



Associations Between Maternity Care Practices and 2-Month Breastfeeding Duration Vary by Race, Ethnicity, and Acculturation

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Abstract

Objectives This study examines the associations between specific maternity care practices and breastfeeding duration for Spanish-speaking Hispanic, English-speaking Hispanic, non-Hispanic Native American, and non-Hispanic White women. **Methods** We analyzed data from the 2012–2014 New Mexico Pregnancy Risk Assessment Monitoring System. We used survey language as a proxy measure of acculturation and categorized women as Spanish-speaking Hispanic, English-speaking Hispanic, non-Hispanic Native American, and non-Hispanic White. We conducted bivariate analyses to compare rates of breastfeeding at 2 months and experiences of maternity care practices and logistic regression analysis to estimate the effects of these practices on breastfeeding duration for each group. **Results** Hispanic women were less likely than non-Hispanic women to breastfeed for at least 2 months (67.9% vs. 76.6%; $p = 0.000$); however, this varied significantly by acculturation level: 78.1% of Spanish-speaking Hispanic women compared to 66.1% of English-speaking Hispanic women breastfed for at least 2 months ($p = 0.000$). The effects of specific maternity care practices on duration varied across groups. Among non-Hispanic White, Native American, and English-speaking Hispanic women, breastfeeding while at the hospital had the strongest effect (AOR 2.09, 95% CI 1.67–2.61; AOR 2.71, 95% CI 2.08–3.52; and AOR 1.99, 95% CI 1.76–2.25, respectively). Among Spanish-speaking Hispanic women, being encouraged to breastfeed on demand had the strongest effect (AOR 5.179, 95% CI 3.86–6.94). **Conclusions for Practice** The effects of maternity care practices on breastfeeding duration vary by race, ethnicity, and acculturation level. Health care systems must acknowledge the diversity of their patient populations when seeking to develop and implement breastfeeding-friendly practices.

Keywords Breastfeeding duration · Race and ethnicity · Acculturation · Maternity care practices · Baby-Friendly Hospital Initiative

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Significance

What is already known on this subject? Certain maternity care practices can promote longer breastfeeding duration, possibly reducing racial and ethnic disparities. Previous research has shown that the effects of these practices on breastfeeding duration vary by race and ethnicity but have not accounted for acculturation among Hispanic women and few have included Native American women. *What this study adds?* English- and Spanish-speaking Hispanic women experience breastfeeding-promoting maternity care practices at different rates, and these practices have varying effects on their breastfeeding duration. Native American women's experiences are significantly different from those of White and Hispanic women.

Introduction

The health benefits of breastfeeding are well documented. Breastfed infants have lower rates of many childhood diseases, and women who breastfeed have lower rates of certain cancers and postpartum depression (AAP 2012, Ip et al. 2007). Despite the benefits, however, duration of breastfeeding in the United States remains below *Healthy People 2020* targets and significant disparities by race and ethnicity persist (Anstey et al. 2017; Healthy People 2020). Of infants born in 2015, 83.2% initiated breastfeeding and 57.6% were still breastfeeding at 6 months of age; only 35.9% breastfed for 12 months, less than half were exclusively breastfed for 3 months, and under a quarter were exclusively breastfed for 6 months (CDC 2018). While this represents an increase over previous estimates, rates still fall below the *Healthy People 2020* targets for breastfeeding at 6 months (60.6%) and exclusive breastfeeding for 6 months (25.5%). Further, non-White women continue to have lower breastfeeding rates than White women (Anstey et al. 2017).

A growing body of research has highlighted the role of acculturation, or the extent to which people have adopted the beliefs and practices of the country in which they are living, in understanding racial and ethnic disparities in breastfeeding rates. Non-White women who migrate to the United States (either as adults or as children) are more likely to breastfeed than are US-born women of the same ethnicity (Hawkins et al. 2014; Merewood et al. 2006; Singh et al. 2007; Sparks 2011). Aside from nativity, acculturation has also been approximated with language. In the case of Hispanic women in the United States, those who primarily speak Spanish are considered less acculturated and those who primarily speak English are considered

more acculturated. Relative to more acculturated Hispanic women, less acculturated Hispanic women are more likely to breastfeed at all and exclusively, and tend to breastfeed longer (Ahluwalia et al. 2012; Chapman and Perez-Escamilla 2013; Gibson et al. 2005; Gill 2009; Gorman et al. 2007; Harley et al. 2007; Sussner et al. 2008; Wambach et al. 2016).

To support breastfeeding, hospitals across the United States, as well as around the world, have adopted specific maternity care practices promoted by the Baby-Friendly Hospital Initiative (BFHI) (WHO/UNICEF 1989, 1998). In the United States, Baby Friendly USA designates hospitals as “baby-friendly” when they have demonstrated the implementation of the 10 Steps to Successful Breastfeeding, which aim to encourage exclusive breastfeeding while at the hospital, discourage practices known to disrupt breastfeeding (such as providing pacifiers and formula samples), and ensure that women have the information and support they need to continue breastfeeding when they leave the hospital (WHO/UNICEF 1989; BFUSA). These practices could potentially help alleviate racial and ethnic disparities in breastfeeding rates. Exclusive breastfeeding in the hospital is positively associated with breastfeeding continuation and exclusive breastfeeding at 1-month postpartum (Petrova et al. 2007). Conversely, even when women intend to exclusively breastfeed, formula supplementation in the hospital is associated with a greater likelihood of not breastfeeding exclusively and of stopping breastfeeding by 2 months (Chantry et al. 2014).

In 2015, 26.1% of infants in the United States were born in hospitals designated “baby-friendly.” (CDC 2018) Access to these hospitals varies by race and ethnicity, however, and could contribute to the racial and ethnic disparities in breastfeeding rates. One study found that Black women were less likely to have access to hospitals implementing practices that promote breastfeeding and another found that Black women were significantly more likely to be given infant formula in the hospital (Lind et al. 2014; McKinney et al. 2016). Rates of exclusive breastfeeding in the hospital also vary by race and ethnicity (Petrova et al. 2007).

To date, little research has focused on whether the associations between specific maternity care practices and breastfeeding duration vary by race and ethnicity. One study found that the practices associated with longer breastfeeding duration varied for Black, White, and Hispanic women, but did not account for acculturation among their sample of Hispanic women (Ahluwalia et al. 2012). The New Mexico Pregnancy Risk Assessment Monitoring System (PRAMS) data provide a unique opportunity to understand the breastfeeding experiences of highly acculturated (English speaking) and less acculturated (Spanish speaking) Hispanic women and Native American women, who are often underrepresented in survey data. The purpose of this analysis is

to examine the associations between specific maternity care practices and breastfeeding duration for Spanish-speaking Hispanic, English-speaking Hispanic, non-Hispanic Native American, and non-Hispanic White women.

Methods

Data

The PRAMS is an ongoing surveillance project jointly administered by the Centers for Disease Control and Prevention (CDC) and state health departments to collect state-specific, population-based maternal, early postpartum and infant health data (CDC PRAMS). The New Mexico PRAMS questionnaire is sent by mail to a sample of over 2000 new mothers each year, randomly selected from records of live births. Mailed questionnaires are the primary mode of response, and telephone interviewers call mothers who do not respond by mail. The mailings and telephone calls are completed within 2–4 months after delivery. Approximately 65% of sampled mothers respond to the survey. Mothers are randomly sampled, covering about 1 in 11 live births. The sample is stratified by maternal race/ethnicity (non-Hispanic White, Hispanic-native born, and all others) and by geography to ensure that the sample approximates the composition of the population as closely as possible. The PRAMS survey asks women about their experiences, attitudes, and behaviors before, during, and shortly after pregnancy, including questions about breastfeeding initiation and duration. Beginning in 2012, the questionnaire included questions about specific maternity care practices experienced at the hospital when they gave birth. For this analysis, we included data from 2012, 2013 and 2014, as these were the most recent data available that included data on maternity care practices.

Measures

Breastfeeding Duration

The PRAMS survey is mailed to women between 2 and 4 months after giving birth. Because some of the women could only have been breastfeeding for 2 months at the time of the survey, we created a dichotomous variable for whether or not the respondent breastfed their baby for at least 2 months to measure breastfeeding duration. This outcome variable reflects “any” breastfeeding, not just exclusive breastfeeding.

Maternal Race and Ethnicity

We combined the race and ethnicity variables to categorize respondents as Hispanic, non-Hispanic White, and non-Hispanic Native American. As a proxy measure for

acculturation, Hispanic women were further categorized as Spanish- or English-speaking, based on the language in which they responded to the survey. Our models were based on the four categories of: English-speaking Hispanic (highly acculturated), Spanish-speaking Hispanic (less acculturated), non-Hispanic Native American, and non-Hispanic White. Other racial designations were too small to allow for robust analyses.

Maternity Care Practices

Respondents were asked if any of the following things happened while they were in the hospital:

- I breastfed my baby at the hospital;
- I breastfed my baby in the first hour after my baby was born;
- My baby was fed only breast milk at the hospital;
- My baby stayed in the same room with me at the hospital “rooming-in”;
- My baby used a pacifier at the hospital;
- The hospital gave me a gift pack with formula;
- The hospital gave me a breast pump to use;
- Hospital staff gave me information about breastfeeding;
- Hospital staff helped me learn how to breastfeed;
- Hospital staff told me to breastfeed whenever my baby wanted;
- The hospital gave me a telephone number to call for help with breastfeeding.

All but two of these (pacifier use and receiving a gift pack with formula) are expected to increase breastfeeding initiation and duration and are promoted (or discouraged, in the case of pacifier use and formula) by the BFHI [BFUSA].

Maternal and Birth Characteristics

We included in our models maternal characteristics known to be associated with breastfeeding duration (Jones et al. 2011; Henninger et al. 2017). Age was included as a continuous variable in our models. Education level was dichotomized as having at least a high school diploma or equivalent or not. We also compared breastfeeding rates between women with some college and no college. Marital status was dichotomized as married or not.

We also included certain characteristics of the birth that have been associated with the likelihood of breastfeeding in other studies (Henninger et al. 2017; Jones et al. 2011; Li et al. 2005; Sutherland et al. 2012). Dichotomous variables for first live birth, Cesarean birth, low birthweight, and hospital stay greater than 2 days were included in the logistic regression models. There was not enough variation in plurality (singleton or multiple birth) to include this variable

in our analyses. We also included intention to exclusively breastfeed prior to giving birth.

Data Analysis

We conducted bivariate analyses to compare rates of women who were still breastfeeding at 2 months by race/ethnicity/acculturation, other maternal demographic characteristics, intention to breastfeed, and birth characteristics. We conducted Chi square analyses to look for variation in experiences of specific maternity care practices by race/ethnicity and logistic regression analyses on the odds of experiencing specific maternity care practices for non-Hispanic Native American, Spanish-speaking Hispanic, and English-speaking Hispanic women relative to non-Hispanic White women. We conducted logistic regression analyses separately for each group of women to estimate the effects of maternity care practices on the likelihood of breastfeeding at 2 months with and without adjustment for demographic and birth characteristics. We used SPSS version 23.0 with the Complex

Samples module to ensure appropriate estimations based on the sample design (IBM 2015).

Ethical Review

This study is approved by the Human Research Protections Office of the University of New Mexico Health Sciences Center (HRC HRPO # 6-200). The New Mexico PRAMS study is approved by the CDC Institutional Review Board and the New Mexico State University IRB. The Navajo Nation Human Research Review Board approved the study for women with Navajo Tribal affiliation.

Results

Sample Characteristics

Of the 4035 women in the data set, 3520 (87.2%) had initiated breastfeeding. We excluded from our analysis the 515 (12.8%) who never initiated breastfeeding. Half (54.4%) of

Table 1 Demographic and birth characteristics of women who initiated breastfeeding, New Mexico PRAMS 2012–2014

	Unweighted count	Weighted percentage
Race/ethnicity/acculturation		
White, non-Hispanic	1179	28.2
Native American	466	13.3
Spanish-speaking Hispanic	278	8.4
English-speaking Hispanic	1455	46.0
Other	105	4.1
Age		
13–17 years	107	3.3
18–19 years	257	8.1
20–24 years	1023	27.8
25–29 years	1022	29.0
30–34 years	725	21.1
35 years and up	386	10.7
Education level		
0–8 years (less than HS)	84	2.5
9–11 years (some HS)	532	15.4
12 years (HS diploma)	831	24.9
13–15 years (some college)	1336	36.6
16+ years (college graduate or more)	707	20.6
Marital status		
Married	1777	49.3
Birth characteristics		
First live birth	1332	39.3
Cesarean delivery	549	15.9
Low birthweight	265	7.7
Hospital stay greater than 2 days	1085	30.9
Intended to exclusively breastfeed prior to birth	2640	74.7

the sample identified as Hispanic; 8.4% were Spanish-speaking Hispanic and 46.0% were English-speaking Hispanic (Table 1). A quarter (28.2%) identified as non-Hispanic White and 13.3% non-Hispanic Native American. Most intended to exclusively breastfeed prior to giving birth.

Breastfeeding Duration

Non-Hispanic White women were the most likely to breastfeed at 2 months: 78.8% of non-Hispanic White women reported breastfeeding at 2 months compared to 69.1% of non-White women ($p=0.000$) (Table 2). Hispanic women overall were significantly less likely to breastfeed compared to non-Hispanic women, 67.9% compared to 76.6% ($p=0.000$), but there was significant variation by language: 78.1% of Spanish-speaking Hispanic women breastfed at 2-months compared to 66.1% of English-speaking Hispanic women ($p=0.000$). Native American women were less likely than non-Hispanic White women to breastfeed at 2 months but more likely than English-speaking Hispanic women with a rate of 70.7%.

Maternity Care Practices by Race and Ethnicity

Maternity care practices experienced at the hospital varied by race, ethnicity, and acculturation (Table 3), though some practices were widely, but not universally, reported,

including: breastfeeding while at hospital, rooming-in, receiving information about breastfeeding, and being encouraged to breastfeed on demand (Table 3). Among the least likely practices reported were using a pacifier at the hospital, receiving a gift pack with formula, and receiving a breast pump (Table 3). After adjusting for maternal demographic and birth characteristics and intention to breastfeed, Native American and Hispanic women were less likely than non-Hispanic White women to report breastfeeding while at the hospital and receiving a phone number for breastfeeding support (Table 4).

Associations Between Maternity Care Practices and Breastfeeding Duration

Table 5 shows the results of four logistic regression models estimating the effects of specific maternity care practices on the odds of breastfeeding at 2 months by race/ethnicity/acculturation, adjusted for maternal demographic and birth characteristics and intention to breastfeed. Among the 11 maternity care practices reported, only two emerged as having significant positive associations with 2-month breastfeeding duration among all populations of women: only feeding breastmilk at the hospital and being encouraged to breastfeed on demand (Table 5). Other practices varied in their associations with 2-month breastfeeding duration.

Table 2 Percentage of women who breastfed for at least 2 months, of those who initiated breastfeeding, New Mexico PRAMS 2012–2014

	% Breastfed at least 2 months		
	1	2	Sig.
Race/ethnicity			
White, non-Hispanic ¹ vs non-White ²	78.8%	69.1%	0.000
Hispanic ¹ vs non-Hispanic ²	67.9%	76.6%	0.000
Native American ¹ vs non-Native American ²	70.7%	72.0%	0.011
Acculturation level of Hispanic women			
English-speaking Hispanic ¹ vs Spanish-speaking Hispanic ²	66.1%	78.1%	0.000
Age			
> ¹ vs < ² 20	74.3%	52.8%	0.000
> ¹ vs < ² 30	80.5%	67.8%	0.000
Education			
> ¹ vs < ² HS	74.4%	61.0%	0.000
> ¹ vs < ² some college	80.4%	60.7%	0.000
Marital status			
Married ¹ vs not married ²	78.2%	65.7%	0.000
Intention to breastfeed			
Intended ¹ vs did not intend to breastfeed exclusively ²	79.3%	49.7%	0.000
Birth characteristics			
First live birth ¹ vs not first live birth ²	70.0%	73.6%	0.000
Cesarean birth ¹ vs vaginal birth ²	68.6%	72.4%	0.000
Low birthweight ¹ vs not low birthweight ²	63.6%	72.5%	0.000
Hospital stay > 2 days ¹ vs ≤ 2 days ²	66.3%	74.2%	0.000

Table 3 Maternity care practices experienced by women who initiated breastfeeding by race, ethnicity, and acculturation, New Mexico PRAMS 2012–2014

	Non-Hispanic White (%)	Non-Hispanic Native American (%)	Spanish-speaking Hispanic (%)	English-speaking Hispanic (%)	Sig.
Breastfed while at the hospital	96.5	93.6	94.1	93.1	0.000
Breastfed within the first hour	74.7	77.8	78.9	72.0	0.000
Baby only had breast milk at the hospital	67.1	65.5	64.8	59.1	0.000
Baby stayed in the same room as mom	89.9	91.0	94.1	87.9	0.000
Baby used a pacifier at the hospital	45.2	32.6	44.8	52.1	0.000
Hospital gave mom a gift pack that included formula	38.3	33.6	34.6	43.1	0.000
Hospital provided a breast pump to use	29.6	49.9	27.0	34.5	0.000
Hospital staff gave information about breastfeeding	92.5	96.6	89.5	93.8	0.000
Hospital staff helped mom learn how to breastfeed	74.9	83.9	79.8	79.9	0.000
Hospital staff told mom to let baby breastfeed whenever baby wanted	86.9	84.1	89.5	85.4	0.000
Hospital provided a phone number for breastfeeding support	80.6	74.8	67.6	75.9	0.000

Table 4 Odds of experiencing maternity care practices for non-Hispanic Native American, Spanish-speaking Hispanic, and English-speaking Hispanic women relative to non-Hispanic White women adjusted for covariates

	Non-Hispanic Native American			Spanish-speaking Hispanic			English-speaking Hispanic		
	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value
Supportive practices									
BF at hospital	0.84	0.74–0.97	0.014	0.54	0.46–0.639	0.000	0.57	0.51–0.63	0.000
BF w/in 1st h	1.21	1.14–1.29	0.000	0.98	0.90–1.077	0.707	0.96	0.91–1.01	0.109
Only B milk	1.13	1.06–1.20	0.000	0.86	0.80–0.932	0.000	0.79	0.75–0.83	0.000
Same room	1.00	0.87–1.12	0.980	1.18	0.99–1.39	0.057	0.83	0.76–0.90	0.000
Provided pump	3.13	2.93–3.34	0.000	1.15	1.05–1.25	0.002	1.22	1.16–1.28	0.000
Provided information	2.41	2.10–2.77	0.000	0.74	0.65–0.84	0.000	1.18	1.09–1.28	0.000
Helped learn	1.86	1.73–2.01	0.000	1.57	1.43–1.72	0.000	1.25	1.19–1.32	0.000
On demand	0.92	0.85–0.99	0.045	1.43	1.27–1.61	0.000	0.99	0.93–1.05	0.715
Phone number	0.87	0.86–0.94	0.000	0.54	0.50–0.59	0.000	0.85	0.81–0.90	0.000
Unsupportive practices									
Used pacifier	0.48	0.45–0.51	0.000	1.03	0.96–1.11	0.444	1.20	1.15–1.26	0.000
Gave formula	0.63	0.60–0.67	0.000	0.76	0.71–0.82	0.000	1.08	1.03–1.12	0.001

Covariates include maternal age, maternal education level (greater than HS diploma), first birth, low birthweight, hospital stay greater than 2 days, Cesarean delivery, and intention to exclusively breastfeed prior to giving birth

Discussion

We used data from a large, population-based state sample of women to study associations between maternity care practices and 2-month breastfeeding duration for Spanish-speaking Hispanic, English-speaking Hispanic, non-Hispanic Native American, and non-Hispanic White women. We found that maternity care practices associated with breastfeeding are not experienced equally, which could be an explanation for observed disparities in breastfeeding rates at 2 months. We also found that the associations

between maternity care practices and 2-month breastfeeding duration varied by race, ethnicity, and acculturation.

English- and Spanish-speaking Hispanic women in our sample had significantly different rates of breastfeeding at 2 months. While Hispanics as a group had lower rates of breastfeeding than either non-Hispanic White or Native American women, this was largely due to the low prevalence of breastfeeding among English-speaking Hispanic women, as Spanish-speaking Hispanic women were almost as likely to breastfeed at 2 months as were non-Hispanic White women. This finding is consistent with previous studies that have used language as a proxy measure for acculturation

Table 5 Odds of breastfeeding for at least 2 months among non-Hispanic White, non-Hispanic Native American, Spanish-speaking Hispanic, and English-speaking Hispanic women who reported experiencing specific maternity care practices, of women who initiated breastfeeding, adjusted for covariates^a, New Mexico PRAMS 2012–2014

	Non-Hispanic White			Non-Hispanic Native American			Spanish-speaking Hispanic			English-speaking Hispanic		
	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value
Supportive practices												
BF at hospital	2.09	1.67–2.61	0.000	2.71	2.08–3.52	0.000	0.85	0.59–1.23	0.376	1.99	1.76–2.25	0.000
BF w/in 1st h	1.97	1.75–2.21	0.000	0.42	0.35–0.50	0.000	0.62	0.48–0.80	0.000	1.18	1.09–1.27	0.000
Only B milk	1.95	1.76–2.17	0.000	1.40	1.23–1.59	0.000	4.43	3.56–5.52	0.000	1.96	1.84–2.10	0.000
Same room	1.11	0.93–1.31	0.254	2.43	1.90–3.12	0.000	0.78	0.51–1.20	0.255	0.75	0.67–0.83	0.000
Provided pump	1.38	1.23–1.54	0.000	0.90	0.80–1.02	0.086	0.79	0.63–0.99	0.036	0.88	0.82–0.94	0.000
Provided info	0.60	0.49–0.73	0.000	0.96	0.69–1.34	0.824	1.90	1.26–2.89	0.002	0.78	0.68–0.90	0.001
Helped learn	0.76	0.68–0.86	0.000	0.51	0.43–0.61	0.000	0.37	0.26–0.54	0.000	0.58	0.53–0.63	0.000
On demand	1.40	1.23–1.60	0.000	1.92	1.64–2.25	0.000	5.18	3.86–6.94	0.000	1.23	1.13–1.34	0.000
Phone number	1.29	1.15–1.45	0.000	1.78	1.56–2.03	0.000	0.54	0.43–0.68	0.000	1.26	1.17–1.35	0.000
Unsupportive practices												
Used pacifier	0.62	0.56–0.68	0.000	1.44	1.26–1.64	0.000	0.63	0.52–0.78	0.000	0.73	0.68–0.77	0.000
Gave formula	0.65	0.60–0.72	0.000	0.44	0.39–0.50	0.000	1.81	1.46–2.25	0.000	0.84	0.79–0.90	0.000

^aCovariates include maternal age maternal education level (greater than HS diploma), first birth, low birthweight, hospital stay greater than 2 days, cesarean delivery, and intention to exclusively breastfeed prior to giving birth

measuring breastfeeding duration among Hispanic women (Ahluwalia et al. 2012). Less acculturated Hispanic women tend to initiate breastfeeding at higher rates and breastfeed for longer than do more acculturated Hispanic women, which is thought to be due to the cultural norms that support breastfeeding (Gibson et al. 2005; Wambach et al. 2016). Also consistent with previous research, Native American women had lower rates of 2-month breastfeeding duration than non-Hispanic White women or Spanish-speaking Hispanic women (Jones 2015).

We also found that the hospital experiences and maternity care practices reported by women varied by race, ethnicity, and acculturation. Native American and Hispanic women (regardless of language) were less likely than non-Hispanic White women to report that they breastfed at the hospital. English-speaking Hispanic women, who were the least likely to be breastfeeding at 2 months, were the least likely to say that they breastfed at the hospital, gave their baby only breast milk at the hospital, and that their baby stayed in the same room with them. They were also more likely than other women to say that the hospital gave them a gift pack with formula. The finding that women experience different maternity care practices at the hospital is consistent with previous research; however, previous assessments have not compared experiences for Native American women or for Hispanic women of different acculturation levels (Ahluwalia et al. 2012).

The maternity care practices included in our models are ones that are encouraged (or discouraged, in the case of pacifier use and formula samples) because they are believed

to promote breastfeeding (WHO/UNICEF 1989, 1998; BFUSA) After adjusting for maternal and birth characteristics known to be associated with breastfeeding duration, only two maternity care practices were positively associated with 2-month breastfeeding duration for all women: feeding only breast milk while at the hospital and being encouraged to breastfeed on demand. Other practices varied in their association with duration based on race, ethnicity, and acculturation. For example, initiating breastfeeding within the first hour of giving birth, which is a practice encouraged by the BFHI, was positively associated with breastfeeding duration for non-Hispanic White and English-speaking Hispanic women but had a negative association with breastfeeding duration among non-Hispanic Native American and Spanish-speaking Hispanic women. Another practice promoted by the BFHI, rooming-in, also had a varying association with duration for women in our sample. Among non-Hispanic White women and Spanish-speaking Hispanic women, rooming-in was not significantly associated with breastfeeding duration. Among non-Hispanic Native American women, it was positively associated with 2-month breastfeeding duration and among English-speaking Hispanic women it was negatively associated with breastfeeding duration.

Our findings are consistent with previous research looking at variations in the associations between maternity care practices and breastfeeding duration, with some important exceptions. Like Ahluwalia et al. (2012), we found that feeding only breast milk at the hospital and being encouraged to breastfeed on demand were positively associated

with breastfeeding duration for all groups of women in our sample. Ahluwalia et al. (2012) also found that initiating breastfeeding within the first hour was positively associated with duration for their sample of Black, White, and Hispanic women. Among our sample this was not the case, because we looked at Native American and Spanish- and English-speaking Hispanic women separately, and the practice of initiating breastfeeding within the first hour actually had a negative association with duration for Native American and Spanish-speaking Hispanic women. The fact that this practice, which is widely considered to be supportive of breastfeeding initiation and longer duration, is negatively associated with 2-month duration for these groups of women cannot be explained with the current data set. It is possible that cultural beliefs or practices around birthing and breastfeeding are inconsistent with this practice.

Other studies have found that providing women with formula samples at the hospital is associated with early termination of breastfeeding. In our study, receiving a gift pack with formula samples was negatively associated with 2-month breastfeeding duration among non-Hispanic White, Native American, and English-speaking Hispanic women, but positively associated with duration among Spanish-speaking Hispanic women. Similarly, pacifier use in the hospital is discouraged by the BFHI because it is believed to interfere with the establishment of breastfeeding. Among our sample, pacifier use in the hospital was negatively associated with duration for non-Hispanic White and both groups of Hispanic women, but positively associated with duration among Native American women. These findings are contradictory to previous research and point to the need for more research that looks specifically at the birthing and breastfeeding beliefs and practices of Native American and Spanish- and English-speaking Hispanic women and how these beliefs and practices might not be supported by or consistent with practices supported by the BFHI.

These findings suggest that practices thought to promote breastfeeding might vary for women of different racial and ethnic backgrounds, and this should be considered when hospitals and health systems are implementing practices intended to promote and support breastfeeding. These findings also suggest that breastfeeding supports, including informational materials and telephone supports, might not be addressing the needs of all populations of women. Receiving a telephone number to call for breastfeeding support was positively associated with breastfeeding duration for non-Hispanic White, non-Hispanic Native American, and English-speaking Hispanic women but was associated with decreased odds of breastfeeding at 2 months among Spanish-speaking Hispanic women. While it is not clear from our data why this is the case, it could be that support services offered by telephone are not being offered in Spanish or are not culturally appropriate.

Initiatives that promote the uptake of breastfeeding-friendly practices are important to lessen racial and ethnic disparities in breastfeeding duration. Giving only breast milk while at the hospital and being encouraged to breastfeed on demand were associated with longer breastfeeding for all groups of women in our sample. However, both groups of Hispanic women in our sample were less likely than non-Hispanic White women to say that they gave their babies only breast milk at the hospital and Native American women were less likely than non-Hispanic White women to say that they were encouraged to breastfeed on demand.

This study has several limitations. The women in our sample were surveyed months after giving birth but were asked to report on things they experienced in the hospital, introducing recall bias as to what women were able to remember about their hospital stay. In addition, the PRAMS data does not include information about the hospitals in which women gave birth, so we are unable to account for hospital-level variations. We are further unable to account for differences in the implementation of the specific maternity care practices. We cannot know from this data what information, for example, women were given about breastfeeding while at the hospital. Because the PRAMS questionnaire is administered 2–4 months after birth, we can only measure breastfeeding duration for up to 2 months, as some women in the sample could have only been breastfeeding for 2 months at the time they complete the survey. Thus, our findings only provide a limited view of duration, and cannot account for variations in longer breastfeeding durations (i.e., the proportions of women from each racial/ethnic breastfeeding at 6 months or 9 months might look different).

In addition, while our findings are generalizable to the population of women in New Mexico, they might not be generalizable to women outside of New Mexico. Additional research is needed to explore whether these patterns exist among other populations of women. Finally, while other studies have used language as a proxy measure for acculturation, use of this measure of acculturation alone might underestimate the heterogeneity of Spanish-speaking and English-speaking women. Studies using additional measures of acculturation (in particular, those that include amount of time spent in the United States) are necessary to further test the relationships that we found between acculturation and maternity care practices.

Despite these limitations, this study makes important contributions to our understanding of breastfeeding disparities by race, ethnicity, and acculturation. Research on the hospital experiences and breastfeeding practices of Native American women is scarce. The Native American women in our sample have lower 2-month breastfeeding duration rates than do non-Hispanic White and Spanish-speaking Hispanic women and experience breastfeeding-friendly maternity care practices at different rates than other women. Our findings

also point to the need for more research to better understand how supportive the BFHI-supported maternity care practices are for Native American women, as some of our findings were contradictory to findings among other groups of women.

These findings also contribute to the literature on the role of acculturation in understanding breastfeeding rates among Hispanic women. The 2-month breastfeeding duration rates, hospital experiences, and associations between BFHI-supported maternity care experiences and breastfeeding duration were significantly different between Spanish- and English-speaking Hispanic women. Our findings indicate the need for more research to better understand how hospitals serving Hispanic women can provide supportive practices that will be complementary to their cultural norms around birthing and breastfeeding.

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