ORIGINAL ARTICLE

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# Breast-Feeding Education and Support: Association with the Decision To Breast-Feed

**CONTEXT.** Rates of breast-feeding in the United States are well below the Healthy People 2000 objective of 75% and do not meet recent American Academy of Pediatrics guidelines.

**OBJECTIVE.** To identify factors associated with the initiation and duration of breast-feeding in managed care enrollees who had had a normal vaginal delivery.

**DESIGN.** Telephone survey of 5213 new mothers (4 to 6 months postpartum) enrolled in commercial managed care plans (response rate 72%).

**MAIN OUTCOME MEASURES.** Starting breast-feeding (ever vs never) and duration of breast-feeding (≤ 6 weeks vs > 6 weeks).

**ANALYSIS.** Logistic regression models controlling for sociodemographic variables. Given the prevalence of the outcome, odds ratios were converted to relative risks (RRs).

**RESULTS.** Seventy-five percent of respondents reported ever breast-feeding, and of those women, 75% reported breast-feeding for more than 6 weeks. In adjusted multivariate analyses, breast-feeding was affected by education, employment, and marital status. Women who were more likely to breast-feed were those who attended childbirth classes (RR, 1.16; 95% CI, 1.11 to 1.20), those who received prenatal breast-feeding advice (RR, 1.24; CI, 1.19 to 1.27), and those who received postpartum breast-feeding assistance (RR, 1.31; CI, 1.15 to 1.34). Breast-feeding for more than 6 weeks postpartum was associated with education, employment status, and the adequacy of postpartum information.

**CONCLUSIONS.** These findings suggest that health plans and employees may promote breast-feeding by providing breast-feeding education and support.

Despite the well-documented advantages of breast-feeding for infants and their mothers, only about 60% of babies in the United States were breast-fed in 1995.[1] This is well below the Healthy People 2000 objective of 75%[2] and fails to meet recent American Academy of Pediatrics (AAP) guidelines.[1]

Previously identified barriers to initiation and more specifically duration of breast-feeding include maternal demographics,[3–7] maternal employment,[8–14] lack of support, breast discomfort or infection,[15] anxiety about how much milk the infant is receiving,[15] media promotion and widespread availability of infant formula,[3] apathy or lack of information by the physician,[16, 17] insufficient prenatal breast-feeding education,[18] hospital practices that do not support breast-feeding,[19, 20] and lack of routine follow-up care during the postpartum period.[21–23]

With an increasing number of women enrolled in managed care plans, particularly through employer-sponsored coverage, there may be opportunities for

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**See related editorial on pages 141–143, Endnote on page 144, and primer on pages 145–146.**

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both managed care organizations and employers to improve breast-feeding rates. Studies conducted in managed care populations[4, 24, 25] confirm the influence of the barriers to breast-feeding described above. Studies of managed care populations and broader populations indicate that employment, particularly an increased number of work hours per week or a nonprofessional occupation status, is associated with a reduced duration (planned or actual) of breast-feeding.[8, 9, 11–14] Studies in the managed care populations have not, however, addressed the role that a managed care organization may play in influencing initiation or duration (or both) of breast-feeding. This study examines how prenatal breast-feeding education and postpartum support can affect the rates of this practice in a managed care population.

## Methods

### Survey Sample

This study of breast-feeding is part of a larger study that is examining women's preferences on the length of the postpartum hospital stay.[26] We performed a telephone survey of women enrolled in a large commercial health plan who had had a normal vaginal delivery between February 1, 1995, and May 31, 1995. To minimize potential confounders for length of maternity stay, women who had had a cesarean delivery, multiple birth, or stillbirth or who put their baby up for adoption were not eligible to participate in the study. The final sample included 5213 women (response rate 72%) who completed the survey 4 to 6 months after delivery.

### Outcome Measures

Initiation of breast-feeding was defined as an answer of "yes" to either of two questions: "Is your baby currently breast-fed?" or "Was your baby ever breast-fed?" Information was collected on the length of time that women breast-fed their infant (defined in weeks), thereby providing a measure of duration. Starting breast-feeding was categorized as "ever" versus "never" and duration of breast-feeding was categorized as 6 weeks or less versus more than 6 weeks.

### Covariates and Exposure of Interest

The maternal demographic variables of age, race, education, household income, region of residence, marital status, and parity were included as covariates in all multivariate models because they have previously been shown to affect breast-feeding.[3–14, 24, 25] We specifically examined the effect of employment status (defined as "employed full-time," "employed part-time," "self-employed," "homemaker," "student," or "other" at the time of interview). The exposures of primary interest were breast-feeding education and support, and they were evaluated by using the following variables: attended childbirth classes, received prenatal advice on breast-feeding, received breast-feeding assistance after delivery, and received enough information about breast-feeding after delivery.

### Analysis

Chi-square analyses were conducted to identify statistically significant differences between breast-feeding status and individual characteristics of interest. Multivariate analyses were conducted by using unconditional logistic regression models to determine the relation between breast-feeding status and several demographic, breast-feeding education and support, and employment characteristics as defined above. Because the outcomes (initiation and duration of breast-feeding) are common, the odds ratios are more extreme than the relative risk (RRs) (i.e., will be farther from 1). Therefore, we have used the method of Zhang and Yu[27] to approximate the relative risk from an adjusted odds ratio. All analyses were done using Statistical Analysis Software, version 6 (SAS Institute, Cary, North Carolina).

## Results

**Table 1** shows the characteristics of the survey sample. Most of the women were married, at least 25 years of age, white, and had higher-than-average socioeconomic status. Almost half were employed full-time. **Table 1** also shows the frequency of various measures of breast-feeding education and support. Almost half (47%) of the respondents attended a childbirth class. The majority indicated that they received breast-feeding advice during prenatal health care visits and enough breast-feeding information in the hospital after delivery. Almost all of the women (99%) indicated that they did not receive breast-feeding assistance during the postpartum period.

### Initiation of Breast-Feeding

Seventy-five percent of the mothers reported breast-feeding their infants. Women who reported ever breast-feeding were more likely to be older, white, college educated, married, and living in the western United States. Women who worked either part- or full-time were less likely to start breast-feeding than homemakers.

**Table 2** shows the independent relation of our measures of breast-feeding education and support. "Attended childbirth classes," "received breast-feeding advice during prenatal care," and "received breast-feeding assistance post-

partum" were significantly associated with breast-feeding. Women who were more likely to breast-feed were those who attended childbirth classes (RR, 1.16; CI, 1.11–1.20), those who received prenatal breast-feeding advice (RR, 1.24; CI, 1.19–1.27), and those who received postpartum breast-feeding assistance (RR, 1.31; CI, 1.15–1.34).

**TABLE 1**
**Maternal Characteristics (*n* = 5213)**

| CHARACTERISTIC | PROPORTION OF STUDY SAMPLE |
|---|---|
| Married | 94% |
| Age (yr) | |
| <20 | 4% |
| 20–24 | 11% |
| 25–29 | 32% |
| 30–34 | 38% |
| 35–39 | 13% |
| ≥40 | 2% |
| Ethnicity | |
| White | 78% |
| African American | 9% |
| Hispanic | 9% |
| Other | 4% |
| Education | |
| Less than high school | 3% |
| High school/GED* | 24% |
| College, 1–3 yr | 27% |
| College, 4+ yr | 46% |
| Employment | |
| Full-time | 46% |
| Part-time | 4% |
| Self-employed | 15% |
| Homemaker | 23% |
| Student | 2% |
| Other | 10% |
| Household income | |
| <$25,000 | 15% |
| $25,000–<$50,000 | 36% |
| $50,000–<$75,000 | 28% |
| ≥$75,000 | 21% |
| Region | |
| Northeast | 23% |
| North Central | 17% |
| South | 45% |
| West | 15% |
| Model of care | |
| Provider network (enrollee must see plan provider) | 42% |
| Point-of-service (enrollee may choose out-of-plan provider) | 58% |
| Parity | |
| First delivery | 42% |
| Two or more deliveries | 58% |
| Breast-feeding education and support | |
| Attended childbirth classes | 47% |
| Received prenatal breast-feeding advice | 75% |
| Received enough breast-feeding information after delivery | 18% |
| Received breast-feeding assistance after delivery | 1% |

**GED = general equivalency diploma.*

### Duration of Breast-Feeding

Among women who reported breast-feeding, 75% reported doing so for more than 6 weeks. As shown in **Table 3**, the demographic characteristics associated with breast-feeding for more than 6 weeks were similar to those associated with beginning breast-feeding. However, only one of our measures of breast-feeding education and support was significantly related to the duration of breast-feeding: Women who "received enough information on breast-feeding postpartum" were slightly more likely to breast-feed for more than 6 weeks than women who did not (RR, 1.08; CI, 1.03–1.13).

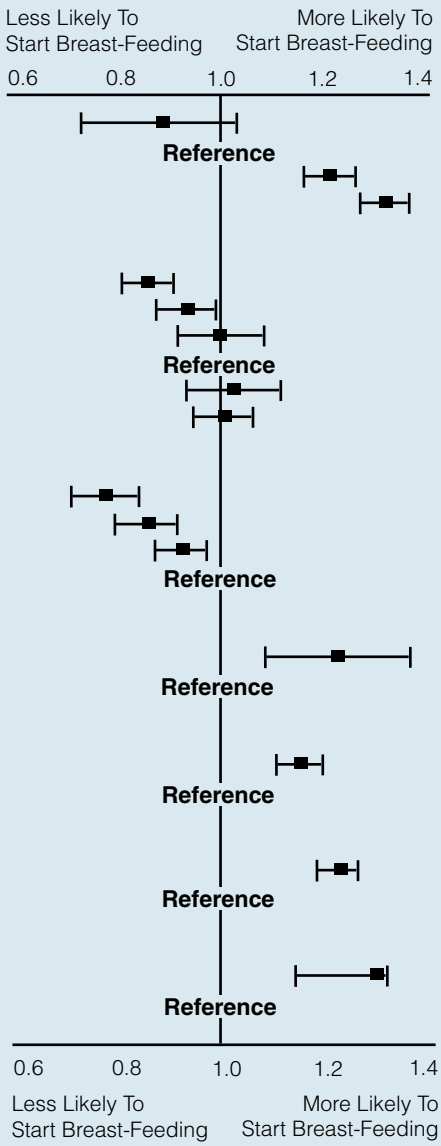
## Discussion

These data suggest that breast-feeding education, access to a lactation consultant, or other postpartum support may improve a woman's chances of starting and continuing to breast-feed her newborn. Our data also indicate that full-time employment puts a woman at higher risk for never breast-feeding or for

**TABLE 2**

**Relationship between Maternal Characteristics and Starting Breast-Feeding (*n* = 5213)***

| CHARACTERISTIC | PROPORTION STARTING BREAST-FEEDING | ADJUSTED RR (95% CI) |
|---|---|---|
| **Education** | | |
| Less than high school | 47% | |
| High school/GED | 61% | Reference |
| College 1–3 yr | 75% | |
| College 4+ yr | 84% | |
| **Employment** | | |
| Full-time | 71% | |
| Part-time | 84% | |
| Self-employed | 76% | |
| Homemaker | 79% | Reference |
| Student | 67% | |
| Other | 77% | |
| **Region** | | |
| Northeast | 68% | |
| North Central | 73% | |
| South | 76% | |
| West | 84% | Reference |
| **Marital status** | | |
| Married | 76% | |
| Not married | 50% | Reference |
| **Attended childbirth classes** | | |
| Yes | 81% | |
| No | 69% | Reference |
| **Received prenatal breast-feeding advice** | | |
| Yes | 79% | |
| No | 64% | Reference |
| **Received breast-feeding assistance postpartum** | | |
| Yes | 97% | |
| No | 75% | Reference |




**Final logistic model was determined by a backward selection process. All demographic variables were forced into the final model; the variables included those listed here as well as age, race, income, parity, model of care, and length of stay after delivery. Odds ratios have been converted to relative risks (RRs). GED = general equivalency diploma.*

breast-feeding for a shorter duration. This study is consistent with previously reported demographic factors associated with breast-feeding. Similar to national data,[28] we found higher breast-feeding rates in the West.

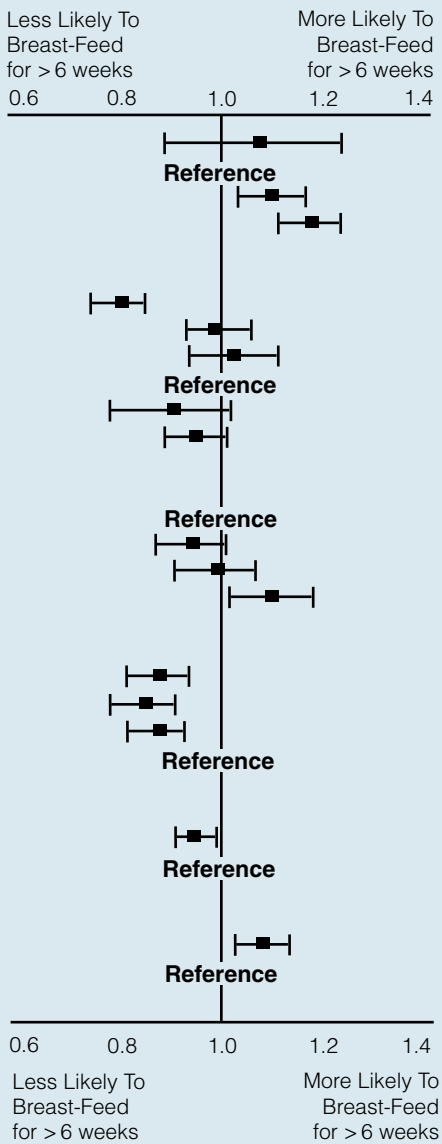
Our rate of women who started to breast-feed and continued to breast-feed for at least 6 weeks is much higher than previously reported national figures.[1] This may be partially explained by two factors: Our study sample only included 1) women who had a normal vaginal delivery and 2) women who had a higher socioeconomic status than the general population.[29]

Our study had several limitations. First, the strong relation between access to breast-feeding help and initiation could be attributable to confounding. It is likely that women who are highly motivated to

**TABLE 3**

**Relationship between Maternal Characteristics and Breast-Feeding for More Than 6 weeks (*n* = 3897)***

| CHARACTERISTIC | PROPORTION BREAST-FEEDING MORE THAN 6 WEEKS | ADJUSTED RR (95% CI) |
|---|---|---|
| **Education** | | |
| Less than high school | 63% | |
| High school/GED | 65% | Reference |
| College 1–3 yrs | 72% | |
| College 4+ yrs | 80% | |
| **Employment** | | |
| Full-time | 67% | |
| Part-time | 84% | |
| Self-employed | 81% | |
| Homemaker | 83% | Reference |
| Student | 64% | |
| Other | 77% | |
| **Household income** | | |
| <$25,000 | 67% | Reference |
| $25,000–<$50,000 | 71% | |
| $50,000–<$75,000 | 76% | |
| ≥$75,000 | 83% | |
| **Region** | | |
| Northeast | 76% | |
| North Central | 73% | |
| South | 71% | |
| West | 83% | Reference |
| **Parity** | | |
| First delivery | 70% | |
| Two or more deliveries | 78% | Reference |
| **Received enough information postpartum** | | |
| Yes | 75% | |
| No | 70% | Reference |




*Final logistic model was determined by a backward selection process. All demographic variables were forced into the final model; the variables included those listed here as well as age, race, model of care, and length of stay after delivery. Odds ratios have been converted to relative risks (RRs). GED = general equivalency diploma.*

breast-feed are the ones who seek additional services and information during the postpartum period. Second, we did not have information about other reasons for not breast-feeding. For example, many individual reasons (e.g., personal preferences or anatomical problems) are likely to influence rates of breast-feeding. We also did not have any information to assess the role of the physician. Third, there is the potential for recall bias and misclassification of variables pertaining to events early in the postpartum period; however, the effect of these biases is expected to be small and nondifferential. Finally, the study sample, by virtue of its enrollment in a commercial health plan, is selective and results cannot be generalized to a broader population. However, they should be generalizable to women with similar demographic characteristics who are also enrolled in a managed care plan.

Barriers to breast-feeding are multidimensional and encompass factors related to the individual, the health care delivery system, and society. Some of these factors are amenable to prenatal and postnatal services, whereas others are more difficult to change. Given that more women are working than ever, it is important to determine how much the breast-feeding practices of working women are influenced by constraints imposed by their employment and how much is a result of the utilities and preferences of women with careers. Employers can identify some of the constraints imposed by the working environment and consider opportunities to promote or support breast-feeding. Further study on the role of corporate-based programs on breast-feeding initiation and duration is warranted.

Health care delivery systems may also play an important role in covering breast-feeding education and lactation-support services as part of routine maternal–child care. Additional research that examines the effect of better access to lactation-support services is needed. We need to know more about whether these services make a difference in improving the initiation and duration of breast-feeding and whether this, in turn, results in cost savings through reduced newborn complications (e.g., lower rates of otitis media and diarrhea) or fewer maternal breast-feeding complications (e.g., mastitis).

Research is also needed to examine the role of the physician in educating and encouraging women to breast-feed and whether this has an impact on breast-feeding practices. As more working women with children are covered by managed care, both employers and managed care organizations should strive to find new and more effective ways to support breast-feeding practices. Continued efforts must be made to promote breast-feeding as the most beneficial source of nutrition for an infant for at least the first year of life.[1]

## Take-Home Points

- **Increasing the proportion of mothers who breast-feed their babies is one of the objectives of Healthy People 2000.**
- **In our telephone survey of new mothers enrolled in commercial managed care plans, we found that 75% of new mothers breast-feed, compared with the national average of about 60%.**
- **As expected, low socioeconomic status and full-time work were related to lower rates of breast-feeding.**
- **Women who attended childbirth classes, received prenatal breast-feeding advice, and received postpartum breast-feeding assistance were more likely to breast-feed.**
- **Health plans and employers may be able to promote breast-feeding by providing breast-feeding education and support.**

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