Reduced Breastfeeding Rates in Firstborn Late Preterm and Early Term Infants

Nicole M. Hackman,¹ Natasha Alligood-Percoco,² Ashley Martin,³ Junjia Zhu,⁴ and Kristen H. Kjerulff^{2,4}

Abstract

Objectives: The primary objective was to determine the rate of breastfeeding by gestational age reported by new mothers 1 month postpartum, with particular focus on early term newborns (37–38⁶/₇ weeks).

Materials and Methods: Three thousand six primiparous women aged 18–36 years were interviewed during their third trimester and again 1 month postpartum. Logistic regression analysis was used to model the association between gestational age and breastfeeding 1 month postpartum among those who reported that they planned to breastfeed, controlling for potentially confounding variables.

Results: Two thousand seven hundred seventy-two women planned to breastfeed (92.2%), among whom 116 (4.2%) delivered late preterm (34–36⁶/₇ weeks), 519 (18.7%) early term (37–38⁶/₇ weeks), and 2,137 (77.1%) term or postterm (39+ weeks). Among those who delivered late preterm, 63.8% were breastfeeding 1 month postpartum, early term 72.6%, and term or postterm 76.5%. This relationship was verified by a multivariate logistic regression analysis; late preterm newborns were significantly less likely to be breastfeeding 1 month postpartum than the term or postterm newborns (odds ratio [OR] 0.44; 95% confidence interval [CI] 0.28–0.69; $p \leq 0.0001$), as were early term newborns (OR 0.77; 95% CI 0.60–0.99; $p = 0.038$).

Conclusions: In this large prospective study of first-time mothers and newborns, gestational age was significantly associated with breastfeeding 1 month postpartum; highlighting late preterm and early term infants as populations at risk for shortened breastfeeding duration and the need to create specific breastfeeding support and education.

Introduction

IN RECENT YEARS, there has been increasing recognition of the vulnerabilities of children born early term (37 weeks 0 day to 38 weeks 6 days). Early term children have higher levels of morbidity and mortality compared to term, which have been found to extend into adulthood.¹ For most of the past half century, children born at 37 weeks 0 day to 41 weeks 6 days were classified as “term” and little research investigated differences in vulnerabilities in relationship to gestational age within those classified as “term.” While it has been recognized for some time that infants born preterm (less than 37 weeks) have a decreased likelihood of breastfeeding initiation and shortened breastfeeding durations, little is known about early term newborns and breastfeeding.

The benefits of prolonged exclusive breastfeeding for both mother and infant have been well documented. Both the WHO and AAP recommend exclusive breastfeeding through 6 months of age and complementary breastfeeding to con-

tinue through at least the first year.^{2,3} Healthy People 2020 goals have set the benchmark by which we can monitor our progress in supporting breastfeeding initiatives.⁴ Thus far, like many other states, Pennsylvania has not reached that target.

The impact of gestational age on breastfeeding continuation has been understudied. The objective of our analysis was to determine the impact of gestational age on breastfeeding rates at 1 month postpartum in first-time mothers.

Materials and Methods

Recruitment

The First Baby Study (FBS) was a longitudinal prospective study that involved prenatal and postnatal interviews through 3 years of infant age. The study was approved by the Institution Review Board of the Penn State College of Medicine as well as at participating hospitals throughout Pennsylvania. Participants were recruited through study brochures and

Departments of ¹Pediatrics and ²Obstetrics and Gynecology, Penn State College of Medicine, Hershey, Pennsylvania.

³Penn State College of Medicine, Hershey, Pennsylvania.

⁴Department of Public Health Sciences, Penn State College of Medicine, Hershey, Pennsylvania.

posters displayed in obstetric offices, clinics and community health centers, weekly publications, and internet postings. Study brochures were mailed to potentially eligible women by a Medicaid insurer serving women across the state and to women whose contact information was obtained from a marketing company. Women were also recruited during childbirth classes and hospital tours. Eligibility was determined either in person or through telephone by trained study recruiters.

Recruitment of study participants occurred from January 2009 through April 2011. Seventy-four women did not complete the 1-month interview and were not included in the study. The final sample size of women who completed both the baseline and 1 month postpartum interview was 3,006. The women who dropped out of the study after the first interview were significantly younger and more likely to be minority and covered by public insurance than those that did not drop out. In addition, the 3,006 participants in the study were older, more likely to be white, more educated, more likely to have private insurance, and more likely to be married than the general population of women having their first singleton birth aged 18–36 years in the state of Pennsylvania as a whole. Additional details about the study participants can be seen elsewhere.⁵

Inclusion/exclusion criteria

The primary outcome of the FBS was to prospectively investigate the effect of mode of first delivery on subsequent childbearing.⁵ This analysis represents a secondary outcome: an analysis of relevant breastfeeding data.

To be included in this study, women had to be pregnant with their first singleton child, 18–35 years, English or Spanish speaking with telephone access, and planning to deliver in a Pennsylvania hospital. Women were excluded if they had planned to deliver at home or in a birthing center not associated with a hospital, or if they planned for the infant to be adopted.

Women were included in the secondary breastfeeding analysis if they had reported that they intended to breastfeed during their baseline interview.

Data collection

Trained study personnel conducted the informed consent. Women in remote areas of Pennsylvania were consented through an IRB-approved phone and mailing process ($N=265$, 8.8%). Baseline interviews occurred between 30 and 42 weeks gestational age and included questions assessing maternal health history, pregnancy complications, mode of delivery preference, and relationship, psychosocial, and sociodemographic factors. The 1 month postpartum telephone interview focused on the labor and delivery experience, in hospital and postdischarge complications, and the health of the baby and mother. For the primary outcome of the FBS study, additional interviews were conducted at 6, 12, 18, 24, 30, and 36 months postpartum. In the baseline interview, women were asked, “Do you plan to breastfeed, bottle feed, or both?” and “Do you plan to breastfeed for less than 6 months, 6 months, or more?” As part of the 1 month postpartum interview, the mothers were asked, “Have you ever breastfed or tried to breastfeed your baby?” If they answered yes to that question, then they were asked, “Are

you still breastfeeding your baby?.” If they answered “no” to that question then they were asked, “Why are you no longer breastfeeding your baby?,” as an open-ended question. The open-ended question was coded and verified by two of the study investigators (K.H.K. and N.A.-P.). According to the World Health Organization’s definition of “breastfeeding,” mothers who reported that they were breast pumping and providing pumped breastmilk to their infants were coded as “yes breastfeeding.”⁶

Statistical analysis

The study variables were summarized by frequency counts and percentages. Column percentages are used in Table 1 to allow comparison of the trends between each of the gestational age categories. Chi-square tests were used to investigate the bivariate relationship between the independent variables and outcome variable (breastfeeding at 1 month postpartum). We used a multivariate logistic regression model to examine the association between gestational age categories and breastfeeding at 1 month postpartum, controlling for maternal age, race/ethnicity, maternal education, marital status, mode of delivery, smoking during pregnancy, prepregnancy body mass index (BMI), plans to return to work, breastfeeding class during pregnancy, and whether or not they were planning to breastfeed exclusively and for at least 6 months. We did not control for time to first feeding, breastfeeding initiation, or latching problems because these were factors that we considered to be intermediate variables on the causal path between exposure (preterm and early term birth) and the outcome of interest in this study (breastfeeding success).⁷ All analyses were performed using statistical software SAS version 9.3 (SAS Institute, Cary, NC). The significance level used was 0.05. Mothers who reported that they were breast pumping and providing pumped breastmilk to their infants ($N=18$) were included in the “yes breastfeeding” category for this analysis.

The analytic sample included all women who reported in the baseline interview (during pregnancy) that they planned to breastfeed their infant, either exclusively or in conjunction with bottle feeding.

Results

Among the 3,006 study participants, 2,772 (92.2%) reported that they planned to breastfeed and were included in this study. Demographic characteristics of our analytic sample (FBS participants who reported during pregnancy that they intended to breastfeed) can be seen in Table 1. Study participants were generally 25–29 years of age, white non-Hispanic, married, and college educated. Maternal age and time to first breastfeeding were statistically different; the late preterm infant was more likely to have a mother 30+ and breastfed for the first time at more than 4 hours after birth. A larger proportion of early term infants had their first breastfeeding session beyond the first hour after birth compared to term/postterm infants (40.8% versus 36.4%, respectively). Fifty-four percent of the late preterm infants had their first breastfeeding session beyond the first hour after birth.

Chi-square analysis of factors associated with breastfeeding continuation at 1 month can be seen in Table 2. By 1 month postpartum, 75.3% of the women who had intended to breastfeed were still breastfeeding. Late preterm and early term infants were less likely to be breastfeeding (63.8% and

TABLE 1. DEMOGRAPHICS FOR FIRST-TIME MOTHERS WHO PLANNED TO BREASTFEED ($N=2,772$)

Variable	Gestational age ^a				p
	Overall	Late preterm	Early term	Term+	
Overall		116 (4.2)	519 (18.7)	2,137 (77.1)	
Maternal age					0.019
18–24	699 (25.2)	18 (15.5)	124 (23.9)	557 (26.1)	
25–29	1,123 (40.5)	46 (39.7)	202 (38.9)	875 (40.9)	
30+	950 (34.3)	52 (44.8)	193 (37.2)	705 (33)	
Race/ethnicity					0.751
White	2,320 (83.7)	99 (85.3)	431 (83)	1,790 (83.8)	
Black	188 (6.8)	8 (6.9)	40 (7.7)	140 (6.6)	
Hispanic	152 (5.5)	4 (3.4)	24 (4.6)	124 (5.8)	
Other	112 (4.0)	5 (4.3)	24 (4.6)	83 (3.9)	
Maternal education					0.388
HS degree or less	418 (15.1)	17 (14.7)	73 (14.1)	328 (15.3)	
Some college or technical school	725 (26.2)	22 (19)	139 (26.8)	564 (26.4)	
College degree+	1,629 (58.8)	77 (66.4)	307 (59.2)	1,245 (58.3)	
Marital status					0.083
Married	2,008 (72.5)	91 (78.4)	390 (75.1)	1,527 (71.5)	
Not married	763 (27.5)	25 (21.6)	129 (24.9)	609 (28.5)	
Mode of delivery					0.335
Normal vaginal	1,733 (62.5)	72 (62.1)	338 (65.1)	1,323 (61.9)	
Assisted vaginal	246 (8.9)	6 (5.2)	36 (6.9)	204 (9.5)	
Planned cesarean	146 (5.3)	7 (6)	29 (5.6)	110 (5.1)	
Unplanned cesarean	647 (23.3)	31 (26.7)	116 (22.4)	500 (23.4)	
Smoked in pregnancy					0.293
Yes	261 (9.4)	8 (6.9)	42 (8.1)	211 (9.9)	
No	2,511 (90.6)	108 (93.1)	477 (91.9)	1,926 (90.1)	
Prepregnancy BMI					0.126
Underweight	94 (3.4)	2 (1.7)	23 (4.4)	69 (3.2)	
Normal	1,518 (54.8)	71 (61.2)	258 (49.8)	1,189 (55.7)	
Overweight	604 (21.8)	24 (20.7)	118 (22.8)	462 (21.6)	
Obese	554 (20.0)	19 (16.4)	119 (23)	416 (19.5)	
Return to work					0.177
Not returning/unsure	325 (12.2)	15 (13)	45 (9.1)	265 (12.9)	
≤2 months	842 (31.6)	30 (26.1)	165 (33.2)	647 (31.5)	
>2 to ≤6 months	1,337 (50.1)	64 (55.7)	250 (50.3)	1,023 (49.8)	
>6 months or doesn't know when	164 (6.1)	6 (5.2)	37 (7.4)	121 (5.9)	
Breastfeeding class during pregnancy					0.668
Yes	1,239 (44.7)	48 (41.4)	238 (45.9)	953 (44.6)	
No	1,533 (55.3)	68 (58.6)	281 (54.1)	1,184 (55.4)	
Planning to breastfeed exclusively					0.648
Yes	1,998 (72.1)	88 (75.9)	374 (72.1)	1,536 (71.9)	
No	774 (27.9)	28 (24.1)	145 (27.9)	601 (28.1)	
Planning to breastfeed for at least 6 months					0.059
Yes	2,100 (77.1)	79 (71.2)	376 (74.3)	1,645 (78.1)	
No	623 (22.9)	32 (28.8)	130 (25.7)	461 (21.9)	
Time from birth to first feed					<0.0001
Within 1 hour	1,694 (62.0)	52 (46)	302 (59.2)	1,340 (63.6)	
1–4 hours	692 (25.3)	26 (23)	130 (25.5)	536 (25.4)	
More than 4 hours	345 (12.6)	35 (31)	78 (15.3)	232 (11)	
Initiated breastfeeding					0.972
Yes	2,721 (98.2)	114 (98.3)	509 (98.1)	2,098 (98.2)	
No	50 (1.8)	2 (1.7)	10 (1.9)	38 (1.8)	
Reason not breastfeeding ($N=635$)					
Not enough milk	259 (40.8)	13 (31.7)	58 (43.6)	188 (40.8)	0.399
Latching problems	154 (24.3)	12 (29.3)	39 (29.3)	103 (22.3)	0.188

Data are n (%).^aLate preterm = 34⁰/₇ to 36⁶/₇ weeks. Early term = 37⁰/₇ to 38⁶/₇ weeks. Term+ = 39⁰/₇ weeks and greater.

BMI, body mass index; HS, high school.

TABLE 2. FACTORS ASSOCIATED WITH BREASTFEEDING AT 1 MONTH POSTPARTUM AMONG FIRST-TIME MOTHERS PLANNING TO BREASTFEED (N=2,772)

Variable	Overall (%)	Still breastfeeding at 1 month		p
		Yes (%)	No (%)	
Overall		2,086 (75.3)	686 (24.7)	
Gestational age				0.003
Late preterm	116 (4.2)	74 (63.8)	42 (36.2)	
Early term	519 (18.7)	377 (72.6)	142 (27.4)	
Term/postterm	2,137 (77.1)	1,635 (76.5)	502 (23.5)	
Maternal age				<0.0001
18–24	699 (25.2)	396 (56.7)	303 (43.3)	
25–29	1,123 (40.5)	910 (81.0)	213 (19.0)	
30+	950 (34.3)	780 (82.1)	170 (17.9)	
Race/ethnicity				<0.0001
White	2,320 (83.7)	1,803 (77.7)	517 (22.3)	
Black	188 (6.8)	109 (58.0)	79 (42.0)	
Hispanic	152 (5.5)	87 (57.2)	65 (42.8)	
Other	111 (4.0)	86 (77.5)	25 (22.5)	
Maternal education				<0.0001
HS degree or less	418 (15.1)	215 (51.4)	203 (48.6)	
Some college or technical school	725 (26.2)	498 (68.7)	227 (31.3)	
College degree+	1,629 (58.8)	1,373 (84.3)	256 (15.7)	
Marital status				<0.0001
Married	2,008 (72.4)	1,662 (82.8)	346 (17.2)	
Not married	764 (27.6)	424 (55.5)	340 (44.5)	
Mode of delivery				0.090
Spontaneous vaginal	1,733 (62.5)	1,332 (76.9)	401 (23.1)	
Assisted vaginal	246 (8.9)	179 (72.8)	67 (27.2)	
Planned cesarean	146 (5.3)	107 (73.3)	39 (26.7)	
Unplanned cesarean	647 (23.3)	468 (72.3)	179 (27.7)	
Smoked in pregnancy				<0.0001
Yes	261 (9.4)	132 (50.6)	129 (49.4)	
No	2,511 (90.6)	1,954 (77.8)	557 (22.2)	
Prepregnancy BMI				<0.0001
Underweight	94 (3.4)	69 (73.4)	25 (26.6)	
Normal	1,518 (54.8)	1,235 (81.4)	283 (18.6)	
Overweight	604 (21.8)	446 (73.8)	158 (26.2)	
Obese	554 (20.0)	335 (60.5)	219 (39.5)	
Return to work				<0.0001
Not returning/unsure	389 (14.0)	313 (80.5)	76 (19.5)	
≤2 months	842 (30.4)	602 (71.5)	240 (28.5)	
>2 to ≤6 months	1,184 (42.7)	920 (77.7)	264 (22.3)	
>6 months or doesn't know when	357 (12.9)	251 (70.3)	106 (29.7)	
Breastfeeding class during pregnancy				<0.0001
Yes	1,239 (44.7)	1,026 (82.8)	213 (17.2)	
No	1,533 (55.3)	1,060 (69.1)	473 (30.9)	
Planning to breastfeed exclusively				<0.0001
Yes	1,998 (72.1)	1,617 (80.9)	381 (19.1)	
No	774 (27.9)	469 (60.6)	305 (39.4)	
Planning to breastfeed for at least 6 months				<0.0001
Yes	2,100 (77.1)	1,705 (81.2)	395 (18.8)	
No	623 (22.9)	353 (56.7)	270 (43.3)	
Time from birth to first feed				<0.0001
Within 1 hour	1,692 (62.0)	1,348 (79.7)	344 (20.3)	
1–4 hour	692 (25.4)	500 (72.3)	192 (27.7)	
More than 4 hours	345 (12.6)	211 (61.2)	134 (38.8)	

Chi-square analysis. Data are *n* (%).

72.6%, respectively) than term/postterm infants (76.5%), $p=0.003$. Maternal age >25 years, advanced education, normal prepregnancy BMI, not planning to return to work, and term gestational age were all positively associated with breastfeeding continuation at 1 month postpartum. Mode of

delivery was not significantly associated with breastfeeding continuation.

A multivariable logistic regression model was constructed to evaluate the association of maternal and infant variables on breastfeeding continuation at 1 month postpartum and

TABLE 3. LOGISTIC REGRESSION MODEL
FOR CONTINUED BREASTFEEDING AT 1 MONTH
POSTPARTUM AMONG FIRST-TIME MOTHERS PLANNING
TO BREASTFEED ($N=2,772$)

Variable	Odds ratio (95% confidence interval)	p
Gestational age		
Late preterm	0.44 (0.28–0.69)	<0.0001
Early term	0.77 (0.60–0.99)	0.038
Term/postterm	Reference	
Maternal age		
18–24	Reference	
25–29	1.59 (1.18–2.15)	0.002
30+	1.54 (1.11–2.15)	0.011
Race/ethnicity		
White	Reference	
Black	1.33 (0.91–1.95)	0.144
Hispanic	0.70 (0.47–1.05)	0.081
Other	1.18 (0.70–1.99)	0.529
Maternal education		
HS degree or less	Reference	
Some college or technical school	1.31 (0.97–1.75)	0.077
College degree+	1.91 (1.36–2.69)	<0.0001
Marital status		
Married	Reference	
Not married	0.57 (0.43–0.76)	<0.0001
Mode of delivery		
Spontaneous vaginal	Reference	
Assisted vaginal	0.64 (0.45–0.91)	0.012
Planned cesarean	0.63 (0.41–0.97)	0.034
Unplanned cesarean	0.82 (0.64–1.04)	0.097
Smoked in pregnancy		
Yes	0.64 (0.46–0.88)	0.006
No	Reference	
Prepregnancy BMI		
Normal/underweight	Reference	
Overweight	0.63 (0.49–0.80)	<0.0001
Obese	0.38 (0.30–0.48)	<0.0001
Return to work		
Not returning/unsure	Reference	
≤2 months	0.84 (0.60–1.17)	0.295
>2 to ≤6 months	0.81 (0.58–1.12)	0.203
>6 months or doesn't know when	0.73 (0.49–1.08)	0.111
Breastfeeding class during pregnancy		
Yes	1.41 (1.15–1.74)	0.001
No	Reference	
Planning to breastfeed exclusively		
Yes	1.83 (1.48–2.26)	<0.0001
No	Reference	
Planning to breastfeed for at least 6 months		
Yes	2.52 (2.02–3.14)	<0.0001
No	Reference	

gestational age (Table 3). We found several variables associated with continued breastfeeding at 1 month; higher maternal age and education, having taken a breastfeeding class in pregnancy, planning to breastfeed exclusively, and planning to breastfeed for at least 6 months. There were several factors associated with decreased odds for continued breastfeeding at 1 month, including maternal smoking and unmarried status, maternal prepregnancy BMI in the over-

weight/obese category, having an assisted vaginal delivery or planned cesarean in comparison to spontaneous vaginal delivery, and late preterm and early term gestational ages in comparison to term/postterm.

There were 685 women who planned to breastfeed, but reported that they were not breastfeeding at 1 month postpartum (24.7% of those who had intended to breastfeed). Among these women, 635 answered the open-ended question asked at 1 month postpartum of why they were no longer breastfeeding. Although women reported a variety of reasons that they were no longer breastfeeding, there were only two reasons that women reported in large enough numbers to analyze: (1) not enough milk and (2) latching problems. As seen in Table 1, among the women who had tried to breastfeed, but were not breastfeeding at 1 month postpartum, gestational age was not associated with the problem of not enough milk, but the mothers of early term newborns were equally likely to report latching problems as the reason they were no longer breastfeeding (29.3%) as the mothers of the late preterm newborns (29.3%), in comparison to 22.3% for the term newborns. However, the numbers were small and the p -value was not significant ($p=0.188$).

Discussion

Our analysis confirms that gestational age is an important variable when evaluating breastfeeding continuation at 1 month. Historically, a term infant was defined as ≥37 weeks, and infants within that gestational age were treated similarly, without special attention to those born within the earlier end of that classification. On the recommendation of the Defining “Term” Pregnancy Workgroup 2013, those infants born between the 37 and 38⁶/₇ weeks of gestation are now to be defined as Early Term.¹

The early term infant has recently been emphasized as a population that is distinctly different from its term counterpart; at risk for breastfeeding complications and shortened breastfeeding durations.^{1,8} Since fetal maturity occurs along a spectrum, and thus is not attained at a distinct point in time, these early term infants may demonstrate physiology and behaviors more closely related to those of a late preterm infant, which can predispose the early term infant and his/her mother to inadequate lactation and shortened breastfeeding duration. The unrecognized immaturity of the early term infant places the infant at risk for breastfeeding challenges and shortened breastfeeding durations. The contributing factors and trends of the breastfeeding early term infant have been understudied to date. Our analysis confirmed that fewer early term infants were breastfeeding at 1 month postpartum when compared to their term/postterm counterparts.

Our analysis demonstrated that gestational age did impact the time to first breastfeeding session. As shown in Table 1, the early term infant was more likely to have their first breastfeeding session after “The Golden Hour” had passed, with 40.8% of the early term infants first breastfeeding at more than 1 hour of age, compared to 36.4% of the term+ infants. This highlights the potential impact of time to first breastfeeding session on breastfeeding duration. The premature discontinuation of breastfeeding of the early term infant may be attributed to their increased likelihood to be breastfed after the first hour of life.

Our results were consistent with current knowledge about maternal breastfeeding risk factors.^{9–16} We add novel evidence to support the contention that the breastfeeding experience of the early term infant is different than their term counterparts and deserves further evaluation. Early term infants should be cared for differently, as detailed in a recent publication by Meier et al.⁸

The results of this secondary analysis were limited by the original study population and design. Questions relating to breastfeeding exclusivity or breastfeeding intensity were not included in the 1-month interview. In addition, participants in the FBS were more likely to be white non-Hispanic, more educated, older on average, and more likely to have private insurance, as commonly occurs in participation studies.^{5,17}

Another potential limitation is that most of the FBS participants (92.2%) reported that they intended to breastfeed in the prepartum interview. Although several studies have reported similar rates of breastfeeding intention among American women (92.8% among low-income women in Iowa¹⁸ and 92.0% in a diverse urban population in New York¹⁹), most report lower rates of prepartum plans to breastfeed, ranging from 48.2% among women in West Virginia²⁰ to 83.0% in a national study.²¹ This suggests that the study participants in our study were more strongly committed to breastfeeding than women in general in the United States. Even in such a sample of generally highly educated women who were strongly committed to breastfeeding, we found a significant effect of gestational age on breastfeeding success. It is possible that the effect of gestational age on breastfeeding success is stronger in the general population of women in the United States who are not as committed to breastfeeding as those in this study.

An additional limitation is that the primary outcome of the study (breastfeeding at 1 month) was measured by self-report telephone interview. Some participants may have been tempted to report that they were breastfeeding even if they were not because of the social desirability of breastfeeding.

The time from birth to first feeding was more likely to be longer than an hour for the preterm and early term newborns in this study, which may partially explain the lower rates of breastfeeding at 1 month postpartum for these infants. In addition, the mothers of early term newborns who were no longer breastfeeding at 1 month postpartum were more likely to report latching problems than those of the term newborns, but the numbers were small and the results were not statistically significant. Further study of this issue comparing early term and full-term newborns on LATCH scores is warranted.

Conclusions

Our analysis confirms that gestational age is a risk factor for premature breastfeeding cessation. Through the identification of variables associated with the early term infant breastfeeding success or early termination, we will be better able to target specific breastfeeding support. Public health initiatives should focus on the identification of modifiable barriers and support programming targeted toward the preterm and early term populations. This analysis supports an approach to newborn medicine: not all “term” infants are created equal. We advocate for special attention to the early term infants, previously thought to be immune from breastfeeding challenges associated with their early delivery.

Acknowledgment

Funding for this project was provided by R 01 HD052990 from the Eunice Kennedy Shriver National Institute of Child Health & Human Development, NIH.

Disclosure Statement

No competing financial interests exist.

References

1. Spong CY. Defining “term” pregnancy: Recommendations from the Defining “Term” Pregnancy Workgroup. *JAMA* 2013;309:2445–2446.
2. World Health Organization. Breastfeeding. Available at www.who.int/topics/breastfeeding/en/ (accessed January 17, 2014).
3. American Academy of Pediatrics, Section on Breastfeeding. Policy Statement: Breastfeeding and the use of human milk. *Pediatrics* 2012;129: e827–e841.
4. U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. Healthy People 2020. Washington, DC. Available at <http://healthypeople.gov/2020/topicsobjectives2020/pdfs/MaternalChildHealth.pdf> (accessed June 27, 2013).
5. 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* 2013;27:62–71.
6. World Health Organization. Indicators for Assessing Infant and Young Child Feeding Practices: Part 1 Definitions: Conclusions of a Consensus Meeting Held 6–8 November 2007 in Washington D.C. Geneva: World Health Organization. Updated 2008. Available at www.who.int/nutrition/publications/infantfeeding/9789241596664/en/ (accessed February 18, 2016).
7. Schisterman EF, Cole SR, Platt RW. Overadjustment bias and unnecessary adjustment in epidemiologic studies. *Epidemiology* 2009;20:488–495.
8. Meier P, Patel AL, Wright K, et al. Management of breastfeeding during and after the maternity hospitalization for late preterm infants. *Clin Perinatol* 2013;40:689–705.
9. Wojcicki JM. Maternal prepregnancy body mass index and initiation and duration of breastfeeding: A review of the literature. *J Womens Health (Larchmt)* 2011;20:341–347.
10. Amir LH, Donath S. A systematic review of maternal obesity and breastfeeding intention, initiation and duration. *BMC Pregnancy Childbirth* 2007;7:9.
11. 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.
12. 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.
13. Riva E, Banderli G, Agostoni C, et al. Factors associated with initiation and duration of breastfeeding in Italy. *Acta Paediatr* 1999;88:411–415.
14. Odom EC, Li R, Scanlon KS, et al. Reasons for earlier than desired cessation of breastfeeding. *Pediatrics* 2013;131: e726–e732.
15. Bartok CJ, Schaefer EW, Beiler JS, et al. Role of body mass index and gestational weight gain in breastfeeding outcomes. *Breastfeed Med* 2012;7:448–456.

16. Demirci JR, Sereika SM, Bogen D. Prevalence and predictors of early breastfeeding among late preterm mother-infant dyads. *Breastfeed Med* 2013;8:277–285.
17. 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.
18. Mitchell-Box K, Braun KL, Hurwitz EL, et al. Breastfeeding attitudes: Association between maternal and male partner attitudes and breastfeeding intent. *Breastfeed Med* 2013;8:368–373.
19. Stuebe AM, Bonuck K. What predicts intent to breastfeed exclusively? Breastfeeding knowledge, attitudes, and beliefs in a diverse urban population. *Breastfeed Med* 2011;6:413–420.
20. Chertok IA, Luo J, Culp S, et al. Intent to breastfeed: A population-based perspective. *Breastfeed Med* 2011;6:125–129.
21. Zhang Y, Carlton E, Fein SB. The association of prenatal media marketing exposure recall with breastfeeding intentions, initiation, and duration. *J Hum Lact* 2013;29:500–509.

Address correspondence to:
Nicole M. Hackman, MD
Department of Pediatrics, HS83
Penn State College of Medicine
500 University Drive
Hershey, PA 17033
E-mail: nhackman@hmc.psu.edu