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Breastfeeding Outcome Comparison by Parity

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Abstract

Objective: Anecdotally, breastfeeding experiences differ between those who have previously nursed an infant and those who are primiparous. This analysis contrasted breastfeeding outcomes between primiparous women and those with previous experience spanning from maternity stay through 6 months postpartum.
Study Design: A secondary analysis was conducted of data collected in a randomized, controlled trial with mothers and ''well'' newborns ≥34 weeks of gestation comparing two post–hospital discharge care models. Mothers completed an in-person interview during the postpartum stay and phone surveys at 2 weeks, 2 months, and 6 months where questionnaires related to breastfeeding were completed. All participants intended to breastfeed. Chi-squared and Wilcoxon rank sum tests were used to test for differences between parity groups. Breastfeeding duration by parity group was compared using a Kaplan–Meier plot and a logrank test. A Cox proportional hazards model was used to evaluate the relationship between breastfeeding duration and parity after adjusting for covariates.
Results: Among 1,099 mothers available for analysis, 542 (49%) were primiparous. Multiparous mothers had a longer intended breastfeeding duration (median, 9 vs. 6 months; $p<0.001$). Following delivery, primiparous mothers had a longer median time to first breastfeeding attempt (119 vs. 96 minutes; $p<0.001$) and were more likely to have eight or fewer feeding attempts in the first 24 hours (33% vs. 44%; $p<0.001$)). More primiparous women reported early breastfeeding problems (35% vs. 20%; $p<0.001$) and mixed feeding at hospital discharge (39% vs. 23%; $p<0.001$) despite reporting less breastfeeding-associated pain during the first week ($p=0.04$). Multiparous women were more likely to breastfeed through 6 months ($p<0.001$). In a multivariable Cox model for breastfeeding duration, an interaction existed between intended breastfeeding duration and parity ($p=0.006$); among those intending to breastfeed for 12 months, multiparous mothers had a significantly lower hazard of stopping breastfeeding (hazard ratio = 0.66; $p=0.03$) than primiparous mothers.
Conclusions: Women who have breastfed previously have significantly different breastfeeding experiences than primiparous women. Pre- and postdelivery breastfeeding support should differentially target primiparous women to improve breastfeeding outcomes.

Introduction

Previous research on the variation in breastfeeding experiences between primiparous and multiparous mothers has been limited. Differences in breastfeeding initiation have been observed by parity, with multiparous mothers more likely to initiate breastfeeding, and most studies have reported that multiparous mothers with prior breastfeeding experience have a longer breastfeeding duration compared with primiparous mothers.[1–5]

These previous studies primarily focused on breastfeeding initiation and duration with few details about the experiences and other factors that may influence duration that occur during pregnancy and postpartum. We therefore sought to evaluate differences in breastfeeding experiences between women with prior breastfeeding experience and primiparous women from our prospective cohort of breastfeeding mother–infant dyads followed from birth to 6 months.[6] We hypothesized that primiparous and multiparous mothers would have different breastfeeding expectations and preparations prenatally, as well as differing experiences during their hospital stay and postpartum, each of which could inform future breastfeeding promotion practices.

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This study is registered at http://clinicaltrials.gov with clinical trial registration number NCT00360204.

Subjects and Methods

Participants

Mothers with a singleton or twin pregnancy delivered at the Milton S. Hershey Medical Center in Hershey, PA were screened for participation in The Nurses for Infants Through Teaching and Assessment After the Nursery (NITTANY) Study.[6] This previously described, randomized, controlled trial compared office-based care with an alternative care model using a home nurse visit as the initial postdischarge encounter for well newborns and mothers after their maternity/nursery stay. All maternal participants intended to breastfeed both during their maternity stay and after discharge. Newborns delivered at ≥ 34 weeks of gestational age were eligible. Enrollment occurred from September 12, 2006 through August 1, 2009.

Additional inclusion/exclusion criteria and other details are provided in the study's primary outcome article.[6] For the current secondary data analysis, women delivering twins and multiparous women who did not breastfeed with prior children were also excluded. This study was approved by the Penn State College of Medicine Institutional Review Board prior to the first participant's enrollment.

Data collection and outcome measures

During the maternity/nursery hospital stay, maternal interviews and hospital chart abstractions were conducted for baseline data collection, including demographics, pregnancy and birth history, and selected surveys. Study coordinators blinded to the study groups conducted telephone interviews with mothers enrolled in both groups at approximately 2 weeks, 2 months, and 6 months after childbirth. Data collection for each visit was allowed to occur at later time points because of scheduling conflicts or other reasons.

The primary outcome for this secondary data analysis—breastfeeding duration—was assessed at baseline and at follow-up telephone assessments. Breastfeeding duration, exclusivity, support, pain, maternal self-efficacy, and reasons for breastfeeding cessation were measured using questions adapted from the Infant Feeding Practices Study II Neonatal Questionnaire and Infant Month 2 Questionnaire.[7] Breastfeeding importance was measured using questions derived from the Birth and Beyond Experience study.[8] Breastfeeding data were obtained through self-report from mothers during the follow-up phone interviews. If mothers reported that they had ceased breastfeeding, they were asked to recall the age of the infant in days, weeks, or months when they completely stopped breastfeeding. Breastfeeding duration data were censored at the final study visit (approximately 6 months) or at the last recorded follow-up visit. During the postpartum hospital stay, mothers were also asked about their intended duration of breastfeeding and their rating of the importance of breastfeeding. Data regarding variables previously analyzed in breastfeeding duration studies such as maternal characteristics (age, race, ethnicity, education, marital status, employment, delivery method, smoking during pregnancy) and infant gestational age were gathered during the postpartum hospital stay.[2–4,9]

Statistical analysis

Breastfeeding duration was defined as the time (days) from birth until a mother completely stopped breastfeeding. Mothers who were still breastfeeding at their last follow-up or at the end of study (6 month visit) were censored at that time point. We constructed breastfeeding duration curves by parity group using the method of Kaplan and Meier and tested for a difference between the curves using a logrank test.[10,11]

We used a Cox proportional hazards model to evaluate the relationship between breastfeeding duration and parity after adjusting for the following variables: mother's age, marital status, education, type of health insurance, type of delivery, smoking during pregnancy, infant birth weight (kg), infant gestational age (weeks), planned duration of breastfeeding, importance of breastfeeding, plans for feeding (breastmilk only vs. breastmilk and formula), problems feeding in the hospital, and randomized study group (home nurse visit vs. office-based care).[12] Mother's age, infant birth weight, infant gestational age, and planned duration of breastfeeding were all continuous variables and modeled using linear effects; linearity was deemed appropriate using exploratory plots and splines. For marital status, education, and health insurance, we combined groups in the regression model because of a small sample size for some responses. We assessed all interactions between parity group and the following variables: planned duration of breastfeeding, breastfeeding importance, postpartum feeding plan, and problems with breastfeeding in the hospital. Proportional hazards were verified using tests of Schoenfeld residuals.[13] We used only complete cases (no missing values for any variable) to fit the model. We reported our final model using hazard ratios (HRs) and 95% confidence intervals (CIs) for all effects.

We used chi-squared tests (or Fisher's exact tests) and Wilcoxon rank sum tests, as appropriate, to test for differences between parity groups with respect to demographics, breastfeeding experience in the hospital, breastfeeding difficulties and cessation, and whether mothers met their breastfeeding goals.

A planned comparison of intended versus actual breastfeeding duration was limited by the 6-month follow-up period. We could not completely determine whether mothers who reported that they planned to breastfeed >6 months met their intended goal. Given this limitation, we analyzed groups separately based on a planned duration of <6 months or ≥ 6 months. For the mothers with planned duration <6 months, we were able to completely determine whether mothers met their goal. For mothers with planned duration ≥ 6 months, we could only determine whether mothers were still breastfeeding at 6 months. For both groups, mothers who were censored prior to 6 months and had not yet met their goal were deemed indeterminate and excluded for the comparison.

Results

Demographics

From the original study cohort of 1,154 participating mothers, 15 mothers were excluded because they delivered twins, and 40 multiparous mothers were excluded who had not previously breastfed, leaving a cohort of 1,099 mothers available for this analysis. Among this cohort, 542 were primiparous (49%), and 557 were multiparous (51%).

Table 1 shows mother and infant characteristics for the overall cohort and stratified by parity status. Multiparous women had an older average age (30.6 vs. 27.3 years; $p<0.001$) and were more likely to be married (85% vs. 73%; $p<0.001$). Primiparous women had a higher mean

Table 1. Characteristics of Mothers and Infants Stratified by Parity

Variable	*Total sample* (n = *1,099*)	*Primiparous* (n = *542*)	*Multiparous* (n = *557*)	p *value*
Age [mean (SD)] (years)	29.0 (5.5)	27.3 (5.4)	30.6 (5.0)	< 0.001
Race/ethnicity [number (%)]				0.89
Missing	3	1	2	
White, not Hispanic or Latino	921 (84.0)	461 (85.2)	460 (82.9)	
White, Hispanic or Latino	48 (4.4)	22 (4.1)	26 (4.7)	
Black, not Hispanic or Latino	62 (5.7)	27 (5)	35 (6.3)	
Black, Hispanic or Latino	8 (0.7)	3 (0.6)	5 (0.9)	
Asian	47 (4.3)	23 (4.3)	24 (4.3)	
Other	10 (0.9)	5 (0.9)	5 (0.9)	
Marital status [number (%)]				
Missing	4	1	3	< 0.001
Married	866 (79.1)	397 (73.4)	469 (84.7)	
Not married, living with partner	96 (8.8)	61 (11.3)	35 (6.3)	
Single	125 (11.4)	81 (15.0)	44 (7.9)	
Divorced	4 (0.4)	0 (0.0)	4 (0.7)	
Other	4 (0.4)	2 (0.4)	2 (0.4)	
Education [number (%)]				0.23
Some high school	27 (2.5)	18 (3.3)	9 (1.6)	
High school graduate	161 (14.7)	72 (13.3)	89 (16.1)	
Some college or technical school	267 (24.4)	129 (23.8)	138 (24.9)	
Completed college	413 (37.7)	203 (37.5)	210 (37.9)	
Postgraduate training/degree	227 (20.7)	119 (22.0)	108 (19.5)	
Health insurance [number (%)]				
Missing	11	7	4	
Private	862 (79.2)	429 (80.2)	433 (78.3)	
Medicaid	145 (13.3)	70 (13.1)	75 (13.6)	
Self-pay	9 (0.8)	4 (0.7)	5 (0.9)	
Other	69 (6.3)	29 (5.4)	40 (7.2)	
None	3 (0.3)	3 (0.6)	0 (0)	
Mother smoked during pregnancy [number (%)]				
Missing	2	1	1	
Yes	101 (9.2)	52 (9.6)	49 (8.8)	
No	996 (90.8)	489 (90.4)	507 (91.2)	
Gestational weight gain [mean (SD)] (pounds)	33.1 (14.5)	35.3 (15.0)	30.8 (13.6)	< 0.001
Delivery type (%)				0.010
Vaginal	752 (68.4)	351 (64.8)	401 (72.0)	
Cesarean	347 (31.6)	191 (35.2)	156 (28.0)	
Infant birth weight [mean (SD)] (kg)	3.440 (0.471)	3.398 (0.462)	3.481 (0.476)	0.004
Gestational age [mean (SD)] (weeks)	39.3 (1.2)	39.4 (1.3)	39.1 (1.1)	< 0.001

gestational weight gain (35.3 vs. 30.8 pounds; $p < 0.001$) and were more likely to have an operative delivery (35% vs. 28%; $p = 0.01$).

Breastfeeding difficulties

Summaries of breastfeeding difficulties during the postpartum hospital stay and future breastfeeding expectations are shown stratified by parity group in Table 2. Multiparous mothers had significantly less delay from time of delivery to time of first breastfeeding attempt, and a significantly greater percentage of mothers attempted to breastfeed at least eight times during the first 24 hours following delivery. A majority (78%) of mothers planned to breastfeed exclusively with no difference by parity group. Multiparous mothers had longer median intended breastfeeding duration (9 months vs. 6 months; $p < 0.001$) but did not place a significantly larger importance on breastfeeding.

Primiparous mothers were more likely to report experiencing a breastfeeding problem during the postpartum stay (35% vs. 20%; $p < 0.001$). Among these mothers ($n = 299$), no significant difference was observed between parity groups regarding the seriousness of the problems (mothers self-reported seriousness using a 1–4 point scale) or in the use of bottles, cups, and nipple shields. For the subset of mothers who participated in the phone interview at 2 weeks ($n = 1{,}023$), primiparous mothers were more likely to be supplementing with formula at hospital discharge (39% vs. 23%; $p < 0.001$), and this group had a larger proportion who achieved mature breastmilk volume more than 3 days after delivery (48% vs. 32%; $p < 0.001$). Primiparous mothers reported lower breastfeeding-associated pain scores (scale of 0–10) at 1 week (mean, 4.4 vs. 4.8; $p = 0.04$), but no statistically significant difference was reported during the hospital stay or at 2 weeks.

Table 2. Summary of Breastfeeding Variables Stratified by Parity Groups

	Primiparous (n = *542*)	*Multiparous* (n = *557*)	p *value*
Postpartum feeding plan [*n* (%)]			0.98
Breastmilk only	423 (78.0)	435 (78.1)	
Breastmilk and formula	119 (22.0)	122 (21.9)	
Planned breastfeeding duration [median (IQR)] (months)	6 (6–12)	9 (6–12)	< 0.001
Maternal rating of breastfeeding importance [*n* (%)]			0.27
Somewhat important	38 (7.0)	47 (8.5)	
Very important	249 (45.9)	230 (41.4)	
Extremely important	255 (47.0)	279 (50.2)	
Time to first breastfeeding [median (IQR)] (minutes)	119 (65–218)	96 (46–194)	0.001
Breastfeeding attempts (≥ 8) in first 24 hours [*n* (%)][a]	176 (32.8)	237 (43.5)	< 0.001
Problems feeding in hospital [*n* (%)]	188 (34.8)	111 (19.9)	< 0.001
For mothers with problems ($n = 299$)			
Seriousness of problem (1–4 point scale) [mean (SD)]	2.5 (0.7)	2.6 (0.8)	0.23
Used a nipple shield [*n* (%)]	44 (23.4)	20 (18.0)	0.27
Pumped and fed breast milk in bottle [*n* (%)]	42 (22.3)	20 (18.0)	0.37
Pumped and cup fed [*n* (%)]	11 (5.9)	3 (2.7)	0.21
For mothers ($n = 1{,}023$) who completed the 2-week phone interview	$n = 504$	$n = 519$	
Supplementation with formula at hospital discharge [*n* (%)]	194 (38.6)	118 (22.7)	< 0.001
Achieved mature breastmilk volume after > 3 days [*n* (%)]	238 (47.5)	168 (32.4)	< 0.001
Breastfeeding-associated pain scores (scale 0–10) [mean (SD)]			
For hospital stay	3.3 (2.5)	3.4 (2.6)	0.95
1 week after delivery	4.4 (2.5)	4.8 (2.4)	0.04
2 weeks after delivery	2.6 (2.5)	2.7 (2.6)	0.76

[a]Seventeen mothers had missing value (five primiparous and 12 multiparous).
IQR, interquartile range.

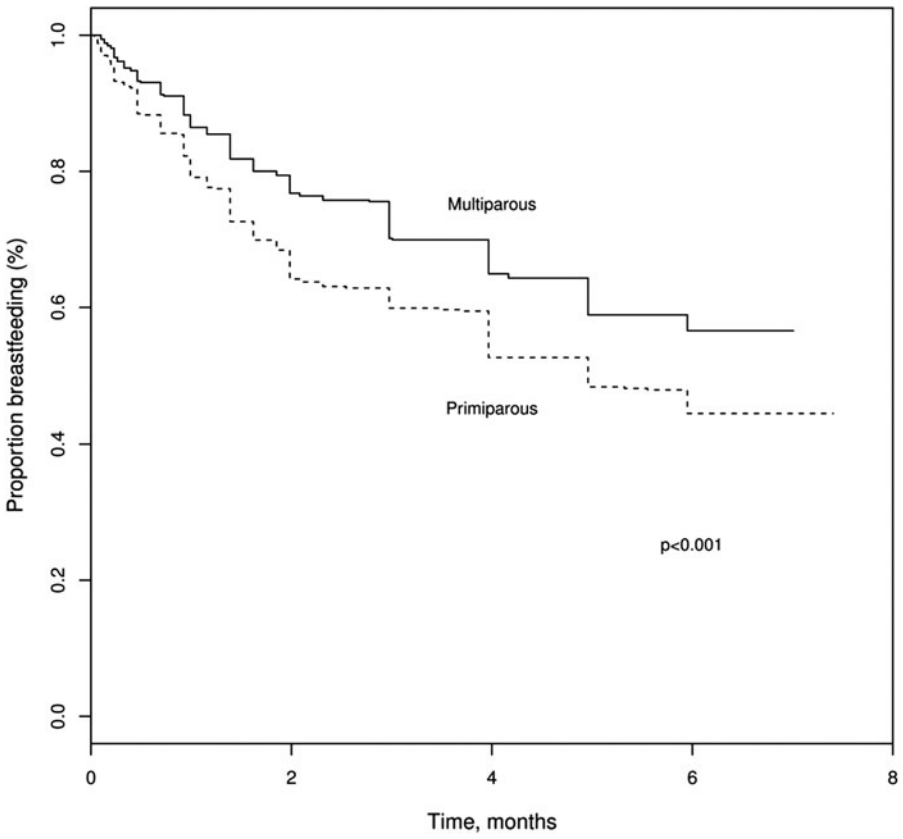

FIG. 1. Kaplan–Meier plot of breastfeeding duration stratified by parity group. Individual breastfeeding rates at the three assessment points were as follows (primiparous vs. multiparous): 2 weeks, 89% versus 93% ($p = 0.008$); 2 months, 64% versus 77% ($p < 0.001$); and 6 months, 44% versus 57% ($p < 0.001$).

Breastfeeding duration

Kaplan–Meier curves of breastfeeding duration by parity group are shown in Figure 1. In total, 550 mothers were censored: 470 at the 6-month visit (85%) and 156 (15%) at earlier time points. Multiparous mothers had a significantly longer breastfeeding duration than primiparous mothers ($p < 0.001$) and had higher rates of breastfeeding at the survey assessment points of 2 weeks (93% vs. 89%; $p = 0.008$), 2 months (77% vs. 64%; $p < 0.001$), and 6 months (57% vs. 44%; $p < 0.001$).

Estimated HRs are shown from the multivariable Cox model for breastfeeding duration in Table 3. In total, 67 patients (6%) were excluded from the model because of a missing value for one of the covariates. An interaction between intended breastfeeding and parity was observed ($p = 0.006$). Given that planned duration of breastfeeding was a continuous variable, we reported HRs for multiparous versus primiparous at specific time points of planned duration (3, 6, 9, and 12 months) in Table 3, although HRs can be calculated for any time point of planned duration. The interaction indicated that the association of parity with breastfeeding duration differed by planned duration of breastfeeding such that multiparous mothers had increasingly lower hazards of stopping breastfeeding (compared with primiparous mothers) as planned duration of breastfeeding increased. For example, multiparous mothers who planned to breastfeed for 6 months had essentially equal hazard of stopping breastfeeding (HR = 1.03; $p = 0.76$) compared with primiparous mothers who also planned to breastfeed for 6 months; however, multiparous mothers who planned to breastfeed for 12 months had significantly lower hazard of stopping breastfeeding (HR = 0.66; $p = 0.03$) than primiparous mothers intending to breastfeed for 12 months. Other factors associated with greater hazard of breastfeeding cessation were less education, unmarried status, lower importance placed on breastfeeding, planned formula use, cesarean delivery, and problems feeding in the hospital.

Breastfeeding cessation

Four hundred seventy-three mothers (43%) stopped breastfeeding at some point during the 6-month study period.

Table 3. Estimated Hazard Ratios from Cox Model for Breastfeeding Duration

Variable	*HR (95% CI)*	p *value*
Mother's age, increase of 5 years	0.92 (0.82–1.02)	0.12
Marital status		
Married (reference)	1	
Not married, living with partner	2.82 (2.06–3.88)	< 0.001
Unattached	1.71 (1.24–2.37)	0.001
Education		
College graduate or postgraduate (reference)	1	
Some college	1.50 (1.17–1.93)	0.001
High school graduate or less	2.23 (1.63–3.05)	< 0.001
Health insurance		
Private (reference)	1	
Other	0.82 (0.62–1.09)	0.17
Delivery		
Vaginal (reference)	1	
Cesarean	1.34 (1.09–1.64)	0.005
Smoking during pregnancy	0.95 (0.70–1.30)	0.76
Newborn birth weight, increase of 5 kg	0.99 (0.88–1.12)	0.90
Gestational age, increase of 1 week	1.01 (0.93–1.10)	0.78
Breastfeeding importance		
Extremely important (reference)	1	
Very important	1.26 (1.02–1.57)	0.001
Somewhat important	1.73 (1.24–2.41)	0.033
Postpartum feeding plan		
Breastfeeding only (reference)	1	
Breastmilk and formula	1.84 (1.48–2.29)	< 0.001
Problems with breastfeeding in the hospital	1.49 (1.22–1.84)	< 0.001
Randomized group		
OBC (reference)	1	
HNV	0.88 (0.73–1.07)	0.19
Interaction between parity group and planned duration of breastfeeding		0.006
Multiparous versus primiparous for planned duration of		
3 months	1.30 (0.99–1.70)	0.06
6 months	1.03 (0.84–1.28)	0.76
9 months	0.83 (0.63–1.07)	0.15
12 months	0.66 (0.45–0.96)	0.031

CI, confidence interval; HNV, home nurse visit; HR, hazard ratio; OBC, office-based care.

Primiparous mothers were more likely to report the following reasons for stopping breastfeeding: ''my baby had trouble sucking and latching on'' (31% vs. 17%; $p = 0.001$); ''I had trouble getting my milk flow to start'' (34% vs. 22%; $p = 0.003$); and ''I didn't have enough milk'' (57% vs. 45%; $p = 0.01$). The last reason was the most common reason given for breastfeeding cessation in each group. Other common reasons included ''breastfeeding was too inconvenient'' (26% in each group), ''I could not or did not want to pump or breastfeed at work'' (primiparous 24% vs. multiparous 25%), and ''I wanted or needed someone else to feed the baby'' (32% in each group).

Breastfeeding intentions and actual breastfeeding duration

For mothers who planned to breastfeed for less than 6 months, 54% (52/96) of multiparous mothers met their goal compared with 41% (42/103) of primiparous mothers ($p = 0.06$). For mothers who planned to breastfeed for at least 6 months, 69% (253/368) of multiparous mothers were still breastfeeding at 6 months compared with 54% (182/337) of primiparous mothers ($p < 0.001$). Overall, 66% of multiparous mothers met their goal or were still breastfeeding at 6 months compared with 51% of primiparous mothers ($p < 0.001$).

Discussion

The results of this analysis demonstrate that women who have breastfed previously have significantly different breastfeeding experiences than primiparous women. Significant differences begin with prenatal intentions and goals and extend through the hospital experience and into the postpartum period. Primiparous women had a shorter intended breastfeeding duration, had a greater delay from delivery to first breastfeeding attempt, were less likely to feed at least eight times in the first 24 hours, and had more breastfeeding problems during their maternity stay. These variables likely contributed to the finding that primiparous women had increased mixed formula and breastmilk feeding at hospital discharge, delayed lactogenesis, and decreased likelihood to reach their intended breastfeeding goal, as well as shorter breastfeeding duration.

Our analysis represents one of the largest sample sizes to evaluate the impact of parity on breastfeeding that was not limited to a particular subset of the population.[2] Prior breastfeeding experience does appear to predict breastfeeding continuation, perhaps by strengthening a mother's breastfeeding intention, determination, and self-efficacy to meet her goal or by providing a more realistic understanding of her breastfeeding intentions and expectations. It is interesting that primiparous mothers did report lower pain scores at 1 week than their multiparous counterpart; this is consistent with prior observations that the intensity of lower abdomen, low back, and breast pain increases with increasing parity.[14]

Breastfeeding intention is a significant variable impacting actual breastfeeding initiation and duration.[15,16] Our analysis is one of the few to demonstrate the impact of parity on breastfeeding intention. Multiparous mothers who planned to breastfeed for 12 months had a significantly lower hazard of stopping breastfeeding compared with primiparous mothers intending to breastfeed 12 months. Primiparous mothers may be overly optimistic about their breastfeeding goals, especially those who reported >6 months of planned duration, without understanding the challenges that can be associated with breastfeeding. Forty-nine percent of primiparous and 34% of multiparous mothers failed to meet their initial breastfeeding goal, highlighting the importance of postpartum support and provider education for both parity groups. These findings are consistent with the limited number of previously published studies evaluating parity and breastfeeding.[9,17]

The results of our analysis are somewhat limited by the study population and design. Women were generally white, non-Hispanic, and well educated. This is consistent with participation studies, where participants tend to be more educated and affluent than the general population.[18,19] Therefore, our results may not be generalized to all U.S. and international populations. Additionally, the study design itself collected breastfeeding information at three points during a 6-month period (2 weeks, 2 months, and 6 months), thus introducing the possibility of recall bias.

Conclusions

Prenatal and postpartum breastfeeding support should differentially target primiparous women to improve breastfeeding outcomes, including prenatal education and parity-specific lactation support during the hospital stay and after discharge. Careful discussion and education during the postpartum period may prevent or limit many of the concerns that may ultimately lead to breastfeeding failure. Mothers should be counseled at infant well-child exams regarding growth spurt feeding behaviors and potential breastfeeding challenges, such as return to work, and they should be provided with tools and resources to address these anticipated events.

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Disclosure Statement

No competing financial interests exist.

References

1. Dennis CL. Breastfeeding initiation and duration: A 1990–2000 literature review. *J Obstet Gynecol Neonatal Nurs* 2002;31:12–32.
2. Haas DM, Howard CS, Christopher M, et al. Assessment of breastfeeding practices and reasons for success in a military community hospital. *J Hum Lact* 2006;22:439–445.
3. Simard I, O'Brien HT, Beaudoin A, et al. Factors influencing the initiation and duration of breastfeeding among low-income women followed by the Canada Prenatal Nutrition Program in 4 regions of Quebec. *J Hum Lact* 2005; 21:327–337.
4. Bourgoin GL, Lahaie NR, Rheaume BA, et al. Factors influencing the duration of breastfeeding in the Sudbury Region. *Can J Public Health* 1997;88:238–241.

5. Grummer-Strawn LM, Scanlon KS, Fein SB. Infant feeding and feeding transitions during the first year of life. *Pediatrics* 2008;122(Suppl 2):S36–S42.
6. Paul IM, Beiler JS, Schaefer EW et al. A randomized trial of single home nursing visits vs office based care after nursery/maternity discharge: The Nurses for Infants Through Teaching and Assessment After the Nursery (NITTANY) Study. *Arch Pediatr Adolesc Med* 2012;166:263–270.
7. Centers for Disease Control and Prevention. Infant Feeding Practices Study II: The Questionnaires. Available at www.cdc.gov/ifps/questionnaires.htm (accessed March 29, 2013).
8. Escobar GJ, Braveman PA, Ackerson L, et al. A randomized comparison of home visits and hospital-based group follow-up visits after early postpartum discharge. *Pediatrics* 2001;108:719–727.
9. Thulier D, Mercer J. Variables associated with breastfeeding duration. *J Obstet Gynecol Neonatal Nurs* 2009;38:259–268.
10. Kaplan EL, Meier P. Nonparametric estimation from incomplete observations. *J Am Stat Assoc* 1958;53:457–481.
11. Peto R, Peto J. Asymptotically efficient rank invariant test procedures. *J R Stat Soc A* 1972;135:185–207.
12. Cox DR. Regression models and life-tables. *J R Stat Soc B* 1972;34:187–220.
13. Grambsch P, Therneau T. Proportional hazards tests and diagnostics based on weighted residuals. *Biometrika* 1994;81:515–526.
14. Holdcroft A, Snidvongs S, Cason A, et al. Pain and uterine contractions during breast feeding in the immediate postpartum period increase with parity. *Pain* 2003;104:589–596.
15. DiGirolamo A, Thompson N, Martorell R, et al. Intention or experience? Predictors of continued breastfeeding. *Health Educ Behav* 2005;32:208–226.
16. Ahluwalia IB, Morrow B, Hsia J. Why do women stop breastfeeding? Findings from the Pregnancy Risk Assessment and Monitoring System. *Pediatrics* 2005;116:1408–1412.
17. McAndrew F, Thompson J, Fellows L, et al. Infant Feeding Survey 2010—Summary. Available at https://catalogue.ic.nhs.uk/publications/public-health/surveys/infant-feed-surv-2010/ifs-uk-2010-chap3-feed-meths.pdf (accessed May 28, 2013).
18. Kjerulff KH, Velott DL, Zhu J, et al. Mode of first delivery and women's intentions for subsequent childbearing: Findings from the First Baby Study. *Paediatr Perinat Epidemiol* 2012;27:62–71.
19. Stradhagen E, Berg C, Lissner L, et al. Selection bias in a population survey with registry linkage: Potential effect on socioeconomic gradient in cardiovascular disease. *Eur J Epidemiol* 2010;25:163–172.

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