

# Breastfeeding Initiation, Duration, and Supplementation Among Mexican-Origin Women in Texas

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abstract

**BACKGROUND:** Mexican-origin women breastfeed at similar rates as white women in the United States, yet they usually breastfeed for less time. In our study, we seek to identify differences in Mexican-origin women's breastfeeding intentions, initiation, continuation, and supplementation across nativity and country-of-education groups.

**METHODS:** The data are from a prospective cohort study of postpartum women ages 18 to 44 recruited from 8 Texas hospitals. We included 1235 Mexican-origin women who were born and educated in either Texas or Mexico. Women were interviewed at delivery and at 3, 6, 12, 18, and 24 months post partum. Breastfeeding intentions and initiation were reported at baseline, continuation was collected at each interview, and weeks until supplementation was assessed for both solids and formula. Women were classified into 3 categories: born and educated in Mexico, born and educated in the United States, and born in Mexico and educated in the United States.

**RESULTS:** Breastfeeding initiation and continuation varied by nativity and country of birth, although all women reported similar breastfeeding intentions. Women born and educated in Mexico initiated and continued breastfeeding in higher proportions than women born and educated in the United States. Mexican-born and US-educated women formed an intermediate group. Early supplementation with formula and solid foods was similar across groups, and early supplementation with formula negatively impacted duration across all groups.

**CONCLUSIONS:** Nativity and country of education are important predictors of breastfeeding and should be assessed in pediatric and postpartum settings to tailor breastfeeding support. Support is especially warranted among US-born women, and additional educational interventions should be developed to forestall early supplementation with formula across all acculturation groups.



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**WHAT'S KNOWN ON THIS SUBJECT:** Hispanic women initiate breastfeeding at high levels, supplement soon after delivery, and breastfeed for <12 months. There is some evidence for an inverse relationship between acculturation and the initiation and duration of breastfeeding among Mexican-origin Hispanic women.

**WHAT THIS STUDY ADDS:** Using a proxy, this study confirms large differences by acculturation in breastfeeding initiation and duration. Differences in duration are not explained by intended breastfeeding duration or early supplementation with formula. The latter is negatively associated with duration across all groups.

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Breastfeeding confers health benefits for both mothers and their newborns.<sup>1-3</sup> The American Academy of Pediatrics (AAP) recommends that all women breastfeed for  $\geq 1$  year and exclusively breastfeed for  $\sim 6$  months after delivery. However, most women do not meet this recommendation.<sup>4</sup> Among Hispanic women in the United States, breastfeeding initiation is similar to that of non-Hispanic white women; however, continuation through 6 months is less common,<sup>3,5</sup> and early supplementation with infant formula is pervasive.<sup>6-8</sup> Moreover, breastfeeding practices are not homogenous across Hispanic subpopulations: Mexican-origin women are more likely than other subpopulations, such as Puerto Ricans, to initiate and continue breastfeeding,<sup>9</sup> and foreign-born Mexican women are more likely than US-born Mexican women to initiate and continue breastfeeding longer.<sup>10,11</sup>

To assess how these patterns may result from exposure to mainstream US culture, previous research has relied on measures of acculturation, such as language spoken at home or time spent in the destination country.<sup>12-14</sup> These studies suggest that increased acculturation is associated with lower breastfeeding initiation and breastfeeding for a shorter duration;<sup>7,12,13,15</sup> however, other studies reveal mixed results.<sup>12,16,17</sup> Another way to capture this phenomenon is with a simple classification based on nativity and the country in which the mother completed her last year of education.<sup>10</sup> Nativity and country of education provide contextual information on an important developmental period, tapping into a myriad of influential adults and peers as well as the educational and policy context that may shape a young woman's beliefs and behaviors,<sup>18,19</sup> and they are consistent with the eco-developmental model of acculturation.<sup>17</sup>

Using nativity and country-of-education categories, we assess the likely role of acculturation in Mexican-origin women's breastfeeding plans and practices with data from women who were recruited in 8 hospitals in 6 Texas cities. We examine the proportion initiating breastfeeding, the intended and actual duration of breastfeeding, and early supplementation with formula and solids. Finally, we estimate social, demographic, and behavioral predictors of breastfeeding initiation and continuation, assessing their additional impact on these outcomes above and beyond nativity and education categories.

## METHODS

### Study Population

Participants were enrolled in the Texas Postpartum Contraception Study, a prospective cohort study designed to assess demographics, health patterns, and reproductive health patterns among women ages 18 to 44 who delivered an infant in 8 hospitals across 6 Texas cities (Austin, Dallas, Edinburg, El Paso, Houston, and Odessa) between October 2014 and April 2016 ( $N = 1700$ ). Hospitals were selected to reflect the experiences of women with public insurance or no insurance delivering in large, urban Texas hospitals. The hospitals in El Paso and Austin were included in a previous study examining similar outcomes.<sup>10,20</sup> At the time of data collection, all hospitals had the Texas Ten Step designation, and 2 hospitals achieved the World Health Organization Baby-Friendly Hospital designation.<sup>21</sup> Both programs provide hospital practice guidelines for nurses and lactation consultants to help mothers successfully initiate and continue breastfeeding, including skin-to-skin contact and breastfeeding initiation within one hour of delivery.<sup>21,22</sup> Eligible

participants delivered a healthy neonate, did not want another child for at least 2 years, lived in the hospital's catchment area, and planned to remain in the area for at least one year. After interviewers obtained informed consent, baseline interviews were conducted in person at the hospital after the delivery. Interviews lasted  $\sim 20$  minutes and were conducted in English or Spanish. Respondents completed structured follow-up interviews by phone at 3, 6, 12, 18, and 24 months after delivery. Women were paid \$30 for the baseline interview and \$15 for each follow-up interview. Additional details of sampling and interview procedures are outlined elsewhere.<sup>23</sup>

This analysis is focused on Mexican-origin women who were born in and completed their last year of education in the United States or Mexico, yielding a final sample of 1235 women. Retention at 24 months was 79%. Of the characteristics compared between study completers and those lost to follow-up, there was slightly lower retention for lower-parity women and younger women as well as lower retention at the 6-month follow-up among women born and educated in the United States (Supplemental Table 4). Thus, self-selection bias is unlikely. The Institutional Review Boards of The University of Texas at Austin and the participating hospitals reviewed and approved the study.

### Measures

To capture women's breastfeeding practices, measures of breastfeeding initiation, intended duration, actual duration, and supplementation (with formula and solids separately) were collected. Breastfeeding initiation was captured at baseline according to whether a woman started breastfeeding by the time of the interview. Women who had not yet breastfed were counted as initiating if they reported breastfeeding in the subsequent interview. Intended

breastfeeding duration was measured at the baseline interview with the question, "For how many months do you plan to breastfeed?" Actual duration was captured at each wave. Women were first asked whether they were currently breastfeeding, and if they were no longer breastfeeding, participants were asked, "How many weeks old was your baby when you stopped breastfeeding?" Time to supplementation was measured for both formula and solids at the 6-month interview for women who had ever reported breastfeeding in a previous interview. Women who continued to breastfeed at 6 months post partum were asked, "Are you supplementing with formula or solids?" and if they said yes, they were asked, "How many weeks old was your baby when you first introduced solids?" and "How many weeks old was your baby when you first introduced formula?" Women who were no longer breastfeeding at the 6-month interview were asked the same questions regarding the time when they were breastfeeding.

The exposure of interest was women's country of birth and the country where they completed their education. Women reported country of birth and education as the United States, Mexico, or "other country." Native-born women were asked their race and/or ethnicity, and all women who reported Hispanic identity were considered to be of Mexican origin given historical patterns of immigration to Texas from Mexico and other Latin American countries.<sup>24,25</sup> All women were asked, "In what country did you complete your last year of schooling?" Women reporting "other country" were excluded from the analyses. In a previous study in El Paso and Austin, breastfeeding practices differed across 3 categories, which are used in these analyses: (1) born in the United States and completed education in the United States

(US-US), (2) born in Mexico and completed education in the United States (MX-US), and (3) born in Mexico and completed education in Mexico (MX-MX).<sup>10,20</sup>

Covariates were selected on the basis of previous research.<sup>10,26-28</sup> Characteristics that were only measured at delivery included a mother's age (18-24, 25-29, 30-34, and  $\geq 35$  years), education level, parity, relationship status, and delivery hospital; whether the newborn spent time in the NICU; and delivery type (vaginal or cesarean). Time-varying characteristics, measured at each follow-up interview, included workforce participation, schooling, and cigarette smoking.

### Analysis

We first assessed the distribution of women's characteristics in the full sample and across groups for nativity and country of completed education. We then calculated the percentage of women who initiated breastfeeding and the percentage of women who intended to breastfeed at least 6 and 12 months. We next calculated the percentage of women who breastfed for  $\geq 6$  months and the percentage who breastfed  $\geq 12$  months, comparing across nativity and country-of-education groups using Pearson's  $\chi^2$  statistic. We also reported whether an infant was fed any formula by 1 week of age and fed any solids by 4 months of age, the introductions of which are associated with reduced likelihood of continuing to breastfeed and increased risk of childhood obesity, respectively.<sup>29,30</sup> We then plotted Kaplan-Meier survival curves to compare intended duration and actual breastfeeding across nativity and country-of-education groups.<sup>31</sup>

Next, to determine if social and demographic characteristics explain nativity and country-of-education group differences in breastfeeding initiation, we modeled breastfeeding

initiation using multivariable logistic regression, adjusting for time-invariant baseline covariates that significantly contributed to the model.

To assess whether breastfeeding continuation differences by nativity and country of education are accounted for by other demographic characteristics, we fit Cox proportional hazard models for breastfeeding discontinuation, with SEs clustered by delivery hospital. Schoenfeld tests of proportionality were conducted for all covariates to ensure the appropriateness of covariate inclusion in the models.<sup>32</sup> Covariates included a measure of early formula use, which was collected at the 6-month interview from 962 women, as well as time-varying covariates for workforce participation and cigarette smoking.

Finally, we assessed the number of weeks of breastfeeding until a mother introduced formula and solids, separately. We plotted Kaplan-Meier survival curves by nativity and country of education to assess differences in duration of exclusive breastfeeding as well as time to formula and solids use. We used Wilcoxon tests of equality and rank-sum tests to test for statistical differences in the timing of supplementation. We conducted all statistical analyses using Stata 15.0 (Stata Corp, College Station, TX).

### RESULTS

Of the 1235 women in the sample, 47% were US-US, whereas 20% were MX-US and 33% were MX-MX (Table 1). Nearly half were ages 18 to 24 at delivery, and the majority was either married or cohabiting. By 6 months post partum, 6% reported smoking, and approximately one-quarter had returned to work. US-US women had higher education levels, were younger at delivery, were more likely to be single and primiparous at baseline, and were more likely to smoke and return to work by

**TABLE 1** Mexican-Origin Women Delivering in Texas Hospitals by Nativity and Country of Education (*N* = 1235)

Characteristic	All	US-US	MX-US	MX-MX	<i>P</i>
	<i>n</i> (%)	( <i>n</i> = 575) <i>n</i> (%)	( <i>n</i> = 246) <i>n</i> (%)	( <i>n</i> = 414) <i>n</i> (%)	
Mother's education level at delivery					.49
Less than high school	466 (37.7)	142 (24.7)	70 (28.5)	254 (61.4)	
High school	482 (39.0)	246 (42.8)	131 (53.3)	105 (25.4)	
More than high school	287 (23.2)	187 (32.5)	45 (18.3)	55 (13.3)	
Hospital of delivery					<.001
Austin	206 (16.7)	84 (14.6)	47 (19.1)	75 (18.1)	
El Paso (2)	285 (23.1)	116 (20.2)	52 (21.1)	117 (28.3)	
Dallas	198 (16.0)	33 (5.7)	55 (22.4)	110 (26.6)	
Odessa	76 (6.2)	56 (9.7)	13 (5.3)	7 (1.7)	
Edinburg	295 (23.9)	217 (37.7)	46 (18.7)	32 (7.7)	
Houston (2)	175 (14.2)	69 (12.0)	33 (13.4)	73 (17.6)	
Age at delivery, y					.004
18–24	576 (46.6)	367 (63.8)	113 (45.9)	96 (23.2)	
25–29	328 (26.6)	139 (24.2)	79 (32.1)	110 (26.6)	
30–34	185 (15.0)	46 (8.0)	29 (11.8)	110 (26.6)	
35+	146 (11.8)	23 (4.0)	25 (10.2)	98 (23.7)	
Relationship status at delivery					.82
Single	251 (20.3)	147 (25.6)	44 (17.9)	60 (14.5)	
Cohabiting	495 (40.1)	226 (39.3)	115 (46.7)	154 (37.2)	
Married	456 (36.9)	188 (32.7)	80 (32.5)	188 (45.4)	
Separated, divorced, or widowed	33 (2.7)	14 (2.4)	7 (2.8)	12 (2.9)	
No. children					<.001
1	312 (25.3)	196 (34.1)	55 (22.4)	61 (14.7)	
2	392 (31.7)	195 (33.9)	91 (37.0)	106 (25.6)	
3	271 (21.9)	94 (16.4)	57 (23.2)	120 (29.0)	
4+	260 (21.1)	90 (15.7)	43 (17.5)	127 (30.7)	
Type of delivery					<.001
Vaginal	795 (64.4)	355 (61.7)	160 (65.0)	280 (67.6)	
Cesarean delivery	440 (35.6)	220 (38.3)	86 (35.0)	134 (32.4)	
Newborn in NICU	54 (4.4)	26 (4.5)	11 (4.5)	17 (4.1)	.95
Currently smoking <sup>a</sup>	58 (5.6)	38 (8.1)	7 (3.2)	13 (3.6)	.005
Currently working <sup>a</sup>	267 (25.6)	156 (33.3)	53 (24.5)	58 (16.2)	<.001
Currently in school <sup>a</sup>	86 (8.3)	58 (12.4)	18 (8.3)	10 (2.8)	<.001

*P* values are reported from Pearson's  $\chi^2$  tests.

<sup>a</sup> Smoking, working, and school enrollment were captured at 6 mo post partum (*n* = 1042).

6 months post partum. MX-MX women had the lowest levels of education, were older and more likely to be married, and delivered higher-order births. MX-US women were most likely to be cohabiting.

Eighty-six percent of women initiated breastfeeding in the hospital: 79% of US-US women started breastfeeding, compared with 91% of MX-US women and 94% of MX-MX women (Table 2). Of the women who initiated breastfeeding, 85% intended to breastfeed for  $\geq 6$  months, and 41% intended to breastfeed for  $\geq 1$  year. Intended duration did not vary across nativity and country of education. However, continuation varied significantly across nativity and

country of education (Fig 1). Only 37% of women breastfed for at least 6 months, although this ranged from 23% of US-US women to 38% of MX-US women and 52% of MX-MX women. Twenty-one percent of women breastfed  $\geq 1$  year, meeting AAP recommendations of providing at least some breast milk for  $\geq 1$  year.<sup>4</sup> Significantly more MX-MX women than women educated in the United States, regardless of nativity, met the AAP recommendations (31%). Only 13% of US-US and 20% of MX-US women met this requirement. Figure 2 illustrates the differences in women's intended duration and their actual duration (in months) and reveals that except for MX-MX women, most discontinued

breastfeeding earlier than intended. This difference was most pronounced among US-US women, half of whom had discontinued by 2 months post partum (Fig 2).

Among women who breastfed, nearly half supplemented with formula within 1 week of delivery. Seven percent of women provided solids in conjunction with breastfeeding by 4 months post partum (Table 2). Neither supplementation with formula nor supplementation with solids varied by nativity and country of education (Fig 3). Wilcoxon rank tests of equality and log-rank tests confirmed no differences in the introduction of formula or solids.

**TABLE 2** Breastfeeding Initiation, Intended Duration and Actual Duration, and Supplementation by Nativity and Country of Education

	All ( <i>n</i> = 1235) <i>n</i> (%)	US-US ( <i>n</i> = 575) <i>n</i> (%)	MX-US ( <i>n</i> = 246) <i>n</i> (%)	MX-MX ( <i>n</i> = 414) <i>n</i> (%)	<i>P</i>
Breastfeeding initiation ( <i>N</i> = 1235)	1066 (86.3)	452 (78.6)	224 (91.1)	390 (94.2)	<.001
Breastfeeding intentions <sup>a</sup>					
Intended to breastfeed for ≥6 mo	910 (85.4)	377 (83.4)	196 (87.5)	337 (86.4)	.28
Intended to breastfeed for ≥12 mo	437 (41.0)	174 (38.5)	95 (42.4)	168 (43.1)	.36
Breastfeeding duration <sup>a</sup>					
Breastfed ≥6 mo	392 (36.8)	104 (23.0)	86 (38.4)	202 (51.8)	<.001
Breastfed 12+ mo (met AAP continuation guidelines) <sup>b</sup>	226 (21.2)	60 (13.3)	45 (20.1)	121 (31.0)	<.001
Supplementation by type ( <i>n</i> = 962) <sup>c</sup>					
Infant fed any formula by 1 wk	413 (42.9)	167 (41.2)	93 (44.9)	153 (43.7)	.64
Infant fed any solids by 4 mo	67 (7.0)	25 (6.2)	13 (6.3)	29 (8.3)	.48

*P* values are reported from Pearson's  $\chi^2$  tests for proportion comparisons and from analysis of variance F tests for mean comparisons.

<sup>a</sup> Reported among women who ever breastfed (*n* = 1066).

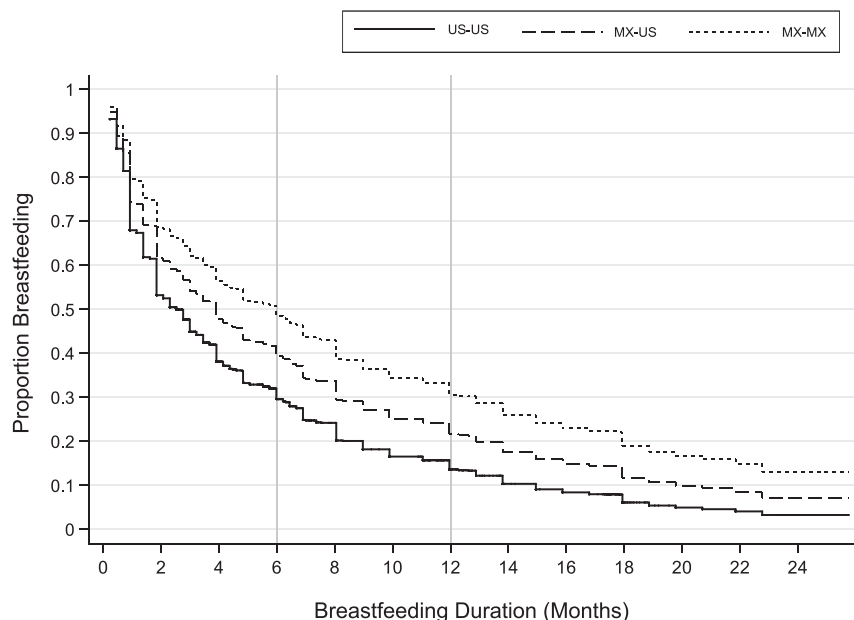
<sup>b</sup> The AAP breastfeeding guidelines recommend that women provide some breast milk for ≥1 y.

<sup>c</sup> Formula and solids questions asked of women who ever breastfed and completed the 6-mo follow-up, which only pertain to the period when they breastfed (*n* = 962). One woman was missing supplementation information, and 82 women were not asked because they never breastfed.

Multivariable logistic regression models with adjustment for possible social and demographic confounders confirmed the differences in breastfeeding initiation by nativity and country-of-education groups (Table 3, logistic regression model). Compared with MX-MX women, US-US women had much lower odds of ever breastfeeding, whereas MX-US

women fell somewhere in between. Older women had higher odds of initiating breastfeeding, whereas higher-parity women had lower odds. Women who had a cesarean delivery had lower odds of ever breastfeeding, but neither NICU treatment nor women's education level were significantly associated with initiating breastfeeding.

Similarly, the hazards model with adjustment for social and demographic characteristics revealed substantial differences in breastfeeding discontinuation across nativity and education groups. US-US women had 69% higher hazards of discontinuing compared with MX-MX women. MX-US women had 30% higher hazards than MX-MX women (Table 3, Cox proportional hazards model). Some social and demographic characteristics were associated with participants' probability for breastfeeding continuation above and beyond their country of nativity and education. Women with higher levels of education and higher parity each had a reduced risk of discontinuing breastfeeding compared with their peers in the sample. However, cigarette smoking doubled the risk of discontinuing, and returning to work increased the risk of discontinuing breastfeeding by 14%. Introducing formula within one week of delivery was associated with a 77% increased hazard of discontinuation.

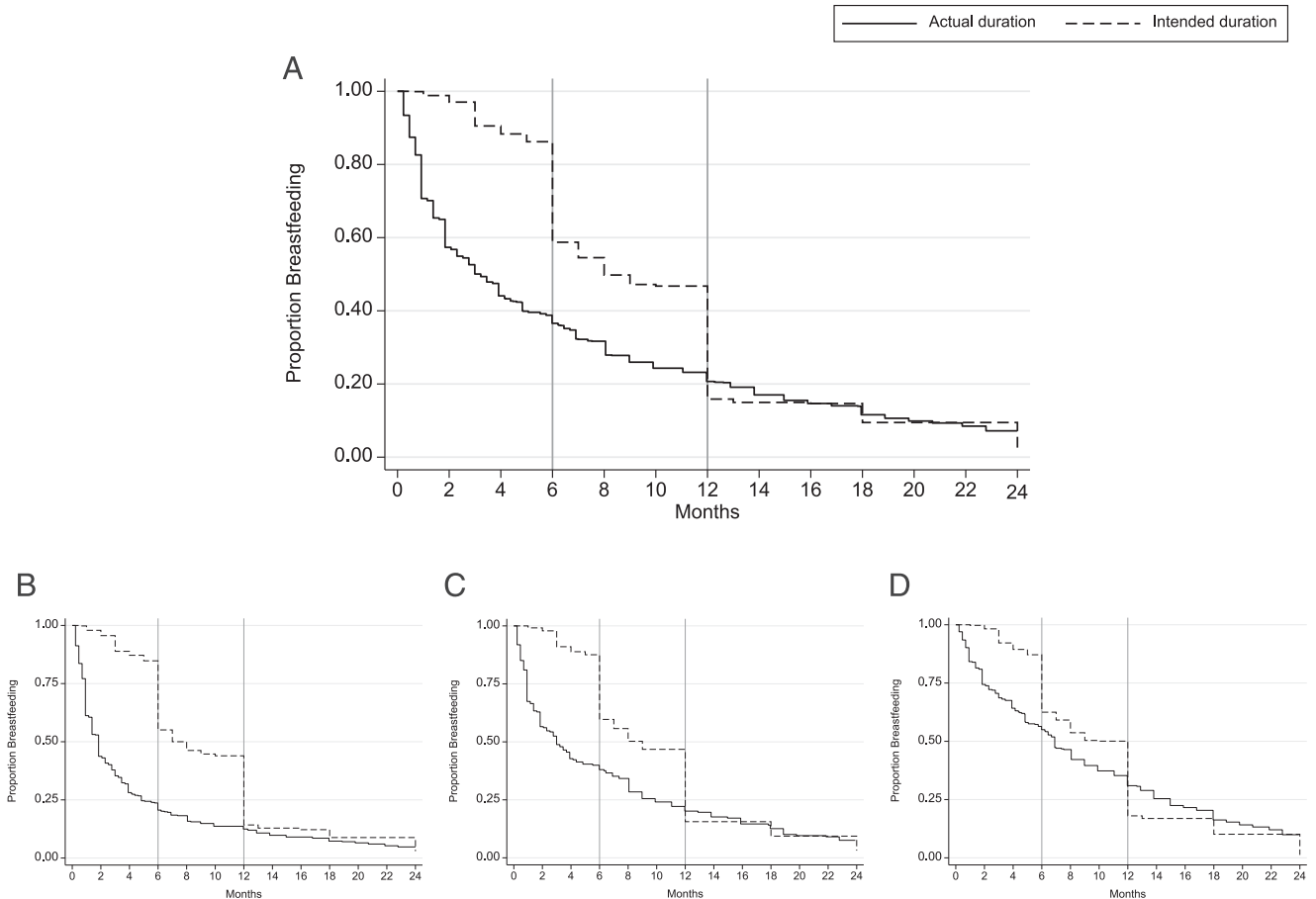


**FIGURE 1** Kaplan-Meier survival curve of months of breastfeeding continuation by nativity and country of education. The graph includes all women who reported any breastfeeding and answered supplementation questions (*n* = 962).

## DISCUSSION

This study revealed large variation in breastfeeding initiation and continuation among Mexican-origin women by nativity and country of education but little variation in





**FIGURE 2**

Kaplan-Meier survival curve comparing months of intended and actual breastfeeding duration. A, Intended breastfeeding duration versus actual duration, full sample. B, US-US. C, MX-US. D, MX-MX.

intended breastfeeding duration and the timing of the introduction of supplementation. Women who were born in Mexico and completed their final year of education in Mexico were more likely to initiate breastfeeding and to breastfeed for  $\geq 6$  months than women who were born and completed their last year of schooling in the United States. Women who were born in Mexico but completed their last year of education in the United States formed an intermediate group. Although the vast majority of women in the sample intended to breastfeed for 6 or 12 months after a birth, most fell short of their plans and discontinued before 6 months post partum. Of note, US-US women had the largest disparity between their intended and actual duration of breastfeeding. Moreover, there was

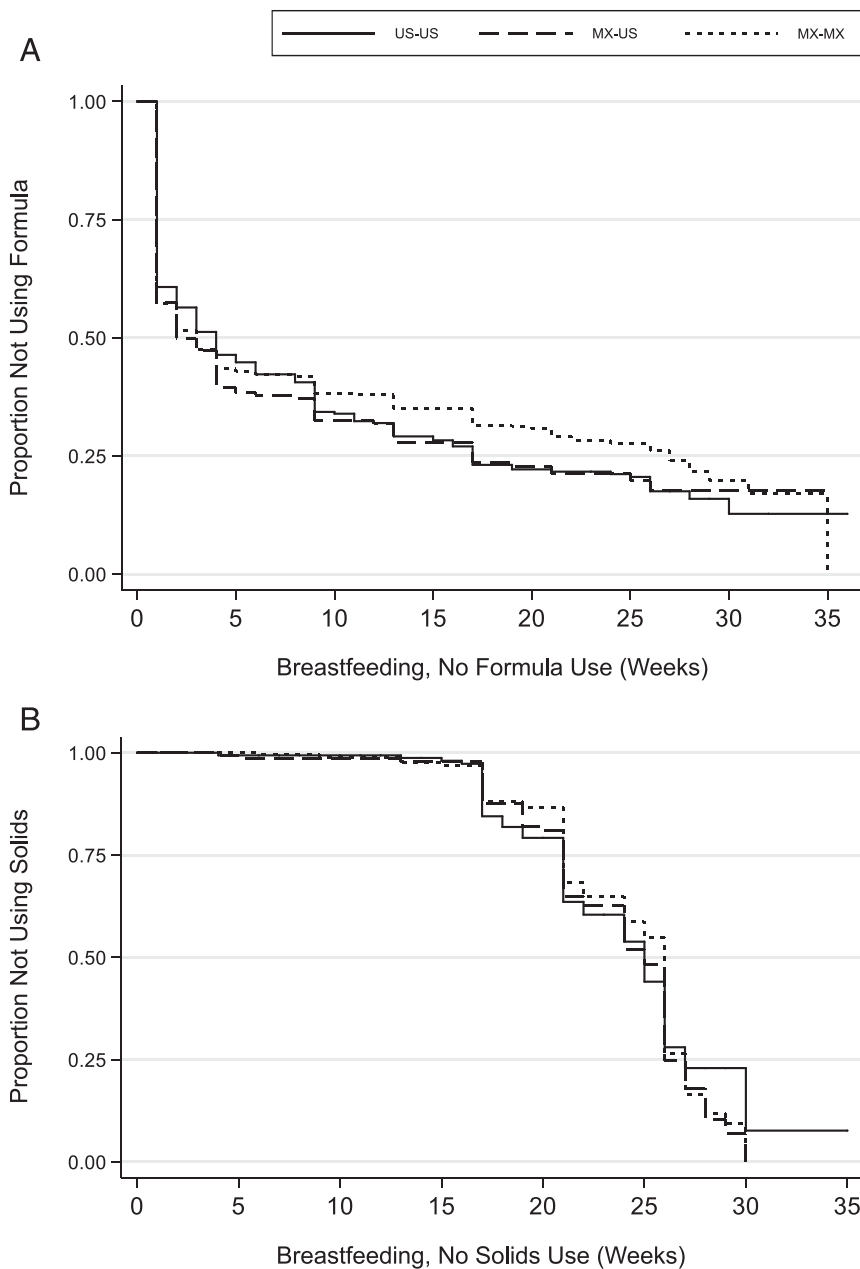
little difference across the 3 groups in early supplementation. The early introduction of formula was common, whereas the introduction of solids before 4 months was rare in all 3 groups.

After accounting for sociodemographic characteristics in adulthood in statistical models, large differences by nativity and country of education persisted. This suggests that the contexts women experience during critical social and behavioral developmental years (ie, their country during early childhood and the school years) are indeed important factors in supporting breastfeeding practices.<sup>10</sup>

The results also revealed that introducing formula within one week of delivery was a strong predictor of

discontinuation, which is consistent with results of other studies of early formula use.<sup>30,33</sup> In addition, returning to work and smoking, which were more common among US-US women, were significant predictors of early breastfeeding discontinuation. These findings are similar to those of other studies that demonstrate that women returning to work are at greater risk of discontinuing breastfeeding.<sup>27,34</sup> Women who start smoking after delivery are also more likely to stop breastfeeding, perhaps because of reduced milk production.<sup>26,35</sup>

Although not concentrated in one subpopulation, early supplementation with formula was common in our sample, with 43% introducing formula within one week of delivery.



**FIGURE 3** Kaplan-Meier survival curve of weeks to supplementation by nativity and country of education. A, Time to formula use. B, Time to solids use.

This finding is consistent with those of other studies revealing that Mexican-origin women often aspire to have large, healthy infants and use complementary feeding, or “*las dos*,” to achieve this goal.<sup>7</sup> Additionally, formula companies in both Mexico and the United States have successfully marketed formula as a healthy alternative to breast milk and make the case for

convenience and ease for new mothers.<sup>36–38</sup> Because women reported desiring to breastfeed for  $\geq 6$  months, physicians and lactation consultants can capitalize on this window of opportunity to reduce early supplementation with formula by educating women on the benefits of breast milk over formula and dispelling common myths that breast milk is insufficient.

Our study has several limitations. Although the sample is large and draws from different regions of the state, it is neither a random sample nor representative of all Mexican-origin births in Texas.

Additionally, our US-born subsample may include a small proportion of Hispanic women whose familial origin may be a country other than Mexico.<sup>24,25</sup> In terms of measures, intended breastfeeding duration was asked after delivery, possibly soon after a woman received breastfeeding education, and responses could have been influenced by social desirability bias. Moreover, our data lack specific measures of hospital-based breastfeeding support, so we are unable to distinguish the support each woman received. In addition, we did not collect a measure of exclusive breastfeeding intentions. Supplementation practices were assessed at the 6-month interview and may be subject to recall bias. Finally, although we controlled for factors known to affect breastfeeding, residual confounding may remain from other characteristics that were not collected.

Despite these limitations, we identified a subpopulation with an opportunity for improving breastfeeding initiation and continuation among Mexican-origin women in Texas: US-born and educated Mexican-origin women had a much lower likelihood of initiating and continuing breastfeeding for 6 months after delivery than women born in Mexico. Only 23% completed 6 months of breastfeeding, although  $>80\%$  intended to breastfeed for at least 6 months. As such, practitioners working with US-born and educated Mexican-origin women should be aware of this disparity and the additional support this population may need to meet their breastfeeding duration goals.

**TABLE 3** Multivariable Logistic Regression of Breastfeeding Initiation and Cox Proportional Hazard Model of Breastfeeding Discontinuation

Characteristic	Breastfeeding Initiation ( <i>n</i> = 1235)			Breastfeeding Discontinuation ( <i>n</i> = 962)		
	Logistic Regression Model			Cox Proportional Hazards Model		
	OR	95% CI	<i>P</i>	HR	95% CI	<i>P</i>
Country of birth and education						
MX-MX (reference)	1.00	—	—	1.00	—	—
MX-US	0.54	0.38–0.77	<.001	1.30	1.11–1.51	<.001
US-US	0.16	0.09–0.27	.001	1.69	1.38–2.06	.001
Age at delivery, y						
18–24 (reference)	1.00	—	—	1.00	—	—
25–29	1.86	1.13–3.06	.02	0.71	0.56–0.90	.005
30–34	2.02	0.96–4.24	.06	0.75	0.59–0.97	.025
35+	1.68	1.21–2.33	.002	0.80	0.56–1.15	.22
Mother's education level at baseline						
Less than high school (reference)	1.00	—	—	1.00	—	—
High school graduate	1.03	0.70–1.51	.89	0.91	0.82–1.02	.12
More than high school	1.30	0.78–2.16	.32	0.76	0.63–0.92	.004
No. children						
1 (reference)	1.00	—	—	1.00	—	—
2	0.43	0.23–0.81	.009	1.06	0.94–1.20	.31
3	0.18	0.07–0.43	<.001	0.93	0.73–1.18	.54
4+	0.24	0.12–0.45	<.001	0.80	0.65–0.98	.04
Newborn in NICU	0.45	0.19–1.08	.08	1.05	0.73–1.53	.77
Type of delivery						
Vaginal (reference)	1.00	—	—	1.00	—	—
Cesarean delivery	0.68	0.50–0.92	.01	1.08	0.90–1.30	.40
Introduced formula within 1 wk	—	—	—	1.77	1.55–2.02	<.001
Cigarette smoking (time varying)	—	—	—	2.00	1.52–2.62	<.001
Working (time varying)	—	—	—	1.14	1.03–1.26	.009
Constant	54.39	22.46–131.71	<.001	—	—	—

*P* values are obtained through 2-tailed tests. CI, confidence interval; HR, hazard ratio; OR, odds ratio; —, not applicable.

Although our results revealed that nativity and country of education were important breastfeeding predictors among Mexican-origin women in Texas, future research is needed to identify whether these results are generalizable to other Hispanic subpopulations in other regions of the United States. Finally, our measure of nativity and country of education can be used by practitioners as an indicator of subpopulations in which there is a pressing need to provide timely guidance and lactation management support during the critical first days and weeks after a birth. Support could be provided in well-infant examinations or postpartum visits, or women could be referred to peer counseling or infant-friendly support groups including the Baby Café.<sup>33,39–43</sup>

## CONCLUSIONS

This study demonstrates how acculturation is related to breastfeeding practices among Mexican-origin women in Texas. There is an opportunity to support breastfeeding women at well-infant and postpartum visits, especially among US-native, Mexican-origin women whose breastfeeding intentions exceeded their eventual practice. A second issue, predominant in all 3 nativity and education groups, was the introduction of infant formula within a few weeks of delivery and its corresponding negative impact on breastfeeding duration. This finding, although not unexpected, strongly suggests the need for renewed efforts to prevent the unnecessary use of infant formula among Mexican-origin women, who should be informed that this practice

increases the risk of shorter breastfeeding duration.

## ACKNOWLEDGMENT

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## ABBREVIATIONS

AAP: American Academy of Pediatrics  
 MX-MX: born in Mexico and completed education in Mexico  
 MX-US: born in Mexico and completed education in the United States  
 US-US: born in the United States and completed education in the United States



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