

# Food Insecurity During Pregnancy and Breastfeeding by Low-Income Hispanic Mothers

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abstract

**BACKGROUND AND OBJECTIVES:** Pregnancy, infancy, and toddlerhood are sensitive times in which families are particularly vulnerable to household food insecurity and when disparities in child obesity emerge. Understanding obesity-promoting infant-feeding beliefs, styles, and practices in the context of food insecurity could better inform both food insecurity and child obesity prevention interventions and policy guidelines.

**METHODS:** We performed purposive sampling of low-income Hispanic mothers ( $n = 100$ ) with infants in the first 2 years of life, all of whom were participants in a randomized controlled trial of an early child obesity prevention intervention called the Starting Early Program. Bilingual English-Spanish interviewers conducted semistructured qualitative interviews, which were audio recorded, transcribed, and translated. By using the constant comparative method, transcripts were coded through an iterative process of textual analysis until thematic saturation was reached.

**RESULTS:** Three key themes emerged: (1) contributors to financial strain included difficulty meeting basic needs, job instability, and high vulnerability specific to pregnancy, infancy, and immigration status; (2) effects on infant feeding included decreased breastfeeding due to perceived poor maternal diet, high stress, and limiting of healthy foods; and (3) coping strategies included both home- and community-level strategies.

**CONCLUSIONS:** Stakeholders in programs and policies to prevent poverty-related disparities in child obesity should consider and address the broader context by which food insecurity is associated with contributing beliefs, styles, and practices. Potential strategies include addressing misconceptions about maternal diet and breast milk adequacy, stress management, building social support networks, and connecting to supplemental nutrition assistance programs.



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**WHAT'S KNOWN ON THIS SUBJECT:** Pregnancy, infancy, and toddlerhood are sensitive times in which families are particularly vulnerable to food insecurity and when disparities in child obesity emerge. Food insecurity during pregnancy and infancy has been associated with obesity-promoting maternal infant-feeding styles and practices.

**WHAT THIS STUDY ADDS:** Low-income Hispanic mothers with infants and toddlers perceived household food insecurity as adversely affecting breastfeeding and requiring active limiting of healthy foods and portion sizes. Findings could inform both food insecurity and child obesity prevention interventions and policy guidelines.

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Poverty-related disparities in early child obesity have substantial public-health consequences, including adverse effects on child health and increased obesity throughout the life span.<sup>1-4</sup> Food insecurity (the limited availability of nutritionally adequate food) is commonly experienced by low-income families at high risk of child obesity.<sup>5</sup> Pregnancy, infancy, and toddlerhood are sensitive times in which families are particularly vulnerable to food insecurity<sup>6-8</sup> and when disparities in child obesity emerge.<sup>9</sup>

Nonresponsive maternal infant-feeding styles in which mothers regulate feeding without responding appropriately to infant feeding cues<sup>10,11</sup> represent a potential mechanism linking food insecurity to child obesity.<sup>8,12-16</sup> Obesity-promoting feeding practices, such as limited exclusive breastfeeding,<sup>17</sup> low fruit and vegetable consumption, and greater consumption of low-cost, high-energy-dense foods, represent another mechanism.<sup>18</sup> However, despite knowing that food insecurity during these sensitive periods is associated with maladaptive feeding styles and practices, there remain significant gaps in comprehending the context of these quantitative associations.<sup>19</sup> Gaining a greater understanding of how food insecurity impacts feeding styles and practices is needed to develop more specific recommendations to help parents cope, to enhance interventions targeting low-income populations, and to inform both food insecurity and child obesity prevention guidelines directed at primary care providers.

To fill these gaps, we conducted semistructured qualitative interviews with low-income Hispanic mothers with children in early infancy, late infancy, and toddlerhood to learn more about their financial pressures and perceived effects on infant and toddler feeding.

## METHODS

### Study Design

We performed a qualitative study of low-income Hispanic mother-infant pairs participating in an early child obesity prevention study at a large urban public hospital in New York City. This study was approved by the institutional review boards of the New York University School of Medicine, Albert Einstein College of Medicine, Bellevue Hospital Center, and New York City Health and Hospitals Corporation and was registered on [www.clinicaltrials.gov](http://www.clinicaltrials.gov) (NCT01541761).

### Starting Early Program Trial Study Sample

This qualitative study was nested within a randomized controlled trial testing the efficacy of a primary care-based early child obesity prevention program, called Starting Early, designed for low-income Hispanic mother-infant pairs, beginning in pregnancy and continuing until child age 3 years.<sup>20</sup> The main components were (1) individual prenatal and postpartum nutrition counseling and (2) nutrition and parenting support groups coordinated with well-child visits. The intervention was not designed to directly address food insecurity. For the larger trial, we enrolled pregnant women in their third trimester who were at least 18 years old, self-identified as Hispanic and/or Latina, were fluent in English or Spanish with a singleton uncomplicated pregnancy, and who intended to receive care at the study sites. We excluded women with significant medical or psychiatric illness, homelessness, or severe fetal anomalies.

### Qualitative Study Recruitment

We employed purposive sampling of mothers randomly assigned to the Starting Early Program intervention to obtain maximum variability across 3 developmental stages of feeding: (1) early infancy (3–7 months old),

(2) late infancy (10–15 months old), and (3) toddlerhood (19–24 months old). Early infancy reflected the period of predominate milk feeding. Late infancy reflected increased consumption of solid foods and independent self-feeding. Toddlerhood reflected increased independence. Given that food insecurity is pervasive in the context of poverty and that even marginal food insecurity is associated with decreased health,<sup>21</sup> we interviewed mothers with negative, marginal, and positive food insecurity screens to identify family strengths and vulnerabilities. Trained staff contacted eligible mothers between March 2015 and October 2015 and obtained written informed consent for the 1-time qualitative interview.

### Interview Procedure

Interview guides (Table 1) were informed by the Core Food Security Module from the US Department of Agriculture,<sup>22</sup> a scale used nationally to assess the extent and severity of food insecurity. The interview guide was designed by a multicultural interdisciplinary team of general pediatricians, a developmental and behavioral pediatrician, a medical student, and registered dietitians. Trained, bilingual English-Spanish interviewers conducted the interviews, ranging from 40 to 70 minutes. Interviews were audio recorded, professionally transcribed and translated, and reviewed by staff to verify translation accuracy.

### Data Analysis

Four researchers, consisting of a general pediatrician, a registered dietitian, a medical student, and a research assistant, used an iterative process of textual analysis. The group used the constant comparative method to identify and iteratively refine codes and devise a final code structure.<sup>23</sup> The group initially read the transcripts in their entirety to gain insight into broad themes, discussed individual thoughts and

**TABLE 1** Interview Domains, Questions, and Probes Related to Household Food Insecurity During Pregnancy, Infancy, and Toddlerhood

Domains	Questions	Probes
Food running out	Sometimes mothers are concerned that food will run out before they get money to buy more. “During your pregnancy, did food ever run out?” “Since your baby has been born, has food ever run out?”	“Can you describe what it was like when this happened?” “What was feeding your family like during those times? What was feeding your baby like during those times?”
Cannot afford healthy foods	Sometimes mothers are concerned that they cannot afford to buy healthy foods, such as fresh fruits and vegetables, for their family. “During your pregnancy, were you ever unable to afford to buy healthy foods for yourself?” “Since your baby has been born, have you ever been unable to afford healthy foods for your family?”	“Can you describe what it was like when this happened?” “What was feeding your family like during those times? What was feeding your baby like during those times?”
Difficulty paying household bills	Sometimes families have difficulty paying their household expenses, such as the telephone or the electricity bills. “During your pregnancy, did you have a similar experience?” “Since your baby has been born, do you sometimes have difficulty paying household expenses?”	“Can you tell me more about this?” “Can you describe what it was like feeding your family during times when you had difficulty paying other household expenses? Can you describe what it was like feeding your baby during those times?”

repeating themes, and confirmed consistency, coherence, and distinctiveness before finalizing the codebook. Consensus was reached regarding each quotation. Data organization, retrieval, and stratification by child age was facilitated by Dedoose software. Interviews were conducted until thematic saturation was reached.

### Sample Characteristics

Sociodemographic data collected from the trial included maternal age, parity, education, work, marital status, country of origin, and participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and the Supplemental Nutrition Assistance Program (SNAP). Food insecurity was determined by using the US Department of Agriculture Core Food Security Module.<sup>22</sup> Continuous scores were generated from 10 questions assessing food security in the previous 12 months. Scores were categorized by using recommended cut points (food secure, 0; marginally food insecure, 1–2; and food insecure, 3–10). Difficulty paying bills in the previous 12 months was assessed by using 2 questions from the Survey of Income and Program Participation and was

defined as either experiencing difficulty paying monthly bills, rent, or mortgage and/or having a service turned off because payments were not made.<sup>24</sup>

## RESULTS

### Characteristics of the Study Sample

We sampled 100 mothers who were primarily born outside the United States (87%), Spanish speaking (87%), WIC participants (91%) with infants (32 with 3–7-month-olds, 31 with 10–15-month-olds, and 37 with 19–24-month-olds). The majority reported experiencing food insecurity (67%; Table 2).

### Results of Qualitative Analysis

Three main themes, each with subthemes, are described below. Example quotations are organized by theme and numbered consecutively in tables.

#### Theme 1: Contributors to General Household Financial Strain and Food Insecurity

See Table 3 for quotations related to contributors. Difficulty meeting basic needs was a common strain. Rent, phone, and electricity bills were hard to manage simultaneously (quotation

1). Paying for household expenses was often prioritized over buying food (quotation 2).

Job instability, prolonged unemployment, and loss of work hours led to increased vulnerability to food insecurity. When fathers were unemployed, families had fewer food choices and ate on the basis of availability. Families became accustomed to having certain income, so the greatest hardship occurred immediately after a job loss (quotation 3). One mother described job loss as a “crisis” that can force families to purchase only necessities (quotation 4).

Pregnancy and infancy increased vulnerability to food insecurity. During pregnancy, mothers described strain due to changes in employment attributed to frequent medical visits (quotation 5), physical limitations, and health complications (quotation 6). New infant expenses forced families to choose between buying diapers and paying bills (quotation 7), leading to feelings of desperation (quotation 8).

Financial strain unique to immigration included the concept of “double expenses” for families with children in both the United States and

**TABLE 2** Sample Characteristics (n = 100)

Family Characteristics	Result
Mother's age, y (SD)	30 (6)
Born in United States, %	13
Spanish speaking, %	87
Educational attainment (less than high school), %	41
Married or living as married, %	76
Prenatal depressive symptoms, %	30
Marginal household food insecurity, %	35
Household food insecurity, %	32
Difficulty paying bills, %	20
WIC participation, %	91
SNAP participation, %	39

their country of origin (quotation 9). Mothers who “support 2 homes” discussed difficulties balancing their own needs with familial obligations in their native country stemming from needing to send money for their children’s housing and food (quotation 10).

**Theme 2: Effects of Food Insecurity on Infant Feeding**

See Table 4 for quotations related to feeding. Common concerns among mothers of young infants related to breastfeeding. Mothers may avoid

breastfeeding because of concerns about their own diet. Mothers perceived their diets as poor and worried that if they did not eat enough fruit and vegetables, their breast milk would be of low quality and lack the necessary nutrients (quotations 11 and 12).

Mothers experienced substantial stress related to food insecurity and difficulty paying bills. Some mothers felt stress would diminish the quantity of their breast milk (quotation 13) or cause the milk to

“dry up” (quotation 14). Mothers worried that if breast milk was insufficient, formula would be needed, which was expensive and not always available.

Mothers tried to hide their worries during feeding, fearing that stress would diminish the infant’s appetite (quotation 15) or affect the infant’s mood (quotation 16). Mothers believed negative emotions could pass to the infant during feeding, either through physical closeness or through the breast milk itself. One mother recalled “elders” cautioning to avoid breastfeeding when stressed because feelings transmit through the breast milk (quotation 17) and that milk may need to be discarded (quotation 18). The belief that infants could absorb the mother’s poor energy during feeding led to family members discouraging breastfeeding and encouraging formula (quotation 19).

Mothers of older infants and toddlers described actively limiting food. Mothers limited each family

**TABLE 3** Quotations Describing Contributors to General Household Financial Strain and Food Insecurity

Subthemes	Quotations
Difficulty meeting basic needs	1: “It was hard what we went through because we had to pay the rent, we had to pay phone bills, you must pay for electricity; so yes, it was a bit hard. That time we also had to leave the apartment where we were staying and go live with my sister-in-law.” 2: “You have to pay for...rent...phone...or...cable or...whatever. So you try to pay that and...and if you have enough money to buy food, fine...So you try to buy the most necessary things that you can afford.”
Job instability	3: “For about three, four months, I got behind with the gas, more or less like eight months or six months, they cut it off because I didn’t have money to pay for it...he was going through a time when they cut his days and since we got used to his salary...the electricity I have been paying for it late.” 4: “Because his dad lost his job and there was a time in which there wasn’t money to pay the bills. We went through a crisis. There wasn’t even money to pay the bills. One had to be...I didn’t spend on things. Only the most important things.”
Vulnerability during pregnancy	5: “I was working while I was pregnant, but sometimes I had to come to the hospital many times. Then I couldn’t work, because I was alone at that time...my husband and I were separated...I didn’t have enough money to pay my expenses. I had low resources.” 6: “I was pregnant, it was a little frustrating. I cried because I wanted certain things and I couldn’t have them. I cried because I wanted to help [my husband], but I know that I couldn’t because of my belly. I’ve always liked to work, and at that stage I stopped working. I had a lot of bleeding, so it was frustrating for us, and more so for him...Because we are four, now.”
Vulnerability during infancy	7: “Well, then we had to pay for diapers, the rent, and all that. Well yes, several times I didn’t pay for gas or electricity, but next month that she had diapers and all that, well, I’d go and pay the electricity bill.” 8: “Even though both of us work and we pay for one apartment, cable, gas, electricity, the Pampers and those are extra expenses that weren’t in our house, so...one doesn’t find a way out and ‘What will we do? What will we do?’ And everything is just for paying, paying, paying.”
Double expenses for immigrant families	9: “We are my husband, my two sons, and me. So we pay for the apartment and it gets more difficult because we pay for all the expenses here. My girl is not with me. She is in our country, so it’s an extra expense. We have to pay for the house where she is living, her diet, and everything, so it’s like double expense...and we have been delayed.” 10: “It’s already a big family, we’re four here, there’s my son here, I still have two sons back in my country, in Ecuador, where we have to support practically two homes, because I still have to pay rent, we don’t have our own house and I have to pay the bills, the school for my kids, and we’re a bit, I mean, I’m worried about the situation because only my husband is supporting the home, then it’s very difficult for us to buy let’s say, the food, everything that’s, everything that’s necessary. Not what we want but what is necessary.”

**TABLE 4** Quotations About the Effects of Food Insecurity on Infant Feeding

Subthemes	Quotations
Perceived effects of poor maternal diet on breast milk quality	11: "I wouldn't know if perhaps because I don't eat enough fruits or vegetables which is the most important, maybe it affects her...I can't say that she's not having enough food to eat, but I don't know if she's having what is necessary." 12: "I always tried to have vegetables because she was breastfeeding...I would like to eat well to keep giving her good milk...I started to worry a little more for the things that I bought, suddenly, I felt recently there's wasn't enough money...well like meat, that suddenly is a little more expensive, and, um...the vegetables suddenly."
Perceived effects of maternal stress on breast milk quantity	13: "If one gets worried, they become stressed, it's like the milk...I feel that it...like it diminishes because, well, one gets too stressed or worries a lot." 14: "Well sometimes I would calm down or sometimes I thought because, also with the stress the, the milk dries up, milk dries up and sometimes there are so many worries, I say no, and especially because she was younger, and since I was giving her formula and breast milk, the formula, they only gave me four at WIC, and it was a time when she was eating more and more, sometimes it is expensive to buy it."
Perceived effect of transmitting stress to the infant during feeding	15: "I try to, when...I'm going to feed her, I try to set aside any worries, so she won't feel them. I feel that if I am going to feed her when I'm worried, stressed out, she can't eat. She turns over, and even if she's hungry, she doesn't eat." 16: "Sometimes when she sees me crying, she looks at me like wanting to ask me what's going on mom, I mean, she stares at me but I don't know if it affects her or if it's curiosity because she sees a different change in me as opposed to how she normally sees me, I don't know, but she stares at me. She stares at me with a fixed look, she doesn't smile, she remains serious." 17: "I think that that does affect her also, because well, the elders, my grandmothers have told me that everything, all the feelings that we have, everything is transmitted to your kids through the breast milk, the milk, and well, I don't know how true that is but that's what they said." 18: "In this way because, where I'm from, let's say, Mexico, let's say that when the mother gets upset or has anxiety, it affects the baby if I'm breastfeeding because if I'm angry and let's say I don't take the milk out, and I throw it away, and I give it directly to the girl, afterwards she'll be restless or she'll start crying, or like she'll also be sad." 19: "You're going to give it to him, he's going to get it...[My husband] said that I didn't have that...that energy, you're too sad, and he absorbs it I think, right? And...well...I think that that is the case, since I give him breast, then [my husband] told me that, if you feel really bad, then give him formula."
Active limiting of portion sizes	20: "I try to save with food, for example, we try not to eat excessively, like large quantities. If we make beef for everyone, there is a limit, a piece of beef for each one." 21: "I would also limit them (fresh fruit, vegetables)...I didn't put too many on the table, and I gave them something else, a piece of cheese, so that it would be enough to last for the week. As we are a bunch already, sometimes it didn't last." 22: "If I'd give her two servings of fruit, I don't give it to her; I give her one, yes...The other food, well I try to, if it's... instead of chicken I give her a little bit of cheese for the soup, so I try to vary it like that." 23: "I was more careful if they ate three yogurts, that they'd eat one a day, because later, or the next day they wouldn't have enough. I'd say that if we'd eat bread, I didn't have to give rice, or a ham sandwich, like that."

member's portion sizes (eg, by giving "just 1 piece of meat"; quotation 20). Healthier, more expensive food, such as fruits and vegetables, were limited by "not putting too many on the table" or substituting less expensive foods (quotations 21 and 22). Active limiting was a tool used to prevent the family from not having enough food the next day (quotation 23).

**Theme 3: Coping Strategies**

See Table 5 for quotations related to home- and community-level coping strategies. Home strategies involved considerable planning. Families made shopping lists to prevent unnecessary purchases and food waste (quotation 24), avoided street foods, and cooked at home (quotation 25). Families limited other spending, such as

electricity, by turning off televisions and lights (quotation 26) and delayed spending on other bills. Many expressed that "food must be first" and delayed buying clothes and shoes (quotation 27) or paying less important bills, such as the telephone (quotations 28 and 29). Mothers relied on inexpensive staples that stored easily and would not spoil, such as beans, rice, and tortillas (quotations 30–32).

Social support networks, such as extended family (quotations 33–35), friends (quotation 36), and churches (quotation 37), provided safety nets when household strategies proved insufficient. Networks either loaned money or directly provided food. Living with extended family allowed

for lower rent burden, decreased expenses, and the distribution of bills among family members.

Supplemental nutrition assistance programs, specifically WIC and SNAP, provided critical assistance, although some expressed eligibility barriers. Some felt that without these services, their food insecurity would be unmanageable (quotations 38 and 39). Other mothers noted difficulty obtaining services (quotation 40) or the funds not lasting the whole month (quotation 41).

**DISCUSSION**

In this inner-city, mostly immigrant, low-income, Hispanic sample, we found that mothers frequently

**TABLE 5** Quotations Describing Coping Strategies

Subthemes	Quotations
Coping strategies used within the home	
Making shopping lists	24: "We started to plan, we go and get food for a week...If we go out to shop, we go and make the list, we don't just get there and grab this and this, and everything. Because sometimes things just get wasted and you don't use them."
Cooking at home	25: "Before we ate a lot on the street, then it was like double spending, because we ate that, on the street, and also we have to cook food because he always carries his lunch to work, so it was double. So I'd prepare food and the rest, since we had eaten, we had leftover food..."
Delaying paying other bills	26: "...it's the same with food, for example, if there are still things for cleaning the house, well we leave this for next week and so on...also the television, if we're not watching it, it must be turned off. At home, if no one is in the room, we just keep the light bulb off, because these are very minor things, but they really help."
Prioritizing food over other expenses	27: "Food comes first, first is the food. If we don't have enough for a pair of shoes, to buy clothes or a garment or something, food comes first. There must be food...material things don't matter." 28: "There were times that I'd stop paying the phone to buy food, it's important, the phone but food is more. So I didn't pay the telephone, or sometimes I'd say to the lady if she could wait for me to pay the rent, and she told me yes." 29: "I make an effort so that my daughter doesn't miss anything...I'll run out of money, the date to pay the phone bill comes up and I haven't paid it, because my priority is that my daughter has food."
Relying on food staples	30: "God doesn't forget us...even if its beans with tortillas there is always [food] in the house. I mean...I won't tell you that they're big meals, but even for the basics we have that." 31: "I had nothing to feed them, so well...sometimes I only had tortillas and cheese, so I gave them that." 32: "When we don't have a lot of money, it's like beans with rice, or sometimes eggs with tortilla only...that's just what we eat when we really don't have much."
Coping strategies that rely on social support networks and other services	
Relying on social support networks	33: "There was a time when we had to pay this...Bills, the phone, rent and then the children needed diapers, milk. But at the same, the solution is that my mom helps me too. My mom backs me up a lot, and well she helps me by giving the children things while we pay the rest...the good thing is that we have a lot of relatives and we borrowed from our family." 34: "We communicate well, one of us is in charge of paying the electricity bill, someone else pays the rent, someone else the food." 35: "My brother used to live in New Jersey, and he moved to New York and moved in with me. So, that...he...he paid for the rent. He helped me." 36: "A friend of mine sometimes tells me, let's go here, and she helps me. She helps me, or sometimes one of my sisters helps me, many times. My sister sometimes brings [food] to me, or sometimes...yes. Also a friend of mine. She gets food stamps, she helps me." 37: "I'm going to be honest with you, since her dad always works, and I sometimes go to a church and that's where they give me apples or melon and there they even if it's just an apple or a banana...every day, yes."
Relying on federal assistance	38: "Thank God I always have enough money for food because I took government aid for my two children...that helps me a lot. Because if I didn't have WIC, I do feel that I'm not going to have enough money at home." 39: "At WIC they gave me ten-dollar coupons. Even just ten dollars, well at least it was enough for buying some fruit, some vegetables." 40: "I've tried to apply for foods stamps, but because I don't have a stable address, they can't help me." 41: "It runs out before the end of the month...and right now she doesn't have any milk...so now we buy it with our money."

experienced food insecurity during pregnancy, infancy, and toddlerhood. Contributors included difficulty meeting basic needs, job instability, and vulnerabilities specific to pregnancy, infancy, and immigration. Mothers perceived food insecurity to affect feeding practices. In early infancy, women worried that poor maternal diet and stress due to food insecurity adversely affected breast milk quantity and quality, leading to perceived need to supplement with formula or discard breast milk. In late

infancy and toddlerhood, mothers described actively limiting expensive healthy foods, including fruits, vegetables, and lean meats. Coping strategies within the home and those relying on outside support mitigated food insecurity. These findings can inform recommendations to assist families with healthy infant feeding within the context of food insecurity and poverty more broadly.

Food insecurity is dynamic and complex. Changes in income,

expenses, or access to government assistance may diminish abilities to purchase healthy foods.<sup>25</sup> Our findings are consistent with studies of broader populations that have described similar experiences with shifting household composition, job instability, housing instability, and unexpected expenses as contributors.<sup>26-29</sup> Hispanic families, particularly immigrant families, have unique vulnerabilities that shape their experience and ability to cope.<sup>30</sup> Immigrant families had to choose

between feeding their households or sending money to their families, often in more dire situations, in their home countries.<sup>28</sup> Remittances are often prioritized when children are left behind.<sup>31</sup>

Contributors unique to pregnancy and infancy included decreased employment and increased expenses, including diapers, clothes, and formula. Food insecurity during pregnancy has been associated with high gestational weight gain, gestational diabetes mellitus, disordered eating, and dietary fat intake postpartum<sup>16,32</sup> as well as higher prenatal stress and obesity-promoting infant-feeding attitudes.<sup>16,33</sup> Food insecurity before and after birth has been associated with nonresponsive maternal infant-feeding styles and obesity-promoting practices.<sup>12,13,15</sup> A key contribution of this study has been the identification of several potential mechanisms linking food insecurity to maladaptive infant-feeding beliefs, styles, and practices, specifically limiting breastfeeding and more expensive healthy foods. These potential mechanisms are each discussed below.

During early infancy, mothers described limiting breastfeeding because of fears that their own poor diet would adversely affect breast milk quantity and quality. Evidence about how maternal diets that are low in macro- and micronutrients may influence breast milk composition has been mixed.<sup>34</sup> Some studies have linked nutrient levels consumed during lactation, such as vitamin C and fish oils, to their concentration in human milk, particularly in low-income Latino countries.<sup>35</sup> However, others found that overall adequacy of human milk is maintained regardless of maternal nutrition.<sup>36</sup> Providers should address these misperceptions and reassure women that exclusive breastfeeding remains the optimal feeding modality and provides health benefits for

mothers. Counseling about these concerns can provide the opportunity to address maternal nutrition in the context of food insecurity, including access to supplemental nutrition-assistance programs and the need to continue prenatal vitamins during lactation. Unnecessary formula supplementation due to these misperceptions may cause overfeeding and represent 1 pathway linking food insecurity during pregnancy and infancy to child obesity.

Although maternal concern about the adverse effects of stress on breastfeeding has been documented,<sup>37,38</sup> no studies, to our knowledge, have explored the belief that maternal stress can be transmitted through breast milk itself. Pregnancy-related stress, generalized anxiety, and postpartum depression have been found to decrease initiation and continued breastfeeding.<sup>39</sup> Studies of low-income women found that stressful life events, in particular financial stressors, were associated with shorter breastfeeding duration. Although there is limited evidence, the existing studies do not suggest that breast milk composition is changed by negative emotions.<sup>40</sup> The decreased initiation, exclusivity, and duration of breastfeeding found in low-income families may be related to this belief, which may represent another link between food insecurity and child obesity. Providers should explore maternal concerns about how stress impacts breastfeeding, provide reassurance that breast milk does not transmit maternal negative emotions, and offer mental health services to enhance stress management.

We found that when food supplies were low, mothers relied on inexpensive staples or actively limited variety, consistent with studies of families with older children.<sup>26</sup> Food insecurity has been associated with higher intake of food staples such as beans and tortillas among

preschoolers, which are likely bought in bulk to use when families cannot afford perishable items.<sup>41</sup> Limiting expensive and perishable foods, such as fruits and vegetables, may hinder opportunities to introduce these foods to young children, negatively affecting development of food preferences. Restrictive feeding has been associated with poor child self-regulation during feeding and increased inappropriate weight gain.<sup>42,43</sup> Restricted access to less nutritious snack foods during periods of food insecurity may increase child demands for these foods during times of relative food security.<sup>41</sup>

Positive coping strategies to secure money for food occur at multiple levels. Within the home, proactive rather than reactionary coping strategies were more effective in reducing or avoiding food insecurity.<sup>26</sup> Protective factors or strategies that are amenable to change included planning ahead for necessary expenses, only buying necessities, relying on staples, and delaying spending. When these strategies proved insufficient, families relied on social support networks. Those lacking family support depended on community and religious organizations. Perceptions toward government assistance programs varied, with some families finding relief and others reporting difficulties receiving enough. Federal benefits attenuate the severity of food insecurity but might not eliminate it, particularly for children and in regions with higher food costs.<sup>25</sup> Health care providers should advocate for increased support for these programs, ensure that families are aware of their eligibility, and provide assistance obtaining these resources.

To date, the American Academy of Pediatrics<sup>25</sup> has published recommendations to incorporate screening for food insecurity in primary care and connecting at-risk families to services that provide food

directly or enhance enrollment into assistance programs. However, these guidelines do not include how families could optimize nutrition in the context of scarce resources. Separate guidelines published by the National Academy of Medicine (formerly the Institute of Medicine) and the American Academy of Pediatrics regarding the prevention of child obesity address promoting healthy infant diets and responsive feeding styles.<sup>44,45</sup> However, these guidelines do not incorporate the need for food insecurity screening to address barriers to implementing infant-feeding recommendations. In the future, policy makers should consider combining food insecurity and child obesity prevention recommendations to enhance the care of families living in poverty.

Limited primary care interventions exist to improve infant feeding in the context of food insecurity. Group prenatal care interventions have been found to improve budget-management skills, diet, and self-efficacy in affording healthy foods.<sup>46</sup> The Keeping Infants Nourished and Developing program, a collaborative partnership between pediatric primary care and a community food bank, found that participants were more likely to connect with social work or the medical-legal partnership

to reduce food insecurity.<sup>47</sup> Although these programs focus on reducing food insecurity, they do not specifically address infant-feeding practices. The Starting Early Program, a primary care-based early obesity prevention intervention,<sup>20</sup> exemplifies an infrastructure that could directly link families to community services during pregnancy and infancy and simultaneously promote healthy infant-feeding practices. Future adaptations will explore the feasibility and efficacy of these modifications.

Our study has several limitations. Given that the sample included inner-city, mostly immigrant, low-income, Hispanic mothers, generalizability may be limited. Additionally, we may not have included individuals with the fewest coping strategies for managing food insecurity given that the trial excluded the most marginalized families, including those with homelessness or severe mental illness. In future studies, researchers should aim to better understand quantitatively the themes identified in this report by studying longitudinal associations between food insecurity, maternal diet, maternal stress, breastfeeding, limiting of healthy foods, and later, child obesity.

## CONCLUSIONS

In this study, low-income Hispanic mothers with infants and toddlers perceived food insecurity to adversely affect breastfeeding and to require actively limiting healthy foods and portion sizes. These maternal beliefs and behaviors may represent potential mechanisms linking food insecurity and obesity-promoting feeding styles and practices. Although the single most important action would be to reduce food insecurity during these sensitive periods, stakeholders in programs and policies to prevent poverty-related disparities in child obesity should consider and address the broader context by which food insecurity is associated with contributing beliefs, styles, and practices.

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## ABBREVIATIONS

SNAP: Supplemental Nutrition Assistance Program  
WIC: Special Supplemental Nutrition Program for Women, Infants, and Children

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