The Effectiveness of a Hospital-Based Program to Promote Exclusive Breast-Feeding among Low-Income Women in Brazil

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ABSTRACT

Objectives. This study examined the effectiveness of a hospital program to promote exclusive breast-feeding in Santos, Brazil.

Methods. In a prospective design, women who delivered at a hospital with an active breast-feeding promotion program (n = 236) were compared with women who delivered at a nearby control hospital (n = 206).

Results. The two groups had similar demographic characteristics and previous breast-feeding histories. Exposure to breast-feeding activities, assessed by maternal recall prior to discharge, was universally high at the program hospital and universally low at the control hospital. Multivariate survival analysis showed that exclusive breast-feeding lasted 53 days longer among women who delivered at the program hospital.

Conclusions. Hospital-based breast-feeding promotion programs may be effective in extending the duration of exclusive breast-feeding. (*Am J Public Health.* 1997;87:659–663)

Introduction

Evidence of a strong protective effect of exclusive breast-feeding (in which breast milk is the sole source of the infant's food) on infant morbidity and mortality in the developing world[1–3] contrasts sharply with data showing the rarity of this practice.[4–7] The observation that high rates of breast-feeding initiation and long durations of any breast-feeding coexist with short durations of exclusive breast-feeding highlights the importance of identifying programs that are successful in extending the duration of exclusive breast-feeding. This study examines the effectiveness of a comprehensive hospital-based breast-feeding promotion program in promoting exclusive breast-feeding among low-income women in the city of Santos, Brazil. It is part of a larger study designed to assess the cost-effectiveness of breast-feeding promotion.[8]

Methods

A prospective design was used to compare prevalences of exclusive breast-feeding at 30 and 90 days postpartum for two cohorts: women who delivered at a hospital with an active breast-feeding promotion program (the program hospital) and women who delivered at a nearby hospital without such a program (the control hospital). For 20 years the program hospital has had a comprehensive breast-feeding promotion program characterized by rooming-in, early initiation of breast-feeding, and breast-feeding assistance and talks during hospitalization. These talks include information on the importance of exclusive breast-feeding for the first 6 months of infancy, how to solve common breast-feeding problems, and where to find postpartum breast-feeding help. The control hospital has no breast-feeding program, though several reforms mandated by Brazilian law, such as rooming-in and prohibition of free gifts of infant formula, have been instituted. It was selected from seven possible control hospitals because its maternity population is similar to that of the program hospital.

All women delivering healthy singleton infants with birthweights of 2000 g or more between June 1992 and March 1993 were enrolled. Data were collected from hospital records and by interviewing the women just prior to hospital discharge and at home at 30 and 90 days postpartum.

Prior to discharge, exposure to hospital breast-feeding practices and activities was assessed by maternal recall. Information was also collected on breast-feeding history and plans, exposure to breast-feeding information during the current pregnancy, demographic characteristics, and socioeconomic status. To control for potential selection bias, in that women more likely to exclusively breast-feed might seek out a hospital supportive of breast-feeding, the women were asked in an open-ended question why they chose that particular hospital.

Exclusive breast-feeding was assessed at each follow-up visit by 24-hour maternal recall in response to a list of liquids (including water) and foods. Infants were classified as exclusively breast-fed only if the mother responded negatively to all items except breast milk. If the mother was not exclusively breast-feeding at the time of the visit, she was asked the date when she first introduced other liquids or foods. This date was used

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TABLE 1—Maternal Characteristics and Breast-Feeding Motivation, by Hospital: Santos, Brazil, 1992/93

	Program Hospital (n = 236)	Control Hospital (n = 206)	P[a]
Characteristics			
Age, y, mean ± SD	25.3 ± 6.5	24.6 ± 5.4	.22
Education, y, mean ± SD	7.3 ± 3.4	7.2 ± 3.5	.13
Employed, %	29.2	29.1	.98
Socioeconomic score,[b] mean ± SD	3.6 ± 0.9	3.7 ± 0.7	.20
Living with father of infant, %	81.3	82.4	.88
Parity, mean ± SD	2.2 ± 1.6	2.0 ± 1.3	.15
Primipara, %	43.2	43.2	.99
Received prenatal care, %	93.6	95.6	.36
Gave birth to male infant, %	53.0	45.6	.12
Child's birthweight, g, mean ± SD	3227 ± 467	3386 ± 499	<.001
Underwent cesarean section, %	23.4	49.0	<.001
Motivation[c]			
Duration of breast-feeding of previous child,[d] mo, mean ± SD	10.9 ± 11.8	13.0 ± 5.7	.30
Received breast-feeding information during prenatal care, %	37.1	26.4	<.05
Planned duration of exclusive breast-feeding, mo, mean ± SD	4.5 ± 2.3	2.8 ± 2.3	<.05
Received breast-feeding information between hospital discharge and first follow-up visit, %	96.8	70.1	<.001
Received breast-feeding information between the first and second follow-up visits, %	52.6	47.4	.82

[a]Significance of differences in means and proportions tested by Student's *t* test and chi-square test, respectively.
[b]Composite indicator of the following household possessions: radio, television, telephone, refrigerator, and car.
[c]As assessed by maternal recall.
[d]Multiparas only.

to determine the length of exclusive breast-feeding. If the mother was still exclusively breast-feeding, the age of the child was entered as the duration of exclusive breast-feeding and that value was censored in the survival model. Information was also collected on breast-feeding information received by the mother postpartum.

Two physicians, not associated with either of the hospitals, administered the pre-discharge questionnaire and abstracted medical information from the records. Three social workers conducted the household interviews; they were blinded with respect to the study objectives and the hospital in which the mother gave birth.

Sample characteristics and exposure to program activities were compared by means of chi-square tests for categorical variables and Student's *t* test for continuous variables. The Cox model, which takes into account censored data, was used to generate survival curves for the multivariate analysis.[9]

Results

A total of 236 and 206 women were interviewed at the program and control hospitals, respectively. Complete data for both follow-up visits are available for nearly 80% of the original sample. No difference in attrition was found between hospitals. With one exception (women followed at the program hospital were older than those lost to follow-up), there were no differences between women followed and lost to follow-up.

Women in the two hospitals were similar with respect to all demographic, medical, and infant variables except infant birthweight and incidence of cesarean section, both of which were higher in the control hospital (Table 1). Maternal motivation to breast-feed, assessed by length of time the previous child was breast-fed (multiparas only), did not differ between hospitals. Compared with women in the control hospital, women in the program hospital were more likely to have received breast-feeding information during prenatal care and postpartum prior to the first follow-up visit, though not between the first and second visit. As expected, planned duration of exclusive breast-feeding was longer at the program hospital.

Differences between hospitals were found for all but one indicator of program exposure (Table 2). Exposure at the program hospital was universally high while exposure at the control hospital was universally low.

Delivery in the program hospital was associated with exclusive breast-feeding: the median duration was 75 days among women in the program hospital compared with 22 days among women in the control hospital, for a difference of 53 days (Figure 1; Table 3). At month 1, the probability of exclusive breast-feeding was .64 in the program group compared with .39 in the control group: this translated to 250 additional women per 1000 who would be exclusively breast-feeding if they had delivered in the program rather than the control hospital. Controlling for potential confounding variables (birthweight, cesarean section, pre- and postnatal breast-feeding information) did not change these results.

Discussion

Despite the vast literature on the protective effects of exclusive breast-feeding on morbidity and mortality, few studies have reported an increase in exclusive breast-feeding as a result of breast-feeding promotion. An increase was reported in exclusive breast-feeding among middle-income married Chilean women who used the lactational amenorrhea method for contraception and were exposed to an intensive postpartum counseling program.[10] The pre–post breast-feeding intervention was not part of an ongoing program but was specifically designed to test contraceptive efficacy. Given the highly select and motivated group of women, the inferences that can be drawn from this study are limited. An increase in exclusive breast-feeding was also documented among low-income Chilean women exposed to a breast-feeding program that included postpartum home visits.[11] However, because most government health budgets do not permit home visits, this program is not easily replicated.

The inferences that can be drawn from the present observational study of two hospitals depend on the degree to which the assumption that women deliver-

ing in the two hospitals were similar in all respects except for exposure to the program is satisfied.[12,13] To the extent that any nonprogram variable is associated with both the program and the duration of exclusive breast-feeding, differences observed between the two groups could be the result of confounding. Establishing plausibly that the difference in exclusive breast-feeding between the two hospitals resulted from program exposure thus depends on the extent to which the following alternative explanations can be rejected: (1) differences in maternal or biomedical characteristics or both; (2) differences in exposure to breast-feeding information during prenatal care, postpartum, or both; and (3) self-selection.

1. Women delivering in the two hospitals were similar with respect to all characteristics examined except infant birthweight and incidence of cesarean section, neither of which had any within-hospital bivariate relationship with exclusive breast-feeding or changed the regression equation when entered (Table 3). The fact that type of delivery did not affect exclusive breast-feeding in either bivariate or multivariate models is consistent with other studies that also failed to show an association.[14–23] Differences in birthweight may be indicative of unmeasured differences in socioeconomic status. Recent studies from Brazil show the greatest improvements in breast-feeding to have occurred among women of higher socioeconomic status.[6] Thus, it cannot be automatically concluded that differences in socioeconomic status, if they exist, explain the association found, as it cannot be assumed that women of lower socioeconomic status are more likely to exclusively breast-feed.

2. Although women in the program hospital were more likely to have received breast-feeding information during prenatal care, such information was not associated with exclusive breast-feeding. Receipt of breast-feeding information between discharge and the first follow-up visit was associated with both program exposure and exclusive breast-feeding at the first follow-up visit. Although the inclusion of this variable in the regression model did not change the results, this is probably because of the small number of women (n = 6) who did not receive such information. Because such information was received in the postpartum breast-feeding clinic, the effect of this clinic independent of maternal motivation to attend the clinic cannot be ascertained.

TABLE 2—Percentage of Mothers Exposed to Hospital-Based Breast-Feeding Promotion Practices,[a] by Hospital: Santos, Brazil, 1992/93

	Program Hospital (n = 236)	Control Hospital (n = 206)
Breast-fed infant in delivery room	65.3	2.2
No separations >15 min	93.2	68.7
No prelacteals[b]	91.5	56.8
No formula or glucose water[c]	99.6	90.3
No gifts of formula, glucose water, or bottles	100	100
Received breast-feeding talk, %	87.3	18.0
Received breast-feeding brochure, %	63.6	40.3
Received help with breast-feeding the first time	72.0	33.7
Received demonstration on breast milk expression	68.2	5.4
Received information on		
Engorgement	76.3	2.4
Sore nipples	68.2	2.9
Knowing whether infant receives enough breast milk	49.2	3.9
Increasing breast milk supply	61.0	5.3
Where to get breast-feeding help	72.5	21.1
Time to introduce liquids	32.6	2.9
Time to introduce solids	31.8	1.5

Note. All differences except one (no gifts of formula, glucose water, or bottles) are significant at $P < .001$.
[a]As assessed by maternal recall just prior to hospital discharge.
[b]7.2% and 40.3% of women in the program and control hospitals, respectively, responded "Don't know" to this question. Prelacteals are defined as any liquid provided to the infant prior to the initiation of breast-feeding.
[c]0.4% and 8.1% of women in the program and control hospitals, respectively, responded "Don't know" to this question.

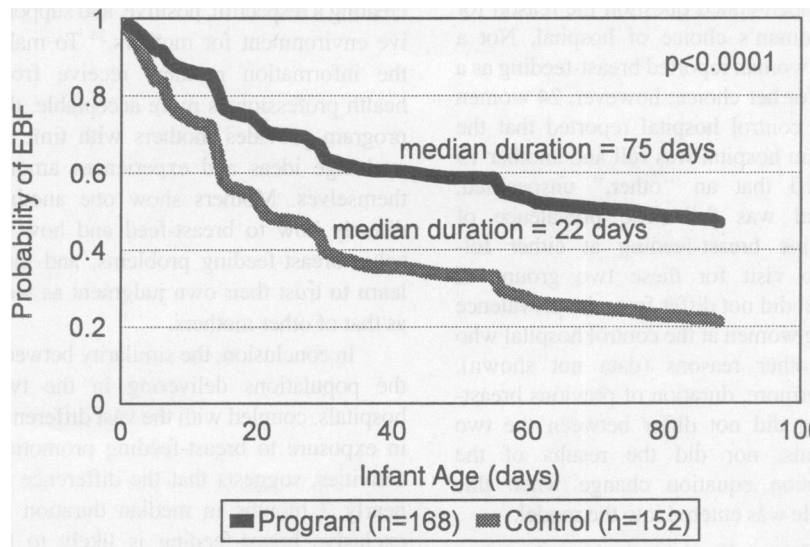

FIGURE 1—Probability of exclusive breast-feeding (EBF): survival curves for program and control hospitals, Santos, Brazil, 1992/93.

Therefore, because differences in postpartum exposure cannot be disentangled from those program activities delivered during hospitalization, program activities need to be defined as those delivered during hospitalization and postpartum.

3. The possible self-selection of women more motivated to practice opti-

TABLE 3—Estimates of the Effectiveness of a Hospital Program to Promote Exclusive Breast-Feeding: Santos, Brazil, 1992/93

	β Estimate (SE)	P	Median Duration of Breast-Feeding, Days	Benefit in Days[a]	Probability of Exclusive Breast-Feeding		Benefit per 1000 Women[b]	
					1 mo	3 mo	1 mo	3 mo
			Model 1[c]					
Hospital	−.368 (.068)	<.01						
Program			75	+53	.64	.46	250	260
Control			22		.39	.20		
			Model 2[d]					
Exclusive breast-feeding	−.342 (.078)	<.01						
Program			75	+54	.64	.46	250	260
Control			21		.39	.20		
Birthweight	.035 (.073)	.63						
Type of birth	.0002 (.0001)	.27						
Prenatal breast-feeding information	−.020 (.07)	.78						
Postpartum breast-feeding information	.10 (.10)	.31						

[a]Increase in the median duration of breast-feeding (program vs control).
[b]Number of additional women per 1000 who would exclusively breast-feed if exposed to the program. Calculated at 1 month as follows: (.64 − .39) (1000) = 250.
[c]Survival analysis (Cox model), n = 341.
[d]Multivariate survival analysis (Cox model) controlling for birthweight, type of birth (cesarean section vs vaginal), breast-feeding information during prenatal care (yes vs no), and breast-feeding information between discharge and first follow-up visit (yes vs no), n = 320.

mal breast-feeding behaviors into the program hospital was addressed by asking in an open-ended question the reason for the woman's choice of hospital. Not a single woman reported breast-feeding as a basis for her choice; however, 24 women at the control hospital reported that the program hospital was full and another 15 reported that an "other," unspecified, hospital was full. The prevalence of exclusive breast-feeding at either follow-up visit for these two groups of women did not differ from the prevalence among women at the control hospital who gave other reasons (data not shown). Furthermore, duration of previous breast-feeding did not differ between the two hospitals, nor did the results of the regression equation change when this variable was entered into the model.

The results of this study are based on quantitative measures of exposure to specific program activities. Such exposure is a necessary condition for changes in infant-feeding behaviors; however, it may not be a sufficient condition. Although not readily quantified, the philosophical underpinnings of this particular hospital's program may be equally important. These include the importance of providing emotional as well as technical support to breast-feeding women and the recognition that this can be accomplished only by creating a respectful, positive, and supportive environment for mothers.[24] To make the information mothers receive from health professionals more acceptable, the program provides mothers with time to exchange ideas and experiences among themselves. Mothers show one another directly how to breast-feed and how to solve breast-feeding problems, and thus learn to trust their own judgment as well as that of other mothers.

In conclusion, the similarity between the populations delivering in the two hospitals, coupled with the vast difference in exposure to breast-feeding promotion activities, suggests that the difference of nearly 2 months in median duration of exclusive breast-feeding is likely to be related to hospital-based breast-feeding promotion. Replication of this model in other settings, however, should be predicated on the fact that conditions for extending the duration of exclusive breast-feeding include both exposure to specific program activities and provision of emotional support and positive reinforcement to women during and after hospitalization for childbirth. □

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Rural Hospitals' Experience with the National Practitioner Data Bank

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ABSTRACT

Objectives. This study examined hospital administrators' experiences with the National Practitioner Data Bank.

Methods. One hundred forty-nine rural hospital administrators completed questionnaires assessing their perceptions of the data bank.

Results. Nearly 90% of respondents rated the data bank as an important source of information for credentialing. Three percent indicated it had directly affected privileging decisions; 43% and 34%, respectively, believed the costs exceeded or equaled the benefits. Twenty percent reported changes that could decrease disciplinary action reports to the data bank.

Conclusions. While the National Practitioner Data Bank is an important source of information to rural hospitals, it may affect few credentialing decisions and motivate behavioral changes that could have a paradoxical effect on quality assurance. (*Am J Public Health.* 1997;87: 663–666)

Introduction

Since September 1990, the National Practitioner Data Bank has served as a central repository of information about malpractice payments, licensure disciplinary actions, clinical privileging restrictions by hospitals and other health care entities, and professional membership restrictions.[1] Federal legislation requires hospitals to query the data bank when hiring or granting privileges to a health care provider and when reviewing staff privileges and membership. The purpose of this study was to describe the rural hospitals' experiences with and perceptions of the National Practitioner Data Bank and the effect of those experiences on peer review and credentialing activities.

Methods

Hospital administrators of all short-stay general hospitals in nonmetropolitan counties[2] in Washington, Alaska, Montana, and Idaho were surveyed in early 1994 regarding their experiences with and use of the National Practitioner Data Bank in the prior 2 years. Administrators were mailed the questionnaire up to three times, with phone encouragement to respond. The number of acute hospital beds and type of hospital ownership,[3] along with community population size,[4] were linked to each hospital's survey results. The Department of Agriculture's Rural-Urban Continuum Codes[2] were used to categorize the rural status of each hospital (Table 1). The Bureau of Health Professions provided aggregate data from the National Practitioner Data Bank system itself for study hospitals.

Standard *t* tests, median tests, and chi-square tests were used to compare the responses of hospitals by total number of beds, active medical staff size, type of ownership, rural status, and whether or not the hospital had received an adverse

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