Effects of breastfeeding and low sugar-sweetened beverage intake on obesity prevalence in Hispanic toddlers[1–3]

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ABSTRACT

Background: Few studies have examined the independent and additive effects of breastfeeding (BF) and sugar-sweetened beverage (SSB) intake in early life on overweight and obesity prevalence.

Objective: The objective was to assess the effects of BF and SSB intake on the prevalence of overweight and obesity in Hispanic toddlers.

Design: Nutrition data were collected via phone surveys with caregivers of 1483 Hispanic children (2–4 y of age) from the Los Angeles County Women, Infants, and Children (WIC) program. BF history at 2–4 y of age was categorized as follows: no BF, >1 wk to <6 mo BF, 6 to <12 mo BF, and ≥12 mo BF. SSB intake at 2–4 y of age was categorized as follows: high SSB (≥2 SSBs/d), mid SSB (1 SSB/d), and no SSB. The height and weight of the children were measured by WIC staff and stored in the Integrated Statewide Information System. Binary logistic regressions assessed the effects of BF and SSB categories on overweight and obesity prevalence.

Results: In comparison with the no-BF participants, the odds of obesity were lower in the ≥12-mo-BF participants (OR: 0.55; 95% CI: 0.37, 0.83; *P* = 0.004). In comparison with high-SSB participants, the odds of obesity were lower in the no-SSB participants (OR: 0.69; 95% CI: 0.47, 1.00; *P* = 0.047). In comparison with the combined no-BF/high-SSB participants, the odds of obesity were lower in the ≥12-mo BF/no-SSB participants (OR: 0.39; 95% CI: 0.19, 0.80; *P* = 0.01).

Conclusion: The results suggest that BF for ≥1 y and low SSB intake during the toddler years can have profound effects on reducing the prevalence of obesity in Hispanic toddlers. *Am J Clin Nutr* 2012;95:3–8.

INTRODUCTION

Numerous studies have shown BF[4] to be associated with a 20–60% lower risk of overweight and obesity in children, depending on the duration of BF and the degree of supplementation (1, 2). One meta-analysis study by Harder et al (3) found a strong dose-response relation, with each month of BF reducing overweight by 4% in children. However, most of these studies were conducted with primarily white children, and the effects of BF on obesity are less clear in Hispanic populations. Some national studies have shown that BF is not protective against overweight or obesity prevalence in Hispanic children (4, 5), whereas others have shown that it is linked to a decreased prevalence of obesity (6).

Mounting evidence indicates that sugar consumption, specifically SSB, is a key modifiable factor that contributes to obesity and related metabolic disorders (7–11). Data from our own studies with Hispanic youth at the University of Southern California Childhood Obesity Research Center over the past 10 y have consistently shown that a high intake of dietary sugar, specifically SSB, is strongly related to adiposity and type 2 diabetes risk (12, 13). Most notably, Ludwig et al (8) found that each additional serving of SSB consumed daily increased the odds of obesity among children by 60%. We previously showed that high intakes of total and added sugar intake and SSB were the only dietary components associated with adiposity and poor β cell function in Hispanic youth living in LAC (12, 13). Less is known about the effect of early exposure to sugar intake, specifically SSB, on obesity risk in Hispanic toddlers.

To our knowledge, no study has examined the combined effects of no BF and high sugar intake during early life on obesity risk. Thus, the purpose of this study was to examine the independent and additive effects of BF and early-life SSB intake on overweight and obesity prevalence in high-risk Hispanic toddlers (2–4 y of age). We hypothesized that BF for ≥1 y and a low SSB intake during early life will have independent and additive effects on reductions in overweight and obesity prevalence.

MATERIALS AND METHODS

Data collection

This article presents a secondary analysis of data obtained from the 2008 PHFE WIC Data Mining Project survey (14). The questionnaire used in this study was based on the 2005 LAC Health Survey (15) and adapted with extensive input from the California State WIC Division and WIC Local Agency staff. The

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[4] Abbreviations used: BF, breastfeeding; ISIS, Integrated Statewide Information System; LAC, Los Angeles County; PHFE, Public Health Foundation Enterprises; SSB, sugar-sweetened beverage; WIC, Women, Infants, and Children.

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objectives of the 2008 PHFE WIC survey were to assess key health indicators, health-related behaviors, and home and community indicators of support for families with young children. Questionnaires were written in English and translated into Spanish. Interviews were conducted by Field Research Corporation—an independent public opinion research organization. The surveys were conducted through a computer-assisted telephone interviewing system, and averaged 20–25 min in length.

Participants

Only persons who reported that they or a child (between birth and <5 y of age) in the household was enrolled in the WIC program were eligible for the survey. The survey was conducted with a random sample of WIC participants who received WIC services in LAC with weight/height data collected between January and March 2008. From the set of all 400,000 families receiving WIC services that month, a total of 5005 WIC participants in LAC completed the survey between April and July 2008. Of those participants, 2525 were of Hispanic descent and had children between the ages of 2 and 4 y. Up to 8 attempts were made to reach and interview eligible respondents from each telephone listing dialed. When WIC participants were reached by phone, 9 of 10 completed the survey (90.3% cooperation rate). However, the survey yielded a total response rate of 58.7% because many WIC participants were never reached at home within 8 call attempts. WIC program staff mailed a $10 gift card to all households that completed a questionnaire. Approval from the Independent Review Consulting Institutional Review Board was obtained for all protocols before commencement of the study.

Anthropometric measurements

To overcome the challenges of accurately assessing a young child's height and weight in a phone survey, survey records were linked to WIC administrative data to obtain accurate anthropometric data for the target children. Children are weighed and measured every 6 mo by WIC staff, with anthropometric data required for delivery of WIC services. In California, all WIC administrative data are stored in the ISIS. Heights and weights are stored in ISIS for all WIC participants, and ISIS generates risk codes for overweight (BMI-for-age $\geq$85th percentile) and obese (BMI-for age $\geq$95th percentile) children. In our analyses, we used the ISIS risk categories of overweight and obese, based on actual height and weight measurements taken by WIC staff. Children without these risk categories (BMI-for-age <85th percentile) are classified as not overweight or obese. The linking of the survey data with ISIS was done by statisticians at PHFE WIC, and the data were stripped of all identifiers to protect client confidentiality. Given that the survey sample was randomly selected from the larger LA County WIC data set with those participants for whom height and weight data were collected between January and March 2008, the survey data are linked to the ISIS risk codes for overweight and obesity generated within the 6 mo before survey administration. A validation study was recently conducted to assess the accuracy of height and weight measurements taken by both PHFE-WIC staff and research staff on 287 PHFE-WIC children aged 2–5 y. Correlations between WIC and research study measurements for height, weight, and BMI were 0.97, 0.99, and 0.92, respectively (16).

Survey variables used

The survey questions were translated into Spanish by trained WIC translators, who do all the PHFE-WIC translations, such that the language was appropriate for the WIC participants. Both the English and Spanish versions were pretested with 15 WIC participants before full-scale survey administration, with the translator listening in. Edits were made on the basis of this pretest administration. Although the survey included 126 questions, this study focused on questions related to early-life feeding practices and nutritional intake (*see* **Table 1** for specific questions). SSB was defined as sodas (eg, Coke and Mountain Dew) or other

TABLE 1
List of all relevant early life nutrition/feeding questions asked on the survey

Survey questions and response options
Have you ever breastfed your child?
Yes, have breastfed
No, have not
Refused
How old was your child the first time he or she ate anything besides breast milk? This includes formula, baby food, cow milk, sugar water, or anything else you fed your infant.
<1 wk
1 wk but <1 mo
1 mo but <3 mo
3 mo but <6 mo
At 6 mo
>6 mo
Don't know
Refused
How old was your child when you completely stopped breastfeeding him or her?
______months
Don't know
Refused
On an average day, about how many sodas, such as Coke or Mountain Dew, or sweetened drinks, such as Gatorade, Red Bull, or Sunny Delight, does your child drink? (Do not include diet sodas or sugar-free drinks. Please count a 12-oz can, bottle, or glass as 1 drink.)
_____drinks per day
None/never
Don't know
Refused
On an average day, how many times does your child drink any kind of milk?
___times per day
None/never
Don't know
Refused
What kind of milk does your child drink the most?
Whole (full-fat) milk
Reduced-fat milk, 1% or 2%
Nonfat milk
Chocolate milk
Soy milk
Rice milk

sweetened drinks (eg, Gatorade, Red Bull, or Sunny Delight); of note, 100% juice was not counted as a SSB. The survey also included questions about the ethnic and racial backgrounds of the child and whether or not the child was born prematurely (born at 36 wk or earlier). Parental self-reported height and weight were also obtained from this survey.

Participants

The final sample used in this analysis included 1483 children who were Hispanic, had available height and weight data, had responses to all BF and dietary questions from the survey, were not born preterm (≥36 wk gestation), and were between 2 and 4 y of age.

Statistical procedures

Data were examined for normality, and the mother's BMI was not normally distributed; therefore, analyses were run on the log-transformed value. Univariate ANOVAs and chi-square tests were run to assess differences in demographic and physical characteristics (eg, child's sex, birth weight, and age and mother's BMI) between BF and sugar intake categories (both separately and combined). Chi-square tests were run to assess whether BF status was related to subsequent SSB intake status. Chi-square tests were run to assess the differences between BF and sugar intake groups (both separately and combined) on prevalence of overweight and prevalence of obesity. If the results of the chi-square test were significant, a binary logistic regression analysis was run, with the dependent variables being the prevalence of either obesity or overweight (yes or no), and the independent variables were BF and SSB groups and the interaction of the BF and SSB groups. The "unhealthy" profile was the referent category (no BF, high SSB, or the combination no BF/high SSB). Covariates included mother's BM, child's sex and age, and type of milk most often consumed during the toddler years (full-fat, lower-fat, nonfat, and chocolate). All analyses were performed by using SPSS version 16.0 (SPSS), with the significance level set at $P \leq 0.05$.

RESULTS

The physical characteristics of the final sample size (n = 1483) are shown in **Table 2**. Of these participants, 20% were not breastfed (no BF), 23% were breastfed for >1 wk to <6 mo (>1 wk to <6 mo BF), 21% were BF for 6 to <12 mo (6 to <12 mo BF), and 36% were BF for ≥12 mo (≥12 mo BF). Eighteen percent of these participants consumed ≥2 SSBs/d at age 2–4 y (high SSB), 25% consumed 1 SSB/d (mid SSB), and 57% consumed no SSBs/d (no SSB). No statistically significant differences in child's age, sex, birth weight, type of milk most often consumed, and mother's BMI were found between the separate or combined BF and SSB categories. Chi-square tests showed that BF status was not significantly related to SSB intake (P = 0.30).

Chi-square tests showed that there was a trend for differences in the obesity prevalence by BF category (P = 0.07), with 17% of the no-BF participants, 17% of >1-wk-to-6-mo-BF participants, 15% of the 6-to-<12-mo-BF participants, and 11% of the ≥12-mo-BF participants being obese. Binary logistic regression showed that the significance for differences in obesity prevalence by BF category were strengthened (P = 0.02) after control for age, sex, mother's BMI, and type of milk most commonly consumed. The results of the binary logistic regression analysis of the independent and combined BF and SSB category effects on obesity prevalence are shown in **Table 3**. With no BF as the referent value, the odds of obesity were lower in the ≥12-mo-BF participants (OR: 0.55; 95% CI: 0.37, 0.83; P = 0.004; Table 3). Chi-square tests showed a trend for differences in overweight prevalence by BF category (P = 1.00), with 28% of the no-BF participants, 29% of the >1-wk-to-<6-mo–BF participants, 28% of the 6-to-<12-mo-BF participants, and 24% of the ≥12-mo-BF participants being overweight. Binary logistic regression analysis showed that the significance of differences in overweight prevalence by BF categories was strengthened (P = 0.03) after control for covariates. With no BF as the referent value, the odds of overweight were lower in the ≥12-mo-BF participants (OR: 0.72; 95% CI: 0.52, 1.00; P = 0.05; data not shown).

Chi-square tests showed a trend for significance (P = 0.06) for differences in obesity prevalence by SSB category, with 18% of the high-SSB participants, 17% of the mid-SSB participants, and 12% of the no-SSB participants being obese. Binary logistic regression showed that differences in obesity prevalence by SSB categories were significant (P = 0.03) after control for age, sex, mother's BMI, and type of milk most commonly consumed. With high SSB as the referent value, the odds of obesity were lower in participants with no SSB (OR: 0.69; 95% CI: 0.47, 1.00; P = 0.05; Table 3). Chi-square tests showed a significant difference in overweight prevalence by SSB categories (P = 0.03), with 31% of the high-SSB participants, 30% the mid-SSB participants, and 24% of the no-SSB participants being overweight. The significance was decreased to a trend (P = 0.06) after control for covariates. With high SSB as the referent value, there was a trend for the odds of overweight to be lower in participants with no SSB (OR: 0.74; 95% CI: 0.55, 1.00; P = 0.06; data not shown).

TABLE 2
Demographic and physical characteristics of the evaluable participants

Characteristics	Value (n = 14,830)
Sex (% male)	51
Age (y)	3.4 ± 0.9[1]
Birth weight (kg)[2]	3.4 ± 0.6
Overweight (%)	27
Obese (%)	15
Mother's BMI (kg/m^2)[3]	27.9 ± 5.6
Breastfeeding category (%)	
No breastfeeding (<1 wk)	20
1 to <6 mo	23
6 to <12 mo	21
≥12 mo	36
Sugar categories (%)	
0 servings/d	57
1 serving/d	25
≥2 servings/d	18
Type of milk most often consumed (%)	
Whole	39
Reduced fat	57
Nonfat	3
Soy milk	1
Chocolate milk	1

[1] Mean ± SD (all such values).
[2] n = 1388.
[3] n = 1035.

TABLE 3
Adjusted ORs of the independent and combined effect of BF and SSB intake categories on predicting the prevalence of obesity in Hispanic toddlers (n = 1483)[1]

Category	No. of subjects	P value[2]	OR (95% CI)	P value[3]
BF				
No BF	300	0.02	Referent	—
>1 wk to <6 mo BF	346		0.72 (0.50, 1.10)	0.13
6 to <12 mo BF	303		0.64 (0.41, 1.00)	0.03
≥12 mo BF	534		0.55 (0.37, 0.83)	0.004
SSB				
No SSB	845	0.07	0.69 (0.47, 1.00)	0.05
Mid SSB	371		0.90 (0.59, 1.40)	0.73
High SSB	267		Referent	—
BF/SSB				
No BF/high SSB	56	0.005	Referent	—
No BF/mid SSB	77		0.75 (0.32, 1.78)	0.52
No BF/no SSB	167		0.61 (0.28, 1.31)	0.21
>1 wk to <6 mo BF/high SSB	71		0.88 (0.38, 2.05)	0.77
>1 wk to <6 mo BF/mid SSB	100		0.85 (0.38, 1.89)	0.68
>1 wk to <6 mo BF/no SSB	175		0.42 (0.19, 0.91)	0.03
6 to <12 mo BF/high SSB	52		0.86 (0.34, 2.15)	0.75
6 to <12 mo BF/mid SSB	74		0.51 (0.21, 1.27)	0.14
6 to <12 mo BF/no SSB	177		0.49 (0.23, 1.05)	0.07
≥12 mo BF/high SSB	91		0.31 (0.12, 0.81)	0.17
≥12 mo BF/mid SSB	117		0.48 (0.21, 1.10)	0.05
≥12 mo/no SSB	326		0.39 (0.19, 0.80)	0.01

[1] BF, breastfeeding; SSB, sugar-sweetened beverage.
[2] Binary logistic regression analyses were run with the following covariates: mother's BMI, child's sex and age, and type of milk most often consumed during the toddler years; the P value reflects the significance for the independent and/or interaction of SSB and/or BF categories on obesity prevalence.
[3] P value reflects the significance of the β for each category, after control for the covariates.

Chi-square tests showed significant differences in obesity prevalence by the combined BF and SSB categories (P = 0.02). Binary logistic regression showed that the interaction of the combined effect of BF and SSB categories was highly significant in the model (P = 0.005). The adjusted combined BF and SSB effect on obesity prevalence is shown in **Figure 1**. With the no BF/high SSB as the referent category, the odds of obesity were significantly lower in the ≥12-mo-BF/no-SSB participants (OR: 0.39; 95% CI: 0.19, 0.80; P = 0.01; Table 3). No significant combined effect of BF and SSB on overweight prevalence was found.

Because the interaction of BF and SSB categories was highly significant in the model (P = 0.005), the data were then split by BF category, and the regressions were rerun to assess the effect of SSB categories (eg, independent variables) on obesity status (dependent variable) within each BF group. SSB intake was only significant in the no-BF (P = 0.04) and >1-wk-to-<6-mo-BF (P = 0.03) participants, and a trend for SSB intake to be significant was observed in the >6-to-<12-mo-BF participants (P = 0.09). However, SSB intake was not significant in the ≥12-mo-BF participants.

DISCUSSION

The purpose of this study was to examine and compare the separate and combined effects of BF in the first year of life and early-life SSB intake at age 2–4 y on the prevalence of overweight and obesity in high-risk Hispanic toddlers. In summary, compared with participants who were not breastfed, participants who were breastfed for ≥12 mo had 45% lower odds of being obese and 28% lower odds of being overweight. Compared with participants who reported a high SSB intake, participants who reported consuming no SSBs had 31% lower odds of being obese. The combined effect was even stronger, with participants who were breastfed for ≥12 mo and had no SSB intake having a >60% decrease in the odds of obesity compared with participants who were not breastfed and reported a high SSB intake. The results also suggest that SSB intake affected obesity prevalence only in those participants who were not BF or were BF

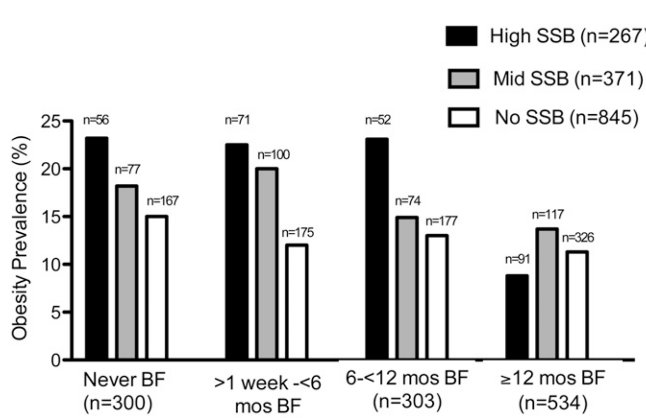

FIGURE 1. Prevalence of obesity by combined BF and SSB categories. With the use of binary logistic regression analysis in a sample of 1483 toddlers, significant differences in the prevalence of obesity by BF and SSB category were observed (P = 0.005) after control for age, sex, mother's BMI, and type of milk most commonly consumed. BF, breastfeeding; SSB, sugar-sweetened beverage.

<12 mo, which suggests that later SSB intake had less of an effect on obesity in infants who were breastfed for ≥12 mo.

Expert panels have concluded that BF reduces the risk of overweight in children and adolescents by 22–24%, with stronger effects for prolonged BF (17). The consistency of the evidence across the life span suggests that early BF may have lasting protective effects independent of other dietary and physical activity patterns later in life (2). However, most of these studies were conducted in white children. Much less data are available in Latino populations, in whom associations between BF and child obesity are inconsistent. National data on 177,304 low-income children at 4 y reported no association between BF and risk of overweight among Hispanics; however, <3% of these children were breastfed ≥12 mo (4). Similarly, Butte (5) reported that neither exclusive (as defined by the WHO as only breast milk with the exception of vitamins/mineral supplements and medicine for ≥6 mo) nor partial BF (as defined by the WHO as some supplementation of formula, milk, or other food) (18) was associated with the risk of obesity in 1030 Hispanic children (4–19 y of age). In contrast, Burdette et al (19) found that ever-BF was linked to a lower prevalence of obesity in 2146 Hispanic children (3 y of age) followed prospectively since birth. The current study provides more evidence that BF is associated with a lower obesity prevalence in Hispanic toddlers, and a longer duration of BF was associated with lower rates of obesity.

Early exposure to added sugar intake also played a substantial role in increased obesity prevalence in children. The most recent data from NHANES on 2- to 18-y-olds show that nearly 40% of total energy consumed is in the form of added sugar, with SSB being among the top source (20). Over the past 3 decades, the percentage of total energy intake from SSB among children and adolescents has more than doubled, from 4.5% to 11% (21, 22). There is a growing body of evidence that a high added sugar intake, specifically of SSBs, contributes to the pediatric obesity epidemic (7–10). A longitudinal study of 170 non-Hispanic white girls aged 5 y, who were assessed biennially for 10 y via multiple dietary recalls, found that greater consumption of SSBs at 5 y of age was associated with higher body fat, waist circumference, and BMI percentiles from ages 5 to 15 y (23). In another study, in >2000 preschool children, the frequency of SSB consumption between meals was strongly associated with the development of overweight. A longitudinal study with low-income African American children (3–5 y of age) found that the prevalence of obesity doubled (10–20% after 2 y) and that SSB was positively associated with this change (24). This study also showed that the odds of a child becoming overweight increased 4% for each additional ounce of SSB consumed, which equates to a 45% increased risk of being overweight with the consumption of one additional 12-oz soda/d. Ludwig et al (8) showed that each additional serving of SSB consumed daily increased the odds of obesity among children (11–12 y of age) by 60%. The results of the current study suggest that SSB intake plays less of a role in protecting against obesity in participants breastfed for ≥1 y, whereas SSB intake plays a larger role in promoting obesity in participants who were not breastfed or breastfed <12 mo. To our knowledge, this was the first study to show the additive effects of BF and SSB intake during early childhood on obesity prevalence.

One might expect that that BF status influences later sugar consumption. However, BF status in the first year of life was not related to SSB intake at 2–4 y of age. Therefore we must consider separate mechanisms for the protective effects of BF and low SSB intake on obesity. The 2 behaviors occurred at very different time points, with the BF behavior being terminated ~2 y before the assessment of height and weight, whereas the SSB behavior was occurring at approximately the same time as the assessment of height and weight. These results imply that the BF effect might act through some type of metabolic or behavioral programming rather than through a direct effect of calories. However, more research is warranted to assess whether BF acts through metabolic or behavioral programming.

There are several mechanistic explanations of why BF is protective against obesity. The first explanation is the BF mothers lack the ability to directly assess and monitor intake and must rely on the infant's satiety cues to determine feeding frequency (25). Therefore, BF mothers are more likely to trust the infant's ability to self-regulate and be more attentive to the infant's expressions and cues indicating fullness and satiation. Another explanation is that breast milk has increased fat content, which provides a satiety signal protecting against overeating (26, 27). Formula-fed infants have a higher insulin response than do breastfed infants (28). Animal studies have shown that BF alters lipid metabolism, by excreting cholesterol as bile acids more slowly (29). Leptin is also produced in the mammary glands and is absorbed by the child and thereby influences satiety and subsequent growth and development (30, 31). Concurrently, SSB intake may lead to obesity by providing additional energy, which leads to a positive energy balance (32). One study found that children (2–5 y) consumed an average of 16 fluid ounces (or 473 mL) of SSB, which accounts for 10% of their total energy intake (22). Promising new research suggests that sugar activates certain brain pathways that are also activated by addictive drugs (33). Sugar also affects endogenous opioids, which play a key role in rewarding aspects of consumption and enhance subsequent feeding (34). Therefore, sugar intake not only increases immediate energy intake, but also may actually stimulate further increased intake. Thus, the combined effects of BF and low SSB intake may act on different pathways to protect against excessive weight gain and obesity prevalence.

This study had several limitations that need to be mentioned. The mother's BMI was calculated from self-reported height and weight on the survey, and only a subsample (*n* = 1035, or 70%) of mother's reported these data. Similarly, only a subset (*n* = 1388, or 90%) of mother's reported the participant's birth weight. Another limitation was that information on gestational diabetes status of the mother during pregnancy was not collected. In addition, we did not analyze subjects based on whether or not they were exclusively breastfed because only a total of 4% (or *n* = 60) of participants were exclusively breastfed (as defined by WHO standards). However, one would expect the prevalence of obesity to be even lower in exclusively breastfed infants, who received mother's milk only during the first year of life. Another limitation was that the SSB intake was based on a serving of 12 fluid ounces (or 355 mL), a rather large serving size for toddlers to consume at one sitting, and may have required mothers to aggregate the SSB intake over multiple times. In addition, the survey did not include questions on other added sugar sources (eg, sweetened grains, candies, and cakes) or on overall energy intake. Another limitation was that the sample size varied substantially among the different BF and SSB categories, with only

56 subjects in the no BF/high SSB category. Finally, the ISIS codes were generated within 6 mo before the survey collection, which made it difficult to assess the causality of SSB on overweight/obese prevalence. Intervention studies to examine the direct effects of increasing BF status and decreasing SSB intake on obesity risk factors are warranted.

In conclusion, to our knowledge, this study is the first to show the combined effect of lack of BF and high SSB intake on obesity prevalence in Latino toddlers. The combined effect of BF for >12-mo and no-SSB intake resulted in a 60% reduction in obesity prevalence. This study also showed that a higher SSB intake may have a greater effect on promoting obesity in children who were not or breastfed <12 mo, as opposed to the protective effect of BF for ≥12 mo, regardless of SSB intake. These 2 early-life nutrition practices are highly modifiable risk exposures and are therefore high potential targets for developing successful interventions during early-life nutrition development.

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The author's responsibilities were as follows—JND: formulated the research question, analyzed and interpreted the data, and prepared the manuscript; SEW: designed the study, oversaw the data collection, interpreted the data, and helped prepare the manuscript; MIG: assisted with the data analyses and interpretation and helped prepare the manuscript. None of the authors declared a conflict of interest.

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