

Infant Feeding and Care Practices in the United States: Results From the Infant Feeding Practices Study II

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THIS SUPPLEMENTAL ISSUE of *Pediatrics* presents the first set of results from the Infant Feeding Practices Study II (IFPS II), which were chosen to cover a wide range of the topics included in the study. The IFPS II was conducted collaboratively by the Food and Drug Administration and the Centers for Disease Control and Prevention (CDC) and was co-funded by other agencies in the Department of Health and Human Services, as indicated in "Acknowledgments."

The design of the IFPS II was similar to that of the original study (the IFPS I), which was conducted in 1992–1993. In the current longitudinal survey, a large cohort of 4900 women was enrolled prenatally, and >2000 were followed through the first year of their infant's life. The mothers were mailed 1 prenatal and 10 postnatal questionnaires at approximate monthly intervals; in addition, prenatal and postnatal subsamples were administered a dietary intake questionnaire. The questionnaires were modeled on the IFPS I, but the IFPS II included several new topics such as postpartum depression, consumption of herbal and alternative medicines, breast-pump use, and infant sleeping arrangements. The details of the study methods and a list of publications from the IFPS I are presented in an article by Fein et al¹ in this supplement.

Why an IFPS II? In the decade since the IFPS I, significant changes have occurred in the products, policies, information, and education related to infant feeding choices. Breast pumps have become more effective and more affordable; new ingredients have been added to infant formula; and changes in state and federal laws have reduced some barriers to breastfeeding. Policies and recommendations about infant feeding (duration and exclusivity) have changed. In 2004–2006, the Department of Health and Human Services conducted a national breastfeeding-promotion campaign, the impact of which had to be evaluated. Thus, the IFPS II was conducted to better understand current infant feeding practices approximately 1 decade after the IFPS I.

The 13 articles in this supplement provide results on several feeding issues: breastfeeding patterns, intensity, and duration; reasons for stopping breastfeeding; and transitional and complementary feeding, including provision of iron-rich foods and supplements to breastfed infants. They examine the association between mothers' behaviors with respect to their infants' feeding and mothers' interface with certain types of organizations that may support or limit their choices, including the maternity care practices of the place at which they delivered and the breastfeeding-related options associated with their place of employment. The articles also describe and analyze patterns of breast milk expression; infant formula handling practices; infant sleeping arrangements; and food-related health problems including food allergy. Another article analyzes the effects of breastfeeding intensity, infant-initiated bottle emptying, and mothers' encouragement of bottle emptying on excess weight during infancy.

Several of the articles examine mothers' adherence to recommendations for infant feeding and care. The authors found that although most mothers generally adhered to the recommendations, a substantial minority of mothers did not. Shealy et al² found large variation from common advice on breastfeeding practices, such as the length of feeds and feeding from both breasts, and also found that a small percentage of breastfeeding mothers (~6%) never put their infant to their breast (ie, only fed their infants expressed breast milk). The authors discuss the possible implications of these variations in breastfeeding practices. Grummer-Strawn et al³ report that nearly half of the breastfed infants were supplemented with infant formula in the hospital and discuss the importance of only supplementing in the hospital when medically necessary. They found that nearly half of the infants were being fed solid foods before the age of 4 months and that more than half of the infants consumed foods high in fat or sugar at 1 year of age.

Fein et al⁴ examined adherence to several recommendations and healthful patterns related to feeding complementary foods, including 5 measures of timing of feeding various complementary foods, 7 measures of diet quality, and the first documentation in a national sample of the practice of prechewing food for infants, estimated at 14% in this sample. In a detailed examination of 1 aspect of complementary feeding, Dee et al⁵ describe adherence to

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Abbreviations

IFPS—Infant Feeding Practices Study
CDC—Centers for Disease Control and Prevention

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recommendations made to ensure that breastfed term and preterm infants receive adequate iron and conclude that a substantial proportion of the mothers did not follow these recommendations. They found that 58% of breastfed 6-month-old infants received neither 2 servings per day of infant cereal, meat, or iron-fortified infant formula combined nor an oral iron supplement regularly. They also found that nearly all mothers who fed their 6-month-old infants formula (in addition to breast milk) used iron-fortified formula. In an examination of infant formula issues, Labiner-Wolfe et al⁶ found that most mothers believed that the 3 forms of infant formula (powdered, liquid concentrate, and ready-to-feed) are equally likely to contain germs, although powdered formula is not a commercially sterile product and the other forms are. Although almost all the mothers reported that they followed the recommendation not to leave prepared infant formula at room temperature for >2 hours, more than half of the mothers reported that they did not always wash their hands before preparing their infant's formula, and one third did not always wash bottle nipples between uses.

Hauck et al⁷ examined the sleeping arrangements of infants and document that one quarter of 3-month-old infants were not placed on their back as recommended by the Back to Sleep campaign and that bed sharing, defined as a mother sleeping with her infant on the same surface, was quite common (34% at 3 months of age). They also describe reasons mothers do and do not lie down or sleep with their infants and report that the major reasons for bed sharing with the infant were to calm a fussy infant, facilitate breastfeeding, and help the infant and/or mother sleep better. The most frequently given reason for not lying down with the infant was concern that it was unsafe.

Two articles examine the effects on breastfeeding of characteristics of mothers' interface with certain types of organizations. In an article on hospital practices, DiGirolamo et al⁸ show that only 8% of the mothers experienced all 6 of the Baby-Friendly hospital practices measured in this study and that continuation of breastfeeding to 6 weeks was much higher among mothers who experienced a greater number of those practices. Fein et al⁹ examined the association between breastfeeding and various strategies that mothers used to combine breastfeeding and employment, an aspect of breastfeeding and working that has not been documented previously. They found that any of 3 strategies that provided milk for the infant during the work day (pumping milk only, breastfeeding directly only, pumping and breastfeeding directly) were equally effective and superior to the strategies that did not provide milk for the infant (pumping and dumping the milk or neither pumping nor breastfeeding during the work day) for maintaining breastfeeding intensity in the month after the mother returned to work. However, feeding the infant directly from the breast during the workday, either alone or in combination with pumping milk, was associated with longer breastfeeding duration after return to work than pumping only, whereas the shortest duration was ob-

served among those who neither pumped nor breastfed during the work day.

Four articles concern a variety of other issues related to infant feeding. Li et al,¹⁰ examining reasons that mothers stopped breastfeeding, found that the mother's perception that the infant was not satisfied by breast milk alone was among the most frequently reported reasons for weaning regardless of age. Other reasons, such as issues related to lactation physiology and self-weaning, varied according to weaning age. Labiner-Wolfe et al¹¹ documented for the first time in the literature the characteristics of milk expression. A very large proportion of breastfeeding mothers expressed milk (85%), and approximately one quarter did so regularly. Labiner-Wolfe et al found that the most frequently reported reason for expressing milk across multiple infant ages was to have breast milk for someone else to feed to the infant. Other frequently cited reasons in all age groups were to have an emergency milk supply and to relieve engorgement. Li et al¹² used the data to examine an obesity-related issue: the association between breastfeeding intensity and bottle-emptying behaviors during early infancy and infants' risk for excess weight at late infancy. They found that excess weight at late infancy was negatively associated with breastfeeding intensity but positively associated with infant-initiated bottle emptying in the first half of infancy.

Luccioli et al¹³ describe the details of the mothers' reports of food-related health problems, including food allergy, in their infants. More than 20% of the infants were reported to have a food-related health problem, with ~6% having an apparent food allergy. They also found that the majority of affected infants developed food-related health problems by 6 months of age. However, only 40% of affected infants received a doctor-given diagnosis of the food problem. They concluded that a better understanding of disease manifestations and diagnoses in infants may help to differentiate food allergies from other food-related health problems in this age group.

This set of articles provides insight into a wide range of practical issues that affect mothers and infants. However, we believe that this is only the beginning; the data sets from the IFPS II are available from the CDC (www.cdc.gov/ifps) for the scientific community to pursue additional analyses and research using this rich source of information.

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