Systematic Review

of

Effectiveness of interventions to promote exclusive breastfeeding in women that are HIV (+) on anti-retroviral therapy living in areas that promote exclusive breastfeeding due to limited resources for safe replacement feeding.

Prepared by

The Academy of Nutrition and Dietetics

Purpose

The objective of the systematic review was to evaluate and synthesize the data on effect of breastfeeding promotion interventions on exclusive breastfeeding in women that are HIV (+) on anti-retroviral therapy living in areas that promote exclusive breastfeeding due to limited resources for safe replacement feeding.

Research Question

In HIV+ women on ART living in developing countries, what is the effectiveness of any breast feeding promotion interventions compared to no interventions on initiation of breast feeding and exclusive breast feeding (for 3 months and 6 months)?

Methods

Studies included for this review

During the literature search phase there were no restrictions applied to study designs. Both randomized clinical trials assessing interventions that promoted early initiation and/or exclusive breastfeeding in the HIV/AIDs population as well as other nonrandomized clinical trials and intervention cohorts that provided data on early breastfeeding initiation (within one hour of birth), breastfeeding initiation, and exclusive breastfeeding at any time point were included in this review. Studies not published in English were excluded from the analysis.

Types of Participants

Pre and post gestational HIV (+) women on ARV therapy

Types of Interventions

Group Counseling
Individual Counseling Sessions
Staff Training
Community Support
Work Environment Support
Policy Environment
Prenatal and postnatal education and counseling

Types of Outcomes Measured

The following outcomes in HIV-exposed infants were assessed:

<u>Primary Outcomes</u>

1. Exclusive Breastfeeding (3 months and 6 months)
2. Initiation of Breastfeeding
3. Early Initiation of Breastfeeding (within 1 hour of birth)

Search methods for identification of studies

An intensive electronic search was conducted to answer the proposed questions. The authors of the review followed the search strategy as outlined by the Academy of Nutrition and Dietetics Evidence Analysis methodology (Academy of Nutrition and Dietetics 2012).

Electronic databases: PubMed; EBSCO Search (MEDLINE, CINAHL, Food Science, Sport Discuss, EMBASE, and the EDS databases)

First, the reviewers independently reviewed the list of titles and abstracts and selected those that met inclusion criteria. Next, the authors independently conducted a second round of review where the title and abstracts were further scrutinized. Articles were marked for inclusion or exclusion (along with reason), any differences were resolved by discussion with the third reviewer. The second review results were then categorized based on the following: review articles, qualitative articles, descriptive studies and clinical trial articles that examined the interventions and outcomes of interest. The reference list of review articles were hand searched for articles that met inclusion, then categorized as above. Full texts of studies selected for inclusion were ordered. A final list of included articles was developed after review of all ordered full text articles.
Attachment A provides information on the search strategy and full protocol.

Data extraction and management

Data was extracted using a standardized online data extraction tool. The following data was extracted from each included study:

- Study Design
- Purpose of Study
- Inclusion and Exclusion Criteria

- Country where study was performed
- Blinding
- Funding
- Size of sample population, dropout rate
- Age, ethnicity and gender of sample population
- Interventions studied: pre or post gestational population, group or individual counseling, intervention provider and setting, frequency and duration of intervention
- Outcomes measured: breastfeeding initiation, early breastfeeding initiation (within 1 hr of birth), exclusive breastfeeding with time point
- Quality Criteria Checklist (Risk of Bias): Selection of participants free from bias, study groups comparable, methods of handling withdrawals, blinding, instruments valid and reliable, appropriate statistical analysis, potential bias and limitations.

Assessment of risk of bias in included studies

Risk of bias was assessed according to the guidelines outlined in Cochrane Handbook for randomized control studies (Cochrane Handbook for Systematic Reviews 2011). The Newcastle-Ottawa Scale was used to assess risk of bias for observational studies (Wells 2005). Randomized control study meeting the inclusion criteria were assessed according to the following:

- Sequence generation
- Allocation concealment
- Blinding
- Incomplete outcome data
- Selective outcome reporting
- Other sources of bias

The observational studies meeting the inclusion criteria were assessed according to the following:

- Selection of study groups

- Comparability of groups
- Ascertainment of exposure/outcome

The quality of each observational study was appraised using a "star system" and a scoring algorithm was used to classify the studies as Good, Fair, or Poor quality. Two reviewers independently evaluated the quality of studies and any differences were resolved with a third reviewer or by discussion.

Risk of bias for included studies is presented in **Attachment B**.

Data Analysis

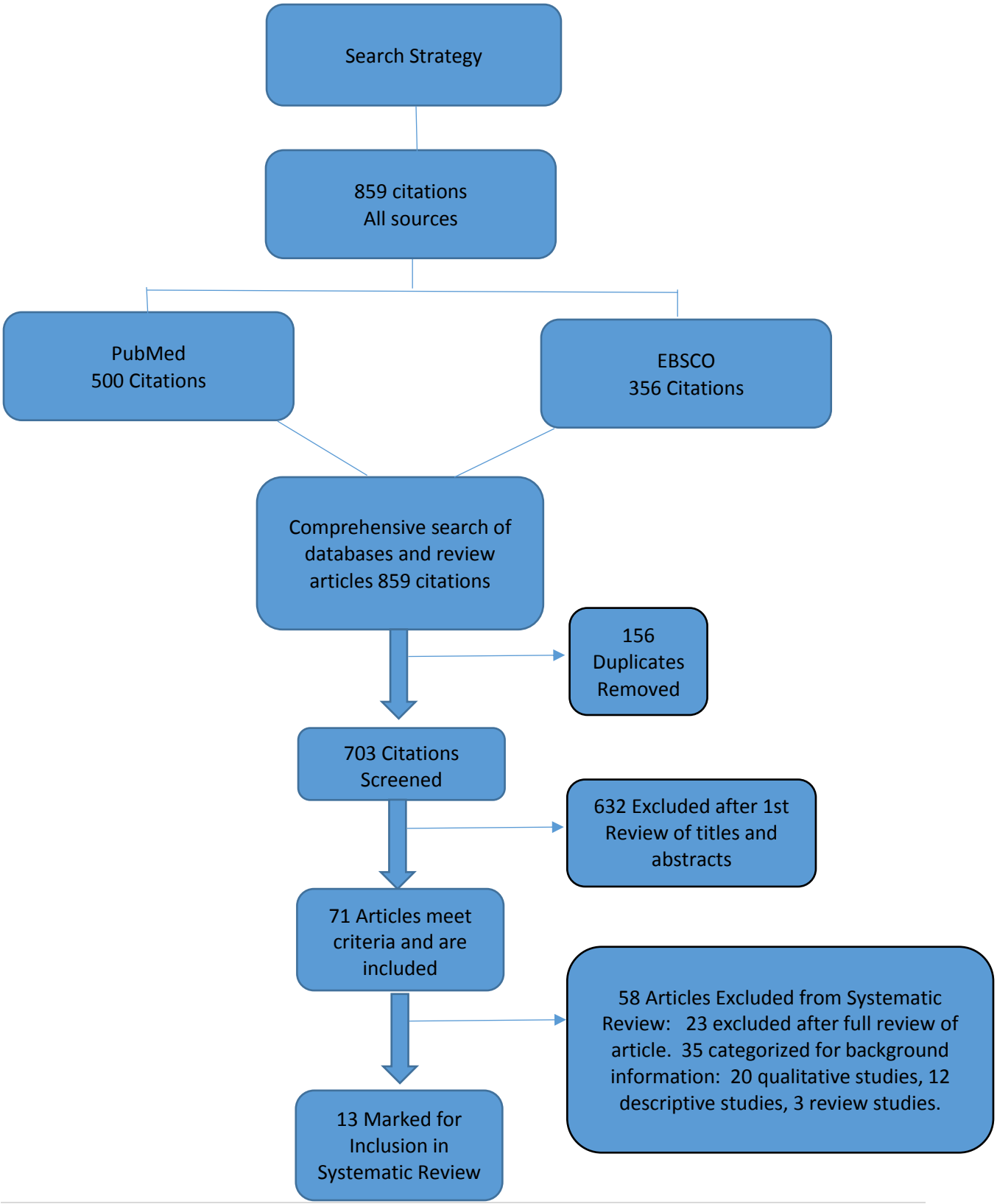
Due to the heterogeneity of the studies in terms of study design, types of interventions, duration of interventions, methods, exposures, and outcomes it was not feasible to conduct a meta-analysis for this systematic review. Due to the same reasons as mentioned before, pooling of data was not possible. With the type of information available for these studies, narrative synthesis seemed the most appropriate method to present the findings. Synthesis focused on describing the intervention, direction of the findings, and overall results.

Results

Initial screening identified 859 citations; of these, 71 potentially relevant articles that met the inclusion and exclusion criteria were identified (Figure 1). After reviewing, 58 articles were excluded from the systematic review for the following reasons (see **Appendix A** for detail explanation of exclusion):

- Review articles
- Data on outcomes of interest was not reported
- Population was not HIV positive
- Impact of intervention was not evaluated
- Information only on intention to breastfeed

Figure 1: Flow chart of the screening process



Characteristics of included studies

Characteristics of the included studies are reported in **Table 1**. Of the13 studies meeting the inclusion criteria, one was a randomized controlled trial (Tomlinson et al 2014), seven cohort studies (Bland et al 2008; Iliff et al 2005; Piwoz et al 2005; Piwoz et al 2007; Read et al 2010; Suryavanshi et al 2003; Thakwalakwa et al 2014), four were cross sectional studies (Bii et al 2008; Matovu et al 2008; Nlend et al 2010; Young et al, 2015), and one pre-post study (Mazia et al 2009). Three studies have been conducted in Zimbabwe, two in South Africa, two in India, and one each in Kenya, Uganda, Malawi, Tanzania, and Cameroon. **Table 1** presents the overall summary of studies stratified by study design.

Outcomes of Interest

Five studies analyzed exclusive breast feeding (EBF) at 6 month's time point (Bii et al 2008; Matovu et al 2008; Piwoz et al 2007; Thakwalakwa et al 2014; Young et al 2015), nine studies analyzed exclusive breast feeding at 3 month time point (Bii et al 2008; Bland et al 2008; Iliff et al 2005; Nlend et al 2010; Piwoz et al 205; Piwoz et al 2007; Read et al 2010; Tomlinson et al 2014; Young et al 2015), four studies analyzed early breast feeding initiation within 1 hour (Matovu et al 2008; Mazia et al 2009; Nlend et al 2010; Tomlinson et al 2014), and six studies analyzed breast feeding initiation (Mazia et al 2009; Nlend et al 2010;Read et al 2010; Suryavanshi et al 2003, Tomlinson et al 2014; Young et al 2015).

Table 2 presents a detailed summary of findings stratified by outcomes.

Exclusive breast feeding (6 month data point)

One cohort study indicated that higher percent of women in the intervention group were exclusively breast feeding compared to the control group (Piwoz et al 2007). A well designed cross sectional study indicated that the odds of exclusively breast feeding were higher in women who attended at least 4 antenatal counseling sessions compared to those who attended less than 4 antenatal counseling sessions (5.95, 95% CI 3.43-10.36) (Matovu et al 2008). This study indicated a dose gradient response – as the number of counseling visits increased, there was an increase in rates of exclusive breastfeeding. The other three studies had no comparison group and hence do not contribute much to the evidence (Bii et al 20008; Thakwalakwa et al 2014; Young et al 2015). (Refer to **Table 2** for detailed summary of findings)

Exclusive breast feeding (3 month data point)

Result from the one randomized study indicated benefit in exclusive breast feeding rates at 3 month's time point (Tomlinson et al 2014). The data from this study is presented in the GRADE profile table. In the intervention group, significantly more women exclusively breast feed (24%) at the three month time point versus only 16% in the control group. The relative risk of EBF in HIV positive women in the intervention group was RR=1.53, 95% CI 1.22-1.94. This study also indicated that there was a 6% relative increase in EBF for every additional visit with the community health worker. (Refer to **Table 2** for detailed summary of findings)

Results from all four cohort studies indicated benefit in EBF rates at 3 month time point from breast feeding promotion interventions and two of them had statistically significant results (Bland et al 2008; Iliff et al 2005, Piwoz et al 2005; Piwoz et all 2007) . These studies also indicated that the frequency of contact was associated with exclusive breast feeding practices and interventions that combined both individualized counseling and group counseling had more impact on EBF. The other three studies had no comparison group and hence do not contribute much to the evidence (Bii et al 2008; Read et al 2010; Young et al 2015). (Refer to **Table 2** for detailed summary of findings)

Early initiation of breast feeding (within 1 hr)

Results from the one randomized controlled study indicated no difference between intervention and control group regarding early breast feeding initiation (within I hour) (Tomlinson et al 2014). Results from the pre post study indicated that breast feeding initiation rate increased from 24% pre-intervention to 33% post-intervention (Mazia et al 2009). Two cross sectional studies indicated 50 -80 percent early breast feeding initiation rates, however, these studies had no comparison/control group (Matovu et al 2008; Nlend et al 2010). (Refer to **Table 2** for detailed summary of findings)

Initiation breast feeding

Results from one randomized controlled study indicated no effect of breast feeding promotion on breast feeding initiation rates (Tomlinson et al 2014). Results from one pre-post study indicated an increase in breast feeding initiation rates post intervention (33% to 74%) (Mazia et al 2009). Other 3 cross sectional studies (Matovu et al 2008; Nlend et al 2010; Read et al 2010) and one cohort study (Suryavanshi et al 2003) conducted in women who were exposed to breast feeding promotion interventions show high benefits of these promotions. The initiation rates range from 53% to 95%, however, none of these studies had a control group or any comparison group. (Refer to **Table 2** for detailed summary of findings)

Grade profiles for recommendations

Data from one randomized controlled trial pertaining to the primary outcomes: Exclusive breast feeding, breast feeding initiation, and breast feeding initiation within 1 hour was used to populate the WHO GRADE profiles.

Refer to detailed GRADE profile tables below:

Question: In countries that promote breastfeeding in HIV (+) women on ARV therapy, what are the effective interventions to support breastfeeding?

Setting: Countries that promote EBF in HIV population

Bibliography: One randomized controlled trial reported primary data with outcomes of interest and was included in grade profile

Quality assessment							№ of patients		Effect		Quality	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	BF promotion	no promotion	Relative (95% CI)	Absolute (95% CI)		
Early initiation within 1 hour (1 RCT)												
Tomlinson 2014	randomized trials	not serious	not serious	serious [1]	not serious	none	561/1629 (34.4%)	607/1865 (32.5%)	**RR 1.06** (0.96 to 1.17)	20 more per 1000 (from 13 fewer to 55 more)	⊕⊕⊕◯ MODERATE	CRITICAL
Exclusive Breast Feeding 3 months (1 RCT)												
Tomlinson 2014	randomized trials	not serious	not serious	not serious	not serious	none	130/405 (32.1%)	101/639 (15.8%)	**RR 1.53** (1.22 to 1.94)	84 more per 1000 (from 35 more to 149 more)	⊕⊕⊕⊕ HIGH	CRITICAL

MD – mean difference, RR – relative risk

1. Indirectness rated as Serious- In the Tomlinson et al, 2014 study the sample population consists of both HIV+ and HIV- women (30% with HIV). Data was not stratified by HIV status for early initiation outcome. (for EBF 3 months the data was stratified by HIV status).

Discussion

This review summarized the evidence of impact of breast feeding promotion on HIV+ women receiving ARV therapy.

Some of the strengths of this review are: an extensive search was conducted to source all studies, regardless of the study design; in-depth study quality assessment for observational studies; and considering study design while interpreting and reporting findings. Even though the search strategy was designed to be as comprehensive as possible, there is always a chance that some studies have been missed. Publication bias can be a serious issue for observational studies and likelihood of negative observational studies being published is definitely lower than a positive study.

The review established that there was only one published randomized controlled trial and majority of the studies were observational in nature. The quality of the evidence reported by the randomized controlled trial was moderate to high quality for outcomes of interest. It clearly indicated that breast feeding promotions help increase the rate of exclusive breast feeding at 3 months and it also demonstrated that for every additional visit (intervention visit) there was a relative increase in exclusive breast feeding.

Finding from the observational studies (specifically cohort studies) supported the results reported by the randomized controlled trials. The results from these studies did indicate that breast feeding promotion had an influence on exclusive breast feeding rates, reduction in post-natal transmission. **Table 3** reports effect direction for individual studies by outcomes. Couple of studies also indicated a dose response gradient e.g. as the number of intervention visits/session increased there was an increase in exclusive breast feeding rates. The quality of the observational studies as assessed by New Castle-Ottawa scale ranges from Poor to Fair. The observational studies included in the systematic review may have been influenced by number of methodological issues. Some of the major limitations influencing the quality were: indirectness (data not primarily collected for this purpose; sample not totally comprised of HIV+ mothers),

bias in sample selection or recall bias (self-reporting of outcomes); and lack of control for confounding variables.

The studies included in the systematic review also emphasized the components that make breast feeding promotions successful. Inclusion of group education along with few individual counseling sessions, addressing infant feeding counseling, involving fathers and family, involving community health workers or trained healthcare workers, and integrated PMTCT programs along with access to anti-retroviral therapy has positive impact on exclusive breast feeding.

Contributions of authors

Lisa Moloney and Deepa Handu wrote the protocol, screened the citations, selected and reviewed the studies for inclusion in this review and grade profile, assessed characteristics and the risk of bias of included studies and wrote the report.

Declaration of interest

none

Table 1. Characteristics of the Studies included in Systematic Review

Author	Country	N	Setting	Intervention summary	Time of intervention	Outcomes	Study Quality
RCT							
Tomlinson 2014	South Africa	1629	Home and Family Environment, Community Environment;	IG: Community Health Workers implemented intervention through structured home visiting program consistent with PMTCT, Integrated Management of Childhood Illness, lactation counselling and newborn care guidelines. Motivational interviewing technique used for breastfeeding counseling. Women in the program received 7 home based visits, 2 during pregnancy, one within 48 h of delivery, during days 3-4 and 10-14, during weeks 3-4 and 7-8. Low birth weight neonates were to receive 2 extra visits within the first week. Intervention provider: Trained community health workers . CG: Community Health Workers provided information and support on accessing social welfare grants and conducted three 3 homebased visits.	Prenatal and postnatal	EBF 3 months; Early Initiation of BF (within 1 hr)	Moderate to High
Cohort studies							
Piwoz 2005	Zimbabwe	8,591	Health Systems and Services, Work setting	IG: The intervention included information on Antenatal education on infant feeding in context of HIV, Information on MTCT including infant feeding was incorporated into Male outreach and education, infant feeding options for HIV positive mothers (integrated into HIV counseling for ZVITAMBO women), and infant feeding options for other mothers. CG: No intervention	Prenatal and Postnatal	EBF 3 months	Selection **** comparability* outcome **
Piwoz 2007	Zimbabwe	437	Health Systems and Services	IG: Intervention: Study nurses provided group talks with antenatal mothers at the ZVITAMBO recruitment sites, with new mothers in postnatal wards during trial recruitment. 2 videos produced and shown during group talks. Two pamphlets produced and distributed. Pamphlets described 4 safe breastfeeding practices which were promoted during	Prenatal and Postnatal	EBF 6 months; EBF 3 months	Selection **** comparability* outcome **

				group sessions. During individual counseling HIV (+) mothers advised about risk, benefits and costs of feeding options. CG: no education visit			
Thakwalakwa 2014	Malawi	248	Health Systems and Services	IG: Mothers were counseled on infant feeding and supported to exclusively breastfeed for the first 6 months and then receive complementary food. CG: no control group	Prenatal and postnatal	EBF 6 months;	Selection *** comparability outcome **
Bland 2008	South Africa	1056	Health Systems and Services	IG: Received antenatal counseling. All women choosing to breastfeeding received up to 3 further antenatal home visit by the counselor to discuss feeding. Within 72 h of delivery all women received one home visit. Mothers initiating breastfeeding received a further 3 home visits in the first 2 weeks and every other week for 6 months after delivery. CG: Did not receive scheduled number of visits.	Prenatal and postnatal	EBF 3 months	Selection *** comparability* outcome **
Iliff 2005	Zimbabwe	2060	Health Systems and Services	IG: Study nurses were trained to counsel HIV-positive women about feeding options, and kitchens were established for teaching replacement feeding. Implemented a program that emphasized EBF for HIV (+) mothers who chose to breastfeed, optimal breastfeeding techniques to avoid cracked nipples, milk stasis an mastitis, the prompt treatment of breast problems. CG: No intervention	Prenatal	EBF 3 months	Selection *** comparability outcome **
Read 2010	India	50	Health Systems and Services	Intervention group: Participants referred to support groups for HIV and treatment centers. Infant feeding counseling based on the WHO/UNAIDS/UNCEF training materials offered to all enrolled women. Infant visits were scheduled at birth (within 24 hrs.), 1 week, 1 month, 2 months, every 2 months between 4 and 12 months of age. (Data collected at visits, does not specify if counselling occurred at postnatal visits) CG: Standard care	Prenatal and immediately after child's birth	EBF 3 months; Initiated BF	Selection **** comparability outcome *
Mazia 2009	South Africa	Pre:114	Health Systems and	Intervention: Sites provided PMTCT services supported by Ministry of health and Social Welfare	Prenatal and Postnatal	Early Initiation	Selection **** comparability

		Post: 136	Services	(MOHSW) and Elizabeth Glaser Pediatric AIDS foundation (EGPAF) in 2006. Post natal care (PNC) was added to clinics and included: immediate care after birth, assessment and examination at least once a day during stay in the facility, assessment, care and counseling at discharge from the facility, postnatal visits (visit at 1 week and 1 visit at 4-6 weeks). CG: Baseline data collection, same subjects served as controls.		of BF (within 1 hr); Initiated BF	outcome **
Suryavanshi 2003	India	101	Health Systems and Services	IG: All women completed antenatal intensive counseling that focused on risks and benefits of feeding choices in the context of HIV and included emphasis on danger of mixed feeding. Some women returned for postnatal counseling. CG: HIV negative women were interviewed but no data was provided for this group.	Prenatal	Initiated BF	Selection *** comparability outcome **
Cross sectional							
Bii 2008	Kenya	150	Health Systems and Services	Cross sectional study, no true intervention conducted. However, the sample had already undergone antenatal and postnatal Counselling or Education and enrolled in PMTCT.	Prenatal and postnatal	EBF 6 months; EBF 3 months	Selection ** comparability outcome *
Matovu 2008	Uganda	139	Health Systems and Services	Cross sectional study, no true intervention conducted. However, the sample had been exposed to PMTCT intervention (Counselling or Education)	Prenatal and postnatal	EBF 6 months; Early Initiation of BF (within 1 hr)	Selection ** comparability** outcome **
Nlend	Cameroon	61	Health Systems and Services	Cross sectional study, the sample was recruited from a cohort. Group counseling for all mothers in antennal period focusing on sound breastfeeding practices on monthly basis (2 female counselors with group of 10-15 women, 2 hr session). Counselors were trained nurses in lactation management and HIV and were assisted by HIV-positive mothers who had	Prenatal and postnatal interventions	EBF 3 months; Initiated BF	Selection ** comparability outcome *

				successfully practiced EBF for 6 months. Importance of EBF was underlined and mothers had an opportunity to meet other mothers which led to set up of self help group. CG: No control group			
Young	Tanzania	196	Health Systems and Services	Intervention: Counseling or Education, PMTCT according to WHO/UNICEF/UNAIDS materials.	Prenatal and postnatal	EBF 6 months; Initiated BF	Selection **** comparability outcome *

Table 2. Summary of Outcomes

Study	Outcomes		
	EBF 6 months : Results (%) and conclusions		
	IG (n/N)(%)	**CG (n/N)(%)**	
Bii 2008 (Cross sectional)	7/150 (4.7%)	No comparison group	Infant feeding decisions were mainly influenced by the male partner's involvement and the socio economic status of the mother. Women who disclosed their HIV status to spouses were more likely to not breastfeed. To encourage women to adhere to good infant feeding practices, involvement of their partners, family members as well as the community for support should be encouraged. Risk of bias: self-reported data
Matovu 2008 (Cross sectional)	Individual Counseling: 92/139 (66.2%) OR: 3.43 (95% CI: 1.87-6.30) At least 4 Antenatal Counseling: 95/139 (68%) OR: 5.95 (95% CI:3.43-10.36) At least 6 postnatal Counseling: 128/139 (92%) OR: 3.34 (95% CI:1.60-6.96)	Group Counseling: 47/139 (66%) < 4 Antenatal Counseling: 44/139 (32%) < 6 postnatal Counseling: 11/139 (8%)	In order to improve adherence to EBF there is need to: involve the family especially fathers in infant feeding counselling and education, target less educated mothers for more intense infant feeding counselling using appropriate methods intensify education on benefits of EBF and on how to produce enough milk and to encourage mothers to attend regularly for antenatal and postnatal care. Risk of bias: the sample in this study was women who adhered to exclusive breast feeding. Recall bias could also be an issue.
Piwoz 2007 (Cohort)	20/362 (5.5%)	3/75 (4%)	The promotion of exclusive breastfeeding has the potential to reduce postnatal HIV transmission among women who do not know their HIV status, and child survival and HIV prevention programs should support this practice.
Thakwalakwa 2014 (Cohort)	241/248 (97.2%)	No comparison group	In this sample breast feeding was highly acceptable among HIV positive mothers. Anti-retroviral therapy provided to HIV-infected mothers who breast-fed their infants led to >90% HIV-free survival after 6 weeks of age.

			Risk of bias: recall bias
Young 2015 (Cross sectional)	26/196 (13.3%)	No comparison group	Breast-feeding practices in this population of HIV-positive women show greater EBF duration than in a recent nationally representative sample, but these rates are still short of national and international recommendations. These results indicate that cost-effective strategies are needed to improve breast-feeding practices in HIV positive mothers. Risk of bias: recall bias
	EBF 3 months: Results (%) and conclusions		
Tomlinson 2014 (RCT)	Intervention group: 130/405 (24%) RR of EBF: 1.53 (95% CI 1.22-1.94)	Control group: 101/639 (16%)	The intervention by Community health workers almost doubled the rate of exclusive breast feeding. With an increase in each community health worker visit there was an increase in EBF rate (6% relative increase in EBF for every additional visit). The relative risk of EBF in HIV positive moms in the intervention group was RR= 1.53, 95% CI 1.22-1.94. This study informed that home visiting models are feasible and effective.
Bii 2008 (Cross sectional)	28/150 (18.7%)	No comparison group	Infant feeding decisions were mainly influenced by the male partner's involvement and the socio economic status of the mother. To encourage women to adhere to good infant feeding practices, involvement of their partners, family members as well as the community for support should be encouraged. Bias: self-reported data
Bland 2008 (Cohort)	Received scheduled no. of visits: 554/957 (57.9%) **OR 2.56** (2.13 to 3.83)	Did not receive scheduled no. of visits: 403/957 (42%)	Lay counselors are effective in promotion and sustaining exclusive breastfeeding in both HIV positive and HIV negative women. EBF should be promoted community wide rather than just targeting HIV positive women. HIV positive mothers who received counselling visits were twice as likely to EBF at 3-4 months compared to those who did not (OR=2.56, 95% CI 2.13-3.83).

Iliff 2005 (Cohort)	After Counseling: 54/156 (34.6%)	Total Study population: 156/2060 (7.6%)	EBF may help in significantly reducing breastfeeding-associated HIV transmission. Introduction of education and counseling was strongly associated with higher EBF rates.
Nlend 2010 (Cross sectional)	58/61 (95.1%)	23.5% for general population in Cameroon	Group therapeutic education and counseling during antenatal and postnatal time along with access to anti-retroviral therapy had a positive impact on EBF rates. Also, the early mother-to-child HIV transmission rate was reduced to 4.3% in breast feeding population.
Piwoz 2005 (Cohort)	Group education only: 52/387 (13%) OR=2.6 (1.9-3.56) Individual counseling: 29/183 (16%) OR=3.35 (2.22-5.06) Group + Individual: 94/396 (24%) OR=5.21 (4.04-6.73)	Control group: 416/7625 (5.5%)	Mother who received program exposure were more likely to EBF compared to mothers with no program exposure (Group education only: OR=2.6, 95% CI 1.9-3.56; individual counseling only: OR = 3.35, 95% CI 2.22-5.06; both group education and individual counseling: OR= 5.21, 95% CI 4.04-6.73). Combining group education with individualized counseling, reaching women (and their partners) frequently during the antenatal and postnatal periods will help increase the rates of EBF. Group education should focus on basic facts about HIV and infant feeding should focus on safer breast-feeding practices.
Piwoz 2007 (Cohort)	1 Education visit: 30/234 (12.8%) 2 Education visits: 19/108 (17.6%) 3 Education visits: 5/20 (25%)	No intervention: 5/75 (6.7%)	Frequency of contact (intervention) was associated with exclusive breastfeeding practices. The promotion of exclusive breastfeeding has the potential to reduce postnatal HIV transmission among women who do not know their HIV status, and child survival and HIV prevention programs should support this practice.
Read 2010 (Cohort)	10/49 (20.4%)	No data on comparison group reported	The education program and infant feeding counseling seems of influence the rates of infant feeding choices. Also, the overall transmission rate was relatively low, suggesting effectiveness of antiretroviral transmission prophylaxis. Limitation: no comparison data provided
Young 2015	67/196 (34.2%)	No comparison group	Breast-feeding practices in this population of HIV-positive women show greater EBF duration than in a recent

(Cross sectional)			nationally representative sample, but these rates are still short of national and international recommendations. These results indicate that cost-effective strategies are needed to improve breast-feeding practices in HIV positive mothers. Risk of bias: recall bias
	Early BF initiation within 1 hour : Results (%) and conclusions		
Tomlinson 2014 (RCT)	Intervention group: 561/1629 (34%) RR: 1.06 (0.96 – 1.17)	Control group: 607/1865 (33%)	The intervention by Community health workers almost doubled the rate of exclusive breast feeding. The relative risk of EBF in the intervention group for early breast feeding initiation was RR= 1.06, 95% CI 0.96 -1.17. This study informed that home visiting models are feasible and effective. Risk of bias: The data was not stratified by HIV status for early initiation outcome. The sample population consists of both HIV+ and HIV- women (30% with HIV).
Matovu, 2008 (Cross sectional)	110/139 (79%)	No comparison group	In order to improve adherence to EBF there is need to: involve the family especially fathers in infant feeding counselling and education, target less educated mothers for more intense infant feeding counselling using appropriate methods intensify education on benefits of EBF and on how to produce enough milk and to encourage mothers to attend regularly for antenatal and postnatal care. Risk of bias: the sample in this study was women who adhered to exclusive breast feeding. Recall bias could also be an issue.
Mazia 2009 (pre-post)	Post intervention: 101/136 (74.3%)	Pre intervention: 38/114 (33.3%)	BF initiation in HIV positive mothers significantly increased Post PNC intervention. High-quality integrated PMTCT programs and MNH postnatal services are feasible and acceptable, and can result in promoting early postnatal visits and improved care of both HIV-positive and HIV-negative

			mothers and their babies.
Nlend 2010 (Cross sectional)	32/61 (52.5%)	No comparison group	Group therapeutic education and counseling during antenatal and postnatal time along with access to anti-retroviral therapy had a positive impact on EBF rates. Also, the early mother-to-child HIV transmission rate was reduced to 4.3% in breast feeding population.
	BF initiation: Results (%) and conclusions		
Tomlinson 2014 (RCT)	Intervention group: 561/1629 (34%)	Control group: 607/1865 (33%)	The intervention by Community health workers almost doubled the rate of exclusive breast feeding. With an increase in each community health worker visit there was an increase in EBF rate (6% relative increase in EBF for every additional visit). This study informed that home visiting models are feasible and effective. Risk of bias: The data was not stratified by HIV status for early initiation outcome. The sample population consists of both HIV+ and HIV- women (30% with HIV).
Mazia 2009 (pre-post)	101/136 (74.3%)	38/114 (33.3%)	BF initiation in HIV positive mothers significantly increased Post PNC intervention. High-quality integrated PMTCT programs and MNH postnatal services are feasible and acceptable, and can result in promoting early postnatal visits and improved care of both HIV-positive and HIV-negative mothers and their babies.
Nlend 2010 (Cross sectional)	32/61 (52.5%)	No comparison group	Group therapeutic education and counseling during antenatal and postnatal time along with access to anti-retroviral therapy had a positive impact on EBF rates. Also, the early mother-to-child HIV transmission rate was reduced to 4.3% in breast feeding population.
Read 2010 (Cohort)	32/49 (65.3%)	No comparison group	The education program and infant feeding counseling seems of influence the rates of infant feeding choices. Also, the overall transmission rate was relatively low, suggesting effectiveness of antiretroviral transmission prophylaxis.
Suryavanshi	56/94 (59.6%)	No data on	Majority of the mothers who chose to breast feed did so

2003 (Cohort)		comparison group provided	because it was suggested by the counselor (30%). Other factors that contributed to breast feeding: could not afford top feed (35%); concerned about social repercussions if they did not breast feed (25%). could not ensure hygienic food preparation (40%). The study also indicated that time immediately after delivery for critical for re-counseling about infant feeding and supporting mother's decision to breast feed.
Young 2015 (Cross sectional)	187/196 (95.4%)	No comparison group	Breast-feeding practices in this population of HIV-positive women show greater EBF duration than in a recent nationally representative sample, but these rates are still short of national and international recommendations. These results indicate that cost-effective strategies are needed to improve breast-feeding practices in HIV positive mothers.

Table 3. Table reporting effect direction for individual outcomes

		Outcomes			
Author	**Study Design**	**EBF 6 months**	**EB 3 months**	**Initiated BF within 1 hr**	**Initiated BF**
Tomlinson 2014	RCT	--------	▲	▲	▲
Bii 2008	Cross-sectional	No comparison group	No comparison group	------	--------
Bland 2008	Cohort	---------	▲	------	-------
Iliff 2005	Cohort	---------	▲	-------	-------
Matovu 2008	Cross-sectional	▲	--------	No comparison group	No comparison group
Mazia 2009	Cohort	---------	-------	▲	▲
Nlend 2010	Cross-sectional	--------	▲	No comparison group	No comparison group
Piwoz 2005	Cohort	-------	▲	-------	-------
Piwoz 2007	Cohort	▲	▲	-------	------
Read 2010	Cohort	-------	No comparison group	No comparison group	No comparison group
Suryavanshi 2003	Cohort	-------	--------	No comparison group	No comparison group
Thakwalakwa 2014	Cohort	No comparison group	--------	---------	--------
Young 2015	Cross-sectional	No comparison group	No comparison group	No comparison group	No comparison group

Effect direction: upward arrow= positive impact of intervention; downward arrow: negative impact of intervention; sideway arrow: mixed effect
Statistical significance: Green arrow p<0.05; yellow arrow p>0.05; grey arrow= no statistics; ------- = no data reported for that outcome

References

Bii S, Otieno-Nyunya O, Siika A, Rotich J. Infant feeding practices among HIV infected women receiving prevention of mother to child transmission services at kitale district hospital, kenya. East African Medical Journal Vol. 85, No 4 April 2008.

Bland R, Little K, Coovadia H, Coutsoudis A, Rollins N, Newell M. Intervention to promote exclusive breast-feeding for the first 6 months of life in a high HIV prevalence area. AIDS (London, England) 2008; 22:883-91.

Iliff P, Piwoz E, Tavengwa N, Zunguza C, Marinda E, Nathoo K, Moulton L, Ward B, Humphrey J. Early exclusive breastfeeding reduces the risk of postnatal HIV-1 transmission and increases HIV-free survival. AIDS (London, England) 2005; 19:699-708.

Matovu A, Kirunda B, Rugamba-Kabagambe G, Tumwesigye N, Nuwaha F. Factors influencing adherence to exclusive breast feeding among HIV positive mothers in kabarole district, Uganda. East African Medical Journal Vol. 85 No. 4 April 2008.

Mazia G, Narayanan I, Warren C, Mahdi M, Chibuye P, Walligo A, Mabuza P, Shongwe R, Hainsworth M. Integrating quality postnatal care into PMTCT in Swaziland. Global public health 2009; 4:253-70.

Nlend A, Ekani B. Preliminary assessment of breastfeeding practices in HIV 1-infected mothers (prior to weaning) under the Djoungolo programme on the prevention of mother-to-child transmission of HIV. Journal of tropical pediatrics 2010; 56:436-9.

Piwoz E, Iliff P, Tavengwa N, Gavin L, Marinda E, Lunney K, Zunguza C, Nathoo K, Humphrey J. An education and counseling program for preventing breast-feeding-associated HIV transmission in Zimbabwe: design and impact on maternal knowledge and behavior. The Journal of nutrition 2005; 135:950-5.

Piwoz E, Humphrey J, Tavengwa N, Iliff P, Marinda E, Zunguza C, Nathoo K, Mutasa K, Moulton L, Ward B. The impact of safer breastfeeding practices on postnatal HIV-1 transmission in Zimbabwe. American journal of public health 2007; 97:1249-54.

Read J, Samuel N, Srijayanth P, Dharmarajan S, Van Hook H, Jacob M, Junankar V, Bethel J, Yu E, Stoszek S. Infants of human immunodeficiency virus type 1-infected women in rural south India: feeding patterns and risk of mother-to-child transmission. The Pediatric infectious disease journal 2010; 29:14-7

Suryavanshi N, Jonnalagadda S, Erande A, Sastry J, Pisal H, Bharucha K, Shrotri A, Bulakh P, Phadke M, Bollinger R, Shankar A. Infant feeding practices of HIV-positive mothers in India. The Journal of nutrition 2003; 133:1326-31.

Thakwalakwa C, Kasonde P, Kankasa C, Sinkala M, Semrau K, Shutes E, Ayash C, Tsai W, Aldrovandi G, Kuhn L. Issues in the design of a clinical trial with a behavioral intervention--the Zambia exclusive breast-feeding study. Controlled clinical trials 2004; 25:353-65.

Tomlinson M, Doherty T, Ijumba P, Jackson D, Lawn J, Persson L, Lombard C, Sanders D, Daviaud E, Nkonki L, Goga A, Rohde S, Sitrin D, Colvin M, Chopra M. Goodstart: a cluster randomised effectiveness trial of an integrated, community-based package for maternal and newborn care, with prevention of mother-to-child transmission of HIV in a South African township. Tropical medicine & international health: TM & IH 2014; 19:256-66.

Young S, Israel-Ballard K, Dantzer E, Ngonyani M, Nyambo M, Ash D, Chantry C. Infant feeding practices among HIV-positive women in Dar es Salaam, Tanzania, indicate a need for more intensive infant feeding counselling. Public health nutrition 2010; 13:2027-33.

Other References:

Academy of Nutrition and Dietetics. Manual for Evidence analysis process. http://www.andeal.org/vault/2440/web/files/2012_Aug_EA_Manual.pdf Accessed 10/13/2015

Higgins JPT, Green S. Cochrane Handbook for Systematic Reviews of Interventions. Version 5.1.0, Updated March 2011.

Wells GA, Shea B, O'Connell D, Peterson J, Welch V, Losos M, Tugwell P. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses. http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp

Attachment A

Breastfeeding Promotion Search Plan

Authors: Lisa Moloney, Deepa Handu and Taylor Wolfram

Academy of Nutrition and Dietetics

Research, International and Scientific Affairs

Question: In countries that promote breastfeeding in HIV (+) women on ARV therapy, what are the effective interventions to support breastfeeding?

Characteristics:
Years: No Restriction
Language: English
Article Types: All
Species: Human
Gender: Female

Information Sources

PUB MED March 2015
Search 1

(((((((("Breast Feeding"[Mesh] OR "Colostrum"[Mesh]) AND "Health Promotion"[Mesh]) OR "Health Education"[Mesh]) OR "Social Support"[Mesh]) OR "Directive Counseling"[Mesh]) OR "Peer Group"[Mesh]) OR "Counseling"[Mesh]) AND "HIV Infections"[Mesh]) OR "HIV"[Mesh] AND "humans"[MeSH Terms]

Hits: 85,910

Search 2

((((("breast feeding"[MeSH Terms] OR ("breast"[All Fields] AND "feeding"[All Fields]) OR "breast feeding"[All Fields]) OR ("colostrum"[MeSH Terms] OR "colostrum"[All Fields]))

AND

(("health promotion"[MeSH Terms] OR ("health"[All Fields] AND "promotion"[All Fields]) OR "health promotion"[All Fields]) OR ("health education"[MeSH Terms] OR ("health"[All Fields] AND "education"[All Fields]) OR "health education"[All Fields]) OR ("social support"[MeSH Terms] OR ("social"[All Fields] AND "support"[All Fields]) OR "social support"[All Fields]) OR ("directive counselling"[All Fields] OR "directive counseling"[MeSH Terms] OR ("directive"[All Fields] AND "counseling"[All Fields]) OR "directive counseling"[All Fields]) OR ("peer group"[MeSH Terms] OR ("peer"[All Fields] AND "group"[All Fields]) OR "peer group"[All Fields]) OR ("counselling"[All Fields] OR "counseling"[MeSH Terms] OR "counseling"[All Fields]) OR ("Intervention (Amstelveen)"[Journal] OR "intervention"[All Fields] OR "Interv Sch Clin"[Journal] OR "intervention"[All Fields])))

AND

(("hiv infections"[MeSH Terms] OR ("hiv"[All Fields] AND "infections"[All Fields]) OR "hiv infections"[All Fields] OR ("hiv"[All Fields] AND "infection"[All Fields]) OR "hiv infection"[All Fields]) OR ("hiv"[MeSH Terms] OR "hiv"[All Fields] OR ("human"[All Fields] AND "immunodeficiency"[All Fields] AND "virus"[All Fields]) OR "human immunodeficiency virus"[All Fields]) OR ("hiv-1"[MeSH Terms] OR "hiv-1"[All Fields] OR "hiv 1"[All Fields]) OR ("hiv-2"[MeSH Terms] OR "hiv-2"[All Fields] OR "hiv 2"[All Fields]) OR ("hiv"[MeSH Terms] OR "hiv"[All Fields]) OR ("acquired immunodeficiency syndrome"[MeSH Terms] OR ("acquired"[All Fields] AND "immunodeficiency"[All Fields] AND "syndrome"[All Fields]) OR "acquired immunodeficiency syndrome"[All Fields])))

AND "humans"[MeSH Terms]

Hits: 500

EBSCO Search (MEDLINE, CINAHL, Food Science, Sport Discuss, and the EDS databases)

"Breastfeeding" + "HIV/AIDS" + "Peer Reviewed" + "English"

Related Terms Included

356 hits, after duplicates removed within EBSCO: 156 duplicates from PubMed search removed: 200 hits

Review Articles: 3 Citations identified

859 Total Citations for Review

Study Selection

1st Review-- Analysts screened abstracts for relevance to research question. 206 abstracts included and marked for further review.

2nd Review-- Analysts reviewed abstracts for the following criteria:

- Review articles or guidelines published within the past 10 years
- Clinical trials that entail applicable interventions and outcomes of interest within the population of interest.
-

Population: Prenatal, antenatal and postnatal mothers, families; group or communities; health facilities, health system; all stakeholders

Interventions: Peer support, counseling, education; group meeting, social mobilization, mass media, social media;

I	**Individual-directed** (e.g. peer support, counseling, education)	**Community-directed** (e.g. group meeting, social mobilization, mass media, social media)	**Health system directed interventions** (e.g. BFHI, Organizational support, Rooming In)	**Regulatory & policy directed interventions** (e.g. maternity leave, workplace regulations, IMS Act)
P	prenatal, antenatal and postnatal mothers, families	Group, community	Health facilities/ Health system	All stakeholders
C	Comparison with no intervention or any other group if available	Comparison with no intervention or any other group if available	Comparison with no intervention or any other group if available	Comparison with no intervention or any other group if available
O	Improvement in early initiation, exclusive and continued breastfeeding rates.			

PICO table taken from document provided WHO.

2nd Review:

132 articles were excluded after further review. 74 articles categorized as follows: 20 Qualitative, 3 Review, and 15 Descriptive. 25 articles identified for possible inclusion in the systematic review. 12 articles excluded because they did not provide data on outcomes of interest.

13 Articles total included in systematic review.

Included Articles

Bii S, Otieno-Nyunya O, Siika A, Rotich J. Infant feeding practices among HIV infected women receiving prevention of mother to child transmission services at kitale district hospital, kenya. East African Medical Journal Vol. 85, No 4 April 2008.

Bland R, Little K, Coovadia H, Coutsoudis A, Rollins N, Newell M. Intervention to promote exclusive breast-feeding for the first 6 months of life in a high HIV prevalence area. AIDS (London, England) 2008; 22:883-91.

Iliff P, Piwoz E, Tavengwa N, Zunguza C, Marinda E, Nathoo K, Moulton L, Ward B, Humphrey J. Early exclusive breastfeeding reduces the risk of postnatal HIV-1 transmission and increases HIV-free survival. AIDS (London, England) 2005; 19:699-708.

Matovu A, Kirunda B, Rugamba-Kabagambe G, Tumwesigye N, Nuwaha F. Factors influencing adherence to exclusive breast feeding among HIV positive mothers in kabarole district, Uganda. East African Medical Journal Vol. 85 No. 4 April 2008.

Mazia G, Narayanan I, Warren C, Mahdi M, Chibuye P, Walligo A, Mabuza P, Shongwe R, Hainsworth M. Integrating quality postnatal care into PMTCT in Swaziland. Global public health 2009; 4:253-70.

Nlend A, Ekani B. Preliminary assessment of breastfeeding practices in HIV 1-infected mothers (prior to weaning) under the Djoungolo programme on the prevention of mother-to-child transmission of HIV. Journal of tropical pediatrics 2010; 56:436-9.

Piwoz E, Iliff P, Tavengwa N, Gavin L, Marinda E, Lunney K, Zunguza C, Nathoo K, Humphrey J. An education and counseling program for preventing breast-feeding-associated HIV transmission in Zimbabwe: design and impact on maternal knowledge and behavior. The Journal of nutrition 2005; 135:950-5.

Piwoz E, Humphrey J, Tavengwa N, Iliff P, Marinda E, Zunguza C, Nathoo K, Mutasa K, Moulton L, Ward B. The impact of safer breastfeeding practices on postnatal HIV-1 transmission in Zimbabwe. American journal of public health 2007; 97:1249-54.

Read J, Samuel N, Srijayanth P, Dharmarajan S, Van Hook H, Jacob M, Junankar V, Bethel J, Yu E, Stoszek S. Infants of human immunodeficiency virus type 1-infected women in rural south India: feeding patterns and risk of mother-to-child transmission. The Pediatric infectious disease journal 2010; 29:14-7

Suryavanshi N, Jonnalagadda S, Erande A, Sastry J, Pisal H, Bharucha K, Shrotri A, Bulakh P, Phadke M, Bollinger R, Shankar A. Infant feeding practices of HIV-positive mothers in India. The Journal of nutrition 2003; 133:1326-31.

Thakwalakwa C, Kasonde P, Kankasa C, Sinkala M, Semrau K, Shutes E, Ayash C, Tsai W, Aldrovandi G, Kuhn L. Issues in the design of a clinical trial with a behavioral intervention--the Zambia exclusive breast-feeding study. Controlled clinical trials 2004; 25:353-65.

Tomlinson M, Doherty T, Ijumba P, Jackson D, Lawn J, Persson L, Lombard C, Sanders D, Daviaud E, Nkonki L, Goga A, Rohde S, Sitrin D, Colvin M, Chopra M. Goodstart: a cluster randomised effectiveness

trial of an integrated, community-based package for maternal and newborn care, with prevention of mother-to-child transmission of HIV in a South African township. Tropical medicine & international health: TM & IH 2014; 19:256-66.

Young S, Israel-Ballard K, Dantzer E, Ngonyani M, Nyambo M, Ash D, Chantry C. Infant feeding practices among HIV-positive women in Dar es Salaam, Tanzania, indicate a need for more intensive infant feeding counselling. Public health nutrition 2010; 13:2027-33.

Excluded Articles after 2nd Review

Articles	Reason for Exclusion
Babirye J, Nuwaha F, Grulich A. Adherence to feeding guidelines among HIV-infected and HIV uninfected mothers in a rural district in Uganda. East Afr Med J. 2009 Jul;86(7):337-43.	Adherence defined as replacement feeding and breastfeeding. Does not single out HIV population nor EXCLUSIVE BREASTFEEDING outcomes.
Becquet R, Ekouevi D, Viho I, Sakarovitch C, Toure H, Castetbon K, Coulibaly N, Timite-Konan M, Bequet L, Dabis F, Leroy V. Acceptability of exclusive breast-feeding with early cessation to prevent HIV transmission through breast milk, ANRS 1201/1202 Ditrame Plus, Abidjan, Côte d'Ivoire. J Acquir Immune Defic Syndr. 2005 Dec 15; 40(5):600-8.	Compared breastfeeding promotion to replacement feeding. Breastfeeding encouraged to stop breastfeeding prior to 6 months.
Bland, Becquet R, Rollins NC, Coutsoudis A, Coovadia H, Newell M. Breast health problems are rare in both HIV-infected and HIV-uninfected women who receive counseling and support for breast-feeding in South Africa. Clin Infect Dis. 2007 Dec 1;45(11):1502-10. Epub 2007 Oct 22.	Only 3% population with HIV.
Bland R, Rollins N, Coovadia H, Coutsoudis A, Newell M. Infant feeding counselling for HIV-infected and uninfected women: appropriateness of choice and practice. Bull World Health Organ. 2007 Apr;85(4):289-96.	Compares intention of feeding to pattern to actual practice – only provides data for first week.
Desmond C, Bland RM, Boyce G, Coovadia H, Coutsoudis A, Rollins N, Newell M. Scaling-up exclusive breastfeeding support programmes: the example of KwaZulu-Natal. PLoS One. 2008 Jun 18;3(6):e2454.	Cost estimates of different programs. EXCLUSIVE BREASTFEEDING estimate used from Bland study.
Doherty T, Sanders D, Jackson D, Swanevelder S, Lombard C, Zembe W, Chopra M, Goga A, Colvin M, Fadnes LT, Engebretsen IM, Ekström EC, Tylleskär T; PROMISE EXCLUSIVE BREASTFEEDING study group. Early cessation of breastfeeding amongst women in South Africa: an area needing urgent attention to improve child health. BMC Pediatr. 2012 Jul 24;12:105.	Predictor of breastfeeding cessation. Could be helpful for report but does not answer question.
Mbuya M, Humphrey J, Majo F, Chasekwa B, Jenkins A, Israel-Ballard K, Muti M, Paul KH, Madzima RC, Moulton L, Stoltzfus R. Heat treatment of expressed breast milk is a feasible option for feeding HIV-exposed, uninfected children after 6 months of age in rural Zimbabwe. J Nutr. 2010 Aug;140(8):1481-8.	Education was focused on expressing and heat treating breastmilk.
Ndubuka J, Ndubuka N, Li Y, Marshall C, Ehiri J. Knowledge, attitudes and practices regarding infant feeding among HIV-infected pregnant women in Gaborone,Botswana: a cross-sectional survey. BMJ Open. 2013; 3(11).	Only information on intention to breastfeed was provided.
Ochola S, Labadarios D, Nduati R. Impact of counselling on exclusive breast-feeding practices in a poor urban setting in Kenya: a randomized controlled trial. Public Health Nutr. 2013 Oct;16(10):1732-40.	Population did not have HIV
Orne-Gliemann J, Mukotekwa T, Miller A, Perez F, Glenshaw M, Nesara P, Dabis F. Community-based assessment of infant feeding practices within a programme for prevention of mother-to-child HIV transmission in rural Zimbabwe. Public Health Nutr. 2006 Aug; 9(5):563-9.	Does not specifically look at EXCLUSIVE BREASTFEEDING for 6 months or early initiation. Also does not test interventions.
Rollins N, Becquet R, Bland RM, Coutsoudis A, Coovadia H, Newell M. Infant feeding, HIV transmission and mortality at 18 months: the need for appropriate choices by mothers and prioritization within programmes. AIDS. 2008 Nov 12; 22(17):2349-57.	After review of full article, EXCLUDE. Does not test intervention to promote EXCLUSIVE BREASTFEEDING, rather mothers given choice then supported in their decisions.

Thea D, Vwalika C, Kasonde P, Kankasa C, Sinkala M, Semrau K, Shutes E, Ayash C, Tsai WY, Aldrovandi G, Kuhn L.Issues in the design of a clinical trial with a behavioral intervention—the Zambia exclusive breast-feeding study. Control Clin Trials. 2004 Aug; 25(4):353-65.	Not a clinical trial. Rationale for a future study.
Schouten E, Jahn A, Midiani D, Makombe SD, Mnthambala A, Chirwa Z, Harries AD, van Oosterhout J, Meguid T, Ben-Smith A, Zachariah R, Lynen L, Zolfo M, Van Damme W, Gilks C, Atun R, Shawa M, Chimbwandira F. Prevention of mother-to-child transmission of HIV and the health-related Millennium Development Goals: time for a public health approach. Lancet. 2011 Jul 16;378(9787):282-4.	Does not address exclusive breastfeeding.
Ndubuka J, Ndubuka N, Li Y, Marshall CM, Ehiri J. Knowledge, attitudes and practices regarding infant feeding among HIV-infected pregnant women in Gaborone, Botswana: a cross-sectional survey. BMJ Open. 2013 Nov 29;3(11):e003749.	Only provides outcomes on decision to breastfeed. Does not specify if EXCLUSIVE BREASTFEEDING actually occurred.
Kesho Bora Study Group. Safety and effectiveness of antiretroviral drugs during pregnancy, delivery and breastfeeding for prevention of mother-to-child transmission of HIV-1: the Kesho Bora Multicentre Collaborative Study rationale, design, and implementation challenges. Contemp Clin Trials. 2011 Jan;32(1):74-85.	Does not test intervention.
Tavengwa N, Piwoz E, Iliff P, Moulton L, Zunguza C, Nathoo K, Hargrove J; ZVITAMBO Study Group, Humphrey J. Adoption of safer infant feeding and postpartum sexual practices and their relationship to maternal HIV status and risk of acquiring HIV in Zimbabwe. Trop Med Int Health. 2007 Jan;12(1):97-106.	Compared costs of different ARV options.
Ciaranello A, Perez F, Keatinge J, Park J, Engelsmann B, Maruva M, Walensky R, Dabis F, Chu J, Rusibamayila A, Mushavi A, Freedberg K. PLoS Med. 2012 Jan;9(1). What will it take to eliminate pediatric HIV? Reaching WHO target rates of mother-to-child HIV transmission in Zimbabwe: a model-based analysis.	Does not test interventions and outcomes of interest.
O'Brien L, Shaffer N, Sangrujee N, Abimbola T. The incremental cost of switching from Option B to Option B+ for the prevention of mother-to-child transmission of HIV. Bull World Health Organ. 2014 Mar 1;92(3):162-70.	Does not look at interventions of interest.
Atashili J, Kalilani L, Seksaria V, Sickbert-Bennett E. Potential impact of infant feeding recommendations on mortality and HIV-infection in children born to HIV-infected mothers in Africa: a simulation. BMC Infect Dis. 2008 May 16;8:66.	Assessed impact of shorter duration of breastfeeding.
Wilson, N. Child mortality risk and fertility: Evidence from prevention of mother-to-child transmission of HIV. Journal of Development Economics. September 2015 116:74-88.	Appears to be secondary analysis. Does not directly address interventions and outcomes of interest.
Goga A, Dinh T, Jackson D, Lombard C, Delaney K, Puren A, Sherman G, Woldesenbet S, Ramokolo V, Crowley S, Doherty T, Chopra M, Shaffer N, Pillay Y. First population-level effectiveness evaluation of a national programme to prevent HIV transmission from mother to child, South Africa. Journal of Epidemiology & Community Health. March 2015, Vol. 69 Issue 3, p240.	Does not look at outcomes of interest, HIV transmission.
Perez F, Mukotekwa T, Miller A, Orne-Gliemann J, Glenshaw M, Chitsike I, Dabis F. Implementing a rural programme of prevention of mother-to-child transmission of HIV in Zimbabwe: first 18 months of experience. Trop Med Int Health. 2004 Jul;9(7):774-83.	Does not measure outcomes of interest.
Ciaranello A, Perez F, Engelsmann B, Walensky R, Mushavi A, Rusibamayila A, Keatinge J, Park J, Maruva M, Cerda R, Wood R, Dabis F,	Does not address outcomes of interest.

Freedberg K. Cost-effectiveness of World Health Organization 2010 guidelines for prevention of mother-to-child HIV transmission in Zimbabwe. Clin Infect Dis. 2013 Feb;56(3):430-46.	

Association Articles Not Included in Systematic Review

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 Apr; 100(4):538-42.	Provides data on percent of sample that received feeding counseling but unable to determine which percent of this subset practiced EXCLUSIVE BREASTFEEDING.
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(2):259-65.	Limited information on breastfeeding promotion interventions. Authors only state that sample received counseling.
Maru S, Datong P, Selleng D, Mang E, Inyang B, Ajene A, Guyit R, Charurat M, Abimiku A. Social determinants of mixed feeding behavior among HIV-infected mothers in Jos, Nigeria. AIDS Care. 2009 Sep; 21(9):1114-23.	Does not address interventions to promote EXCLUSIVE BREASTFEEDING.
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 Mar 26; 12:240.	Does not address interventions to promote EXCLUSIVE BREASTFEEDING.
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. Zulliger R(1), Abrams EJ, Myer L. Trop Med Int Health. 2013 Dec;18(12):1547-54.	Outcomes provides breastfeeding rates. Does not specify if breastfeeding practice was exclusive.
Petraro P, Duggan C, Msamanga G, Peterson K, Spiegelman D, Fawzi W. Predictors of breastfeeding cessation among HIV-infected women in Dar es Salaam, Tanzania. Matern Child Nutr. 2011 Jul;7(3):273-83.	Does not address outcomes of interest (exclusive breastfeeding or early initiation of breastfeeding).
Young, S; Plenty, A; Luwedde, F; Natamba, B; Natureeba, P; Achan, J; Mwesigwa, J; Ruel, T; Ades, V; Osterbauer, B; Clark, T; Dorsey, G; Charlebois, E; Kamya, M; Havlir, D; Cohan, D. Household Food Insecurity, Maternal Nutritional Status, and Infant Feeding Practices Among HIV-infected Ugandan Women Receiving Combination Antiretroviral Therapy. Maternal & Child Health Journal. Nov2014, Vol. 18 Issue 9, p2044-2053	Does not address interventions to promote breastfeeding.
Onono, A; Cohen, C; Jerop, M; Bukusi, E; Turan, J M. HIV serostatus and disclosure: implications for infant feeding practice in rural south Nyanza, Kenya. BMC Public Health. 2014, Vol. 14 Issue 1, p1-20.	Does not address intervention to promote exclusive breastfeeding.
Kimunai, E, Kapella-Mshigeni, S, Anderson, P, Prehn, A Relationship Between Demographics and Breastfeeding Behavior Among HIV Positive Women in Kenya. International Journal of Childbirth Education, 2014 Jan; 29 (1): 21-6.	Does not address intervention to promote exclusive breastfeeding. Instead review maternal demographics.
Ssenyonga R; Muwonge R; Nankya I. Towards a better understanding of exclusive breastfeeding in the era of HIV/AIDS: a study of prevalence and factors associated with exclusive breastfeeding from birth, in Rakai, Uganda. Journal Of Tropical Pediatrics [J Trop Pediatr], ISSN: 0142-6338, 2004 Dec; Vol. 50 (6), pp. 348-53.	Does not address interventions to promote exclusive breastfeeding.
Lawani, L; Onyebuchi, A; Iyoke, C; Onoh, R; Nkwo, P. The challenges of adherence to infant feeding choices in prevention of mother-to-child transmission of HIV infections in South East Nigeria. Patient	Does not address interventions to promote exclusive breastfeeding.

Preference and Adherence. Annual, 2014, Vol. 8, p377, 5 p.	
Berer, M. Traditional Birth Attendants in Developing Countries Cannot Be Expected to Carry Out HIV/AIDS Prevention and Treatment Activities. Reproductive Health Matters. Nov2003, Vol. 11 Issue 22, p36. 4p	Does not address interventions to promote breastfeeding nor does the article address outcomes of interest, exclusive breastfeeding.

Qualitative Articles Excluded from Systematic Review

Andreson J, Dana N, Hepfer B, King'ori E, Oketch J, Wojnar D, Cowgill K, Israel-Ballard K. Infant feeding buddies: a strategy to support safe infant feeding for HIV-positive mothers. J Hum Lact. 2013 Feb;29(1):90-3.	Qualitative Study – addressed intervention but does not provide outcomes of interest.
Buskens I, Jaffe A, Mkhatshwa H. Infant feeding practices: realities and mind sets of mothers in Southern Africa. AIDS Care. 2007 Oct;19(9):1101-9.	Not a clinical trial. Does not address interventions or outcomes of interest.
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 Apr;7(2):148-59. Epub 2010 Sep 7.	Unable to determine what percent of study population received feeding intervention. Unable to determine what percent of those that received intervention, EBF.
Desclaux A, Alfieri C. Counseling and choosing between infant-feeding options: overall limits and local interpretations by health care providers and women living with HIV in resource-poor countries (Burkina Faso, Cambodia, Cameroon). Soc Sci Med. 2009 Sep;69(6):821-9.	Does not provide data on interventions or outcomes of interest.
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 Sep;136(9):2421-6.	Does not provide information on interventions of interest. Unclear if women encouraged to EBF.
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 Feb;84(2):90-6.	Unable to assess association between interventions and outcomes of interest.
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 Mar 7;5(4):1-13.	Assesses barriers that hinder PMTCT
Mahaka H, Chakombera E. Knowledge, attitudes and practices on infant feeding options among HIV positive mothers. Cent Afr J Med. 2008 Sep-Dec;54(9-12):51-3.	Does not provide data on outcomes on interest.
Nor B, Ahlberg B, Doherty T, Zembe Y, Jackson D, Ekström EC; PROMISE-EBF. Mother's perceptions and experiences of infant feeding within a community-based peer counselling intervention in South Africa. Matern Child Nutr. 2012 Oct;8(4):448-58.	Does not address outcomes of interest.
Petrovic K(1), Maimbolwa M, Johansson E. Primiparous mothers' knowledge about mother-to-child transmission of HIV in Lusaka, Zambia. Midwifery. 2009 Dec;25(6):e1-e10.	Does not address outcomes of interest.
Seidel G, Sewpaul V, Dano B. Experiences of breastfeeding and vulnerability among a group of HIV-positive women in Durban,	Does not address outcomes of interest.

South Africa. Health Policy Plan. 2000 Mar;15(1):24-33.	
Sibeko L, Coutsoudis A, Nzuza S, Gray-Donald K. Public Health Nutr. 2009 Nov;12(11):1983-90. Mothers' infant feeding experiences: constraints and supports for optimal feeding in an HIV-impacted urban community in South Africa.	Assessment of counseling, does not address outcomes of interest.
Bezner Kerr R, Dakishoni L, Shumba L, Msachi R, Chirwa M. "We grandmothers know plenty": breastfeeding, complementary feeding and the multifaceted role of grandmothers in Malawi. Soc Sci Med. 2008 Mar;66(5):1095-105.	Does not address outcomes of interest.
Buskens I, Jaffe A. Demotivating infant feeding counselling encounters in southern Africa: do counsellors need more or different training? AIDS Care. 2008 Mar;20(3):337-45.	Assessment of counseling, does not address outcomes of interest.
Nor B, Zembe Y, Daniels K, Doherty T, Jackson D, Ahlberg B, Ekström EC; PROMISE-EBF Study Group. "Peer but not peer": considering the context of infant feeding peer counseling in a high HIV prevalence area. J Hum Lact. 2009 Nov;25(4):427-34.	Does not address outcomes of interest.
Sripipatana T, Spensley A, Miller A, McIntyre J, Sangiwa G, Sawe F, Jones D, Wilfert C. Site-specific interventions to improve prevention of mother-to-child transmission of human immunodeficiency virus programs in less developed settings. Am J Obstet Gynecol. 2007 Sep;197(3 Suppl):S107-12.	Review of qualitative program highlights.
Våga BB, Moland K, Evjen-Olsen B, Blystad A. Reflections on informed choice in resource-poor settings: the case of infant feeding counselling in PMTCT programmes in Tanzania. Soc Sci Med. 2014 Mar;105:22-9.	Compares interventions but not on outcomes of interest.
Østergaard LR(1), 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 Sep;14(3):213-22.	Does not provide information on interventions of interest.
Thairu L, Pelto G, Rollins N, Bland R, Ntshangase N. Sociocultural influences on infant feeding decisions among HIV-infected women in rural Kwa-Zulu Natal, South Africa. *Maternal and Child Nutrition*, **1,** , pp. 2–10	Compared cohort to ethnographic study. Limited information on intervention and outcomes of interest from cohort.
Sellen, D, Wachira, C, Gill, Z. Prevention of mother to child transmission of HIV/AIDS (PMTCT): client experience with counseling for safe infant feeding (SIF) in Voi Area Development Program, Kenya. FASEB Journal. Apr2007, Vol. 21 Issue 5, pA677-A678	Does not provide information on interventions and impact on outcomes of interest.

Review articles not included in systematic review

Saloojee H, Cooper P. Feeding of infants of HIV-positive mothers. Curr Opin Clin Nutr Metab Care. 2010 May; 13(3):336-43.	Review article
Bhandari N(1), Kabir AK, Salam MA. Mainstreaming nutrition into maternal and child health programmes: scaling up of exclusive breastfeeding. Matern Child Nutr. 2008 Apr;4 Suppl 1:5-23.	Review article
Rollins N, Coovadia H. Breastfeeding and HIV transmission in	Review article

the developing world: past, present, future. Curr Opin HIV AIDS. 2013 Sep;8(5):467-73.	

Attachment B

Risk of Bias of included RCT study

Risk of Bias																		
Studies	**Adequate sequence generation?**			**Allocation concealment?**			**Blinding**			**Incomplete outcome data addresses?**			**Free of selective reporting?**			**Free of other bias**		
	Yes /No	**Judgement**	**Description**	**Yes/ No**	**Judgement**	**Description**	**Yes /No**	**Judgement**	**Description**	**Yes /No**	**Judgement**	**Description**	**Yes /No**	**Judgement**	**Description**	**Yes /No**	**Judgement**	**Description**
Tomlinson et al 2014	Y	low	Computer randomisation.	Y	Low	Computer randomisation.	Y	Low	Trained data collectors blinded to arm visited.	Y	Low	Low attrition rate. Unlikely to impact outcomes.	Y	low	Prespecified outcomes reported in results section.	Y	low	Appears to be free from other sources of bias.

Quality assessment for Cohort studies:

	Study (author and year): Bland 2008						
Selection				**Comparability**	**Outcome**		
Representativeness of the exposed cohort	**Selection of the non exposed cohort**	**Ascertainment of exposure**	**Demonstration that outcome of interest was not present at start of study (for side effects)**	**Comparability of cohorts on the basis of the design or analysis**	**Assessment of outcome**	**Was follow-up long enough for outcomes to occur**	**Adequacy of follow up of cohorts**
a) truly representative of the average in the community* b) somewhat representative of the average in the community * c) selected group of opioid dependent people d) no description of the derivation of the cohort	a) drawn from the same community as the exposed cohort * b) drawn from a different source c) no description of the derivation of the non exposed cohort	a) secure record (eg clinical records) * b) structured interview * c) written self report d) no description	a) yes * b) no	a) Study controls for * (Most important factors) b) Study controls for any additional factor *	a)Independent blind assessment* b) record linkage * c) self report (for side effects) d) no description	a) yes (select an adequate follow up period for outcome of interest) ** b) no	a) complete follow up - all subjects accounted for* b) subjects lost to follow up unlikely to introduce bias (lost to follow-up ≤5%)* c) subjects lost to follow up > 5% and description provided of those lost d) no statement
Selection*** Comparability* Outcome **							

	Study (author and year): Iliff 2005						
Selection				**Comparability**	**Outcome**		
Representativeness of the exposed cohort	**Selection of the non exposed cohort**	**Ascertainment of exposure**	**Demonstration that outcome of interest was not present at start of study (for side effects)**	**Comparability of cohorts on the basis of the design or analysis**	**Assessment of outcome**	**Was follow-up long enough for outcomes to occur**	**Adequacy of follow up of cohorts**
a) truly representative of the average in the community* b) somewhat representative of the average in the community * c) selected group of opioid dependent people d) no description of the derivation of the cohort	a) drawn from the same community as the exposed cohort * b) drawn from a different source c) no description of the derivation of the non exposed cohort	a) secure record (eg clinical records) * b) structured interview * c) written self report d) no description	b) yes * b) no	a) Study controls for * (Most important factors) b) Study controls for any additional factor *	a)Independent blind assessment* b) record linkage * c) self report (for side effects) d) no description	a) yes (select an adequate follow up period for outcome of interest)* b) no	a) complete follow up - all subjects accounted for* b) subjects lost to follow up unlikely to introduce bias (lost to follow-up ≤5%)* c) subjects lost to follow up > 5% and description provided of those lost d) no statement
Selection *** Comparability 0 stars Outcome**							

	Study (author and year): Mazia 2009						
Selection				**Comparability**	**Outcome**		
Representativeness of the exposed cohort	**Selection of the non exposed cohort**	**Ascertainment of exposure**	**Demonstration that outcome of interest was not present at start of study (for side effects)**	**Comparability of cohorts on the basis of the design or analysis**	**Assessment of outcome**	**Was follow-up long enough for outcomes to occur**	**Adequacy of follow up of cohorts**
a) truly representative of the average in the community* b) somewhat representative of the average in the community * c) selected group of opioid dependent people d) no description of the derivation of the cohort	a) drawn from the same community as the exposed cohort * b) drawn from a different source c) no description of the derivation of the non exposed cohort	a) secure record (eg clinical records) * b) structured interview * c) written self report d) no description	c) yes * b) no	a) Study controls for * (Most important factors) b) Study controls for any additional factor *	a)Independent blind assessment* b) record linkage * c) self report (for side effects) d) no description	a) yes (select an adequate follow up period for outcome of interest) ** b) no	a) complete follow up - all subjects accounted for* b) subjects lost to follow up unlikely to introduce bias (lost to follow-up ≤5%)* c) subjects lost to follow up > 5% and description provided of those lost d) no statement
Selection**** Comparability 0 stars Outcome**							

	Study (author and year): Piwoz 2005						
Selection				**Comparability**	**Outcome**		
Representativeness of the exposed cohort	**Selection of the non exposed cohort**	**Ascertainment of exposure**	**Demonstration that outcome of interest was not present at start of study (for side effects)**	**Comparability of cohorts on the basis of the design or analysis**	**Assessment of outcome**	**Was follow-up long enough for outcomes to occur**	**Adequacy of follow up of cohorts**
a) truly representative of the average in the community* b) somewhat representative of the average in the community * c) selected group of opioid dependent people d) no description of the derivation of the cohort	a) drawn from the same community as the exposed cohort * b) drawn from a different source c) no description of the derivation of the non exposed cohort	a) secure record (eg clinical records) * b) structured interview * c) written self report d) no description	d) yes * b) no	a) Study controls for * (Most important factors) b) Study controls for any additional factor *	a)Independent blind assessment* b) record linkage * c) self report (for side effects) d) no description	a) yes (select an adequate follow up period for outcome of interest) ** b) no	a) complete follow up - all subjects accounted for* b) subjects lost to follow up unlikely to introduce bias (lost to follow-up ≤ 5%)* c) subjects lost to follow up > 5% and description provided of those lost d) no statement
Selection**** Comparability* Outcome**							

	Study (author and year): Piwoz 2007						
Selection				**Comparability**	**Outcome**		
Representativeness of the exposed cohort	**Selection of the non exposed cohort**	**Ascertainment of exposure**	**Demonstration that outcome of interest was not present at start of study (for side effects)**	**Comparability of cohorts on the basis of the design or analysis**	**Assessment of outcome**	**Was follow-up long enough for outcomes to occur**	**Adequacy of follow up of cohorts**
a) truly representative of the average in the community* b) somewhat representative of the average in the community * c) selected group of opioid dependent people d) no description of the derivation of the cohort	a) drawn from the same community as the exposed cohort * b) drawn from a different source c) no description of the derivation of the non exposed cohort	a) secure record (eg clinical records) * b) structured interview * c) written self report d) no description	a) yes * b) no	a) Study controls for * (Most important factors) b) Study controls for any additional factor *	a)Independent blind assessment* b) record linkage * c) self report (for side effects) d) no description	a) yes (select an adequate follow up period for outcome of interest) ** b) no	a) complete follow up - all subjects accounted for* b) subjects lost to follow up unlikely to introduce bias (≤ 5%)* c) subjects lost to follow up > 5% and description provided of those lost d) no statement
Selection****Comparability* Outcome*							

	Study (author and year): Read 2010						
Selection				**Comparability**	**Outcome**		
Representativeness of the exposed cohort	**Selection of the non exposed cohort**	**Ascertainment of exposure**	**Demonstration that outcome of interest was not present at start of study (for side effects)**	**Comparability of cohorts on the basis of the design or analysis**	**Assessment of outcome**	**Was follow-up long enough for outcomes to occur**	**Adequacy of follow up of cohorts**
a) truly representative of the average in the community* b) somewhat representative of the average in the community * c) selected group of opioid dependent people d) no description of the derivation of the cohort	a) drawn from the same community as the exposed cohort * b) drawn from a different source c) no description of the derivation of the non exposed cohort	a) secure record (eg clinical records) * b) structured interview * c) written self report d) no description	b) yes * b) no	a) Study controls for * (Most important factors) b) Study controls for any additional factor *	a)Independent blind assessment* b) record linkage * c) self report (for side effects) d) no description	a) yes (select an adequate follow up period for outcome of interest) ** b) no	a) complete follow up - all subjects accounted for* b) subjects lost to follow up unlikely to introduce bias (lost to follow-up □□5%)* c) subjects lost to follow up > 5% and description provided of those lost d) no statement
Selection**** Comparability 0 stars Outcomes*							

	Study (author and year): Suryavanshi 2003						
Selection				**Comparability**			**Outcome**
Representativeness of the exposed cohort	**Selection of the non exposed cohort**	**Ascertainment of exposure**	**Demonstration that outcome of interest was not present at start of study (for side effects)**	**Comparability of cohorts on the basis of the design or analysis**	**Assessment of outcome**	**Was follow-up long enough for outcomes to occur**	**Adequacy of follow up of cohorts**
a) truly representative of the average in the community* b) somewhat representative of the average in the community * c) selected group of opioid dependent people d) no description of the derivation of the cohort	a) drawn from the same community as the exposed cohort * b) drawn from a different source c) no description of the derivation of the non exposed cohort	a) secure record (eg clinical records) * b) structured interview * c) written self report d) no description	c) yes * b) no	a) Study controls for * (Most important factors) b) Study controls for any additional factor *	a)Independent blind assessment* b) record linkage * c) self report (for side effects) d) no description	a) yes (select an adequate follow up period for outcome of interest) ** b) no	a) complete follow up - all subjects accounted for* b) subjects lost to follow up unlikely to introduce bias (lost to follow-up ≤5%)* c) subjects lost to follow up > 5% and description provided of those lost d) no statement
Selection*** Comparability 0 stars Outcome**							

	Study (author and year): Thakwalakwa 2014						
Selection				**Comparability**	**Outcome**		
Representativeness of the exposed cohort	**Selection of the non exposed cohort**	**Ascertainment of exposure**	**Demonstration that outcome of interest was not present at start of study (for side effects)**	**Comparability of cohorts on the basis of the design or analysis**	**Assessment of outcome**	**Was follow-up long enough for outcomes to occur**	**Adequacy of follow up of cohorts**
a) truly representative of the average in the community* b) somewhat representative of the average in the community * c) selected group of opioid dependent people d) no description of the derivation of the cohort	a) drawn from the same community as the exposed cohort * b) drawn from a different source c) no description of the derivation of the non exposed cohort	a) secure record (eg clinical records) * b) structured interview * c) written self report d) no description	d) yes * b) no	a) Study controls for * (Most important factors) b) Study controls for any additional factor *	a)Independent blind assessment* b) record linkage * c) self report (for side effects) d) no description	a) yes (select an adequate follow up period for outcome of interest) ** b) no	a) complete follow up - all subjects accounted for* b) subjects lost to follow up unlikely to introduce bias (lost to follow-up □□5%)* c) subjects lost to follow up > 5% and description provided of those lost d) no statement
Selection*** Comparability 0 stars Outcome**							

Quality assessment of Cross-sectional studies

Study (author and year): Bii 2008						
Selection (max 5 stars)				**Comparability (max 2 stars)**	**Outcome (max 3 stars)**	
Representativeness of the sample	Sample size	Non-respondents	Ascertainment of the exposure (risk factor)	The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.	Assessment of outcome	Statistical test
a) Truly representative of the average in the target population. * (all subjects or random sampling) b) somewhat representative of the average in the target population. * (non-random sampling) c) Selected group of users. d) No description of the sampling strategy.	a) Justified and satisfactory. * b) Not justified	a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. * b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory. c) No description of the response rate or the characteristics of the responders and the non-responders.	a) Validated measurement tool. ** b) Non-validated measurement tool, but the tool is available or described.* c) No description of the measurement tool.	a) The study controls for the most important factor (select one). * b) The study control for any additional factor. *	a) Independent blind assessment. ** b) Record linkage. ** c) Self report. d) No description.	a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). * b) The statistical test is not appropriate, not described or incomplete. --just percentage reported
Selection ** Comparability 0 stars Outcome 0 stars						

Study (author and year): Matovu 2008						
Selection (max 5 stars)				**Comparability (max 2 stars)**	**Outcome (max 3 stars)**	
Representativeness of the sample	Sample size	Non-respondents	Ascertainment of the exposure (risk factor)	The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.	Assessment of outcome	Statistical test
a) Truly representative of the average in the target population. * (all subjects or random sampling) b) some what representative of the average in the target population. * (non-random sampling) c) Selected group of users. (women adhered to EBF were enrolled) d) No description of the sampling strategy.	a) Justified and satisfactory. * b) Not justified	a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. * b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory. c) No description of the response rate or the characteristics of the responders and the non-responders.	a) Validated measurement tool. ** b) Non-validated measurement tool, but the tool is available or described.* c) No description of the measurement tool.	a) The study controls for the most important factor (select one). * b) The study control for any additional factor. *	a) Independent blind assessment. ** b) Record linkage. ** c) Self report. d) No description.	a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). * b) The statistical test is not appropriate, not described or incomplete.
Selection **Comparability **Outcome*						

Study (author and year): Nlend 2008						
Selection (max 5 stars)				**Comparability (max 2 stars)**	**Outcome (max 3 stars)**	
Representativeness of the sample	Sample size	Non-respondents	Ascertainment of the exposure (risk factor)	The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.	Assessment of outcome	Statistical test
a) Truly representative of the average in the target population. * (all subjects or random sampling) b) somewhat representative of the average in the target population. * (non-random sampling) c) Selected group of users. (women who intended to breast feed) d) No description of the sampling strategy.	a) Justified and satisfactory. * b) Not justified	a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. * b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory. c) No description of the response rate or the characteristics of the responders and the non-responders.	a) Validated measurement tool. ** b) Non-validated measurement tool, but the tool is available or described.* c) No description of the measurement tool.	a) The study controls for the most important factor (select one). * b) The study control for any additional factor. *	a) Independent blind assessment. ** b) Record linkage. ** c) Self report. d) No description.	a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). * b) The statistical test is not appropriate, not described or incomplete.
Selection** Comparability 0 stars Outcomes*						

Study (author and year): Young 2015						
Selection (max 5 stars)				**Comparability (max 2 stars)**	**Outcome (max 3 stars)**	
Representativeness of the sample	Sample size	Non-respondents	Ascertainment of the exposure (risk factor)	The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.	Assessment of outcome	Statistical test
a) Truly representative of the average in the target population. * (all subjects or random sampling) b) somewhat representative of the average in the target population. * (non-random sampling) c) Selected group of users. d) No description of the sampling strategy.	a) Justified and satisfactory. * b) Not justified	a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. * b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory. c) No description of the response rate or the characteristics of the responders and the non-responders.	a) Validated measurement tool. ** b) Non-validated measurement tool, but the tool is available or described.* (pre-tested tool used) c) No description of the measurement tool.	a) The study controls for the most important factor (select one). * b) The study control for any additional factor. *	a) Independent blind assessment. ** b) Record linkage. ** c) Self report. d) No description.	a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). * b) The statistical test is not appropriate, not described or incomplete.
Selection**** comparability 0 stars Outcome*						

Question: In countries that promote breastfeeding in HIV (+) women on ARV therapy, what are the effective interventions to support breastfeeding?
Setting: Countries that promote EBF in HIV population

Bibliography: Thirteen studies reported primary data with outcomes of interest and were included in grade profile

Quality assessment							№ of patients		Effect		Quality	Importance
№ of studies	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**breastfeeding promotion**	**no breastfeeding promotion**	**Relative (95% CI)**	**Absolute (95% CI)**		
Exclusive Breastfeeding for 6 Months (Bii 2008, Matovu 2008, Piwoz 2007, Thakwalakwa 2014, Young 2015)												
5	observational studies	serious [1]	not serious	not serious	not serious	none	386/1095 (35.3%)	0.0%	not estimable		⊕◯◯◯ VERY LOW [1]	CRITICAL
Early Initiation of Breastfeeding (within 1 hr) Observational (Matovu 2008, Mazia 2009, Nlend 2010)												
3	observational studies	serious [1,2]	not serious	not serious	not serious	none	243/336 (72.3%)	0.0%	not estimable		⊕◯◯◯ VERY LOW [1,2]	CRITICAL
Early Initiation of Breastfeeding (within 1 hr) RCT (Tomlinson 2014)												
1	randomised trials	not serious	not serious	serious [3]	not serious	none	561/1629 (34.4%)	607/1865 (32.5%)	**RR 1.06** (0.96 to 1.17)	20 more per 1000 (from 13 fewer to 55 more)	⊕⊕⊕◯ MODERATE [3]	CRITICAL

Quality assessment							№ of patients		Effect		Quality	Importance
№ of studies	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**breastfeeding promotion**	**no breastfeeding promotion**	**Relative (95% CI)**	**Absolute (95% CI)**		
Exclusive Breastfeeding for 3 Months (Bii 2008, Bland 2008, Iliff 2005, Nlend 2010, Piwoz 2007, Read 2010, Young 2015)												
8	observational studies [4]	serious [2]	not serious	serious [5]	not serious	none	1000/2897 (34.5%)	980/10717 (9.1%)	**OR 2.86** (2.13 to 3.83)	132 more per 1000 (from 85 more to 187 more)	⊕◯◯◯ VERY LOW [2 5]	CRITICAL
Exclusive Breastfeeding for 3 months RCT (Tomlinson 2014)												
1	randomised trials	not serious	not serious	not serious	not serious	dose response gradient	130/405 (32.1%)	101/639 (15.8%)	**RR 1.53** (1.22 to 1.94)	84 more per 1000 (from 35 more to 149 more)	⊕⊕⊕⊕ HIGH	CRITICAL
Breastfeeding initiated (Mazia 2009, Nlend 2010, Read 2010, Suryavanshi 200, Young 2015)												
5	observational studies	serious [2]	not serious	not serious	not serious	none	408/536 (76.1%)	0.0%	not estimable		⊕◯◯◯ VERY LOW [2]	

Quality assessment							№ of patients		Effect		Quality	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	breastfeeding promotion	no breastfeeding promotion	Relative (95% CI)	Absolute (95% CI)		
Breastfeeding initiated RCT (Tomlinson 2014)												
1	randomised trials	not serious	not serious	serious [3]	not serious	none	561/1629 (34.4%)	607/1865 (32.5%)	**RR 1.06** (0.96 to 1.17)	20 more per 1000 (from 13 fewer to 55 more)	⊕⊕⊕◯ MODERATE [3]	

MD – mean difference, RR – relative risk

1. Matovu et al, 2008 :Risk of bias-Serious: Matovu included HIV+ women who already adhered to EBF. This selection bias can influence the findings.
2. Nlend et al, 2010: Risk of bias- Serious: the sample consists of women who were breast feeding and intended to breastfeed. This selection bias can influence the findings.
3. Tomlinson et al, 2014: Indirectness- Serious: the sample population consists of both HIV+ and HIV- women (30% with HIV). Data was not stratified by HIV status for early initiation outcome.
4. Bland et al, 2008 was the only study that reported odds ratios
5. Piwoz et al, 2005: Indirectness- Serious: the sample population consists of both HIV+ and HIV women (30% with HIV). Data was not stratified by HIV status for 3 month EBF .