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Determinants Of Early Feeding Practices Among Hiv+ Mothers In Sub- Saharan Africa: A Realist Review

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Determinants of Early Feeding Practices among HIV+ Mothers in Sub-Saharan Africa: A realist review

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ABSTRACT:

INTRODUCTION: Exclusive breastfeeding has been shown to provide many benefits that can be life saving for the infant and mother in low resource settings⁷. Although the potential effects of breastfeeding appear large, exclusive breastfeeding rates remain low in this area of the world, and are even lower among the HIV population⁸⁻¹⁰. It is important to understand what influences HIV + mothers to exclusively breastfeed, as well as formula feed and adhere to ARV (antiretroviral) medication while breast feeding in order to make comprehensive policy recommendations that are as culturally sensitive and practical as possible. The objective of this review is to understand the positive determinants that influence recommended early infant feeding practices such as exclusive breastfeeding and formula feeding among HIV + mothers in SSA and adherence to ARVS when made available.

METHOD: A realist approach was chosen in order to determine what other factors can complement Prevention of Mother to Child Transmission (PMTCT) programs and the 2010 WHO Guidelines on HIV and Infant Feeding upon the decisions HIV + mothers make in regards to infant feeding and how causal mechanisms can be shaped and constrained by social context. The literature search was iterative and ongoing throughout the project. A total of 23 articles were included for further analysis.

PRELIMINARY RESULTS: In terms of using ARV medication while breastfeeding, some determinants include: having self-efficacy, fear of MTCT, and having a good relationship with PMTCT counselors. For exclusively formula feeding, some determinants include: disclosure of status to family and support, being independent/ having flexibility in everyday routine, and being financially stable. For exclusively breast-feeding, some determinants include: fulfilling the role of a good mother, belief in breast milk having nutritious benefits, and making the choice antepartum.

CONCLUSIONS: In many sub-Saharan societies, exclusive breastfeeding is considered by far the best feeding option for HIV + mothers. Strengthening and generalizing promotion of exclusive breastfeeding by first identifying the determinants that help to generate positive adherence at a policy and then community based level should be a major public-health priority both for the infant's HIV-free survival and the mother's welfare.

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INTRODUCTION:

Rationale for review:

In the context of HIV, exclusive breastfeeding while using ARVs would be the most effective in seeing decreased rates of mother to child transmission (MTCT) in Sub Saharan Africa (SSA)¹. The guidelines recommend that mothers known to be HIV infected should be provided with lifelong ARV therapy or antiretroviral prophylaxis interventions². However, regardless of this recommendation, PMTCT programs that offer ARV therapy for the mother and child are still reporting low coverage of treatment¹. For example, the Buesseler and colleagues report on a cross sectional surveillance study that an overall neviraphine coverage estimate of 51 % (n=3196) among 43 randomly selected sites in Cameroon, Cote d'Ivoire, South Africa, and Zambia. Additionally, Buesseler and colleagues reported on a cross sectional study in Cote d'Ivoire in which a survey of maternal infant single dose neviraphine found coverage to be low 24 % (n=570) among 10 randomly selected facilities providing delivery services in Cote d'Ivoire. Most studies related to ARV therapy and breastfeeding are concerned about medication efficacy of vertical transmission rates rather than factors that affect whether or not a mother will adhere to the drug regimen which could make all the difference in understanding how to better communicate safer practices among this population¹.

The WHO Guidelines also recommend that HIV infected mothers can give infant formula milk as a replacement feed to their infants when Acceptable, Feasible, Affordable, Sustainable and Safe (AFASS) conditions are met^{2,3}. Exclusive formula feeding (EFF) does provide a safer mode for feeding in relation to HIV transmission. However, in the Sub-Saharan African context, most living situations do not meet the AFASS conditions, which can lead to higher rates of mortality⁴.

Finally, in the context in which ARVS are not accessible or infant formula is not appropriate, the 2010 WHO Guidelines for HIV and Infant Feeding still recommends that mothers should exclusively breastfeed in the first six months of life and then introduce complementary foods thereafter, and continue breastfeeding the first 12 months of life⁵. The choice of whether to breastfeed while HIV + is controversial as the mothers can still pass the infection down to her infant through this mode of feeding. Despite the high risk of transmission, breastfeeding is still the preferred means of infant feeding in developing countries⁶.

Exclusive breastfeeding (EBF) has been shown to provide benefits to the infant such as a decreased risk in infant mortality, gastrointestinal infections, and respiratory infections; an increase in intellectual development; and benefits to the mother a decreased risk in fertility return, postpartum hemorrhage, and breast cancer; and an increase in bone health⁷.

The Setty and colleagues reported on a prospective observational study conducted in Bangladesh that found infants who received partial or no breastfeeding were more than twice as likely to die before age one than infants who were exclusively breastfed for the first four months of life. Additionally, Setty and colleagues report on a study conducted in Brazil in which infants who were partially breastfed and those who were not breastfed had

a higher risk of developing pneumonia than for infants who were exclusively breastfed. Finally, Setty and colleagues report on one large study which found a reduced risk of breast cancer averaging 14% among women who ever breastfed compared with women who never breastfed.

Although the potential effects of breastfeeding appear large, breastfeeding rates are low, and are even lower among the HIV population in low resource settings⁸⁻¹⁰.

For example, in Malawi, it is estimated that the median duration of exclusive breastfeeding is 3.7 months. In some parts of Malawi, rates are as low as 19% at one month, and less than 5% at six months. This is true regardless of whether the mother is HIV-positive or HIV-negative⁸. Nor and colleagues report on several studies conducted to determine EBF rates in low resource settings which are described as following. A secondary data analysis of Demographic and Health Survey of 2482 children in Bangladesh shows a 42.5% prevalence of EBF under 6 months. In Uganda, a dietary recall since birth have shown an EBF rate of only 7% by 3 months in spite of a strong breastfeeding culture. Similar trend has been documented in South Africa, where in 2009 a United Nations Children's Fund (UNICEF) report on the state of world's children found an EBF rate under 6 months of only 7% despite the fact that breastfeeding is the traditional feeding mode with majority (88%) of mothers initiating breastfeeding soon after birth.

When creating policies and interventions geared towards sensitive and stigmatizing topics such as HIV, it is important to not just assume that having knowledge of HIV transmission, the WHO Guidelines, or access to certain resources such as infant formula or ARVS will generate adherence for the most appropriate infant feeding type. Decisions can be more heavily impacted by the socio-cultural beliefs and practices of the community which can sometimes act as a barrier towards choosing a mode of infant feeding that is the most beneficial for the mother and child for their situation of living.

For example, mixed feeding is very commonly practiced in SSA in which regular foods and other liquids are introduced to the infants before it is an appropriate time to start weaning along with either breast milk or infant formula^{3, 4, 11}. Mothers are pressured from older family members and friends to follow this traditional norm^{3, 4, 11}. In places where communal living, respecting elders, and abiding to tradition is key to survival, young mothers face pressures between staying in good graces with the greater part of society and doing what is best for the wellbeing of the infant and herself^{3, 4, 11}. This unfortunately, can cause digestive complications and weaken the child's immune system, which can increase the risk of transmission for HIV exposed infants^{3, 4, 11}.

Understanding and then optimizing upon factors that influence women to commit to feeding their infant as safely and feasibly as they possibly can despite social pressures can severely impact the effectiveness of policy recommendations and interventions by first catering to the context that these vulnerable populations are living in.

Objectives/Focus of Review:

The objective of this review is to understand the positive determinants that influence adoption of recommended early infant feeding practices such as exclusive breastfeeding and formula feeding among HIV + mothers in SSA and adherence to ARVS when made available.

METHODS:

Rationale for using realist synthesis:

The realist research question answers the question “What works for whom under what circumstances, how, and why”¹². Realist inquiry is based on a realist philosophy of science and considers the interaction between context, mechanism, and outcome. These types of syntheses address social realities that cannot be measured directly, but can be known indirectly¹². This idea can relay back to the very present social barriers HIV + mothers in SSA face when having to decide how to best feed their infants. Even though, these obstacles are not strongly addressed in policy, they can still be identified through the stories women tell through observational and qualitative studies.

Also, these syntheses can evaluate social programs, such as the PMTCT programs that implement WHO guideline policies into their interventions. These types of programs can benefit from the findings of realist reviews by presenting their information, resources, and opportunities in a way that best matches an individual’s social context so that the individual is better equipped to handle whatever barriers there may be¹².

Finally, to understand the relationship between context and outcome, realist reviews use the concept of mechanisms, or social structures which operate in particular contexts to generate outcomes of interest¹².

In the context of early infant feeding and an HIV + status, it is hoped that mothers in SSA who have information on recommendations from the 2010 WHO Guidelines on early infant feeding and access to ARVS or infant formula will adopt the optimum feeding method for their infant. If the knowledge of the guidelines can then be translated into concrete action or changes in attitude (mechanisms), in theory, one would expect to see ideal infant health outcomes. However, in reality, there are many other factors that a mother considers when deciding the safest infant feeding mode for her infant based on her situation, regardless of having or not having knowledge or other resources. Chart 1 of the appendix demonstrates what outcomes are to be expected based on knowledge (context) and utilization of resources (mechanism). This review is not only aimed to test out this theory but to then understand what determinants are most effective in relation to adherence of the WHO guideline recommendations in SSA in hopes that these findings can then be optimized and translated into policy that may reach vulnerable populations in other parts of the world. Conclusions drawn from this review can hopefully influence future WHO guidelines to consider cultural factors when giving out recommendations on infant feeding in the context of HIV.

A realist approach was chosen in order to understand how PMTCT programs and the WHO Guidelines can generate outcomes through HIV+ mothers deciding which infant feeding

practices fits their particular lifestyle and how causal mechanisms are shaped and constrained by social context.

Scope of the literature:

A review of the 2010 WHO Guidelines was first conducted in order to get a scope of what the infant feeding recommendations were for HIV + women are in different contexts. The guidelines were then used to build a Context-Mechanism-Outcome (CMO) model framework that would theoretically predict ideal mechanisms and outcomes based on those different contexts.

Search Process:

The literature search was iterative and ongoing throughout the project. An initial search was conducted of various academic databases such as Ovid Medline, Embase, and Global Health. Search terms included: Breastfeeding, Bottle Feeding, Infant Formula, HIV/HIV infections, and Africa/Africa South of the Sahara. Searches were also limited to articles written and English and published within the past five years. Iterative searches were carried out at a later time to find additional articles. As the review progressed, it became apparent that my initial search was not capturing the second aspect of my desired outcomes (determinants) or articles related to antiretroviral adherence while breastfeeding. Additional terms included this time around were Sociological Factors/Age Factors/Risk Factors/Sex Factors, Antiretroviral Therapy, and Highly Active/Anti-HIV Agents/antiretroviral agents that were added to the initial search terms. Three different searches were conducted based on infant feeding type. For example, for exclusive breastfeeding the following terms were used in various combinations: Breastfeeding, HIV/HIV infections, Africa/Africa South of the Sahara and Sociological Factors/Age Factors/Risk Factors/Sex Factors. For exclusive formula feeding, the terms bottle feeding and infant formula replaced breastfeeding. For adhering to ARVS during breastfeeding, the terms Antiretroviral Therapy, and Highly Active/Anti-HIV Agents/antiretroviral agents were added to the exclusive breastfeeding search.

Selection and Appraisal of Documents:

Titles and abstracts were analyzed to ascertain if they met the following criteria:

1. Studies conducted in SSA
2. Study populations including HIV+ mothers with infants
3. Study designs that are either of mixed methods or qualitative
 - a. The realist approach offers the potential for insight that go beyond the narrowly experimental paradigm of the randomized control trial which is why they were excluded¹². Findings from this review are to reflect practical changes that can be made in an individual's everyday life; not in a temporary controlled environment.
4. Outcomes include determinants of infant feeding types
5. Infant feeding types include: Exclusive breastfeed, Breastfeeding while using ARVs, and Exclusive Formula Feeding

Data extraction:

Demographical information about the study population and details related to how the study was conducted were collected. In addition, determinants of why these feeding types were chosen were also collected. Based on these outcomes, general themes were created based on similar findings among the included articles.

RESULTS:

Document of flow diagram:

Figure 2 in the appendix shows a flow diagram illustrating search process and article disposition. 171 of the articles from the initial search were then further screened to analyze full text references that brought the final count of my initial search to 19 articles.

Commentary pieces were also included as contextual supportive information. 460 articles were collected from the iterative searches. The majority of the articles were able to be discarded as they many of them turned out to be duplicate articles that had been discarded previously from the initial search. Two additional articles were added at the completion of the iterative searches. A total of 21 articles were left for further analysis.

Document of characteristics: Demographic and Methodological characteristics for the inclusive studies are organized via Tables 1 and 2 of the appendix.

This review encompasses 22 articles with a study population of around 1500 HIV+ mothers total from 10 countries in SSA: Burkina Faso, Ethiopia, Ivory Coast, Nigeria, Zambia, Tanzania, South Africa, Democratic Republic of Congo (DRC), Malawi, and Uganda. The majority of the studies were conducted in South Africa (n=7). Ages of these mothers ranged from 15- 40 years of age. Studies were conducted between 2002 and 2013. Study designs were a mix of qualitative and mixed methods with the majority of the studies as qualitative (n=17). Thirteen of the studies observed PMTCT counseling services being offered to the study participants.

Main Findings: Determinants of infant feeding practices by infant feeding type are described in Tables 3, 4, and 5 in the appendix and below.

ANTIRETROVIRAL THERAPY WHILE BREASTFEEDING:

Key determinants of using ARTs while breastfeeding included: self-efficacy, desire to avoid MTCT, having a good relationship with PMTCT counselors, disclosing status to family members and being able to gain their support, being able to prolong life, and the PMTCT programs providing free treatment

Self-Efficacy:

A woman's ability to adhere to medication amongst stigmatization was influenced by wanting to keep herself and her infant as healthy as possible. Having a strong and independent mind set to do what's right in the midst of objectification played as a strong factor into taking prescribed medications at the appropriate times and returning for refills.

One woman explained her commitment to adhere to the medication regimen in the Buessler et al 2014 article: "I took the medicine in the morning at eight o'clock and also in the evening at eight o'clock. I never forget, because I am ill. I always ask someone with a watch if it is eight o'clock. My day to die has not yet come. I want to live a long life to care for my children"¹.

According to Madiba, S. et al., 2013, most women experienced PMTCT positively, and the desire to protect their babies from HIV infection influenced their participation. A quote reads, "When I was taking treatment, I was thinking about the safety of the baby and also my wellbeing"¹³.

Fear of Transmission:

According to Buessler, H. M. et al., 2014, women are strongly motivated to adhere to prophylaxis to protect their unborn baby. As one woman explained, "I was scared the baby would become HIV-positive, so I did every- thing [the midwives] told me to do"¹.

Good relationship with PMTCT counselors:

According to Buessler, H. M. et al., 2014, women trusted the advice of the midwives, who offer posttest encouragement and assistance, and assure the women that medications exist to prevent transmission to their babies. One quote reads, "Really, the only thing you need to do [to give birth to a healthy baby] is to follow the advice of the midwives"¹.

Disclosure of status/Support from Partners:

According to Madiba, S. et al., 2013, those who disclosed to family members did so for the purpose of receiving support to adhere to PMTCT. A quote reads, "Only three people know my HIV status, which is my two aunts because when I started with ART one of them was my treatment buddy so that she can support me with taking of treatment"¹³.

Prolong life:

According to Ngarina, M. et al., 2014, some of the participants were very positive towards the idea of taking drugs for life after being diagnosed with HIV during pregnancy. They all gave the same reason that this will help them have a better and longer life enabling them to raise their children for a much longer. One quote reads, ""I will take medicine for life and I will adhere to all instructions they give and I will take them all the time to protect myself so that I live longer and take care my children time before they die"¹⁴.

Program providing Free Medication:

Women reported that without free medications, they are likely to struggle to adhere to prophylaxis. According to Buessler, H. M. et al., 2014 "the midwives consoled me and told me the medicines were free, so I felt better after that"¹.

EXCLUSIVE FORMULA FEEDING:

For exclusively formula feeding, common determinants include: fear of MTCT, disclosure of status to family and support, having a good relationship with PMTCT counselors, being independent/ having flexibility in everyday routine, being financially stable, and having self-efficacy.

Fear of Transmission to Infants:

According to Cames, C. et al., 2010, mothers did not want to take any risks of infecting the infant, defined as 'the top priority', the social risk was pushed to the background. One mother says, 'As for me, I give the baby formula because if he didn't get the disease during the pregnancy, he can only get it when he grows up [infection at adulthood]. It won't be me, his mother, who will be responsible for his infection'¹⁵.

Disclosure of status to family/support:

According to Cames, C. et al., 2010, the husband was an actor, even leader, in not only developing strategies to resist the family circle but also sometimes in managing infant feeding. One mother says, "I had no problem during formula feeding because before I gave birth, my husband and I had intended to give the baby formula"¹⁵.

Good relationship with PMTCT counselors:

According to Madiba, S. et al., 2013, most women perceived the counseling they received as good and reported that it made it easy for them to deal with their HIV status. A quote reads, "I gave my baby only bottle-feeding; I was helped by the counseling that was provided to us". One mother says, 'As for me, I give the baby formula because if he didn't get the disease during the pregnancy, he can only get it when he grows up [infection at adulthood]. It won't be me, his mother, who will be responsible for his infection'¹³.

Having independence/flexibility in everyday routine:

According to Leshabari, S. C. et al., 2007, the majority of the formula feeding mothers was living alone or in a nuclear family and was not under the daily control of their mothers-in-law¹⁶.

Financial stability/Program providing Free Formula:

According to Zulliger, R. et al., 2013, women expressed concern about the end of provision of free formula. They felt that formula allowed them to provide the best care for their children and to save their money for other expenses¹⁷.

Self-Efficacy:

According to Cames, C. et al., 2010, “self-confidence was reinforced by practicing a feeding method that had no transmission risk and was viewed as adequate to satisfy the infant’s nutritional needs”. Their high level of self-efficacy allowed them to see the consequences of their choice not as problems but rather as new stages that they must learn to surmount. One mother tells, “...when talking about difficulties, I especially want to talk about the fatigue, but now it’s OK”¹⁵.

EXCLUSIVE BREASTFEEDING:

For exclusively breast feeding, common determinants include: it was the cultural norm and role of the mother, having a good relationship with PMTCT counselors, belief in breast milk having nutritious benefits, making the choice antepartum, and having self-efficacy.

Cultural Norm/Role of Mother:

According to Traore, A. T. et al., 2009 for the women, breastfeeding illustrates the concrete dimensions of maternity and constitutes one of the means to assume their role as mother¹⁸.

Good relationship with PMTCT counselors:

According to Cames, C. et al., 2010, breastfeeding mothers particularly valorized the knowledge they acquired about breastfeeding techniques and considered themselves ‘informed’ compared with other mothers in their situation. One mother says, ‘As for me I thought that you simply breastfed the baby; I didn’t know there was a way to breastfeed. You have to make sure the breast has no wounds that can transmit the disease to the baby’¹⁵.

Nutritious Benefits/Protecting Child from Infectious Diseases:

According to Maman, S. et al., 2012, a motivating factor for continuing exclusive breastfeeding was the belief that breast milk provided essential protein for the infant’s health. Women often mentioned the fact that breastfeeding was “natural” and to deny their child of breast milk was too difficult¹⁹.

Choice made antepartum:

According to Lawani, L. O. et al., 2014, all the mothers who practiced EBF made an informed infant feeding choice antepartum. This was made jointly by the partners in 61.1% of cases, indicating some level of male involvement/participation in PMTCT interventions, which is the recommended standard of care, especially in enhancing adherence to infant feeding choice and other PMTCT interventions¹¹.

Self-Efficacy:

According to Ostergaard, L. R. et al., 2010, a key factor in successful EBF is a feeling of empowerment within the woman, which allows her to negotiate the conflicting expectations of her kin and to navigate society's expectations of how she should behave as a mother. Only women with determination and social power can overcome this conflict. One woman states, "Sometimes my relatives and my mother were forcing me to start giving the child some food or water but I told them that I will follow what I have been told at the hospital"²⁰.

DISCUSSION:

Summary of Findings:

Upon completion of this realist review determinants for early infant feeding choices decided upon by HIV + mothers in SSA were identified.

Women reported high levels of adherence to during pregnancy and following delivery. Women receiving care from health centers report they are able to adhere to prophylaxis regimens. While stigma around using HIV treatment will always serve as an obstacle, women showed commitment to doing all they could to protect their infants from MTCT. The availability of free ARVs is also critical. Without free medications, significant more women are likely to struggle to adhere to prophylaxis where relatively few barriers were otherwise reported. Studies also found that women who disclosed to husbands or steady cohabiting partners were supported to adhere to infant feeding, as well as the baby's ART medication. Finally, they were simply of the opinion that they needed to prolong their lives so that they could care for their young ones.

FF mothers showed to be more financially stable than breastfeeding mothers. They succeeded without major problems in justifying the use of expensive infant food with family and neighbors. Although their socio-economic conditions were better suited to cope with social pressure and replacement-feeding difficulties, ultimately, mothers who maintained their choice of FF were those who showed high levels of self-efficacy in the difficult process of protecting their infant from HIV infection and facing adverse situations. Mothers and infants also benefited from a sustained and excellent support and a care package within the health clinics.

Breastfeeding is imbued with meaning beyond the purely nutritional aspects and the physical feeding of a baby. The meaning attached to the feeding methods is embedded in concepts and norms of breastfeeding, procreation and motherhood. The study findings strongly demonstrate the power of breastfeeding as a culturally anchored practice and as a moral commitment on the part of the mother. Therefore, the issue doesn't necessarily lie in convincing these mothers to breastfeed, but to do it exclusively when access to infant formula and ARVs are not available.

The long-term benefits of any PMTC program in low-income countries depend on its capability to support women in practicing EBF.

The social pressures to mix feed or early wean from older relatives will always be there as it serves as a cultural tradition in many SSA countries. However, mothers are rather determined to do what's best for their babies if given the right amount of support. Effective PMTCT counseling is a required social capital to actually practice EBF.

Limitations:

Limitations of the studies were that women were recruited within the framework of a PMTCT trial rather than a 'routine' context. It is likely that women who did not wish to participate experienced even greater difficulties with their feeding choice than those who consented.

Also, since women were recruited through clinic support groups, their responses may be skewed toward positive experiences with the health care system and a stronger biomedical orientation.

Social desirability bias may have influenced some women's responses to questions about adherence. It is possible women perceived the interviewer to be closely linked to clinic staff, thereby limiting their inclination to be critical of the care they received.

The sample sizes were small, and the accounts presented here do not reflect the experiences of all HIV-positive mothers. These women may be different from other women living with HIV as a high proportion had disclosed their HIV status and had a socio-economic situation that enabled many to purchase formula milk and to remain at home with their infants during the first few months of life.

In terms of the articles related to ARV medication adherence, the validity of self-reports is put into question, as the studies did not have the capacity to objectively examine women's reported prophylaxis adherence.

Finally, since mixed feeding is such a huge cultural norm in this part of the world, the biggest limitation was finding articles that demonstrated success rates of EBF for at least 6 months.

Comparison with existing literature:

A meta-synthesis entitled "Commonalities and differences in infant feeding attitudes and practices in the context of HIV in Sub-Saharan Africa" by Tuthill, E. et al., 2014 was found to have a similar approach as my realist review. The aim of the meta-synthesis was to identify overarching themes, commonalities, and differences in infant feeding choices among qualitative studies with HIV+ mothers in SSA. The study's findings addressed the influences on EBF and EFF, the role of family and healthcare providers, and the identity as wife and mother in the context of infant feeding²¹. While this study looks at overall experiences of HIV + mothers in SSA, my realist synthesis differs to focus on findings of determinants that positively influence mothers to decide on the most appropriate infant feeding choice specific to their situation. My review also includes mixed methods studies rather than just qualitative studies. Finally, I also include experiences of women who adhere to ARV

medication while breastfeeding as well to include another cohort of HIV+ women with other distinct set of experiences.

POLICY IMPLICATIONS:

Most potential barriers to ARV adherence were overcome by women's motivation to protect their infant's health couple with the availability of free ARVs. Strong ties to the public health care system and high quality antenatal care (ANC) and PMTCT services also facilitate adherence to prophylaxis. Due to these findings, more evidence-based research should be conducted on where having support from both health clinics and family members makes a difference in using ARVs in addition to just having access to them. Although the counseling sessions in the PMTCT program are focused on the woman, the raising of a child in the African context is family oriented which has significant implications for the PMTCT program. It is essential that the PMTCT program is refocused to include community-based interventions that would educate male partners, family members and the community about infant feeding in the context of HIV infection to further reduce stigma.

This kind of research can then influence policy change to also address the social and cultural struggles women face in taking ARVs so they can potentially overcome them rather than just recommending that they take it based on availability.

Formula feeding seemed to be acceptable and feasible for some women in particularly favorable circumstances, when formula was sustainably provided for free. The WHO Guidelines give extensive provisions already for formula feeding. However, despite AFASS conditions, studies are showing an increase in women choosing to introduce formula to their infants even at the expense of mixed feeding^{3, 6, 22, 27, 31, 34, 36, 43, 44, 48}. PMTCT services need to either to provide free formula for the first six months of birth in addition to governments providing clean water systems to sustain appropriate preparedness of delivering formula to infants or both policy and PMTCT services need to place more emphasis on the consequences of mixed feeding and that formula should only be introduced if efforts are exclusive for the full six months. The health care workers play a key role in providing correct information on PMTCT and supporting women's infant feeding choices to adhere to guidelines of exclusive infant feeding.

EBF counseling guidelines need to be developed through the strategy of better understanding of HIV-positive mothers' infant feeding experience, which takes into account the complexity of their socio-cultural context.

Counseling services must therefore go to a greater extent to recognize the cultural implications of breastfeeding, and consider each woman's life situation. For example, guidelines should have counselors encouraging expecting mothers to make the decision to EBF prior to delivery and to also transfer their decision to significant family members such as the husband and grandmother. This will hopefully ease social pressure or at the most

make mothers more confident in their informed choice as to stand up to those social pressures.

In many sub-Saharan societies, exclusive breastfeeding is considered by far the best feeding option for HIV positive mothers, but is challenged by low acceptability and feasibility. Strengthening and generalizing promotion of exclusive breastfeeding should be a major public-health priority both for the infant's HIV-free survival and the mother's welfare while providing health benefits to all infants. This review indicates that investing in better relationships among PMTCT counselors, HIV + mothers, and close family members is likely to help improving EBF rates in the context of HIV in SSA. Ways in which this can be achieved is to further support this already instilled notion that breastfeeding is one of the most natural and rewarding events to be shared among mother and child regardless of HIV status. Breast milk has nutritious benefits that cannot be found in formula milk and is protective against infant mortality whereas contracting HIV is not necessarily a guaranteed death sentence. EBF is the most feasible feeding option for mothers in SSA and other investments with money that may have been intended for formula feeding should be emphasized. Finally, mothers need support in making the choice antepartum as to be more self-efficacious in resisting from outside pressures to mix feed or wean early. Specific tools and activities on how to carry out these ideas should be provided to PMTCT programs through agencies such as the WHO and should be included in their future policy recommendations to illustrate a more comprehensive scenario of what a mother living with HIV in a low resource setting has to consider when choosing the most appropriate infant feeding choice for her infant.

REFERENCES

1. Buessler HM, Kone A, Robinson J, Bakor A, Senturia K. Breastfeeding: the hidden barrier in Cote d'Ivoire's quest to eliminate mother-to-child transmission of HIV. *J Int AIDS Soc.* 2014; 17:18853.
2. Matovu JN, Onyango-Makumbi C, Namuli PE, Tanga EO, Kagawa MN, Nalwadda GK, et al. WHO 2010 infant feeding guidelines in resource-limited settings: attitudes of human immunodeficiency virus-infected women and other role players in Kampala, Uganda. *SAJCN South African Journal of Clinical Nutrition.* 2014; 27:63-8.
3. Yetayesh M, Jemal H. Infant feeding practice of HIV positive mothers and its determinants in selected health institutions of Addis Ababa, Ethiopia. *Ethiopian Journal of Health Development.* 2009; 23:107-14.
4. Maru S, Datong P, Selleng D, Mang E, Inyang B, Ajene A, et al. Social determinants of mixed feeding behavior among HIV-infected mothers in Jos, Nigeria. *AIDS Care.* 2009; 21:1114-23.
5. Eamer GG, Randall GE. Barriers to implementing WHO's exclusive breastfeeding policy for women living with HIV in sub-Saharan Africa: an exploration of ideas, interests and institutions. *Int J Health Plann Manage.* 2013; 28:257-68.
6. Koricho AT, Moland KM, Blystad A. Poisonous milk and sinful mothers: the changing meaning of breastfeeding in the wake of the HIV epidemic in Addis Ababa, Ethiopia. *International Breastfeeding Journal.* 2010; 5.
7. Setty V. Better breastfeeding, healthier lives. *Population Reports.* 2006; 33.
8. Kafulafula UK, Hutchinson MK, Gennaro S, Guttmacher S, Chirwa E. Practice environment related barriers to exclusive breastfeeding among HIV-positive mothers in Blantyre, Malawi. *Health.* 2013; 5:1412-21.
9. Medina M, Jemal H. Assessment of the prevalence and factors influencing adherence to exclusive breast feeding among HIV positive mothers in selected health institution of Addis Ababa, Ethiopia. *Ethiopian Journal of Health Development.* 2012; 26:169-75.
10. Nor B, Ahlberg BM, Doherty T, Zembe Y, Jackson D, Ekstrom EC, et al. Mother's perceptions and experiences of infant feeding within a community-based peer counselling intervention in South Africa. *Matern Child Nutr.* 2012; 8:448-58.
11. Lawani LO, Onyebuchi AK, Iyoke CA, Onoh RC, Nkwo PO. The challenges of adherence to infant feeding choices in prevention of mother-to-child transmission of HIV infections in South East Nigeria. *Patient Preference and Adherence.* 2014; 8:377-81.
12. Wong G, Greenhalgh T, Westhorp G, Buckingham J, Pawson R. RAMESES publication standards: realist syntheses. *BMC medicine.* 2013; 11:21.
13. Madiba S, Letsoalo R. HIV disclosure to partners and family among women enrolled in prevention of mother to child transmission of HIV program: implications for infant feeding in poor resourced communities in South Africa. *Glob J Health Sci.* 2013; 5:1-13.
14. Ngarina M, Tarimo EAM, Naburi H, Kilewo C, Mwanyika-Sando M, Chalamilla G, et al. Women's preferences regarding infant or maternal antiretroviral prophylaxis for prevention of mother-to-child transmission of HIV during breastfeeding and their views on option B+ in Dar es Salaam, Tanzania. *PLoS ONE.* 2014; 9.
15. Cames C, Saher A, Ayassou KA, Cournil A, Meda N, Simondon KB. Acceptability and feasibility of infant-feeding options: experiences of HIV-infected mothers in the World

Health Organization Kesho Bora mother-to-child transmission prevention (PMTCT) trial in Burkina Faso. *Matern Child Nutr.* 2010; 6:253-65.

16. Leshabari SC, Blystad A, Moland KM. Difficult choices: infant feeding experiences of HIV-positive mothers in northern Tanzania. *Sahara J.* 2007; 4:544-55.

17. Zulliger R, Abrams EJ, Myer L. Diversity of influences on infant feeding strategies in women living with HIV in Cape Town, South Africa: a mixed methods study. *Trop Med Int Health.* 2013; 18:1547-54.

18. Traore AT, Querre M, Brou H, Leroy V, Desclaux A, Desgrees-du-Lou A. Couples, PMTCT programs and infant feeding decision-making in Ivory Coast. (Special Issue: Women, mothers and HIV care in resource-poor settings.). *Soc Sci Med.* 2009; 69:830-7.

19. Maman S, Cathcart R, Burkhardt G, Omba S, Thompson D, Behets F. The infant feeding choices and experiences of women living with HIV in Kinshasa, Democratic Republic of Congo. *AIDS Care.* 2012; 24:259-65.

20. Ostergaard LR, Bula A. "They call our children "Nevirapine babies?" ": A qualitative study about exclusive breastfeeding among HIV positive mothers in Malawi. *Afr J Reprod Health.* 2010; 14:213-22.

21. Tuthill E, McGrath J, Young S. Commonalities and differences in infant feeding attitudes and practices in the context of HIV in sub-Saharan Africa: a metasynthesis. *AIDS Care.* 2014; 26:214-25.

22. Bii SC, Otieno-Nyunya B, Siika A, Rotich JK. Infant feeding practices among HIV infected women receiving prevention of mother-to-child transmission services at Kitale District Hospital, Kenya. *East Afr Med J.* 2008; 85:156-61.

23. Binagwaho A, Smith Fawzi MC, Drobac P, Franke M, Ivers L, Jim YK, et al. HIV, infant feeding and implementation failure: Advancing policies for women with HIV infection and attaining the Millennium Development Goals. *Bull World Health Organ.* 2009; 87:A-B.

24. Blystad A, Moland KM. Technologies of hope? Motherhood, HIV and infant feeding in Eastern Africa. *Anthropology and Medicine.* 2009; 16:105-18.

25. Brown BJ, Oladokun RE, Osinusi K. Situation analysis of the existing infant feeding pattern at the commencement of the prevention of mother to child transmission (PMTCT) of HIV programme in Ibadan. *Niger J Clin Pract.* 2009; 12:421-8.

26. Chinkonde JR, Hem MH, Sundby J. HIV and infant feeding in Malawi: public health simplicity in complex social and cultural contexts. *BMC Public Health.* 2012; 12:700.

27. Chisenga M, Siame J, Baisley K, Kasonka L, Filteau S. Determinants of infant feeding choices by Zambian mothers: a mixed quantitative and qualitative study. *Matern Child Nutr.* 2011; 7:148-59.

28. Colombini M, Stockl H, Watts C, Zimmerman C, Agamasu E, Mayhew SH. Factors affecting adherence to short-course ARV prophylaxis for preventing mother-to-child transmission of HIV in sub-Saharan Africa: a review and lessons for future elimination. *AIDS Care.* 2014; 26:914-26.

29. Dionisio D. Prevention of mother-to-child HIV transmission in low-income settings: Current situation and future challenges. *Current Women's Health Reviews.* 2012; 8:172-6.

30. Doherty T, Chopra M, Nkonki L, Jackson D, Greiner T. Effect of the HIV epidemic on infant feeding in South Africa: "When they see me coming with the tins they laugh at me". *Bull World Health Organ.* 2006; 84:90-6.

31. Doherty T, Chopra M, Nkonki L, Jackson D, Persson LA. A longitudinal qualitative study of infant-feeding decision making and practices among HIV-positive women in South Africa. *J Nutr.* 2006; 136:2421-6.
32. Gara CP, Pazvakavambwa I, Maponga CC, Gavaza P. An investigation of the factors influencing the choice of infant feeding methods among urban Zimbabwean women in the context of HIV transmission. *Cent Afr J Med.* 2005; 51:1-4.
33. Gewa CA, Oguttu M, Savaglio L. Determinants of early child-feeding practices among HIV-infected and noninfected mothers in rural Kenya. *J Hum Lact.* 2011; 27:239-49.
34. Ijumba P, Doherty T, Jackson D, Tomlinson M, Sanders D, Persson LA. Social circumstances that drive early introduction of formula milk: an exploratory qualitative study in a peri-urban South African community. *Matern Child Nutr.* 2014; 10:102-11.
35. Kuhn L, Aldrovandi GM. Clean water helps but is not enough: challenges for safe replacement feeding of infants exposed to HIV. *J Infect Dis.* 2009; 200:1183-5.
36. Ladzani R, Peltzer K, Mlambo MG, Phaweni K. Infant-feeding practices and associated factors of HIV-positive mothers at Gert Sibande, South Africa. *Acta Paediatr.* 2011; 100:538-42.
37. Lazarus R, Struthers H, Violari A. Promoting safe infant feeding practices - the importance of structural, social and contextual factors in Southern Africa. *J Int AIDS Soc.* 2013; 16:18037.
38. Levy JM, Webb AL, Sellen DW. "On our own, we can't manage": experiences with infant feeding recommendations among Malawian mothers living with HIV. *International Breastfeeding Journal.* 2010; 5.
39. Matovu A, Kirunda B, Rugamba-Kabagambe G, Tumwesigye NM, Nuwaha F. Factors influencing adherence to exclusive breast feeding among HIV positive mothers in Kabarole district, Uganda. *East Afr Med J.* 2008; 85:162-70.
40. Moland KMI, Paoli MMd, Sellen DW, Esterik Pv, Leshabari SC, Blystad A. Breastfeeding and HIV: experiences from a decade of prevention of postnatal HIV transmission in sub-Saharan Africa. *International Breastfeeding Journal.* 2010; 5.
41. Muluye D, Woldeyohannes D, Gizachew M, Tiruneh M. Infant feeding practice and associated factors of HIV positive mothers attending prevention of mother to child transmission and antiretroviral therapy clinics in Gondar Town health institutions, Northwest Ethiopia. *BMC Public Health.* 2012; 12:240.
42. Musoke RN. Challenge of infant feeding choices among HIV infected mothers in Africa. *East Afr Med J.* 2008; 85:153-5.
43. Njom Nlend A, Penda I, Same Ekobo C, Tene G, Tsague L. Is exclusive artificial feeding feasible at 6 months post partum in cameroon urban areas for hiv-exposed infants? *J Trop Pediatr.* 2007; 53:438-9.
44. Oladokun RE, Brown BJ, Osinusi K. Infant-feeding pattern of HIV-positive women in a prevention of mother-to-child transmission (PMTCT) programme. *AIDS Care.* 2010; 22:1108-14.
45. Ramara NS, Maputle MS, Lekhuleni ME. Infant feeding and HIV positive mothers in the Capricorn District of Limpopo province. *Curationis.* 2010; 33:5-16.
46. Ratnaike D. Breastfeeding with HIV. *RCM Midwives.* 2006; 9:422.
47. Sadoh WE, Sadoh AE. Experiences of HIV positive mothers who chose not to breastfeed their babies in Nigeria. *Afr J Reprod Health.* 2009; 13:27-35.

48. Sibeko L, Coutsooudis A, Nzuza S, Gray-Donald K. Mothers' infant feeding experiences: constraints and supports for optimal feeding in an HIV-impacted urban community in South Africa. *Public Health Nutr.* 2009; 12:1983-90.
49. Thairu LN, Pelto GH, Rollins NC, Bland RM, Ntshangase N. Sociocultural influences on infant feeding decisions among HIV-infected women in rural Kwa-Zulu Natal, South Africa. *Matern Child Nutr.* 2005; 1:2-10.

APPENDIX:

**Chart 1.
Context-Mechanism
Outcome Model**

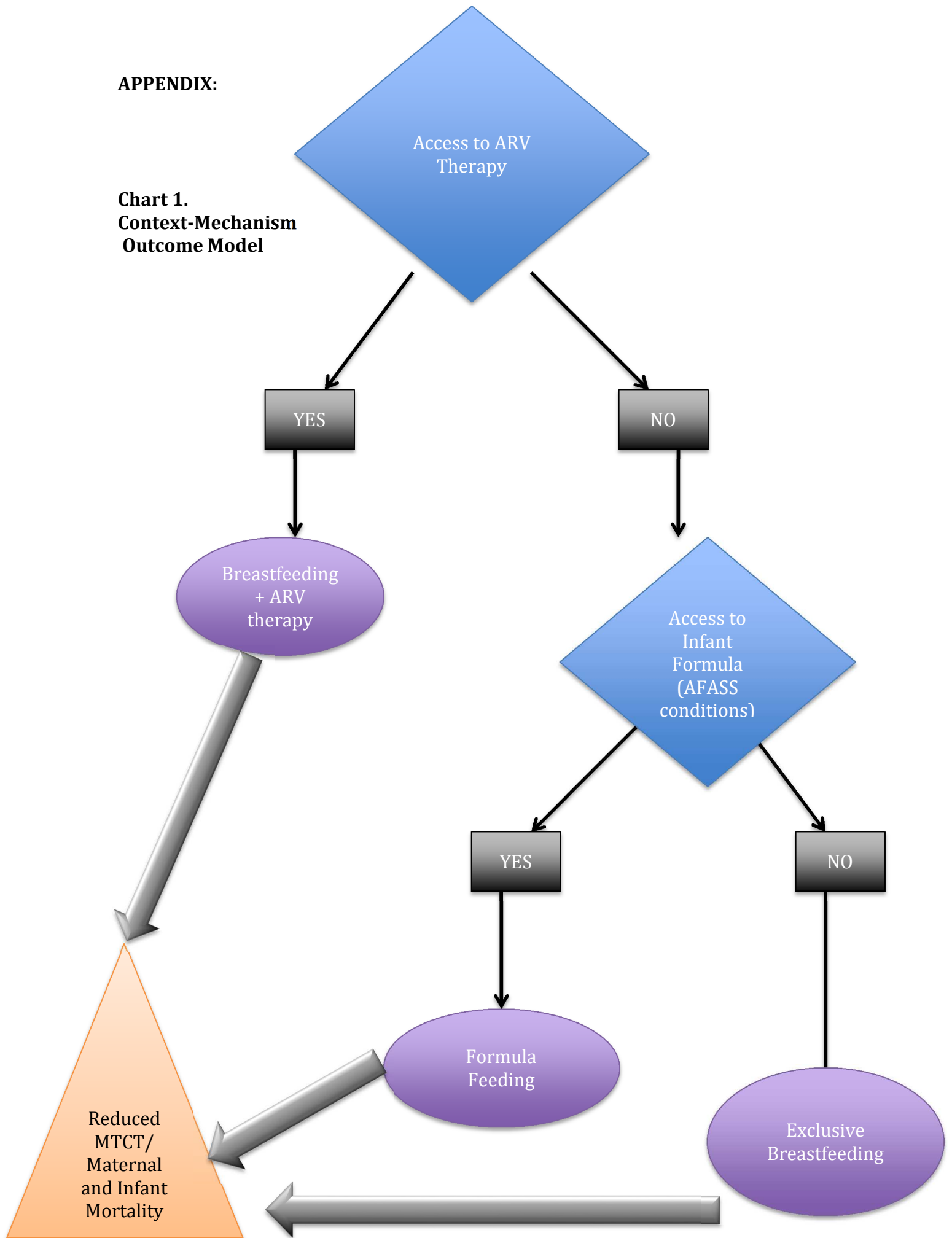


Chart 2. Flow diagram illustrating search process and article disposition

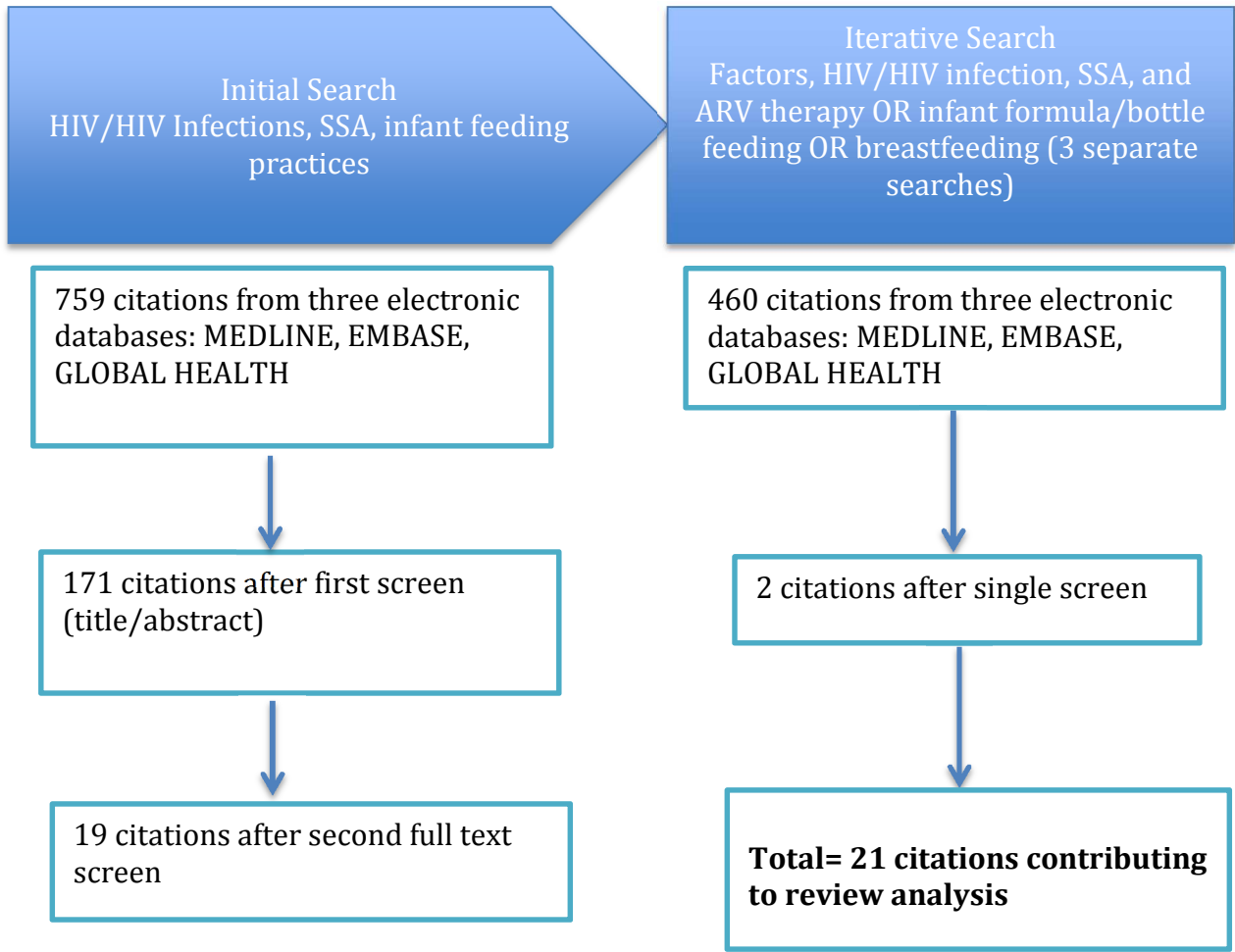


Table 1. Demographic Information from Each Individual Study included in Realist Review

Author and Year	Country	Sample Size	Age of participants	Dates of data collected
Buesseler, H. M. et al., 2014	Ivory Coast	24 HIV-positive women and five health care workers	32	Aug 2009
Cames, C. et al., 2010	Burkina Faso	17 formula-feeding and 19 breastfeeding mothers	Mean age (FF)=29; Mean age (BF)=25.6	April–May 2006
Chinkonde, J. R. et al., 2012	Malawi	20 HIV-positive mothers	Semi urban: 32.2 rural: 28.5	February 2008 and April 2009
Chisenga, M. et al., 2011	Zambia	20 HIV infected mothers; 7-10 HIV uninfected mothers; 7-10 midwives	HIV -= 25.6; HIV += 28.3; HIV-U=26.1	2009
Doherty, T. et al., 2006	South Africa	40 HIV infected mothers	24	February and June 2004
Doherty, T. et al., 2006	South Africa	27 women who had a positive HIV test result	25	May 2004 and January 2005
Kafulafula, U. K. et al., 2013	Malawi	16 HIV-positive mothers and 11 women with unknown HIV status	27.7	16 April 2009 and 8 May 2009
Koricho, A. T. et al., 2010	Ethiopia	Twenty two HIV positive infant feeding women; 10 healthcare professionals	22 to 39	N/A
Lawani, L. O. et al., 2014	Nigeria	Of the 556 parturient infected with HIV/AIDS, those who had difficulty adhering to their preference.	28	August 1, 2012–July 31, 2013

Leshabari, S. C. et al., 2007	Tanzania	20 HIV-positive mothers	20-32	August 2003 and June 2004
Madiba, S. et al., 2013	South Africa	25 post natal HIV positive women	18-40	November 2010 and February 2011
Maman, S. et al., 2011	DRC	Forty in-depth interviews were conducted with HIV + women who were pregnant (16) or who had recently given birth (24)	N/A	July through December, 2006
Matovu, J. N. et al., 2014	Uganda	9 HIV+ pregnant women; 10 HIV + mothers; 10 family members of pregnant women; 2 key informants	At least 18	September-November 2011.
Medina, Mukerem et al., 2012	Ethiopia	10 HIV positive mothers	29.1	January 1 to February 30, 2012
Ngarina, M. et al., 2014	Tanzania	27 women and 31 IDIs	22-37 years	July 2012 and June 2013
Ostergaard, L. R. et al., 2010	Malawi	21 HIV + mothers	18-40	December 2008 to January 2009
Ramara, N. S. et al., 2010	South Africa	10 HIV + mothers	17-36	N/A
Sibeko, L. et al., 2009	South Africa	11 HIV + mothers	25	October 2004 to March 2005
Thairu, L. N. et al., 2005	South Africa	22 HIV + mothers	27.5	June-August 2002
Traore, A. T. et al., 2009	Ivory Coast	20 couples; 16 mothers who interviewed alone	Coupled Females: 23 to 30	N/A

			Coupled Males: 25-49 Single Females: 23-31	
Zulliger, R. et al., 2013	South Africa	203 were postpartum and 207 were pregnant	Pregnant: 28.6; post-partum: 30.0	2011

Table 2. Methodological Characteristics of the Qualitative Studies Included in the Realist Review

Author and Year	Study Design	Data Collection	Data Analysis	PMTCT counseling : Postnatal Care
Buesseler, H. M. et al., 2014	Exploratory, qualitative	Semi structured interviews	Atlas.ti 6.1	Yes
Cames, C. et al., 2010	Qualitative	Six FGDs were conducted, three with formula- feeding and three with breastfeeding mothers.	reading and rereading word- processed texts, computerized coding, synthesizing and grouping sections of text	Yes
Chinkonde, J. R. et al., 2012	Qualitative	In depth Interviews; case studies	Content analysis to find themes	Yes
Chisenga, M. et al., 2011	Mixed Methods	Interviews and FDGs	thematic data analysis	Yes
Doherty, T. et al., 2006	Qualitative Interview study	Interviews; One Focus Group Discussion	Interpretative approach for key categories and recurring themes	Yes
Doherty, T. et al., 2006	Longitudinal, Qualitative Interview Study	Open-ended interviews	Thematic content method	Yes

Kafulafula, U. K. et al., 2013	Exploratory Qualitative	FGDs and in depth interviews	Thematic content analysis	Yes
Koricho, A. T. et al., 2010	Qualitative Interpretive Study	Interviews	Qualitative triangulation methods; themes	Not Specified
Lawani, L. O. et al., 2014	Mixed Methods	Focused individual and group interviews	N/A	Yes
Leshabari, S. C. et al., 2007	Exploratory Descriptive	Observation; Open ended In-depth Interviews	Thematic approach	Yes
Madiba, S. et al., 2013	Qualitative	FGDs	Thematic approach	Yes
Maman, S. et al., 2011	Qualitative study	In-depth Interviews	Themes	Not Specified
Matovu, J. N. et al., 2014	Phenomenological Qualitative	FGDs and interviews	Descriptive, topical and analytical reflection	Yes
Medina, Mukerem et al., 2012	Mixed Methods	In-depth Interviews	Likert's scale to measure attitude towards EBF	Not Specified
Ngarina, M. et al., 2014	Exploratory Qualitative	FGDs and in depth interviews	Thematic content analysis	Yes
Ostergaard, L. R. et al., 2010	Qualitative study	Observation; In-depth Interviews	Thematic approach	Yes
Ramara, N. S. et al., 2010	Phenomenological Qualitative	In-depth Interviews	Themes	Not Specified

Sibeko, L. et al., 2009	Qualitative	In-depth Interviews; observations	Pattons general interview guide (2002)	Not Specified
Thairu, L. N. et al., 2005	Ethnographic, qualitative	Exploratory Interviewing; Ethnographic Interviews	Conversation Analysis	Not Specified
Traore, A. T. et al., 2009	Qualitative	In depth Interviews	Word, Excel	Yes
Zulliger, R. et al., 2013	Mixed Methods	semi-structured, qualitative interviews	themes	Not Specified

Table 3. Determinants of ARV Adherence while Breastfeeding

Study	Themes				
	Self-Efficacy	Protection from Transmission	Role of PMTCT counselors	Disclosure of HIV Status/Support	Treatment Availability
Buesseler, H. M. et al., 2014	"I want to live a long life to care for my children."		"They really followed me well."		"...Told me the medicines were free, so I felt better after that."
Madiba, S. et al., 2013	"Thinking about the safety of the baby and also my wellbeing"	"...Protects the baby when you are breastfeeding"		"...He comforted me on our way home."	
Ngarina, M. et al., 2014		"An opportunity to breastfeed for as long as they wished and still protect the baby"			

Table 4. Determinants of Exclusive Formula Feeding

Study	Themes				
	Disclosure of Status/Support	Protection from Transmission	Role of PMTCT counselors	Independence/Flexibility	Formula Availability
Cames, C. et al., 2010	“My husband gets up at night and prepares the milk and then he feeds the baby”	“The top priority is to give her the formula and nothing will happen to her”	“Discussing it together is a great remedy”	“... I especially want to talk about the fatigue, but now it’s OK”	
Chinkonde, J. R. et al., 2012			“I will never repeat taking the advice from hospital Lightly”.		
Doherty, T. et al., 2006		“...What made my child to feed on this tin is my health condition. That is what is most important.”			
Doherty, T. et al., 2006					“At night, I make it and store it in a flask.”

Koricho, A. T. et al., 2010			"The nurse almost screamed at me saying 'Why are you going to breastfeed your baby? Are you going to give your baby your disease?'"		
Leshabari, S. C. et al., 2007		"It is the only way to prevent transmitting the HIV infection to the baby."			
Ramara, N. S. et al., 2010	"My parents helped me and bought a tin of formula for my child".				
Traore, A. T. et al., 2009	"...We had to encourage each other to get through it."				
Zulliger, R. et al., 2013		"I didn't trust breastfeeding while positive."	"The nurse was open enough to advise me that in whatever I'm doing I shouldn't put myself in a situation that may compromise my baby's health."		"...Formula allowed them to provide the best care for their children and to save their money for other expenses."

Table 5. Determinants of Exclusive Breast Feeding

Study	Themes				
	Self-Efficacy	Role of PMTCT Counselors	Role of Mother	Nutritional Benefits	Choice Antepartum
Chisenga, M. et al., 2011				“Breast milk is the best, nutrients in the breast milk. This is the best for the baby.”	
Doherty, T. et al., 2006				“I like that breast milk is not bought and it has vitamins which are very important in the baby’s body while he is still young”	“... gave mothers information that they could use to explain their behavior to family members...”
Kafulafula, U. K. et al., 2013		By giving me advice, for example, health			

		workers say that eating cassava and soaked rice every morning helps the mother to have adequate milk in her breasts. I think I will try it.			
Lawani, L. O. et al., 2014					“All the mothers who practiced EBF made an informed infant feeding choice antepartum.”
Leshabari, S. C. et al., 2007			“All good mothers breastfeed their babies.”		
Madiba, S. et al., 2013	“After having the baby I came to the clinic so that they could write me a letter that supports that my baby must be exclusively breastfed.”	“PMTCT assisted me to know that it is also important to breastfeed your baby even if you are HIV positive.”			

Maman, S. et al., 2011		“..but he encouraged me to continue breastfeeding, to squeeze the breasts to discharge the milk”	Breastfeeding was “natural”		
Matovu, J. N. et al., 2014			“Breast milk is high-quality nutrition and promotes infant growth”		
Ostergaard, L. R. et al., 2010	“...Empowerment within the woman, which allows her to negotiate the conflicting expectations of her kin and to navigate society’s expectations of how she should behave as a mother.”				

Sibeko, L. et al., 2009	"I am not going to visit my family in the farm until my baby is 6 months, at that time the baby will be eating food."	"They explained that the baby is satisfied with my breast milk. So I continued just breast-feeding..."		"Babies feeding from the breast grow well and look big and healthy"	
Traore, A. T. et al., 2009		"They gave us all the information and advice we needed."	"... Illustrates the concrete dimensions of maternity."	"... The best way to feed their infants because of the nutritive qualities..."	
Thairu, L. N. et al., 2005				"Protects against diseases"	

