who felt it was affordable to exclusively breastfeed, OR = 2.7; 95% CI (1.15 - 6.25) (Table 2).

There was even a higher propensity to exclusively breastfeed if mothers felt that choosing only formula feeding could lead to stigmatization OR = 7.50; 95% (CI 2.30 - 24.44). In multiple logistic regression model, mothers with nine or more years of formal education were on average 80% less likely to exclusively breastfeed OR = 0.21; 95% CI (0.05 - 0.88) . On the contrary, perception on stigma related to formula feeding OR = 15.62; 95% CI 3.94 - 61.98), and cost of infant formula (OR = 4.60; 95% CI 1.40 - 15.14) were the significant predictors of exclusive breastfeeding of infants. This model included Cost of replacement feeding; Fear that replacement feeding may lead to stigmatization; HIV-sero status disclosure to partner; Residency; Education; and Belief in the benefits of breastfeeding (Table 2).

Infant feeding experiences and challenges faced by mothers

We present below the condensed narratives on three of the 10 women whose experiences and challenges were recorded during the in-depth interviews. Those presented here bring up the recurring experiences and challenges that were revealed from the interviews. Social pressure to mix-feed, local norms such as water supplementation, negative repercussions of disclosure of HIV status or partner notification, and "the baby friendly hospital initiative" were the issues that influenced infant feeding choices and implementation efforts.

Table 1. Background, socio-demographic characteristic and reproductive history of mothers who participated in the infant feeding choices survey (N = 128).

Characteristic	Frequency	Percent
Study hospitals		
Atua Government hospital	65	50.8
St Martins de Porres Hospital	17	13.3
Tema General Hospital	46	35.9
Marital status		
Single	23	18.0
Married	56	43.8
Divorced/Separated	3	2.3
Widowed	2	1.6
Cohabiting	44	34.4
Residence		
Rural	79	61.7
Urban	49	38.3
Level of education		
No formal education	33	25.8
Primary	31	24.2
Junior High School	54	42.2
Seniour High school, Vocational Training, Post-Sec	9	7.0
Tertiary	1	0.8
Age bracket		
24 years or younger	17	13.3
25-35 years	82	64.1
36 years or older	29	22.7
Parity		
Primiparous	37	28.9
Secundiparous	32	25.0
Multiparous	59	46.1
Gravidity		
Primigravid	20	15.6
Secundigravid	24	18.8
Multigravid	84	65.6
Type of delivery		
Spontaneous Vaginal delivery	127	99.3
Caesarean Section	1	0.77

One theme that came up was the notion that, mothers who disclose their HIV status suffer negatively from this commendable behaviour. This is evidenced by the experiences of the only mother in this study who opted to do exclusive formula feeding for six months. She ended up doing so for three months. According to her, her choice was successfully implemented for the first three months with fiscal support from her in-laws (her husband had died of an unidentified cause a couple of months before she delivered). This mother after months of debating on

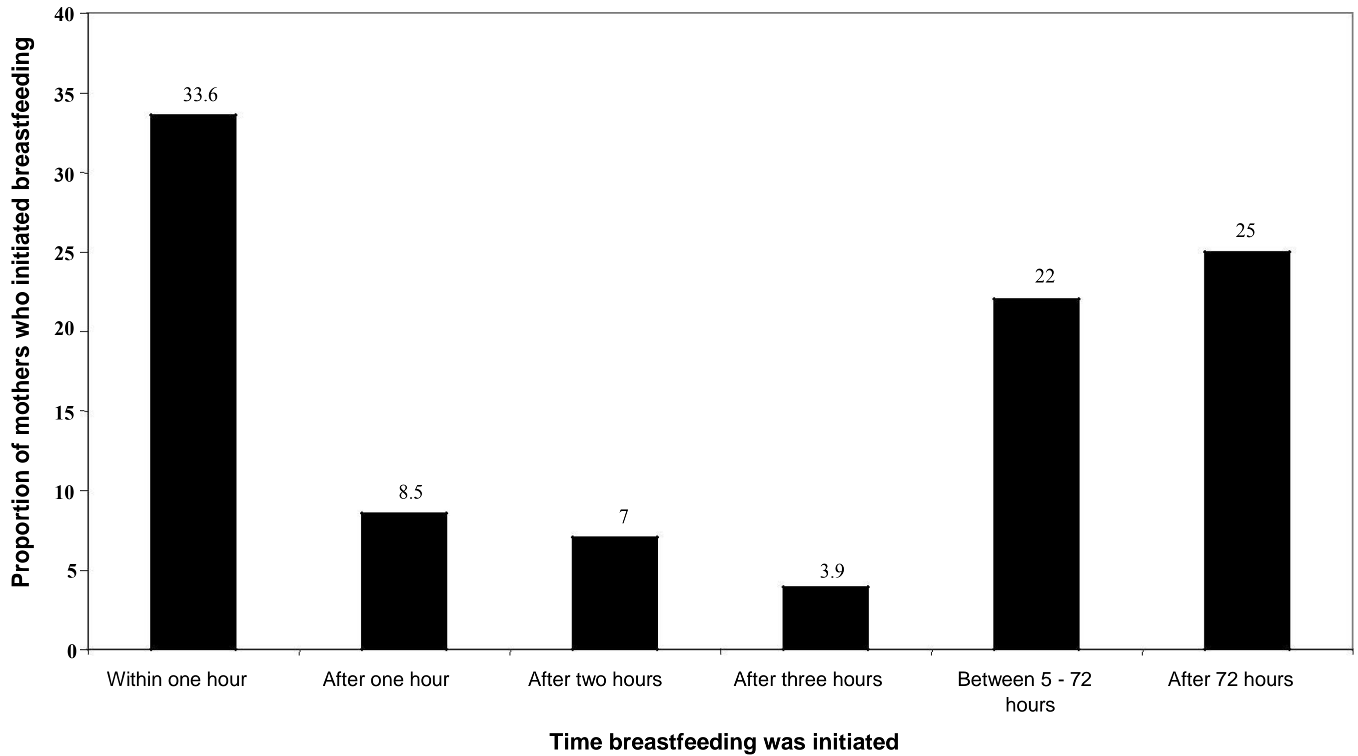

Figure 1. Breastfeeding initiation among mothers.

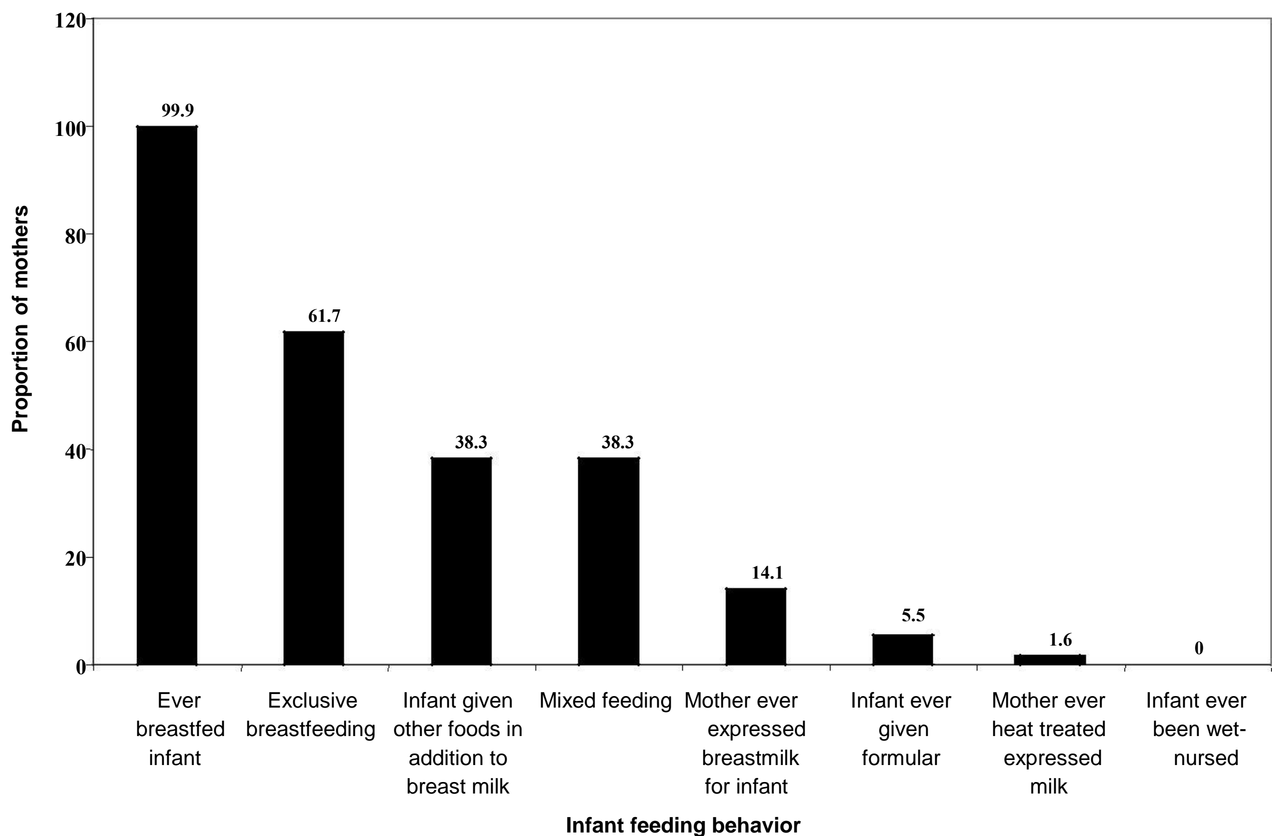

Figure 2. Infant feeding choices of HIV+ mothers (all 128 mothers).

Table 2. Some potential predictors of infant feeding choice.

Infant feeding type	EBF n	Other! n	Total N	p-value	OR[1]	95% CI[1]	OR[2]	95% CI[2]
Factors								
Cost of replacement feeding								
Not affordable	67	33	100	0.020 (τ)	2.70	1.15 – 6.25	4.60	1.40 - 15.14
Affordable	12	16	28					
Afraid that replacement feeding may lead to stigmatization								
Yes	75	35	110	<0.001(τ)	7.50	2.30 - 24.44	15.62	3.94 - 61.98
No	4	14	18					
HIV-sero status disclosed to husband								
No	67	41	108	0.863 (τ)	1.09	0.41 - 2.86	1.42	0.32 - 6.325
Yes	12	8	20					
Rural residency								
Yes	52	27	79	0.225 (τ)	0.64	0.31 - 1 .32	0.65	0.188 - 2.22
No	27	22	49					
Nine or more years of formal education								
Yes	35	29	64	0.102 (τ)	0.55	0.27 – 1.12	0.21	0.05 - 0.88
No	44	20	64					
Believes in the benefits of breastfeeding								
No	4	4	8	0.07 (F)	0.24	0.06 – 1.09	0.33	0.05 - 1.96
Yes	73	18	91					
Regular maternal income								
No	63	37	100	0.573 (τ)	1.28	0.54 – 3.03	Not included in model	
Yes	16	12	28					
Afraid of HIV disclosure repercussions								
No	10	4	14	0.428 (τ)	1.64	0.48 – 5.56	Not included in model	
Yes	69	45	114					

P (τ) = p value for Chi Square test; p (F) = p-value for Fisher's exact test; EBF = Exclusive breastfeeding; other! = Any other mode of infant feeding (mixed or formula). OR[1] = Odds Ratio Estimate from bivariate cross-tabulation/simple logistic regression analysis; CI[1] = 95% Confidence Interval for OR[1]; OR[2] = Odds Ratio Estimate from multiple logistic regression model containing (Cost of replacement feeding, Afraid that replacement feeding may lead to stigmatization, HIV-sero status disclosed to husband, Residency, Education, Believes in the benefits of breastfeeding); CI[2] = 95% Confidence Interval for OR[2].

whether or not to disclose her status to her benefactors, finally mastered courage and did. This (disclosure) in her own words marked the beginning of her misery. "When I told them this, they ceased all communications with me, no more financial remittances; they literally cut of links with me. I regret disclosing my status to my in-laws". Is it a crime to disclose your status? She asked.

In a related case, a mother who opted to exclusively breastfeed for six months could not implement this because of both partner and community members' stigmatizing behaviour towards her. This mother morosely narrated that she was highly stigmatized at home and in her area after disclosing her HIV status to her husband, a man she claimed is an alcohol addict. "He comes to the house most of the time after his daily bout of drinking to verbally abuse me. He literally broadcasts my status to the people in the area. This is a serious problem to me. These days, people around my area call me all kinds of names. Some even confront me that I should stop breastfeeding for I will give the sickness to my baby. If I knew that disclosure of my status to him was going to lead to this disgrace, I would not have...". When asked

about the reason why she chose breastfeeding given that she was aware that she was HIV-positive, this is what she said, "Breastfeeding was the best choice for me. No one does wet nursing or expresses breast milk in this community. I couldn't have chosen formula feeding. I also didn't want to be asked by people around me for reasons for my not breastfeeding the baby. Everyone in this community does breastfeeding. More so my nurse counsellor tells me infant formula is very, very expensive". I didn't know my partner would broadcast my HIV status to the community. I wouldn't have, if I knew he was going to do that…." It is also noteworthy that, there have been conscious efforts by nurse counsellors in all the three hospitals to frown on the AFASS of infant formula. The Prevention of Mother-To-Child Transmission of HIV (PMTCT) "In-charges" assert that, being signatories to the Baby-friendly Hospital Initiative, it is binding on them to not display infant formula at their facilities.

The issues of water supplementation, peer pressure to mix-feed, and naiveté of some mothers regarding the appropriateness of feeding choices are illustrated in the experience of a mother who antenatally opted to do exclusive breastfeeding but ended up doing mixed feeding after delivery. To some extent, her failure to appreciate the intricacies of infant feeding practices played a role. She indicated she singlehandedly adopted the practice of formula feeding and water supplementation when she had problems of "milk flow", a condition her sister had previously experienced. Her sister who was incapable of lactating after undergoing a Caesarean section was advised to formula-feed. She saw this as a successful practice and hence adopted it for her infant for she felt she was not producing enough milk for her infant. Another challenge this mother faced was her refusal to disclose her status to anyone. This she indicates troubles her mentally and makes her not enjoy the act of nourishing her son with breast milk. She believes there is a possibility that that feeding option could transmit the virus to him, justifying the intermittent introduction of infant formula. When asked why she was not sticking to formula alone, she replied that she did not have the means. Having lost both parents in her childhood, she indicated she was very afraid that disclosure to her partner for financial support could lead to untold consequences. *"I might be sacked from the house, I have no where to go to.*

DISCUSSION

Breastfeeding intentions, breastfeeding initiation and infant feeding choices of mothers

It was refreshing to note that three out of four of the mothers who participated in the postpartum survey had declared their intentions to exclusively breastfeed for six months during the antepartum survey. The benefit of breastfeeding is very well publicized in medical literature. Interactions both with the PMTCT nurse counselors and the HIV-positive mothers revealed that the socio-cultural context in which these women make their infant feeding decisions is one in which breastfeeding is highly valued. As in most parts of Ghana, breastfeeding in the Manya Krobo and Tema is culturally normative, and there is no evidence in this study to suggest that this fundamental cultural practice is being eroded, even in this era of HIV. Leshabari et al. in a study that explored infant feeding decision making among HIV-positive Tanzanian women describe the failure of a mother to breastfeed as 'a significant failure', pointing to the substantial failure to live up to practices deeply embedded in a culturally constituted moral universe (Leshabari et al., 2007b). These authors further noted that, in addition to putting the life of the child at risk and violating the rules of good motherhood, not breastfeeding an infant is interpreted as an act of disrespect to the lineage. These interpretations of the value attached to breastfeeding with certainty can be extrapolated to the communities in which this current study was conducted. This fundamental cultural practice of attaching particular importance to breastfeeding in the Manya Krobo and Tema, if well harnessed could positively affect infant feeding practice.

About one-third (33.6%) initiated breastfeeding within an hour of delivery. Given the national norm, and the fact that the three hospitals where the study was conducted are signatories to "The Baby Friendly Hospital Initiative", this particular observation is rather below expectation. The initiative enjoins signatory institutions to support mothers to initiate breastfeeding within an hour after birth. Further interactions with both the PMTCT nurse counselors and the HIV+ mothers revealed that nurse counselors in these settings do not feel comfortable pro-viding helpful instructions about formula feeding in the name of this initiative. The importance of hospital breastfeeding policy and attitudes of health personnel in affecting breastfeeding practices has been repeatedly documented (Knodel et al., 1990; Williamson, 1990; Weng, 2003). In reality, however, the Baby Friendly Hospital Initiative does not preclude the use of replace-ment feeding in situations that are medically indicated (WHO/UNICEF, 1989). In addressing this problem, we suggest that supportive supervisions and refresher train-ing be given to this group of health workers. In their bid to significantly increase the rates of exclusive breastfeeding, health workers need to be reminded of the other options available to nursing mothers as enshrined in the guidelines for infant feeding for HIV-positive mothers (WHO, 2006).

A questionnaire item explored the practices of seven different kinds of infant feeding behaviors. These were "ever breastfed", "exclusive breastfeeding for up to three months", "mixed-feeding", "ever expressed breast milk with the intention to feed the infant", "ever given formula to infant", "ever heat-treated expressed breast milk" and

"wet-nursing". As indicated earlier, in Manya Krobo and in the Tema, breastfeeding is normal practice. Not surprisingly, close a 100% of the participants had ever breastfed but not exclusively with breast milk. In keeping with the result of a previous study from Nigeria (Sadoh et al., 2008), a sizeable proportion (38.3%) of the mothers in this study who opted to breastfeed had introduced to their infants water and other kinds of foods. Similar findings have been reported by Abiona et al. where participants of a focus group discussion argued that breast milk is 'food' and that, just as an adult drinks water after eating, a baby should be given water after being breastfed (Abiona et al., 2006). In fact, most infants are given water from birth, in part due to cultural perceptions that infants need water to survive. To ensure that HIV-positive mothers who choose to breastfeed do so exclusively, these beliefs and attitudes in relation to giving infants water, and other foods, without a doubt need to be addressed. Both formal and informal interactions between researchers, health workers and community members through durbars could help in reshaping some of these long held attitudes.

In this present study, none of the infants was wet-nursed. As indicated by one of the mothers "Breast-feeding was the best choice for me. No one does wet nursing or express breast milk here. I could not have chosen formula feeding. What reasons will I give to the people around me for not breastfeeding the baby? Everyone in this community does breastfeeding. This is also in line with findings of a Nigerian study where participants in a focus group discussion noted that wet-nursing is very rare (Sadoh et al., 2008).

The financial cost of feeding with infant formula is estimated to be about GH¢20.00 per month. The costs of fuel, safe water, and utensils are not considered in the derivation of this cost. In low-income families these (costs of fuel, safe water, and utensils) have been noted to be important (Rea et al., 2007). Given that a significant proportion of the women in this present study were from underprivileged settings, infant formula was not thought of as a feasible feeding option for most of the mothers. About 6% indicated having ever given formula to their infants; only one doing so exclusively in this study. It is only in rare cases - when mothers have the economic means to purchase it, that infant formula is used. Other reasons for opting for infant formula noted in this current study stems from the notion that, only mothers who are well to do, opt for formula feeding. This behaviour has the potential of spilling over to affect HIV-negative nursing mothers. Efforts at addressing this through the various health communication channels discussed above should be vigorously pursued.

Education, perception on stigma that may stem from failure to breastfeed, and also perceptions on cost of infant formula were revealed in this study to have significant influences on exclusive breastfeeding behaviour. Mothers with nine or more years of formal education were on average 80% less likely to exclusively breastfeed. On the contrary, perception on stigma related to formula feeding and cost of infant formula were the significant predictors of exclusive breastfeeding of infants. This information will be useful to HIV counselling service providers in these districts. If efforts are made to address these issues in these areas, infant feeding practices may be positively enhanced

Experiences/challenges faced by mothers in implementing infant feeding intentions.

The in-depth interview component of this investigation has given a snapshot of the experiences and challenges that HIV-positive mothers in the Manya Krobo and Tema Municipality face as they make attempts at implementing their infant feeding intentions. These experiences manifest a variety of hardships regarding the choosing, implementing, and sustaining the feeding intentions. The few, who managed to implement their feeding options religiously, did not do so without challenges.

For instance, the only mother who had delivered by caesarean section opted to do exclusive formula feeding for six months, managed to do so for only three months because of the following reasons. Her challenges included stigmatization, discrimination, cessation of communications and financial remittances by her in-laws. Disclosure of HIV status to the partner is usually a major condition for successful replacement feeding. However, in this study, disclosure resulted in problems. For instance a study in Uganda found that women who succeeded in adhering to replacement feeding had family support (Matovu et al., 2002) . In this study, however, as illustrated by the experiences of one of the mothers, "I am highly stigmatized at home and in my community after disclosing my status to my husband…"

All the women interviewed in the present study had been informed by their PMTCT nurse counsellors that the HIV can be transmitted to their infants through breast-feeding. They were also counselled on the other options available to them. The majority opted to breastfeed their infants for various socio-cultural and economic reasons outlined earlier. As Senah rightly remarked in his paper titled "Maternal Mortality in Ghana: the other side", the factors which promote good health and those that precipitate ill health are not purely biological, but can be social, economic, and cultural (Senah, 2003). This dynamics can be likened to the decision making processes of these women with regard to what to feed their infants. A decision to breastfeed or not to do so is not merely linked to knowledge of medical risks of mother-to-child transmission of HIV through breastfeeding as Leshaberi et al. (2007) put it, but can be occasioned by social and cultural nuances of the community. In contributing to making the current global infant feeding guidelines useful in this locale, we call that such guidelines be modified taking cognizance of all these issues.

CONCLUSION

This investigation on infant feeding choices by HIV-positive mothers has revealed that breastfeeding as a fundamental cultural practice is highly valued in the Manya Krobo District and Tema Municipality.

The study also shows that mothers in the study areas face various individual-level, community-level and service-related barriers in choosing and implementing their feeding intentions. Such barriers include social pressure to mix -feed, local norms such as water supplementation and "the baby friendly hospital initiative". These challenges presented here may not be unique to only the mothers of the Manya Krobo District and Tema Municipality, but may be experienced by other mothers in various parts of Ghana. HIV counselling service providers in these districts need to address these issues in order to improve infant feeding practice.

Recommendations

At present, the WHO advises that unless replacement feeding is acceptable, feasible, affordable, sustainable and safe for infant and mother, exclusive breastfeeding should be practiced. These findings are suggestive that the ideal circumstances for replacement feeding are unlikely for a lot of the women in the Manya Krobo District, and Tema Municipality. We therefore recommend that these guidelines be modified to address the issues discussed. The issues also need to be brought to the knowledge of PMTCT service providers in these areas.

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