

Improving Infant Feeding Practices: Programs Can Be Effective!

¹Sandra L. Huffman, ²Cynthia P. Green, ³Laura E. Caulfield, and ⁴Ellen G. Piwoz

¹ *Director of Ready to Learn, International Center for the Education of Children, Academy for Educational Development, Washington, D.C.*

² *Frontiers of Reproductive Health, Population Council, Washington, D.C.*

³ *Center for Human Nutrition, Johns Hopkins University, Baltimore.*

⁴ *The Academy for Educational Development, Washington, D.C.*

INTRODUCTION

Optimal infant feeding includes exclusive breastfeeding to about 6 months of age and then continued breastfeeding with appropriate complementary feeding to two years of age and beyond. While the benefits of exclusive breastfeeding for the first six months are well known, whether or not increases in exclusive breastfeeding can be attained has often been questioned. Many nutrition programs have also attempted to improve complementary feeding practices in order to reduce malnutrition in children ages six to 24 months. This paper discusses the success that such programs have had and suggests how their effectiveness can be further enhanced.

Promoting exclusive breastfeeding

A recent review of review of articles in English, French and Spanish published between 1978 and 1998 identified 35 studies that used specific interventions or combinations of interventions to improve rates of exclusive breastfeeding (green, 1998). Many of the studies had shortcomings in their research design such as the lack of an appropriate control group or baseline behavioral measurements, small sample size, self-selection of participants and high attrition (drop-out or loss to follow-up). These weaknesses were taken into consideration in assessing the impact of various interventions.

Most studies combined several types of interventions (including changes in hospital policies/actions and training hospital workers, peer counseling, prenatal education, mass media, and home visits) making it difficult to determine which were most effective. Nevertheless, these studies demonstrate that providing multiple services and reaching women at different times (e.g. pregnancy, soon after delivery, and during the first six postpartum months) do lead to significant changes in exclusive breastfeeding.

One of the most effective means to improve exclusive breastfeeding is to ensure that it is facilitated within the hospital following delivery (Who, 1998). Providing prenatal education to mothers about exclusive breastfeeding, changing hospital policies to encourage early contact and suckling during the first hour after birth and to ensure rooming-in, training hospital staff in lactation management, and restricting use of bottles in the hospital are all associated with increases in the duration of exclusive breastfeeding especially in the first few weeks postpartum (WHO, 1998). This was clearly illustrated in a cost-effectiveness study of breastfeeding promotion which showed the clear benefits of hospital interventions in Brazil, Honduras and

Mexico (Sanghvi, 1996).

In Mexico the Ministry of Health implemented the Baby-and Mother-Friendly Hospital initiative on a national basis in 1991. The infant formula manufacturers agreed to stop giving infant formula samples to public and private hospitals. Other actions included extensive training of health workers, distribution of community education materials, follow-up by health professionals working in hospitals, and creation of mothers support groups. In 1995 IMS S, the Social Security Institute, established a system for postnatal follow-up by linking primary health care posts with child care facilities. Among infants seen at 38 health posts in Mexico City and nine in Veracruz None, the prevalence of exclusive breastfeeding among newborns rose from 44 percent in 1991 to 48 percent in 1993 and 74 percent in 1995.

Hospital based interventions generally have effects on exclusive breastfeeding for the first few weeks postpartum. Subsequently, community based approaches are needed to maintain exclusive breastfeeding. Home visits by workers knowledgeable about breastfeeding, peer counseling programs in the community, counseling within health centers and mass media have all been shown to increase rates of exclusive breastfeeding during the first few months of life.

A 1995-96 study in Mexico, conducted by the National Institute of Nutrition and La Leche League of Mexico, found a dose-response effect between the number of home visits by a peer counselor and the duration of exclusive breastfeeding. At three months postpartum, 72% of the mothers visited six times by a peer counselor (twice during pregnancy, immediately after delivery, and at 2, 4 and 8 weeks postpartum) were exclusively breastfeeding during the last week, compared with 50% of those visited three times (at the end of pregnancy, immediately after delivery, and at 2 weeks postpartum) and 7% among mothers who were in the control group and were not visited (Morrow *et al.*, 1996). This study is especially important as improvements in exclusive breastfeeding were possible even in the context of very short durations of exclusive breastfeeding normally seen in Mexico which also one of the highest rates of never breastfeeding in the developing world.

Although many countries have mothers-support groups, few such groups have been systematically studied. La Leche League of Guatemala sought to increase exclusive breastfeeding among low-income mothers in 17 pen-urban communities. It recruited and trained volunteer breastfeeding advocates, who formed mother-to-mother support groups based on the La Leche League model. The volunteers held group meetings and provided educational materials. In one community, exclusive breastfeeding increased from 16% in 1990 (before the intervention) to 22 percent in 1992 (after the groups had been in place for a year) among infants under 4 months and from 10 percent to 18% among those under 6 months (Brown *et al.*, 1998).

The Asociacion Hondurena de Lactancia Materna (AHLACMA) and Foster Parents Plan (Plan International) compared the impact on exclusive breastfeeding rates of community-based breastfeeding counselors to community health committees in rural areas in the Department of Francisco Morazan outside of Tegucigalpa in 1991 - 1992 (personal communication, R. Landgren). Four volunteer counselors were selected within each community. The counselors and the committees conducted monthly group meetings with pregnant women and those with children under one year of age in twenty communities each. They were able to obtain 46%

coverage during the first year of the project. The rate of exclusive breastfeeding among infants at age six months increased from 12% to 21% in the villages with breastfeeding counselors but there was no change in the control communities. The median duration of exclusive breastfeeding increased from 1.2 months to three months. This program required a large amount of supervision to the breastfeeding counselors, with supervisors visiting each village at least once each month, for several hours each visit.

Health worker counseling of women about exclusive breastfeeding at clinic visits in the first few months postpartum and mass media campaigns about exclusive breastfeeding have also been shown to be effective in increasing rates of exclusive breastfeeding when combined with other breastfeeding promotion efforts. The use of mass media in isolation has not been assessed.

Greater attention needs to be given to national and institutional policies to ensure that the overall social setting C especially hospitals and the workplace C is supportive of breastfeeding. Policy changes can have a widespread impact and lasting effects. Monitoring of policy implementation is also important.

The timing of interventions is critical. Different strategies and messages are needed at five stages: (1) at the prenatal period, when women are making decisions about breastfeeding; (2) at the time of delivery and immediately postpartum, when breastfeeding is initiated; (3) during the first month postpartum, when breastfeeding is becoming established; (4) at 2-6 months postpartum, when mothers need encouragement to continue exclusive breastfeeding; and (5) at 7-24 months postpartum, when mothers should be introducing complementary foods and may need guidance regarding adequate diets and continued breastfeeding. Because breastfeeding must be practiced continually from childbirth, interventions prior to delivery can help women make the decision to breastfeed, while those during the first few days and weeks after delivery can ensure that breastfeeding becomes established. Once the new mother leaves the hospital, the role of the family and community support systems, peer counselors, local health workers, multimedia campaigns, and other sources of information and guidance becomes paramount.

To date, most programs do not identify subgroups of mothers who may need greater attention to ensure that they adopt the recommended breastfeeding practices. Mothers under age 21, first-time mothers, and those without a personal support system are possible candidates for special attention.

Promoting complementary feeding

Most nutritional damage to child growth occurs by age two. By age 2-3 years, children's weights may become appropriate for their lower heights, but little can be done to bring these children up to the stature of well-nourished children. For girls, the consequences of stunting are heightened risks of obstructed labor during childbirth since stunting affects the size of the birth canal (pelvic size). In addition, a stunted woman is more likely to give birth to a low birth weight baby.

What behaviors are needed to improve complementary feeding?

In addition to promotion of exclusive breastfeeding for the first six months, promotion of

continued breastfeeding and optimal complementary feeding are needed to prevent nutritional deficits. Improving complementary feeding includes increasing energy (sometimes protein) as well as micronutrient intake.

The importance of continued breastfeeding on energy intake is shown in Table 1 (Brown *et al.*, 1998). If an infant 6-8 months of age is not breastfed, she/he will need to eat an additional three times as many calories from complementary foods than one who is breastfed, and at 9-11 months about twice as much food.

Recommendations that have proved successful in increasing energy intake among young children include the following:

- Frequent on-demand **breastfeeding**, including night feeding for infants
- **Introduction** of complementary foods beginning around the sixth month
- Increased food **quantity** with increasing infant age *while* maintaining frequent breastfeeding
- Increased **feeding frequency** with increasing infant age and during and after illness, using a combination of meals and snacks
- Increased food **viscosity and variety** with increasing infant age
- Practice **inter-active feeding**

While the first five recommendations are well known, there is recent evidence that inter-active feeding is particularly important. In many populations breastfeeding is widely practiced, foods offered to young children are sufficiently energy-dense, and feeding frequency is high. Food consumption, however, is often less than adequate. This may be due to a limited variety of foods, anorexia due to illness, or low micronutrient intake, but may also be due to the way in which caretakers feed their children. Inter-active feeding means that the caregiver adapts to the child's interest in eating and motor skills (such as ability to pick up pieces of food) and is responsive to the child's desires (such as reaching for food or desire to feed him/herself)

In numerous studies throughout the world, children who are inter-actively fed have improved nutritional status. Most studies of inter-active feeding have been observational studies comparing well nourished to poorly nourished children (Engle, 1992; Engle *et al.*, 1997). However, there have been few interventions that have specifically tried to promote inter-active feeding and to evaluate its effectiveness. Caregivers may need to be supported in their ability to inter-actively feed their children in settings where this type of interaction is not common. The following are some suggestions for enhancing inter-active feeding:

- Feed young children directly and assist older children when they feed themselves
- Offer additional food and encourage children to eat more when they lose interest
- Talk to a child during feeding
- Show older children how to feed themselves

For children with depressed appetites, experiment with different food combinations, taste and textures to find recipes that appeal to them

What have been the results of programs to improve complementary feeding?

Programs to improve energy intake among young children have been in existence for decades, with generally good results. A recent review of five research (efficacy designs) studies and 16 field programs illustrated that increases in energy intake among young children are feasible (Caulfield *et al.*, 1998). The efficacy studies were carried out in five countries: Indonesia, Bangladesh, Colombia, Guatemala, and Jamaica. These studies varied in their objectives, designs, as well as the type of supplement provided, the mode of delivery and frequency. None of the trials also included promotion of optimal breastfeeding practices.

In spite of these differences, four conclusions may be drawn from these studies:

1. The foods offered in these studies were liked and accepted by children and their caregivers.
2. Energy intakes from complementary foods were improved (with additional intakes from complementary foods of about 150-300 kcal/day for infants 6-12 months of age.)
3. Increases in complementary food intake often occurred along with reductions in breast milk intake among the 6-12 mo old infants with about 10-200 fewer kcal/day consumed from breast milk as a result of this replacement.
4. Net increases in total energy intakes associated with the efficacy research were in the range of 65-300 kcal/d from the study interventions, compared to the deficits of about 270-450 calories.
5. The growth of children improved. For example, weight-for-age Z-scores improved by about 0.25 to 0.46 SD in 6-12 month infants. Height-for-age improvements were variable but ranged from no improvement to +0.35 SD among these children.

In order to determine how effective field programs been for improving feeding practices, a review of experiences from 16 programs in 14 countries (Peru, the Dominican Republic, Indonesia, Philippines, Mali, Burkina Faso, Nigeria, The Gambia, Cameroon, Tanzania, Swaziland, Ghana, Niger, and Senegal) was also conducted. All of these programs were comprehensive in nature (using a variety of medium and communications strategies), and they included some form of consultative research to develop and test specific food recipes and practices, as well as to design education messages and counseling strategies. Many of these programs were implemented in conjunction with growth promotion, and most reached populations of 1,000 or more beneficiaries.

Table 1. Daily energy requirements and additional energy needed from complementary foods among breastfed and non-breastfed children

<i>Age in months</i>	<i>Non breastfed Daily energy requirement (kcal/day)</i>	<i>Breastfed Total daily energy needed for complementary foods in addition to breast milk</i>
6-8	680	270
9-11	830	450
12-23	1090	750

Table 2. Grams of nutrient-dense foods to satisfy iron, zinc and vitamin A needs of breastfed children ages 9-11 months

<i>Food</i>	<i>Iron</i>	<i>Zinc</i>	<i>Vitamin A</i>
Beef	368	34	Contains little/no vitamin A
Chicken liver	130 (22 livers)	53 (8 livers)	1 (1/6 liver)
Fish	579	277	120
Beans (lentils)	330	192	Contains little/no vitamin A
Spinach	308	303	5
Requirements from complementary foods ¹	11 mg	2.3 mg	42 µg Retinol Equivalents

¹ Brown et al. (1998)

Only three of the programs reviewed actually carried out impact evaluations and reported information on dietary intakes of program beneficiaries (contrasted to non-participating children). for infants 6-12 mo old. This age range was selected to facilitate comparison between studies and programs. The results suggest that programs to improve young child feeding were able to increase energy intakes by about 70-165 kcal/day, which is similar to the range of intake impact reported in the efficacy trials (65-300 kcal/day net increase). In addition, the program evaluations showed a positive impact on nutritional status. These impacts ranged from about +0.2 to 0.9 SD in weight-for-age and/or height-for-age. The impact on nutritional status (anthropometry) was actually greater in some of the programs than in the efficacy studies. This could have been because of the comprehensive strategies employed by the programs, that other services were also provided to young children; or because of the evaluation designs used.

Although malnutrition rates declined, significant levels remained among children served by these programs. More attention thus needs to be focused on inter-active feeding to increase energy intake, maintenance of breastfeeding, reduced contamination of complementary foods and increasing intakes of iron, zinc, vitamin and other micronutrients limited in local diets that also affect growth.

For example, anemia (in part due to low intakes of bio-available iron) and vitamin A deficiency among children are widespread. Young children are at high risk to iron deficiency anemia because they are growing so quickly and because good sources of iron are limited in their diets. iron deficiency is associated with impaired intellectual development, behavioral development and motor skills, difficulty in learning and reduced growth (Draper, 1997).

Zinc intakes among young children are also limited and recent evidence has pointed to the importance of zinc in reducing severity of infection and promoting child growth (Black, 1998; Sandstead *et al.*, 1998). Improved zinc status has also been associated with increases in activity in children and improved cognitive development (Black, 1998a).

While only small amounts of low cost plant-based foods rich in beta-carotene can improve vitamin A status in children, promoting the intake of foods high in iron and zinc is more difficult unless animal products or fortified foods are available. Table 2 illustrates some of the most nutrient dense food sources of iron, zinc, and vitamin A and the amount of any one food a 9-11 month old breastfed child would need to consume to meet requirements as specified in a recent WHO publication (Brown *et al.*, 1998). Few, if any, children of these ages consume such foods in these quantities needed to meet iron or zinc requirements, however vitamin A needs can more easily be met. An infant would need to consume 1/3 kilo of beef and 22 chicken livers to obtain enough iron, obviously an impossible task. And consuming this quantity of liver would exceed safe levels of intake for vitamin A! Since these foods have the large amounts of iron and zinc (are very nutrient dense), it is nearly impossible for a young child to meet iron and zinc requirements from a normal diet without fortified foods or supplements. Until this issue is addressed, growth deficits and/or health problems in children are likely to continue.

CONCLUSION

Programs have been successful in improving infant feeding practices in developing countries. Further impact can be achieved by increasing support to women at a community level to exclusively breastfeed their infants for about 6 months and then adequately feed children 6-24 months of age with continued breastfeeding and appropriate complementary feeding. Increasing the availability of fortified foods (or supplements when feasible) to improve micronutrient intakes of young children, providing techniques for improving food hygiene, and focusing more attention on inter-active feeding will also be necessary. In combination with improvements in women's nutritional status to reduce rates of low birth weight and stunting at birth, and to improve the women's own health status and thus her ability to optimally care for her children, these efforts will enable programs to be more effective in reducing malnutrition among children in developing countries.

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