Breastfeeding among Latina Mothers, Acculturation, and the Role of Health Care Providers

By

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ABSTRACT

Breastfeeding rates in the United States (U.S.) fall short of public health goals and expert recommendations. While similar demographic factors predict breastfeeding among Latinas as in the population of U.S. women at large, culture influences both breastfeeding success and breastfeeding difficulties. Because suboptimal breastfeeding generates substantial economic and health costs for mothers and infants, increasing breastfeeding rates in the U.S. should be considered an important population health goal. To this end, a number of breastfeeding promotion interventions have been studied.

The first part of this paper is a systematic review of the effectiveness of health care provider-led breastfeeding promotion interventions in Latina mothers. Synthesis of the evidence suggests that these interventions moderately increase breastfeeding duration among Latina women.

The original manuscript that follows the review assesses the relationship between acculturation and breastfeeding duration and difficulties in a small prospective birth cohort of Latina mothers. In this population, women with more Latina-oriented cultural identities breastfed longer and more exclusively and experienced a different pattern of breastfeeding difficulties than more acculturated women. This study is unique in its use of a formal, long-form acculturation scale. It is also the first study to our knowledge to describe the association between acculturation and breastfeeding difficulties.
Review: Health Care Provider-Led Interventions to Promote Breastfeeding among Latinas

Kathryn McKenney

ABSTRACT

Background. Current breastfeeding rates among Latina women in the United States fall short of both public health goals and expert recommendations for duration and exclusivity. Some studies have found that Latinas experience a different pattern of breastfeeding difficulties than women of other ethnicities. Suboptimal breastfeeding results in substantial economic and health cost for mothers and infants. Reviews of a variety of health care provider-led interventions to promote breastfeeding suggest that these interventions produce a moderate benefit, but none of these reviews have focused on Latina women in particular.

Objective. We sought to examine whether breastfeeding promotion interventions led by health care providers, compared to usual care, prolong duration of breastfeeding among Latina mothers in the United States.

Methods. We searched the National Library of Medicine database through PubMed from 2000 to 2014, as well as the reference list of a recent review of breastfeeding interventions among minority women. We included English-language articles that described randomized, controlled trials of health care provider-led, maternal breastfeeding promoting interventions conducted in the United States and reporting breastfeeding duration as an outcome. One reviewer abstracted descriptive data from each study, including setting, population, intervention, outcomes, follow-up, and findings. The same reviewer assessed study quality based on potential for selection and measurement biases as well as appropriateness of analysis.

Results. We identified 143 potentially relevant articles, of which we included four in our review. Each of the four articles describes a randomized, controlled trial of a health care provider-led
breastfeeding promotion intervention with a study population comprising a majority of Latinas. Quality of the studies ranged from poor to good. Two studies reported a positive effect of the tested intervention on breastfeeding duration, while two reported no effect.

**Conclusions.** The available evidence suggests a moderate likelihood of moderate benefit of health care provider-led breastfeeding promotion interventions on duration of breastfeeding among Latinas. The harms from breastfeeding promotion are likely minimal, and the health benefits of breastfeeding are numerous; further, suboptimal breastfeeding produces substantial health and opportunity costs. Thus, provider-led breastfeeding support interventions may help reduce health care costs and could help mothers achieve their breastfeeding goals, all while improving maternal and infant health.
BACKGROUND

Current breastfeeding rates in the United States (U.S.) fall well short of professional organizations’ clinical recommendations. The American Academy of Pediatrics (AAP), the American College of Obstetricians and Gynecologists (ACOG), and the World Health Organization (WHO) recommend exclusive breastfeeding for all infants through six months,\(^1\)–\(^3\) and the AAP and WHO recommend continued breastfeeding for one year or longer.\(^1\)–\(^3\) Toward that goal, the U.S. public health campaign Healthy People 2020 recommends targets of 81.9%, 60.6%, and 34.1% for babies breastfed ever, for 6 months, and for one year, respectively, and 25.5% breastfed exclusively through six months.\(^4\) National Immunization Survey numbers show that breastfeeding rates for babies born in 2010 were approximately 77%, 49%, 27%, and 16% for babies breastfed ever, for 6 months, for one year, and exclusively for six months, placing us 20% to 37% short of Healthy People 2020 targets\(^4\) for duration and exclusivity.

More than half of mothers who initiate breastfeeding do not breastfeed for as long as they intend because of breastfeeding-related concerns or difficulties.\(^5\)–\(^6\) A variety of factors are associated with successful breastfeeding initiation and continuation in the U.S., including maternal age, income, education, marital status, mental health, country of origin, and ethnicity.\(^7\)–\(^10\) Younger, single mothers and those with low income or less than college-level education are less likely to breastfeed at all and for recommended durations than are their older, married, wealthier, more educated counterparts.\(^7\)–\(^9\) On the other hand, mothers with better emotional and mental health status are more likely to breastfeed.\(^9\)–\(^10\) Foreign-born mothers are more likely to breastfeed than US-born mothers.\(^9\) Non-Hispanic black mothers have the lowest rates of initiation and continuation of breastfeeding, while Latina mothers breastfeed at similar or higher rates as and non-Hispanic white mothers.\(^7\)–\(^9\)
While Latinas initiate breastfeeding at rates close to national goals, they lag behind national targets for breastfeeding duration and exclusivity. Breastfeeding among Latinas varies across similar factors as in the population as a whole—college-educated, wealthier, married Latinas with family and health professional support are more likely to breastfeed. Additionally, Latinas experience a unique profile of barriers to breastfeeding. Compared to mothers of other ethnicities, Latinas are more likely to stop breastfeeding because of latching difficulty; pain or fear of pain; perception of insufficient milk supply or infant preference for formula; inconvenience or interference with desired lifestyle; physical appearance; modesty or embarrassment; and belief that only poor women breastfeed.

Breastfeeding is especially important among women with low income because, in addition to its role as a health-promoting behavior, breastfeeding provides an economic good. A recent evaluation by Smith et al. estimates that in 2010, $45 billion in human milk was produced in the United States. Because of premature weaning, the U.S. is missing out on about 60% of potential value from human milk production, meaning annual economic loss of about $63 billion per year.

Breastfeeding represents more than a commodity, however; breast milk is also a health-promoting dietary element for infants, with well-established health benefits. A 2007 review and meta-analysis by the Agency for Health Research and Quality (AHRQ) of outcomes in developed countries found that breastfeeding lowers mothers’ risk of breast and ovarian cancer and may lower their risk of type 2 diabetes mellitus; that review also found lower odds of a variety of diseases among term babies who were breastfed longer compared to babies who were breastfed for shorter duration or never.
Bartick and Reinhold modeled the effect of breastfeeding on cases and costs of many of those pediatric diseases, including otitis media, gastroenteritis, necrotizing enterocolitis (NEC), lower respiratory tract infection (LRTI) requiring hospitalization, sudden infant death syndrome (SIDS), childhood asthma, leukemia, type 1 diabetes mellitus, and childhood obesity. They found that current rates of breastfeeding, compared with 90% compliance with the expert recommendation to breastfeed exclusively for six months, costs the U.S. an excess $13 billion per year and results in over 900 excess child deaths—most attributable to SIDS, NEC, and severe LRTI. Another study by Bartick et al. assessed the effect of suboptimal breastfeeding on costs related to maternal disease and found that, compared to optimal breastfeeding rates, current breastfeeding rates are associated with over 4,000 potentially preventable maternal deaths and $733 million in direct maternal health costs yearly.

Given the well-established health benefits of breastfeeding, a variety of health care provider-led interventions to promote breastfeeding have been studied. Chung et al. reviewed the evidence for provider-led interventions for the U.S. Preventive Services Task Force (USPSTF). Though clinical and methodologic heterogeneity among the trials they reviewed limited their meta-analysis, they found some evidence that breastfeeding interventions increase rates of short and long term exclusive breastfeeding compared with usual care, with the best outcomes resulting from interventions in which pre- and post-natal interventions were combined. Based on that evidence review, the USPSTF issued a “B” recommendation for breastfeeding promotion interventions, citing convincing evidence of substantial health benefits of breastfeeding, adequate evidence that interventions work, and minimal potential harms. Similarly, the U.S. Surgeon General calls for integrated basic and skilled lactation support in primary care settings, including access to International Board Certified Lactation Consultants (IBCLCs).
We sought to discern whether breastfeeding promotion interventions by health care providers, compared to usual care, prolong duration of breastfeeding among Latina mothers in the United States. Since the USPSTF review, other trials have found positive results from provider-led interventions on breastfeeding duration and intensity. A more recent review of breastfeeding promotion interventions that focused on minority women identified a variety of interventions that improved breastfeeding outcomes, including peer counseling, teams of peer counselors and health professionals, group prenatal classes, and breastfeeding-specific clinic appointments. However, neither of these two reviews focused on Latina women in particular. Because Latina mothers have different breastfeeding patterns and difficulties than mothers of other ethnicities, we chose to focus on this population specifically. Further, this review centers on interventions by health care professionals, excluding studies of breastfeeding promotion by lay health promoters in order to maintain a narrow focus.

METHODS

Search Strategy and Inclusion Criteria

We searched the National Library of Medicine database through PubMed. We used the MeSH headings "Breast Feeding" and "Hispanic Americans" and the keywords breastfeeding, Hispanic, and Latina to locate relevant articles.

A single reviewer (KM) screened titles, abstracts, and full-text articles based on inclusion criteria defined a priori. We required that articles be available in English language full-text; that they describe a randomized, clinical trial of a maternal breastfeeding-promoting intervention; that they be conducted in the U.S.; and that they report breastfeeding duration as an outcome. We
excluded studies that did not assess a health care professional-led intervention, studies whose participants were not a majority Latina, and studies published before January 1, 2000.

We erred on the side of inclusion of titles and abstracts to ensure that we did not exclude relevant studies; studies were not dropped from review until it was clear they did not meet inclusion criteria. Further, the same reviewer searched reference lists of articles for which the full text was reviewed and used the same set of selection criteria for titles selected from those lists. The reference list of a recent review of breastfeeding interventions among minority women was reviewed in the same fashion.29

Data Abstraction

We abstracted descriptive data from each study, including information about study setting, study population, intervention description and duration, type of health care professional leading the intervention, outcomes measures, duration of follow-up, and study findings. For one study, we consulted a companion paper for a more detailed methods description.

Quality Assessment

We assessed study quality based on three main criteria: potential for selection bias, potential for measurement bias, and appropriateness of analysis (Table 1). The rating for selection bias took into account procedures for randomization and initial comparability of groups, as well as missing data, drop-outs, and crossovers. The rating for measurement bias assessed allocation concealment as well as validity and reliability of outcomes measures. The rating for analysis took into account whether the study followed the intention-to-treat principle, how missing data were handled, and whether appropriate covariates were included.

Because composite numeric quality scores overlook the directionality of potential biases associated with individual quality domains,30 we evaluated each of the above quality elements
separately and assigned qualitative ratings to each. We assessed the potential for selection and measurement biases as “low,” “moderate,” or “high,” with “high” representing potential for bias that compromises the study’s validity. We handled studies’ data analysis similarly, rating appropriateness as “poor,” “fair,” or “good.” Finally, taking into account all three components, we assigned an overall quality rating for each trial.

RESULTS

Search Results

Our initial PubMed search yielded 133 titles with full text available (Figure 1). Review of titles yielded 19 potentially eligible abstracts. We chose nine articles for full-text review, and three articles met our inclusion criteria to be included in our review. Review of the references of the nine articles selected for full-text review as well as the references of the recent review by Chapman and Perez-Escamilla\textsuperscript{29} yielded ten additional abstracts and five full-text articles for possible inclusion; one of these articles met eligibility criteria and is included in our review.

Study Characteristics

Each of the included studies was a randomized clinical trial of a health care provider-led breastfeeding promotion intervention. Sample sizes ranged from 104 to 540 participants, totaling 1,367 participants overall (Table 2). Two of the trials took place at urban hospitals,\textsuperscript{26,31} and two were conducted in urban ambulatory care settings.\textsuperscript{32,33} Study populations ranged from 57% to 88% Latina.

Lactation consultants, nurses, or master’s-level clinical social workers facilitated all of the tested interventions. Intensity of the interventions varied substantially between trials, but all consisted of some combination of brief in-person educational sessions, phone calls, and home
visits. Control groups received usual discharge and postpartum care; one study also used a sham phone call for the control group to ensure equal exposure to providers. Duration of the interventions ranged from two weeks to several months. Length of follow-up ranged from three months to one year postpartum.

All studies measured duration of any breastfeeding. Some also measured duration of predominant or exclusive breastfeeding, and one assessed breastfeeding intensity using a 7-level scale.

**Study Quality**

Two of the included studies qualified as good quality, one fair, and one poor (Table 3). All studies had either low or moderate potential for selection and measurement bias, while appropriateness of analysis ranged from poor to good.

All studies had >10% loss to follow-up, and only one demonstrated negligible effect of missing data on the distribution of baseline variables. All studies appeared to use robust randomization procedures, which were for the most part clearly described. Initial groups were comparable with regard to important baseline variables, except in one study, in which baseline differences between groups may have biased the result away from the null.

Only one study concealed participant allocation from those collecting data. The necessity of using maternal self-report to collect data about breastfeeding duration introduces a potential for reporting bias in all four studies, particularly those in which data about breastfeeding outcomes are collected by the provider administering the intervention. Some of the studies asked about breastfeeding behaviors several months retrospectively, which creates a potential for recall bias.
Notably, none of the studies adhered completely to the intention-to-treat principle, since no study analyzed all participants in their originally assigned groups. Additionally, two studies did not clearly account for how missing data were handled\textsuperscript{31,32}, and only one study accounted for the effects of missing data on the originally assigned groups.\textsuperscript{33} None of the studies analyzed Latinas in a separate subgroup designated a priori.

**Overall Findings**

Two of the studies found that the intervention did not produce a significant difference in duration of breastfeeding.\textsuperscript{31,32} However, the two studies whose quality we rated as “good” did find that the intervention significantly increased breastfeeding duration relative to the control.\textsuperscript{26,33} Howell et al. found that mothers in the intervention group breastfed for 12.0 weeks, versus 6.5 weeks in the control group.\textsuperscript{26} Similarly, Bonuck et al. found that mothers who received the intervention were more likely to breastfeed through 20 weeks postpartum (53% vs. 39%).\textsuperscript{34} Of the studies that assessed breastfeeding exclusivity, none found a difference in exclusive breastfeeding, although Bonuck et al. found that the intervention group had higher breastfeeding intensity at both 13 and 52 weeks postpartum.\textsuperscript{34} The two studies with the largest proportions of Latinas\textsuperscript{31,32} found that their interventions had no significant effect on breastfeeding duration or exclusivity.

**DISCUSSION**

Of the studies we reviewed, two met criteria to be labeled good quality, one fair quality, and one poor quality. Common problems include poor allocation concealment as well as failure to truly analyze according to intention-to-treat principles, which require analyzing available data for all randomized participants in their originally assigned treatment groups.
Taken in sum, the studies included in this review found a null to positive effect of health care provider-led breastfeeding promotion interventions on breastfeeding outcomes among Latinas. The two studies rated as “good” quality found that provider-led interventions increased duration of breastfeeding, while the studies rated as “fair” and “poor” quality did not find an effect. Among studies that measured intensity/exclusivity, one found no effect on exclusivity, while the other found increased BF intensity at 13 and 52 weeks.

The studies whose populations comprised the highest proportion of Latinas were also the two lower quality studies, limiting interpretation of their findings in that population. Perhaps surprisingly, the two studies that found a positive effect fall at both extremes in terms of intervention intensity: participants in the study by Howell et al.\(^26\) had the least study contact time, consisting of one fifteen-minute face to face visit and one phone call, while those in the study by Bonuck et al.\(^28\) received multiple prenatal and postnatal visits and had telephone access to an on-call lactation consultant.

Several factors limit our review. First, the studies we reviewed were methodologically heterogeneous. Study populations differed geographically and ethnically. Three of the studies took place in New York or New Jersey, while one was conducted in Colorado, where breastfeeding rates are somewhat lower.\(^35\) The proportion of Latinas ranged from 57% to 88%.

Similarly, differences between interventions limit direct comparison. Two of the studies were conducted in outpatient settings and two in inpatient labor and delivery settings. Some interventions used lactation consultants, while others used nurses or social workers. Two interventions took place both prenatally and postpartum, while the others were restricted to the postpartum period. Intervention type and intensity varied from study to study, as did descriptions of the “usual care” provided to comparison groups. Duration of follow up ranged from three
months to one year. Perhaps most importantly, no two studies measured breastfeeding outcomes the same way.

Conclusions from this review are further limited by lack of measurement of the “usual care” control experience. Though Howell et al. used a “sham” counseling session and phone call to equalize health care provider exposure time between groups, it is difficult to assess what degree of infant feeding-related information was provided to mothers in the “usual care” arm of each study from the descriptions provided. If mothers in the intervention arms received more counseling or provider attention than those in the control arms, any apparent intervention effect may be less a result of effective curricular content and more a result of increased exposure to health care providers. Future studies should more extensively quantify contact time and content of provider counseling to help clarify the true origin of effect.

Finally, despite large proportions of Latina women in each study, the studies’ findings cannot be assumed to be specific to Latinas. None of the studies performed subgroup analysis by ethnicity. If Latinas responded differently to the intervention than women of other ethnicities, study outcomes could be biased toward or away from the null. Further research should consider analyses based on subgroups designated a priori in order to clarify the influence of ethnicity on effectiveness of provider-led interventions.

Despite the limitations of the included literature, the studies we reviewed had large sample sizes (104 to 540), totaling 1,367 participants overall. Additionally, each trial was randomized, minimizing potential for confounding; the four studies also had relatively low potential for selection bias, a problem which often plagues case-control studies of breastfeeding. While the studies focused mostly on low-income, urban, ethnic minority women of healthy infants, this population represents a large proportion of the women who fall most short of breastfeeding
recommendations. Finally, though the interventions these trials assess vary substantively in terms of provider, setting, timing, and intensity, the heterogeneity of the interventions makes the findings of this review more broadly generalizable.

CONCLUSION

Available evidence suggests a moderate benefit of health care provider led interventions on breastfeeding duration among Latinas. Additionally, strong evidence shows that increased breastfeeding duration benefits both infant and maternal health. None of the studies in our review directly assessed the subject of harm from breastfeeding promotion; future studies of such interventions could consider measuring maternal perceptions of shame, guilt, and autonomy in breastfeeding decision making as well as infant growth to assess whether breastfeeding promotion results in negative maternal self-perception or failure to supplement with formula when needed. However, we believe the potential for harm is low. Thus, health care provider-led interventions to promote breastfeeding among Latinas are likely to produce a net benefit for maternal and infant health. Because breastfeeding promotion by health care professionals requires a relatively low volume of health care resources and may reduce illness-related health care spending on mothers and infants, such interventions are likely to be a worthwhile use of health care dollars. Further, because the burden of suboptimal breastfeeding disproportionately occurs in underserved populations, as health professionals and public health advocates we should enact clinical practice and policy changes that support breastfeeding mothers in order to help individual mothers achieve their own breastfeeding goals and to bring evidence-based population-level goals for breastfeeding within reach.
REFERENCES


TABLES AND FIGURES

**Figure 1:** Selection of articles.
**Table 1: Quality Criteria.**

<table>
<thead>
<tr>
<th>Selection Bias</th>
<th>Measurement Bias</th>
<th>Analysis</th>
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<tbody>
<tr>
<td>- Clearly describes randomization procedures</td>
<td>- Allocation concealed from both participants and researchers</td>
<td>- Follows intention-to-treat principle, analyzing all randomized participants in their assigned groups</td>
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<tr>
<td>- Randomization procedures robust</td>
<td>- Outcomes measured at each time point to minimize recall bias</td>
<td>- Appropriate covariates assessed, based on established literature</td>
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<td>- Initial groups comparable</td>
<td>- No difference in methods for measurement of exposure or outcomes between intervention and control groups</td>
<td>- Procedure for handling of missing data clearly described</td>
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<tr>
<td>- Either &lt;10% LTFU/missing data OR clearly demonstrates negligible effect of missing data on distribution of baseline variables</td>
<td></td>
<td>- Sensitivity analyses performed to illuminate any bias caused by missing data</td>
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<tr>
<td>Author, year</td>
<td>Recruitment Setting</td>
<td>Study population</td>
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<tr>
<td>Howell 2014</td>
<td>New York City tertiary care hospital labor and delivery unit</td>
<td>-62% Latina -Low income adult women -BW &gt;2500g, 5m APGAR &gt;7 , access to telephone</td>
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<tr>
<td>Study</td>
<td>Setting</td>
<td>Participants</td>
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<td>Bunik 2010</td>
<td>Denver urban safety net hospital mother-baby unit</td>
<td>-88% Latina -Low income adult women -Access to telephone -Excluded women who did not breastfeed, had prolonged hospital stay, or had infant in NICU</td>
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<td>Petrova 2009</td>
<td>New Brunswick, NJ maternal and pediatric ambulatory care center</td>
<td>-88% Latina -WIC-qualified low income adult women -Singleton pregnancy, HIV negative, no cancer, no illegal drug use</td>
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<tr>
<td>Bonuck 2006</td>
<td>Two Bronx, NY, hospital-affiliated ambulatory health centers</td>
<td>-57% Latina -English or Spanish speaking -Plans to remain in hospital system for prenatal and infant care for one year postpartum -At least two telephone numbers -HIV negative, able to breastfeed, excluded if + for pre-gestational DM, HTLV-1, breast reduction surgery, or hepatitis B or C</td>
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*Number of participants randomized
Table 3: Quality Assessment of Included Trials.

<table>
<thead>
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<th>Study</th>
<th>Potential for Selection Bias</th>
<th>Potential for Measurement Bias</th>
<th>Appropriateness of Analysis</th>
<th>Overall Quality Assessment</th>
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<td>Bunik 2010</td>
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<td>Petrova 2009</td>
<td>moderate</td>
<td>moderate</td>
<td>poor</td>
<td>poor</td>
</tr>
<tr>
<td>Bonuck 2006</td>
<td>low</td>
<td>moderate</td>
<td>good</td>
<td>good</td>
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Original Manuscript: Acculturation and Breastfeeding in a Latina Birth Cohort

Kathryn McKenney and Sandraluz Lara-Cinisomo

ABSTRACT

Background: Duration of breastfeeding among Latinas falls short of targets set by medical and public health experts. Acculturation level and breastfeeding difficulties have been explored separately as explanations for premature weaning among Latinas. Here, we examine these factors simultaneously in a prospective cohort of North Carolina Latinas.

Methods: This study used data collected from a prospective birth cohort, SEPAH-Latina (N=20). Acculturation was assessed at baseline using the Acculturation Rating Scale for Mexican-Americans-II (ARSMA-II) Breastfeeding and breastfeeding difficulties were assessed in the first 12 weeks postpartum.

Results: Low acculturated women were 1.5 times as likely to breastfeed for at least twelve weeks as women in the highest acculturation category (73% vs 50%), and women with the lowest acculturation level were 1.8 times as likely to breastfeed exclusively for twelve weeks or longer (36% vs 20%). Women in the lowest acculturation category reported insufficient milk supply more frequently than women in the highest category (73% vs 50%), who were more likely to report difficulty latching (25% vs 18%) and infant self-weaning (50% vs 0%).
Conclusions: In this prospective sample of North Carolina Latinas, less acculturated women had better breastfeeding outcomes and a different distribution of breastfeeding difficulties. A more comprehensive understanding of the relationship between acculturation and breastfeeding difficulties among Latinas may inform targeted interventions.
INTRODUCTION

United States Breastfeeding Epidemiology

Breastfeeding rates in the United States (US) have been climbing slowly over the last two decades. From 2000 to 2010, the proportion of infants breastfed at six months increased from 34% to 49%, while the percentage breastfed at one year grew from 16% to 27%. Rates of exclusive breastfeeding have climbed at a slower rate; in 2010, 38% of infants were exclusively breastfed at 3 months and 16% at 6 months, compared to 30% and 10% in 2003. In 2013, 77% of infants initiated breastfeeding. Breastfed babies are less likely to experience a variety of serious acute and chronic conditions, and mothers who breastfeed lower their risk of breast and ovarian cancers as well as diabetes, hypertension, and myocardial infarction. Currently, breastfeeding rates in the US as a whole fall about 8 to 15 absolute percentage points short of national goals set by the Healthy People 2020 campaign and even further short of expert guidelines, which recommend that all mothers breastfeed exclusively through six months of age and continue breastfeeding through one year.

Breastfeeding rates in the US vary substantially across ethnicities. Eighty percent of Latina mothers in the US initiate breastfeeding, compared with 59% of black mothers and 75% of white mothers, and Latina women are more likely than black mothers and about as likely as white mothers to continue breastfeeding until their babies are six months (45%) or twelve months old (26%). While the rate of breastfeeding initiation among Latinas has nearly reached the Healthy People 2020 campaign’s goal of 82%, continuation of breastfeeding in that population for six and twelve months falls 16 and 8 absolute percentage points below target rates, respectively.
Factors Associated with Breastfeeding

Cross-sectional and cohort studies have found a variety of maternal factors associated with breastfeeding initiation, duration, and exclusivity in the US as a whole. Rates of breastfeeding initiation are higher among women who are older and more educated and who have live-in partners, higher household incomes, and better mental and emotional health. Similarly, women who breastfeed longer and more exclusively tend to be college-educated, nonsmoking, stay-at-home mothers who have breastfed before and experience few breastfeeding difficulties during the early postpartum period. Barriers to breastfeeding among mothers who stop breastfeeding in the first two months postpartum include difficulty with infant latching, insufficient milk supply, and perception that breast milk along does not satisfy the infant.

Latinas and Breastfeeding

Latinas and Breastfeeding

Latinas and Breastfeeding

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Latinas experience different patterns of breastfeeding difficulties than other mothers. Li et al. describe barriers to breastfeeding in seven categories: lactational, psychosocial, nutritional, lifestyle-related, medical, milk pumping, and self-weaning. They found that Latina mothers were more likely than mothers of other ethnicities to stop breastfeeding because of concern that
breast milk alone did not satisfy their babies.\textsuperscript{5} Other studies have described additional barriers experienced by Latina mothers, including pain or fear of pain; modesty or embarrassment; desire to return to work, school, or social life; and perception that hospitals or providers recommend formula feeding.\textsuperscript{16,44}

**Role of Acculturation**

Among Latina women, immigration status, time in the US, and acculturation modify the likelihood of breastfeeding. In a 2006 study (n=4,207), 90\% of Latina immigrants initiated breastfeeding, compared to 50\% of US-born Latinas; at six months, immigrant Latinas breastfed at more than twice the rate of US-born Latinas (59\% vs 23\%).\textsuperscript{45} An earlier study (n=1,829) found that foreign-born Latina mothers were 70\% more likely than US-born mothers to initiate breastfeeding.\textsuperscript{41} Further, in a California cohort study (n=490), increasing maternal time in the US was significantly associated with both lower rates of initiation and lower rates of continued breastfeeding at six months and one year postpartum.\textsuperscript{43}

Acculturation occurs when individuals from one culture interact continuously with another, changing thinking and behavior patterns in one or both cultures.\textsuperscript{46} Studies of acculturation and breastfeeding have found that U.S.-acculturated Latina mothers are less likely to breastfeed, and those who breastfeed do so for shorter durations than less acculturated women.\textsuperscript{14,15,47–50} Many of these studies (combined N=11,037) have used scales primarily based on language in order to assess acculturation.\textsuperscript{14,47,48} Gibson et al. found that 59\% of low-acculturated Latina women breastfed all of their children, compared to 33\% of high-acculturated women.\textsuperscript{47} Gorman et al. found that low-acculturated women had 1.36 times the odds of breastfeeding compared to high acculturated women.\textsuperscript{48} Ahluwalia et al. found that larger numbers
of low-acculturated women initiated breastfeeding (91%) and continued breastfeeding for 10 weeks or longer (69%) compared to high-acculturated women (80% and 51%, respectively).\textsuperscript{14}

Other studies (combined N=3,020) have used more robust measures of acculturation.\textsuperscript{15,49,50} A study by Kimbro et al. incorporated various cultural engagement variables along with language to assess acculturation; they found that cultural engagement, church attendance, and Spanish language interview were associated with 8%, 18% and 24% increases in breastfeeding initiation.\textsuperscript{15} Another earlier study by Rassin et al. used a longer scale based on other validated scales to assess acculturation; this study found that 53% of low-acculturated Latinas breastfed at two or three weeks postpartum, compared to 36% of high-acculturated Latinas.\textsuperscript{49} A smaller 2013 study also used a shortened version of a previously validated acculturation scale, the Acculturation Rating Scale for Mexican Americans (ARSMA-II).\textsuperscript{46,50} That study by Chapman et al. found that low-acculturated women were significantly less likely to stop breastfeeding compared to high-acculturated women, with a hazard ratio of 0.54; however, when they included maternal age in their model, the effect of acculturation was no longer significant.\textsuperscript{50} To our knowledge, no study has used the full-form ARSMA-II scale or any other formal, previously validated acculturation scale in an assessment of breastfeeding outcomes.

Similarly scant literature examines how difficulties with breastfeeding vary by acculturation status. A 2005 paper (N=460) evaluated reasons why mothers chose not to breastfeed all of their children; they found that low-acculturated Latinas were twice as likely to cite the child’s physical or mental condition and less than half as likely to cite the child’s preference for a bottle as were high-acculturated Latinas.\textsuperscript{47} Aside from that paper by Gibson et al., we are aware of no other paper that has examined acculturation and barriers to breastfeeding.
Study Aims

Because breastfeeding improves both infant and maternal health, studying how acculturation affects both breastfeeding success and breastfeeding difficulties informs development of better interventions to improve breastfeeding success and, by proxy, the health of the mother-infant dyad. This study describes the relationship between acculturation and breastfeeding in a small cohort of Latina mothers in North Carolina. We examine how scores on the ARSMA-II, a long-form acculturation scale, relate to breastfeeding duration, as well as whether barriers to breastfeeding differ by acculturation status.

METHODS

Study Design

The present study analyzes data from SEPAH Latina (Study of Exposure to Stress, Postpartum Mood, Adverse Life Events, and Hormonal Function Among Latinas), a prospective birth cohort study that examined relationships between hormone levels, stress, trauma history, maternal mental health, and lactation success. SEPAH Latina followed 34 women from the third trimester of pregnancy until twelve weeks postpartum during the period of August 2013 until August 2014. Subjects were interviewed in person at 32 to 38 weeks’ gestational age and at eight weeks postpartum as well as by phone at both four and twelve weeks postpartum. Breastfeeding history and intentions were collected at the time of enrollment, and breastfeeding practices were assessed during each postpartum interview.

Study Participants
Participants for the SEPAH Latina cohort were recruited by convenience sampling at the local obstetrics clinic, as well as by word of mouth in the local community. Women were invited to participate if they had a singleton pregnancy, planned to breastfeed for at least two months, and were willing to be followed through 12 weeks postpartum. Women who at the time of enrollment used tobacco products, alcohol, or other street drugs; had untreated thyroid disorders; had psychiatric diagnoses other than unipolar depression; or had any other medical diagnosis that might interfere with breastfeeding were excluded. Our study was approved by the University of North Carolina Internal Review Board, and we obtained informed consent from all participants at study entry.

Variables

Overview. Baseline demographics, acculturation, obstetric history, and breastfeeding history and intentions were assessed at an initial, in-person prenatal interview following enrollment. Information about infant feeding behaviors was obtained as part of each postpartum interview. Interviewers also collected data on time in the U.S., language preference, and country of origin.

Acculturation. Our primary independent variable was acculturation, which was measured at each participant’s prenatal interview using Scale 1 of the Acculturation Rating Scale for Mexican Americans II (ARSMA-II). This scale assumes a linear model of acculturation, from “very Mexican” to “very Anglo” and assesses four components of acculturation: ethnic identity, ethnic behaviors, and ethnic interactions, as well as language. Authors of a 2009 systematic review of acculturation measures in public health recommended that researchers use the ARSMA-II when sufficient resources are available and in depth.
information about acculturation is desired.\textsuperscript{51} ARSMA\textsuperscript{46} and SASH\textsuperscript{52} are the most commonly used scales in public health.\textsuperscript{51}

We modified the ARSMA-II to be inclusive of women of non-Mexican origin, replacing the word “Mexico” or “Mexican” with “Country of Origin” or “Latina.” Scale 1 of the ARSMA-II consists of two subscales: the 13-item Anglo Orientation Subscale (AOS) and the 17-item Mexican Orientation Subscale, to which we refer as the Latina Orientation Subscale (LOS); items are 5-option Likert-type self-rating scales. Questions cover language preferences for a diverse range of activities, as well as contact with Latina and Anglo cultures, food preferences, preferred associations, and cultural self-identification.\textsuperscript{46} We calculated mean scores for each subscale and obtained the overall score for Scale 1, to which we refer as the “ARSMA-II Score,” by subtracting the LOS mean from the AOS mean. ARSMA-II scores are divided into five “Acculturation Levels” ranging from very Latina to Anglicized (Table 1) based on numeric cut-offs. The ARSMA-II also contains an optional, “experimental” second scale that can be combined with Scale 1 results to assign acculturative types. Though we collected responses for the second scale, we did not use those data.

**Breastfeeding.** The primary outcome for this study was rate of any continued breastfeeding at 4, 8, and 12 weeks postpartum. We also examined breastfeeding initiation, exclusivity, and difficulties. Interviewers collected information about breastfeeding by maternal self-report over the phone at 4 and 12 weeks postpartum and in person at 8 weeks postpartum. The interview script asked a number of questions about breastfeeding behaviors, including “Did you ever breastfeed or try to breastfeed this baby?”; “Have you ever fed your baby formula?”; and “Have you completely stopped breastfeeding or pumping milk for your baby?” Our survey also asked about the age of the infant at the first formula feeding and at breastfeeding cessation.
Breastfeeding Difficulties. Interviewers elicited breastfeeding difficulties with a questionnaire shortened from the one created by Li et al. The brief questionnaire asks whether or not the mother experienced each of six difficulties at each time point: problems latching, infant disinterest or self-weaning, insufficient milk supply, pain with breastfeeding, inconvenience of breastfeeding, or needing another person’s help to feed the infant. The questionnaire was administered to all participants, including those who continued to breastfeed through the end of the study.

Analysis

We included only data from participants who completed all waves of the study and at least 75% of the ARSMA-II questionnaire in the analyses (N=21). One participant who had completed all waves of the study was dropped from analysis because of missing acculturation data. For participants with fewer than 25% of answers missing, we replaced missing observations the participant’s mean score for the appropriate subscale (AOS or LOS). Given the descriptive nature of this paper and the small sample size, we did not perform hypothesis testing but instead chose to display relative frequencies for baseline variables and for bivariate comparisons. All analyses were performed using Stata 13 (StataCorp 2013, College Station, TX).

RESULTS

Table 2 displays the demographics, acculturation, and breastfeeding characteristics of our study population (N=20). Income data were missing for two participants. Latina mothers who completed all waves of the study and had sufficient acculturation data were mostly partnered, non-US born immigrants with low employment, low income, and low levels of education.
Seventy percent preferred to speak Spanish. About two-thirds of the women in our sample had other children (N=13), and 85% (N=11) of these mothers had breastfed before.

The average ARSMA-II score was low, representing a preference for Spanish language speaking, listening, reading, writing, and thinking, as well as adherence to traditional Latina cultural practices, association primarily with other Latinas, and self-identification with country of origin. Slightly more than half of mothers were categorized in Acculturation Level I: Very Latina Oriented. No women in our sample had acculturation scores higher than Level III: Slightly Anglo Oriented Bicultural.

All of the women initiated breastfeeding in the immediate postpartum period, and 65% of our study sample continued non-exclusive breastfeeding past the endpoint of our study. All women who breastfed exclusively at any point during the study (25%) also breastfed through twelve weeks postpartum.

Table 3 shows rates of continued and exclusive breastfeeding at twelve weeks postpartum by Acculturation Level. Women with low acculturation— that is, very “Latina” oriented women— were 1.5 times as likely to breastfeed for at least twelve weeks as women in the highest acculturation category. Further, very Latina oriented women were 1.8 times as likely to breastfeed exclusively for twelve weeks or longer. No women in the highest acculturation category in our sample breastfed exclusively.

Most women experienced at least one difficulty with breastfeeding. Over half of women reported insufficient milk supply, with three-fourths of low-acculturated women experiencing this problem, compared to only half of women in the highest acculturation category (Table 4). Women with the lowest acculturation level were less likely to report difficulties with latching
than those with higher acculturation levels (18% compared with 49% in Level II and 25% in Level III). Finally, no women in the very Latina-oriented category reported infant self-weaning, compared to half of women in the high acculturated group.

DISCUSSION

Findings

This study examined the relationship of acculturation to breastfeeding success and breastfeeding difficulties. In this small cohort of Latina women, low acculturation was associated with higher rates of breastfeeding at twelve weeks postpartum. Mothers with low acculturation were also more likely to breastfeed exclusively for twelve weeks or longer. Distribution of breastfeeding difficulties, including milk supply, latching, and infant self-weaning, differed across acculturation levels as well. Low acculturated mothers were more likely to perceive that their milk supply was insufficient to satisfy their infants, while more acculturated women more frequently reported difficulty with latching or with infant self-weaning.

Our findings of higher breastfeeding success rates among low-acculturated Latinas are consistent with results of previous studies on this topic, which have found that low acculturation is associated with increased initiation and duration of breastfeeding. Report by most mothers in our cohort that their breast milk supply was insufficient to satisfy their infants aligns with a previous study that found Latinas were more likely than other mothers to cite this as a problem. The differential distribution of difficulties across acculturation levels found in our population is consistent with prior literature that has examined acculturation and breastfeeding difficulties.
More research into how breastfeeding difficulties vary across acculturation levels is needed, because the body of literature examining this topic is small. Additionally, a larger study of ARSMA-II linear acculturation levels and multidimensional acculturative types among breastfeeding Latinas would help to further characterize how these factors relate to breastfeeding outcomes.

**Limitations**

The small sample size of our pilot cohort limits our analysis. We enrolled only women who intended to breastfeed for at least two months, so our results may not apply to women who do not plan to breastfeed. Further, there may be important differences between SEPAH-Latina participants, who self-selected for an intensive longitudinal study, and other populations. Our sample population is geographically limited; however, we believe that the relationship between acculturation and breastfeeding in this population is likely generalizable to other Latina populations in the US. Importantly, the SEPAH-Latina study population represents only three of five of the acculturation levels designated by Cuellar et al.; this narrow range limits our ability to assess how breastfeeding behaviors may vary across the full spectrum of acculturation levels. Further study of breastfeeding outcomes in a population with more diverse acculturative status may generate a clearer picture of the relationship between acculturation and breastfeeding. Further, the ARSMA-II subscale that we used does not assess acculturation multi-dimensionally. Finally, future covariate analysis may illuminate factors that confound the relationship between acculturation and breastfeeding—for example, the influence of age in the study by Chapman et al.—that we are unable to assess given our small sample size.

To our knowledge, this is the first study of breastfeeding that has used the full-form ARSMA-II linear acculturation scale to assess acculturation among Latinas, and this scale gives
a more complete picture of acculturation status than using language or other short-form scales as proxies for acculturation. Further, this is only the second paper of which we are aware that has examined the association between acculturation and breastfeeding difficulties. Though we did not perform hypothesis testing, in this small sample, we found variation in breastfeeding duration and difficulties by acculturation level, highlighting an important relationship that may inform future interventions to promote breastfeeding among Latina mothers.

**Implications for Further Study**

The findings of this study have important implications for health care providers and other breastfeeding advocates. Latina mothers who are more acculturated may need more guidance and support to encourage longer duration and higher exclusivity of breastfeeding. More acculturated Latina mothers should receive skilled instruction on how to help their babies latch properly as well as on how to assess and maintain infant interest in breastfeeding. On the other hand, health care providers should reassure low-acculturated women that their traditional cultural practice of breastfeeding is a healthy choice for them and their infants, and providers should mothers verify whether their milk supply is adequate for their infants. Focusing on culture-specific breastfeeding support needs may increase the effectiveness of breastfeeding promotion interventions.
References:


TABLES AND FIGURES

Table 1: ARSMA-II\textsuperscript{46} Acculturation Levels.

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Very Latina Oriented</td>
</tr>
<tr>
<td>II</td>
<td>Latina Oriented to Approximately Balanced Bicultural</td>
</tr>
<tr>
<td>III</td>
<td>Slightly Anglo Oriented Bicultural</td>
</tr>
<tr>
<td>IV</td>
<td>Strongly Anglo Oriented</td>
</tr>
<tr>
<td>V</td>
<td>Very Assimilated; Anglicized</td>
</tr>
</tbody>
</table>
### Table 2. Characteristics of Study Population (N=20).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Mean (SD) or Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>29.9 (6.5)</td>
</tr>
<tr>
<td>Partnered</td>
<td>85%</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Middle school or less</td>
<td>65%</td>
</tr>
<tr>
<td>High school or GED</td>
<td>15%</td>
</tr>
<tr>
<td>College or more</td>
<td>20%</td>
</tr>
<tr>
<td>Employed</td>
<td>20%</td>
</tr>
<tr>
<td>Income to Poverty Ratio (N=19)</td>
<td>1.15 (1.3)</td>
</tr>
<tr>
<td>US-born</td>
<td>20%</td>
</tr>
<tr>
<td>Years in US</td>
<td>14.3 (6.6)</td>
</tr>
<tr>
<td>Language Preference</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>10%</td>
</tr>
<tr>
<td>Spanish</td>
<td>70%</td>
</tr>
<tr>
<td>Both</td>
<td>20%</td>
</tr>
<tr>
<td>Acculturation(^a) (N=20)</td>
<td></td>
</tr>
<tr>
<td>ARSMA-II Score</td>
<td>-1.31 (1.2)</td>
</tr>
<tr>
<td>AOS score</td>
<td>2.89 (1.0)</td>
</tr>
<tr>
<td>LOS score</td>
<td>4.21 (0.5)</td>
</tr>
<tr>
<td>Acculturation Level(^a)</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>55%</td>
</tr>
<tr>
<td>II</td>
<td>25%</td>
</tr>
<tr>
<td>III</td>
<td>20%</td>
</tr>
<tr>
<td>Multiparous</td>
<td>65%</td>
</tr>
<tr>
<td>Prior breastfeeding history(^b)</td>
<td>85%</td>
</tr>
<tr>
<td>Breastfeeding Duration(^c)</td>
<td></td>
</tr>
<tr>
<td>&lt;12 weeks</td>
<td>35%</td>
</tr>
<tr>
<td>≥12 weeks</td>
<td>65%</td>
</tr>
<tr>
<td>Breastfeeding Exclusivity</td>
<td></td>
</tr>
<tr>
<td>Exclusive Breastfeeding &lt;12 weeks</td>
<td>25%</td>
</tr>
<tr>
<td>Exclusive Breastfeeding ≥12 weeks</td>
<td>25%</td>
</tr>
<tr>
<td>Never breastfed exclusively</td>
<td>50%</td>
</tr>
</tbody>
</table>

\(^a\)Among multiparous women
\(^b\)Acculturation Levels were assigned based on the ARSMA-II score cut-offs described in the paper by Cuellar et al. on page 285,\(^46\) as follows:
Level I: Very Latina Oriented;
Level II: Latina Oriented to Approximately Balanced Bicultural;
Level III: Slightly Anglo Oriented Bicultural;
Level IV: Strongly Anglo Oriented;
Level V: Very Assimilated, Anglicized.
No women in our study had scores qualifying for Levels IV or V.
‘100% of women in the study initiated breastfeeding. At the time of prenatal interview, 24% of women intended to also feed their infants formula.
<table>
<thead>
<tr>
<th>Duration of Any Breastfeeding</th>
<th>All women</th>
<th>Acculturation Level&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N=11)</td>
<td>I (N=5)</td>
</tr>
<tr>
<td>&lt;12 weeks</td>
<td>33%</td>
<td>27%</td>
</tr>
<tr>
<td>≥12 weeks</td>
<td>67%</td>
<td>73%</td>
</tr>
<tr>
<td>Duration of Exclusive Breastfeeding&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 12 weeks</td>
<td>29%</td>
<td>18%</td>
</tr>
<tr>
<td>≥ 12 weeks</td>
<td>24%</td>
<td>36%</td>
</tr>
</tbody>
</table>

<sup>a</sup>See Table 1 for notes on Acculturation Level.
<sup>b</sup>Among all women who ever breastfed.
Table 4. Percent Experiencing Breastfeeding Difficulties by Acculturation Level.

<table>
<thead>
<tr>
<th>Breastfeeding Difficulties</th>
<th>Acculturation Levela</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I (N=11)</td>
</tr>
<tr>
<td>Difficulty latching</td>
<td>18%</td>
</tr>
<tr>
<td>Infant weaned self</td>
<td>0%</td>
</tr>
<tr>
<td>Insufficient milk supply</td>
<td>73%</td>
</tr>
<tr>
<td>Pain</td>
<td>36%</td>
</tr>
<tr>
<td>Inconvenience</td>
<td>18%</td>
</tr>
<tr>
<td>Needed help from others</td>
<td>18%</td>
</tr>
</tbody>
</table>

aSee Table 1 for notes on Acculturation Level.
ACKNOWLEDGEMENTS

First and foremost, I thank my preceptor and mentor Dr. Sandraluz Lara-Cinisomo, who provided training, guidance, and encouragement throughout my work with the SEPAH-Latina project and my writing of the original manuscript contained here. I also thank the mothers and infants who participated in SEPAH-Latina, as well as my co-workers on the project, including Chihiro Christmas, Mala Elam, Carol Hodgman, Sierra Pierce, Jasmine Plott, Maribel Sierra, and Jayme Wood. Finally, I thank my advisor, Dr. Anthony Viera, and my second reader, Dr. Alison Stuebe, for their expert guidance and feedback on this paper.