

**Breastfeeding promotion and infant feeding practices
in South African women living in an area of high HIV prevalence**

Bentley J,

Highest degree: BSc Diet (Hons),
Exact description of position: Research Dietitian
Affiliated to: University of Natal,
Department to which work is attributed: Department of Paediatrics and Child Health

Coutsoudis A,

Highest degree: PhD
Exact description of position: Associate Professor
Affiliated to: University of Natal,
Department to which work is attributed: Department of Paediatrics and Child Health
Financial Support for project: USAID

Kagoro H.

Highest degree: - MSc
Exact description of position: Biostatistician
Affiliated to: Medical Research Council of South Africa
Department to which work is attributed: Biostatistics Unit

Newell M-L,

Highest degree: PhD
Exact description of position: Professor of Paediatric Epidemiology
Affiliated to: University College, London
Department to which work is attributed: Centre for Paediatric Epidemiology,
Institute of Child Health

Abstract:

Aim: To assess the effect of breastfeeding promotion on the rate of exclusive breastfeeding, and determine the effect of non-exclusive breastfeeding on the incidence of diarrhoea.

Methods: Mothers of infants younger than 6 months of age in an area of high HIV prevalence in Durban, South Africa, were surveyed before and after the introduction of an exclusive breastfeeding promotion campaign. Similar assessments were made in a control area where there was no intervention.

Main Findings: Exclusive breastfeeding rates increased in the intervention site ($P=0.031$) but not in the control site. Although the overall breastfeeding rate did not change, the use of formula increased significantly in the control site ($P=0.025$). The view that formula is good for the baby increased in both sites ($P=0.019$ intervention site; $P=0.000$ control site), probably as a consequence of the introduction of a new policy for the distribution of free formula milk to HIV infected mothers. Exclusive breastfeeding significantly reduced the reported episodes of diarrhoea in the 2 weeks prior to the survey ($P=0.000$).

Conclusions: It is possible to increase exclusive breastfeeding rates, thereby improving child health, but information must be consistent, especially in areas of high HIV prevalence, where formula use can increase mixed feeding rates.

Key words:

Breastfeeding, HIV, diarrhoea, peer counsellors

Summary

Aim: To assess the effect of breastfeeding promotion on the rate of exclusive breastfeeding in an area of high HIV prevalence, and to determine the effect of non-exclusive breastfeeding on the incidence of diarrhoea.

Methods: Mothers of infants younger than 6 months of age attending an antenatal clinic in the Cato Manor area of Durban, South Africa, were surveyed before and after the introduction of an exclusive breastfeeding promotion campaign. Similar assessments were made in a control area (KwaMashu) where there was no intervention. The intervention included the selection and training of 12 peer counsellors, who were responsible primarily for visiting women in their homes before and shortly after delivery to encourage, and support exclusive breastfeeding. Posters, a pamphlet, and 4 articles for the local newspaper were developed, and widely distributed in the intervention site. Role-plays, drama, songs and competitions were specially devised to promote exclusive breastfeeding on 3 breastfeeding promotional days in the clinic. At these promotional days, prizes were awarded for correctly completed competitions and random prizes were awarded for correctly completed competitions. These prizes included t-shirts, canvas bags, and notepads with exclusive breastfeeding slogans.

A questionnaire was developed as a cross sectional assessment tool to determine the infant feeding practices of women in the community, in the previous 24 hours. In addition mothers with infants 0-2 weeks old were also asked about feeding in the first 24 hours after delivery. Verbal consent for participation was obtained from each participant, before each interview. This questionnaire was administered to all eligible women attending the respective clinics, who were willing to participate, until 40 questionnaires were completed in each of five infant age categories: 0-2, 3-6, 7-13, 14-18 and 19-26 weeks, to ensure an even spread of ages for a total sample size of 200 in each area. The sample size of 200 was based on the following assumptions: an estimated exclusive breastfeeding rate of 10.4% at baseline to increase with the intervention to 20%. The significance level was set at 0.05 and the power at 80%. The interview was conducted in the local language, by trained counsellors. After 17 months, the same questionnaire was administered to women in the same 2 clinics in exactly the same age groups, in order to determine changes in infant feeding practices in these communities.

Main Findings: Over a 17 month period, the exclusive breastfeeding rate increased from 13.6% (n=29) to 21.5% (n=45) in the intervention site (P=0.019), while there was no change in the control site. The overall number of women breastfeeding did not change significantly over time, although in the intervention site, the use of formula within the first 24 hours decreased significantly (P=0.005), while it increased significantly in the control site (P=0.012). The view that formula is good for the baby increased in both sites (P=0.019 intervention site; P=0.000 control site), most likely as a consequence of the introduction of a new policy for the distribution of free formula milk to HIV infected mothers at King Edward Hospital and KwaMashu clinic. Exclusive breastfeeding was significantly associated with fewer reported episodes of diarrhoea in the 2 weeks prior to the questionnaire (P=0.000). While 4.8% (n=6) of the exclusively breastfed infants had reported diarrhoeal episodes, 18.7% (n=136) of the infants not exclusively breastfed reportedly had diarrhoea. When the mixed feeding group was separated from the group not being breastfed, 16.2% (n=94) of the mixed breastfeeding group, and 29.6% (n=42) of those not breastfed, had had an episode of diarrhoea.

Conclusion: It is possible to increase exclusive breastfeeding rates, thereby improving child health, but information given to new mothers must be consistent, especially in areas of high HIV prevalence, where formula use can increase mixed feeding rates.

Introduction

Exclusive breastfeeding, that is, feeding the infant breastmilk only, with no added fluids, solids, or non-sterile medicines (1) has been shown to be the healthiest, most protective method of feeding an infant in the first 6 months of life both in developing (2, 3, 4, 5, 6, 7) and developed countries (8, 9, 10, 11).

Breastfeeding is a risk factor for mother-to-child transmission of HIV infection, and where prolonged into the second year of life, may double the overall rate of transmission (12). However, findings from a study in Durban suggest that infants who are exclusively breastfed are less likely to become infected than those who receive both breastmilk together with other fluids and/or solids (13). Where HIV infected women are not in a position to provide safe breastmilk substitutes, promotion of exclusive breastfeeding may be one way to make breastfeeding safer (14; 15). Promotion of exclusive breastfeeding includes good management of lactation, encouraging proper attachment of the infant to the breast, and frequent feeding, both of which are important for preventing cracked nipples, engorgement, and mastitis, which increase the risk of HIV transmission through breastfeeding (14).

However, most mothers worldwide supplement breastmilk with water, teas, formula milk or cereal based feeds from an early age (16; 17). South Africa is no exception. Although 99% of the population initiate breastfeeding, exclusive breastfeeding is rare (18; 19); water is usually introduced before 1 month of age (19), and in Cape Town, only 24% of the babies received breastmilk as their only milk source between 4-6 months of age (20). Most mothers introduce solids before 3 months of age (19; 21; 22).

In South Africa, the 1998 DHS survey showed a rate of exclusive breastfeeding of 10.4% in infants under the age of 4 months (23). Our aim was to assess the rate of exclusive breastfeeding before and after a specific promotion campaign and to investigate reasons why other foods and drinks are used to supplement breastmilk. In addition we assessed the incidence of diarrhoea related to feeding practices. We surveyed mothers of infants younger than 6 months of age in two areas of Durban, where HIV prevalence is high. We then implemented a strategy to promote exclusive breastfeeding in one area. The efficacy of this intervention in increasing exclusive breastfeeding rates was assessed in comparison with rates in the control area.

Methods

The population

The intervention site was Cato Manor, an informal settlement on the outskirts of Durban. Following recent development of housing and infrastructure, this population is roughly equally distributed between those who have relatively well-built houses, running water and good sanitation, while the other half has informal housing, no sanitation, or electricity, and water from communal water points. Estimated HIV prevalence rates amongst pregnant women was 44% in 2001 (A. Coutsooudis, personal communication, 2002). A primary health care clinic services the area, open 5 days a week, from 7am to 4pm. Women deliver at the nearby referral hospital (King Edward Hospital (KEH)), which does not have any baby friendly policies, or practices.

The control site, KwaMashu, is a similar area about 30 km north of Cato Manor, but older, and with more developed infrastructure. Estimated HIV prevalence rates amongst pregnant women were 48% in 2001 (24). KwaMashu has a primary health care polyclinic that is open 24 hours, 7 days a week. There are delivery facilities at the polyclinic, and only complicated cases are referred to a hospital; usually KEH. This clinic became a government PMTCT (prevention of mother to child transmission of HIV) pilot site during the last 7 months of the intervention. As part of this intervention mothers who after counselling, elected to formula feed were provided with free formula milk by the health workers at the site.

Focus groups

To inform the strategy for the promotion of exclusive breastfeeding, informal focus group discussions were held with lay counsellors, and mothers. The lay counsellors had been working in the clinic for at least 6 months, talking to women about feeding choices with regards to their HIV status. Issues discussed included common feeding practices in the community, prejudices that women encountered, beliefs surrounding infant feeding, and care practices. Discussions held with mothers were included in our peer counsellor selection programme, where applicants were divided into groups of 5 women, with a study member in each group. In these discussion groups, common feeding practices in the community, why people chose to do this, who was considered influential, as well as barriers to breastfeeding promotion were addressed. In addition we used information obtained from formal focus group discussions held in the Hlabisa district, a rural area two hours north of Durban (22) and reviewed published literature.

Intervention Strategy

The intervention strategy consisted of the selection and training of 12 peer counsellors from the community, who were responsible primarily for visiting women in their homes to encourage them, and give information, where required. Bright, attractive posters were developed, as well as a pamphlet on exclusive breastfeeding, which was widely distributed. On antenatal clinic days, exclusive breastfeeding was promoted in the clinic through morning talks, songs, role-plays, as well as small group discussions with clients waiting to see the Nursing Sisters.

To select the peer counsellors, notices were placed in prominent areas of the community, requesting applications. Women were short-listed if they had completed 12 years of education, and had some additional training in care. Short-listed women were invited to a 2-day workshop, involving a variety of activities to determine characteristics such as caring, confidence, English language ability, leadership, and personal communication

skills. Twelve women from the community were selected, and trained as peer counsellors, using the WHO/UNICEF Breastfeeding Counselling Course (25). The women were of the same ethnic group as the community, and spoke the local language and English fluently. All had graduated from high school, and all but one had had previous breastfeeding experience. The latter counsellor did not have children, but had excellent counselling skills. The training consisted of 3 weeks of half-day classes, followed by 2 weeks of working in the clinic with supervision, and practical sessions in the local hospital, observed by a La Leche League Leader. Ongoing training and support was provided, with weekly report-back and problem solving sessions facilitated by one of us (JB).

A set of visual aids for each peer counsellor was developed to assist in the group counselling process. The peer counsellors were responsible for antenatal breastfeeding promotion at the clinic, and at home; supporting mothers in the local hospital to initiate breastfeeding as soon after delivery as possible, and visiting mothers in their homes to encourage them, and assist where necessary. There were no standard visiting protocols, but the peer counsellors attempted to visit mothers at least twice in the first month, and monthly thereafter. If a mother had difficulties, she was visited as required. Pregnant women in their last trimester were identified in the clinic, and visited at home. The peer counsellors working in the local hospital identified women who had recently delivered, and reported back to the group, and often mothers were identified by nappies hanging on the line outside their house, or pointed out by neighbours.

The peer counsellors also developed role-plays, drama, and songs to promote exclusive breastfeeding on special breastfeeding promotional days in the clinic. These promotional days were held 3 times during the 17 months of the intervention. At these promotional events prizes were awarded for correctly completed competitions. These prizes included specially printed t-shirts and canvas bags, with specially designed exclusive breastfeeding slogans. Notepads with promotional messages were also designed, and given out freely. A pamphlet promoting exclusive breastfeeding was developed, and distributed widely within the community, and 4 articles were written in the local newspaper, discussing various aspects of exclusive breastfeeding. The newspaper was only distributed in the intervention area, and would not have been available in the control site, unless a visitor had brought it from the community.

Five clinic Nursing Sisters also attended an 18 hour lactation management course provided by our study team in conjunction with the nursing services in-service training division. Unfortunately, due to Health Department policy, nurses were rotated frequently, and the clinic did not necessarily benefit from this training exercise.

Survey

A questionnaire was developed and piloted with 20 mothers who attended the intervention clinic. Following this it was modified before being finalised. The questionnaire was developed as a cross sectional assessment tool, to determine the infant feeding practices of women in the community in the 24 hours before the survey. Verbal consent for participation was obtained from each participant, before each interview.

In the baseline survey in both intervention and control areas, women were asked how they had fed their infants in the last 24 hours, whether they had been away from the infant in the last week, and how the infant was fed during their absence. Questions also included whether the infant had had diarrhoea in the last 2 weeks, had ever been hospitalised for

diarrhoea, why the mother was feeding her baby as she was, and who had been the main source of information regarding infant feeding requirements. This questionnaire was administered to all eligible women attending the respective clinics, who were willing to participate, until 40 questionnaires were completed in each of the following age categories: 0-2, 3-6, 7-13, 14-18 and 19-26 weeks, to ensure an even spread of ages for a total sample size of 200 in each area. The sample size of 200 was calculated using the following assumptions; based on findings from the 1998 DHS survey an estimated 10.4% of the women in the intervention site would be exclusively breastfeeding and with the intervention this would increase to 20%. The significance level was set at 0.05 and the power at 80%. Mothers in the 0-2 weeks group were also asked about feeding in the first 24 hours after delivery. The interview was conducted in the local language, by trained counsellors. After the intervention programme had been in place for 17 months (July 2000 to November 2001) the same questionnaire was administered to women in the same 2 clinics and in the same age groups, to determine changes in infant feeding practices in these communities.

Statistical Analysis

Statistical analysis was conducted using the Statistical Analysis System (SAS) and SPSS software. Continuous variables were analysed using T-tests, and associations between categorical variables were analysed using Chi Square tests. Logistic regression analysis was used to determine the important predictors of the likelihood of exclusive breastfeeding.

Ethics Approval

Ethics approval was obtained from the University Ethics Committee, and permission to conduct the questionnaire in the clinics was obtained from the local Health Department. Permission for the peer counsellors to work in the area was obtained from the local community leaders.

Results

A total of 849 questionnaires were completed: 214 baseline and 209 evaluation questionnaires in Cato Manor (intervention site), and 217 baseline and 209 evaluation questionnaires were completed in KwaMashu (control site). The respondents were mostly mothers (93%), but sometimes by other carers. Median maternal age at interview was 24 year (range 12-52), and did not differ by area or by time (Table 1). Only 17.2% of the mother had not received some high school education, and there was no significant difference between sites or at the two time points.

While most mothers in the intervention site delivered in a hospital (n=169; 79%), fewer mothers at the control site delivered in a hospital (n=64; 29.6%). Eighteen percent (n=38) of the mothers from the control site delivered at the same hospital as the mothers from the intervention site. The place of delivery affected how soon the mother saw her baby for the first time, and how soon she initiated feeding. While at baseline only 10% (n=4) of the mothers in the intervention site fed their infant within the first hour, 52.4% (n=22) of the mothers at the control site did so (Table 1). This did not change significantly over time (Table 1).

Most mothers initiated breastfeeding within the first 24 hours (Table 1). At the control site, there was a drop in the initiation of breastfeeding within the first 24 hours, but this was not statistically significant (Table 1). In the intervention site, the extent of giving formula feeds within the first 24 hours decreased significantly over the period of time, while it increased significantly in the control site (Table 1).

Most mothers (n=705; 83%) reported to be breastfeeding in the preceding 24 hours at both time points, in both sites, and this did not change significantly. There was a significant change in the use of formula milk in the control site (P=0.025).

Exclusive breastfeeding:

The exclusive breastfeeding rate in the preceding 24 hours in all age groups increased from 13.6% (n=29) at baseline, to 21.5% (n=45) after 17 months of breastfeeding promotion in the intervention site (P=0.019) (Table 2). In contrast in the control site there was no significant change in exclusive breastfeeding rates (Table 2). At baseline in the intervention site, about one in five infants aged less than 13 weeks were exclusively breastfed, and less than one in twenty between 14 and 26 weeks. This increased to about one in three infants in the first 13 weeks, and one in seven between 14-26 weeks post intervention (p=0.034) (Table 2). The difference between the 2 sites in the proportion of infants exclusively breastfed aged 0-13 weeks was statistically significant (P=0.009). In logistic regression analysis age of the mother was significantly associated with exclusive breastfeeding (P=0.0223), and a one unit increase in age (years) was associated with a 3.9% increase in the odds of exclusive breastfeeding.

Supplementation of breastmilk

155 (38%) women decided to provide the infant with formula milk in addition to breastmilk because they 'did not have enough milk'. Maternal employment was the second most common reason for introducing formula (n=92; 21.8%). The view that formula is good for the baby increased in both sites, from 3% (n=3) to 11.7% (n=11) in the intervention site (p=0.019), and from 0% to 19.5% (n=23) in the control site (p=0.000).

The most common drinks given to infants were over-the-counter medicines (n=380; 44.8%), followed closely by water (n=263; 31%). There was a significant drop in the use of water in the

intervention site from 32.7% (n=70) pre-intervention to 20.6% (n=43) post-intervention (p=0.016); and a significant increase in use of water in the control site from 30.1% (n=65) to 40.7% (n=85) (p=0.009). The use of sugar water also increased significantly in the control site from 6.9% (n=15) pre-intervention to 13.9% (n=29) post-intervention (p=0.027). In the intervention site, there was a significant reduction in the use of traditional medicines from 10.3% (n=22) pre-intervention to 3.3% (n=7) post-intervention (p=0.01), as well as an overall reduction in the use of drinks in infants aged between 14-26 weeks (n=71 (88.8%) pre-intervention, and n=63 (75.9%) post-intervention, p=0.032).

One of the main reasons why fluids were added was for 'cleaning the baby's stomach', or purging the infant. Water, sugar water, oral rehydration solution, medicines from the traditional healer, and over-the-counter medicines were given for this purpose. Water and juice were also given for quenching thirst, while sugar water, and oral rehydration solution were also given to combat diarrhoea. Over-the-counter medications were also given for constipation, and traditional medicines were given to protect the infant from evil, and illness.

Solids were offered most often because the baby was not satisfied with milk only (n=262; 66.7%). The next most common reason for adding solids was that the baby was old enough (n=65; 16.5%). These reasons were the most common in infants of all ages.

Post intervention, there was a significant reduction (p=0.007) in the number of infants aged between 14 and 26 weeks who received solids in the intervention site viz. from 89.9% (n=71) to 73.5% (n=61), but no such reduction was seen in the control site (87.5% (n=70) and 81.7% (n=67) respectively).

Separation:

Most mothers who were separated from their infants, were away for less than eight hours. Of these there was a significant increase in the number of mothers who left expressed breastmilk for their infant while they were away. At baseline, in the intervention site, only 3 mothers (5.8%) left breastmilk, while post intervention, 18 (25%) left breastmilk for their infants (P=0.005). In the control site, use of expressed breastmilk increased nearly two-fold from 5 (6.7%) at baseline to 9 (11.39%) (P=0.045).

Advice given regarding infant feeding:

Most women (n=359; 85.9%) had heard talks on antenatal days about breastfeeding, but while 47.4% (n=99) of the mothers had received some advice on breastfeeding from a health care worker in the intervention site, 84.2% (n=176) at the control site had had advice from a health care worker (p=0.000). In the intervention site, 73.3% (n=33) of the women who were exclusively breastfeeding had had advice from a health care worker regarding breastfeeding, and 93% (n=42) had listened to a talk on breastfeeding during pregnancy. Fifty one percent (n=23) of these women had been visited by a breastfeeding counsellor.

Infant feeding and morbidity:

Since the groups were very small, all data from both time points was pooled to evaluate the effect of infant feeding on morbidity. Exclusive breastfeeding in the 24 hours preceding the interview was significantly associated with fewer reported episodes of diarrhoea in the 2 weeks prior to the questionnaire (P=0.000). While 4.8% (n=6) of the exclusively breastfed infants had reported diarrhoeal episodes in the previous 2 weeks, 18.7% (n=136) of the infants not exclusively breastfed reportedly had diarrhoea in the previous 2 weeks (RR=3.96 with a 95% CI [1.79, 8.76]). All 6 exclusively breastfed infants who had

diarrhoea were less than 14 weeks old, and 40.4% (n=55) of the non-exclusively breastfed infants who had diarrhoea were less than 14 weeks old. When the mixed feeding group was separated from the group not being breastfed, 16.2% (n=94) of the mixed breastfeeding group (RR=3.4 with a 95% CI [1.53, 7.59]), and 29.6% (n=42) of those not breastfed, had had an episode of diarrhoea in the previous 2 weeks (RR=6.21 with a 95% CI [2.73, 14.12]).

Although there were no exclusively breastfed infants that were hospitalised for diarrhoea, and there were 19 (2.6%) infants who were not exclusively breastfed hospitalised for diarrhoea, this difference was not significant. Of the 19 infants, 9 (47.4%) were not breastfed. Of all the non-breastfed infants, 6.3% (n=9) had been hospitalised for diarrhoea, as compared to 1.4% (n=10) of the total breastfeeding population (RR=4.63 with a 95% CI [1.92, 11.19]). This difference was significant (P=0.000).

Discussion:

We assessed infant feeding practices in the first 6 months of life in two cross sectional surveys, 17 months apart, in two communities living in two sites in Durban, South Africa. In one site, Cato Manor, an extensive exclusive breastfeeding promotion intervention was implemented while in the other site, KwaMashu, this was not the case. Although the prevalence of exclusive breastfeeding is known to be overestimated by surveys of this sort (26, 27), which we also observed, our objective was to monitor change over time after the implementation of a breastfeeding promotion intervention. The results at the two time points and at the two sites are thus likely to overestimate the rate of exclusive breastfeeding to the same extent, making the results comparable.

The two study sites were similar in character, but not identical. Differences did exist in place of delivery, which affected when the mother first saw her baby, and gave the first breastfeed. Most women in the intervention site delivered in a tertiary hospital, where they waited more than four hours before initiating breastfeeding. On the other hand, most mothers in the control site initiated breastfeeding within the first hour post delivery, and delivered in a local clinic. Initiating breastfeeding within the first hour of delivery has been associated with longer duration of breastfeeding, and an increased rate of exclusive breastfeeding (28). These differences highlight the need for interventions aimed at improving exclusive breastfeeding to include hospital based services as well as community based health care provisions (29).

In our survey, more than 90% of mothers reported to have initiated breastfeeding within the first 24 hours, similar to percentage reported by others in South Africa (18; 19). The use of formula significantly decreased in the intervention site, but increased in the control site over the study period. This increase in the control site could have been attributable to the distribution of free formula to HIV infected mothers participating in the PMTCT programme at the control clinic.

The promotion of exclusive breastfeeding in the community led to a significant increase in the rate of exclusive breastfeeding, despite the fact that less than half of the intervention population interviewed had ever been visited at home by a peer counsellor. There was no change in the overall rate of breastfeeding in the control site, but there was a significant increase in the number of women who were giving formula suggesting an increase in women who were mixed feeding ie giving formula milk in addition to breastfeeding, which is known to be detrimental for infant health (14; 15). This may reflect a “spill-over” effect of the free formula being distributed at the PMTCT sites resulting in an increase in the practice of mixed breastfeeding with breastmilk and formula milk as highlighted by Coutsooudis et al (30) and as shown in the recent evaluation of the PMTCT sites in Botswana (31). Reasons given by mothers for adding formula were mostly related to perceived insufficient milk, and separation due to employment, similar to findings elsewhere (32, 33).

A disturbing finding was the significant increase in the perception of the mothers that formula is as good as breastmilk, especially in the control area, which became a pilot site for PMTCT seven months prior to the second evaluation. This increase may have been related to the advice from health care workers to HIV infected women to formula feed, as well as the media coverage of the legal battle between the Treatment Action Campaign (TAC), and the government, regarding the distribution of nevirapine and free formula to all

pregnant HIV infected women (34; 35). Distribution of free formula by health workers is seen as an endorsement of the product and can have serious spill-over effects as mentioned earlier (30).

Exclusive breastfeeding was significantly associated with fewer reported episodes of diarrhoea in the 2 weeks prior to the survey questionnaire, consistent with other reports (7; 8; 36). Again this has important implications for populations in Africa where formula feeding is encouraged as a means of preventing HIV transmission with little regard for the converse that formula feeding increases morbidity and mortality (37; 38; 30).

The introduction of breastfeeding counsellors to the intervention site may have resulted in a shift in the perceived responsibility of the nursing staff. Although most women had heard talks on antenatal days about breastfeeding (mostly by breastfeeding counsellors at the intervention site), less than half of the mothers had had any individual advice on breastfeeding from a health care worker. Of the women who were exclusively breastfeeding, three-quarters had had advice from a health care worker regarding breastfeeding, and nearly all had listened to a talk on breastfeeding during pregnancy. The consistent, repeated advice from different sources may be the reason why these women were more likely to adhere to the advice given.

In both sites the number of mothers who were expressing breastmilk to cover the period while they were absent, increased over time, probably because during this period the Department of Health had developed a pamphlet on expressing breastmilk which was available at all clinics in the province including the 2 clinics involved in this study. This was very encouraging and highlights the important role played by the endorsement of a practice by health workers and health facilities.

In conclusion our study has shown that it is possible to increase exclusive breastfeeding rates at a population level, and thus improve child health. However exclusive breastfeeding rates did not improve to the same extent as found in Bangladesh (39) and Mexico (40). This may be partly due to the method of assessment and the cross-sectional nature of our community-based survey, and partly because the intervention was not directly linked to individual women targeted for the intervention. Because of the informal nature of the intervention community women in the post-intervention evaluation may not have been in the community for the full 17 months of the intervention. In addition the community was exposed to conflicting information – little breastfeeding promotion by the nursing staff; little support for exclusive breastfeeding in the delivery hospital; media coverage of the risks of contracting HIV through breastfeeding, and then promotion of exclusive breastfeeding by peer counsellors. The study highlights the importance of comprehensive promotional efforts, for better success, and the use of specific messages regarding exclusive breastfeeding, rather than general breastfeeding promotional messages, which may only increase the rate of mixed feeding (29, 41, 36, 40).

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Table 1. Comparison of Mothers at the 2 sites

	Intervention site		Control site	
	Baseline	Post intervention	Baseline	Post intervention
Maternal age (years)	25.1 (24.3-25.9)	26.2 (25.1-27.4)	24.8 (23.9-25.6)	25.7 (24.8-26.6)
Mother as respondent	202/213 (94.8%)	197/204 (94.4%)	199/216 (92.1%)	192/207 (92.8%)
No high school education	40/212 (18.9%)	33/201 (16.4%)	37/203 (18.2%)	31/206 (15%)
Breastfed < 1hr after delivery	4/40 (10%)	8/40 (20%)	23/42 (54.8%)	21/40 (52.5%)
Breastmilk in first 24 hours	37/40 (92.5%)	40/40 (100%)	40/42 (93%)	34/40 (85%)
Formula in first 24 hours	12/40 (30%)	0/40 (0%)#	2/42 (4.8%)	6/40 (15.4%)*
Breastmilk in last 24 hours	179/214 (83.6%)	176/209 (84.2%)	182/217 (84.3%)	168/209 (80.4%)
Formula in last 24 hours	102/214 (47.7%)	94/209 (45%)	99/217 (45.8%)	119/209 (56.9%)†

(P=0.005)

* (P=0.012)

† (P=0.025)

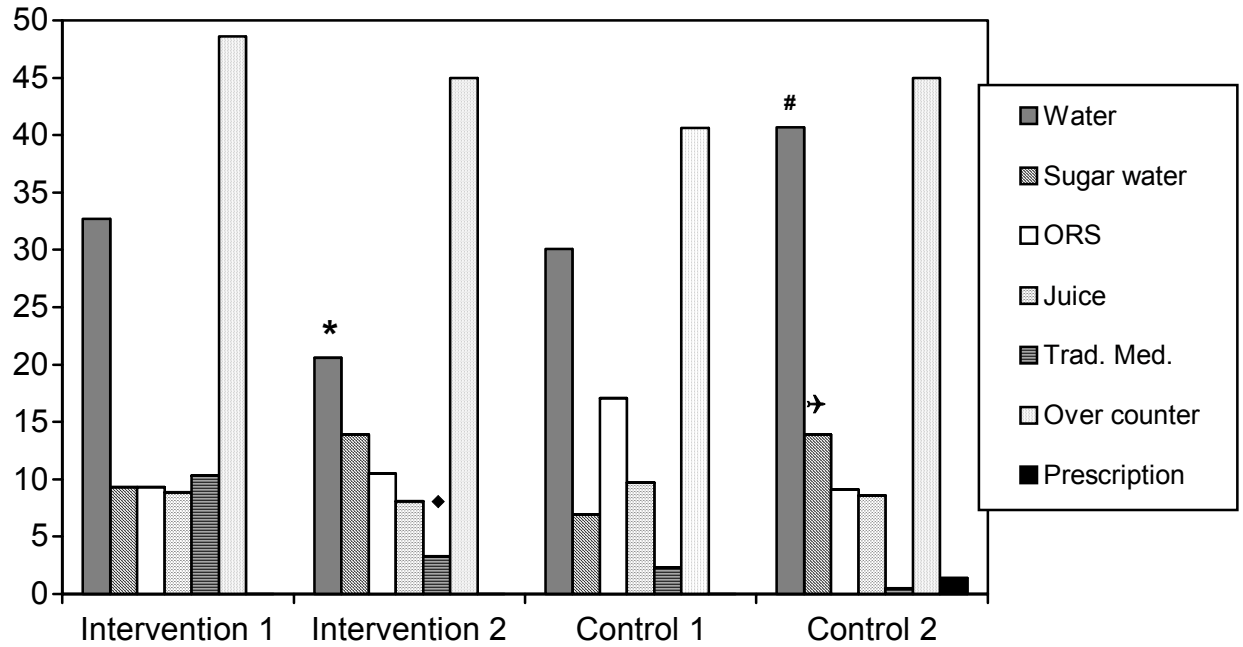
Table 2. Comparison of Exclusive Breastfeeding Practices at the 2 sites.

	Intervention site		Control site	
	Baseline	Post intervention	Baseline	Post intervention
Exclusive breastfeeding	29/214 (13.6%)	45/209 (21.5%) †	29/217 (13.4%)	23/209 (11.0%)*
Exclusive breastfeeding (% of all breastfeeders)	29/ 179 (16.2%)	45/176 (25.6%) †	29/182 (15.9%)	23/168 (13.7%)
Exclusive breastfeeding < 14 weeks (% of breastfeeders)	27/122 (21.1%)	36/111 (32.4%)◆	26/119 (21.8%)	19/112 (17%)
Exclusive breastfeeding 14-26 weeks (% of breastfeeders)	2/57 (3.5%)	9/65 (13.8%)◆	3/63 (4.8%)	4/56 (7.1%)

† (P=0.031)

- * (P=0.004) (Intervention site vs control site)
- ◆ (P=0.009) (Intervention site vs control site)
- ◆ (P=0.034)
- ‡ (P=0.03)

Figure 1 Use of supplemental liquids (Percentage of all infants)



Intervention1 = baseline at the intervention site;
 Intervention 2 = endpoint at the intervention site
 Control 1 = baseline at the control site;
 Control 2 = endpoint at the control site

* Significant decrease in the use of water in the intervention site post-intervention (p<0.05)

Significant increase in use of water in the control site post-intervention (p<0.01)

‡ Significant increase in the use of sugar water in the control site post-intervention (p<0.05)

◆ Significant reduction in the use of traditional medicines in the intervention site post-intervention (p<0.05)