

Full Length Research Paper

Factors influencing the choices of infant feeding of HIV-positive mothers in Southern Ghana: The role of counsellors, mothers, families and socio-economic status

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The study assessed the perspectives of HIV-positive mothers and family members (grand-mothers and fathers) of the infant feeding options recommended for HIV-infected mothers in Ghana. This entailed individual interviews with 40 HIV-positive mothers with infants aged 0 to 12 months and 6 focus group discussions with HIV-positive mothers, fathers and grandmothers of unknown status in two urban districts. All infants born to HIV-positive mothers in both districts had been breastfed. Breastfeeding was initiated between three hours and three days following birth. While some of the infants had been exclusively breastfed, none had been exclusively formula fed. Early mixed feeding patterns were deeply entrenched. Barriers to exclusive replacement feeding by HIV-positive mothers included cultural and familial influences, socio-economic factors including cost of infant formula, lack of access to fridges, clean water and fuel. Interventions designed to promote safer infant feeding among HIV-infected mothers in these settings need to be mindful of these barriers (socio-economic, cultural and familial) that these women face. Failure by policy makers to incorporate these issues will continue to lead to a gap between well-intended policies and programmes, and actual practices of HIV-positive mothers.

Key words: Cultural norms, HIV-positive mothers, socio-economic status, infant feeding.

INTRODUCTION

The benefits of breastfeeding relating to nutrition, prevention of common childhood illness, child spacing, reduction in infant and child morbidity and mortality are well described in the literature (Coutsoudis, 2005, Kakute et al., 2005; WHO, 2000). However, in recent years, there has been conclusive evidence that breastfeeding confers a significant risk of HIV transmission from an infected mother to the child (Coutsoudis, 2005; De Cock et al., 2000). Globally, it is estimated that 200,000 to 350,000 infants contract HIV via prolonged breastfeeding up to 2 years (De Cock et al., 2000). In Ghana, the focus of this

paper, it is estimated that 15% of infants born to HIV infected women acquire the infection through breastfeeding (NACP, 2009).

Ghana, like other developing countries across the world, has a strong breastfeeding culture, where breastfeeding is practiced for up to 2 years of age and above (Ghana Statistical Service, 1999). According to Ghana Statistical Service, 97% of all children born in the past five years were breast fed for over two years (Ghana Statistical Service, 1999). Despite the strong breastfeeding culture, only a minority of women practice exclusive breastfeeding (EBF) up to 6 months of age (Ghana Statistical Service, 1999). Initiation of breastfeeding often starts between a few minutes to three days after delivery depending on the type of influence from the community, family members and the mother's

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exposure to health and nutrition information from health workers (Awumbila, 2003).

Davis et al. (2003) reported in Ghana that, water is customarily given to infants shortly after birth since it is believed that following the birthing process, the infant is exhausted and thirsty and requires water to quench his or her thirst. Moreover, giving the infant water is also regarded as cultural gesture to welcome the child into the world. According to Ghana Statistical Service (1999), food supplementation (giving of water based liquids or "koko", a maize-based fermented porridge) starts very early by most mothers (38%) by age 2 to 3 months, a stage when it is recommended that the child be exclusively breastfed. In the context of HIV/AIDS, there is conclusive evidence that mixed feeding is associated with increased risk of MTCT of HIV (Coutsoudis et al., 2001; Iliff et al., 2005).

Given the risk of HIV transmission associated with breastfeeding, current international guidelines on infant feeding, advocate for only using replacement feeding when it is acceptable, feasible, affordable, sustainable and safe (AFASS) taking into account local circumstances, the individual woman's situation and the risks of replacement feeding (WHO, 2007). According to Leshabari et al. (2007), these guidelines may not be immediately appropriate in certain settings unless they are adapted to the social and cultural context of the women who make the choices.

Since the adoption of the WHO infant feeding guidelines into Mother and Child Health (MCH) services in Ghana in 2001, little has been done with respect to assessing the implications of this in terms of influences, choices and practices of HIV-positive mothers, as well as the enabling environment needed for their implementation. By investigating the factors influencing infant feeding choices of HIV-positive mothers, this study attempted to contribute to the limited knowledge in this area in Ghana. Furthermore, it seeks to draw attention of policy makers and implementers to areas that need further attention and strengthening.

Aims and objectives of this study

The aim of this study was to assess the perspectives of HIV-positive mothers and family members (fathers and grandmothers) of the infant feeding options for HIV infected mothers in Ghana. The specific objectives of this study were to (1) assess HIV-positive mothers' knowledge and understanding of the WHO guidelines for infant feeding in the context of HIV/AIDS; (2) understand HIV-positive mothers' perspectives, practices and attitudes towards infant feeding options (IFOs); (3) assess the influence of socio-economic status of HIV-positive mothers on infant feeding decisions and (4) assess the perspectives and attitudes of family members towards infant feeding options for HIV-positive mothers.

METHODOLOGY

The study sites

The study was carried out in 3 urban hospitals between December 2008 and February 2009. The hospitals included Tema general hospital in the Tema municipality in Greater Accra region, St Martin's de Porres Catholic hospital, and Atua government hospital in Agromanya, Manya-Krobo district in the eastern region. The study hospitals provide PMTCT services such as VCT, and infant feeding counseling to both urban and rural populations. The three hospitals were chosen since they were the first to pilot the National Prevention of Mother-to-Child-Transmission of HIV (PMTCT) and the antiretroviral therapy programme in 2001. Available data regarding the proportion of HIV-infected women accessing postnatal services from Manya-Krobo district is 6.0% (District-Health-Directorate-Manya-Krobo 2000 to 2006). In the Tema Municipality, service data indicate that the proportion of HIV-infected women accessing postnatal services is 3.6% (Tema-Municipal-Health-Administration, 2002 to 2006). Based on this information that the sample size required for this study was determined.

Study design and population

The study employed both structured interviews and focus group discussions methods since the topic of focus requires an enquiry into socio-cultural factors. These two methods were used for triangulation to help to widen and deepen the understanding of issues of infant feeding practices.

The quantitative component was a cross-sectional hospital-based survey of HIV-positive mothers. To be eligible to participate, the mothers had to have infants aged between 0 to 12 months. The mothers who met the selection criteria and agreed to participate in the study during child welfare clinics and postnatal services at the hospitals were purposively recruited with support from trained nurse counselors and two experienced research assistants.

Six FGDs were conducted with forty-one participants. FGDs were conducted with the following participants: First, HIV-positive mothers with infants aged between 0 to 12 months. Across both study districts, the same HIV-positive mothers who participated in the SIs also participated in the FGDs. These participants were purposively recruited from the three hospitals. Second, fathers and grandmothers of unknown HIV status. To be eligible to participate, the fathers and the grandmothers had to have infants and grandchildren breastfeeding. The participants who met the selection criteria and agreed to participate in the study were purposively recruited. Like the HIV-mothers, the fathers and the grandmothers were purposively recruited from local churches and clinics. In the FGDs, one research assistant served as the moderator and another as a notes-taker. The moderator was responsible for conducting the discussions according to the FGD guide. The FGDs were tape-recorded in Akan. In total, six FGDs were conducted with forty-one participants. HIV-positive mothers with infants were thirteen, (seven from Manya-Krobo and six from Tema). Fathers of unknown HIV status were fourteen (seven from Manya-Krobo and seven from Tema) and the grandmothers of unknown HIV status were fourteen (seven from Manya-Krobo and seven from Tema).

Ethical issues

Ethical approval for the study was obtained from two Ethical Review Boards after meeting the guidelines for research involving human subjects. The study protocol was first reviewed by the University of Cape Town Ethical Review Committee for appropriateness and scientific content. Ethical approval for the study was later obtained from the Ethical Review Committee of the Ghana Health Service (GHS-ERC: 04/1/08). The procedure, potential risks, benefits were explained to participants after which a written informed consent was obtained from each study participant at the beginning of the study after been informed about the objectives of the study. They were also assured of strict confidentiality with regards to any information obtained from them.

Data analysis

Statistical analysis of the data was performed using Statistical Packages for Social Scientist (SPSS) version 16.0. The FGDs were tape-recorded, transcribed, typed and analysed manually in terms of themes in relation to the study objectives.

RESULTS

The socio demographic profiles of all respondents including their partners across the two districts are summarized in Table 1. The age of the participants varied between 19 to 43 years and the average age was 30 years. The average age of all infants was 6 months ranging from 5 days to 12 months. Twenty four of these infants were under the age of six months and sixteen were between 6 to 12 months.

The majority 34 (85%) of the respondents in both districts had a spouse or partner living with them. Twenty-six (65%) of them had some level of formal education across both districts. Most of the women, 28 (70%) were employed as traders. There were slight differences between the two districts in terms of the type of employment that women's partners were engaged in. Overall (mothers together with their partners) across both districts, seven (18%) were employed as government employees, while two thirds (82%) of them were traders and artisans.

Infant feeding practices by HIV-positive mothers

Fifteen out of 24 (62%) infants under six months had been exclusive breastfed (EBF) for between a period of 0 to 6 months (Table 2). Of the 16 infants between the ages of 6 to 12 months, 9 (56%) had been EBF for between a period of 0 to 6 months. The remaining 16 (40%) were given breast milk in addition to other foods (mixed feeding). Other foods typically included water, traditional medicines and cereal foods, and was often initiated between one and three months based on influence from family members and cultural norms. None of the mothers used animal milk, wet-nursing and expressed heat-treated breast milk due to lack of counseling on them. None of the infants were exclusive formula fed (Table 2).

However, mothers who mixed-fed their infants were aware of the guidelines recommending not introducing complementary feeds prior to 6 months of EBF and cited the transmission of HIV to the infant as the basis for this recommendation, but were helpless in the face of pressure from family members. Their reasons for being unable to stand by their decision not to mix-feed varied from fear over their HIV status being discovered and their subordinate role and lack of autonomy over decision-making including their husbands and mothers-in-law:

"Though, I was told by the nurses about the risk of an HIV - positive mother introducing solids or liquids in addition

to the breast milk, I introduced water in the first month of exclusive breastfeeding under the instruction of my husband since I could not tell him that I was HIV-positive" (Mothers FGD- Tema)".

"My husband gave my baby local concoctions when it was around two months old. I told him about the nurses' advice to exclusive breastfeed but he never listened" (Mothers FGD-Many-Krobo)".

"The grandmother insisted and fed my three months old baby with porridge when I was sick with the reason that my breast milk was not enough to satisfy my baby" (Mothers FGD- Tema)".

In both the FGDs and the SIs, all the HIV-positive mothers expressed great concern over the social consequences of not breastfeeding. Fears over stigmatization were often cited:

"Immediately people realize that you are not breastfeeding your baby, they just conclude that you have the disease AIDS. If they finally get to know you have the disease, they will make you the subject of discussion and a laughing stock in the area. It is really a hell for some of us" (Mothers FGD- Tema)".

"The situation is better if you are not living in an extended family house or a compound household. If you are living with your partner alone and he knows your problem, the easier it is to formula feed your baby without a problem" (Mothers FGD- Many-Krobo).

Knowledge and understanding of HIV-positive mothers of MTCT and infant feeding guidelines

Thirty three (83%) out of the 40 HIV-positive mothers interviewed from both districts had received counseling on mother-to-child transmission (MTCT) of HIV and WHO recommended feeding options for infants during either antenatal care or postnatal services. During the FGDs, the women demonstrated a good understanding of MTCT transmission, especially postnatal transmission:

"Infants can also acquire HIV from their infected mothers' breast, if the baby happens to bite the teat of the breast or if there is a sore on the teat" (Mothers FGD, Tema).

Across both districts, 36 (90%) mentioned the infant feeding options to include EBF and exclusive replacement feeding (ERF). During the FGDs with mothers, majority of them from both districts correctly understood EBF:

"EBF is the feeding of the infant with breast milk only with exception of prescribed medicines, up to six months from the day of birth" (Mothers FGD, Many-Krobo and Tema).

Table 1. Socio demographic profile of the study population.

Characteristics	HIV-positive mothers- Tema (n = 15) (%)	HIV-positive mothers- Manya-Krobo (n = 25) (%)	Total sample (n = 40) (%)
Age (years)	n (%)	n (%)	n (%)
19 - 29	7 (47)	13 (52)	20 (50)
30 - 39	8 (53)	9 (36)	17 (42.5)
40+	0 (0)	3 (12)	3 (7.5)
Education			
Middle/JSS	7 (47)	7 (28)	14 (35)
Primary	1 (7)	7 (28)	8 (20)
Secondary/Vocational	2 (13)	1 (4)	3 (7.5)
Post-secondary	0 (0)	1 (4)	1 (2.5)
No education	5 (33)	9 (36)	14 (35)
Husband's education			
Middle/JSS	7 (47)	15 (60)	22 (55)
Primary	1 (7)	3 (12)	4 (10)
Secondary/Voc.	3 (20)	4 (16)	7 (17.5)
Post-sec.	2 (13)	0 (0)	2 (5)
No education	2 (13)	3 (12)	5 (12.5)
Marital status			
Married / Cohabiting	13 (87)	21 (84)	34 (85)
Never married / Single parent / Separated / Divorced	2 (13)	4 (16)	6 (15)
Employment			
Trader/Artisan	11 (73)	17 (68)	28 (70)
Farmer	0 (0)	2 (8)	2 (5)
Government worker	1 (7)	2 (8)	3 (7.5)
House wife/Unemployed	3 (20)	4 (16)	7 (17.5)
Husband's employment			
Trader/Artisan	6 (40)	16 (64)	22 (55)
Farmer	3 (20)	6 (24)	9 (23)
Government worker	4 (27)	0 (0)	4 (10)
Unemployed	2 (13)	3 (12)	5 (12)
Religion			
Christian	11 (73)	25 (100)	36 (90)
Muslim	4 (27)	0 (0)	4 (10)

Minority 4 (10%) of the mothers from both districts partially understood ERF:

“ERF is a situation where an infant is fed on only breast milk substitutes such as infant formula, porridge and other foods from birth” (Mothers FGD, Manya-Krobo and Tema).

Grandmothers and fathers across both districts had a

limited knowledge on EBF and ERF during FGDs since none of them understood the terms.

Less common infant feeding methods, such as wet-nursing, expressed heat-treated breast milk and modified animal milk were neither well understood, accepted nor regarded as feasible options by all the 40 (100) individual women interviewed. They also reported in the FGDs that during counseling, some of these options were mentioned briefly since emphasis was on exclusive

Table 2. HIV-positive mothers feeding practices for infants under 6 and above 6 months.

Infant age in months	Exclusive breast feeding		Other foods in addition to breast milk	Exclusive formula feeding	Total
	0 - 3 months	4 - 6 months	0 - 6 months		
0- 3	10	-	5	0	15
4- 5	-	5	4	0	9
6- 9	2	1	2	0	5
10- 12	3	3	5	0	11
Total	15	9	16	0	40

breastfeeding and exclusive replacement feeding. Therefore, their knowledge and understanding of these options was poor due to lack of counseling on them:

“Expressing breast milk and boiling it to feed a baby was mentioned briefly by the nurses during counseling but was not demonstrated to us” (Mothers FGD- Manya-Krobo and Tema).

Influence of socio-economic status of HIV-positive mothers on infant feeding practices

As previously noted, none of the 40 mothers interviewed practiced ERF. All the 40 (100) cited the cost of infant formula as a key reason. The socio-economic status of mothers and in this instance those who are HIV-positive has an important influence on their decision-making particularly in relation to replacement feeding. Both respondents and participants in the SIs and FGDs respectively, across both districts viewed the current cost of a tin of infant formula milk of sixteen Ghana cedis (GH¢16 ≈ (\$11) as unaffordable:

“Feeding the infant with only formula milk will be difficult for some of us considering our financial status compared to cost of infant formula milk” (Mothers FGD-Tema and Manya-Krobo).

Of concern is the reporting that on account of formula milk being expensive, it necessitated it being used alongside traditional foods contributing to the practice of mixed feeding:

“A tin of formula milk is small and expensive, it also finishes very fast if the baby is feeding well. The cost is compelling some of us to manage the formula milk with some local foods” (Mothers FGD-Tema).

“Because some of us do not have the money to ensure continuous purchase of the formula milk, we decide to use it economically by adding other foods though we know that feeding the baby exclusively on formula is the best” (Mothers FGD-Manya-Krobo).

However, all the mothers, 40 (100%) in the survey and the FGDs were confident that they would be able to practice replacement feeding successfully as recommended by health workers if infant formula was distributed free of charge or subsidized.

Other socio-economic challenges linked to problems encountered in the preparation of infant formula foods which was reported by 17 (43%) out of 40 of the women interviewed, included the time required in fetching wood and making fire, and resources (buying of cooking utensils, travelling to purchase infant formula). Other challenges included access to clean water and having to devote time for other activities including household chores, all of which speak to issues of socio-economic challenges that these women face. Related to this was access to storage facilities (freezers and fridges) which are important for the safe storage of formula milk. Also, the importance of being employed and having a regular source of income was also identified as important.

Perceptions and attitudes of family members towards IFOs for HIV-positive mothers

Results from the 4 FGDs held with fathers and grandmothers in both districts, show that the knowledge of the link between breastfeeding and the HIV infection from mother to child was good. In addition, MTCT of HIV was understood to occur during pregnancy, delivery and breastfeeding. It was also understood that in order to reduce the risk of HIV transmission via breastfeeding, replacement feeding had to be considered:

“It is possible for a woman to transmit any disease she is having to the baby during the time of pregnancy, delivery or during breast feeding” (Grandmothers and Fathers FGD, Manya-Krobo and Tema).

“If it will demand an infected mother stopping breastfeeding altogether to prevent the infant from getting the HIV virus, it is a good idea” (Grandmothers FGD-Tema).

Paradoxically, despite the acknowledgement that replacement feeding had to be considered in order to

reduce the risk of HIV transmission via breastfeeding, participants were very vocal about the benefits of breastfeeding and argued for its continuation, for reasons of mother-child bonding and communication:

“Non-breast fed children misses the motherly love and communication that is usually created between the mother and the baby in the course of breastfeeding, through voice and smell and by touch thus strengthening the social bond between the mother and the infant” (Grandmothers and Fathers FGD- Manya-Krobo and Tema).

Fathers and grandmothers discussed the practice of giving water, traditional medicines and local foods to a newly born baby:

“The new born baby is welcomed by giving water or herbal mixture for it to become part of the family as custom demands. Such traditional medicines have the potency of making the baby to fight against evil spirits which come its way” (Fathers FGD-Manya-Krobo).

“The giving of water to the new born baby is just like how one welcomes a visitor or a stranger to the home with water” (Grandmothers FGD- Tema).

In addition, participants expressed several misconceptions about alternate replacement options (expressed heat-treated breast milk, wet-nursing and animal milk) and regarded them as the least acceptable options:

“The practice of expressing breast milk to boil and feed babies is not been practiced in our community. We have never seen or heard of it before. I don't think mothers will be allowed to do that” (Fathers FGD- Manya-Krobo).

“I don't think animal's milk is good for a baby's consumption since a baby can develop the character of the animal by feeding on its milk. Also, it is very difficult to digest” (Grandmothers FGD- Tema).

However, according to participants, wet-nursing was growing less popular because of the fear of transmitting diseases, including HIV:

“Wet-nursing used to be a normal practice between mothers in the community when one of them was sick. This is not done anymore due to fears of transmitting diseases such as HIV virus and other diseases through the breast milk” (Fathers and Grandmothers FGD-Tema and Manya-Krobo).

Clearly, although the participants understood MTCT and the recommendation of replacement feeding, they still supported mixed-feeding (breast-feeding and the

introduction of water and foods) during infancy. This discussion reinforces the difficulty that women with HIV face in adhering to infant feeding in the face of the often over-whelming pressures that they face from their partners and families in patriarchal societies.

DISCUSSION

Studying the socio-cultural and economic environment of HIV-positive mothers and communities in the context of infant feeding in relation to the WHO infant feeding recommendations is of critical importance for understanding the reasons why there is often a gap between knowledge and actual practices.

Amongst the 40 HIV-positive mothers surveyed in both districts, the majority reported receiving counseling on infant feeding options and many of them were able to define EBF and to a lesser extent ERF correctly, as well as showing a high degree of the understanding of the increased risk of MTCT through breastfeeding. They also understood that ERF was necessary in order to avoid transmission of the HIV virus to their infants. These findings are consistent with similar studies in Tanzania (de Paoli et al., 2002), Thailand (Talawat et al., 2002) and South Africa (Thairu et al., 2005). However, while mothers were knowledgeable of infant formula as a replacement option, their awareness of other options such as animal milk, wet-nursing and expressed heat treated breast milk was limited and this can be attributed to a gap in counseling. This gap has also been found in other cross-country studies in Botswana, Kenya, Malawi and Uganda (Chopra and Rollins, 2008) and is common across PMTCT programmes (Koniz-Booher et al., 2004).

In terms of practices, all infants born to the surveyed HIV-positive mothers had been breastfed. During the FGDs held with HIV-positive mothers, grand-mothers and fathers, it was reported by all three groups that breastfeeding was vital for bonding between mother and child and is important for the infants' health. This is similar to other studies in Ghana and Tanzania which found that breastfeeding is a social norm and a culturally entrenched practice (Awumbila, 2003; Davis et al., 2003; Ghana Statistical Service, 1999; Leshabari et al., 2007). Obviously, this has important implications in the context of HIV/AIDS and the recommended replacement feeding options for HIV-positive mothers.

Clearly, HIV-positive mothers practicing “new” infant feeding methods in these communities face huge social disapproval due to the deeply ingrained beliefs of the benefits of breastfeeding for the baby. In this study, HIV-positive mothers often felt compelled to hide the fact that they formula fed over fear of stigma. Fear of disclosure may be an impediment to choosing formula feeding (Kuhn et al., 1999). In countries where breastfeeding is the norm, formula feeding has been known to alert a woman's family to the fact that she is HIV-positive, and

this may result in her being abused or shunned (de Paoli et al., 2002). Choosing to use replacement feed is tantamount to HIV-positive mothers announcing their HIV status, and consequently, this has many implications including extreme consequences such as violence and divorce (Adejuyigbe et al., 2008; Njunga, 2008). Stigma and discrimination in relation to HIV/AIDS is widespread in Ghana where only 15% of men and 8% of women were found to have accepting attitudes toward people with HIV/AIDS (NACP, 2009). As knowledge of HIV transmission through breastfeeding is disseminated into local communities, a woman who opts for replacement feeding will be carefully watched (Leshabari et al., 2007). It is not surprising then that women who choose to formula feed do so in secret. Similar studies in Uganda and Tanzania have confirmed that HIV-positive mothers who succeeded in adhering to replacement feeding had disclosed their status to the family members and received support (Leshabari et al., 2007; Matovu et al., 2002).

Magoni and Giuliano (2005) claims that, it is near impossible to adhere to EBF and ERF because both are alien concepts in African societies where mixed feeding is the norm. This was supported by the individual interviews with HIV-positive women as well as the FGDs held with HIV-positive mothers, grand-mothers and fathers in this study. The reasons given for mixed feeding in this study include amongst others the custom that every stranger (including newborns) is welcomed to the household with water. Entrenched family and social pressure, and cultural norms compel mothers in Ghana and other developing countries to maintain mixed feeding (Awumbila, 2003; Davis et al., 2003; Becquet et al., 2005a; Kiarie et al., 2004). In addition, stigma may serve as an additional factor influencing the continuation of mixed feeding and the failure of HIV-positive mothers to adhere to the guidelines to either EBF or ERF. The advice given by counselors to HIV-positive mothers to either EBF or ERF thus entails substantial worry for many mothers, as it simply goes against the local norm of early supplementation of water, juice, herbal mixtures, porridge, and prolonged partial breastfeeding for up to two years (Becquet et al., 2005b; Leshabari et al., 2007). The new WHO guidelines on HIV and infant feeding (WHO, 2009) are now promoting breastfeeding for up to 12 months while the infant receives nevirapine prophylaxis and the huge dilemma and difficulty in encouraging mothers to take on a culturally unacceptable practice such as ERF should now be a bit easier. However, it is still important that during the first 6 months, that mothers practice exclusive breastfeeding.

Similar to this study, other studies have reported cost and socio-economic status of the HIV positive mothers as important barriers to replacement feeding (De Paoli et al., 2004; Kuhn et al., 2004). Across many developing countries, many HIV-positive women do not have the resources to prepare replacement feeds in an acceptable, feasible, affordable, sustainable and safe

manner (WHO, 2000). This study had similar findings. Financial access in terms of affordability has important implications for being able to choose and adhere to appropriate feeding practice. This study also found that all the mothers were confident they would use infant formula if distributed free of charge. This is consistent with a study in Tanzania (De Paoli et al., 2004).

Animal milk and manually expressed heat-treated breast milk was not considered the normal practice or acceptable by participants (that is fathers, grandmothers, and HIV-positive mothers). However, participants argued that, if for instance, expressed heat-treated breast milk is proven safe, it could be used as infant feeding option for HIV-positive mothers within their communities. Wet-nursing and animal milk were not considered viable and safe options, mainly due to the fear of transmission of diseases between the wet-nurse and the infant. This finding is consistent with that of Abiona et al. (2006) and Leshabari et al. (2007) in Nigeria and Tanzania. There is the need to explore with counselors, why the full range of feeding options (that is heat-treated breast milk, animal milk and wet-nursing) are not discussed with mothers. This will also provide an opportunity for discussing the associated misconceptions that are prevalent and associated with these options. Based on this, it does appear that the guidelines need to be refined further to take account of mothers and community fears over these other options.

A key finding of this study is that, families (that is fathers, grandmothers) friends and community members play a leading role in infant feeding practices and in the context of HIV infection through breastfeeding, this often leads to non-compliance with infant feeding guidelines. This demands the need for a multi-dimensional behavioral change strategy involving mothers, family members and significant community members. Health education efforts should focus not only on narrowly promoting EBF and ERF amongst HIV-positive women, but also on changing the knowledge, perception, understanding and attitudes of families and communities and also explicitly deal with the issue of mixed feeding. Studies have shown that socio-cultural factors militating against ERF are amenable to interventions such as maternal and community education and counseling, as well as training of health workers on infant feeding support (Chopra et al., 2005; Piwoz et al., 2005).

It is recommended that the involvement of a male partner in antenatal care be integrated into the public health system. This is important if the disclosure of HIV status is to be promoted since non-disclosure to partners often encourages mixed feeding and poor adherence to replacement feeding. Partners should be counseled along with their wives at the time of testing. Measures to support both husband and wife must be put in place to prevent the negative effects of this on their relationship. The need to provide a country wide programme to promote exclusive breastfeeding in the first 6 months for

all women who are breastfeeding regardless of HIV status.

Interventions designed to promote safer infant feeding among HIV-infected mothers in these settings need to be mindful of the barriers (socio-economic, cultural and familial) that women face. Policy makers should help guide policy that would be safest for the children. To help address these barriers, there is the need for public health and medical communities to play a role by bringing the community up to reaching the safest feeding practices to reduce HIV transmission.

This study has provided information on the factors influencing infant feeding choices among HIV-positive mothers in two urban districts in Eastern and Greater Accra regions. However, caution must be exercised in generalizing these results. Firstly, since a limited number of participants were recruited, the results may not be representative of the two districts as a whole and for the country in general. Also, participants recruited from churches and clinics are likely to differ significantly from those who do not go to church or use the clinic. Ideally only women with infants under 7 months of age should have been chosen to make the period of recall of EBF not too long. Though the study took place in two urban districts, the results are generalisable to other urban districts in Ghana despite the very low number of the study but would not be generalisable to rural districts as the socio-economic status differs a lot. However, these findings could be used as a guide in counseling mothers and informing communities in similar settings. Hence, this is a pilot study investigating the research questions.

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REFERENCES

- Abiona TC, Onayade AA, Ijadunola KT, Obiajunwa PO, Aina OI, Thairu LN (2006). Acceptability, feasibility and affordability of infant feeding options for HIV-infected women: A qualitative study in south-west Nigeria. *Matern. Child. Nutr.*, 2: 135-144.
- Adejuyigbe E, Orji E, Onayade A, Makinde N, Anyabolu H (2008). Infant feeding intentions and practices of HIV-positive mothers in southwestern Nigeria. *J. Hum. Lact.*, 24: 303-310.
- Awumbila M (2003). Social Dynamics and Infant Feeding Practices in Northern Ghana. *Res. Rev.*, 19: 85-98.
- Becquet R, Castetbon K, Viho I, Ekouevi DK, Bequet L, Ehrou B, Dabis F, Leroy V (2005a). Infant feeding practices before implementing alternatives to prolonged breastfeeding to reduce HIV transmission through breast milk in Abidjan, Cote d'Ivoire. *J. Trop. Pediatr.*, 51: 351-355.
- Becquet R, Ekouevi D, Viho I, Sakarovich C, Toure H, Castetbon K, (2005b). Acceptability of Exclusive Breast-Feeding With Early Cessation to Prevent HIV Transmission Through Breast Milk. *J. Acquir. Immune. Defic. Syndr.*, 40: 600-608.
- Chopra M, Doherty T, Jackson D (2005). Preventing HIV transmission to children: Quality of counselling of mothers in South Africa. *Acta. Paediatr.*, 94: 357-363.
- Chopra M, Rollins N (2008). Infant feeding in the time of HIV: rapid assessment of infant feeding policy and programmes in four African countries scaling up prevention of mother to child transmission programmes. *Arch. Dis. Child.*, 93: 288-291.
- Coutsoudis A (2005). Infant feeding dilemmas created by HIV: South African experiences. *Nutr. J.*, 135: 956-999.
- Coutsoudis A, Pillay K, Kuhn L, Spooner E, (2001). Method of feeding and transmission of HIV-1 from mothers to children by 15 months of age: Prospective cohort study from Durban, South Africa. *South Afr. J. AIDS.*, 15: 379-387.
- Davis P, Tagoe-Darko E, Mukuria A (2003). Water, Koko, and Appetite; Complementary Feeding Practices in Kumasi, Ghana. Maryland, ORC Macro Calverton.
- De Cock K, Fowler M, Mercier E, De Vincenzi I, Saba J, Hoff E (2000). Prevention of mother-to child HIV transmission in resource poor countries. *JAMA*, 283: 1175-1185.
- De Paoli MM, Manongi R, Klepp KI (2002). Counsellors' perspectives on antenatal HIV testing and infant feeding dilemmas facing women with HIV in northern Tanzania. *Reprod. Health Matt.*, 10: 144-156.
- De Paoli, Manong R, K-I K (2004). Are infant feeding options that are recommended for mothers with HIV acceptable, feasible, affordable, sustainable and safe? Pregnant women's perspectives in Moshi, Tanzania. *Public Health Nutr.*, 7: 611-619.
- Ghana Statistical Service (1999). Ghana Demographic and Health Survey, 1998. Ghana Statistical Service, Calverton, Maryland: Macro International Inc.
- Iliff PJ, Piwoz EG, Tavengwa NV, Zunguza CD, Marinda ET, Nathoo KJ, (2005). Early exclusive breastfeeding reduces the risk of postnatal HIV-1 transmission and increases HIV-free survival. *AIDS.*, 19: 699-708.
- Kakute, Ngum JM, Pat K, Kathryn AF, Wangnkeh GN, Keming LM, (2005). Cultural Barriers to Exclusive Breastfeeding by Mothers in a Rural Area of Cameroon. *Med. Anthropol.*, 50: 324-328.
- Kiarie JN, Richardson BA, Mbori-Ngacha D, Nduati RW, John-Stewart, GC (2004). Infant feeding practices of women in a perinatal HIV-1 prevention study in Nairobi, Kenya. *J. Acquir. Immune Defic. Syndr.*, 35: 75-81.
- Koniz-Booher P, Burkhalter B, A D W (2004). HIV and infant feeding: a compilation of programmatic evidence. Centre for Communication Programmes. Bethesda, Maryland, University Research Company. Quality Assurance Project, Jul. [116] p. (USAID Grant No. GPH-C-00-02-00004-00).
- Kuhn Mathews C, Fransman D, Dikweni LG, Hussey G (1999). Child feeding practices of HIV-positive mothers in Cape Town, South

- Africa. *AIDS.*, 13: 144-146.
- Kuhn L, Stein Z, Susser M (2004). Preventing mother-to-child transmission in the new millennium: The challenge of breast feeding. *Paediatr.Perinat. Epidemiol.*, 18: 10-16.
- Leshabari SC, Blystad A, Moland KM (2007). Difficult choices: Infant feeding experiences of HIV-positive mothers in northern Tanzania. *Sahara J.*, 4: 544-555.
- Magoni M, Giuliano M (2005). Authors' response to 'HIV and infant feeding: A complex issue in resource-limited settings' by Becquet and Leroy, to the letter to the editors by Coutoudis et al., and to 'Increased risk of infant HIV infection with early mixed feeding' by Piwoz and Humphrey. *AIDS.*, 19: 1720-1721.
- Matovu Bukonya R, Musoke PM, Kikonyogo F L G (2002). Experience of providing free generic infant formula to mothers in the nevirapine implementation program at Mulago hospital in Kampala, Uganda. *International Conference on AIDS.* Jul 7-12; 14. Abstract no. MoPeE3748.
- NACP (2009). National HIV prevalence and AIDS Estimates Reports 2008-2015. Accra: National AIDS Control Programme, Ghana Health Service, Ministry of Health.
- Njunga J (2008). Infant Feeding Experiences of HIV positive mothers enrolled in Prevention of Mother To Child Transmission (PMTCT) programs. The case for Rural Malawi. Medical School of Densitry.Norway, University of Bergen,Universitetet i Bergen (UiB). <http://hdl.handle.net/1956/2883>
- Piwoz E, Iliff P, Tavengwa N, Gavin L, Marinda E, Lunney KEA (2005). An education and counseling program for preventing breast-feeding-associated HIV transmission in Zimbabwe: Design and impact on maternal knowledge and behaviour. *Nutr. J.*, 135:950-955.
- Talawat S, Dore GJ, Le Coeur S, Lallemand M (2002). Infant feeding practices and attitudes among women with HIV infection in northern Thailand. *AIDS Care*, 14: 625-631.
- Thairu LN, Pelto GH, Rollins NC, Bland RM, Ntshangase N (2005). Sociocultural influences on infant feeding decisions among HIV-infected women in rural Kwa-Zulu Natal, South Africa. *Matern. Child Nutr.*, 1: 2-10.
- WHO (2000). Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality due to infectious diseases in less developed countries pooled analysis. *Lancet.*, 355: 451-455.
- WHO (2007). WHO/UNICEF/UNAIDS/UNFPA- HIV and Infant feeding new evidence and programmematic experience. Report of the technical consultation held on behalf the interagency task team (IATT) on prevention of HIV infections in pregnant women, mothers and their infants. Geneva, Switzerland.
- WHO (2009). Rapid advice: use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants.Geneva, (http://www.who.int/hiv/pub/mtct/rapid_advice_mtct.pdf, accessed 28 December, 2010).