Feeding Decisions Among Latina Mothers at UNC

By

Christopher Iskander

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Sue Tolleson-Rinehart, PhD, Advisor

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Date

Jacob Lohr, MD, Second Reader

11 July 2017

Date
ABSTRACT

BACKGROUND: The American Academy of Pediatrics has for years championed the recommendation that mothers exclusively breastfeed their newborns for 6 months continuing to supplement up to 1 year of age. This is a recommendation that has been observed to varying extents by various populations, but has not been tracked within the Latina population.

OBJECTIVE: To identify variables that influence initial feeding decisions, determine the prevalence of breastfeeding by Latina mothers at three months post-delivery, and identify the triggers that prompt mothers to change methods of feeding between the discharge and follow-up.

METHODS: 21 women were recruited to the study shortly after giving birth at UNC Hospitals. These women were administered the initial survey, and then were followed up with at 1-month postpartum.

RESULTS: Of the 21 women recruited, 19 were eligible for follow-up at the time of submission. Of these 19 women, 6 women responded to the follow-up survey, one of whom was recruited early enough to provide follow-up response at 1, 2, and 3 months postpartum. The women who completed follow-up surveys were predominantly born in the United States and unlikely to work outside the home, whereas a smaller proportion of the mothers from the initial survey a group of responses which did include the mothers who followed up were from the United States, but a higher percentage worked outside the home.

CONCLUSIONS: 94.7% of Latina mothers who deliver at UNC leave the hospital intending to breastfeeding their newborns. 57.9% of these women plan to exclusively breastfeed. 50% of those who followed up continued to exclusively breastfeed at 1-month postpartum. Additionally, when conducting follow-up with the Latina population, text message is the ideal form of communication, and when not possible, using a non-hospital affiliated phone line better than using a hospital land line.
ACKNOWLEDGEMENTS

I would like to take this opportunity to thank several people without whom I could not have accomplished and learned as much as I have. First, I would like to thank Dr. Jacob Lohr, my preceptor and second reader, for accepting me as one of his research protégés and for helping me design a project appropriate for my level of learning. His guidance and mentorship throughout the year in both research as well as for a future in pediatrics has been invaluable. I consider myself truly fortunate to have had the opportunity to work with him over the past year. Second, I want to thank Lara Reller for her help as my fellow recruiter and supporter throughout the project. I would not have been able to reach my goals for this research without her help, nor would it have been as enjoyable a process. Third, I would like to thank Dr. Amy Jones for providing me with the foundation of my research, and allowing me to build off of the work she completed the last two years. Last, but certainly not least, I want to thank Dr. Sue Tolleson-Rinehart for being my advisor and first reader on this project. Her investment and efforts in this project go well beyond what could be expected from an advisor. I am truly grateful for her time, teaching, and guidance throughout the entire MPH experience.
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Introduction

In 1997 the American Academy of Pediatrics (AAP) produced formal guidelines recommending that mothers breastfeed their newborns.\textsuperscript{1} As of 2005 these recommendations have been revised and enhanced to encourage mothers to continue exclusively breastfeeding their newborns for the first six months of life, and continue to breastfeed in the next 6 months even while supplementing with other food.\textsuperscript{2} The AAP has based this recommendation on both short- and long-term outcomes for newborns. Myriad studies have demonstrated a correlation between breastfeeding and reductions in numbers of hospitalizations, rates of Type II Diabetes Mellitus, rates of Acute Lymphoblastic Leukemia (ALL) and Acute Myeloid Leukemia (AML), rates of Sudden Infant Death Syndrome (SIDS), and risk of obesity later in adolescence.\textsuperscript{3} Given the potential consequences of each of these outcomes for a child’s development and long-term quality of life, it is imperative that pediatricians present expecting mothers with this information so that they can make an informed decision on how to feed their children.

Hospital-based practices at the time of labor, delivery, and post-delivery recuperation have a distinct influence on the duration and exclusivity of breastfeeding among new mothers, and yet research shows that providers routinely fail to adhere to evidence-based practices.\textsuperscript{4} To assure the delivery of the message about the benefits breastfeeding conveys, institutions must apply systematic, formal analyses of their practice

performance in order to evaluate how effectively patient counseling translates into breastfeeding of newborns. In the event that mothers are not breastfeeding their newborns, providers must make efforts to determine both if the new mother genuinely desires to breastfeed, and what obstacles are preventing her from breastfeeding. It is this formal analysis that yields sustainable results and provides the foundation of improved patient care.

While the origins of quality improvement in health care can be traced back to the mid 19th Century, it was not until the late 1990s and early 2000s that organizations such as the Institute of Medicine and Joint Commission started to introduce comprehensive quality initiatives.\(^5\) Thus it is only in the last fifteen to twenty years that hospital administrations have started to embrace and apply quality improvement as a means of improving outcomes and efficiency. This lag time has left gaps both across the fields of study, but also among subgroups within various fields.

This gap is made evident in the realm of breastfeeding research, as numerous studies have analyzed breastfeeding rates and the variables that determine those rates, but only one study has ever targeted breastfeeding decision making in the Latina population.\(^6\) Within this population it is known that mothers plan to breastfeed upon leaving the nursery, but there has never been a follow-up study to determine if these mothers face external barriers, including cultural or work pressures, that force them to change their planned method of feeding earlier than they initially intend. The significance of these


external barriers lies in the discrepancy between the expected feeding method and the one mothers implement.

It is this discrepancy between mothers’ expectations for their feeding plans, and what they are actually able to implement, that providers must investigate. The standard of care providers can deliver is determined in part by the provider’s ability to identify an element of quality that improves outcomes and then to promote that element. For this reason, providers cannot be blind to the potential disconnect between creating a clinical process and what the patient can actually do to follow that process outside of the clinical setting. Providers must ask specific questions in order to get a sense of the mother’s home and work environments so they can develop a plan that works for a specific mother and her newborn.

The principal outcome in this study is the rate at which Latina mothers are breastfeeding at three months postpartum. The research team identified this time point because it was deemed a reliable surrogate marker for whether a mother would make it to six months of breastfeeding, reaching the time thought to confer breastfeeding’s health benefits on the newborn.

Despite these assumed benefits and a mother’s intention to breastfeed, external barriers may prompt a mother to start supplementing breast milk with formula or even convert to formula exclusively well before that six-month benchmark. The most common barriers include the need to go back to work, and social or cultural pressures.

As is true of other social determinants of health, socioeconomic status can play a significant role in determining breastfeeding rates in particular subgroups of patients. The socioeconomic status of the average Hispanic family is akin to that of the average African
American family and well below that of the average non-Hispanic white family.\textsuperscript{7} Financial need, quite apart from one’s desire to work for other reasons, may mean that Latina women must work to help support their families financially. This necessity to contribute to the family’s finances is often paired with limited educational opportunities, frequently leading to hourly-wage jobs with minimal benefits. Of these limited benefits, one that is seldom considered is the ability to express breast milk while at work. In the process of conceiving the Affordable Care Act, policy makers included a provision stating that employers must provide employees with a space to express breast milk other than a bathroom.\textsuperscript{8} Yet while on paper the law provides mothers with the right to these resources, there is little to no enforcement of the law and thus it is within reason to suspect that many of these women do not have the clean, private space, or the time, in which to pump breast milk. Such constraints mean that Latina mothers may have to make a decision between continuing to breastfeed or going back to work to help support their families.

Even those women who may not have to make the decision between going back to work and breastfeeding may still face what they perceive to be social or cultural pressures to stop breastfeeding. These pressures can stem from embarrassment of to having to nurse a newborn every two hours which may require exposing one’s breast while in public.\textsuperscript{9} The unwanted attention and anxiety that come with it, may then force a mother to stop breastfeeding in favor of bottle feeding, which carries much less perceived social stigma

\textsuperscript{8} Affordable Care Act 29 U.S.C. § 207 (2010)
and thus allows the mother to avoid months of social isolation. A mother’s concerns about her body image can also act as a barrier because of concerns that breastfeeding will cause sagging of the breasts or lead to unflattering changes in body shape that can cause further anxiety. In light of the subjective nature of the embarrassment and body image concerns a mother might have, gaining a better understand of these anxieties is vital to a provider’s ability to counsel new mothers effectively.

Given the known benefits to breastfeeding and the paucity of research about women’s decision-making processes, it is not only imperative that pediatricians encourage breastfeeding, but that they analyze the environment within which they practice in order to evaluate the quality of care they deliver to their patients. A survey such as the survey presented in this study can help achieve both aims. Such a survey can determine the rate at which Latina mothers are breastfeeding at three months postpartum, and can identify the “right questions” pediatricians need to ask in order to offer the most patient-centered care to their Latina patient populations.

Pediatricians at UNC Health Care, the quaternary health system of The University of North Carolina, are tasked with counseling a diverse patient population on recommended practices. For this reason patient-reported outcomes (PROs) are important guides for pediatricians as they create treatment plans and identify goals of counseling. Implementing comparative effectiveness research is necessary to determine whether existing interventions are effective for specific populations or subsets of a population, or if systems or intervention changes are required. This research can then inform best practices for providers, and thus plays an invaluable role in service of both the research and clinical
missions of medicine at UNC and elsewhere. For breastfeeding, this means working to gain a better understanding of what motivates women’s decisions about feeding their babies.

Dr. Amy Jones and her colleagues at UNC demonstrated that 99% of Latina mothers who deliver at UNC breastfeed in some capacity, with 65% exclusively breastfeeding and 35% using a combination of breastmilk and formula.\textsuperscript{10} Although encouraging, these data do not give providers any information on the length of time mothers are providing breastmilk to their babies. Specifically, data are still lacking on the prevalence of breastfeeding by Latina mothers for any time point out from delivery. The study I describe here aims to address this research question by creating and administering two original questionnaires, a baseline survey and a follow-up survey at one, two, and three months. The research team designed both surveys with the intention of using them to identify variables that influence initial feeding decisions, determine the prevalence of breastfeeding by Latina mothers at three months post-delivery, and identify the triggers that prompt mothers to change methods of feeding between the two time points.

\textbf{Methods}

\textit{Recruitment:}

All mothers of neonates in the Newborn Nursery at North Carolina Children’s Hospital who self-identify as Latina and are 18 years of age or older were eligible to participate in the study. Otherwise eligible patients were excluded if the treating physician deemed the patient’s condition not stable enough for participation. Upon obtaining UNC IRB approval for the study and for all subsequent survey modifications, the recruitment

\textsuperscript{10} Jones A, et al.
team, composed of Lara Reller, R.N. and me, began to recruit eligible mothers in the Newborn Nursery within the window of twelve to seventy-two hours after delivery. Having passed the UNC Hospitals interpreter examination, Ms. Reller focused on recruiting primarily Spanish speaking mothers, while I focused on recruiting primarily English speaking mothers. Recruiters initially described the study, risks, and measures taken to protect patient identity to potential patients and then obtained written consent. After obtaining consent patients were instructed on how to complete the online survey using their personal mobile device or a recruitment mobile device.

**Questionnaire Design:**

Prior to recruiting patients, the research team adhered to usual best survey practices to develop the questionnaires. The initial survey, which can be found in Appendix A, consisted of twenty-two items each of which fell into one of four domains: the decision making process, past experiences, future plans, or demographic information. The introductory questions to the survey focus on the decision making process, asking questions concerning the timeline the mother used to make her decision, how she was fed as a baby, what she anticipated might sway her decision, and the type of feeding she thinks best for her baby's growth and development. The fifth indicator in this domain (see Figure 1) effectively acts as five questions by gathering information about advice from others, fiscal concerns, and work constraints.

Figure 1 about here

The second domain, past experiences asks about exposure to the Supplemental
Nutrition Program for Women, Infants and Children (WIC), level of anxiety about starting respective methods of feeding, initial impressions after starting, and methods of feeding used for previous children. The third domain, future experiences, asks about the intended method of feeding for the baby, anticipated length of time (in weeks) that feeding method will be used, and plans to feed future children, should she choose to have more. The fourth domain collects demographic and acculturation information.

Upon finalizing the items to include in the questionnaire, we used standard best practices to translate it into Spanish. This began with its initial translation performed by a native Spanish speaker. The translation was then back-translated into English by a second native Spanish speaker, and finally re-translated from English into Spanish by a third native Spanish speaker.11,12 This process was implemented in order to ensure that the meaning of the English instrument was not lost in translation. All translators used Mexican dialect Spanish, since the overwhelming majority of Latina mothers delivering at UNC are of Mexican descent. This process was applied both to the initial and follow-up surveys. The English version of the initial questionnaire can be found in Appendix A; the Spanish version is available from the study investigators on request.

Follow-Up:

As part of the initial survey encounter, willing participants listed their contact information (email addresses and/or phone numbers) with the understanding that they would be contacted by a member of the recruitment team at one, two and three months

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post-delivery. At each of those intervals, a follow-up survey was administered by sending the participant a link to the questionnaire. The items in this survey asked how the participant was currently feeding her baby, the length of time she had been feeding the baby this way, how much longer she intended to feed her baby this way (both in weeks), and if she had made a change in the method of feeding she was using for her baby. The survey then included items specific to the participant’s answer about how she initially was feeding the baby upon discharge from the hospital. These items aimed to gauge the extent to which various influences affected the mother’s decision about whether to switch methods of feeding.

Results

At this time, we are still early in the data collection phase of this ongoing project and thus only have data from the baseline survey and the one-month follow-up surveys. To date twenty-one women have been recruited to the study, but at the time of this submission, nineteen of the twenty-one women recruited were eligible for follow-up. Demographics of these women can been seen in Table 1. Of these nineteen women, six women (31.6%) responded to the follow-up survey, one of whom was recruited early enough to provide follow-up response at 1, 2, and 3 months postpartum.

Table 1 about here

The women who completed follow-up surveys were predominantly born in the United States (83.3%) and unlikely to work outside the home (16.7%), whereas a smaller proportion of the mothers from the initial survey - a group of responses which did include
the mothers who followed up - were from the United States (47.4%), but a higher percentage worked outside the home (26.3%).

At the time of the initial survey, eleven mothers chose to breastfeed, one chose to bottle-feed, and seven chose combination feeding for their newborns, a distribution noticeably different from the 1-month follow-up responses who were evenly split between breastfeeding and combination feeding (Table 2).

Table 2 about here

Of the mothers who submitted a follow-up survey, only one mother changed her method of feeding during the 1-month interval between delivery and the first follow-up. Additionally, one mother who was enrolled early on was able to submit surveys for 1, 2, and 3-month follow-up, and reported breastfeeding for that entire time period with the intention to continue exclusively breastfeeding until six months postpartum. We are too early in the study to analyze the influence of external forces in any of these decisions or to analyze patterns of consistency or change over time.

Discussion

Previous research has shown that mothers are less likely to retain counseling administered in the immediate postpartum period (24-48hrs) because of physiologic and psychological stressors.\textsuperscript{13,14} Furthermore, Dr. Jones and her colleagues discovered most mothers make their decision about feeding before pregnancy, regardless of the method

they intend to use.\textsuperscript{15} Yet despite this evidence, counseling is often delayed until the mother goes into the hospital to deliver.

Given this state of counseling on feeding, it is important that pediatricians recognize that their window of opportunity is well in advance of the newborn’s delivery. In addition to recognizing when best to counsel, providers should adjust their goals of counseling, in order to tailor counseling to patients’ needs, wants, and concerns. Greenberg and colleagues conducted seminal research on this topic, finding that the mothers’ expectations and those of their pediatricians all too commonly were misaligned.\textsuperscript{16} Discordant practices leave patients feeling as though there are gaps in the level of care they received. Although as clinicians we strive to understand and apply the science of medicine with the unchanging objectivity it seems to demand, many instances of patient care require not this perspective of the “science” of medicine but, instead, a sensitivity to the “art” of medicine, including balancing an appreciation of variation in patient experience, and ultimately in outcomes, with the best evidence. This is why PROs are so valuable to us, the providers: they offer a systematic approach to collecting and understanding patient beliefs, expectations, and intentions, and consequently better equip providers to counsel, treat, and satisfy the needs of our patients “where they are.”

Although the number of follow-up responses reported here is not as robust as hoped and the opportunity to learn more about our counseling techniques limited, to date this study has provided ample opportunity to learn about this population of patients who are being cared for at UNC. From the outset the means of communication for follow-up was...

\textsuperscript{15} Jones A, et al.
a vital piece of the process, and one the research team discussed at length. The research team suspected that phone calls would be the best means of communicating with participants long-term because it created a more personal connection between the mother and the team. While phone calls were more effective than emails, text messaging participants with a brief message and the link to the survey proved to be the most effective method of the three.

Moreover, it was determined that the source of the phone call to participants was imperative to success in reaching them. Of the phone calls dialed from a UNC Hospitals land line, nearly all went to voicemail. Meanwhile calls made from a personal line were picked up at a much higher rate. This discrepancy in calls picked up between personal and UNC Hospital phone lines leads us to believe that these mothers seek to avoid repeated contact with the institution of UNC, although the source of that possible reluctance to communicate with UNC Health Care cannot be determined from these data.

This finding is of even greater interest when combined with the breakdown of country of origin within the follow-up responses. Five of the six women who responded were born in the United States, yet over half of the women enrolled in the study were born outside of the United States. This disproportionate response rate in conjunction with the discrepancy in calls picked up between personal and UNC Hospital phone lines hints at the notion that many of the women not born in the United States are afraid to follow-up with the study because they view the institution of UNC as an extension of the government. Given UNC’s reputation as “the state’s hospital,” these women seem to avoid repeated interaction. While we feel it inappropriate to speculate, it would be reasonable for a mother whose immigration status is in question to be hesitant to have repeated interaction with an
institution she believes is a government hospital or at least affiliated with the government in some capacity.

Despite our best efforts, our current political climate seems to have frightened a significant portion of this population. Although prior to consenting patients we explain that contact information is kept private and that as soon as the three-month period is over we delete their information, our response rates suggest mothers within this population do not feel safe with repeated institutional contact. Although difficult to address, this is an obstacle this research team and other research teams must be prepared to encounter as they proceed with research in the future.

In terms of the next steps within this project, once enough survey responses have been collected at the 1, 2, and 3 month intervals, the research team plans to run a survival analysis to determine a general model for the duration of breastfeeding amongst Latina mothers who deliver at UNC. The research team has decided to use a Kaplan-Meier estimator to produce this survival curve on the basis that the data being collected is unlikely to follow a specific distribution and is thus non-parametric. Once generated, this curve would be a useful way to show providers the timeline on which Latina mothers change the method by which they feed their newborns. Early data indicates that Latina mothers understand the value of breastfeeding and intend to do so when they leave the hospital. It is our responsibility as providers to further study any barriers to this goal and address them so that mothers can


Table 1. Delivery and 1-Month Follow-Up Demographics of Participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Delivery</th>
<th>1 Month Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=19</td>
<td>N=6</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>24.4 years</td>
<td>24 years</td>
</tr>
<tr>
<td>Country of Origin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>9 (47.4%)</td>
<td>5 (83.3%)</td>
</tr>
<tr>
<td>Mexico</td>
<td>7 (36.8%)</td>
<td>1 (16.7%)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (15.9%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Years of School</td>
<td>11.8</td>
<td>12</td>
</tr>
<tr>
<td>Work Outside the Home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5 (26.3%)</td>
<td>1 (16.7%)</td>
</tr>
<tr>
<td>No</td>
<td>14 (73.7%)</td>
<td>5 (83.3%)</td>
</tr>
<tr>
<td>Languages Spoken at Home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>3 (15.8%)</td>
<td>2 (33.3%)</td>
</tr>
<tr>
<td>English</td>
<td>4 (33.3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (63.2%)</td>
<td>4 (66.7%)</td>
</tr>
</tbody>
</table>

SOURCE: UNC Study of Latina Feeding Decisions, Iskander (PI)
### Table 2: Feeding Method at Delivery and 1-Month Follow-Up

<table>
<thead>
<tr>
<th>Feeding Method</th>
<th>Delivery</th>
<th>1-Month Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=19</td>
<td>N=6</td>
</tr>
<tr>
<td>Breastfeeding</td>
<td>11 (57.9%)</td>
<td>3 (50.0%)</td>
</tr>
<tr>
<td>Bottle-feeding</td>
<td>1 (5.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Combination</td>
<td>7 (36.8%)</td>
<td>3 (50.0%)</td>
</tr>
</tbody>
</table>

SOURCE: UNC Study of Latina Feeding Decisions, Iskander (PI)
Figure 1. Item 5 of the Initial Survey

Many things go into our choices about how to feed our babies. Please look at the list below, and use the slider bars to tell us how much these different things helped you make your decision. Zero means "this did not matter" and 100 means "this mattered very much."*

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>The advice of friends and family</td>
<td></td>
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<td></td>
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<tr>
<td>The cost of formula</td>
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<tr>
<td>My doctor's advice</td>
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<tr>
<td>How much time I would have off from work</td>
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<tr>
<td>Whether I could feed the baby or pump my milk at work</td>
<td></td>
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</tbody>
</table>

SOURCE: UNC Study of Latina Feeding Decisions, Iskander (PI)
Appendix A: Methods

Consent Form

University of North Carolina at Chapel Hill
Consent to Participate in a Research Study
Adult Participants

Consent Form Version Date: 4/27/2016
IRB Study # 16-1251
Title of Study: Decisions Regarding Newborn Feeding by Latina Mothers at Delivery and at Three Months Post Delivery
Principal Investigator: Jacob Lohr
Principal Investigator Department: Pediatrics
Principal Investigator Phone number: (919) 966-2504
Principal Investigator Email Address: jacob_lohr@med.unc.edu
Co-Investigators: Chris Iskander, Lara Reller

What are some general things you should know about research studies?
You are being asked to take part in a research study. To join the study is voluntary. You may refuse to join, or you may withdraw your consent to be in the study, for any reason, without penalty.

Research studies are designed to obtain new knowledge. This new information may help people in the future. You may not receive any direct benefit from being in the research study. There also may be risks to being in research studies.

Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study.

You will be given a copy of this consent form. You should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?
The purpose of this research study is to examine the factors that influence Latina mothers' decisions to initiate breastfeeding, bottle feeding, or both, and to examine factors that may prompt Latina mothers to switch feeding methods within the first three months after delivery. You are being asked to be in the study because you have self identified as a Latina mother of a newborn child.

Are there any reasons you should not be in this study?
You should not be in this study if you are under the age of 18, do not feel that you are healthy enough to participate, or if for any other reason you do not wish to participate.

**How many people will take part in this study?**
There will be approximately 250 people in this research study.

**How long will your part in this study last?**
This study will take approximately 15 minutes of your time for each encounter. There will be three follow-up encounters via phone or email, whichever you prefer. In total this study will take up 60 minutes of your time.

**What will happen if you take part in the study?**
If you consent to the study, you will be asked a series of questions about your background, education, employment and home life. We will also ask you about what influenced your decision to breastfeed, bottle feed, or both. You will then receive a phone call or email at 1, 2, and 3 months after you leave the hospital. Each of these encounters will be used to follow up on your feeding method at those times. If you do not wish to answer a question for any reason, you may choose not to do so. If you have a question at any time, you are free to ask it. If you do not participate in this study, your decision will not influence the medical care that you receive here, and no personally identifiable information about you will be retained for study purposes.

**What are the possible benefits from being in this study?**
Research is designed to benefit society by gaining new knowledge. You will not benefit personally from being in this research study.

**What are the possible risks or discomforts involved from being in this study?**
Some of the survey questions may cause you to be embarrassed or uncomfortable, although this is not the intention of the research team. The researchers made efforts to avoid undue embarrassment or discomfort, and there are no known risks associated with these questions.

**What if we learn about new findings or information during the study?**
You will be given any new information gained during the course of the study that might affect your willingness to continue your participation.

**How will information about you be protected?**
Your answers to the survey questions will be kept anonymous, so that no one can link your responses to your identity. Survey question responses will be stored on a secure computer
system maintained by the UNC School of Medicine. ID numbers, which are unrelated to your identity, will be used to identify survey responses.

Participants will not be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety.

**What if you want to stop before your part in the study is complete?**
You can withdraw from this study at any time, without penalty. The investigators also have the right to stop your participation at any time. This could be because you have had an unexpected reaction, or have failed to follow instructions, or because the entire study has been stopped.

**Will you receive anything for being in this study?**
You will not receive anything for being in this study.

**Will it cost you anything to be in this study?**
It will not cost you anything to be in this study.

**What if you have questions about this study?**
You have the right to ask, and have answered, any questions you may have about this research. If you have questions about the study (including payments), complaints, concerns, or if a research-related injury occurs, you should contact the researchers listed on the first page of this form.

**What if you have questions about your rights as a research participant?**
All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject, or if you would like to obtain information or offer input, you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.
**Participant’s Agreement:**

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.

____________________________________________________
Signature of Research Participant                           Date

____________________________________________________
Printed Name of Research Participant

____________________________________________________
Signature of Research Team Member Obtaining Consent       Date

____________________________________________________
Printed Name of Research Team Member Obtaining Consent
Initial survey questions

Below is the content of the initial survey, and beneath that is a screen shot of one question to demonstrate the format in which participants interacted with the survey.

It is important for us to understand how Latina mothers feed their babies! But this has not been studied very much. We hope you will help us study this important topic. We value the Latina population. We want to learn how Latina mothers feed their babies. We also want to understand why new mothers make the choices they make.

Q1 If you are willing to help us with this study, that will mean taking a short survey now. We will also ask you to take other short surveys later on.
No, I don’t want to take this survey
Yes, I’m ready to start the survey

Q2 When the baby is coming, many women think about whether they want to breastfeed or use formula. And other women don’t think about it until the baby has come. What about you? When did you start thinking about how you would feed your newborn?
Prior to pregnancy
1-12 weeks
13-27 weeks
28 weeks-birth
After birth

Q3 And when did you decide how you would feed your baby?
Prior to pregnancy
1-12 weeks
13-27 weeks
28 weeks-birth
After birth

Q4 How were you fed as a baby?
I was breastfed
I was fed with a bottle
Both
I don’t know

Q5 Many things go into our choices about how to feed our babies. Please look at the list below, and use the slider bars to tell us how much these different things helped you make your decision. Zero means "this did not matter" and 100 means "this mattered very much."
(The following choices will appear on the qualtrics survey tool with a slider bar from 0-100)
The advice of friends and family
The cost of formula
My doctor’s advice
How much time I would have off from work
Whether I could feed the baby or pump my milk at work

Q6 Which kind of feeding do you think will be best for you baby’s growth?
- Breastfeeding
- Bottle feeding
- Both

Q7 Has anyone told you about WIC [Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)]?
- Yes
- No

Q8 Did anything you learned at WIC help you decide how to feed your baby?
- Yes
- No

Q9 How will you feed your baby?
- Breast feeding (including only pumping)
- Bottle feeding
- Both

Breast feeding
Q10 Here are some questions about breastfeeding (or pumping). Please choose the answer that comes closest to what you are feeling.
- I was nervous to start breastfeeding.
- Breast feeding was easier than I thought it would be
- I plan to breast feed my future children

Q11 How long do you plan to breastfeed (or pump)?
(The answer choices will appear on the qualtrics survey tool with in the form of a slider bar measuring weeks planning to breastfeed or pump)

Q12 Do you plan on breastfeeding your future children? (If you choose to have more children)
- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q13 If you already have children, how did you feed them?
- Breastfeeding
- Bottle feeding
Both

**Bottle Feeding**
Q10 Here are some questions about bottle feeding. Please choose the answer that comes closest to what you are feeling.
I was nervous to start bottle feeding.
Bottle feeding was easier than I thought it would be
I plan to bottle feed my future children

Q11 How long do you plan to bottle feed?
(The answer choices will appear on the qualtrics survey tool with in the form of a slider bar measuring weeks planning to bottle feed.)

Q12 Do you plan on bottle feeding your future children? (If you choose to have more children)

Strongly disagree
Somewhat disagree
Neither agree nor disagree
Somewhat agree
Strongly agree

Q13 If you already have children, how did you feed them?
Breastfeeding
Bottle feeding
Both

**Breast and Bottle feeding**

Q10 Here are some questions about breast and bottle feeding. Please choose the answer that comes closest to what you are feeling.
I was nervous to start breast and bottle feeding.
Breast and bottle feeding was easier than I thought it would be
I plan to breast and bottle feed my future children

Q11 How long do you plan to breast and bottle feed?
(The answer choices will appear on the qualtrics survey tool with in the form of a slider bar measuring weeks planning to breast and bottle feed.)

Q12 Do you plan on breast and bottle feeding your future children? (If you choose to have more children)

Strongly disagree
Somewhat disagree
Neither agree nor disagree
Somewhat agree
Strongly agree

Q13 If you already have children, how did you feed them?
Breastfeeding
Bottle feeding
Both

Q14 What is your age?

Q15 What is your country of origin
USA
Mexico
Other

Q16 In the past five years, how many times have you returned to your family’s home country?
Visits

Q17 How many years of school have you had?

Q18 Who lives at home?
Baby’s parents
Baby’s siblings
Baby’s Grandparent(s)
Baby’s Aunt(s)
Baby’s Uncle(s)
Baby’s Cousin(s)

Q19 What language(s) do you speak at home? Check as many boxes as you need.
Spanish
English
Both
Another language

Q20 Do you work outside the home?
Yes
No

Q21 When do you plan to go back to work?
Weeks before going back to work

Q22 Does your employer give workers maternal leave?
Yes-paid
Yes-unpaid
No
Unknown
Q23 Does your employer give workers a private place to pump breast milk?
Yes
No
Unknown

Q24 With your permission, we will be coming to ask you questions again about how feeding is going. Please provide a phone number and/or email address. Thank you again!

Email
Phone number

It is important for us to understand how Latina mothers feed their babies! But this has not been studied very much. We hope you will help us study this important topic.

We value the Latina population. We want to learn how Latina mothers feed their babies. We also want to understand why new mothers make the choices they make.

If you are willing to help us with this study, that will mean taking a short survey now. We will also ask you to take other short surveys later on.

☐ No, I don't want to take the survey

☐ Yes, I'm ready to start the survey.
Follow up survey

Below is the content of the follow-up survey, and beneath that is a screen shot of one question to demonstrate the format in which participants interacted with the survey.

Q1 Hello again, and thank you for your help with our study of how Latina mothers feed their babies!
How are you feeding your baby now?
Breast feeding
Bottle feeding
Both

Q2 How many weeks have you been feeding your baby this way?
(Answer is in the form of an electronic dropdown menu in weeks)

Q3 How much longer do you plan to feed your baby this way?
(Answer is in the form of an electronic dropdown menu in weeks)

Q4 Have you changed the way you feed your baby since going home?
If so, how did you feed your baby before? If you did not change, select the way you currently feed your baby.
Breast feeding
Bottle Feeding
Both

Breast feeding
Q5 How many weeks did you breast feed after you went home?
(Answer is in the form of an electronic dropdown menu in weeks)

Q6 Here are some questions about breast feeding. Please choose the answer that comes closest to what you are feeling.

Breast feeding was harder than expected
Family or friends helped me decide to change how I feed my baby
Going back to work caused me to feed my baby
My beliefs of what is best for my baby changed and that is why I changed how I feed my baby

Bottle feeding
Q5 How many weeks did you bottle feed after you went home?
(Answer is in the form of an electronic dropdown menu in weeks)

Q6 Here are some questions about bottle feeding. Please choose the answer that comes closest to what you are feeling.
Bottle feeding was harder than expected
Family or friends helped me decide to change how I feed my baby
Going back to work caused me to feed my baby
My beliefs of what is best for my baby changed and that is why I changed how I feed my baby

Breast and bottle feeding
Q5 How many weeks did you breast and bottle feed after you went home?
(Answer is in the form of an electronic dropdown menu in weeks)

Q6 Here are some questions about breast and bottle feeding. Please choose the answer that comes closest to what you are feeling.

Breast and bottle feeding was harder than expected
Family or friends helped me decide to change how I feed my baby
Going back to work caused me to feed my baby
My beliefs of what is best for my baby changed and that is why I changed how I feed my baby
Hello again, and thank you for your help with our study of how Latina mothers feed their babies!

How are you feeding your baby now?

- Breast feeding
- Bottle feeding
- Both

How many weeks have you been feeding your baby this way?

0  1  2  3  4  5  6  7  8  9  10  11  12  13  14

Weeks
Appendix C: Limited Systematic Review

Introduction

Pediatricians are often tasked with counseling parents from diverse patient populations on best practices for their children. This is of particular importance when discussing with expecting parents the method of feeding that is best for their newborn. Implementing comparative effectiveness research is necessary in order to determine whether existing interventions are effective for specific populations or subsets of a population, or if systems or intervention changes are required. This research can then inform best practices for providers, and thus serves an invaluable role within both the research and clinical realms of medicine. With regard to breastfeeding this means working to gain a better understanding of what motivates parents’ decisions about feeding methods for their babies.

With regard to breastfeeding in the Latina population that delivers at UNC, Dr. Amy Jones and her colleagues demonstrated that 99% of Latina mothers who deliver at UNC breastfeed in some capacity, with 65% exclusively breastfeeding and 35% using a combination of breastmilk and formula.\(^\text{17}\) Although encouraging, this data does not give providers any information on the length of time mothers are providing breastmilk to their babies. Specifically, data is still lacking on the prevalence of exclusive breastfeeding by Latina mothers for any time point out from delivery. While the study above aims to address this research question as it pertains specifically to Latina mothers at UNC through the creation and implementation of two original questionnaires, the aim of this systematic

review is to evaluate all studies that documented the prevalence of breastfeeding, both exclusively and in combination with formula feeding, within Latina mothers at time points of 4 weeks, 6 weeks, 12 weeks, or 6 months. These data can then be compared to the national average in order to gauge the need for further intervention, such as counseling, or to learn from the Latina population in the event their prevalence is higher than the national average.

**Methods**

**Search Strategy**

I implemented the literature search to identify studies that collected data to demonstrate the prevalence of breastfeeding by Latina mothers in the United States. No published protocol was used in the completion of this systematic review. The search had no restriction regarding the year of publication. Language was used as a criterion for preliminary selection, and thus only articles written in English were included. Additionally, I evaluated only published works, thus any in progress works not included. I searched PubMed and Web of Science. The decision to use these databases was determined upon consultation with an expert with a Masters in Library Science. Web of Science was chosen as the second database based on its reputation for consolidating qualitative studies. In an attempt to maintain consistency, the same search terms were used in both databases. Finally ClinicalTrials.gov was used to explore the grey literature within this field. The search strategy used consisted of three topics:

**Topic 1: breastfeeding**

Breastfeeding[MeSH] OR “breast feeding” OR “breast fed” OR “breastfeed” OR (newborn AND feeding) OR (infant AND feeding)
Topic 2: Latina
Latina OR Latino OR Latinx OR Hispanic

Topic 3: Duration
Duration

Of these three search topics, the main search was Topic 1 and Topic 2 OR Topic 3. This combination was chosen based on the priority of the topics within the search, as well as consultation of an expert with a Masters in Library Science.

**Selection**

**Inclusion Criteria**
- All studies included in this review looked at rates of breastfeeding at 4 weeks, 6 weeks, 12 weeks, or 6 months post-delivery.
- The study designs selected were prospective cohort studies, retrospective cohort studies, cross-sectional surveys, and randomized controlled trials.
- Only studies conducted in the United States were selected.
- All studies including an intervention (education/counseling/support) were assessed and the control group used for data abstraction purposes, but an intervention was not a requirement.
- All studies were included regardless of the percentage lost to follow-up.
- All studies were published, and not simply submitted for publication

**Exclusion Criteria**
- All studies with prevalence data that was not stratified for ethnicity, specifically Hispanic participants, was excluded from the study.
- The study design rejected was case-control studies.
- All studies including Latina mothers under 18 years of age were excluded from the study.
- All studies which included a survival analysis curve, but did not give clear points for 4 weeks, 6 weeks, 12 weeks, or 6 months were excluded from the study.
- All studies which asked patients to recall if they were breastfed and if so for what duration were excluded from the study.
- All studies whose full text could not be retrieved were excluded from the study.
### Table 1: PICOTSS Inclusion & Exclusion

<table>
<thead>
<tr>
<th></th>
<th>Included</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Studies focused on Latina mothers including all of Central and South Americas, Mexico, and Puerto Rico</td>
<td>Studies focused on mothers from Spain</td>
</tr>
<tr>
<td>Intervention (Exposure)</td>
<td>Breastfeeding/pumping postpartum</td>
<td>Studies which only studied initiation</td>
</tr>
<tr>
<td>Comparator</td>
<td>The national average (not required)</td>
<td>-</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Duration of breastfeeding at intervals of 1, 2, 3, and 6 months as well as 1 year</td>
<td>Studies which only collected data at 1 year postpartum, but no intervals in between</td>
</tr>
<tr>
<td>Timing</td>
<td>No time restriction</td>
<td>-</td>
</tr>
<tr>
<td>Setting</td>
<td>Only studies conducted in the United States</td>
<td>Studies of Latina mothers in Latin American countries</td>
</tr>
<tr>
<td>Study Designs</td>
<td>Prospective cohort studies, retrospective cohort studies, RCTs, cross-sectional surveys</td>
<td>Case-control</td>
</tr>
</tbody>
</table>

**Data abstraction**

Data was abstracted from the literature by one medical student using Zotero. Once all publications were added to a Zotero folder, the student reviewed each publication title and abstract to determine if a full-text assessment was warranted. Upon reading full texts of sixty-eight publications, publications which provided information on breastfeeding rates amongst Latina women were moved to a separate folder. Once these twelve publications were determined to fit the desired criteria, the medical student extracted data on the characteristics of each study in a notes tab within Zotero. Characteristics considered were the location of the study, setting, study design, demographic of participants included, rates of loss to follow-up, duration of breastfeeding postpartum both exclusively and in
combination with formula feeding, and funding source. There was no formal attempt to obtain and confirm data from investigators. The template provided from the PUBH 752 Seminar in Critical Appraisal of Health Literature at the UNC Gillings School of Global Public Health was utilized to assess for risk of bias, specifically various forms of measurement bias, as well as to establish external validity of the studies. Prevalence was the only summary measure appreciated. Upon completion of the data abstraction, the data was then synthesized via a narrative synthesis methodology.

Results

Study Selection

Upon searching the three databases and consolidating results with respect to duplicates, the search produced one hundred ninety publications (Figure 1). These publications were abstract and title screened and works that met any of the exclusion criteria were eliminated. This left sixty-eight publications to be full-text reviewed to confirm eligibility. Subsequent to completing the full-text reviews, twelve papers were deemed appropriate based on the inclusion and exclusion criteria.

Data Synthesis

A thorough assessment of each study was completed in order to maintain a high level of quality for the studies included. The studies were then categorized by the duration of breastfeeding as well as the dichotomous variable of exclusive breast feeding or combination feeding. Of these twelve studies, only one study collected data on exclusive breastfeeding alone, and it collected this data for 1,2,3, and 6 month periods. Three studies collected information on combination breastfeeding-formula feeding. All three of these studies collected data for the 6-month interval, and one of them additionally collected data
at the 3-month interval while another also collected data for a 1-year interval. The other eight studies recorded information on both exclusive breastfeeding and combination breastfeeding-formula feeding. These studies varied from accumulating data for only 1 month to as long as 1 year, with 3 and 6 month intervals included in several. In total eight of the twelve studies collected data for a 6-month period, five collected data for a 3-month period, and six collected data for a 1-month period. Of note, most of these studies collected data for several time points which is why the aforementioned sum is more than twelve studies.
Figure 1: Flow diagram showing identification of studies.

Risk of Bias

In order to assess the risk of bias within studies, the aforementioned template provided from the PUBH 752 Seminar in Critical Appraisal of Health Literature at the UNC Gillings School of Global Public Health was utilized to establish internal validity of the studies on a low, medium, high scale. Of the twelve studies included, seven studies were deemed to have a low level of bias based on their inclusion criteria and method of population sampling. Five of these studies implemented a longitudinal study design that collected baseline information in the hospital and then followed up either via phone call or at clinic visits over various time intervals. The other also collected baseline information at the time of delivery, but mailed out follow-up surveys. The first mailed out follow-up at 2-6 months post-delivery, while the second mailed out follow-up at 6 months and 12 months. Both of these studies accounted for regional response variation by oversampling regions that were known to have lower response rates on mail-based follow-up in previous studies.

Four of the twelve studies were rated medium risk of bias based on phone call follow-up at delayed time intervals. Three of these studies followed up at 19-35 months post-delivery and a fourth followed up between 6 months and 5 years post-delivery. Although these studies discussed strategies to adjust for variables such as the number of lines in a home, house hold nonresponse, and non-coverage due to lack of landlines, the delayed timeline for follow-up left these studies susceptible to recall bias.

One of the twelve studies was rated high risk of bias due to the retrospective study design. While the retrospective nature of the study did not inherently cause a high rating, the study collected data by means of chart review. The authors admit there was missing
information in charts, and that they were unable to accurately classify the degree of breastfeeding for this reason.

**Overview of Study Results**

Table 1 summarizes the prevalence findings of all twelve publications with breakdowns for exclusive breastfeeding and combined breast- and bottle-feeding when data was available. Four of the twelve studies released prevalence data at one month postpartum with a range from 11.8% to 70.5%. Eight of the twelve studies presented prevalence data on exclusive breastfeeding at six months postpartum, with a range from 8.2% to 17%. Five of the twelve studies only followed up at one time point postpartum to collect prevalence data, and they did so at 1, 2, and 6 months, with three studies publishing data at 6 months.

**Table 2: Summary of Study Prevalence Findings at Respective Follow-Up Intervals**

<table>
<thead>
<tr>
<th>Publication (Author)</th>
<th>Follow-up Interval(s)</th>
<th>EBF Prevalence</th>
<th>Combined Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forste and Hoffman</td>
<td>6 months</td>
<td>17%</td>
<td>39.4</td>
</tr>
<tr>
<td>Ahluwalia et al.</td>
<td>2 months</td>
<td>15.1%</td>
<td>62.2%</td>
</tr>
<tr>
<td>Sloand et al.</td>
<td>1, 3, 6 months</td>
<td>11.8% (1mo)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13.6% (2mo)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.1% (4mo)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.6% (6mo)</td>
<td></td>
</tr>
<tr>
<td>Ryan et al.</td>
<td>6 months</td>
<td>16.2%</td>
<td>32.8%</td>
</tr>
<tr>
<td>Li et al.</td>
<td>1, 3, 6 months</td>
<td>70.5% (1mo)</td>
<td>73.4% (1mo)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>55.3% (3mo)</td>
<td>61.0% (3mo)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13.8% (6mo)</td>
<td>40.2% (6mo)</td>
</tr>
<tr>
<td>Jones et al.</td>
<td>6 months</td>
<td>16.8%</td>
<td>74.9</td>
</tr>
<tr>
<td>Linares et al.</td>
<td>1, 3, 4 months</td>
<td>36% (1mo)</td>
<td>84% (1mo)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26% (3mo)</td>
<td>65% (3mo)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22% (4mo)</td>
<td>60% (4mo)</td>
</tr>
<tr>
<td>Glassman et al.</td>
<td>1 month</td>
<td>12.8%</td>
<td>31.4%</td>
</tr>
<tr>
<td>Study</td>
<td>Duration</td>
<td>Prevalence</td>
<td>Notes</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Holbrook et al.</td>
<td>6 months</td>
<td>N/A</td>
<td>72.9%</td>
</tr>
<tr>
<td>Hendrick and Potter</td>
<td>3, 7, 10 months</td>
<td>N/A</td>
<td>59.3% (3mo) 40.3% (7mo) 29.9% (10mo)</td>
</tr>
<tr>
<td>CDC</td>
<td>6, 12 months</td>
<td>N/A</td>
<td>45.1% (6mo) 24.0% (12mo)</td>
</tr>
<tr>
<td>Efrat et al.</td>
<td>1, 3, 6 months</td>
<td>31.4% (1mo) 23.2% (3mo) 8.2% (6mo)</td>
<td>60.0% (1mo) 71.4% (3mo) 77.6% (6mo)</td>
</tr>
</tbody>
</table>

**Discussion**

This systematic review provides a base of evidence regarding the decisions Latina mothers make as to how they will feed their newborn. As demonstrated by the number of studies included in this systematic review, there is a dearth of research devoted to this patient population, and the results vary substantially. Of particular interest are two studies with trends that deviated from the other studies. Sloand et al. reported exclusive breastfeeding rates at 1, 2, 4, and 6 months with a steady decrease from two months through the end of the follow-up period at six months, as one would expect. Of interest, however, is that the prevalence rate reported at two months (13.6%) was greater than the prevalence at one month (11.8%). Yet despite this unusual trend, there was no explanation by Sloand and her colleagues.

The second trend of note comes from the research of Efrat et al. The combined breastfeeding prevalence reported in this study steadily increased over the follow-up period, a trend unlike that of the other eleven publications. Further investigation of the data revealed that this increase was due to loss to follow up over the six-month follow-up period, which caused the gradual increase from 60.0% to 71.4% to 77.6%.
This systematic review was limited by the inclusion criterion that only publications published in English would be included. Given the objective of learning about Latina mothers in the United States, this is criterion likely does not exclude too many publications, but it is possible that there is literature with meaningful findings that were excluded. The second limitation is the inability to obtain four texts in full and thus these texts were only evaluated based on the abstracts available. Based on review of the abstracts alone, it is expected that they would not have been included in the final systematic review, but for the sake of thoroughness it would have been better to have looked at them.

As previously mentioned the information discovered in completing this systematic review provides a foundation which will prove useful for future research. In spite of this foundation, none of these studies surveyed women to get a sense of what prompted them to continue breastfeeding as long as they did or what enticed them to change the method by which they feed their newborn. The next step in providing for these patients is to conduct a longitudinal study that will survey Latina mothers at multiple time points postpartum and inquire about the factors that went into their decisions at each of those points. This will better provide pediatricians with information to use when counseling patients as well as advocating for them.

**Funding**

I did not receive any funding for this review nor do I have any financial disclosures to state.