

Baby-Friendly Hospital Practices and Meeting Exclusive Breastfeeding Intention



WHAT'S KNOWN ON THIS SUBJECT: Most mothers in the United States do not meet recommendations for exclusive breastfeeding; however, little is known about how long mothers intend to exclusively breastfeed or how hospital practices affect achieving these intentions.



WHAT THIS STUDY ADDS: Most mothers who want to exclusively breastfeed intend to do so for ≥ 3 months, but the majority are not meeting their intended duration. Mothers are more likely to achieve their intended duration when their infant is not supplemented in the hospital.

abstract

OBJECTIVE: To describe mothers' exclusive breastfeeding intentions and whether Baby-Friendly hospital practices are associated with achieving these intentions.

METHODS: In the 2005–2007 Infant Feeding Practices Study II, women completed a prenatal questionnaire and approximately monthly questionnaires through 12 months. Mothers met their prenatal exclusive breastfeeding intention if their duration after the hospital stay (excluding hospital supplementation) equaled or exceeded their intention. Primary predictor variables included 6 Baby-Friendly hospital practices: breastfeeding within 1 hour of birth, giving only breast milk, rooming in, breastfeeding on demand, no pacifiers, and information on breastfeeding support.

RESULTS: Among women who prenatally intended to exclusively breastfeed ($n = 1457$), more than 85% intended to do so for 3 months or more; however, only 32.4% of mothers achieved their intended exclusive breastfeeding duration. Mothers who were married and multiparous were more likely to achieve their exclusive breastfeeding intention, whereas mothers who were obese, smoked, or had longer intended exclusive breastfeeding duration were less likely to meet their intention. Beginning breastfeeding within 1 hour of birth and not being given supplemental feedings or pacifiers were associated with achieving exclusive breastfeeding intention. After adjustment for all other hospital practices, only not receiving supplemental feedings remained significant (adjusted odds ratio = 2.3, 95% confidence interval = 1.8, 3.1).

CONCLUSIONS: Two-thirds of mothers who intend to exclusively breastfeed are not meeting their intended duration. Increased Baby-Friendly hospital practices, particularly giving only breast milk in the hospital, may help more mothers achieve their exclusive breastfeeding intentions. *Pediatrics* 2012;130:54–60

AUTHORS: Cria G. Perrine, PhD, Kelley S. Scanlon, PhD, RD, Ruowei Li, MD, PhD, Erika Odom, PhD, and Laurence M. Grummer-Strawn, PhD

Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, Georgia

KEY WORDS

exclusive breastfeeding, intention, duration, Baby-Friendly Hospital Initiative

ABBREVIATIONS

aOR—adjusted odds ratio

CI—confidence interval

IFPS II—Infant Feeding Practices Study II

WIC—Special Supplemental Nutrition Program for Women, Infants, and Children

All authors had technical input on the analytic design and contributed to and approved the final manuscript. Dr Perrine conducted the analysis and drafted the manuscript.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

www.pediatrics.org/cgi/doi/10.1542/peds.2011-3633

doi:10.1542/peds.2011-3633

Accepted for publication Feb 28, 2012

Address correspondence to Cria G. Perrine, PhD, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, 4770 Buford Hwy NE, Mailstop K-25, Atlanta, GA 30341. E-mail: cperrine@cdc.gov

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2012 by the American Academy of Pediatrics

FINANCIAL DISCLOSURE: *The authors have indicated they have no financial relationships relevant to this article to disclose.*

FUNDING: No external funding.

Breast milk is the best source of nutrition for young children and provides both short- and long-term health benefits.^{1,2} Infants who are breastfed are less likely to experience a variety of infections and to develop chronic conditions later in life.³ Breastfeeding also provides environmental, economic, and maternal health benefits.⁴ The World Health Organization and American Academy of Pediatrics recommend that mothers breastfeed exclusively (only breast milk and medications or micronutrient supplements, but no other liquids or solids) for about the first 6 months of their infant's life.^{1,2} In the United States, breastfeeding initiation rates have been increasing over the past several decades,⁵ such that 75% of infants born in 2008 were ever breastfed. However, only 35% of infants were exclusively breastfed for 3 months and only 15% were exclusively breastfed for the recommended 6 months.⁶

Breastfeeding intention is a strong predictor of infant feeding outcomes. Multiple studies have documented that women who prenatally intend to breastfeed are more likely to initiate and to continue breastfeeding.^{7–10} In the United States, ~80% of women intend to breastfeed¹¹; however, less is known about intended duration. It is unclear whether the low prevalence of continued exclusive breastfeeding is because women do not intend to exclusively breastfeed for the recommended 6 months, or because other factors interfere with them meeting their intended duration of exclusive breastfeeding.

In 1991, the World Health Organization and the United Nations Children's Fund developed the Baby-Friendly Hospital Initiative, which outlines 10 steps hospitals should implement to support breastfeeding.¹² Several studies have demonstrated that implementation of Baby-Friendly maternity care practices is associated with increased rates of exclusive breastfeeding.^{13,14}

To our knowledge, only 1 study in the United States has examined whether Baby-Friendly hospital practices are associated with a mother's achievement of her own exclusive breastfeeding intention. Declercq et al¹⁵ used data from the Listening to Mothers II survey, which interviewed mothers at, on average, 7 months postpartum, and asked retrospectively about exclusive breastfeeding intention and exclusive breastfeeding at 1 week postpartum. They found that ~60% of women intended to exclusively breastfeed (no data were available on intended duration of exclusive breastfeeding), with only half meeting this intention at 1 week. Experiencing 6 to 7 Baby-Friendly hospital practices was associated with a sixfold increase in achieving exclusive breastfeeding intention at 1 week among primiparous women, and a twofold increase among multiparous women, compared with women who experienced none or 1 of the steps.¹⁵

Our objectives were to describe prenatal exclusive breastfeeding intention, including intended duration, and the association of Baby-Friendly hospital practices with achievement of these intentions. This analysis builds on the findings by Declercq et al,¹⁵ as exclusive breastfeeding intentions were asked before women gave birth, and we were able to assess whether women met their own intended duration of exclusive breastfeeding.

METHODS

Study Sample

We analyzed data from the Infant Feeding Practices Study II (IFPS II), a longitudinal survey of US mothers of healthy singletons, which was conducted from 2005 through 2007 by the Food and Drug Administration in collaboration with the Centers for Disease Control and Prevention. Women were recruited in their third trimester of pregnancy through a consumer-opinion mail panel. Eligibility

criteria included that the mother be at least 18 years old, the mother and infant be without medical conditions that would affect feeding, and the infant be born after at least 35 weeks of gestation and weigh at least 5 lb. Each IFPS II participant was mailed 1 prenatal and 10 postnatal questionnaires at approximately monthly intervals that asked about various infant-feeding and care practices. Extensive details of the IFPS II methodology and sample have been published previously.¹⁶ Although the IFPS II sample included women from around the country with varying sociodemographic backgrounds, 84% of the sample was white, compared with 72% nationally in 2010.¹⁷ Further, women who participated in IFPS II were more likely to be employed, older, and of higher education compared with US mothers of infants born in 1998–2000.¹⁶

Exclusive Breastfeeding Intention and Achieved Intention

As a part of the prenatal questionnaire, women were asked, "What method do you plan to use to feed your new baby in the first few weeks?" Our classification of women who intended to exclusively breastfeed refers to those who answered "breastfeed only" to this question; other response options were "formula-feed only," "both breast and formula feed," or "don't know yet." Women who intended to exclusively breastfeed were further asked "How old do you think your baby will be when you first feed him or her formula or any other food besides breast milk?" We used this question to categorize intended duration of exclusive breastfeeding (<1 mo, 1–2 mo, 3–4 mo, 5–6 mo, ≥7 mo).

The neonatal questionnaire asked mothers about experiences and infant-feeding practices during their hospital stay. We assessed exclusive breastfeeding during the hospital stay determined both by how mothers reported they were feeding their infants when they left the

hospital and by whether they reported the hospital giving any formula, water, or glucose water to their infants. Each of the postnatal surveys (administered at approximately 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.5, 9.0, 10.5, and 12.0 months) included a food-frequency chart that referred to an infant's intake within the preceding 7 days. Infants were considered to be exclusively breastfeeding at each survey time point that they received only breast milk but no other food or liquid. Exclusive breastfeeding duration was estimated as the midpoint of infant age between the last time the mother indicated exclusive breastfeeding and the first time she indicated she was not exclusively breastfeeding. As we were interested in looking at the effect of maternity care practices, including hospital supplementation, on achieved exclusive breastfeeding intention, our calculation of exclusive breastfeeding duration included only how the mother said she was feeding her baby when she left the hospital and did not include hospital supplementation. For example, a mother may have reported that her infant received formula or water in the hospital, but that she was exclusively breastfeeding when she left the hospital and continued to do so for 4 months; we classified this as an exclusive breastfeeding duration of 4 months. A mother was categorized as having met her prenatal exclusive breastfeeding intention if her achieved duration was greater than or equal to her intended duration.

Predictor Variables

The main predictor variables were factors consistent with 6 of the 10 Baby-Friendly hospital practices. These included mothers initiating breastfeeding within 1 hour of birth (step 4), the hospital giving no food or drink other than breast milk unless medically indicated (step 6), rooming in (step 7), breastfeeding on demand (step 8), giving no pacifiers (step 9), and providing

mothers with information on breastfeeding support (step 10). These data were based on mothers' self-report and were collected on the first postnatal questionnaire at ~1 month after delivery; data were not available on whether the hospitals where mothers delivered were designated Baby-Friendly. More details on the questions used to represent these steps are available from DiGirolamo et al.¹⁸ Indicators of the other 4 Baby-Friendly practices were not available in the IFPS II survey. As all of the infants in IFPS II were healthy, we assumed no supplementation was medically necessary. Covariates included maternal age, race/ethnicity, poverty-to-income ratio, education, prepregnancy BMI, parity, smoking status, participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), cesarean delivery, marital status, and intended duration of exclusive breastfeeding.

Statistical Analysis and Sample

Prenatal and neonatal questionnaires, including prenatal feeding intention, were available for 3006 women. Of these, 59.6% ($n = 1792$) intended to exclusively breastfeed, 13.3% ($n = 401$) intended to exclusively formula feed, 23.5% ($n = 706$) intended to both breast and formula feed, and 3.6% ($n = 107$) were unsure of their infant-feeding plans. All further exclusions and analyses were conducted only among women who intended to exclusively breastfeed ($n = 1792$). Not all mothers in the IFPS II sample completed all questionnaires; 96 mothers indicated they were still exclusively breastfeeding on the last questionnaire that they completed. Sixteen of these had achieved their exclusive breastfeeding intention by this time and were included in the analysis, whereas 80 had to be excluded, as we could not assess whether they had met their exclusive breastfeeding intention. Mothers were additionally excluded

from the analysis if they were missing data on feeding method when leaving the hospital ($n = 7$), on experience of Baby-Friendly hospital practices ($n = 126$), or on covariates ($n = 158$). Mothers may have had missing data on more than 1 variable, giving a final analytic sample of 1457. Mothers who intended to exclusively breastfeed and were excluded from the analysis for missing data were more likely to be multiparous and less likely to participate in WIC compared with mothers who were included in the analysis; other characteristics were similar among the groups.

SAS 9.2 (SAS Institute, Inc, Cary, NC) was used for all analyses. We used logistic regression to describe maternal characteristics associated with meeting exclusive breastfeeding intention, and to assess the association of Baby-Friendly hospital practices with achieving exclusive breastfeeding intention. Adjusting for covariates, we modeled each hospital practice separately, as well as all together, in a fully adjusted model. Previous research suggests this association may vary by parity.¹⁵ In the fully adjusted model, a chunk test of all 2-way interactions between hospital practices and parity was done using the log likelihood method.¹⁹ Overall, these interaction terms were not significant ($P < .05$), so the interaction terms were dropped. We also calculated the percentage of mothers achieving their exclusive breastfeeding intention by the number of Baby-Friendly hospital practices experienced, and modeled the number of practices experienced on achieving intention, adjusting for covariates.

RESULTS

The majority of women in the sample were 25 to 34 years old, white, married, and had some education beyond high school (Table 1). Approximately half were overweight or obese and one-third were participating in WIC. Experience of Baby-Friendly maternity care practices ranged

from 46.9%, for pacifiers not being given, to 72.8% receiving information on breastfeeding support.

More than 85.0% of mothers intended to exclusively breastfeed for at least 3 months, whereas 57.8% intended to exclusively breastfeed for at least 5 months (Table 2). Regarding achieved duration of exclusive breastfeeding, 45.3% of mothers exclusively breastfed for at least 3 months, and 24.9% exclusively breastfed for at least 5 months. Only 1.1% of mothers intended to exclusively breastfeed for less than 1 month, yet this is how long 41.6% exclusively

breastfed. Overall, 32.4% of mothers in our sample met their own exclusive breastfeeding intention after the hospital stay.

In adjusted analyses, mothers who were married and multiparous were more likely to meet their exclusive breastfeeding intention, whereas those who were obese, smoked, and had longer intended durations were less likely to meet their intention (Table 3). In analyses adjusting for maternal characteristics, breastfeeding initiation within 1 hour of birth (adjusted odds ratio [aOR] = 1.4; 95% confidence interval [CI] 1.1, 1.9), no food or drink other than breast milk being given to the infant (aOR = 2.5; 95% CI 1.9, 3.2), and no pacifiers given (aOR = 1.3; 95% CI 1.1, 3.1) were associated with achieving exclusive breastfeeding intention (Table 4); rooming in was borderline significant (aOR = 1.2; 95% CI 1.0, 1.6). When adjusting for all other hospital practices in addition to maternal characteristics, only receiving no food or drink other than breast milk remained significant (aOR = 2.3; 95% CI 1.8, 3.1). Based solely on how mothers reported they were feeding their babies, 84.6% of mothers said they were exclusively breastfeeding when they left the hospital; however, using a more strict definition that did not allow for any supplementation while in the hospital, only 59.9% of mothers were truly exclusively breastfeeding in the hospital (data not shown).

The percentage of women who met their own exclusive breastfeeding intention

after the hospital stay increased by number of Baby-Friendly hospital practices experienced (Table 5), from 23.4% who experienced 0 to 1 practice to 46.9% who experienced 6 practices. In adjusted analyses, mothers experiencing 6 hospital practices had 2.7 times the odds of achieving their exclusive breastfeeding intention compared with women experiencing 0 to 1 practice.

DISCUSSION

Whether asked retrospectively or prenatally, ~60% of mothers in both the Listening to Mothers II and the IFPS II surveys, respectively, reported that they intended to exclusively breastfeed. In addition, we found that most mothers who plan to exclusively breastfeed intend to do so for at least 3 months, with more than half intending to do so for longer. Despite these intentions, many mothers stop exclusively breastfeeding within a few weeks.

All of the women in this study intended to exclusively breastfeed, yet on leaving the hospital, 15% had already given up exclusively breastfeeding their infant, highlighting the importance of the first few days postpartum for establishing exclusive breastfeeding. The primary hospital practice associated with women not achieving their exclusive breastfeeding intention was infants receiving non-breast milk feedings, which is consistent with the findings of Declercq et al.¹⁵ Despite all of the mothers in this analysis intending to exclusively

TABLE 1 Sample Characteristics of Women Who Intended To Exclusively Breastfeed, IFPS II, 2005–2007 (*n* = 1457)

Maternal age, y	
18–24	18.5
25–29	36.9
30–34	28.6
≥35	16.1
Race/ethnicity	
White	88.2
Black	2.9
Hispanic	4.5
Asian/Pacific Islander/Other	4.4
Poverty-to-income ratio	
<185%	35.9
185%–349%	38.5
350%	25.6
Maternal education	
≤ High school	15.3
1–3 y college	39.3
≥ College graduate	45.4
Prepregnancy BMI (kg/m ²)	
<18.5	4.9
18.5–24.9	47.9
25.0–29.9	25.1
≥30	22.1
Primiparous	31.3
Smoker	5.6
WIC participation	32.1
Cesarean delivery	26.1
Married	83.5
Baby-Friendly Hospital Initiative steps	
Breastfeeding initiation within 1 h (step 4)	62.6
No food/drink other than breast milk (step 6)	60.3
Rooming in (step 7)	57.8
Breastfeeding on demand (step 8)	57.0
No pacifiers given (step 9)	46.9
Provide information on breastfeeding support (step 10)	72.8

TABLE 2 Among Women Who Intended To Exclusively Breastfeed, Intended Duration of Exclusive Breastfeeding and Achieved Duration of Exclusive Breastfeeding, and Percentage Who Met Goal, IFPS II, 2005–2007 (*n* = 1457)

Intended Duration, mo	%	Achieved Duration					Met Goal, %
		<1 mo	1–2 mo	3–4 mo	5–6 mo	≥ 7 mo	
<1	1.1	93.8	6.3	0.0	0.0	0.0	100.0
1–2	11.9	61.3	23.1	11.0	4.6	0.0	38.7
3–4	29.2	47.7	15.3	22.5	14.1	0.5	37.1
5–6	40.6	33.1	10.3	22.5	30.4	3.7	34.1
≥7	17.2	34.4	9.6	19.6	24.8	11.6	11.6
Total	100.0	41.6	13.1	20.4	21.3	3.6	32.4

TABLE 3 Odds of Achieving Exclusive Breastfeeding Intention by Sociodemographic Factors, IFPS II, 2005–2007 (*n* = 1457)

	<i>n</i>	% Met Goal	aOR ^a	95% CI
Maternal age, y				
18–24	269	18.6	1.0	—
25–29	538	34.0	1.5	1.0, 2.3
30–34	416	36.3	1.4	0.9, 2.3
≥35	234	37.6	1.7	1.0, 2.8
Race/ethnicity				
White	1285	34.2	1.0	—
Black	42	9.5	0.4	0.1, 1.2
Hispanic	66	19.7	0.5	0.3, 1.0
Asian/Pacific Islander/Other	64	25.0	0.6	0.3, 1.2
Poverty-to-income ratio				
<185%	523	30.8	1.0	—
185% to 349%	561	34.8	0.8	0.6, 1.1
350%	373	31.1	0.7	0.5, 1.0
Maternal education				
≤ High school	223	25.1	1.0	—
1–3 y college	573	27.4	1.0	0.6, 1.4
≥ College graduate	661	39.2	1.5	1.0, 2.3
Prepregnancy BMI (kg/m ²)				
<18.5	71	40.9	1.1	0.6, 2.0
18.5–24.9	698	35.1	1.0	—
25.0–29.9	366	32.2	0.8	0.6, 1.1
≥30	322	24.8	0.6	0.4, 0.8
Primiparous				
Yes	456	18.6	1.0	—
No	1001	38.7	1.9	1.4, 2.7
Smoker				
Yes	81	16.1	0.5	0.2, 0.9
No	1376	36.6	1.0	—
WIC participation				
Yes	467	23.6	0.7	0.5, 1.0
No	990	36.6	1.0	—
Cesarean delivery				
Yes	380	27.6	0.9	0.7, 1.3
No	1077	34.1	1.0	—
Married				
Yes	1216	35.7	1.7	1.1, 2.6
No	241	15.8	1.0	—
Intended duration of exclusive breastfeeding, mo				
<1–2	189	43.9	1.0	—
3–4	426	37.1	0.6	0.4, 0.9
5–6	592	34.1	0.5	0.3, 0.7
≥7	250	11.6	0.1	0.1, 0.2

^a aOR model adjusted for all other variables in the table and all Baby-Friendly hospital practices.

breastfeed, and very few of their infants likely to have a medical need for supplementation, 40% reported that their infant received supplemental feedings in the hospital, which is inconsistent with best practices in maternal care. Hospital supplementation of breastfeeding infants is associated with delayed onset of lactation, suboptimal breastfeeding practices, perceived problems with breastfeeding during the hospital stay,

and shorter durations of exclusive breastfeeding.^{20–22} Yet hospital supplementation of breastfeeding infants is common; a recent report showed that 78% of US hospitals are routinely supplementing healthy breastfeeding infants.²³

There appeared to be a dose-response relationship between number of hospital practices experienced and achieving exclusive breastfeeding intention; however,

much of this association may have been driven by hospital supplementation. The overall OR for experiencing 6 steps versus 0 to 1 was 2.7, which is only slightly higher than the independent effect of hospital supplementation (aOR = 2.3). To explore this further, we calculated the odds of achieving exclusive breastfeeding intention by number of Baby-Friendly hospital practices experienced, excluding hospital supplementation. Those who experienced 5 practices had twice the odds of achieving their exclusive breastfeeding intentions compared with those who experienced 0 to 1 practice (aOR = 2.0; 95% CI 1.2, 3.3); after further adjusting for hospital supplementation, this relationship was no longer significant (aOR = 1.4; 95% CI 0.8, 2.3).

In this analysis, there was a substantial gap between exclusive breastfeeding intention and exclusive breastfeeding duration, with only 32.4% of women surveyed achieving their exclusive breastfeeding intention. Women who smoked, were obese, unmarried, or giving birth for the first time were less likely to exclusively breastfeed as long as they planned. These findings are not surprising, as all of these characteristics have been associated with shorter durations of breastfeeding.^{24–26} Although hospital practices that support breastfeeding are certainly important, they alone are not sufficient for ensuring women achieve their breastfeeding intentions. Even among women experiencing 6 Baby-Friendly hospital practices, fewer than half exclusively breastfed as long as they intended. For mothers to achieve their breastfeeding intentions, they likely will need support from multiple entities, including health care providers, communities, families, and employers.⁴ Returning to work and poor workplace support are known to be associated with shorter durations of breastfeeding,²⁷ and may be associated with women not achieving their breastfeeding intentions. We did not

TABLE 4 Odds of Achieving Exclusive Breastfeeding Intention According To Reported Experience of Baby-Friendly Hospital Practices, IFPS II, 2005–2007

	<i>n</i> = 1457					
	<i>n</i>	% Met Goal	Model 1 aOR	95% CI	Model 2 aOR	95% CI
Breastfeeding initiation within 1 h (step 4)						
Yes	912	36.5	1.4	1.1, 1.9	1.3	0.9, 1.7
No	545	25.5	1.0	—	1.0	—
No food/drink other than breast milk (step 6)						
Yes	878	39.8	2.5	1.9, 3.2	2.3	1.8, 3.1
No	579	21.2	1.0	—	1.0	—
Rooming in (step 7)						
Yes	842	32.4	1.2	1.0, 1.6	1.1	0.8, 1.4
No	615	32.4	1.0	—	1.0	—
Breastfeeding on demand (step 8)						
Yes	831	34.4	1.1	0.9, 1.4	0.9	0.7, 1.2
No	626	29.7	1.0	—	1.0	—
No pacifiers given (step 9)						
Yes	683	35.1	1.3	1.1, 1.7	1.2	0.9, 1.5
No	774	30.0	1.0	—	1.0	—
Information on breastfeeding support (step 10)						
Yes	1061	33.8	1.2	0.9, 1.6	1.2	0.9, 1.6
No	396	28.5	1.0	—	1.0	—

Model 1 adjusted for maternal age, race/ethnicity, poverty-to-income ratio, education, prepregnancy weight status, parity, smoking status, WIC participation, cesarean delivery, marital status, and intended duration of exclusive breastfeeding. Model 2 adjusted for the same factors as Model 1, plus all other hospital factors.

have sufficient data to examine these factors; however, more than half of the mothers in our analysis had stopped exclusively breastfeeding by 2 months, which is before many women return to work. Future analyses may need to explore how returning to work and other environmental supports in the early postpartum period are associated with

TABLE 5 Odds of Achieving Exclusive Breastfeeding Intention by Number of Baby-Friendly Hospital Practices Experienced, IFPS II, 2005–2007 (*n* = 1457)

No. Steps Experienced	% Met Goal ^a	aOR ^b	95% CI
0–1	23.4	1.0	—
2	26.0	0.9	0.5, 1.6
3	26.6	1.1	0.7, 1.8
4	32.7	1.5	0.9, 2.5
5	40.6	2.1	1.3, 3.5
6	46.9	2.7	1.5, 4.8

^a Cochran-Armitage trend test $P < .0001$ for percentage who met goal.

^b aOR adjusted for maternal age, race/ethnicity, poverty-to-income ratio, education, prepregnancy weight status, parity, smoking status, WIC participation, Cesarean delivery, marital status, and intended duration of exclusive breastfeeding.

women achieving their exclusive breastfeeding intentions.

This study has several limitations and strengths. First, the mothers included in the IFPS II survey were drawn from a consumer opinion mail panel and are not nationally representative; however, it was not practical or economically feasible to randomly select a large sample of women in the third trimester of pregnancy, and IFPS II is the largest longitudinal study on infant feeding in the United States. Second, we had to exclude mothers from the analysis who were missing data or who were still exclusively breastfeeding at the time they completed their last questionnaire if they had not yet reached their intended duration. Exclusion of these mothers may have introduced some bias into our analysis. We conducted a sensitivity analysis to assess how our estimates of meeting intention may have changed if data on exclusive breastfeeding duration were available from those mothers still exclusively breastfeeding at the time they completed

their last questionnaire; if none of these mothers had met their intention, 30.1% overall would have met their exclusive breastfeeding intention, whereas if all of these mothers had met their intention, 35.3% overall would have met their exclusive breastfeeding intention. In addition, exclusive breastfeeding duration was calculated based on the midpoint between when mothers reported exclusive breastfeeding and not exclusive breastfeeding, which may have led to some misclassification bias. Third, our estimates of hospital practices and infant feeding were based on maternal report. There may be some bias in maternal recall of hospital practices either because mothers inaccurately remembered certain practices, or because they were unaware of practices occurring when their infant was not with them. As we collected data at ~1 month after birth and monthly thereafter, the period of recall was short for all indicators, which may have helped limit some recall bias. In addition, prospective collection of 7-day recalls of infant feeding have been shown to accurately reflect exclusive breastfeeding duration.²⁸ Fourth, as all infants in IFPS II had to have been born after at least 35 weeks, weigh at least 5 lb, and not have a medical condition that could affect feeding, we assumed that no infants would require formula in the hospital; however, mothers delivering late preterm infants (in our sample, those 35 to <37 weeks) may have delayed lactogenesis, and late preterm infants may have trouble latching and suckling.²⁹ We repeated our analyses excluding all late preterm infants ($n = 61$), and our findings did not change. Finally, we dichotomized achieving exclusive breastfeeding intention into those who met and those who did not meet their goal. It may be that differences exist among those who did not meet their goal and fell far short and those who did not meet their goal but were close. Further analyses may need to explore these distinctions.

CONCLUSIONS

Ideally, all women who intend to exclusively breastfeed would be supported to achieve their goals. The hospital stay, although often only 2 days,

is a critical time for mothers to establish exclusive breastfeeding, and experiences there affect whether mothers exclusively breastfeed as long as they would like to after leaving the hospital.

Increased implementation of Baby-Friendly hospital practices, especially giving only breast milk in the hospital, may help more mothers achieve their exclusive breastfeeding intentions.

REFERENCES

1. Gartner LM, Morton J, Lawrence RA, et al; American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics*. 2005;115(2):496–506
2. World Health Organization. *Global Strategy for Infant and Young Child Feeding*. Geneva, Switzerland: World Health Organization; 2003
3. Ip S, Chung M, Raman G, Chew P, Magula N, DeVine D., et al. *Breastfeeding and Maternal and Infant Health Outcomes in Developed Countries*. Rockville, MD: Agency for Healthcare Research and Quality; 2007
4. US Department of Health and Human Services. *The Surgeon General's Call to Action to Support Breastfeeding*. Washington, DC: US Department of Health and Human Services, Office of the Surgeon General; 2011
5. Grummer-Strawn LM, Shealy KR. Progress in protecting, promoting, and supporting breastfeeding: 1984–2009. *Breastfeed Med*. 2009;4(suppl 1):S31–S39
6. Centers for Disease Control and Prevention. Breastfeeding among US children born 1999–2007, CDC National Immunization Survey. Available at: www.cdc.gov/breastfeeding/data/NIS_data/index.htm. Accessed March 14, 2011
7. Donath SM, Amir LH; ALSPAC Study Team. Relationship between prenatal infant feeding intention and initiation and duration of breastfeeding: a cohort study. *Acta Paediatr*. 2003;92(3):352–356
8. Bai Y, Middlestadt SE, Peng CY, Fly AD. Predictors of continuation of exclusive breastfeeding for the first six months of life. *J Hum Lact*. 2010;26(1):26–34
9. Heath AL, Tuttle CR, Simons MS, Cleghorn CL, Parnell WR. A longitudinal study of breastfeeding and weaning practices during the first year of life in Dunedin, New Zealand. *J Am Diet Assoc*. 2002;102(7):937–943
10. Ahluwalia IB, Morrow B, Hsia J. Why do women stop breastfeeding? Findings from the Pregnancy Risk Assessment and Monitoring System. *Pediatrics*. 2005;116(6):1408–1412
11. Declercq ER, Sakala C, Corry M, Applebaum S. *Listening to Mothers II: Report of the Second National US Survey of Women's Childbearing Experiences*. New York, NY: Childbirth Connection; 2006
12. World Health Organization. UNICEF. *Baby Friendly Hospital Initiative: Revised, Updated and Expanded for Integrated Care*. Geneva, Switzerland: World Health Organization and UNICEF; 2009
13. Merten S, Dratva J, Ackermann-Liebrich U. Do baby-friendly hospitals influence breastfeeding duration on a national level? *Pediatrics*. 2005;116(5). Available at: www.pediatrics.org/cgi/content/full/116/5/e702
14. Braun ML, Giugliani ER, Soares ME, Giugliani C, de Oliveira AP, Danelon CM. Evaluation of the impact of the baby-friendly hospital initiative on rates of breastfeeding. *Am J Public Health*. 2003;93(8):1277–1279
15. Declercq E, Labbok MH, Sakala C, O'Hara M. Hospital practices and women's likelihood of fulfilling their intention to exclusively breastfeed. *Am J Public Health*. 2009;99(5):929–935
16. Fein SB, Labiner-Wolfe J, Shealy KR, Li R, Chen J, Grummer-Strawn LM. Infant Feeding Practices Study II: study methods. *Pediatrics*. 2008;122(suppl 2):S28–S35
17. Humes KR, Jones NA, Ramirez RR. *Overview of Race and Hispanic Origin: 2010*. Washington, DC: US Census Bureau; 2011
18. DiGirolamo AM, Grummer-Strawn LM, Fein SB. Effect of maternity-care practices on breastfeeding. *Pediatrics*. 2008;122(suppl 2):S43–S49
19. Kleinbarum DG, Klein M. *Logistic Regression: A Self-Learning Text*. 2nd ed. New York, NY: Springer; 2002
20. Dewey KG, Nommsen-Rivers LA, Heinig MJ, Cohen RJ. Risk factors for suboptimal infant breastfeeding behavior, delayed onset of lactation, and excess neonatal weight loss. *Pediatrics*. 2003;112(3 pt 1):607–619
21. Alikasifoğlu M, Erginoz E, Gur ET, Baltas Z, Beker B, Arvas A. Factors influencing the duration of exclusive breastfeeding in a group of Turkish women. *J Hum Lact*. 2001;17(3):220–226
22. Semenic S, Loiselle C, Gottlieb L. Predictors of the duration of exclusive breastfeeding among first-time mothers. *Res Nurs Health*. 2008;31(5):428–441
23. Centers for Disease Control and Prevention (CDC). Vital signs: hospital practices to support breastfeeding—United States, 2007 and 2009. *MMWR Morb Mortal Wkly Rep*. 2011;60(30):1020–1025
24. Rasmussen KM. Association of maternal obesity before conception with poor lactation performance. *Annu Rev Nutr*. 2007;27:103–121
25. Donath SM, Amir LH; ALSPAC Study Team. The relationship between maternal smoking and breastfeeding duration after adjustment for maternal infant feeding intention. *Acta Paediatr*. 2004;93(11):1514–1518
26. Li R, Fein SB, Chen J, Grummer-Strawn LM. Why mothers stop breastfeeding: mothers' self-reported reasons for stopping during the first year. *Pediatrics*. 2008;122(suppl 2):S69–S76
27. Fein SB, Roe B. The effect of work status on initiation and duration of breast-feeding. *Am J Public Health*. 1998;88(7):1042–1046
28. Bland RM, Rollins NC, Solarsh G, Van den Broeck J, Coovadia HM; Child Health Group. Maternal recall of exclusive breast feeding duration. *Arch Dis Child*. 2003;88(9):778–783
29. Meier PP, Furman LM, Degenhardt M. Increased lactation risk for late preterm infants and mothers: evidence and management strategies to protect breastfeeding. *J Midwifery Womens Health*. 2007;52(6):579–587

Baby-Friendly Hospital Practices and Meeting Exclusive Breastfeeding Intention

Cria G. Perrine, Kelley S. Scanlon, Ruowei Li, Erika Odom and Laurence M.

Grummer-Strawn

Pediatrics 2012;130;54; originally published online June 4, 2012;

DOI: 10.1542/peds.2011-3633

Updated Information & Services	including high resolution figures, can be found at: /content/130/1/54.full.html
References	This article cites 21 articles, 10 of which can be accessed free at: /content/130/1/54.full.html#ref-list-1
Citations	This article has been cited by 30 HighWire-hosted articles: /content/130/1/54.full.html#related-urls
Post-Publication Peer Reviews (P³Rs)	2 P ³ Rs have been posted to this article /cgi/eletters/130/1/54
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): Nutrition /cgi/collection/nutrition_sub Breastfeeding /cgi/collection/breastfeeding_sub
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: /site/misc/Permissions.xhtml
Reprints	Information about ordering reprints can be found online: /site/misc/reprints.xhtml

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2012 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Baby-Friendly Hospital Practices and Meeting Exclusive Breastfeeding Intention

Cria G. Perrine, Kelley S. Scanlon, Ruowei Li, Erika Odom and Laurence M. Grummer-Strawn

Pediatrics 2012;130;54; originally published online June 4, 2012;
DOI: 10.1542/peds.2011-3633

The online version of this article, along with updated information and services, is located on the World Wide Web at:
</content/130/1/54.full.html>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2012 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

