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Development of Effective Strategies to Support Breastfeeding

M. Jane Heinig, PhD, IBCLC, Karen Farley, RD, IBCLC

In nearly every country in the world, the duration of exclusive breastfeeding falls short of that recommended by the World Health Organization. Despite extensive efforts toward breastfeeding promotion in industrialized nations, gains in breastfeeding rates have been made predominantly in initiation rather than duration. This lack of progress has puzzled and frustrated many well-intentioned breastfeeding advocates. However, few agencies and organizations have taken a systematic approach in developing broad-based programs.

One of the most efficient means to progress toward a goal is to learn from the experience of others. We are fortunate that two recent extensive reviews highlight effective strategies used to enhance breastfeeding initiation and duration among a variety of populations.

Fairbank et al conducted a systematic review of interventions to promote the initiation of breastfeeding. This review critically evaluated the effectiveness of 59 studies, including both randomized and nonrandomized trials of interventions that occurred before the first breastfeed. Although few populations reached initiation rates that were comparable to public health goals, several types of interventions were related to breastfeeding rates that were significantly greater in experimental groups as compared to controls. These successful interventions included informal small-group training during the prenatal period, changes in hospital practices (such as the implementation of mother-baby “rooming in”), media campaigns, multifaceted interventions (media campaigns or peer counselor programs, combined with structural changes to the health sector or health education programs), and peer counselor programs (although alone they were found to be successful only among motivated women). Programs that were not found to be successful included those providing literature only, health care provider training, and social support efforts by health care providers.

De Oliveira et al, in this issue of JHL, review interventions intended to extend the duration of breastfeeding. Interventions carried out in primary health care settings were included in this review. Thirty-seven studies met their selection criteria. Effective strategies combined information, guidance, and support, and were long-term and intensive. Among interventions provided only during the prenatal period, group education was the only strategy found to be effective. Home visits, individual education sessions, and multifaceted interventions were effective both prenatally and postnatally. Ineffective strategies provided no face-to-face contact, included practices that contradicted educational messages, or were small-scale interventions.

Although the evaluation of specific strategies provides important data in the development of promotion and support programs, we must question the usefulness of individual strategies in an effort to affect a complex behavior. A mother’s decisions whether or not and how long to breastfeed are affected by many factors; therefore, promotion and support of breastfeeding must include several components. A conceptual view of these components is presented (Figure 1) and illustrates that each is dependent and built upon the others.

Motivation is central to a woman’s choice to breastfeed and is driven by her personal beliefs and the support and information she receives from her family, friends, and society at large. Much of the investment in breastfeeding promotion has been spent in attempts to motivate women through the provision of information regarding the benefits of breastfeeding, incentive programs, and media campaigns. In the last few years, breastfeeding advocates have realized that motivation is necessary not just for mothers but for friends and family members and for health care providers, because these individuals are likely to directly affect a mother’s feeding decision. Motivation continues to be important throughout lactation. As mothers’ other responsibilities increase, motivation may be more difficult to sustain. Further, cultural and family support for breastfeeding.
may wane as the infant grows older. Certainly, motivation of families and health care providers is essential to building an effective program; however, it is only the first step in the process.

Education is also an important component in any effort to improve breastfeeding rates. Women, family members, community members, and health care providers must be educated with regard to the basics of the breastfeeding process, that is, at least to the point where they will “do no harm.” In intensive programs, further specialized education is needed for more advanced support. Because of the many myths perpetuated by a society that has long been bottle-fed, client-centered lactation education may be the key to removing some of the greatest barriers faced by new mothers. The evidence suggests that education is best provided informally to mothers and families during both the prenatal and postnatal periods.

Skills are not learned through discussion, media campaigns, or reading materials. Skills are obtained through hands-on training and practice, and their acquisition requires mother and baby to have access to each other. A mother must have skills training specific to her circumstances. Often, this is the element most lacking in breastfeeding support. Mothers need access to their infants and time to practice new behaviors with supportive and knowledgeable assistance. Access may be a particular issue for women who must be separated from their infants due to illness or employment, and lack of access may be a significant barrier to extended breastfeeding.

With the broader picture in mind, comprehensive programs should be developed to address each step in this process. Such programs might include both professional and public education, prenatal and postnatal support by qualified professionals, development and enforcement of model hospital policies, and advocacy for changes in the workplace. Although there are many intangibles that cannot be addressed through this process, such as mothers’ self-esteem and success with the transition to motherhood, addressing the larger picture will provide every mother with the best chance to be confident that she can overcome any barriers that may arise.

Individual programs or agencies cannot address all new mothers’ needs. Such efforts require broad-based cooperation among many individuals, programs, and institutions. Coalitions, interested health care providers, and lactation consultants can provide the broader view and become agents for change. Unfortunately, cooperation is most needed in areas with the least resources, where competition for scarce funds may result in acrimony. However, until we have such cooperation, it is unlikely that great strides will be made in extending breastfeeding duration (either exclusive or with complementary foods) to meet public health goals.

References
Hydrogel Dressings

I can appreciate and share the concerns expressed with regard to recommendations for the use of hydrogel dressings on nipple wounds in breastfeeding mothers (JHL 2001;17:115-116). We began using ConMed’s water-based hydrogel dressing product, Clear Site, more than 5 years ago after investigating treatment options for damaged nipples. There are many varieties of hydrogel dressings on the market, and we searched for a product that was safe, effective, and completely compatible with breastfeeding. ConMed repeatedly assured us, verbally and in writing, that a nursing mother could safely use Clear Site. We used the product on hundreds of mothers with very positive results. Mothers verbalized tremendous and immediate pain reduction. We experienced no increase in infection rates.

There was no research available with regard to the use of a water-based hydrogel as a nipple wound treatment. We began such a research project involving a subjective pain rating scale and serial wound photographs, comparing the use of Clear Site with ultra-pure lanolin for speed of healing and pain relief in nipple wounds. ConMed, Medela, and our hospital had all partially funded the study. We suspended the study when questions arose with regard to what amount of propylene glycol residue was left on the breast once the dressing was removed, and ConMed was no longer recommending the use of the product for nipple wounds pending the outcome of its own research.

Propylene glycol is a solvent, commonly listed as an ingredient in numerous infant and pediatric oral medications, including vitamins, antihistamines, and fever reducers. It is also used as a moisturizing agent, both in creams and lotions, and in water-based hydrogel dressings. World Health Organization guidelines suggest that intake be limited to 25 mg/kg every 24 hours.

Hydrogels are either glycerin based, such as the recently introduced Soothies™, or water based, as is Clear Site and the recently introduced Maternimates™. We were fearful of using a glycerin-based dressing, based on Brent’s study, which showed a high infection rate with the use of Elasto-Gel, a glycerin-based hydrogel.

We began to search for an alternative water-based hydrogel product. Several other wound-dressing companies introduced competing products designed and marketed specifically for breastfeeding mothers. One company, Kendall, of Tyco Healthcare, introduced a water-based hydrogel for use on nipple wounds, now known as Maternimates™, with initial directions to wash the breast before nursing in order to remove any potential propylene glycol residue left on the skin. Subsequently, Kendall did research with regard to levels of propylene glycol left on the skin after dressing removal, which indicated that washing the breast before nursing was not necessary. The current Maternimates™ guidelines omit this step based on Kendall’s studies. We have been using this product for some time now and have been very pleased with its performance. It lasts longer than Clear Site, 3 to 7 days, and the dressing itself can be rinsed to wash.

Additional research is indicated as we all strive to improve the quality of care given to breastfeeding mothers experiencing nipple pain and trauma. I believe hydrogels will have a role in the treatment of nipple wounds.

Bonnie Cable, RN, IBCLC
Columbus, Ohio, United States

Reference

These factors are also a significant reason given by new mothers for discontinuing breastfeeding.\(^1\)

At a recent meeting of lactation counselors near Boston, Massachusetts, the use of hydrogel dressings to treat and soothe sore nipples became the subject of discussion. These dressings were being used widely by members of the group, who gave anecdotal evidence that they provided rapid relief from pain and that the mothers were delighted with them. Healing appeared to be more rapid compared to other more traditional methods (e.g., lanolin-based creams). Hydrogel dressings, which were primarily developed to treat burns and other deep skin wounds, combine glycerin and water in varying amounts within a polyurethane gel. These are now available as disks, as flat sheets, or in a gauze cover for the treatment of sore nipples between feeds.

The code of professional practice under which lactation consultants practice requires that, when advising women about a product, lactation consultants must inform the mother of the use, benefits, and any associated risks. It is therefore important to note that while there is extensive research on the benefits of hydrogel dressings when used for treating severe wounds such as burns, the evidence for use by lactating women is minimal.\(^2\) To date, only 2 small clinical controlled trials have been reported pertaining to these dressings for treating sore nipples, both of which demonstrated that there was a higher incidence of infection in the group using the dressings compared to the group using lanolin cream.\(^3,4\) In addition, the trial carried out by Brent et al\(^5\) was discontinued early when significantly more infections were recorded in the group using dressings compared to women who were using the more traditional lanolin-based cream and breast shells. Interestingly, the results of the trial by Brent et al were published in *Archives of Pediatric Adolescent Medicine*, a journal that is not widely read by lactation consultants.

The high infection rate found in the 2 studies is puzzling in light of the fact that the dressings are so effective for deep-wound healing. Extensive studies show that 85% glycerin solutions are bactericidal, fungicidal, and even virucidal, and the results of animal and laboratory studies demonstrate that glycerin dressings inhibit the growth of a wide range of microorganisms.\(^5\)\(^6\) The use of glycerin for the preservation of cadaver skin by the European Skin Bank has also proved to be safe and effective.\(^6\) However, the studies show that the bactericidal effects are not instant, and it may take some time before the microbes are destroyed.\(^6\) A possible explanation for the high infection rate in the sore nipple studies could be that mothers were asked to massage breast milk onto the nipple prior to applying the dressing. This technique is an effective way of soothing tender nipples when allowed to dry naturally in air but may result in bacterial and fungal contamination from the mother’s hands onto the nipple prior to applying the hydrogel dressing. The continued leakage of additional milk provides an ideal growing medium for the organisms that could migrate into the nipple ducts before the dressing is able to take effect.

While there is little evidence currently to support the use of these dressings, they are now widely available to mothers and can be purchased freely over the counter, on the World Wide Web, or by post. It is therefore very important that women follow the manufacturer’s instructions when using these dressings. There is an additional risk of the baby choking and suffocation if mothers cut small pieces to apply to the nipple and then forget to remove them before feeding.

Preliminary findings in a clinical trial by Cadwell\(^7\) appear to be more encouraging. The study being carried out by the Association of Midwives of Latvia has produced more positive results, with mothers reporting significantly greater pain relief with the use of hydrogel dressings compared to lanolin cream. However, it should be noted that the midwives provide ongoing support and a community-based postnatal follow-up service, something that is not widely available to mothers who live in the United States.

If mothers are to succeed in breastfeeding, it is important that they receive from skilled professional staff appropriate advice, support, and encouragement during initiation and early feeding. Hydrogel dressings appear to provide relief from the pain of sore nipples, but I believe that professional staff should use caution in recommending them until research evidence proves conclusively that they are safe for this purpose.

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Marlborough, Massachusetts, United States

**References**


Breastfeeding Knowledge and Beliefs Among Adults in Eastern Tobago

Adelia C. Bovell-Benjamin, PhD, William Benjamin, MPhil, Marsha Ivey, MS, Donald T. Simeon, PhD

Abstract

Using a cross-sectional survey, the knowledge and beliefs about breastfeeding were evaluated among adults in Eastern Tobago (N = 509). Of the respondents, 95%, 69%, and 48% indicated that a baby should be exclusively breastfed at birth, 3 months, and 6 months, respectively. The baby’s mother was thought to have the greatest influence on breastfeeding decisions. Of the respondents, 63% and 80% were unaware of expressed breast milk and cup-feeding an infant, whereas 82% believed that a solely breastfed baby should receive water. Additionally, 23% and 44% felt that breastfeeding should be terminated before 6 months and between 6 and 12 months, respectively. Inadequate maternal nutrition and employment were reported as the principal factors affecting breastfeeding. There is a lack of knowledge about the anatomy and physiology of lactation and about the benefits of exclusive breastfeeding. These findings are useful for guiding the development and implementation of interventions to promote breastfeeding in Tobago. J Hum Lact. 17(4):298-303.

Keywords: breastfeeding, maternal employment, expressed breast milk

The large-scale manufacture and marketing of infant formula after World War II resulted in dramatic declines in breastfeeding rates in the developed and developing world.1,2 Prior to this development, breastfeeding was a universal practice in Trinidad and Tobago (personal communication, National Breastfeeding Committee, 1999). However, this has changed, and the national breastfeeding rate is currently 24% (personal communication, National Breastfeeding Committee, 1999). The national breastfeeding rate is calculated from health center records based on mothers’ reports of any breastfeeding done during the first 3 to 6 months postpartum. The monitoring system for breastfeeding rates is dependent on mothers’ attendance at the health centers after giving birth, and whether they report accurately on their breastfeeding activities.

The Tobago Regional Hospital has been successful at increasing rates of exclusive breastfeeding initiation to more than 98% of mothers in Tobago. However, after hospital discharge, this rate declines rapidly during the first 3 months postpartum. Routine data collected at the health centers throughout Tobago reveal that of the 621 babies born in 1998, 54%, 43%, and 32% were exclusively breastfed for 1, 2, and 3 months, respectively. This is a cause for concern. Furthermore, it is believed that sustained exclusive breastfeeding for the first 6 months postpartum is rarely practiced among women in Tobago, but the data with regard to this practice remain limited.

Increased maternal employment outside the home, religious beliefs, cultural attitudes, more aggressive
marketing of infant formula, and insufficient knowledge about breastfeeding benefits and the physiology of lactation among the population have been advanced as reasons for the decline in breastfeeding. However, data with regard to the population’s breastfeeding knowledge, attitudes, and practices are unavailable. Knowledge, beliefs, and attitudes are important determinants of infant-feeding decisions and provide greater potential as intervention targets. Therefore, such information is urgently needed because the factors that affect the breastfeeding rates need to be identified and corrective measures taken to prevent further decline. This study was designed to evaluate the knowledge and beliefs with regard to breastfeeding among adults in Eastern Tobago. It is our intention to extend the study to Western Tobago and to use the findings to plan and guide the development and implementation of specific community-based educational interventions designed to promote exclusive breastfeeding and breastfeeding for the first 6 months of life and into the second year, respectively.

**Method**

**Location**

The study was confined to the eastern district of Tobago, which comprises a number of rural villages. Tobago is part of the twin-island republic, Trinidad and Tobago, which is located 10 km off the Venezuelan coast. Although Trinidad and Tobago is a developing country, it is not characterized by extreme malnutrition or poverty. Tobago has a predominantly African-descent population of approximately 55,000. Each of the villages surveyed has a health center. A physician, nutritionist, dentist, district health visitor, pharmacist, district nurse, and nursing assistants service these health centers.

**Design**

A cross-sectional survey was conducted in 5 villages in Tobago in June 1999 using in-person (face-to-face) structured interviews.

**Sample**

The sample size (n = 509) was a convenient one, based on funds available to conduct the study. Table 1 shows the number of respondents selected from each of the 5 villages. Adults 18 years and older were selected using a quota sampling method. Community-based organizations such as village councils, youth groups, and women’s groups in the selected villages informed their members about the study. Subsequent to this, the interviewers recruited volunteers using a door-to-door approach. Door-to-door recruitment continued until the quota for each age category was met. In each village, 25%, 50%, and 25% of the participants belonged to the age categories 18 to 25 years, 26 to 47 years, and 48 years and older, respectively. The inclusion criteria were (1) ability to give verbal consent, (2) ability to conduct an oral interview, (3) willingness to participate in the study, and (4) age 18 years and older.

Agreement to be interviewed was obtained from the respondents. The purpose of the survey was explained, confidentiality of response was assured, and respondents were informed that participation was voluntary. After initial contact, an interview time was arranged with the potential respondent if the present time was inconvenient. In-person (face-to-face) interviews were conducted at locations convenient to the respondents. The survey was approved by the Division of Health of the Tobago House of Assembly.

**Questionnaire Development**

In preparation for the survey, questions were formulated based on responses received from interviews conducted with health professionals and parents from the Eastern Tobago community. Subsequently, a 45-item prototype questionnaire was developed, reviewed for clarity and appropriateness, and then pretested on a convenience sample of adults. After pretesting, a revised 39-item questionnaire was used in the survey. The ques-

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Table 1. Demographic Characteristics of the Sample

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No.</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Village (n = 509)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belle Garden</td>
<td>124</td>
<td>(24.4)</td>
</tr>
<tr>
<td>Delaford</td>
<td>122</td>
<td>(24.0)</td>
</tr>
<tr>
<td>Charlotteville</td>
<td>91</td>
<td>(17.9)</td>
</tr>
<tr>
<td>Roxborough</td>
<td>89</td>
<td>(17.5)</td>
</tr>
<tr>
<td>Speyside</td>
<td>83</td>
<td>(16.3)</td>
</tr>
<tr>
<td>Gender (n = 508)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>196</td>
<td>(38.6)</td>
</tr>
<tr>
<td>Female</td>
<td>312</td>
<td>(61.4)</td>
</tr>
<tr>
<td>Education (n = 505)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>286</td>
<td>(56.6)</td>
</tr>
<tr>
<td>Secondary school</td>
<td>219</td>
<td>(43.4)</td>
</tr>
<tr>
<td>Age category (n = 498)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 to 25 years</td>
<td>125</td>
<td>(25.1)</td>
</tr>
<tr>
<td>26 to 47 years</td>
<td>243</td>
<td>(48.8)</td>
</tr>
<tr>
<td>Older than 47 years</td>
<td>130</td>
<td>(26.1)</td>
</tr>
</tbody>
</table>

*Ten percent of the total adult (18 years and older) population of each selected village was taken.
The questionnaire contained a mixture of closed-ended and open-ended questions, with closed-ended questions predominating. Trained personnel conducted all interviews.

**Data Analysis**

Chi-square analysis was done to examine relationships between breastfeeding knowledge and beliefs and gender.

**Results**

A total of 509 adults from five villages in Eastern Tobago participated in the study. There were 196 (39%) men and 312 (61%) women. Almost all (98%) of the respondents originally approached agreed to participate in the study. The demographic characteristics of the sample are shown in Table 1. Of the respondents, 49% were between 26 and 47 years old. The highest level of education completed was primary school (57% of the respondents), and 43% of the respondents completed secondary school.

A total of 447 (95%), 348 (69%), and 237 (48%) respondents stated that a baby should be exclusively breastfed at birth, at 3 months, and at 6 months, respectively (Table 2), whereas 2%, 11%, and 12% of the sample stated that a baby should receive a combination of breast milk and formula at the same respective ages.

When asked whether they had ever been given any information with regard to breastfeeding, 54% of the respondents answered “yes.” The most frequently quoted sources of information about breastfeeding were the health center (53%) and other sources (21%) such as reading, the media, and the hospital. Only 8% of the respondents received information from physicians.

The respondents demonstrated substantial deficits in knowledge with regard to breastfeeding. For example, more than one half (63%) of the sample had never heard about expressed breast milk, whereas 80% did not think that a newborn baby could be cup-fed. The majority (82%) of respondents indicated that an exclusively breastfed infant should be given water. Whereas 47% of the sample believed that breastfeeding caused a woman’s breasts to sag, 39% disagreed with this and 14% were unsure.

Respondents were asked how long they thought infants should breastfeed. The results indicated that 23%, 44%, and 31% felt that it was acceptable to breastfeed a baby for less than 6 months, 6 to 12 months, and more than 12 months, respectively.

Of the respondents, 70% agreed that breastfeeding was good for the baby but a sacrifice for the mother. The respondents tended to have positive attitudes with regard to breastfeeding issues. An overwhelming 95% agreed that breastfeeding fosters a good relationship between mother and child, whereas 61% agreed that the baby should be breastfed on demand. Eighty-five percent of the sample disagreed with the statement, “Nowadays it is no longer necessary with the mess of breast-feeding when formula is available.” The majority of the sample (89%) indicated that breast milk protects against germs, whereas 97% and 79% answered that breastfeeding was physically healthier for the baby and mother, respectively. In contrast, 61% and 26% of the respondents stated that convenience and health, respectively, were the benefits of bottle-feeding.

The factors that respondents mentioned as preventing a mother from successfully breastfeeding included consumption of an unbalanced diet (38%), employment (28%), and small breast size (15%). However, when respondents were asked whether a working woman could breastfeed, 87% answered “yes.”

One half of the sample (50%) said that in the absence of medical necessity, the mother should decide on the

---

**Table 2.** Respondents’ Responses When Asked “What Should a Baby Be Fed From Birth to 6 Months?”

<table>
<thead>
<tr>
<th></th>
<th>Birth (n = 503)</th>
<th>1 Months (n = 503)</th>
<th>2 Months (n = 502)</th>
<th>3 Months (n = 502)</th>
<th>4 Months (n = 502)</th>
<th>5 Months (n = 500)</th>
<th>6 Months (n = 499)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
</tr>
<tr>
<td>Breast milk</td>
<td>477 (94.8)</td>
<td>450 (89.5)</td>
<td>423 (84.3)</td>
<td>348 (69.3)</td>
<td>282 (56.2)</td>
<td>260 (52.0)</td>
<td>237 (47.5)</td>
</tr>
<tr>
<td>Formula/bottle</td>
<td>0 (0)</td>
<td>11 (2.2)</td>
<td>19 (3.8)</td>
<td>26 (5.2)</td>
<td>40 (7.9)</td>
<td>43 (8.6)</td>
<td>43 (8.6)</td>
</tr>
<tr>
<td>Breast milk and formula</td>
<td>12 (2.4)</td>
<td>26 (5.2)</td>
<td>38 (7.6)</td>
<td>56 (11.2)</td>
<td>66 (13.2)</td>
<td>67 (13.4)</td>
<td>61 (12.2)</td>
</tr>
<tr>
<td>Breast milk and other food</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>24 (4.8)</td>
<td>33 (6.6)</td>
<td>34 (6.8)</td>
<td>68 (13.6)</td>
</tr>
<tr>
<td>Other*</td>
<td>12 (2.4)</td>
<td>14 (2.8)</td>
<td>20 (3.9)</td>
<td>46 (9.2)</td>
<td>79 (15.7)</td>
<td>94 (18.8)</td>
<td>88 (17.6)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
</tr>
</tbody>
</table>

*The “other” category included any response that did not fit into the 4 broad categories mentioned in the table, such as flour porridge, cassava porridge, cereals, goat milk, and herbal teas.
feeding practice for the baby, followed by mother and father jointly (29%), and father alone (10%). There was a gender difference in who was thought to be the most influential person \( (P < .01) \). Eighty percent of women and 66% of men stated that the mother was the most influential person in the woman’s decision to breastfeed, whereas 20% of men and 6% of women, respectively, stated that the father was the most influential.

The concept of the naturalness of breastfeeding was acceptable to the respondents. In response to the question “How do you feel when you see a woman breastfeeding?” 95% of the respondents said, “I feel fine, it is the natural thing to do.”

When asked about foods used to cure the baby’s illness or improve health, a mixture of herbal teas, porridges, and home remedies were given. For example, 25% and 18% of the respondents thought that gripe water (a mixture of terpeneless, sodium bicarbonate, and dill seed oil that is usually sold in the drug store) and orange juice with cod liver oil, respectively, should be introduced within the first month, whereas 31% and 44% believed that they should be introduced within the first 3 months (Figure 1). Most of the respondents believed that herbal teas and porridges should be given during the first 3 months and the fourth month, respectively (Figure 1).

In most instances, respondents believed that the herbal teas, porridges, and home remedies should be given from birth to 12 months for the following reasons: (1) to relieve gripe (baby has gas or wind, ie, stomach pains and flatulence), (2) for cold or to clear phlegm on the chest, and (3) for balanced diet/general health/strength/to improve appetite/cleanser/growth/weight gain/healthy skin and/or strong bones and teeth. Various other reasons were given, such as to treat allergies, to treat intestinal parasites, as a coolant, to prevent maljoe (baby gets sick after being touched or played with by someone who is not genuine), and to prevent blithe (bad luck for the baby).

**Discussion**

The respondents in this study were generally quite knowledgeable about the benefits of breastfeeding, such as protection against diseases and improved mother-baby bonding. However, sustained exclusive breastfeeding for the first 6 months postpartum was not highly valued. This is consistent with reports from community services, which indicate that breastfeeding rates in Tobago remain well below desirable standards. However, other studies on infant feeding practices have also revealed that worldwide, sustained exclusive breastfeeding is rare and early supplementation is the norm.\(^5\)\(^6\)

Although the respondents in our study rated breastfeeding as the best nutrition for infants, they supported not exclusive breastfeeding but, rather, supplementation of breast milk with water, herbal teas, porridges, and home remedies. Davies-Adetugbo\(^7\) reported similar findings after assessing the knowledge and attitudes of breastfeeding in poor, rural communities of Nigeria. Guerrero et al\(^8\) observed a similar situation in a periurban community in Mexico City. The mothers in their study ranked breastfeeding as the best nutrition for their infants; however, they did not practice exclusive breastfeeding but, rather, supplemented breast milk with clear fluids and formula. Such practices are not in keeping with the finding that breastfeeding is adequate in all nutrients including water.\(^9\) Furthermore, these practices can result in diminished breast milk production, early cessation of breastfeeding, and the development of a “bottle-feeding culture.”\(^10\)

Most respondents believed that inadequate maternal nutrition is a barrier to successful breastfeeding. These findings are consistent with those of Guerrero et al\(^8\) in their assessment of breastfeeding practices in Mexico. The relationship between employment and breastfeeding is not well elucidated in the literature. Some studies have found that employment negatively affects the duration of breastfeeding, whereas in others, maternal employment does not appear to have a negative impact.
On breastfeeding.\textsuperscript{11,12} On closer examination, it seems that when breastfeeding is highly valued in a society and the society and its mothers view the practice as a responsibility rather than a burden, maternal employment appears to have no effect on breastfeeding.\textsuperscript{13,14} In the present study, although the respondents agreed that working women could breastfeed, employment was ranked highly as a barrier to successful breastfeeding. This type of response suggests that factors other than employment, such as the cultural environment, negatively affect breastfeeding.

There was a general lack of knowledge among the respondents about the anatomy and physiology of lactation, the value of exclusive breastfeeding, and the economic benefits of breastfeeding. For example, more than 10\% of our sample believed that successful breastfeeding is related to breast size. They were not aware that breast size is related to fatty tissue deposits and not functional glandular tissue. These results are in agreement with the findings of Ellis,\textsuperscript{1} who reported a similar misconception among secondary students in British Colombia over a decade ago. The belief that breastfeeding could cause a woman’s breast to sag was prevalent and could weigh against breastfeeding. This finding is consistent with that of Baisch et al,\textsuperscript{15} who found that among 128 adolescents surveyed, 25\% and 48\% agreed and were unsure, respectively, that breastfeeding causes one’s breast to sag.

Most of the respondents were not aware that breast milk could be expressed and that a neonate could be cup-fed. This general lack of breastfeeding knowledge was not surprising, since only 56\% of our sample had been given information about breastfeeding. Although health care advice from professionals is not the only expected source of information, it is interesting to note that a higher number of the respondents received breastfeeding information from other sources such as the media rather than from a physician, school, or the family. The fact that more respondents received information about breastfeeding from other sources and less from the family has some bearing on attitude formation to breastfeeding.\textsuperscript{16}

The results showed that most respondents believed that breastfeeding should be discontinued between 6 and 12 months. We speculate that this is the current breastfeeding practice in Tobago because the respondents who experienced recent or current infant-feeding situations in their homes reported a predominantly breast-bottle combination (data not shown). This practice, however, is not consistent with the recommendation that for the first 6 months postpartum, the baby should be exclusively breastfed and, subsequently, should continue to be breastfed while receiving other foods up to 12 months or beyond.\textsuperscript{17,18}

There was a significant gender difference with regard to the person who had the most influence on the woman’s desire to breastfeed. More women than men indicated that the mother had the greatest influence. In contrast, more men as opposed to women were predisposed to the father being the most influential. These findings are contrary to the popular, local belief that grandmothers have a very strong influence on the selection of infant-feeding practices. They are also different from the results of Guerrero et al,\textsuperscript{8} who found that in Mexico, the maternal grandmother had the greatest influence on feeding practices. McLorg and Bryant\textsuperscript{19} also found that grandmothers were the most important advisers on infant-feeding issues.

Although the respondents agreed that breast milk is healthiest for the infant, their general perception was that supplementation with home remedies is necessary from birth. Respondents stated that the baby needed a mixture of herbal teas, porridges, gripe water, and orange juice with cod liver oil to prevent gripe, colic, and colds; to fatten; and to promote growth. Early supplementation with herbal preparations and medicines exposes the infant to contaminants and suboptimal nutritional intakes, but it is still practiced in many parts of the world.\textsuperscript{7,20,21} Furthermore, feeding of supplements may lower breast milk intake, thereby creating a breast milk insufficiency syndrome and exacerbating malnutrition.\textsuperscript{22}

The findings of this survey must be considered within the limits of the study design used. Our sample size, study villages, and selection method may have been biased as products of convenience, thereby limiting the potential to generalize our findings to the entire Tobago community. It is also possible that the respondents may have misinterpreted some of the questions, even though the interviewers were well trained.

Although the results of this survey cannot be generalized to the entire Tobago community, we concluded that there was a lack of knowledge among the respondents with regard to the anatomy and physiology of lactation, and that the economic benefits of breastfeeding were evident. Furthermore, exclusive breastfeeding for the first 6 months postpartum was not highly valued, nor was its importance well understood in this sample. It


was also concluded that mothers were reported to be the primary decision makers with regard to whether to breastfeed the infant, and that early cessation of breastfeeding, between 6 and 12 months, was favored.

A difference between this study and the majority of studies examining breastfeeding knowledge, beliefs, and practices is the substantial number of male respondents in this study. Although the respondents believed that mothers exert the most influence on breastfeeding practices, fathers are also viewed as an important potential source of influence. Therefore, future interventions to promote breastfeeding in Tobago should include fathers to communicate with them the positive aspects of breastfeeding and dismiss erroneous beliefs.

The data collected in this study can be used as a foundation for formulating and implementing specific community-based educational interventions designed to promote exclusive breastfeeding and breastfeeding for the first 6 months of life and well into the second year of life, respectively. Finally, research with regard to the prevalence of exclusive breastfeeding and breastfeeding practices in the Tobago community is urgently needed.

References


Resumen

Se utilizó en este estudio una encuesta de corte seccional donde se evaluaron los conocimientos y creencias sobre la lactancia materna entre los adultos de la región oriental de Tobago (N=509). Noventa y cinco porciento, 69% y 48% de los que respondieron indicaron que todo bebé se debe alimentar exclusivamente al pecho al nacer, tres meses y seis meses respectivamente. Se cree que la madre es la que tiene mayor influencia en la decisión de amamantar. Sesenta y seis porciento y 80% de los que respondieron no tenían conocimiento sobre la extracción de leche y alimentación con taza al recién nacido, mientras que el 82% creen que los bebés que se amamantan los primeros 6 meses deben recibir agua. Además, 23% y 44% piensan que la lactancia materna debería suspenderse <6 meses y entre los 6-12 meses. Entre los principales factores que afectan la lactancia se reportaron una inadecuada nutrición materna y empleo materno. Se observaron áreas de conocimientos insuficientes en la anatomía y la fisiología de la lactancia y los beneficios de la lactancia materna exclusiva. Estos hallazgos son importantes para guiar el desarrollo e implementación de intervenciones para promover la lactancia materna en Tobago.
Long-Term Breastfeeding: Nourishment or Nurturance?

Kathleen M. Buckley, PhD, RN, IBCLC

Abstract
Mothers frequently describe the primary benefit of breastfeeding beyond a year as providing comfort rather than nourishment. Little is known about the effect of extended breastfeeding on the growth or nutritional status of children in the United States. Data collected on 38 long-term breastfeeding children (12 to 43 months old) included growth measurements, breastfeeding patterns, and dietary intake obtained through diaries and dietary recalls. Although the children’s weight-for-age, length/height-for-age, and weight-for-length/height Z scores clustered below zero, they fell within two standard deviations of the median, suggesting normal growth. The daily time and frequency of breastfeeding were not different between the 1-year-old and 2-year-old age groups but were significantly lower in the 3-year-old age group. In an analysis of non–breastmilk diets, the children would need an average intake of 100 to 460 mL of breast milk per day to meet the RDA for energy intake and nutrients that were lower in their diets compared to national food intake surveys. J Hum Lact. 17(4):304-312.

Keywords: long-term breastfeeding, infant feeding, growth, dietary intake

Breastfeeding during infancy has been found to supply an optimal source of nutrients for growth and development. The American Academy of Pediatrics recommends breastfeeding as the optimal method of feeding “for at least 12 months, and thereafter for as long as mutually desired.” The degree to which the benefits persist in the older child who continues to breastfeed for 1 or more years remains uncertain. In several studies of long-term breastfeeding (after the child’s first birthday), North American mothers frequently describe the primary benefits as providing nurturance and comfort to the child. Nutritional benefits of long-term breastfeeding are often described as secondary.

The relationship between long-term breastfeeding and child growth and nutritional status remains unclear because the research conducted in the past decade has shown mixed results. Some studies of children in Asia and Africa have found a positive relationship between prolonged breastfeeding and growth, with a decrease in the incidence of malnutrition. Other research has reported a negative association between prolonged breastfeeding and growth, resulting in lower nutritional status. In a review of the effect of prolonged breastfeeding on child growth, Grummer-Strawn proposed that the nature of the association is indefinite due to a lack of control for confounding variables and reverse causality. External causes, such as poverty, inadequate supplementation, illness, and access to health care services, need to be controlled for as confounding variables. Reverse causality may also be a factor affecting the relationship. Long-term breastfeeding may be more common among lower-income, less-educated women because of economic necessity. Some researchers have suggested that mothers in less-developed countries may prolong breastfeeding for undernourished children, who are showing delays in growth or poor development, because they are aware of the mortality risk following weaning.

In industrialized countries, there is little information with regard to the effect of breast milk on the growth and dietary patterns of children who continue with partial breastfeeding beyond 1 year of age. Many questions remain unanswered. What is the pattern of breastfeed-
ing with the older child? Does breastfeeding consistently decrease in length of time and frequency as the child ages? What is the impact of long-term breastfeeding beyond infancy on the child’s growth and dietary intake?

The goals of this exploratory study were to examine the breastfeeding patterns, dietary intake, and growth measurements of a group of children who were continuing to breastfeed beyond 1 year of age. The study was considered exploratory because of the relatively small sample size and methodological limitations.

**Method**

**Sample**

The sample consisted of 38 mother-child pairs living in the Washington, DC, metropolitan area. Because of the social stigma and often hidden behaviors associated with long-term breastfeeding, potential participants were recruited through contacts with local pediatricians, lactation consultants, breastfeeding peer counselors, and La Leche League members over a 4-month period. Criteria for inclusion were the following: no congenital abnormalities in the children, no hospitalization of the mother or child 3 months prior to the study, and mother was currently breastfeeding a child at least 1 year of age or older. The mothers provided written consent for their own as well as their child’s participation. Initially, 40 mother-child pairs (10 Hispanic and 30 non-Hispanic) were targeted and sampled. After collecting the data, it was discovered that two of the non-Hispanic mothers were breastfeeding nontwin siblings (tandem nursing). These individuals were eliminated from the final sample.

**Measures**

Data collection on growth and dietary intake was part of a primarily qualitative study in which mothers were interviewed during 2 home visits and talked about their attitudes, beliefs, and experiences with long-term breastfeeding. This study was approved by the Committee for the Protection of Human Subjects at the Catholic University of America. Within 1 to 2 weeks of recruitment by telephone, a home visit was scheduled. During the initial visit, basic demographic information and anthropometric measurements were collected. The mother was instructed on how to complete a 7-day breastfeeding diary, and an interview of her experiences with long-term breastfeeding was initiated. Interviews were tape-recorded and transcribed for analysis. Two to 3 weeks later, at a follow-up visit, the completed breastfeeding diary was collected. The interviewer also obtained a 24-hour dietary recall of the child’s diet as reported by the mother. All visits were scheduled to avoid any period of illness for the mother or the child.

At the initial home visit, a trained investigator (registered nurse) collected a single measurement of the child’s weight and length or stature. Weights were obtained using a portable platform scale (Health-O-Meter, Bedford Heights, Ohio, United States) and measured to the nearest .5 pound. Recumbent length was measured to the nearest .5 cm on all children <2 years of age using a pediatric measuring board (Ellard Instrumentation and Ross Laboratories Division of Abbot Laboratories, Columbus, Ohio, United States). Height (stature) was taken on all children ≥2 years of age, while standing upright with shoes removed. A flat board was placed on top of the child’s head and was made to rest firmly against the wall to form a 90° angle, and the height from floor to board was measured to the nearest .5 cm.

Data on the children’s dietary intake were collected through breastfeeding records and 24-hour dietary recalls as reported by the mothers. The mothers kept a diary of the frequency and length of breastfeeding over a 7-day period. The diary included the time of the breastfeeding episodes and the length in minutes of active suckling for each episode. Incidents of breastfeeding were considered separate episodes if 15 or more minutes had elapsed between the end of one feeding and the beginning of the next.

The mothers were asked by a trained interviewer to provide detailed descriptions of all foods and beverages consumed including times of consumption, amounts, brand names, and cooking methods. Measuring cups and spoons were used to assist the mothers in estimating correct portions of foods consumed. Findings were recorded on food records according to a standardized protocol. The children’s non–breast milk diets were systematically analyzed to determine their contribution toward the recommended dietary allowance (RDA). Individual percentages were averaged to obtain the mean percentage for energy intake and selected nutrients.

**Data Analysis**

Analysis of age group differences on breastfeeding frequency and duration was done with one-way analysis of variance (ANOVA) with post hoc comparisons testing using Dunnet C after a Bonferroni adjustment. For
each ANOVA, a test of homogeneity of variance using the Levene statistic was performed, and all were nonsignificant based on $\alpha = .05$.

Percentiles were determined for the children’s growth measurements (weight, length/height, and weight-for-length/height) using US reference curves and analyzed with descriptive statistics. Less than the 3rd and greater than the 97th percentiles for gender and age were used as reference limits for stunting and overweight, respectively. Because 4 different reference growth charts based on age, gender, weight, and length/height were used, Z scores were also calculated for standardization with the software program NutStat (Epi Info 2000, Version 1.0, Centers for Disease Control, Atlanta, Ga, United States). Z scores greater than 2 standard deviation units below the reference median for the 3 indices were used to classify low anthropometric levels.

Data from 7-day breastfeeding records were tabulated and analyzed using descriptive statistics. The dietary intake of the children based on a 24-hour recall were analyzed with the use of a software dietary analysis program (Diet Analysis Plus, Version 4.0, ESHA Research, Salem, Ore, United States). Energy (kcal/kg) and the percentage intake of the RDAs for primary nutrients were calculated for each child. The energy and nutrient data were compared to US national standards for children of the same sex and age calculated to the nearest whole integer year. Analysis was performed with the Statistical Package for the Social Sciences (SPSS, Version 10, Chicago, Ill, United States).

Results

Of the 38 children in the final data set, 22 were boys and 16 were girls. The children’s ages ranged from 12 to 43 months. Most ($n = 21$) of the children were between the ages of 12 and 23 months. A smaller group ($n = 11$) was between 24 and 35 months of age, and fewer ($n = 6$) were 36 months or older. Eighty percent of the Hispanic children were in the youngest age group. The children were reported by the mothers to be “healthy,” with no recent episodes of acute illness or history of chronic illness.

The mothers’ ages ranged from 25 to 45 years. The mothers’ educational level and family income were similar between the children’s age groups. Most of the mothers were full-time homemakers. Twenty-eight of the mothers were white, non-Hispanic, and born in the United States, and 10 were white, Hispanic, and had emigrated to the United States from the Spanish-speaking Caribbean islands or Central or South America. The Hispanic mothers had lived in the United States between 1 and 23 years, with a mean of $9.3 \pm 6.2$ years. All had arrived as young adults. Forty-three percent of the primiparous mothers had children in the youngest age group (Table 1).

Growth Measurements

Only one child, a non-Hispanic female, had a weight below the 3rd percentile, while her other measurements were within expected limits. This 15-month-old was the child of a pediatrician who was well aware of her growth parameters. One other 15-month-old Hispanic male child had a weight at the 96th percentile and height at the 97th percentile. The remaining children exhibited growth measurements within normal ranges.

The children’s $Z$ scores for weight, length/height, and weight-for-length/height were also analyzed (Table 2). In comparison with the current US growth charts, the children’s $Z$ scores for the 3 indices tended to cluster below zero but fell within two standard deviations of the median, suggesting normal growth (Figure 1).

Breastfeeding Records

On review of the 7-day breastfeeding records for the children, the frequency and length of breastfeeding episodes, as well as the total minutes of breastfeeding per day, varied with the age of the child (Table 3). There was a statistically significant difference in the mean number of breastfeeding episodes per day ($P = .005$) between the 1-year-old, 2-year-old, and 3-year-old age groups. Post hoc testing showed that the 3-year-olds were significantly different from the 1-year-olds and 2-year-olds. There was also a statistically significant difference in average total minutes of breastfeeding per day ($P = .009$) between age groups. The only significant difference was between the 2-year-olds and the 3-year-olds, with a mean difference of 71.0 minutes ($P = .006$). The oldest group of children not only had fewer breastfeedings per day but also spent less total time per day at the breast. The average length of feeding time was examined as a third dependent variable. There was no significant difference between any age groups, indicating that whereas the number of breastfeeding episodes varied across age groups, the length of the breastfeeding episodes did not vary significantly.
Explanations for Breastfeeding Patterns

On review of the breastfeeding records, several mothers discussed their surprise at the frequency of breastfeeding and the daily total time spent breastfeeding on the part of their 2-year-olds. They related this frequency to a more relaxed behavior on their part in breastfeeding a toddler due to their previous experiences with long-term breastfeeding. Six of the 11 mothers who were breastfeeding a child near the second year had nursed a previous sibling beyond 1 year. Their earlier experience with breastfeeding and weaning a toddler may have made them more comfortable in meeting their children’s frequent requests for the breast as part of a “normal” process that would not impede weaning. As one mother stated:

I think he still gets quite a lot of his nutrition from breastfeeding, more than my daughter did at this age. It is probably because I’m more laid back about it now that I’ve seen her wean and do fine. With her I was much more, “Come on, we’ve got to wean.” With him I don’t care. He can pick and snack. I feel like breast milk is much more nutritious than a cookie.

Table 1. Demographic Characteristics of Mothers and Children Practicing Long-Term Breastfeeding

<table>
<thead>
<tr>
<th>Table 1. Demographic Characteristics of Mothers and Children Practicing Long-Term Breastfeeding</th>
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<tr>
<td></td>
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<tr>
<td>Child age, mo</td>
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<tr>
<td>Range</td>
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<tr>
<td>Mean ± SD</td>
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<tr>
<td>Maternal age, y</td>
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<td>Range</td>
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<td>Mean ± SD</td>
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<td>Maternal education, y</td>
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<tr>
<td>Range</td>
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<tr>
<td>Mean ± SD</td>
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<tr>
<td>Household annual income, $1000</td>
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<tr>
<td>Range</td>
</tr>
<tr>
<td>Mean ± SD</td>
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<tr>
<td>Ethnicity, no. (%)</td>
</tr>
<tr>
<td>White, non-Hispanic</td>
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<tr>
<td>White, Hispanic</td>
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<tr>
<td>Maternal employment status, no. (%)</td>
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<tr>
<td>Working full-time or part-time</td>
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<tr>
<td>Full-time homemaker</td>
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<tr>
<td>Parity, no. (%)</td>
</tr>
<tr>
<td>Primiparous</td>
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<td>Multiparous</td>
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Table 2. Growth Z Scores for Long-term Breastfeeders (N = 38)

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<th>Table 2. Growth Z Scores for Long-term Breastfeeders (N = 38)</th>
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<tr>
<td></td>
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<tr>
<td>Growth Measurement</td>
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<tr>
<td>Weight-for-age</td>
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<tr>
<td>Height-for-age</td>
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<tr>
<td>Weight-for-length</td>
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</table>

Explanations for Breastfeeding Patterns

On review of the breastfeeding records, several mothers discussed their surprise at the frequency of breastfeeding and the daily total time spent breastfeeding on the part of their 2-year-olds. They related this frequency to a more relaxed behavior on their part in breastfeeding a toddler due to their previous experiences with long-term breastfeeding. Six of the 11 mothers who were breastfeeding a child near the second year had nursed a previous sibling beyond 1 year. Their earlier experience with breastfeeding and weaning a toddler may have made them more comfortable in meeting their children’s frequent requests for the breast as part of a “normal” process that would not impede weaning. As one mother stated:

I think he still gets quite a lot of his nutrition from breastfeeding, more than my daughter did at this age. It is probably because I’m more laid back about it now that I’ve seen her wean and do fine. With her I was much more, “Come on, we’ve got to wean.” With him I don’t care. He can pick and snack. I feel like breast milk is much more nutritious than a cookie.
Several of the mothers who were breastfeeding 2-year-olds expressed surprise after reviewing their breastfeeding record. A mother who was breastfeeding an average of 9.5 times per day expressed her reaction:

First of all, I realized I’m nursing him to a much greater extent by keeping this record than I actually thought. I thought we were very far along on weaning. What I realized was that he is nursing what I thought was 20 to 30 minutes was actually 1 hour and 5 minutes. I was just amazed that if I briefly look at the days, I’m spending a good several hours a day literally with him in my arms.

Another mother discussed the length of the feedings for her 2-year-old as associated with her child’s satisfaction of hunger and the provision of comfort:

He seems to be on a schedule although he nurses on demand. There are certain patterns that pretty much repeat. . . . If it’s going to be a short feeding, it’s usually between 4 and 7 minutes, and a long feeding is between 12 and 20 minutes. When he nurses for a long one, it’s not eating. It’s more of a comfort thing. In other words, he’s just kind of lying there and enjoying being held and sucking, because there is no milk. He’s past getting anything out of it. It’s just kind of enjoying each other, hanging out together.

Another mother described the frequency of breastfeeding as a means of calming her active and sometimes unhappy 2-year-old toddler:

One of the best things about nursing a toddler is that we get to sit down. I don’t do that very often with him while he’s not nursing. It defuses a lot of situations where he’s very frustrated and it turns into a tantrum and he cries. When he’s crying and upset, it’s magic, “joy juice,” and it just really helps him out.

**Dietary Intake**

Most of the children’s diets consisted of 3 main meals with 2 to 3 snacks a day. Seventy percent of the children started their day with cereal. Other less common breakfast foods included waffles, pancakes, eggs, and bagels. Lunches and dinners varied considerably, with their content ranging from meats, to cheeses, pasta, soups, cooked vegetables, and fresh fruit. A variety of “ethnic foods” (e.g., burritos, tacos, Chinese noodles, pita bread, and pizza) and items from fast-food restaurants were found to be equally distributed in the diets of both Hispanic and non-Hispanic children. Because of the similarities in the feeding patterns and food content of the diets for both ethnic groups, the nutritional data were combined for analysis.

The children’s non–breast milk diets were found to have met an average of 77% of the RDA for energy intake through complementary foods (Table 4). The mean food energy intake for the children consisted of 13% protein, 59% carbohydrate, and 28% fat (11% saturated fatty acids). The children were able to meet at least 70% of the RDA for protein, vitamin C, thiamin, riboflavin, niacin, vitamin B6, phosphorus, and magnesium. This is consistent with the mothers’ reports of dairy products, cereals, grains, fruits, and juices as the usual foods and sources of these nutrients in the children’s diets. However, the supplementary diets contributed 70% or less of the RDA for the 1-year-olds and/or 2-year-olds for vitamin A, vitamin E, calcium, iron, and zinc. No significant differences were found between age groups for these nutrients.

The low mean intake of calcium (67% of RDA) in the children’s supplementary foods may have been related to the total absence of soy or cow’s milk in 46% of the children’s diets. Over one third (34%) of the children’s diets also lacked any meat for the day analyzed, possibly contributing to the low intake of zinc. This is partially explained by the information gained during the interviews in which 23% of the mothers volunteered that they followed a vegetarian diet with their children. Although an additional 17% of the mothers did not

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**Table 3. Comparison of Breastfeeding Patterns Between Age Groups**

<table>
<thead>
<tr>
<th></th>
<th>12-23 Months (n = 21)</th>
<th>24-35 Months (n = 11)</th>
<th>36-47 Months (n = 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding episodes per day</td>
<td>5.8 ± 2.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.8 ± 2.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.5 ± 2.0&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total time breastfeeding (min/ld)</td>
<td>65.2 ± 44.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>102.2 ± 51.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>31.2 ± 24.6&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Length of breastfeeding (min/episode)</td>
<td>10.8 ± 6.1</td>
<td>14.2 ± 6.1</td>
<td>11.6 ± 5.6</td>
</tr>
</tbody>
</table>

<sup>a</sup>Values are expressed as mean ± SD.

<sup>a,b</sup>Differing superscripts denote a significant difference between groups (post hoc analysis).
Table 4. Mean (± SD) Intake as a Percentage of the 1989 Recommended Dietary Allowances, by Age Group* ***

<table>
<thead>
<tr>
<th>Selected Nutrients</th>
<th>12-23 Months (n = 21)</th>
<th>24-35 Months (n = 11)</th>
<th>36-47 Months (n = 6)</th>
<th>Total (n = 38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food energy</td>
<td>81 ± 43</td>
<td>66 ± 27</td>
<td>86 ± 31</td>
<td>77 ± 37</td>
</tr>
<tr>
<td>Protein</td>
<td>195 ± 111</td>
<td>151 ± 86</td>
<td>224 ± 95</td>
<td>187 ± 102</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>37 ± 34</td>
<td>24 ± 10</td>
<td>83 ± 43</td>
<td>48 ± 106</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>46 ± 44</td>
<td>44 ± 25</td>
<td>66 ± 39</td>
<td>49 ± 38</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>103 ± 68</td>
<td>210 ± 134</td>
<td>161 ± 136</td>
<td>143 ± 110</td>
</tr>
<tr>
<td>Thiamin</td>
<td>99 ± 62</td>
<td>110 ± 33</td>
<td>137 ± 65</td>
<td>109 ± 64</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>126 ± 81</td>
<td>98 ± 50</td>
<td>150 ± 74</td>
<td>122 ± 72</td>
</tr>
<tr>
<td>Niacin</td>
<td>80 ± 47</td>
<td>83 ± 43</td>
<td>101 ± 56</td>
<td>84 ± 47</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>87 ± 58</td>
<td>79 ± 48</td>
<td>104 ± 39</td>
<td>88 ± 52</td>
</tr>
<tr>
<td>Calcium</td>
<td>76 ± 52</td>
<td>42 ± 26</td>
<td>84 ± 35</td>
<td>67 ± 46</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>85 ± 52</td>
<td>63 ± 33</td>
<td>103 ± 37</td>
<td>82 ± 46</td>
</tr>
<tr>
<td>Magnesium</td>
<td>159 ± 89</td>
<td>165 ± 76</td>
<td>218 ± 99</td>
<td>171 ± 87</td>
</tr>
<tr>
<td>Iron</td>
<td>69 ± 41</td>
<td>70 ± 43</td>
<td>96 ± 43</td>
<td>74 ± 42</td>
</tr>
<tr>
<td>Zinc</td>
<td>40 ± 21</td>
<td>32 ± 13</td>
<td>54 ± 18</td>
<td>40 ± 19</td>
</tr>
</tbody>
</table>

*Based on 24-hour dietary recalls, excluding the consumption of breast milk.  
**Values are expressed as mean ± SD percentage of recommended dietary allowance.

espouse a vegetarian dietary pattern, they did not include any meat in their child’s diet for the day the 24-hour recall was collected. It is not known whether this was intentional on the mother’s part or simply a matter of circumstance.

**Discussion**

The study’s findings must be treated with caution given the methodological limitations of the small sample size and restrictions inherent in 24-hour dietary recall data.

Data from the DARLING Study suggest that the mean weight of breastfed infants is significantly lower than that of formula-fed infants up to 18 months of age. This is consistent with the growth data in this study in which the children who had continued breastfeeding beyond the first birthday were found to have a mean weight-for-age and weight-for-length/height less than the 50th percentile. Although the more recently developed growth charts are more inclusive of breastfed children than the older National Center for Health Statistics charts, they may not be reflective of the norm for children who continue with long-term breastfeeding. Although the use of single growth measurements is limited in assessment of body composition, overall data suggest an absence of major nutritional problems among the sample. Repeated measurements would allow for the children in the sample younger than 2 years of age. Furthermore, the American Academy of Pediatrics does not advise children to follow a diet that restricts assessment of body composition, overall data suggest an absence of major nutritional problems among the sample. Repeated measurements would allow for the children in the sample younger than 2 years of age. Furthermore, the American Academy of Pediatrics does not advise children to follow a diet that restricts

assess changes in the children’s body composition over time and provide a better indication of growth status.

The US Department of Agriculture’s Continuing Survey for Food Intakes by Individuals (CSFII) found that nonbreastfed children aged 1 to 3 years reported, on average, mean energy intake that met 93% to 108% of the RDA. In this study, the mean percentage of energy intake from the non–breast milk diet was 77% RDA. RDAs are widely used standards developed by the Food and Nutrition Board of the National Academy of Sciences. With the exception of energy, RDAs are not average requirements but recommendations expected to satisfy the physiologic needs of most healthy people in the United States. Because a margin of safety over requirements is included in the RDAs, they surpass most children’s physiologic requirements. Consequently, children consuming less than the RDAs are not necessarily taking in an inadequate diet. However, as the percentage of the population with intake below 100% of a given RDA increases, so does the likelihood that some individuals in that population are at nutritional risk. RDAs are generally intended to be average intakes for at least 3 days—for others, several months—whereas estimates in this study are based on a 1-day average and, therefore, may not be reflective of the children’s usual dietary intake.

Based on an average child 1 to 3 years of age requiring 1300 kcal per day, the children in this study would need an additional 300 kcal (or 450 mL of breast milk) to meet 100% of the RDA. This is consistent with reported intake of 400 to 600 mL for children in developing countries, as well as the findings in the study by Dewey et al of two groups of breastfed children between the ages of 11 and 16 months in Northern California. Their mothers reported an average breast milk intake of about 550 mL/d, which contributed to about 50% of their children’s total energy intake. However, according to the researchers, the women were “somewhat unusual in their commitment to breastfeeding.” The researchers suggested that the percentage of energy intake reported was probably greater than generally expected for most women in industrialized countries.

Although the children’s food energy intake of protein (13%), carbohydrate (59%), and fat (28%) were within the recommendations based on 2000 Dietary Guidelines for Americans, these guidelines are not appropriate for the children in the sample younger than 2 years of age. Furthermore, the American Academy of Pediatrics does not advise children to follow a diet that restricts
intake to less than 30% of energy from fat because of concerns about possible effects on growth.\textsuperscript{23} Whether or not the slightly lower level of fat found in this study is significant or could be replicated in a larger, more diverse sample is an area for future research.

The CSFII reported an average intake of most vitamins and minerals as exceeding 100% of the RDA for 1 to 3 years of age.\textsuperscript{19} The noted exceptions for this age group were vitamin E (77% to 91% RDA) and zinc (72% to 85% RDA). In the present study, not only were vitamin E and zinc at low levels, but vitamin A was less than 70% of the RDA in 1-year-old and 2-year-old children’s non–breast milk diets. Calcium was found to be low only among the 2-year-old age group.

The children averaged a mean intake of 48% of the RDA for vitamin A, which was met by complementary foods in their diets. The recommendation for this age group is 400 μg retinol equivalents per day. To meet that recommendation, the children would need an average intake of 310 mL of breast milk per day. Again, this is consistent with the reported intake of breast milk. Although vitamin A concentrations in breast milk are related to the mother’s vitamin A status, a deficiency is rare among breastfed infants even in areas of the world that are known for deficiencies.\textsuperscript{24}

Children 1 to 3 years of age require 800 mg/d of calcium.\textsuperscript{20} Mean concentrations of calcium in mature human milk are approximately 280 mg/L.\textsuperscript{24} Although human milk contains a smaller amount of calcium than cow’s milk, calcium and phosphorus occur in a more balanced proportion and in a higher calcium/phosphorus ratio. The children in the study, who were receiving an average of 48% of the RDA for calcium, would need to consume an average of 395 mL of breast milk per day to meet the RDA.

Vitamin E was also lacking in the diets of the children, who were receiving an average of 49% of the RDA for this nutrient. Based on the recommendation of 600 μg tocopherol equivalent for this age group,\textsuperscript{20} the children would need to consume at least 100 mL of breast milk per day to meet the RDA.

Finally, the children demonstrated a moderate intake of iron, with an average of 74% of the RDA for all age groups. Breast milk is generally found to be deficient in meeting the total iron needs of children beyond the age of 6 months. Dewey et al\textsuperscript{21} reported that iron concentrations in human milk decrease in the first 6 months, but there is no further decline in later lactation (7 to 20 months).

The nutritional effect of an absence of meat in more than one third of the daily intake of the children is not known. A related issue is whether the vegetarian diet also followed by the mothers altered their breast milk composition. In a study of late lactation (7 to 20 months), Dewey et al\textsuperscript{21} reported little or no dietary influence of a vegetarian diet on breast milk nutrients. The only significant difference found between the vegetarian and nonvegetarian mothers was that the vegetarian mothers had slightly lower protein concentrations. However, vegetarian diets may have contributed to the lower levels of zinc in the children’s dietary analyses. The children were receiving only 40% of the recommended 1000 μg per day for zinc in their supplemental diet. Because breast milk contains about 130 μg/100 mL,\textsuperscript{25} they would need to consume 460 mL of breast milk to meet the RDA. However, to be comparable to the CSFII report of usual intake, the children would require only 250 to 350 mL of breast milk.

In summary, the children would need an average intake of between 100 and 460 mL of breast milk per day to meet the RDA for energy intake as well as nutrients that were lower in their diets as compared to national food intake surveys. This amount is consistent with breast milk volumes reported for this age group in developing countries and the United States. More research is needed to determine whether these patterns are consistent over larger sample populations.

Summary and Conclusion

With respect to nourishment versus nurturance, the following conclusions may be drawn from the findings. In industrialized countries, mothers commonly state that long-term breastfeeding is a form of “comfort nursing” and often perceive their child as receiving the necessary nutrients from foods other than breast milk. The meaning of breastfeeding as nourishment and nurturance is comparable to Van Esterik’s\textsuperscript{26} conceptual differentiation between breastfeeding as a “product” or “process.” Although the women in this study identified breast milk as a nutritional product that provides nourishment for their children, they emphasized the nurturing process of breastfeeding. They viewed long-term breastfeeding as creating a special bonding relationship between mother and child.

The question remains as to whether breast milk provided an important contribution toward meeting the children’s RDA for nutrient intake, especially for vitamin A, calcium, vitamin E, and zinc. Although there are
limitations in comparing the children’s nutrient intake, which was based only on complementary foods, with complete food intake reported in national surveys, it could be theorized that breast milk makes up for the lower levels of nutrients found in the children’s partial (non–breast milk) diets. Further research is needed to determine whether the nutritional content of breast milk contributes to a significant proportion of the daily energy and nutrient intake for children practicing long-term breastfeeding and consuming complementary foods in a larger, more heterogeneous sample with established external validity. Additional research would also be useful to establish whether children who continue breastfeeding into the toddler and preschool years are at increased risk for a deficiency of any nutrient, contributing to disorders such as iron deficiency anemia.

Anecdotal accounts and the lay literature report that long-term breastfeeding consistently decreases in terms of frequency and length of feedings as the child ages. Further research is needed to study whether there are specific ages when breastfeeding episodes may increase or decrease in frequency and/or length, and to determine the effect of what is often perceived as a nutritional “supplement” to the child’s growth and development. Additional studies are needed to determine whether there are differences in the changing patterns of long-term breastfeeding among various ethnic groups in developing as compared to more industrialized countries, and to identify the associated variables with differences in breastfeeding patterns.

Although limiting the number of breastfeeding sessions has been shown to reduce breast milk volume, it is not known how breastfeeding frequency and breast milk volume are related. Therefore, it is problematic to estimate milk volumes based on frequency and length of breastfeeding. Test weighing of infants before and after feedings and sample milk expression by the mothers have been done to estimate milk volume. It is feasible that this methodology could be used be used to discern average milk volumes of older children practicing long-term breastfeeding.

Mothers who continue with long-term breastfeeding are feeding their child in a manner that may not be acceptable by general society. Because of the stigma associated with the practice, the practice remains hidden. There is more to understand about growth and development, as well as feeding practices, associated with long-term breastfeeding. Mothers may have concerns about their children’s nutritional status or progress toward weaning, especially if there is a noticeable increase in the frequency and/or length of feedings as the child ages. If health care providers are to provide mothers with the information and emotional support for parenting, more information is needed with regard to the normal patterns of this behavior.

References
Las madres con frecuencia describen los beneficios de la lactancia materna más allá del año como darles consuelo más que nutrición a sus hijos. Se conoce muy poco sobre los efectos de la lactancia materna prolongada tanto en el crecimiento como en el estado nutricional de los niños en los Estados Unidos. Se recolectaron datos de 38 niños que recibieron lactancia materna prolongada (12-43 meses de edad) y se hicieron mediciones de crecimiento, patrones de lactancia e ingesta a través de registros diarios y recordatorio de ingesta. A pesar de que las medidas z-score de peso-edad, talla-edad y peso-talla estaban por debajo de 0, estas estaban dentro de las 2 Desviaciones Estandard (DE) de la media que se considera como crecimiento normal. El tiempo y la frecuencia del amamantamiento no mostraron diferencias entre los grupos de 1 y 2 años de edad pero fue significativamente más bajo en el grupo de 3 años de edad. En un análisis de dietas sin leche materna, los niños necesitaban un promedio de 100-460 ml de leche materna al día para cubrir los requerimientos de la RDA de alimentos con energía y nutrientes bajos en sus dietas comparada con las encuestas nacionales de ingesta de alimentos.
Exclusive Breastfeeding in the Era of AIDS

Marina de Paoli, MSc, Rachel Manongi, MD, Msc, Elisabet Helsing, PhD, Knut-Inge Klepp, PhD, MPH

Abstract

The aim of this study was to describe breastfeeding practices, as well as what pregnant women know about breastfeeding and mother-to-child transmission (MTCT) of HIV, and explore factors associated with exclusive breastfeeding, especially in the presence of HIV/AIDS. A cross-sectional interview survey of 500 pregnant women was conducted in the Kilimanjaro region, supplemented by focus group discussions with pregnant women. Among the 309 mothers having previously breastfed, 85% had initiated breastfeeding within the first few hours postpartum, and 18% of newborns received some prelacteal food. Mean duration of breastfeeding was 23.7 months, but 46% of mothers had introduced other fluids early. Knowledge of HIV-transmission through breastfeeding was not associated with breastfeeding practices. Married women (odds ratio [OR] = .09, 95% confidence interval [CI] = .04-.24) and those having knowledge of exclusive breastfeeding (OR = .08, 95% CI = .02-.31) were the least likely to end exclusive breastfeeding early. Exclusive breastfeeding is a rare practice, and MTCT of HIV may further complicate recommendations with regard to this practice. J Hum Lact. 17(4):313-320.

Keywords: breastfeeding, exclusive breastfeeding, infant feeding, prelacteal food, mother-to-child transmission, sociodemographic differences, Tanzania

In Tanzania, breastfeeding is widely practiced and high rates of breastfeeding initiation have been observed.1-3 According to the Tanzania Demographic Health Survey (TDHS) conducted in 1996, the median duration of breastfeeding was 21.6 months nationally and 22.6 months in the Kilimanjaro region.4 However, these breastfeeding figures mask a suboptimal breastfeeding pattern. The 1996 TDHS reported that the median duration of exclusive breastfeeding was only about 1 month, as many young infants receive water in addition to breast milk. This is consistent with other studies undertaken in Tanzania and in other resource-poor settings, where the extent and duration of exclusive breastfeeding remains low even though breastfeeding initiation is high and partial breastfeeding is of long duration.1,2,5

In 1998, the World Health Organization (WHO), the Joint United Nations Program on HIV/AIDS (UNAIDS), and the United Nations International Children’s Emergency Fund (UNICEF)6,7 issued a set of revised guidelines on HIV and infant feeding for HIV-infected women in resource-poor settings. These guidelines called for a strengthening of initiatives to protect, promote, and support breastfeeding among mothers who are HIV-negative or of unknown HIV status and to promote fully informed and free choice of infant-feeding methods for HIV-infected mothers. Specifically, the guidelines recommended that counsel given to HIV-infected mothers should include the best available information on the benefits of breastfeeding, on the risk of HIV-transmission through breastfeeding, and on the risks and possible advantages of alternative methods of...
infant feeding. Several infant-feeding options for HIV-infected mothers are described. For HIV-infected mothers who choose to breastfeed, breastfeeding is recommended for the first few months of life but is also recommended to be discontinued as soon as an alternative form of feeding becomes feasible.\(^8\)

A recent study exploring the influence of infant-feeding patterns (mixed, exclusive, or no breastfeeding) on infants born to HIV-infected mothers reported that infants who are exclusively breastfed for 3 months or more have no greater risk of HIV infection over a 6-month period than those who are never breastfed.\(^9\) If confirmed, these findings will have important implications for HIV and infant-feeding policies in resource-poor settings, thus making it critical that further research be undertaken. Thus, we need to know more about factors that discourage and encourage exclusive breastfeeding,\(^10\) and in particular we need information about exclusive breastfeeding as a potential option for HIV-infected mothers and about women’s evaluation of the risks involved.

A better understanding of such factors will make it easier to assess the feasibility of exclusive breastfeeding and to identify effective interventions. This is crucial in a country such as Tanzania, where breast milk provides up to 40% of a child’s total energy intake in the second year of life.\(^11\) It is especially important to understand how to improve breastfeeding practices and to counteract the risk of a decline in breastfeeding rates due to the revised WHO/UNAIDS/UNICEF guidelines. We have not been able to identify any study from Tanzania investigating cognitive as well as demographic factors predicting exclusive breastfeeding.

The aim of this study is to describe breastfeeding practices, as well as what pregnant women know about breastfeeding and mother-to-child transmission (MTCT) of HIV. An additional objective is to explore the ways in which knowledge and sociodemographic factors are associated with current breastfeeding practices, with particular emphasis on exclusive breastfeeding in the face of HIV/AIDS.

**Participants and Method**

This study, conducted between June and September of 1999 at 9 governmental antenatal clinics, was part of a survey undertaken in the urban and rural districts of Moshi, which is located at the foot of Mt Kilimanjaro in northern Tanzania. All 4 urban antenatal clinics in the town of Moshi and 5 large clinics in Moshi’s rural district participated in the study.

A total of 503 women were approached and asked to participate in an interview during their antenatal visits. Of these, 500 participated (99.4%). All respondents were pregnant but currently not breastfeeding, since according to local tradition a pregnant woman should not breastfeed. Primigravidas (n = 167) and women who spontaneously aborted or whose last-born child died before initiating breastfeeding (n = 24) were excluded from the analysis of breastfeeding histories. Thus, breastfeeding histories were obtained for 309 mothers and children.

Participants were recruited in close collaboration with the health care staff at the participants’ antenatal clinics. Due to the logistics of the study and practical circumstances at the clinics, it was not possible to randomly select women. The staff had been thoroughly informed about the purpose of the study and instructed to select a wide range of mothers (ie, different ages, ethnicities, socioeconomic groups, number of pregnancies). The interviews were carried out at the clinics in private rooms. Five trained nurses from the regional referral hospital (Kilimanjaro Christian Medical College (KCMC)) conducted the questionnaire interview, which lasted 1 to 1.5 hours. Because breastfeeding and AIDS are sensitive issues, each woman was given ample time to ask questions after the interview session was over. They were also offered a counseling session on breastfeeding and HIV issues.

The study consisted of a structured, cross-sectional interview survey. A pretested, structured questionnaire administered in Kiswahili (the national language) was used to obtain the quantitative data. The questionnaire consisted of 4 parts: (1) demographic factors (age, level of education, marital status, area of residence and clinic attendance, employment status, and number of pregnancies), (2) previous infant-feeding and breastfeeding history and knowledge about breastfeeding issues, (3) HIV/MTCT-related questions surveying general knowledge and perceptions about breastfeeding and the perceived risk of HIV and MTCT, and (4) perceptions with regard to the WHO/UNAIDS/UNICEF revised guidelines. Information on the actual HIV status of mothers was not requested. This article only presents data from parts 1 to 3 of the questionnaire.

We were aware of existing indicators for assessing current breastfeeding practices,\(^12\) but because our results are based on retrospective data, we decided to develop
our own indicators. The age of the child at termination of breastfeeding was obtained by asking “For how long did you breastfeed your last born child?” Children who were said to have received only breast milk for the first few months postpartum were defined as “exclusive breastfeeding.” Those for whom additional fluids and/or food were introduced during the first few days after birth were given the classification “early termination of exclusive breastfeeding” and were defined as having been “partially breastfed.” Women were classified as having knowledge of exclusive breastfeeding if they responded negatively to the question “Do breastfed infants need water in addition to breast milk during the first 4 months?” Intention to breastfeed was measured in months. Because this unit of measure is not commonly used in this community, we also included an optional question with 7 other markers for breastfeeding intention: “when I return to work,” “until I get pregnant,” and so on. Because a majority of the women (78%) actually replied in terms of months, this is what we have presented. Women were classified as having knowledge of MTCT transmission if they correctly answered 4 questions about ways in which HIV can be transmitted from mother to child, that is, during pregnancy (yes), during labor (yes), through breastfeeding (yes), and through breathing (no). Consequently, “low knowledge” includes those having 0 to 3 correct answers.

To supplement this quantitative approach, focus group discussions were conducted with pregnant women attending the selected clinics. All of these women were recruited while they were attending an antenatal clinic, and about half of them had also participated in the interview survey. Six focus group discussions were carried out with a total of 46 pregnant women. An additional focus group discussion was carried out with 10 women who were active members of the Kilimanjaro Women’s Group against AIDS, an active nongovernmental organization working in the region. Information from these discussions was used to validate the quantitative data obtained from the structured interviews.

Research and ethical clearance was obtained from the National AIDS Control Program, the Ministry of Health, the Commission for Science and Technology, the Tanzania Food and Nutrition Center, the KCMC Ethical Committee, and the Norwegian Committee for Medical Research Ethics. Participation was based on oral informed consent. Each participant was given a code number to ensure anonymity and confidentiality.

Analysis of variance was used to examine differences between groups in terms of actual breastfeeding duration and intended duration of breastfeeding. Logistic regression analyses were used to examine the effect of demographic factors on discrepancies between knowledge and practice of exclusive breastfeeding and on knowledge of MTCT of HIV. The following variables were separately examined in bivariate models: age of the mother, education, marital status, location of clinic, employment status, number of pregnancies, knowledge of exclusive breastfeeding, and knowledge of routes of MTCT of HIV. In the multivariate logistic analysis, only those variables that were significant in the bivariate analysis were included. All analyses were run using the SPSS-PC 10.0 statistical software package.

**Results**

Table 1 presents demographic characteristics of the sample. The mean age of the total sample was 25 years (range, 16-44 years), and one third were primigravidas (n = 167).

**Infant-Feeding Practices**

Among the multigravidas (n = 309), the mean duration of their previous breastfeeding was 23.7 ± 8.9 months. The long duration of partial breastfeeding and the introduction of prelacteal fluids did not vary with sociodemographic factors. Eighty-two percent of the newborns were given breast milk as their first food, whereas 18% were given prelacteal fluids (usually plain water or sugar water). Ninety-one percent reported using colostrum, and 85% said they had initiated breastfeeding within the first few hours after birth. Fifty-four percent of the mothers recalled practicing exclusive breastfeeding for the first few days, whereas the remaining (46%) had at this early stage introduced water, sugar water, and/or cow’s milk. The practice of introducing fluids was discussed during focus group discussions. The main reason given for the practice was that “the child is thirsty,” reflecting the strong belief that breast milk will not quench thirst. Another constraint to exclusive breastfeeding was the practice of resuming work after 3 months of maternity leave. The mean age at which solid food was introduced was 3.4 ± 1.2 months, and by the age of 8 months, all children had been given some kind of complementary food.
Intention to Breastfeed

The intended duration of breastfeeding for the expected child was 32.3 ± 9.8 months for the total sample. We found that this intention varied significantly with sociodemographic factors: A shorter intended duration of breastfeeding was associated with younger age groups, lowest parity, unmarried status, not being a farmer, urban residence, and attendance at an urban clinic (Table 2).

Knowledge of MTCT of HIV

The majority of the respondents regarded AIDS as a threat to the community, but only 7% had been HIV tested themselves. Ninety percent of the total sample knew that the virus could be transmitted either during pregnancy or through breastfeeding, and two thirds (66%) knew that it could be transmitted during labor. Due to a common misconception that HIV could be transmitted through breathing, this “dummy” question was included in the questionnaire; 37% believed that this was a route of transmission. Thirty-seven percent correctly answered all 4 questions on possible routes of transmission. Having more than one child increased the likelihood of having 4 correct answers about the routes of MTCT (40.3% vs 29.1%; odds ratio [OR] = 1.65, 95% confidence interval [CI] = 1.01-2.46), whereas not being married reduced the likelihood (25.7% vs 38.4%; OR = .56, 95% CI = .31-.98). Focus group discussions revealed a strong, widespread belief that all infants born to HIV-infected mothers were already infected in utero.

Knowledge of the Benefits of Breast Milk

Breast milk was highly valued, and all but one of the participants regarded it as the best way to feed an infant. Only a modest percentage, 17%, of the women were

Table 1. Selected Characteristics of the Sample

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total Sample (N = 500)</th>
<th>Multigravidas (n = 333)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
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<td></td>
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<tr>
<td>16-20</td>
<td>124 (24.8)</td>
<td>24 (7.2)</td>
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<td>21-25</td>
<td>155 (31.0)</td>
<td>104 (31.2)</td>
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<td>26-30</td>
<td>140 (28.0)</td>
<td>126 (37.8)</td>
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<td>31-44</td>
<td>81 (16.2)</td>
<td>79 (23.7)</td>
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<tr>
<td>Residence</td>
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<td>Rural</td>
<td>323 (64.6)</td>
<td>211 (63.4)</td>
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<td>Urban</td>
<td>177 (35.4)</td>
<td>122 (36.6)</td>
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<td>Clinic attendance</td>
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<tr>
<td>Rural</td>
<td>249 (49.8)</td>
<td>176 (52.9)</td>
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<td>251 (50.2)</td>
<td>157 (47.1)</td>
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<tr>
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<td>72 (21.6)</td>
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<td>84 (25.2)</td>
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<td>39 (7.8)</td>
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<td>Primary (standard 5-7)</td>
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<td>83 (16.6)</td>
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<td>No. of pregnancies</td>
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<tr>
<td>1</td>
<td>167 (33.6)</td>
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<tr>
<td>2</td>
<td>122 (24.2)</td>
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<td>3</td>
<td>84 (16.8)</td>
<td>84 (25.2)</td>
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<tr>
<td>4+</td>
<td>127 (25.4)</td>
<td>127 (38.1)</td>
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</table>

Table 2. Intention to Breastfeed Next Child (in Months) by Sociodemographic Factors

<table>
<thead>
<tr>
<th>Sociodemographic Factor</th>
<th>No.</th>
<th>Average Months (95% Confidence Interval)</th>
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<tr>
<td>Age, y</td>
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<tr>
<td>16-20</td>
<td>124</td>
<td>30.9 (29.0-32.8)</td>
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<tr>
<td>21-25</td>
<td>155</td>
<td>32.1 (30.4-33.8)</td>
</tr>
<tr>
<td>26-30</td>
<td>140</td>
<td>31.5 (29.8-33.2)</td>
</tr>
<tr>
<td>31-44</td>
<td>81</td>
<td>36.1 (33.5-38.7)</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>323</td>
<td>33.6 (32.4-34.9)</td>
</tr>
<tr>
<td>Urban</td>
<td>177</td>
<td>29.8 (28.4-31.2)</td>
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<tr>
<td>Clinic attendance</td>
<td></td>
<td></td>
</tr>
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<td>Rural</td>
<td>249</td>
<td>34.3 (32.9-35.7)</td>
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<td>Urban</td>
<td>251</td>
<td>30.3 (29.0-31.6)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/cohabiting</td>
<td>428</td>
<td>32.7 (31.7-33.7)</td>
</tr>
<tr>
<td>Not married</td>
<td>72</td>
<td>29.1 (26.1-32.2)</td>
</tr>
<tr>
<td>Employment</td>
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<td></td>
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<tr>
<td>Farmer</td>
<td>208</td>
<td>34.9 (33.4-36.5)</td>
</tr>
<tr>
<td>Housewife/student/unemployed</td>
<td>131</td>
<td>29.8 (27.8-31.6)</td>
</tr>
<tr>
<td>Petty trader/day employee/other work</td>
<td>122</td>
<td>30.9 (29.0-32.8)</td>
</tr>
<tr>
<td>Permanent employment</td>
<td>39</td>
<td>30.3 (27.4-33.3)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate/primary (standard 1-4)</td>
<td>51</td>
<td>33.0 (29.6-36.4)</td>
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<tr>
<td>Primary (standard 5-7)</td>
<td>366</td>
<td>32.8 (31.7-33.9)</td>
</tr>
<tr>
<td>Secondary or higher</td>
<td>83</td>
<td>29.6 (27.4-31.9)</td>
</tr>
<tr>
<td>No. of pregnancies (including the current one)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>167</td>
<td>28.8 (27.2-30.4)</td>
</tr>
<tr>
<td>2</td>
<td>122</td>
<td>32.0 (30.2-33.8)</td>
</tr>
<tr>
<td>3</td>
<td>84</td>
<td>33.9 (31.8-36.0)</td>
</tr>
<tr>
<td>4+</td>
<td>127</td>
<td>35.2 (33.0-37.4)</td>
</tr>
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</table>
aware that breastfeeding could prolong the intervals between births, and a minority had used breastfeeding as a method of preventing pregnancy. The main reasons for terminating breastfeeding were a new pregnancy, “traditions,” insufficient breast milk, and the child’s refusal to take the breast.

Furthermore, only 17% knew that it is not necessary to add water during the first 4 months. Women attending urban clinics more often responded that “fluids other than breast milk were not necessary during the first 4 months of life” compared to women attending rural clinics (23.1% vs 10.4%; OR = 2.58, 95% CI = 1.56-4.25). Furthermore, women with secondary education were more likely to have knowledge of exclusive breastfeeding than were women with no formal education (21.7% vs 7.8%; OR = 3.25, 95% CI = 1.03-10.23). However, only the urban-rural clinic attendance relationship remained statistically significant in the multivariate analysis (OR = 2.37, 95% CI = 1.42-3.96). No other demographic variables showed any significant relationship with exclusive breastfeeding.

Factors Predicting Early Termination of Exclusive Breastfeeding

Table 3 shows the prevalence of early termination of exclusive breastfeeding of the last born child in the group of multigravidas among different subgroups and a logistic regression analysis predicting the likelihood of not disrupting exclusive breastfeeding early. Marital status and having knowledge of exclusive breastfeeding were the factors that showed a significant difference, as unmarried women and women not having knowledge of exclusive breastfeeding were more likely to terminate exclusive breastfeeding early.

Discussion

In this area of northern Tanzania, breastfeeding is universal and prolonged partial breastfeeding is widely practiced. We found only modest variations in the duration of breastfeeding among demographic subgroups in this population. However, few infants were exclusively breastfed for the first 4 months in this region, and this has also been reported in a number of other countries in Africa in spite of long duration of partial breastfeeding. Our findings are also consistent with the results from other studies of breastfeeding practices undertaken in Tanzania. 3,4,14,15

Based on our own qualitative work, we know that fluids are commonly given as a supplement, for there is a misconception that breast milk is not sufficient to quench thirst. Therefore, we believe that the prevalence of mothers who introduced fluids early is still underestimated. Furthermore, the importance of exclusive breastfeeding is a topic commonly taught at the mother-child-health clinics, and most mothers are now highly aware of the benefits of practicing exclusive breastfeeding; consequently, questions concerning the practice may be regarded as sensitive, and answers may be given in order to please the interviewer.

In the 1996 TDHS survey, it was noted that the median duration of exclusive breastfeeding is about 1 month. 4 Our results do not support this finding, since as many as 46% of the women reported that they had introduced additional fluids to breast milk after only a few days. Our finding is further supported by the fact that only 17% responded that the infant did not need any fluids in addition to breast milk during the first 4 months. We found that 85% started breastfeeding within the first 2 hours after birth, which is consistent with the 1996 TDHS report. 4

The participation rate of this study was high. We believe that the reason for this is that MTCT of the HIV-virus is a topic in which the pregnant women were interested and the setting (a antenatal clinic) was seen as appropriate for an interview concerning these issues.

We have used 4 months as the reference period for exclusive breastfeeding, although recent research has shown that there appears to be no evidence in favor of introducing complementary foods before 6 months of age. 16-18 We believe, however, that 4 months was appropriate in this setting where the prevalence and duration of exclusive breastfeeding is low.

Our breastfeeding histories are based on retrospective data. It is recommended that breastfeeding practices be based on 24-hour-recall data rather than retrospective data. 12 The associations based on retrospective data collection may suffer from both recall bias and digit preference. 3 Various difficulties of accurately estimating the duration of breastfeeding and breastfeeding trends in general have been reported in the literature. 3 One of the disadvantages of a retrospective approach is that in many non-Western cultures, precision of age in terms of months (or weeks) is not perceived as important. In the 1991-1992 TDHS, 60% of the reported breastfeeding durations were multiples of 6. 19 This was considered to be the result of measurement errors and not a true reflection of the weaning patterns. 3,10 In our study, 70% of the reported breastfeeding durations were multiples of 6.
Although our result (23.7 months) does not differ much from that of the TDHS (22.6 months), based on current information on breastfeeding, this methodological problem may explain the weak correlation in our study between reported breastfeeding duration and sociodemographic factors.

The fact that young urban women with some modern attributes (eg, unmarried, not farmers, of low parity) reported a shorter intention to breastfeed than women with traditional attributes suggests that the average breastfeeding duration might gradually decline in Tanzania in the coming years (as this segment of the population may increase). This finding is further supported by an anthropological study undertaken in a neighboring region that found that young childless women to a large degree perceived their breasts in terms of their attractiveness rather than their function. The women who were interviewed emphasized the aesthetic aspects of having beautiful breasts²⁰ and indicated their belief that breastfeeding leads to less attractive breasts. This contrasts with the traditional perception of breasts, which gives greater emphasis to their functional attribute, that is, producing milk for the infant. The Kiswahili word for milk and breast is the same, maziwa.

The knowledge of MTCT transmission through breastfeeding and during pregnancy was high. The

<table>
<thead>
<tr>
<th>Background Factor</th>
<th>No.</th>
<th>Early Termination of Exclusive Breastfeeding (%)</th>
<th>Bivariate</th>
<th>95% Confidence Interval</th>
<th>Multivariate</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-20</td>
<td>18</td>
<td>(50.0)</td>
<td>1</td>
<td></td>
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<td>21-25</td>
<td>95</td>
<td>(48.4)</td>
<td>.94</td>
<td>.34-2.57</td>
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<td></td>
</tr>
<tr>
<td>26-30</td>
<td>120</td>
<td>(45.0)</td>
<td>.82</td>
<td>.30-2.20</td>
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<tr>
<td>31-44</td>
<td>76</td>
<td>(43.4)</td>
<td>.77</td>
<td>.27-2.15</td>
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<tr>
<td>Rural</td>
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<td>(45.8)</td>
<td>1</td>
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<td></td>
<td></td>
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<tr>
<td>Urban</td>
<td>117</td>
<td>(46.2)</td>
<td>1.01</td>
<td>.64-1.61</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Clinical attendance</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>165</td>
<td>(48.5)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>144</td>
<td>(43.1)</td>
<td>.80</td>
<td>.51-1.26</td>
<td></td>
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<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate/primary (1-4)</td>
<td>35</td>
<td>(54.3)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary (standard 5-7)</td>
<td>237</td>
<td>(44.7)</td>
<td>.68</td>
<td>.33-1.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>37</td>
<td>(45.9)</td>
<td>.72</td>
<td>.28-1.81</td>
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<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not married</td>
<td>25</td>
<td>(88.0)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Married/cohabiting</td>
<td>284</td>
<td>(42.3)</td>
<td>.10</td>
<td>.03-.34</td>
<td>.09</td>
<td>.04-.24</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td>133</td>
<td>(49.6)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife/student/unemployed</td>
<td>65</td>
<td>(44.6)</td>
<td>.82</td>
<td>.45-1.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petty trader/day employee/other work</td>
<td>82</td>
<td>(45.1)</td>
<td>.83</td>
<td>.48-1.45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent employment</td>
<td>29</td>
<td>(34.5)</td>
<td>.53</td>
<td>.23-1.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of pregnancies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>122</td>
<td>(50.5)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>84</td>
<td>(39.0)</td>
<td>.63</td>
<td>.35-1.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4+</td>
<td>124</td>
<td>(46.8)</td>
<td>.86</td>
<td>.51-1.45</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Knowledge of exclusive breastfeeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need fluids</td>
<td>254</td>
<td>(53.5)</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Do not need fluids</td>
<td>55</td>
<td>(10.9)</td>
<td>.11</td>
<td>.04-.26</td>
<td>.08</td>
<td>.02-.31</td>
<td></td>
</tr>
<tr>
<td>Knowledge of mother-to-child transmission of HIV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-3 correct answers</td>
<td>178</td>
<td>(49.4)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 correct answers</td>
<td>129</td>
<td>(40.3)</td>
<td>.69</td>
<td>.44-1.09</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Children who were said to have received only breast milk for the first few months were defined as exclusively breastfed. Those for whom additional fluids and/or food were introduced during the first few days after birth were given the classification “early termination of exclusive breastfeeding” and were defined as having been partially breastfed.
reported yet inconclusive finding that exclusive breastfeeding had been shown to carry a significantly lower risk of MTCT of HIV-1 than mixed or partial feeding was incorporated as a theme during focus group discussions. This information was perceived as contradictory to women’s recent awareness that breast milk can transfer the virus. Thus, it was not easily understood and was received with skepticism. The matter is further complicated by the common misconception that an infant born to an HIV-infected mother is already infected in utero. For these reasons, mothers perhaps do not regard the recommendation to exclusively breastfeed as a valid option. In addition, we have to bear in mind, as with other infections, that HIV infection may affect milk production and/or maternal behavior with regard to feeding.

Attending an urban clinic was the strongest predictor of knowledge of exclusive breastfeeding, although urban women reported a shorter intended period to breastfeed than their rural counterparts. This finding is consistent with another study conducted in Tanzania, which reports that urban mothers are more likely to initiate and practice exclusive breastfeeding than rural mothers, although rural women breastfeed their children slightly longer. An explanation for this could be that in general, the health care staff at urban clinics have a better education, the work of the staff is better supervised, and staff members are exposed to more training opportunities compared to their rural counterparts. It may also indicate that health care workers themselves must be knowledgeable and convinced of the benefits of the practice to enable mothers to follow their advice. Having knowledge of exclusive breastfeeding and being married remained statistically significant predictors for not terminating exclusive breastfeeding early.

**Conclusion**

Breastfeeding practices have been shown to be sensitive to a number of individual and societal characteristics. The “urban and able,” who are most able to afford an alternative to breastfeeding, are indeed the ones who have the lowest intention (in terms of duration) to breastfeed in the future. When combined with a recent awareness of MTCT of HIV through breastfeeding, mothers not knowing their status may believe they are at risk of being infected and start to feel guilty about breastfeeding their infant, which can lead to changing infant-feeding practices over time.

If the results from the observational study of Coutsoudis et al. are confirmed, then the public health benefits of exclusive breastfeeding for HIV-infected mothers in resource-poor settings are considerable. However, it remains a challenge to motivate and enable HIV-infected mothers and mothers of unknown status to practice exclusive breastfeeding. The early introduction of fluids will have to be challenged, and further research is needed to understand the reasons that mothers continue to practice this tradition. According to the WHO/UNAIDS/UNICEF guidelines, the decision of whether to breastfeed should be made by each HIV-infected mother based on full information of the options available. In our study, the majority of mothers did not see a need for, or even any benefit from, the protection offered by exclusive breastfeeding because they believed that the babies were already born HIV infected. Therefore, it is important to be aware that in addition to being a rare practice, the benefit of practicing exclusive breastfeeding if infected with HIV is being questioned by most mothers. The guidelines further recommend that women of unknown HIV status should continue to breastfeed. This recommendation would apply to a majority of women in large, resource-poor areas where testing is not routinely practiced. If exclusive breastfeeding is going to be a viable option, intensive efforts to promote the practice, not least among health care workers and other role models, are necessary.

**References**


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**Resumen**

El objetivo de este estudio fue describir las prácticas de la lactancia materna; el conocimiento sobre la lactancia materna de las mujeres embarazadas con relación a la transmisión madre-hijo del VIH; y explorar factores asociados a la lactancia materna exclusiva, especialmente en presencia del VIH/SIDA. Se efectuaron encuestas con entrevistas en un corte seccional a 500 mujeres embarazadas en la región de Kilimanjaro, junto a grupos focales con mujeres embarazadas. Entre las 309 madres que habían amamantado previamente, 85% iniciaron la lactancia materna en las primeras horas postparto, y 18% de los recién nacidos recibieron algún alimento suplementario. La duración promedió de la lactancia fue de 23.7 meses, pero 46% de las madres introdujeron otros líquidos tempranamente. El conocimiento de la transmisión del VIH a través de la leche materna se asoció a las prácticas de la lactancia. Las mujeres casadas (OR = .09, 95% CI = .04-.24) y aquellas que conocían el concepto de lactancia materna exclusiva (OR = .08, CI = .02-.32) fueron las que menos suspendieron la lactancia materna exclusiva tempranamente. La lactancia materna exclusiva se encontró como una práctica poco frecuente y la transmisión madre-hijo del VIH puede complicar las recomendaciones con relación a esta práctica.
Factors Associated With Exclusive Breastfeeding in Ibadan, Nigeria

T. O. Lawoyin, MBBCh, MPH, FMCP, J. F. Olawuyi, PhD, M. O. Onadeko, MD, MPH, FMCPH, FWACP

Abstract

Although nationwide efforts to promote exclusive breastfeeding began in Nigeria in 1992, data on this type of infant feeding are still generally scarce. Current status breastfeeding data were obtained from 2794 mothers, enrolled from randomly selected infant welfare clinics in Ibadan, Nigeria, to evaluate factors that are associated with exclusive breastfeeding. The exclusive breastfeeding rate dropped from 57.4% at 1 month to 23.4% at 6 months. Using multiple regression analysis, younger age of infant ($P < .0001$), higher maternal occupation ($P < .05$), and delivery in tertiary ($P < .0001$) or secondary ($P < .0001$) health facility were predictive of exclusive breastfeeding. Mothers 24 years or younger and primiparous mothers were less likely to breastfeed their babies exclusively ($P < .01$ and $P < .05$, respectively). Additional programs are needed to meet the needs of at-risk mothers, who should be identified and counseled. J Hum Lact. 17(4):321-325.

Keywords: exclusive breastfeeding, Baby-Friendly Hospital Initiative, infants, developing country

Before British colonization and subsequent independence in 1960, Nigerian infants were traditionally breastfed exclusively and for long periods.1-3 Motherless babies and infants of mothers who could not breastfeed were routinely put to the breast of close relatives and neighbors.3-5 A notable decline in the practice of breastfeeding was observed in Nigeria by the late 1970s. Several factors have been identified as being responsible for this decline, among which are increased maternal educational attainment, high socioeconomic status, the negative impact of certain hospital policies, and the aggressive marketing of breast milk substitutes.6-8 Nationwide efforts to promote exclusive breastfeeding in Nigeria started in 1992 with the introduction of the Baby-Friendly Hospital Initiative.9 Government commitment to the program and the support of the United Nations International Children’s Emergency Fund (UNICEF) and the World Health Organization have resulted in making exclusive breastfeeding more popular among Nigerian mothers.10,11 The exclusive breastfeeding rate at 3 months has consequently risen from the 2% reported at the beginning of the last decade to 22% in 1999.12,13

There is a lack of data on exclusive breastfeeding and factors associated with exclusive breastfeeding in this community, making it difficult to identify areas that require intervention. Moreover, baseline data are generally lacking, making trend assessment difficult. This study attempts to provide baseline information on the pattern of exclusive breastfeeding among Nigerian mothers and to identify factors associated with it. Policy makers and health care professionals urgently need this information because they make decisions regarding implementation, and relate the breastfeeding policy to community members.

Method

Study Area

The study was carried out in Ibadan, the capital of Oyo, Nigeria. Ibadan, one of the largest cities in Africa...
(with a population of more than 2 million), is divided into 3 well-demarcated socioeconomic zones\textsuperscript{14,15} the inner city (lower socioeconomic zone), the transitional section (middle socioeconomic zone), and the low-density urban periphery (higher socioeconomic zone) and 5 local government areas (Ibadan North, Northeast, Northwest, Southwest, and Southeast). UNICEF-supported training of government health workers in the tertiary, secondary, and primary care facilities within the 5 zones has been completed, and workers facilities are expected to have received training in lactation management that will enable them to promote, support, and protect exclusive breastfeeding adequately.

**Study Design**

Using a multistage sampling technique, all health facilities with infant welfare clinics in the Ibadan municipality were first stratified into primary and secondary health facilities according to their designation. In the second stage, 5 primary and 2 secondary facilities were selected by simple random sampling for the study. The infant welfare clinic of the only tertiary hospital in the city was also selected for the study. The infant welfare clinics at the primary, secondary, and tertiary levels were run as primary care clinics, and referrals were not required to attend such clinics at the secondary and tertiary levels. Permission and ethical approval to carry out the study was obtained from the office of the chief medical officer, Adeoyo State Hospital; from the local government chairman in the local government areas involved; and from the director of the Institute of Child Health, University College Hospital, Ibadan.

**Sampling Procedure and Measurements**

Total sampling of all mother-infant pairs (singleton deliveries, infants 180 days old) seen in the clinics from July to December 1998 was carried out. The purpose of the study was explained, and consent was obtained from all mothers who participated in the study. Each mother was interviewed during routine consultation using a standardized questionnaire, and each was asked about her baby’s current feeding status. Current status data, whether the mother was breastfeeding exclusively (coded as 1) or not (coded as 0), were obtained.\textsuperscript{16} Infant’s age at the time of the interview, measured in days and confirmed with age recorded in the Road-to-Health clinic cards, was also obtained along with other relevant demographic data. Exclusive breastfeeding is defined as infant feeding with human milk without the addition of any other liquid or solids.

Occupation was classified as higher, middle, and lower. The higher occupational group includes the professionals and the top civil servants (including the managerial cadre of workers). The middle socioeconomic class includes the technical and skilled workers, whereas the lower class includes the partially skilled and the unskilled. Mission homes are delivery homes owned and run by churches. Mothers are attended to by trained birth attendants and occasionally by midwives.

**Data Management and Analysis**

Collected data were coded and entered into a computer using EPI Info version 6\textsuperscript{17} and analyzed. Data were exported into Systat\textsuperscript{18} software for regression analysis.

**Results**

A total of 2794 mother-infant pairs were enrolled. Of this total, 48.1% (n = 1345) of the babies were exclusively breastfed at the time of the study whereas 51.9% (n = 1449) were nonexclusively breastfed. None of the survey infants were completely weaned at the time of the study. Table 1 shows the exclusive breastfeeding rates by age. The proportion of exclusively breastfed babies dropped with increasing age, whereas the proportion of babies nonexclusively breastfed increased with age. Table 2 shows stratified bivariate relationships between exclusive breastfeeding and selected factors. Infant age, place of delivery, infant sex, parity of mother, and occupation of mother and father were significantly associated with exclusive breastfeeding. The older the baby, the less likely that the mother-infant pair was breastfeeding exclusively ($\chi^2 = 58.46$, $P < .001$). There was no overall significant difference in exclusive breastfeeding rate by maternal age ($P > .05$).

**Place of Delivery and Exclusive Breastfeeding**

Delivery at a tertiary or secondary health care facility favored exclusive breastfeeding; 62.1% and 60.4% of babies born in these facilities, respectively, were exclusively breastfed. This was followed by delivery at a private hospital (45.6%). Primary facilities, mission homes, and respondents’ homes, as well as the delivery facilities outside the study area, had significantly lower breastfeeding rates (36.4%, 34.5%, 36.3%, and 38.0%, respectively) when compared to the tertiary and secondary facilities ($P < .05$). Exclusive breastfeeding rates were no different among mothers who delivered in primary health care facilities when compared with mothers who delivered their babies at the mission homes, at
home, and outside the study facilities ($P > .05$). In addition, the exclusive breastfeeding rate obtained among mothers using the primary care facilities was significantly lower than the rate obtained for the private facilities ($\chi^2 = 3.67, P < .05$). Only the staff at tertiary, secondary, and primary facilities had received lactation management training at the time of the study.

### Multivariate Analysis

Logistic regression was used to construct a model of variables to predict exclusive breastfeeding and remove the effect of confounders. Factors independently associated include younger age of baby ($-P < .0001$), primiparity ($-P < .05$), higher maternal occupation ($+ P < .05$), young maternal age (24 years and younger) ($- P < .01$), and delivery in tertiary or secondary care facility ($+P < .0001$ and $P < .0001$, respectively). Sex of the baby and occupation of the father were not significant predictors of exclusive breastfeeding ($P > .05$). These variables predicted 54.2% of the variance in exclusive breastfeeding in the community (Table 3).

### Discussion

Mothers in industrialized and developing countries alike now breastfeed, a practice that was on the decline in the 1970s and 1980s. In Nigeria, breastfeeding is almost universal at birth, and 43% of children are breastfed at 20 to 23 months. Exclusive breastfeeding, however, is not as widely practiced. The data presented show that exclusive breastfeeding is practiced by just more than one half of the mothers in the first postpartum month, and that by 6 months, fewer than 1 in 4 mothers are breastfeeding their babies exclusively. This underscores the need to identify factors mitigating against exclusive breastfeeding in this community so that steps can be taken to improve the proportion of women breastfeeding exclusively in the first 6 months. Exclusive breastfeeding rates are lower in this community than in Karnataka, India, and in Canterbury, United Kingdom, but higher than rates in Uppsala, Sweden, and Riyadh, Saudi Arabia.

The 3-day (18-hour) lactation management training program has been shown to be adequate for imparting knowledge and improving the practice of exclusive breastfeeding. Despite the fact that workers in the designated primary health care facilities in this study had received training in lactation management, the exclusive breastfeeding rates among mothers who delivered there were not significantly different from

### Table 1. Breastfeeding Pattern Among Mothers in Ibadan, Nigeria (n = 2794)

<table>
<thead>
<tr>
<th>Postpartum day</th>
<th>Exclusive Breastfeeding</th>
<th>Nonexclusive Breastfeeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>0-30</td>
<td>349</td>
<td>57.4</td>
</tr>
<tr>
<td>31-60</td>
<td>319</td>
<td>50.2</td>
</tr>
<tr>
<td>61-90</td>
<td>310</td>
<td>48.7</td>
</tr>
<tr>
<td>91-120</td>
<td>266</td>
<td>45.3</td>
</tr>
<tr>
<td>121-150</td>
<td>75</td>
<td>34.9</td>
</tr>
<tr>
<td>151-180</td>
<td>26</td>
<td>23.4</td>
</tr>
<tr>
<td>Total</td>
<td>1345</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2. Number and Percentage of Mothers Who Reported Exclusive Breastfeeding by Sociodemographic Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total No.</th>
<th>Exclusively Breastfeeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant age, d**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-30</td>
<td>608</td>
<td>349</td>
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<tr>
<td>31-60</td>
<td>636</td>
<td>319</td>
</tr>
<tr>
<td>61-90</td>
<td>637</td>
<td>310</td>
</tr>
<tr>
<td>91-120</td>
<td>587</td>
<td>266</td>
</tr>
<tr>
<td>121-150</td>
<td>215</td>
<td>75</td>
</tr>
<tr>
<td>151-180</td>
<td>111</td>
<td>26</td>
</tr>
<tr>
<td>Infant sex*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1374</td>
<td>646</td>
</tr>
<tr>
<td>Female</td>
<td>1420</td>
<td>699</td>
</tr>
<tr>
<td>Parity*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primiparous</td>
<td>1032</td>
<td>540</td>
</tr>
<tr>
<td>Multiparous</td>
<td>1762</td>
<td>805</td>
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<tr>
<td>Father’s occupation*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher</td>
<td>291</td>
<td>172</td>
</tr>
<tr>
<td>Middle</td>
<td>439</td>
<td>242</td>
</tr>
<tr>
<td>Lower</td>
<td>2058</td>
<td>931</td>
</tr>
<tr>
<td>Mother’s occupation**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher</td>
<td>173</td>
<td>101</td>
</tr>
<tr>
<td>Middle</td>
<td>297</td>
<td>169</td>
</tr>
<tr>
<td>Lower</td>
<td>2318</td>
<td>1065</td>
</tr>
<tr>
<td>Maternal age, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>966</td>
<td>409</td>
</tr>
<tr>
<td>25-29</td>
<td>1007</td>
<td>444</td>
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<td>30-34</td>
<td>527</td>
<td>275</td>
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<tr>
<td>35 and older</td>
<td>290</td>
<td>115</td>
</tr>
<tr>
<td>Delivery facility**</td>
<td></td>
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</tr>
<tr>
<td>Tertiary</td>
<td>267</td>
<td>166</td>
</tr>
<tr>
<td>Secondary</td>
<td>945</td>
<td>572</td>
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<tr>
<td>Primary</td>
<td>143</td>
<td>52</td>
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<tr>
<td>Private</td>
<td>417</td>
<td>190</td>
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<tr>
<td>Mission home</td>
<td>449</td>
<td>155</td>
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<tr>
<td>Home</td>
<td>460</td>
<td>167</td>
</tr>
<tr>
<td>Outside study area</td>
<td>113</td>
<td>43</td>
</tr>
</tbody>
</table>

* $P < .05$, chi-square test.
** $P < .001$, chi-square test.
those of mothers who delivered in facilities that had not benefited from such training. This finding underscores the need to determine whether the 3-day lactation management training at such facilities is adequate and to determine, in a later study, why rates were not higher. On the other hand, no group had very low rates for exclusive breastfeeding, which suggests that mothers are getting some information on exclusive breastfeeding in the community.

In the bivariate analysis, exclusive breastfeeding was associated with mothers’ and fathers’ occupation. However, following multiple regression analysis, occupation was no longer significant. The strong unadjusted effect may have been due to mediating effects of place of delivery, given that mothers of higher occupation are very unlikely to deliver at home, in mission homes, or in primary care facilities. Delivery at tertiary and many private clinics is expensive, and these facilities are usually staffed by physicians. In the absence of an emergency, mothers from the lower socioeconomic class do not routinely patronize these facilities. Mission homes are generally free and typically attract women from the lower socioeconomic class.

Additional programs are needed to meet the needs of young mothers and those having their first baby. Training needs to be extended to the staff at private clinics and to the traditional birth attendants at the mission homes. It is necessary to identify factors that contribute to the low rate of exclusive breastfeeding among mothers who deliver at the primary care centers. It is proposed that such mothers need to be identified and counseled. These measures not only would promote exclusive breastfeeding but would also contribute immensely to infant and maternal well-being in this community.

References
Resumen

Desde que se comenzaron los esfuerzos para la promoción de la lactancia materna exclusiva en 1992, en Nigeria se tienen muy escasos datos estadísticos de este tipo de alimentación infantil. Este estudio muestra datos de 2794 mujeres que se seleccionaron aleatoriamente en las clínicas de asistencia pública en la ciudad de Ibadan, Nigeria, con el fin de evaluar los factores asociados a la lactancia materna exclusiva. La lactancia materna exclusiva disminuyó de 57.4% al mes a 23.4% a los 6 meses de edad. Utilizando un análisis de regresión múltiple, se encontraron como factores pronosticables para una lactancia materna exclusiva; la temprana edad del infante ($P < .0001$), alto empleo materno ($P < .05$), y parto atendido en una facilidad de atención terciaria ($P < .0001$) o facilidad de atención secundaria ($P < .0001$). Las madres de 24 años o más jóvenes y primigravidas fueron menos probable de alimentar a sus hijos exclusivamente ($P < .01$ y $P < .05$). Es necesario contar con programas adicionales para responder a las necesidades de las madres en riesgo, que se deben identificar y aconsejar.
Extending Breastfeeding Duration Through Primary Care: A Systematic Review of Prenatal and Postnatal Interventions

Maria Inês Couto de Oliveira, PhD, MSc, Luiz Antonio Bastos Camacho, MD, DrPH, Alison E. Tedstone, PhD

Abstract
This literature review provides an overview of the effectiveness of strategies and procedures used to extend breastfeeding duration. Interventions carried out during pregnancy and/or infant care conducted in primary health care services, community settings, or hospital clinics were included. Interventions covering only the delivery period were excluded. Interventions that were most effective in extending the duration of breastfeeding generally combined information, guidance, and support and were long term and intensive. During prenatal care, group education was the only effective strategy reported. Home visits used to identify mothers’ concerns with breastfeeding, assist with problem solving, and involve family members in breastfeeding support were effective during the postnatal period or both periods. Individual education sessions were also effective in these periods, as was the combination of 2 or 3 of these strategies in interventions involving both periods. Strategies that had no effect were characterized by no face-to-face interaction, practices contradicting messages, or small-scale interventions.

Keywords: breastfeeding duration, effectiveness, procedures, strategies, primary care

In recent years, many countries have begun to develop protocols to promote, protect, and support breastfeeding within primary health care. Chile, Nicaragua, Peru, Argentina, the United Kingdom, and Brazil are countries that have taken such steps. This movement follows the success of the Baby-Friendly Hospital Initiative, launched by the World Health Organization (WHO) and the United Nations International Children’s Emergency Fund (UNICEF) in 1992 to encourage maternity hospitals to adopt the “10 steps to successful breastfeeding.” As of June 2000, 132 countries have joined the initiative, and 14,845 hospitals have been designated as baby friendly. Baby-friendly hospitals discourage practices that undermine breastfeeding and adhere to those that promote it, such as skin-to-skin contact/early breastfeeding upon delivery and rooming-in. Nonetheless, mothers are discharged home soon after delivery, and usually before breastfeeding is established, when they are transferred to primary care.

Primary health care services are responsible for monitoring women’s pregnancy and infant health and are offered at no charge in many countries. Thus, they offer a key opportunity for breastfeeding advocacy. This article reviews the available evidence with regard to primary care interventions conducted during the prenatal

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and postnatal phases (excluding delivery care) to improve breastfeeding duration, so that a program of effective breastfeeding promotion, protection, and support for primary care can be defined.

**Method**

**Literature Search Approach**

A systematic literature search was undertaken to evaluate primary care interventions designed to extend breastfeeding duration (exclusive, full, or any kind of breastfeeding) during the prenatal and/or postnatal period. Interventions that took place during the delivery period only were excluded. The literature search used an earlier systematic infant-feeding review that focused on the developed world as the starting point. Additionally, databases were searched (Medline, Popline, HealthStar, CAB-Health, Cochrane Library, CINAHL, and Lilacs) using the key words *promotion*, *intervention*, *assess*, *programme*, *community*, *education*, *effect*, *impact*, and *evaluation* (linked to breastfeeding). Studies published between 1980 and 1999 with experimental or quasi-experimental designs were included. Key researchers in the field were also contacted to obtain unpublished material or narrowly disseminated reports.

Interventions that were applicable to the primary care setting were defined as interventions of low complexity, not demanding hospitalization, and related to the general health care necessities of the population. They were based in primary health care services (defined broadly as clinics outside the hospital), in community settings, or in hospital antenatal and/or postnatal clinics.

**Selection Criteria for Inclusion**

The studies reviewed were divided into 3 blocks:

- **Internally valid studies.** Experiments (trials following formal or nonformal randomization procedures) or quasi-experiments (with a prospective comparable nonrandomized control group) whose findings were unlikely to be explained by bias, with adequate control of confounding factors and an attrition rate of no more than 25% (excluding losses to follow-up due to stillbirths or infant death). These have been included in the text and in the tables of this article.

- **Studies with methodological problems.** Experiments or quasi-experiments whose findings could be explained by bias or other methodological problems (many of them acknowledged by the authors), such as the use of historical control group, limited consideration of confounding factors, and large (above 25%) or nonstated attrition rate. These have been included in the text (with comments on the putative breaches in validity) but not in the tables.

- **Studies excluded from this review.** Studies with observational designs; interventions targeting high-risk groups; or studies reporting only the effect of the intervention on mother’s knowledge of breastfeeding, infant-feeding decision, or breastfeeding initiation, rather than breastfeeding duration. These studies have not been cited.

**Categorization of Studies, Quality Assessment, and Breastfeeding Definitions**

The studies included in the text were grouped in accordance with the period in which the interventions were conducted: prenatal phase; postnatal phase; prenatal and postnatal phase; hospital and postnatal phase; and prenatal, hospital, and postnatal phase. The internally valid studies were assessed using a 3-item quality scale evaluating (1) the approach to covariate unbalance in the intervention and control groups, (2) independence of outcome assessment, and (3) methods of statistical analysis and presentation of results. This quality score is presented in the tables, ranging from 3/3 (good) and 2/3 (moderate) to 1/3 and 0/3 (poor).

The terminology used to define the different kinds of breastfeeding varied across the articles. To make them uniform, WHO definitions of breastfeeding categories were used in this review.

**Measures of Effectiveness**

Interventions were considered to be effective when supported by internally valid evidence that the exposure to the intervention extended the duration of breastfeeding. The outcomes of most studies were the extension of exclusive, full, or any kind of breastfeeding at points in time varying from 4 weeks to 6 months. The main outcome measure was the proportion of mothers breastfeeding at or until a specified point in time, but some studies reported the median or the mean breastfeeding duration.

The main features of each intervention (context or setting, type of support staff, strategies and procedures,
and effectiveness) are described in the text. The tables summarize the country, study design, quality score, sample size, strategy, and timing of each study, and present the interventions’ maximum duration of effect that proved to be statistically significant at a 90% level. The effects presented are the percentage of exclusive breastfeeding, full breastfeeding, or any kind of breastfeeding among the intervention and control groups, with the corresponding $P$ value. We also derived the attributable fraction and constructed 95% confidence intervals when the data presented by the authors were conclusive or suggestive (marginal statistical significance) of effect. The attributable fraction (AF) is defined as the proportion of the outcome rate achieved in the intervention group that is due to the intervention, and is a measure of effectiveness in this context. It corresponds to the difference between breastfeeding rates in the intervention (I) and control (C) groups, expressed as a proportion of the rate in the intervention group: $AF = (I - C)/I$. It can also be derived from the relative risk (RR) through the expression $AF = (RR - 1)/RR$. We used this same expression to calculate the confidence limits of the attributable fraction, based on the upper and lower limits of the relative risk.

**Results**

In this review, 33 experimental and 31 quasi-experimental studies were selected through the identification of interventions conducted in the prenatal and postnatal phases aiming to extend breastfeeding duration. Thirty-seven were considered internally valid studies, whereas 27 had methodological problems. Interventions took place in women’s homes (34%), primary health care units (29%), hospital clinics (29%), and the community (8%). These interventions are discussed below, in groups according to the period in which they were conducted.

**Prenatal Phase**

**Internally Valid Studies**

Eight studies were included in this category. The interventions were based in antenatal hospital clinics. Seven were designed with a focus on group sessions (7/8). Six were effective at extending breastfeeding duration (6/8), although the effects reported varied from the extension of full breastfeeding until 6 months to the extension of any kind of breastfeeding until 4 weeks. In Chicago, two strategies were tested among black low-income women born in the United States: group sessions and individual counseling. Those assigned to group sessions were encouraged by health professionals to share experiences, their partners were encouraged to participate in the discussion, and former class members demonstrated breastfeeding. The topics covered were the benefits of breastfeeding, common myths, how breast milk is produced, milk expression and storage to combine work and breastfeeding, and common inhibitions or problems and ways to overcome them. Topics discussed in the individual counseling session were similar. Group sessions were found to extend breastfeeding duration, but individual counseling was effective only in increasing breastfeeding initiation rates.

In Santiago, a subset of the intervention group (already participating in the Breastfeeding and Lactational Amenorrhea Method Program) was exposed to prenatal breastfeeding skills group education, where a trained midwife encouraged women to express their doubts and concerns and to share their own personal experiences. The advantages of immediate contact and rooming-in were discussed, and breastfeeding skills were developed using a breast model and a baby-sized doll. Full breastfeeding at 6 months was increased from an already high level of 65% to an astonishing proportion of 80% of mothers. In Mexico, pregnant women not intending to breastfeed were provided with 4 classes on the advantages and techniques of breastfeeding. The intervention was successful, as 72% of this initially nonmotivated clientele continued to breastfeed at 4 weeks postpartum compared to 16% in the control group.

In Australia, a culture-specific education program was conducted with pregnant Vietnamese women, in small groups, showing videotape and confronting misconceptions about bottle-feeding with factual information on breastfeeding. The intervention group had almost twice the women breastfeeding from birth up to 4 weeks. Another intervention in Australia developed a group teaching session with primiparas who intended to breastfeed, aiming specifically at correct positioning and attachment, each woman using a doll to simulate the baby on the breast. Three times as many mothers were breastfeeding at 6 weeks and fewer had nipple trauma in the experimental group in comparison to the control group.
<table>
<thead>
<tr>
<th>Author, Year, and Country</th>
<th>Design, Score, ** and Sample Size</th>
<th>Intervention</th>
<th>Outcome</th>
<th>Intervention Versus Control</th>
<th>P Value</th>
<th>Attributable Fraction</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kistin et al (1990),14 United States</td>
<td>RCT, 2, N = 159</td>
<td>Intervention 1: group session (at least 1): 50-80 min</td>
<td>Any BF at 7-12 wk</td>
<td>15 vs 4</td>
<td>.058</td>
<td>77</td>
<td>0-95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervention 2: individual counseling: 15-30 min (from before the 30th week)</td>
<td>Any BF at 7-12 wk</td>
<td>6 vs 4</td>
<td>.643</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td>Pagin et al (1996),15 Chile</td>
<td>Q-Exp, 1, N = 422</td>
<td>Group session 3-5 times: 20 min (during the last trimester)</td>
<td>Full BF at 6 mo</td>
<td>80 vs 65</td>
<td>.035</td>
<td>19</td>
<td>6-30</td>
</tr>
<tr>
<td>Vega-Franco et al (1985),16 Mexico</td>
<td>Q-Exp, 2, N = 50</td>
<td>Group session 4 times: 30 min + pamphlet (after the sixth month)</td>
<td>Any BF at 4 wk</td>
<td>72 vs 16</td>
<td>&lt; .001</td>
<td>78</td>
<td>44-91</td>
</tr>
<tr>
<td>Rossiter (1994),17 Australia</td>
<td>RCT, 2, N = 194</td>
<td>Group session 3 times: 2 h + 25 min video (after the 12th week)</td>
<td>Any BF at 4 wk</td>
<td>50 vs 26</td>
<td>.002</td>
<td>49</td>
<td>21-67</td>
</tr>
<tr>
<td>Duffy et al (1997),18 Australia</td>
<td>RCT, 3, N = 70</td>
<td>Group session 1 time: 1 h, using dolls (during the last month)</td>
<td>Any BF at 6 wk</td>
<td>91 vs 29</td>
<td>&lt; .001</td>
<td>69</td>
<td>47-82</td>
</tr>
<tr>
<td>Wiles (1984),19 United States</td>
<td>RCT, 2, N = 40</td>
<td>Group session 1 time (duration not given) (after the 32nd week)</td>
<td>Any BF at 1 mo</td>
<td>90 vs 30</td>
<td>&lt; .001</td>
<td>67</td>
<td>34-83</td>
</tr>
<tr>
<td>Hill (1987),20 United States</td>
<td>RCT, 2, N = 64</td>
<td>Group session 1 time: 40 min lecture, 5-10 min questions + pamphlet (period not given)</td>
<td>Any BF at 6 wk</td>
<td>39 vs 30</td>
<td>.657</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td>Serwint et al (1996),21 United States</td>
<td>RCT, 1, N = 156</td>
<td>Pediatric visit 1 time (duration not given) (between 32 and 36 wk)</td>
<td>Any BF at 1 mo</td>
<td>19 vs 14</td>
<td>.602</td>
<td>†</td>
<td></td>
</tr>
</tbody>
</table>

*RCT = randomized controlled trial; Q-Exp = quasi-experimental; BF = breastfeeding.
**3 = good; 2 = moderate; 1-0 = poor.
†Data suggest lack of effect; the attributable fraction does not apply.
An intervention aimed at primiparas who intended to breastfeed reported similar success, with 3 times as many mothers breastfeeding in the experimental group as in the control group at 1 month of life. The intervention included a prenatal education class about anatomy and physiology, advantages and techniques of breastfeeding, feeding frequency, self-care, possible setbacks, and methods of combining breastfeeding and work.

Two interventions reported no effect on breastfeeding outcome. One was based in Chicago and was aimed mostly at Caucasian women. It consisted of a lecture and slide presentation on the importance of frequent breastfeeding for milk production and the prevention and management of problems, followed by a brief question-and-answer period. A pamphlet was given reinforcing the information presented. The second intervention was also based in the United States. It involved a visit with the infant’s future pediatrician offered to urban, low-income primiparas. Counseling topics included the advantages of breastfeeding, infant car safety seat use, circumcision, and pediatric health care.

**Studies With Methodological Problems**

Five studies were included in this category: 3 randomized controlled trials and 2 quasi-experimental ones. Prenatal group teaching sessions focused on the advantages and necessary skills to breastfeed in China, Venezuela, and Brazil and reported a positive effect on breastfeeding duration. However, the results of these studies must be treated with caution because of a limited consideration of confounding factors in the first 2 and a small sample size in the third.

Two culturally specific lecture-based interventions were directed at small groups of Asian women (in East London) and at black Zulu-speaking women (in South Africa). In both, the initial randomization procedures were abandoned and those attending the classes were arbitrarily considered the “educated” group. Even in this biased group, the desired extension of the duration of breastfeeding was not observed, and the scarce benefits described are unreliable.

**Postnatal Phase**

**Internally Valid Studies**

Of the 9 interventions conducted only during the postnatal phase (after hospital discharge), 3 showed no effect (3/9) on breastfeeding duration and 2 indicated a marginal effect (2/9). The 4 interventions that were effective had a wide range of outcomes, making comparison difficult (Table 2).

In the south of Brazil, trained health professionals who had positive personal breastfeeding experience visited homes. At these visits, mothers were helped to deal with such problems as engorgement, colic, and crying. The most frequent counseling was with regard to breastfeeding frequency, delaying the introduction of tea and bottles, and proper positioning and latch. The median duration of breastfeeding seen in the intervention group was 120 days compared to 105 days in the control group. In Massachusetts, the effect of support at home to mothers (who planned to breastfeed while pregnant) by a breastfeeding counselor was studied. Topics covered in early visits included dealing with engorgement, frequency of feeding, how to determine adequate intake, stooling patterns, and confidence building. In later visits, discussions centered on the expression and storage of breast milk; nursing in public; and dealing with fatigue, work, or school. Mothers were also provided with the counselor’s phone number. A 2-fold increase in the prevalence of breastfeeding at 2 months was seen in the intervention group compared to the control group.

In Chile, mothers were asked to visit a clinic between 7 and 10 days after delivery and at the end of each month for 6 months. Obstetricians and pediatricians helped with lactation problems, recommended exclusive breastfeeding, and gave advice on the lactational amenorrhea method of contraception. At 6 months, twice as many women were fully breastfeeding in the intervention group than in the control group. In Canada, breastfeeding primiparous mothers received weekly support phone calls from a nurse who had interviewed them at the hospital. Advice was given on infant behavior and techniques of breastfeeding, and mothers were referred to nursing care at the maternity hospital if necessary. Median breastfeeding duration was extended 1 week in the intervention group as compared to the control group.

In Taiwan, mothers were assigned systematically to receive home visits, nurse-initiated phone calls, or no additional support. Nurses provided anticipatory guidance of expected occurrences aiming to increase breastfeeding compliance by reducing stress. Home visits had a marginal effect on breastfeeding duration, and follow-up phone calls had no effect. An American intervention used home visits to ameliorate primiparous
<table>
<thead>
<tr>
<th>Author, Year, and Country</th>
<th>Design, Score, ** and Sample Size</th>
<th>Intervention</th>
<th>Outcome</th>
<th>Intervention Versus Control</th>
<th>P Value</th>
<th>Attributable Fraction %</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barros et al (1994), 27 Brazil</td>
<td>RCT, 3, N = 900</td>
<td>Home visits at d 5, 10, 20</td>
<td>Any BF at 2 mo</td>
<td>73% vs 62%</td>
<td>&lt; .001</td>
<td>15</td>
<td>6-22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Any BF</td>
<td>Median BF duration, d</td>
<td>120 vs 105</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.096</td>
<td>44</td>
<td>0-69</td>
</tr>
<tr>
<td>Serafino-Cross and Donovan (1992), 28 United States</td>
<td>RCT, 2, N = 52</td>
<td>5-8 home visits during 2 mo + counselor’s phone number available</td>
<td>Any BF at 2 mo</td>
<td>62% vs 35%</td>
<td>&lt; .001</td>
<td>53</td>
<td>44-60</td>
</tr>
<tr>
<td>Valdés et al (1993), 29 Chile</td>
<td>Q-Exp, 1, N = 735</td>
<td>Individual consultation at d 7-10 and monthly until 6 mo</td>
<td>Full BF at 6 mo</td>
<td>67% vs 32%</td>
<td>&lt; .001</td>
<td>14</td>
<td>8-20</td>
</tr>
<tr>
<td>Bloom et al (1982), 30 Canada</td>
<td>RCT, 3, N = 100</td>
<td>Phone calls at d 10, 17, 21 + referral to nurse care</td>
<td>Any BF at 6 mo</td>
<td>89% vs 77%</td>
<td>&lt; .001</td>
<td>44</td>
<td>0-69</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Any BF</td>
<td>Median BF duration, d</td>
<td>28.6 vs 21.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chen (1993), 31 Taiwan</td>
<td>RCT, 2, N = 180</td>
<td>Intervention 1: home visits, wk 1, 2, 4, 8</td>
<td>Any BF</td>
<td>Mean BF duration, wk</td>
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<td>47</td>
<td>0-73</td>
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<td></td>
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<td>Home visit: 4.07</td>
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<td></td>
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<td></td>
<td></td>
<td>Phone call: 3.62</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Control: 3.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pugh and Milligan (1998), 32 United States</td>
<td>RCT, 2, N = 60</td>
<td>2 home visits with help in home tasks at d 3-4 and 12 + phone call</td>
<td>Any BF at 6 mo</td>
<td>50% vs 27%</td>
<td>&gt; .05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean before duration, d</td>
<td>136.3 vs 88.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lynch et al (1986), 33 Canada</td>
<td>RCT, 2, N = 270</td>
<td>1 home visit within 5 days of discharge + phone calls until 6 mo</td>
<td>Any BF at 1, 3, 6, and 9 mo</td>
<td>84%, 62%, 42%, 29% (in both groups)</td>
<td>.547</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean before duration, d</td>
<td>136.3 vs 88.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currò et al (1997), 34 Italy</td>
<td>RCT, 3, N = 200</td>
<td>Booklet: instructions for practical breastfeeding management (given during the 1st pediatric visit)</td>
<td>Full BF</td>
<td>Median duration, wk</td>
<td>.547</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Hauck and Dimmock (1994), 35 Australia</td>
<td>RCT, 2, N = 150</td>
<td>33-page breastfeeding booklet sent home shortly after discharge</td>
<td>Any BF at 6 mo</td>
<td>48% vs 44%</td>
<td>.547</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Any BF at 6 mo</td>
<td>59% vs 52%</td>
<td>.342</td>
<td>†</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Any BF at 6 mo</td>
<td>55% vs 56%</td>
<td>.954</td>
<td>†</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Any BF at 12 mo</td>
<td>16% vs 22%</td>
<td>.540</td>
<td>†</td>
</tr>
</tbody>
</table>

**RCT = randomized controlled trial; Q-Exp = quasi-experimental; BF = breastfeeding.**

**3 = good; 2 = moderate; 1-0 = poor.**

†Data suggest lack of effect; the attributable fraction does not apply.
women’s fatigue, increase mothers’ self-esteem, and decrease breastfeeding difficulties. Help with household tasks (such as helping with the dishes or laundry, or even helping with childcare) was provided, and positioning and ways to use comfort measures were discussed. Besides the 2 nurse visits, mothers received a lactation consultant’s phone call. Despite the apparent magnitude of differences between the mean breastfeeding length in the control group (88.3 days) and intervention group (136.3 days), no statistically significant results were found at a 95% level, and the data provided did not allow P-value calculation.

In Canada, a breastfeeding consultant visited mothers at home soon after delivery to observe breastfeeding; give instructions on proper positioning and hand expression; and discuss issues such as rest, family relations, and work. A card with a phone number was given, and phone calls (to identify difficulties and give advice) were made weekly during the first month and monthly for 6 months. Overall, the same percentages of mothers were still breastfeeding at 1, 3, 6, and 9 months in the intervention and control groups. Two trials, conducted in Italy and Australia, tested the efficacy of a booklet containing information on the management of common breastfeeding problems and neither booklet was seen to have any effect on breastfeeding.

Studies With Methodological Problems

Three studies fell in this category. In the United States, the effect of peer counselor support was investigated using a quasi-experimental design. Peer counselors contacted mothers by telephone, by letter, or in person within a few days of delivery; at 2 weeks; and at 1, 2, and 3 months. This study reported an increase in the duration of full breastfeeding up to 3 months, but assignment to intervention was based on the mother’s desire to have a counselor, the sample size was small, and the attrition rate high, thus limiting the validity of the results.

In Israel, the impact of a course on infant feeding, given to small groups of mothers, was assessed. This quasi-experimental study reported increased breastfeeding rates up to 1 year of age, but the results must be treated with caution because of severe confounding problems. A randomized controlled trial was held in Australia comparing early visits to a general practitioner (1 week after discharge from the hospital) versus standard care (6 weeks postpartum). Timing of the first visit had no effect on breastfeeding at either 3 or 6 months, although high attrition rates limit the interpretation of these results.

Prenatal and Postnatal Phases

Internally Valid Studies

Most of the 9 interventions in this category included home visits (5/9) and were effective (7/9). Their effects ranged from the extension of full breastfeeding until 3 months to the extension of exclusive breastfeeding until 5 months. Two other studies were ineffective in extending breastfeeding duration (Table 3).

In Pakistan, flip charts and photographs were used during group discussions and at home visits on a weekly basis from the last month of pregnancy until the end of the first month after birth and each fortnight until 6 months postpartum. Health workers trained in community motivation stressed the protective role of colostrum and prompt initiation of breastfeeding after birth, and explained the advantages of exclusive breastfeeding, as well as the hazards of bottle-feeding in causing diarrhea. This intervention produced a striking effect, with a majority (94%) of the intervention group mothers fully breastfeeding until 4 months of age compared to 7% in the control group. In Nigeria, talks were conducted in clinics and at home involving family members. Health workers from these rural communities used posters and handouts and undertook one-to-one counseling on the methods and advantages of exclusive and prolonged breastfeeding, early initiation, and demand feeding. During the postnatal phase, monthly home visits were conducted to reinforce information and to help to solve breastfeeding problems. The prevalence of full breast-
Table 3. Effect on Breastfeeding Duration of Interventions Covering the Prenatal and Postnatal Phases*

<table>
<thead>
<tr>
<th>Author, Year, and Country</th>
<th>Design, Score, ** and Sample Size</th>
<th>Intervention</th>
<th>Outcome</th>
<th>Intervention Versus Control</th>
<th>P Value</th>
<th>Attributable Fraction %</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haider (1998),39 Bangladesh</td>
<td>RCT, 3, N = 726</td>
<td>15 home visits: last trimester of pregnancy until 5 mo</td>
<td>Exclusive BF at 5 mo</td>
<td>70% vs 6%</td>
<td>&lt; .001</td>
<td>91</td>
<td>86-95</td>
</tr>
<tr>
<td>Morrow et al (1999),40 Mexico</td>
<td>RCT, 3, N = 130</td>
<td>Intervention 1: 6 home visits until 8 wk</td>
<td>Exclusive BF at 3 mo</td>
<td>67% vs 12%</td>
<td>&lt; .001</td>
<td>82</td>
<td>53-93</td>
</tr>
<tr>
<td>Akram et al (1997),41 Pakistan</td>
<td>Q-Exp, 1, N = 140</td>
<td>Frequent home visits and group discussions until 6 mo</td>
<td>Full BF at 4 mo</td>
<td>94% vs 7%</td>
<td>&lt; .001</td>
<td>92</td>
<td>79-97</td>
</tr>
<tr>
<td>Davies-Adetubgo (1996),42 Nigeria</td>
<td>Q-Exp, 2, N = 256</td>
<td>Talks, one-to-one counseling, posters, monthly home visits until 4 mo</td>
<td>Full BF at 4 mo</td>
<td>40% vs 14%</td>
<td>&lt; .001</td>
<td>65</td>
<td>41-79</td>
</tr>
<tr>
<td>Palti et al (1988),43 Israel</td>
<td>Q-Exp, 1, N = 310</td>
<td>Individual sessions from 7th mo of pregnancy until 6 mo</td>
<td>Full BF at 13 wk</td>
<td>29% vs 18%</td>
<td>.061</td>
<td>39</td>
<td>1-62</td>
</tr>
<tr>
<td>Davies-Adetubgo (1996),44 Nigeria</td>
<td>Q-Exp, 2, N = 256</td>
<td>Talks, one-to-one counseling, posters, monthly home visits until 4 mo</td>
<td>Full BF at 4 mo</td>
<td>40% vs 14%</td>
<td>&lt; .001</td>
<td>65</td>
<td>41-79</td>
</tr>
<tr>
<td>Jakobsen et al (1999),45 Guinea Bissau</td>
<td>RCT, 3, N = 1154</td>
<td>Individual session at 1st prenatal visit and until 9 mo</td>
<td>Any BF at 26 wk</td>
<td>29% vs 12%</td>
<td>.003</td>
<td>58</td>
<td>26-76</td>
</tr>
<tr>
<td>Kistin et al (1994),46 United States</td>
<td>Q-Exp, 1, N = 102</td>
<td>Antenatal talk, frequent postnatal phone calls until 3 mo or more</td>
<td>Full BF</td>
<td>Mean BF duration, wk 9.3 vs 7.0</td>
<td>.051</td>
<td>20</td>
<td>1-36</td>
</tr>
<tr>
<td>Mongeon et al (1995),47 Canada</td>
<td>RCT, 3, N = 200</td>
<td>1 prenatal home visit (at the last month), phone calls until 5 mo</td>
<td>Any BF</td>
<td>Mean BF duration, wk 8 vs 4</td>
<td>&lt; .05</td>
<td>20</td>
<td>1-36</td>
</tr>
<tr>
<td>Greiner and Mitra (1999),48 Bangladesh</td>
<td>Q-Exp, 2, N = 10,128</td>
<td>Home visits, radio jingles and talks, advertisements, printed matter</td>
<td>Any BF at 12-23 mo</td>
<td>93% vs 92%</td>
<td>.253</td>
<td>†</td>
<td>&gt; .2</td>
</tr>
</tbody>
</table>

*RCT = randomized controlled trial; Q-Exp = quasi-experimental; BF = breastfeeding.

**3 = good; 2 = moderate; 1-0 = poor.

†Data suggest lack of effect; the attributable fraction does not apply.
feeding at 4 months increased from 14% in the control group to 40% in the intervention group.

At a health center in Israel, individual sessions with nurses covered issues such as advantages of breastfeeding, breast care, and prevention and treatment of early breastfeeding problems. Nurses provided encouragement and reassurance to continue breastfeeding. Mean duration of full breastfeeding was extended 2 weeks in the intervention group as compared to the controls. Also at a health center, this time in Guinea Bissau, local female health workers with a positive experience in breastfeeding encouraged mothers to avoid the introduction of weaning food and water for the first 4 to 5 months and to continue breastfeeding for at least 2 years. The intervention included family planning information and was conducted through individual 10-minute sessions at the first antenatal visit and at the baby’s vaccination session in weeks 6, 10, and 14 and at 9 months. At 4 months of age, an increase in full breastfeeding was observed.

In the United States, mothers were given information and support from trained peer counselors before delivery and phone calls twice per week until breastfeeding was established and periodically afterwards. Home visits were provided. A 2-fold higher mean duration of any (and full) breastfeeding was found in the intervention group as compared to the controls.

A volunteer telephone support program (which included one visit at home in the last month of pregnancy) was developed in Canada to prevent and treat breastfeeding problems. No effects were observed in the first 6 months of life. In Bangladesh, a large-scale vitamin A community-based project held individual and group education at home, including singing performances in villages, printed material, advertisements in cinemas, and broadcast jingles. The intervention consisted of integrating simple breastfeeding promotion messages encouraging mothers to breastfeed for at least 2 years and advising them to give colostrum at birth. No effect on breastfeeding was found during the first 6 years of life.

**Studies With Methodological Problems**

Eleven studies were included in this category: 1 randomized controlled trial and 10 quasi-experimental studies. At a government health clinic in Chile, an auxiliary nurse conducted 4 lectures and slide presentations in the clinic’s waiting area addressing the advantages and techniques of breastfeeding. Nursing soon after delivery and exclusive breastfeeding for the first 6 months were recommended. During the postnatal phase, infants were weighed and mothers were supported during monthly visits to the well-baby clinic and through home visits. This study reported an increase in full breastfeeding up to 6 months; however, because of the use of historical controls, the results could be due to secular changes. Nevertheless, this study reported that in the following year, when the originator of the program was no longer involved, the effect (of this after-2 intervention) observed was still significantly higher than that obtained in the control group, but at a lower level, which seemed to represent a dose response effect.

In a Special Supplemental Food Program for Women, Infants, and Children (WIC) in Arizona, prizes were used to motivate participation in breastfeeding classes for couples expecting their first baby. Mothers’ and fathers’ concerns about breastfeeding were addressed, and the benefits and myths of breastfeeding, the basics of milk production, positioning and latch-on techniques, and milk expression and storage were discussed. Postnatal peer counselor support was provided to help with any breastfeeding problems. However, awarding of prizes was related to self-reporting of breastfeeding outcome, raising doubts about the reported increase of exclusive breastfeeding until 3 months.

At a clinic in Nebraska, and in a general practice setting in Australia, the effect of employing a lactation consultant (providing information and support to breastfeed) was found to increase breastfeeding rates until 4 and 6 months, respectively. The Nebraska study, however, was based on a review of medical records from a WIC clinic before and after intervention. The Australian study compared concurrent follow-up data from the intervention group with a retrospective control group.

In Cape Town, South Africa, a quasi-experimental study examined the provision of support to mothers during the first 2 weeks after delivery by health visitors, as well as in antenatal and breastfeeding clinics. Talks were given in the community on the advantages of breastfeeding, and the telephone numbers of volunteers were made available to help mothers with problems. The results of this study (increased full breastfeeding between 6 and 12 weeks of life) need to be interpreted with caution because the wide age range used to present the results (instead of a specified point in time) might confound the results.

The effect of volunteer peer counselors among rural low-income women was studied in the United States.
During home visits or in the WIC clinic, peer counselors used flip charts and pamphlets to present short lessons on breastfeeding and nutrition. They also answered questions, addressed client concerns, and provided moral support, maintaining telephone contact between visits. The high attrition rate and selection bias possibly affected the increase in the median breastfeeding duration reported.

Also in the United States, the effect of a program directed to WIC clients who had emigrated from Southeast Asia was investigated. Prenatally, an individual meeting was held in which concerns were assessed, complemented by a group session on the popularity of breastfeeding, benefits to the baby’s health, and child spacing. An early postpartum session and a WIC session at 3 to 6 weeks for counseling and support, plus incentives, completed the intervention. Because data available in WIC files on the historical controls were limited, the potential for bias could not be properly assessed, limiting the validity of the reported increase in mothers still breastfeeding between 3 and 6 weeks postpartum.

A community-based approach was developed in Mexico linking mass media, individual, and group instruction. The authors reported a small increase in exclusive (not defined) breastfeeding rates at 1 month; however, the attrition rates were not stated and differences between the communities may have contributed to the results. In a Brazilian shantytown, a nurse visited homes every month during pregnancy up to 6 months postpartum. She provided information about anatomy and physiology of lactation, breastfeeding advantages, and techniques. The reported increase in breastfeeding at 6 months reported may be confounded by the use of a “before-after” design and a high attrition rate.

Three strategies were tested among African American women in a WIC-based intervention held in Baltimore, Maryland, and showed no effect. The first one used a motivational video, sometimes followed by a discussion with service providers trained in the Best Start counseling approach, plus printed information. The second strategy consisted of one-to-one counseling and group support sessions held by peer counselors (former WIC clients who had successfully breastfed at least one child). The third strategy combined the 2 above. Limitations of this study include the use of only one clinic per mode of intervention and high rates of loss to follow-up (resulting in a possible loss of power to detect differences in breastfeeding practices). Only the peer counselor strategy seemed to improve breastfeeding initiation, but this effect was gone by 7 to 10 days postpartum. Also in the United States, trained peer counselors made recommendations and helped mothers attending the Salt Lake City Indian Health Care Center with breastfeeding problems. No significant effects were encountered in breastfeeding rates up to 6 months; however, the use of historical controls and high attrition rates limit the validity of results.

Hospital and Postnatal Phases

Internally Valid Studies

Seven interventions covered only the hospitalization and postnatal periods, 5 of which presented significant effects that varied from the extension of exclusive breastfeeding from 2 to 4 months and the extension of any kind of breastfeeding from 20 weeks to 6 months. Two studies showed no effect (Table 4).

In the United States, 3 strategies were tested: an individual 20- to 40-minute bedside session provided at the hospital by a trained counselor plus 8 follow-up phone calls offering help with problems, commercial discharge packs containing bottles and nipples being replaced by research discharge packs, or a combination of both. The combined intervention produced the strongest effect (a 3-fold increase in the prevalence of exclusive breastfeeding at 3 months when the intervention and control groups were compared), whereas the bedside session plus follow-up phone calls showed no effect.

In the United Kingdom, 2 interventions used a midwife or lactation nurse to support and encourage mothers during their hospital stay and at home, assisting them to establish breastfeeding and giving them the opportunity to voice problems, as well as helping to solve them. Both presented an attributable fraction of 27% in extending breastfeeding duration until 6 months and 20 weeks, respectively.

Mothers participated in a breastfeeding education program during their stay at the maternity ward of a public hospital in Iran and during follow-up for 4 months in the mother and child health center (or at home). They learned about the importance of exclusive breastfeeding, breastfeeding on demand, anatomy and physiology, and how to position the baby. Mean exclusive breastfeeding duration was observed to be 3 times as high in the experimental group in comparison to the control group. In Turkey, a group education session on the advantages and practice of breastfeeding was held.
Table 4. Effect on Breastfeeding Duration of Hospital and Postnatal Interventions*

<table>
<thead>
<tr>
<th>Author, Year, and Country</th>
<th>Design, Score,** and Sample Size</th>
<th>Intervention and Timing</th>
<th>Outcome</th>
<th>Intervention Versus Control</th>
<th>P Value</th>
<th>Attributable Fraction %</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frank et al (1987),59 United States</td>
<td>RCT, 3, N = 343</td>
<td>Intervention 1: bedside session at hospital/phone calls until 3 mo + research discharge pack</td>
<td>Exclusive BF at 3 mo</td>
<td>20% vs 6%</td>
<td>.014</td>
<td>70</td>
<td>22-89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF at 4 mo</td>
<td>71% vs 54%</td>
<td>.043</td>
<td>24</td>
<td>3-40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervention 2: research discharge pack</td>
<td>Exclusive BF at 3 mo</td>
<td>15% vs 6%</td>
<td>.094</td>
<td>61</td>
<td>0-86</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF at 4 mo</td>
<td>58% vs 54%</td>
<td>.705</td>
<td>†</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervention 3: bedside session at hospital/phone calls until 3 mo</td>
<td>Exclusive BF at 2 mo</td>
<td>29% vs 20%</td>
<td>.301</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF at 4 mo</td>
<td>56% vs 54%</td>
<td>.944</td>
<td>†</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF at 3 mo</td>
<td>38% vs 28%</td>
<td>.013</td>
<td>27</td>
<td>7-42</td>
<td></td>
</tr>
<tr>
<td>Jones and West (1985),60 Wales</td>
<td>RCT, 3, N = 678</td>
<td>Hospital and home visits during early weeks</td>
<td>Any BF at 4 mo</td>
<td>38% vs 28%</td>
<td>.013</td>
<td>27</td>
<td>7-42</td>
</tr>
<tr>
<td>Houston et al (1981),61 Scotland</td>
<td>Q-Exp, 0, N = 80</td>
<td>Hospital and home visits in the 1st week and each fortnight until 24 wk</td>
<td>Any BF at 20 wk</td>
<td>89% vs 65% ‡</td>
<td>.040</td>
<td>27</td>
<td>7-42</td>
</tr>
<tr>
<td>Froozani et al (1999),62 Iran</td>
<td>RCT, 2, N = 134</td>
<td>Hospital session, individual counseling in the clinic (or at home) until 4 mo</td>
<td>Exclusive BF at 4 mo</td>
<td>54% vs 6%</td>
<td>&lt;.001</td>
<td>88</td>
<td>68-95</td>
</tr>
<tr>
<td>Neyzi et al (1991),63 Turkey</td>
<td>RCT, 3, N = 941</td>
<td>Hospital group session + 10 min video, 1 home visit at 5-7 d + booklet</td>
<td>Any BF at 4 mo</td>
<td>95% vs 81%</td>
<td>.054</td>
<td>14</td>
<td>2-24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exclusive BF at 2 mo</td>
<td>4% vs 2%</td>
<td>.065</td>
<td>53</td>
<td>1-78</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BF at 3 mo</td>
<td>75% vs 70%</td>
<td>.089</td>
<td>6</td>
<td>0-14</td>
<td></td>
</tr>
<tr>
<td>Bolam et al (1998),64 Nepal</td>
<td>RCT, 2, N = 540</td>
<td>Individual session (20 min): Intervention 1: at birth + at 3 mo</td>
<td>Exclusive BF at 5 mo</td>
<td>33% vs 28%</td>
<td>.508</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervention 2: at birth</td>
<td>24% vs 28%</td>
<td>.682</td>
<td>†</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervention 3: at 3 mo</td>
<td>29% vs 28%</td>
<td>.984</td>
<td>†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grossman et al (1990),65 United States</td>
<td>RCT, 2, N = 97</td>
<td>Individual bedside session in hospital, booklet, phone call at d 2, 4, and 7-10 and at 3 wk, lactation clinic available</td>
<td>Any BF at 6 wk</td>
<td>59% vs 73%</td>
<td>.248</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF at 3 mo</td>
<td>35% vs 48%</td>
<td>.287</td>
<td>†</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF at 6 mo</td>
<td>14% vs 23%</td>
<td>.434</td>
<td>†</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*RCT = randomized controlled trial; Q-Exp = quasi-experimental; BF = breastfeeding.

**3 = good; 2 = moderate; 1-0 = poor.

†Data suggest lack of effect; the attributable fraction does not apply.

‡Values estimated from chart.
after birth by dieticians, followed by one repeated session at home, when mothers were given a booklet. The prevalence of exclusive breastfeeding at 2 months increased from 2% to 4%, but continued to be very low.

In Nepal, \textsuperscript{64} individual educational sessions (on the importance of exclusive breastfeeding and of immunization, on the need for family planning, and on how to perceive and treat diarrhea and acute respiratory infection) were conducted in 3 different ways: at birth, in the mother’s home 3 months afterwards, or at birth and at home. None of them had an effect. In the United States, \textsuperscript{65} a nurse spent 30 to 45 minutes in a one-on-one bedside session on proper breastfeeding techniques and the inappropriateness of supplements (although WIC furnished formula to both groups of bottle-fed infants). Each woman received a booklet, the phone number of the Breastfeeding Helpline, and phone calls at home to assist with problems. No effect was seen on breastfeeding outcome.

\textit{Studies With Methodological Problems}

Three (quasi-experimental) studies\textsuperscript{66-68} fell in this category. An investigation in Brazil\textsuperscript{66} examined the effect of rooming-in and slide presentations during hospital stay, followed by group discussions on the importance of breastfeeding, breast care, characteristics of colostrum, ejection reflex, breastfeeding techniques, stooling patterns, and other questions raised by the mothers. Help with problems was provided at the clinics or during home visits, and family planning services were available. An increase in full breastfeeding up to 5 months was reported; however, high attrition rates could bias these results. Also in Brazil, \textsuperscript{67} 3 nurses and a lactation consultant conducted an intensive support program to increase exclusive breastfeeding rates for the development of a new WHO growth chart. A hospital meeting focused on breastfeeding advantages and technique, offered guidance on manual extraction of breast milk, and provided mothers and their partners with printed matter. Eleven or more home visits intercalated with phone calls (to give positive feedback and help with difficulties) completed the 1-year follow-up. Much higher rates of exclusive breastfeeding at 3 months and of complemented breastfeeding at 6 and 12 months were found, but the use of a similar cohort (control of confounders not given) from 5 years earlier as a control group and high attrition rates are reasons for concern.

WIC participants living in a rural New Mexico community were enrolled in a quasi-experimental study.\textsuperscript{68} The intervention consisted of a hospital visit in which a feeding was observed and the appropriate technique discussed; a phone call was made at 4 to 5 days; and a group support class was held 2 weeks postpartum. Despite the intervention group being composed of 80 members, only 36 participated in all activities proposed. There was a trend toward increased breastfeeding duration during the first 12 weeks postpartum in the intervention group, but not at a statistically significant level. Only the subgroup exposed to the 3 support activities (subject to selection bias) breastfed significantly longer.

\textit{Prenatal, Hospital, and Postnatal Phases}

\textit{Internally Valid Studies}

Finally, 4 effective investigations\textsuperscript{69-72} included multiple activities during the prenatal, hospital, and postnatal phases (Table 5).

In the United States, \textsuperscript{69} the intervention consisted of frequent individual lactation consultations during which the benefits and practice of breastfeeding were discussed: early initiation, demand feeding, positioning and latching on, avoidance of artificial nipples, and so on (based on patients’ needs and interests), from pregnancy up to the baby’s first birthday. Follow-up included a phone call 48 hours after discharge. The median duration of breastfeeding was almost 3 times as high in the intervention group in comparison to the control group.

In England, \textsuperscript{70} a psychological approach was used, including home visits prenatally and postnatally and visits to mothers at the hospital to listen to concerns, to offer praise for their persistence, and to provide advice on practical problems. The prevalence of exclusive breastfeeding at 3 months was 3 times as high in the experimental group in comparison to the control group. In Chile, \textsuperscript{71} local health promoters conducted home visits during the last trimester of pregnancy and provided support to mothers in the maternity ward, whereas health professionals followed up mothers at the health center. Monthly workshops for group education were held, reinforced by informative posters and pamphlets. Topics covered included exclusive breastfeeding until 6 months of age, maternal nutrition, breastfeeding techniques, and problem solving. Full breastfeeding at 6 months, not practiced by the control group, reached 42% in the intervention group.

An intervention designed to verify the results of an early postpartum discharge program and nursing care
### Table 5. Effect on Breastfeeding Duration of Prenatal, Hospital, and Postnatal Interventions*

<table>
<thead>
<tr>
<th>Author, Year, and Country</th>
<th>Design, Score, **</th>
<th>Intervention</th>
<th>Outcome</th>
<th>Intervention Versus Control</th>
<th>P Value</th>
<th>Attributable Fraction %</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brent et al (1995),69 United States RCT, 2, N = 115</td>
<td>Daily round at hospital, 1 phone call, prenatal and postnatal individual consultations until 1 y</td>
<td>Any BF at 2 mo</td>
<td>37% vs 9%</td>
<td>&lt; .001</td>
<td>76</td>
<td>42-91</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF</td>
<td>Median BF duration, d</td>
<td>84 vs 33</td>
<td>.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jenner (1988),70 England RCT, 2, N = 38</td>
<td>One-to-one counseling: prenatal and postnatal home visits until 3 mo, visit at hospital, booklets</td>
<td>Exclusive BF at 3 mo</td>
<td>68% vs 21%</td>
<td>.009</td>
<td>69</td>
<td>22-88</td>
<td></td>
</tr>
<tr>
<td>Alvarado et al (1996),71 Chile Q-Exp, 1, N = 138</td>
<td>Prenatal home visits, hospital visit, group sessions, individual consultations until 6 mo, posters and pamphlets</td>
<td>Full BF at 5 mo</td>
<td>53% vs 3%</td>
<td>&lt; .001</td>
<td>94</td>
<td>77-99</td>
<td></td>
</tr>
<tr>
<td>Gagnon et al (1997),72 Canada RCT, 3, N = 201</td>
<td>Home visits, early postpartum discharge, phone calls until d 10 postpartum</td>
<td>Full BF at 6 mo</td>
<td>42% vs 0%</td>
<td>&lt; .001</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF at 6 mo</td>
<td>98% vs 62%</td>
<td>&lt; .001</td>
<td>37</td>
<td>24-48</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any BF at 1 mo</td>
<td>55% vs 39%</td>
<td>.051</td>
<td>29</td>
<td>2-48</td>
<td></td>
</tr>
</tbody>
</table>

*RCT = randomized controlled trial; Q-Exp = quasi-experimental; BF = breastfeeding.

**3 = good; 2 = moderate; 1-0 = poor.

†Adjustment for “planning to breastfeed” and others at baseline.
(procedures not given) on competence in mothering, extension of “predominant” breastfeeding (defined as less than one breast milk substitute per day), infant weight gain, and other aspects was developed in Canada. Antenatal nursing care was provided by 2 home visits at 34 and 38 weeks gestation and postnatally by phone calls at 48 hours and 10 days and home visits at 3 and 5 days. Multivariate analyses were applied because randomization procedures did not produce comparable groups and the effect of the intervention was reduced from 1.41 to 1.25 times as likely to be “predominantly” breastfeeding at 1 month.

Studies With Methodological Problems

Five studies were included in this category: one randomized controlled trial and 4 quasi-experimental studies. A culturally specific approach was used in a Navajo community in the United States, combining breastfeeding discussions during prenatal and postnatal visits, a program of peer support by grandparents, early breastfeeding initiation and phasing out of discharge packs containing formula at the hospital, and the presentation of a slide show postnatally in the maternal and child health clinics. T-shirts showing a happy Navajo baby were distributed as incentives by WIC workers to breastfed infants. Given that historical controls were used, it is difficult to assess how secular changes may have contributed to the increase of the mean breastfeeding duration. Also in the United States, pregnant women at a health center received individualized breastfeeding education by a nutritionist or a peer counselor, commercial discharge packs at the hospital were replaced by packs with a pamphlet and a T-shirt advocating breastfeeding, and telephone support was provided within 1 week of discharge. Increased breastfeeding rates at 2 weeks were reported, but this effect should be interpreted cautiously because the only confounding factor taken into consideration between the before (control group), after-1 intervention, and after-2 intervention was ethnicity, and even in this sole aspect the after-2 sample was significantly different from baseline.

In Bombay, India, information and motivation to breastfeed were provided during an antenatal visit, in the hospital, at the 10th and 20th day after delivery, and then monthly for the next 3 months. Postnatally, help with problems was also given. A 2-fold prevalence of higher “exclusive” breastfeeding (not defined) was observed in the intervention group at 3 months, but limited consideration was given to confounding factors.

In Australia, a trial provided well-educated mothers with a 3-hour teaching session about the advantages and psychological preparation for breastfeeding, anatomy and physiology of lactation, and management of breastfeeding. At the hospital, breastfeeding consultants observed a feed and provided written material on problems and how to solve them. After leaving the hospital, mothers received a phone call (and a home visit, if requested). A postnatal discussion group at 6 to 8 weeks offered the opportunity for social support. The study’s inclusion criteria (which may have selected older and wealthier women) and a high attrition rate may have contributed to the lack of effects throughout the 4-month follow-up period.

The Best Start program, conducted in the United States, discussed breastfeeding benefits, perceived barriers, techniques, diet, and breast milk production during the individual prenatal sessions. At the hospital, mothers were helped to initiate breastfeeding and secure a breast pump. Postnatally, a home visit was made in the first week of life and lactation specialists followed up mothers by telephone. This study reports an increase in the initiation rate but not in breastfeeding duration, although the use of historical controls limits the validity of the results.

Discussion

It was difficult to identify what type of interventions and which procedures were more likely to effectively promote, protect, and support breastfeeding during the antenatal and postnatal periods because of the wide variety of approaches tested. The most frequent strategies identified were home visits, individual consultations, group sessions, phone calls, a combination of 2 or more strategies, and printed matter. The effect of the interventions in extending breastfeeding duration varied with the strategies and procedures used, with the timing of the interventions, and with the context in which they were developed. Also, the kinds of breastfeeding outcomes reported varied widely. Therefore, summary measures of association derived with meta-analysis techniques from those studies were not considered meaningful.

Procedures used to extend breastfeeding duration were often combined. Some procedures were used nearly universally (eg, guidance on positioning and attachment), whereas others appeared infrequently (eg, education with regard to the protective role of colostrum was more frequent in African and Asian studies), since
different cultural beliefs and practices may demand different approaches. The combination of procedures prevents an evaluation of the effects of individual components and any interaction between them. Nevertheless, a set of procedures occurred consistently in successful interventions, suggesting that they were effective components.

In the effective studies, the most common information given to pregnant women and mothers (and sometimes also family members) was related to the benefits of breastfeeding for mother and baby; early initiation; how breast milk is produced; hazards of bottle-feeding or providing teats to babies; breastfeeding on demand; exclusive breastfeeding up to 4, 5, or 6 months; prolonged breastfeeding for at least 2 years; and family planning and the lactational amenorrhea method. Mothers also received guidance on positioning and attachment; expression and storage of breast milk; combining breastfeeding and work; and overcoming problems such as engorgement, colic, and crying. Emotional support, encouragement, and reassurance were provided to promote maternal confidence, and mothers were encouraged to share experiences.

The most effective interventions generally combined face-to-face information, guidance, and support and were long term and intensive. Interventions spanning the prenatal period or both periods were generally more effective than interventions conducted only during the postnatal phase, except for one study. The most effective strategies identified were group sessions during the prenatal phase; home visits during the postnatal phase or in both periods; and the combination of group sessions, home visits, and individual sessions in interventions spanning both periods. Individual sessions carried out in the postnatal phase or in both periods were also effective.

The effectiveness of the interventions did not seem to be related to the kinds of personnel involved. Most interventions (70%) were conducted by health professionals or health workers, such as midwives, nurses, pediatricians, obstetricians, nutritionists, and auxiliaries. Peer counselors, generally local mothers with a positive personal experience in breastfeeding (trained by health professionals), carried out 14% of the interventions; some studies combined both (13%), and a few used only printed matter (3%). Among the internally valid studies, there was no significant difference between the proportion of effective interventions carried out by health professionals (21/27) and by peer counselors (4/6).

The impact of interventions on breastfeeding duration was shown to be negligible when practices contradicted messages, such as programs advising mothers to breastfeed while providing formula to infants. The same occurred when interventions were of a small scale, limited to a short period of time during pregnancy or postnatal care. Brief breastfeeding messages given among several other topics were also ineffective, possibly because women were provided with information about many subjects without taking into account their current needs. The isolated use of printed matter, such as booklets given to mothers, showed no effect. Most strategies with no or brief face-to-face interaction, such as interventions based on telephone support, failed to produce significant results. Only one study based on phone calls (conducted by peer counselors trained in Paulo Freire’s empowerment techniques) was effective in extending full breastfeeding duration until 3 months. The combination of effective strategies seemed to produce a synergistic effect. However, when effective and ineffective strategies were combined, the effect was often negligible.

It is now timely to build on the success of the Baby-Friendly Hospital Initiative by extending it into primary care and by integrating the efforts of the secondary and primary care systems to ensure consistent quality provision of care across both settings. The primary health care units should inform, encourage, and support pregnant women in breastfeeding; the maternity hospitals should allow women to bond with their babies and help them to establish breastfeeding; and the primary health care units should be able to guide, reinforce, and support this practice continuously, completing the cycle. Although there is evidence supporting the effectiveness of primary care strategies in extending breastfeeding duration, there is a need for broad-based, well-designed studies testing the effect of the combination of the procedures referred above, preferably spanning the prenatal and postnatal periods, to encourage the development of evidence-based protocols concerning the promotion, protection, and support of breastfeeding in primary care.

References


**Resumen**

Esta revisión de la literatura muestra estrategias y procedimientos efectivos utilizados para aumentar la duración de la lactancia materna. Intervenciones durante el embarazo y/o el cuidado del niño que se hacen en los servicios de los centros de salud, en el ámbito comunitario o en consultas hospitalarias se incluyeron en esta revisión. Se excluyeron intervenciones que cubrieran sólo el período del parto. Las intervenciones que mostraron mayor efectividad para aumentar la duración de la lactancia materna fueron generalmente una combinación de educación, asesoramiento y apoyo y fueron intensivas y de largo plazo. Durante el cuidado prenatal la educación en grupo fue la única estrategia efectiva reportada. Las visitas domiciliarias que identifican las preocupaciones de las madres sobre lactancia, aconsejan a las madres para resolver...
problemas e involucran a los familiares como parte del apoyo a la lactancia fueron efectivas en el período postnatal o en ambos períodos. Las sesiones de educación individual fueron también efectivas durante estos períodos, lo mismo que la combinación de dos o tres intervenciones en los dos periodos. Las estrategias que no mostraron efectividad se caracterizaron por la ausencia de interacción personal, mensajes contradictorios o intervenciones a baja escala.
Nearly 10% of all postpartum women will experience some form of psychiatric illness. The development of postpartum psychosis consisting of symptoms such as auditory hallucinations, delusions, and disorganization is greatest within the first 4 weeks after delivery. In fact, a majority of cases (54%) occur within 14 days of delivery. Unfortunately, there are minimal guidelines established with regard to the use of antipsychotics during lactation. This article will review currently available data on the excretion of traditional and atypical antipsychotics into breast milk and make recommendations with regard to the use of individual agents during lactation.

Keywords: antipsychotics, neuroleptics, lactation, breast milk, breastfeeding
the maternal daily dose of risperidone and its metabolite, respectively. Furthermore, the total infant exposure (as risperidone equivalents) was estimated at 4.3% of the maternal dose. Hill pointed out that this small estimated exposure is not likely to cause dose-related side effects such as sedation and EPS. Rarely, acute dystonic reactions may involve the larynx, posing a life-threatening reaction. The likelihood of a dystonic reaction in an infant receiving an antipsychotic via breast milk is exceedingly small. However, breastmilk concentrations may not predict the likelihood of non-dose-related events such as neuroleptic malignant syndrome. This point would be true for all antipsychotic agents.

Olanzapine

A review of the literature revealed only one report discussing olanzapine’s distribution into breast milk. An infant with first and third trimester olanzapine exposure was born with cardiomegaly and experienced jaundice and sedation. The mother was receiving olanzapine 5 mg/d. Seven days after delivery, breastfeeding was discontinued. However, the jaundice and sedation continued, suggesting no causality between olanzapine and the persistent symptoms. A second infant was exposed to olanzapine at 2 months of age for an unknown duration. No adverse events were noted in the infant. The mother was receiving olanzapine 10 mg/d, in addition to paroxetine, trifluoperazine, and procyclidine (doses unknown). There were no milk or plasma pharmacokinetic data reported for this mother-infant pair.

Clozapine

Clozapine is an atypical antipsychotic that is generally reserved for those patients with treatment-resistant illness or intolerable extrapyramidal side effects. Its reported M:P ratio is > 2.5. Clozapine is associated with an increased risk of agranulocytosis and seizure compared to other traditional and atypical antipsychotic agents. Due to these risks, clozapine should be avoided while breastfeeding.

There are no data available for quetiapine or ziprasidone.

Traditional Antipsychotics

A Medline search revealed breast milk excretion data for chlorprothixene, flupentixol, zuclopenthixol, perphenazine, chlorpromazine, haloperidol, and trifluoperazine. There are no reports available for additional traditional antipsychotics.

Olesen reported the distribution of perphenazine into breast milk. Samples were collected on 2 separate occasions over a 24-hour period. Breast milk samples corresponded with oral perphenazine doses of 24 and 16 mg/d. Both doses were divided equally and were administered at 8 in the morning and evening. Olesen reported the total concentration of perphenazine to be 3.2 and 2.1 ng/mL for perphenazine doses of 24 and 16 mg/d, respectively. The total amount of perphenazine collected via breast milk per 24-hour period was 1.59 and 1.06 µg, respectively. Maternal serum perphenazine concentrations drawn immediately before the morning dose were 4.9 and 2.0 ng/mL, respectively. The calculated M:P ratios were 0.7 and 1.1 for the higher and lower perphenazine doses, respectively. Based on the calculated infant exposure (0.1% of maternal dose), breastfeeding was initiated. Over the next 3.5 months, the infant was noted to be developing normally, and no adverse effects were reported.

Pons et al summarized initial (and conflicting) data with regard to excretion of traditional antipsychotics into breast milk. Initial chlorpromazine reports, using relatively nonspecific assays, demonstrated a maximum breast milk concentration of 0.29 mg/L after a single 1200 mg dose. Peak maternal serum concentrations occurred 2 to 4 hours postdose. However, other reports indicated that chlorpromazine concentrations in breast milk (7 to 98 µg/L) are higher than those in maternal plasma (16 to 52 µg/L). Details about the timing of samples in relationship to medication administration were not available. Regardless of the lack of detailed pharmacokinetic information, it was noted that infants experienced drowsiness and lethargy when fed milk with chlorpromazine concentrations of 96 µg/L. Thus, it appears that chlorpromazine should be avoided in all nursing mothers due to the risk of such side effects.

Yoshida et al reported on the distribution of haloperidol, chlorpromazine, and trifluoperazine into breast milk and the developmental effects in 10 breastfed infants. Eighteen nonbreastfed infants, whose mothers also received antipsychotics, served as controls. Ten breastfeeding women began taking one or more of these agents after delivery. The duration of breastfeeding ranged from 6 to 40 weeks. Maternal and infant plasma and urine samples were collected 12 to 15 hours after the last psychotropic dose. In addition, samples of foremilk and hindmilk were collected at this time. The
mean M:P ratio for haloperidol was 2.8 in the foremilk and 3.6 in the hindmilk. There was no dose correlation between maternal plasma and milk haloperidol concentrations. The infant plasma concentrations ranged from 8.0 ng/mL (maternal haloperidol dose = 40 mg/d) to 0.8 ng/mL (maternal haloperidol dose = 10 mg/d).

Of those women receiving chlorpromazine, the mean chlorpromazine M:P ratio was 1.2 for foremilk and 1.6 for hindmilk. Maternal doses of chlorpromazine ranged from 50 to 600 mg/d, with corresponding maternal serum concentrations of 8 ng/mL and 139 ng/mL, respectively. Chlorpromazine plasma concentrations (n = 3) ranged from < .01 to 0.7 ng/mL in infants whose mothers were receiving chlorpromazine 200 and 400 mg/d, respectively. Two patients received trifluoperazine at doses of 5 and 10 mg/d. There were no M:P ratios available for this agent.

Finally, Yoshida measured the mental and psychomotor development of the infants using the Bayley Scales of Infant Development. There were no significant differences between the 2 infant groups at 1 to 4 months of age. Three breastfed infants scored low to borderline on both indices at 12 to 18 months; all other infants were developing normally. However, none of the infants who scored low to borderline demonstrated frank neurological abnormalities as per the Amiel-Tison assessment. These infants were the children of the mothers who were receiving both haloperidol and chlorpromazine. Two of these mothers had abnormally high haloperidol and chlorpromazine serum concentrations. Despite this, plasma concentrations of haloperidol and chlorpromazine were detected in only 1 of the 3 infants. Yoshida noted that it is not possible to make a definitive statement concerning the high maternal plasma concentrations and the developmental decrements. Furthermore, the influence of other factors such as the severity of the mother’s illness cannot be overlooked. The remaining 9 infants, whose mothers received only one antipsychotic agent, were all developing normally.

Chlorprothixene, flupentixol, and zuclopenthixol have M:P ratios that vary largely between foremilk and hindmilk samples. Foremilk and hindmilk M:P ratios are 1.2 and 2.6 for chlorprothixene, 0.5 and 1.4 for flupentixol, and 0.24 and 0.71 for zuclopenthixol, respectively. Secondary to this large fluctuation in milk concentrations, previously estimated infant exposure that used mean milk concentrations may have underestimated the infant’s relative dose.

Sulpiride, a benzamide antipsychotic, has potent antidopaminergic properties in the dopamine tuberoinfundibular tract, which is responsible for elevations in prolactin. In fact, these properties have been employed to facilitate breast milk production. Aono et al treated 66 women with sulpiride 100 mg/d for the first 7 days of lactation. They reported that women taking sulpiride had significantly higher breast milk production and elevations in serum prolactin versus women receiving placebo. The mean sulpiride concentration in breast milk was 0.97 µg/mL 2 hours after the dose. Estimated infant exposure over the 7-day treatment period was 1.5 mg. By 1 month of age, fewer infants in the sulpiride group were fully bottle-fed compared to the placebo group. There were no adverse effects reported for the infants. Others have reported that infants exposed to sulpiride gained more weight in comparison to control groups in short-term studies (eg, 2 weeks). However, these differences were not apparent with prolonged therapy.

**Conclusion**

In conclusion, there is a definite lack of data with regard to the safety of antipsychotic agent exposure to neonates and infants. Clearly, the risks of agranulocytosis and/or seizure associated with clozapine outweigh the benefits of breastfeeding. There is conflicting data with regard to the safety of chlorpromazine during lactation. Although chlorpromazine has been used in neonates for the treatment of neonatal abstinence syndrome, it is rarely recommended because of its prolonged half-life, risk for hypothermia, and other central nervous system and hematologic side effects. In light of these conflicting data, breastfeeding would not be advisable with chlorpromazine. For the other agents discussed, all are associated with a relatively low M:P ratio. For agents in which limited data have not demonstrated the development of adverse effects in the neonate or infant, the risk of breastfeeding may be acceptable. However, these risks must always be discussed in full with each patient and preferably with her family. Discussions should include a thorough characterization of the risk of potentially life-threatening side effects that are not dose dependent.

**References**


Resumen

Casi el 10% de las mujeres postparto experimentan alguna forma de enfermedad psiquiátrica. El desarrollo de la psicosis postparto se presenta con síntomas como alucinaciones auditivas, alucinaciones sensitivas y desorganización mental en las primeras 4 semanas después del parto. En realidad la mayoría de los casos (54%) ocurren en los primeros 14 días postparto. Los antipsicóticos no-tradicionales se prefieren debido a los escasos efectos colaterales comparados con los antipsicóticos tradicionales para tratar los síntomas. Desgraciadamente, hay muy pocas pautas establecidas con relación al uso de los antipsicóticos durante la lactancia materna. Este artículo revisa la información más reciente sobre la excreción de antipsicóticos tradicionales y los no-tradicionales a través de la leche materna y hace recomendaciones para el uso de agentes específicos durante la lactancia materna.
July Board Meeting

The midyear meeting of the International Lactation Consultant Association (ILCA) board of directors was held at the Princess Hotel in Acapulco, the site of this year’s annual conference. The outgoing president, Sallie Page-Goertz, chaired the 3-day meeting, and the retiring board voted throughout the entire meeting, with incoming board members as nonvoting observers.

Despite an excellent program of speakers and an exciting venue, the attendance at the annual conference in Acapulco was lower than expected due to factors that could not be anticipated when the site was chosen. Many of you are already aware that this will mean budgetary restraints in the short term, in the interests of fiscal responsibility. The board would like to reassure members that this does not mean curtailing member services, but more effective targeting of member needs instead. It is hoped that this will lead to improved member services.

Services to Members

Despite the tight budget, your board has been focusing on ways of improving and increasing services to members. Priorities that have been identified are (1) the website and (2) marketing. Access to membership application forms will be improved and made easier; for instance, a membership application form accompanies Association News in this issue of *JHL*.

Website

The website will be progressively updated. It can be visited at www.ilca.org. Members are urged to visit the website regularly to access new information and services as they are added.

Marketing News

Our marketing consultants, Signature Resources Inc, conducted an e-mail member survey and interviewed board members as part of phase 1 of their brief. There was a good deal of congruence between the surveys. The need for IBCLCs to have access to marketing materials and training for self-promotion so that they can improve their business is already being addressed. Group sessions on marketing were conducted at the annual conference in Acapulco by Dr. Les Wallace and Kathy Hanson of Signature Resources, and Dr. Wallace also conducted a plenary session on this important topic. Your board plans to provide user-friendly material on self-promotion on the ILCA website, and you can expect to hear more about marketing at future annual and regional conferences. The consultants have demonstrated the trend by membership associations toward smaller boards, devolving more of the decision making to committee structures. Your board is currently considering ways to restructure the board in the future. This would require a bylaws change on which the membership is entitled to vote.

Also regarding marketing, ILCA has approved the establishment of an International Lactation Consultant Day to celebrate the profession and draw attention to the role of the IBCLC. Watch this space, and the website, for more news. In 2002, an ILCA marketing kit will be used for World Breastfeeding Week instead of the WABA kit.

ILCA Ambassadors

A new volunteer position is being developed, that of ILCA ambassador. This role will take the place of the US regional representatives. Ambassadors will, in essence, promote ILCA in their areas and be encouraged to attend marketing training, possibly at ILCA conferences. This is an exciting new development to promote the IBCLC profession. An application procedure is to be put in place, with an application form to be placed on the website.

The Globe Online

The upcoming issue of the *Globe* will be placed on the ILCA website as part of the current budgetary restraints. If you have access to the Internet but your colleagues do not, I am sure they would appreciate it if you were to take a moment to download the *Globe* for them. Your board would welcome feedback on the online *Globe*.

Membership Subscriptions

A motion was passed to raise the membership subscription by 10%. A suggestion was made by a member at the town meeting during the annual conference that
members be given the opportunity to pay their subscriptions early, and this is being considered.

Course Accreditation

The board is grateful for the hard work of the Professional Education Council (PEC) in developing the third prong of the profession, that is, course accreditation. The 3 prongs are certification (IBLCE), professional body (ILCA), and course accreditation. The PEC’s document delineating the criteria to be considered in the accreditation process for course offerings has been approved in principle.

Future Conferences

ILCA is in the process of planning a regional conference on the West Coast to be held in 2002. Watch this space, and the website, for details about the date, venue, and exciting program. The 2002 ILCA conference will be held in popular Boca Raton, Florida. The preconference day is July 24, with the conference proper on July 25-28. ILCA will be going offshore for the 2003 conference, to be held in Sydney, Australia, the city that hosted the 2000 Olympics. Watch the website for advance details about all these conferences.

Research Challenge

 Individuals and affiliates are invited to contribute to the research fund, which provides funds for deserving research projects that advance the profession and expand our knowledge base. The Riordan family has offered to donate a sum of money to a research grant in their name, provided ILCA can raise the remaining $1000. Can you help ILCA raise this money? Can you or your affiliate offer a substantial grant in memory of a deceased loved one or member?

External Affairs

Liaison with UN bodies creates awareness of the existence and value of the IBCLC profession. ILCA is an organization in relations with the World Health Organization (WHO), Geneva, with Madeleine Lehmann-Buri as the ILCA’s liaison. She provides a link with ILCA’s 2 designated technical officers in the WHO. In New York, a team of volunteers led by Margot Mann represents ICLA at relevant meetings at the United Nations. Chris Mulford has provided a voice on issues at the International Labor Organization related to the rights of working women to breastfeed. ILCA is developing a network of talented members who are able to attend and represent ILCA at relevant international meetings in their regions, subject to budgetary allowances. Approval has been given for the establishment of an ILCA HIV team, consisting of the members of the UN team and others, at no extra expense. This was considered important because of the issues related to breastfeeding and HIV-positive mothers and the potential role of IBCLCs in reducing risk factors in mother-to-child transmission (such as cracked nipples and mastitis). The duration of exclusive breastfeeding has been an important issue this year, and ILCA’s statement on the period of exclusive breastfeeding has been approved. It is to be placed on the website.

Positions Vacant

Terms for most ILCA positions are 3 years unless a shorter term has been set, and we aim to have a transparent process of application and appointment at the end of such terms. Consequently, ILCA is seeking to fill 2 positions:

- Independent study module (ISM) coordinator
- World Breastfeeding Week (WBW) coordinator.

The ISM coordinator is a paid contract position, and the WBW coordinator is a volunteer who works closely with the Marketing Committee. A full job description for each position is available from the ILCA office (e-mail: ckerr@olson.mgmt.com). We would like to thank Genevieve Becker for her work in producing ISMs during her 3-year term (which expires in December) and Doraine Bailey for her dedication to the promotion of World Breastfeeding Week. Application details can be found in this issue of JHL. Applications were sought for 4 positions on the ILCA board of directors to replace directors whose terms expire in 2002:

- President elect
- Vice president of professional development
- Secretary
- Canadian delegate.

Job descriptions and application packages for board positions can be obtained from the ILCA office. The closing date for applications for board positions is November 1, each year, after which the Nominating Committee prepares the slate of candidates.

Virginia Thorley, OAM, MA, IBCLC
ILCA Secretary
**Changes to Instructions for Authors**

A few small but important changes have been made to the Instructions for Authors for 2001. The revised Instructions for Authors may be found in the February 2001 issue of *JHL*. Prospective authors should read all of the instructions carefully before submitting manuscripts. Any questions with regard to the instructions or editorial policy of *JHL* should be submitted to the editorial office.

**Clinical Perspectives Topics**

Do you find yourself at odds with colleagues or other health care professionals over breastfeeding-related issues? Have any papers published recently in the scientific literature sparked your curiosity? Are there controversial topics you would like to see discussed by experts in the pages of *JHL*? Clinical Perspectives will present invited commentaries from international experts on controversial clinical issues. If you know of a lactation-related topic that you would like to see included in this column, please direct your suggestions to the editorial office.

**Consultants’ Corner Issues**

Is there a particular problem that you have seen in your practice that you would like to see discussed by your peers? Are you curious about how similar situations may be dealt with by different lactation consultants? We would like your input on topics you would like to see in Consultants’ Corner. Send your ideas to the *JHL* Editorial Office, Consultants’ Corner, ATTN: Assistant Editor. E-mail: lanommsen@ucdavis.edu.

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Books

HHS Blueprint for Action on Breastfeeding
US Department of Health and Human Services, 2000
33 pages, free, softcover
Orders: National Women’s Health Information Center,
8550 Arlington Boulevard, Suite 300, Fairfax, VA 22031
Tel: (800) 994-9662
Electronic copy available at: www.4woman.gov
Electronic newsletter on women’s health available at:
www.4woman.gov/about/listserv.htm

This document was crafted by the Department of Health and Human Services Office on Women’s Health in cooperation with other federal agencies and health care professional organizations. It is divided into 5 sections, beginning with Breastfeeding as a Public Health Challenge. Breastfeeding terms are defined in sidebars in several sections providing educational foundation for readers who are not familiar with these terms.

Benefits of Breastfeeding is a concise piece listing the significant aspects of breastfeeding and human milk. Cautions About Breastfeeding includes realistic information on environmental exposure, maternal and infant illness, medications, nicotine use, and alcohol consumption. Positive comments with regard to perceived insurmountable obstacles are exemplified by the following statement: “For women who cannot or will not stop smoking, breastfeeding is still advisable since the benefits of breast milk outweigh the risks from nicotine exposure” (p. 13).

Facilitation and Support for Breastfeeding notes the importance of base knowledge consistency among health care providers and the need for breastfeeding education in the public education system. Social marketing encourages breastfeeding promotion as the “normal way to feed an infant in most places women and their infants go” (p. 16). This section also mentions the World Health Organization Code and appropriate guidelines for promoting breastfeeding without inadvertent marketing of infant formula.

Although brief, Blueprint for Action on Breastfeeding delineates clearly the importance and influence of the health care system, workplace, family, and community and the need for research to support breastfeeding promotion. This document is well referenced with 175 timely and accurate citations.

The appendices include (1) a brief list of environmental pollutants that may be found in human milk and their potential health effect and (2) goals and objectives for a strategic plan to promote breastfeeding in the United States. Individual sections can be used when promoting lactation programs in the workplace or public health sector. Free availability on the Internet facilitates all health care providers to make themselves familiar with this official government breastfeeding publication.

Mary Kay Smith, CLE, IBCLC
Romeoville, Illinois, United States

Breastfeeding 2001, Part I: The Evidence for Breastfeeding
Edited by Richard J. Schanler
WB Saunders Company, 2001
271 pages, single issue (US)$39, hardcover
Orders: WB Saunders, Harcourt Health Sciences, Periodicals Order Fulfillment Department, 6277 Sea Harbor Drive, Orlando, FL 32887-4800 USA
Tel: (US) (800) 654-2452; (outside US) (407) 345-4000
URL: www.wbsaunders.com
Breastfeeding 2001, Part II: The Management of Breastfeeding

Edited by Richard J. Schanler
WB Saunders Company, 2001

This book is a keeper. Although it is directed specifically to pediatricians, it will be useful to any health professional who cares for women during the childbearing year and/or their breastfed infants. Lactation consultants will find little new information, but the book is an excellent reference and source of supporting research. The attitude implied by the term “caring for” in the goal statement rather than “management of” typifies the tone of individual articles. Articles have a warm tone and support the benefits to mother and infant of early, frequent, extended, and untampered-with breastfeeding. To balance this enthusiasm, the lead article reminds readers that breastfeeding by mothers not properly equipped physiologically or who mismanage breastfeeding can have tragic outcomes.

The book contains 18 chapters by various authors, many of them well known for their research in human lactation. Discussions range from fairly technical (on jaundice and iron) to conversational (answers to typical questions posed by mothers calling a breastfeeding warm line). Among the most immediately practical for lactation consultants may be chapters on managing common breastfeeding problems, assessing slow growth in the young breastfed infant, and assessing hypoglycemia in the breastfed newborn. With only insignificant exceptions, the advice given is consistent from one article to the next (if only most medical practices were so consistent!). Most articles are extensively referenced, and the citations contain a mix of classic and recent articles, some as recent as 2000.

The writing is quite accessible. The book is marred only by occasional gaffes that the publisher should have caught (a citation numbered 43 [p 360] to a 35-item reference section; “see article by Gert” [p 421], where Gert is the author’s given name; “this has a roll [role] in bonding” [p 480]; “hospital regulations . . . to compliment [complement] the goals” [p 519]; “courses or tapes that report [purport] to prepare candidates” [p. 521]; and “bilirubin-laden [laden] meconium” [p 529]).

This book’s broad scope, thorough research base, consistent breastfeeding-friendly advice, and warm
The Effect of Labor Epidurals on Breastfeeding
Lactation Consultant Series 2: Unit 4
Jan Riordan and Shirley Riordan
La Leche League International, 2000
12 pages, (US)$3
Orders: La Leche League International, 1400 N. Meacham Road, P. O. Box 4079, Schaumburg, IL 60168-4079 USA
Tel: (847) 519-9585 or toll free (800) LALECHE;
Fax: (847) 519-0035
E-mail: OrderDepartment@llli.org
URL: www.lalecheleague.org

In the 1980s, as epidural analgesia for labor became more widely used, anecdotal reports began to appear of suckling disorganization and weakness in babies whose mothers had received labor epidurals. In the interests of providing an evidence-based service, this unit will be a welcome addition to the lactation consultant’s resources.

A brief history of labor analgesia and the prevalence of epidurals in different cultures is offered, along with well-referenced tables and text covering procedures, commonly used medication, and potential risks to the mother. The authors highlight the complexity associated with trying to determine the effect of epidurals on babies and breastfeeding. Epidurals are usually associated with other obstetric interventions, such as maternal intravenous fluids, vacuum extraction, and infant oral suctioning; hence, it is difficult to pinpoint which event has an impact on suckling and which event does not. Earlier studies examining the effect of epidurals on general neonatal behavior have shown differing results but have not measured breastfeeding as an outcome.

The use of a valid breastfeeding assessment tool enabled later researchers to judge objectively how well the baby breastfeeds and, thus, provide evidence that epidural use during labor does diminish the baby’s early ability to suckle. The frequency of this problem is not known. In general, the effect on the neonate is dosage and time dependent and appears to be temporary.

This well-structured publication supplies perinatal health professionals with the information needed to discuss a difficult topic in a balanced manner with women. It contains a wealth of information in its 12 pages. Particularly useful is the section on practical implications and the health professional’s responsibility.

Jean Ridler, RN/M, IBCLC
Cape Town, South Africa

Teens and Breastfeeding
Lactation Consultant Series 2: Unit 3
Denise Parker and Nancy Williams
La Leche League International, 2000
16 pages, (US)$3.00, softcover
Orders: La Leche League International, 1400 N. Meacham Road, P. O. Box 4079, Schaumburg, IL 60168-4079 USA
Tel: (847) 519-9585 or toll free (800) LALECHE;
Fax: (847) 519-0035
E-mail: OrderDepartment@llli.org
URL: www.lalecheleague.org

Teens and Breastfeeding is more a primer on adolescent development, pregnancy motivation, and personal experiences than evidence-based recommendations and detailed descriptions of “best practices.” The authors speak from their hearts and their experiences with teens and dedicate the unit to 2 of their daughters who were teen mothers.

Recommendations are often universally applicable (eg, practical issues for establishing breastfeeding, myths vs reality). Too many times statements are described as teen issues when actually they may apply to all women (eg, “Telling a teen who may not be comfortable with her own sexuality that many women find breastfeeding sensually pleasant may trigger a negative reaction” [p 6]). The reality of returning to school and the need for continued support is discussed minimally. Mentors and support groups are described, as well as how to reach out to teen mothers.

There is no mention of actual teen breastfeeding rates and no description of documented times when teen mothers typically stop nursing. Those who are currently working with teens will have no way to compare their rates with the “norms.” Measurable impacts are absent, whereas some influences are noted such as fears, body image, and contraception. Other areas that influence teen breastfeeding are overlooked: the rate of sexual abuse prior to pregnancy; 3-generational living, including foster care; and the impact of poverty. The authors acknowledge that there is a world of difference between
a 12-year-old and a 17-year-old mother but generalize their remarks to all teens. A differentiation would have made this resource more effective.

In addition to the predominantly long-term involvement described, the lactation consultant will need information on how to quickly establish rapport and troubleshoot with a parenting teen. A page is devoted to general programs for teen parents. A sorely needed resource would have been programs that focus on breastfeeding, such as a list of best practices for teen breastfeeding.

The authors have obviously given their hearts to working with teens. This is reflected in their closing remark, “What a privilege to be a part of this!” Hopefully all lactation consultants who have the opportunity to work with young mothers will feel this way.

Teri Shilling, MS, IBCLC
Gunnison, Colorado, United States

Choosing Waterbirth: Reclaiming the Sacred Power of Birth
Lakshmi Bertram
Hampton Roads Publishing Company Inc, 2000
171 pages, illustrated, (US)$14.95, softcover
Orders: Hampton Roads Publishing Company Inc, 1125 Stony Ridge Road, Charlottesville, VA 22902 USA
Tel: (804) 296-2772 or toll-free (800) 766-8009; fax: (804) 296-5096
E-mail: hrpc@hrpub.com
URL: www.hrpub.com

Choosing Waterbirth: Reclaiming the Sacred Power of Birth is a beautiful testimony to the rewards of an unmedicated birth. It is written by a mother who has given birth five times in the water, who delights in her pregnancies and treats this time as sacred, and who portrays giving birth in the water as “freeing and empowering” (p 94).

The book is refreshing to read, as the perinatal period is described as a time of joy instead of drudgery. Bertram speaks warmly and confidently to the reader and uses her own experience to illustrate some points. She sums up the birthing process as “a time when we must reach deep inside ourselves to find a strength we didn’t know we possessed until the moment comes and it is needed” (p 12).

The chapters include the concise description of prenatal yoga and relaxation exercises. The photographs are clear, which will help readers assume the different asanas. One chapter, Mama Juice, provides a simple but encouraging description of breastfeeding. I believe that this chapter is pertinent to lactation consultants, who may find it useful for encouraging their clients, and it will encourage women in general to breastfeed. I enjoyed the chapters describing Bertram’s 5 waterbirths and the one of her sister. They will be an enjoyable and inspiring reading for pregnant mothers rocking their growing fetuses to sleep.

Choosing Waterbirth, however, is not a nuts-and-bolts book on how to prepare and proceed with a waterbirth. Chapters 7 through 9 (pp 26-40) contain statements that are not clear, with several generalizations that deserve more specification. For example, addition of salt in the water being no longer necessary is not explained (p 26) and “diseases or illness of the mother . . . or baby [that] contraindicate waterbirth” (p 28) are not listed.

This book will encourage and inspire women to enjoy all aspects of motherhood. The author’s personal stories of her waterbirth experiences are what makes Choosing Waterbirth so wonderful. It may serve as a special gift from professionals and from all individuals to women of child-bearing age. I highly recommend it.

Susanna Napierala-Cox, BA, CMT
Kenwood, California, United States

Briefly Noted

International Baby Food Action Network, 2001
12 pages, illustrated, stapled booklet, free against cost of postage and packing
Orders: International Baby Food Action Network, PO Box 19, 10700 Penang, Malaysia
Fax: +60-4-890-7291

If you are looking for a little humor on a volatile subject, you will find it here. The astute mélange of simple language and line drawings skillfully illustrates the controversy surrounding breastfeeding support and big corporations’ appetite for financial gain. In my favorite cartoon, a baby bottle is sitting down, cross-legged and smoking a cigar, angrily watching for the handle of a baby scale to reach the 6-month mark so it can start its advertising campaign.
The Code in Cartoons does not mince words. Statements such as “No wonder . . . bottle feeding cause . . . dehydration and DEATH!” (p 4) and “All kinds of dirty tricks are used” (p 6) will appeal to some for their frankness and offend others for their boldness. Too many statements such as “breastfed babies are more intelligent” (rather than nonbreastfed babies are less intelligent) suggest artificial feeding as the standard. Nevertheless, the core message is unequivocal.

Nicole J. Bernshaw, MSc, IBCLC
Salt Lake City, Utah, United States

The State of the World’s Children 2001
Carol Bellamy
116 pages, illustrated, (US)$12.95
French- and Spanish-language versions also available
Orders: United Nations International Children’s Emergency Fund, Editorial and Publications Section, Division of Communication, 3 UN Plaza, New York, NY 10017 USA
Tel: (212) 326-7513
E-mail: pubdoc@unicef.org
URL: www.unicef.org

The State of the World’s Children 2001 focuses on early childhood development (ECD), from birth to age 3, as the critical period to maximize cognitive and social potential. Breastfeeding is an integral part of the nutrition component of the ECD aid programs. The report consists of case studies of ECD programs in different nations, interwoven with the discussion of the interaction of early childhood care with social problems such as domestic violence, war, poverty, and gender inequality. Graphs, charts, and maps show that many of these problems can be overcome by providing support and education to parents to assist them in raising their young children. Statistical tables of early childhood indicators such as mortality rates, primary school enrollment rates, and immunization rates are included for each nation. Unfortunately, the table most interesting for lactation professionals is missing data on breastfeeding rates at different ages for many nations. Overall, this publication is interesting reading for anyone involved with families with young children worldwide.

Catherine Watson Genna, IBCLC
New York, New York, United States

The Crazy Makers: How the Food Industry Is Destroying Our Brains and Harming Our Children
Carol Simontacchi
Jeremy P Tarcher/Putnam, 2000
300 pages, (US)$24.95, hardcover
Orders: Putnam Special Markets, 375 Hudson Street, New York, NY 10014 USA
www.TheCrazyMakers.com

Two chapters in this book may interest lactation consultants: Building the Infant Brain and Nourishing a Baby’s Brain. The author offers excellent support of breastfeeding and correctly depicts the food industry’s part in undermining breastfeeding promotion. Although there are some valid concerns discussed and some good basic information on infant brain development, nearly all the footnotes indicate the information is a distillation of newspaper articles, newsletters, and other books. An example of the statements freely made without a footnote is, “High levels of estrogen with low zinc levels can reduce the bonding instinct in the mother” (p. 81).

This book is written for a lay audience by a certified clinical nutritionist who has a radio program aired on 50 stations. Although certified clinical nutritionists are usually valid adjuncts to health care, this book relies too heavily on unsubstantiated statements to be recommended for lactation consultants.

Michelle I. Scott, RD, IBCLC
Mason, New Hampshire, United States

Videos

Because You’re Pregnant
Vida Health Communications and Pampers Parenting Institute, 2000
VHS, 30 minutes, (US)$195
Orders: Vida Health Communications, 6 Bigelow Street, Cambridge, MA 02139 USA
Tel: (617) 864-4334 or toll free (800) 550-7047; Fax: (617) 864-7862
URL: www.vida-health.com

Because You’re Pregnant provides basic pregnancy health information for a waiting room at a doctor’s or midwife’s office, a maternity care facility, or a WIC clinic. The language is simple and straightforward without talking down to the viewer, which makes the film particularly effective for teens and people of an elementary educational background. The mothers profiled
range in age, race, and life experience and are cared for by certified nurse midwives and doctors. The video moves quickly enough to maintain interest, yet the information provided is not overwhelming.

The 12 segments can be viewed independently of each other. They are as follows: Introduction (which includes basic fetal development), Everybody Means Well, But . . ., Prenatal Check-Ups, Special Tests, Things to Avoid When You Are Pregnant, Emotional Ups and Downs, Good Food for a Healthy Baby, Keeping Fit, Dealing With Discomforts, Emergencies, Preterm Labor, and Getting Ready for Your Baby’s Birth Day.

The focus is on normal, low-risk pregnancies. Routine medical care is described as prenatal visits, weight and urine checks, monitoring of blood pressure, and pulse and uterine measurements. Other tests, including ultrasound and alpha-fetoprotein screening, are classified as “special tests.” It is made clear that there are risks and benefits to such tests and that it is the decision of expectant parents to use them.

The sections on health and safety offer straightforward suggestions that are easy to incorporate. Domestic abuse is addressed, as are symptoms that span from discomfort to danger. During the nutrition segment, specific food suggestions (including nonanimal sources) are offered with a focus on protein, iron, calcium, carbohydrates, and liquids.

Although infant feeding is not discussed, breastfeeding is assumed. In one office, Medications and Mothers’ Milk is on a table; in another exam room, a breastfeeding poster is on the wall. Prenatal breastfeeding classes are encouraged and shown. Although a nursing bra and shirt are shown, bottles are not. La Leche League is presented as a resource, and its toll number and website are given, although www.laleche.com is incorrect. (The correct URL is www.lalecheleague.org.)

The video offers a well-rounded introduction to prenatal wellness and health care.

Jessica Mattingly, MED, CCE
Lee’s Summit, Missouri, United States

Works of Wonder
Vida Health Communications and the Pampers Parenting Institute, 2000
VHS, 84 minutes, (US)$395
Vida Health Communications, 6 Bigelow Street, Cambridge, MA 02139 USA

Tel: (617) 864-4334 or toll free (800) 550-7047; Fax: (617) 864-7862
URL: www.vida-health.com

Works of Wonder gives the viewer an overview of a variety of labor practices in birth centers and hospitals through a sampling of 3 births with and without interventions. The first is a drug-free birth with a midwife, narrated by the father of the baby. Next is a birth with an obstetrician and a doula present, using analgesic drugs and Pitocin. The third shows the use of epidural anesthesia. All the births are clearly shown, with explanations of what is happening.

Illustrations of signs of labor, ruptured membranes, and the phases of labor follow the birth series. A variety of comfort techniques are shown to help cope with labor, such as the use of a birth ball, massage, music, and aromatherapy. Several procedures are explained, including induction, use of intravenous fluids, fetal monitoring, and interventions to relieve labor pain. There is a clear illustration of placement of epidural anesthesia and a view of the procedure, as well as the risks and side effects to mother and baby. The film does not report possible difficulty breastfeeding following an epidural.

The last part of the film shows an unscheduled cesarean birth. The various procedures are carefully explained to the laboring parents and the viewer prior to and during the surgery. There are views and illustrations of the procedure, which includes the mother breastfeeding afterward. The narrator discusses the possibility of a vaginal birth for a future pregnancy.

Two out of 4 mothers are shown nursing, with little discussion about breastfeeding in general. It might have been more effective to present the stages of labor, procedures, and comfort measures shown first, followed by the actual births. I would like to have seen more focus on births without interventions and a discussion about the effects of interventions on the infant.

I would recommend this film for viewing by the consumer because the details of labor and birth are clear and well supported by both scenes and graphics; unfortunately, it is rather expensive. I particularly love the button worn by the midwife in the first birth, which read “Birth Is Normal.”

Roni M. Chastain, RN, LCCE
Glen Cove, New York, United States
Starting Out Safe and Sound
Vida Health Communications, 2000
VHS, 30 minutes, (US)$195.00
Orders: Vida Health Communications, 6 Bigelow Street, Cambridge, MA 02139 USA
Tel: (617) 864-4334 or toll free (800) 550-7047;
Fax: (617) 864-7862
URL: www.vida-health.com

The overview on the jacket states that this video “presents ‘need to know’ information about infant health and safety for the first few months of life.” Sponsored by the Pampers Parenting Institute, this overambitious video conveys a tremendous amount of information on a broad array of routine care and safety concerns from diapering and cord care to burn prevention and car safety. There is little about feeding a baby despite the fact that “feeding cues” and “introduction to breastfeeding” are listed on the cover.

The first section of the video, Keeping Your Baby Healthy, begins with a description of the normal newborn at birth, covering briefly such physical aspects as puffy eyelids, peeling skin, vernix, and lanugo. However, milia, infant acne, the appearance of crossed eyes, and bowed legs are not depicted. Although the narrator states that circumcision has no health benefits, circumcision wound care is covered in detail, but not how to care for the intact penis. No mention is made of newborn reflexes and infant state, topics which are important when discussing a healthy newborn.

Breastfeeding is promoted, but no instruction is provided. Numerous shots of breastfeeding infants are shown throughout the video, none of bottle-feeding infants. Viewers are told to “give serious thought” to breastfeeding, and parents are encouraged to attend a breastfeeding class during the last trimester of pregnancy. In the section on when to call the baby’s care provider, a partial list of dehydration symptoms is discussed.

The brevity of the video is its biggest flaw. Too much information is given too quickly for the viewer to absorb during one 30-minute viewing. Some topics are explained in great detail and yet others are given short shrift or none at all. As a childbirth educator, I would love to find a great introduction to the newborn and newborn care for my classes at a reasonable price. I’m still looking.

Margaret Ann Paxton, CCE, IBCLC
Lexington, Virginia, United States

News About Newborns is the fourth video of the new series Hello Family, which replaces the older classic Hello Baby for childbirth educators. As with the others in the set, this video offers a mix of positive and negative that does not justify the high cost of purchase.

Positive aspects of the film include the encouragement to put baby to breast early. A scene in which the father is reading to his baby reinforces a very positive parenting behavior. The views of infant-feeding cues are important, because prospective parents will learn what their baby’s signals mean. It is nice to see a scene in which the La Leche League’s classic, The Womanly Art of Breastfeeding, is part of the background.

A remarkable finding of this video, as well as of the others in the series, is that it illustrates mainstream parenting in the United States. Babies are rarely shown in arms. They are more often shown in trays, strollers, car seats, cribs, gliders, and all the other forms of plastic caches in common use. In one scene the parent is talking to an infant in a plastic carrier, en face, with no physical contact. The underlying message is that infant care does not require much physical contact, which is incongruent with the essential closeness of breastfeeding or attachment parenting. Infant sounds are a first step in language development and dialogue, yet the film dismisses those wonderful noises by saying that they are not related to language. The sight of a newborn with red and swollen eyes secondary to routine prophylaxis might disturb parents in a childbirth class.

The recommendation of not letting the baby fall asleep at breast, but rather to put the baby down slightly awake so it can learn to fall asleep on its own, will create worry in every new breastfeeding mother. While there are positive aspects to the film, the continual modeling of distance between parents and babies is not something I want new parents to see. Babies must be in arms for long-term breastfeeding, not in plastic seats.

Nikki Lee, RN, MSN
Elkins Park, Pennsylvania, United States
Celebrate Birth 
Lamaze International and Injoy Videos, 2000
VHS, 41 minutes, (US)$179.95
Orders: Injoy Videos Inc, 1435 Yarmouth, Suite 102,
Boulder, CO 80304 USA
Tel: (800) 326-2082
E-mail: custserv@injoyvideos.com
URL: www.injoyvideos.com

Celebrate Birth is a video for the pregnant family. The first segment, Lamaze Class, features a prenatal class together with a couple who have recently given birth. The instructor answers questions clearly and authoritatively, encouraging parents-to-be to contribute their thoughts. This balance of textbook knowledge and personal accounts reinforces the message that childbirth is safe and that everyone is capable of having a positive birth experience.

Everyday Miracles focuses on what is needed for the perfect birth with regard to safety, trust, and pain perception. It concludes with 3 vaginal deliveries (there is no mention of any medication, yet 2 of the 3 women have intravenous lines). Connie’s Birth identifies the start of labor and illustrates coping with back labor, the use of a doula, and a partner’s involvement. It shows that an unmedicated birth may be arduous yet achievable. Finally, Moving With Pregnancy and Birth offers pointers on getting out of bed, into a car, sitting down, and getting up. Alternative birth positions are also described.

What I appreciated about Celebrate Birth is the use of couples of all ages and ethnicities and a strong emphasis on a partner’s responsibilities and input throughout. It is always the pregnant couple who are addressed, never the woman in isolation. The focus on letting the woman’s body do what it knows and on trusting birth is fully realized, highlighting many alternatives in coping with fear, anxiety, and pain.

Celebrate Birth is limited to traditional hospital deliveries with obstetricians. Surprisingly, there is no mention of pain medication, being torn or cut, or the possibility of a cesarean section, which are major concerns for most women. There is scant information on breastfeeding. Only one mother is shown breastfeeding with skin-to-skin contact; one mother does not breastfeed at all. In a society bereft of a constant and unwavering voice to bring the baby to breast, how better to “celebrate birth” than by getting all babies on the breast on this videotape. Consequently, I would only recommend this video in the context of a class in which an instructor could remedy the deficiencies.

Connie Milner, CNM, IBCLC
New York, New York, United States

Choices in Childbirth Volume Two: Induction and Augmentation
Injoy Videos, 2001
VHS (NTSC), 15 minutes, (US)$199.95
Orders: Injoy Videos, 1435 Yarmouth Avenue, Suite 102-D, Boulder, CO 80304 USA
Tel: (800) 326-2082; fax (303) 449-8788
E-mail: custserv@injoyvideos.com
URL: www.injoyvideos.com

Induction and Augmentation is a short video packed with important information for any woman faced with decisions about these labor interventions. Their risks and benefits are explained in a way that is neither frightening nor underplayed, while stating that induction and augmentation should only be done for medical reasons.

In the first section, the most common reasons for induction and procedures are outlined. Clear graphics help to describe the importance of cervical ripeness and the baby’s position in relationship to the chance of the induction working. This section ends with the statement that “inducing labor is associated with an increased risk of cesarean birth and fetal distress.”

The augmentation section makes it clear that every woman’s labor needs to be individually assessed and that everyone involved should have a “realistic expectation of how long the birth process can take.” The most common methods of augmentation are thoroughly described and include stripping the membranes, use of prostaglandins, breaking the waters, and the use of Pitocin. The side effects of Pitocin are listed as an “increased risk of postpartum blood loss and newborn jaundice.”

My favorite section is on natural methods of induction and augmentation. Women are encouraged to try them first, including waiting and sexual activity if the waters have not broken. Women are advised to talk to their care providers about therapeutic massage, acupuncture, and herbs. Nipple stimulation is demonstrated. Women are recommended to relax and stay well nourished and hydrated. Key questions to ask the care providers are discussed, and a written list of the questions is provided.
As a midwife, I would strongly recommend this video to care providers and childbirth teachers. It would be an asset to any lending library or childbirth class. As a lactation consultant, I was disappointed that breastfeeding was not mentioned. The impact of inductions, augmentations, and cesarean sections on breastfeeding would have fit in beautifully.

Janet Hoover Malo, LM, IBCLC
Santa Cruz, California, United States

Websites

San Diego County Breastfeeding Coalition
URL: www.breastfeeding.org
Languages: English, Spanish, USA

The San Diego County Breastfeeding Coalition website brings together local and regional resources and articles and information for families and professionals. The site has a professional appearance, but with minimal graphics. It loads quickly and is easy to navigate. Pages are cross linked and all are directly accessible from the home page. The most useful parts for lactation professionals outside of San Diego County include the resources for drug information, the model hospital policies and procedures, and the breastfeeding-friendly business award criteria.

As a regional coalition site, www.breastfeeding.org focuses on local and regional resources. It features a Breastfeeding Resource Guide in English and Spanish, with a brief discussion of newborn nursing, milk supply, and so on. It contains an extensive listing of breastfeeding resources in San Diego County including contact information. Both the English and Spanish guide assume a relatively high reading level. The descriptions of local resources in the Spanish guide are still in English, which may not help Spanish-speaking women access them. An access guide to local resources is being developed.

Other sections include articles for families and professionals, frequently asked questions about breastfeeding, advocacy and legal issues, and information about the coalition including its newsletter. The articles, many authored by well-known experts, are informative and accurate. The only article with graphics is Before Baby Arrives, which includes pictures of breast anatomy, breastfeeding positions, and proper latch. Several of the articles are actually reproductions of Best Start materials. There is also a Vietnamese pamphlet. The professional articles range from a basic reference list to specialized articles about hepatitis C, dental health, cup-feeding, banked milk, and hospital policies and procedures. Links contain a wide variety of organizations, listed in alphabetical order followed by their URL. It would be helpful if the links were categorized and/or described. One very enjoyable page, Fun Facts, includes a list of well-known people who were breastfed.

Anne Montgomery, MD, IBCLC
Olympia, Washington, United States

United Nations Children's Emergency Fund
URL: www.unicef.org
Languages: English, French, Spanish

Not surprisingly, the United Nations Children’s Emergency Fund (UNICEF) website is bursting with information and statistical data for professionals and researchers, brochures and pamphlets for families and community members, informational games and puzzles for children, upcoming events around the world, and much more. The home page is small and compact, with links to UNICEF in action, highlights, information resources, press releases, voices of youth, and, of course, donations, greeting cards, and gifts. The home page also offers a search engine leading to the numerous resources UNICEF has to offer.

The home page and lead pages of other sections are attractive and well designed, usually fitting onto the computer screen at once. Pages load quickly, and some mouseovers are fun to observe, with text changing color, each links’ tables of contents appearing, and black-and-white pictures turning to color. Navigation tools and search field are easy to find and to use and appear at the top of each page. Many links are written in very small point size and, therefore, are difficult to read. UNICEF information booklets and pamphlets are easily accessible through links and the search engine. Many of them come up as PDF files through Acrobat Reader (which can be downloaded free on line). These are formatted just as the pamphlet or booklet appears in hard copy.

A search for breastfeeding yields 742 matches, ranked by appropriateness of the match. Links include UNICEF booklets and pamphlets, statistical data, educational materials, and press releases, some of which are easier to read on screen than others. Each is well written,
attractive, and appropriate for its intended audience. Ordering information for hard copies of materials is available at Information Resources but not at each online publication page. The site provides links to the United Nations (UN) and other UN agency websites, but to very few other organizations. It is difficult to return to the UNICEF website from some of the outside links.

Although some parts of this website are difficult to read, it is a gold mine of information and resources, well written and attractively presented for health care professionals, researchers, and lay readers alike.

Naomi Bromberg Bar-Yam, PhD
Newton, Massachusetts, United States
Several studies have implicated a strong link between pacifier use and early weaning. This association might be causal. For example, pacifier use may lead to impaired suckling ability or decreased desire to breastfeed, either of which may eventually result in the use of supplements and early weaning. Along this line of reasoning, one of the 10 steps of the World Health Organization Baby-Friendly Hospital Initiative includes pacifier avoidance. Alternatively, the association observed between pacifier use and early weaning might be a result of reverse causation, such as weaning from the breast leading to pacifier use. Pacifier use could also be a confounding variable, for example, a marker of breastfeeding difficulties or mother’s decreased motivation to breastfeed. Previous studies have been limited by the observational nature of their design; thus, it has been impossible to determine whether pacifiers cause early weaning from the breast. All that can be concluded is that there is an association between the 2 behaviors. The research study featured in this issue’s Research Spotlight is unique in that it is the first to employ a randomized design in studying the link between pacifier use and breastfeeding duration.

Kramer and colleagues randomly assigned 221 mothers who planned to breastfeed for at least 3 months either to a breastfeeding support and education intervention that included discouragement of pacifier use (experimental group) or to one that did not (control group). All other aspects of the intervention were the same in the 2 groups and also included information on methods of comforting a fussy, crying infant. Mothers were recruited from a University Hospital in Montreal, Canada, during their postpartum stay. Additional breastfeeding support was provided as needed, but at minimum via telephone on day 10 and week 3 postpartum. Subjects were instructed in the completion of 3-day infant behavior logs detailing episodes of crying, fussing, and pacifier use at 4, 6, and 9 weeks. A research assistant, blinded to assignment status, conducted an interview with the mother at 3 months postpartum to assess breastfeeding status and pacifier use. The main outcome measures were early weaning, defined as within the first 3 months, frequency and duration of crying/fussing, and pacifier use.

The intervention was successful in significantly decreasing pacifier use. The prevalence of complete pacifier avoidance was 38.6% among interventions vs 16.0% among controls (relative risk [RR] = 2.4, 95% confidence interval [CI] = 1.5-3.8). The mean number of pacifier insertions per day was also significantly less (0.8 vs 2.4 at 4 weeks, 0.8 vs 3.0 at 6 weeks, and 1.3 vs 3.0 at 9 weeks in the intervention group vs control group, respectively, P < .005).

One of the research objectives was to determine whether the intervention resulted in increased frequency and duration of cry/fuss episodes. At 4 weeks of age, the number of cry/fuss episodes per day was actually less in the experimental group (6.3 vs 7.7 in the control group, P = .03), but no significant differences were observed in total duration (143 vs 151 minutes per day in experimental and control groups, respectively) or in either frequency or duration at 6 or 9 weeks of age. Thus, pacifiers do not seem to be more useful than other soothing activities, such as nursing, carrying, and rocking, in reducing infant fussiness.

Decreased pacifier use among the intervention group did not result in improved breastfeeding status at 3 months: 18.9% in the experimental group were weaned prior to 3 months versus 18.3% in the control group (RR = 1.0, 95% CI = 0.6-1.7). There also was no significant difference in exclusive breastfeeding rate between groups (36% of intervention infants were being exclusively breastfed at 3 months vs 34% of control infants).

Even the use of logistic regression analysis to control for the effect of marital status and smoking did not result in a change in the relative risk of early weaning. Thus, these results strongly suggest that there is not a causal relationship between pacifier use and early weaning.

The study authors also examined the observational relationship between pacifier use and weaning. To do this, breastfeeding status was compared between infants exposed to a pacifier and those not exposed, irrespective of group assignment. Consistent with other observa-
tional studies, significant differences were found. Based on daily pacifier use, 25% of exposed infants were weaned by 3 months versus 13% of unexposed infants (RR = 1.9, 95% CI = 1.1-3.3). As the study authors summarize, “This combination of findings [no causal relationship but a strong observational one] leads us to conclude that pacifier use is a marker of breastfeeding difficulties or reduced motivation to breastfeed, rather than a true cause of early weaning.”

Certainly, the results of one study do not conclusively determine the appropriate role of pacifiers in infant care. However, these findings are consistent with previous studies in which significant associations have been observed between pacifier use and suboptimal breastfeeding practices such as lower feeding frequency, shorter feed duration, and scheduled feeds (in contrast to on-demand feeds). Mothers of infants given pacifiers also tend to have more negative attitudes toward breastfeeding.

What are the practical implications for the lactation consultant? If pacifier use is indeed more a marker than a cause of underlying breastfeeding troubles, then perhaps our counseling approach will need to be redirected. We may be more effective in increasing breastfeeding duration if we focus on the underlying concerns and inappropriate breastfeeding practices for which pacifier use may be a “red flag” rather than simply discourage pacifier use.

Laurie Nommsen-Rivers, MS, RD, IBCLC

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Artificial Baby Milk


Breast Cancer


Breastfeeding Promotion and Support


Philipp BL. Every call is an opportunity: supporting breastfeeding mothers over the telephone. *Pediatric Clinics of North America*. 2001;48:525-532.


**Engorgement**


**Hypoglycemia**


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Devine PC, Malone FD, Athanassiou A, Harvey-Wilkes K, D’Alton ME. Maternal and neonatal outcome of 100


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Lactation Counselor Certificate Training Program (CLC). RNs: 42 contact hours; RDs: 35 credit hours; IBCLCs: 42.0L CERPs. To register, contact the Center for Breastfeeding, Healthy Children 2000 Project, 8 Jan Sebastian Way #13, Sandwich, MA 02563 USA; phone: (508) 888-8044; fax: (508) 888-8050; e-mail: hea@capecod.net; website: www.healthychildren.cc.

November 12-16, 2001 Madison, WI
December 3-7, 2001 Sioux Falls, SD

November 30-December 1, 2001 Medications, Mothers’ Milk and More. Ala Moana Hotel, Honolulu, Hawaii. Sponsoring Lactation Education Consultants. Featured speakers include Tom Hale, Linda Kutner, Carole Peterson, and Jan Barger. RN, ADA CEUs, IBLCE CERPs available. For more information or to register, contact the Lactation Education Consultants office; phone: (630) 260-4847; e-mail: LECoffice@aol.com; website: www.lactationeducationconsultants.com.

Certification Cram Course. Planning on taking the IBLCE exam in 2002? Need a refresher course, or just need to get some more CERPs? This course is for you! Sponsored by Lactation Education Consultants, it is being held in the following cities:

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March 21-23, 2002 Charlotte, NC
April 25-27, 2002 San Francisco, CA
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February 21-26, 2002 Dallas TX
April 11-16, 2002 Chicago IL
October 10-15, 2002 Orlando FL

March 2, 2002 Breastfeeding Promotion: A Civic Duty? Royal Free Hospital, London, United Kingdom. Sponsoring Lactation Consultants Great Britain. For more information, please contact Rosie Keaveney, 79 Arden Road, Furness Green, Crawley, West Sussex, RH10 6HL, UK; phone: (0)1293 403680.

April 12-13, 2002 Have a mountaintop experience and get CERPs in the bargain! The Third International VELB Conference—Breastfeeding and Lactation will be held in Basel close to the Swiss Alps, featuring speakers from throughout Europe, the United States, and Australia. Simultaneous translation in English, French, and German will be provided for all sessions. Take 2 days to catch up on the latest in lactation—collect CERPs, network with your colleagues from Europe and around the world—and then all of Switzerland and Europe is yours to discover. For more information, please contact VELB, European Lactation Consultant Association, Conference Office, Postfach 139, CH-6055 Alpnach Dorf, Switzerland; fax: +41/41/6710171; e-mail: office@velb.org.

Repeated Workshops. UCLA Extension Lactation Educator and Consultant Training Programs. Varied dates and locations. Contact UCLA Extension Health Sciences at (310) 825-8423, or visit their website at www.uclaextension.org/healthsci/directry.htm.
**Independent Study Modules Coordinator/World Breastfeeding Week Coordinator Needed**

Put your editorial and marketing skills to work! The ILCA Board invites member applications for 2 open positions: an independent study modules coordinator and a World Breastfeeding Week coordinator. The independent study modules coordinator is a paid contract position; the World Breastfeeding Week coordinator is a volunteer who works closely with the Marketing Committee. A full job description for each position is available from the ILCA office; e-mail: ckerr@olson.mgmt.com.

**ILCA Website**

Have you visited the ILCA website (www.ilca.org)? The website is your window into ILCA. A progressive upgrade is in the process of placing more member information and member services on the website for easy access 24 hours a day. See the Association News column in this issue of *JHL* for some clues to what is new on the website. See this, and MORE!
Erratum

A sentence was incorrectly printed in a video review by Libby Rosen, RN, IBCLC (J Hum Lact. 2001;17:176-177). The sentence ought to have read, in its entirety, as follows: “Consequently, the video leaves us with a positive impression of epidurals and breastfeeding with an emphasis on choice.”
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