Research Article

An Exploratory Analysis of Child Feeding Beliefs and Behaviors Included in Food Blogs Written by Mothers of Preschool-Aged Children

Allison E. Doub, MS[1]; Meg Small, PhD[2]; Leann Birch, PhD[3]

ABSTRACT

Objective: This study analyzed child feeding beliefs and behaviors, types of recipes, and their associations in blogs focused on child feeding.

Design: The authors selected 13 blogs using purposive snowball sampling, from which 158 blog posts were sampled and coded using directed qualitative content analysis.

Variables Measured: Child feeding beliefs and behaviors and types of recipes were coded using schemes developed from existing literature.

Analysis: Code frequencies were calculated. Chi-square tests for independence examined associations between child feeding and recipe codes. Bonferroni corrections were applied: $P < .05/(n \text{ tests})$.

Results: Child feeding beliefs and behaviors were coded in 78% and 49% of posts, respectively. Beliefs about children's food preferences (48% of posts) and involving children in food preparation (27% of posts) were the most frequent codes. Recipes were included in 66% of posts. Most recipes were for mixed dishes (32% of recipes), followed by sweets and desserts (19% of recipes). Vegetable recipes were more likely in posts that included behavior encouraging balance and variety ($\chi 2$ [1, n = 104] = 18.54; $P < .001$).

Conclusions and Implications: Blog posts contained information that may influence readers' child feeding practices. Future research should explore how mothers use blogs to learn about child feeding.

Key Words: blogs, child feeding practices, recipes, social media, mothers (*J Nutr Educ Behav*. 2016;48:93–103.)

Accepted September 2, 2015. Published online October 23, 2015.

INTRODUCTION

In 2011–2012, nearly 1 in 4 preschool-aged children were overweight or obese.[1] To reduce the prevalence of childhood obesity, more research is needed regarding the risk and protective factors that can be modified during infancy and early childhood.[2] Child feeding practices are one such modifiable influence[3,4] and include decisions about what to feed children (ie, types and portion sizes of food and beverages) and more nuanced beliefs and behaviors about how to feed children (eg, amount of control exerted over children's eating behavior, whether food is used to soothe or reward, and establishing mealtime/snack routines).[5] Mothers' child feeding practices in particular may influence childhood obesity risk because mothers tend to spend the most time on child feeding tasks such as purchasing groceries, preparing food, and eating with children.[6] Overtly restrictive or indulgent (ie, highly permissive, child-controlled) feeding practices are likely to promote childhood obesity,[7-9] whereas responsive feeding practices that are prompt, contingent on children's hunger and fullness cues, and developmentally appropriate may promote children's self-regulatory skills and reduce childhood obesity risk.[10,11]

Associations between child feeding practices and childhood obesity may be partially mediated by the foods that mothers offer and children consume.[12] Data from the 2008 Feeding Infants and Toddlers Study revealed that 86% of 2- to 3-year-old children consumed foods of little nutritional value (eg, sweetened beverages, sweets, salty snacks) whereas < 15% consumed highly nutritious foods such as dark green or deep yellow vegetables in a day.[13] Among preschool-aged children, indulgent feeding practices have been associated with higher fat

[1]Department of Human Development and Family Studies, College of Health and Human Development, Pennsylvania State University, University Park, PA

[2]Bennett Pierce Prevention Research Center for the Promotion of Human Development, Pennsylvania State University, University Park, PA

[3]Department of Foods and Nutrition, College of Family and Consumer Sciences, University of Georgia, Athens, GA

Conflict of Interest Disclosure: The authors' conflict of interest disclosures can be found online with this article on www.jneb.org.

Address for correspondence: Allison E. Doub, MS, Department of Human Development and Family Studies, College of Health and Human Development, Pennsylvania State University, 115 Health and Human Development Bldg, University Park, PA 16802; Phone: (717) 658-3998; Fax: (814) 863-7963; E-mail: aed5142@psu.edu

©2016 Society for Nutrition Education and Behavior. Published by Elsevier, Inc. All rights reserved.

http://dx.doi.org/10.1016/j.jneb.2015.09.001

consumption[8] and lower vegetable, fruit, and dairy consumption.[14] Conversely, responsive feeding practices have been associated with lower sweetened beverage consumption,[8] higher home availability of vegetables and fruits, and higher consumption of vegetables and dairy.[15] More research is needed on how child feeding beliefs and behaviors influence the types of foods that mothers offer to their children.

Despite their potentially important role in childhood obesity prevention, there is limited evidence on how mothers acquire their child feeding practices.[16] Existing research has primarily focused on maternal factors including demographic characteristics (eg, income, education), mental health (eg, depression, eating pathology), and maternal weight status,[17-20] or on child factors including child weight status, appetitive traits, and temperament.[21-24] Few studies have examined how broader contextual influences such as peers and media (eg, magazines, television, Web sites) influence child feeding practices. Social norms that are transmitted through peers and media may influence maternal beliefs about child feeding (eg, expectations about children's food preferences), child feeding behaviors (eg, involving children in food preparation), and the types of foods that mothers offer.[16,25-27]

The Internet has created new media contexts that may convey information and social norms related to child feeding practices. In 2014, 91% of parents used the Internet and over 80% of online mothers used a social media platform such as Facebook (81%), Pinterest (40%), or Instagram (30%).[28] One study of primarily white college-educated mothers found that 75% read blogs, which suggests that blogs are also highly accessed by some mothers.[29] Previous studies found that mothers from diverse racial/ethnic and socioeconomic backgrounds use Web sites and social media to obtain general parenting information and social support.[28,30,31] Because of the potential reach of information shared on Internet-based media such as blogs, research is needed on the information about child feeding practices that mothers are likely to consume.

Blogs are generally defined as publicly available, chronologically organized, frequently updated Web pages that focus on specific topics. Blog posts are individual dated entries that contain digital content such as text, photos, videos, and/or hyperlinks to other Web pages. Many blogs have social networking features that promote communication and community among bloggers and blog readers who may not know each other offline (eg, comment threads). Food blogs typically include text about food culture, cooking, and eating, food photography, and recipes.[32,33] The purpose of the current study was to describe information conveyed in food blogs focused on child feeding that were written by mothers of preschool-aged children, to begin to explore how these media may influence readers' child feeding practices. Specifically, the first aim was to describe the child feeding beliefs and behaviors that bloggers endorsed and/or modeled in their blog post text. The second aim was to identify the types of recipes that were included in blog posts, because recipes may convey social norms about the foods and beverages that mothers offer to their children. The third aim was to explore the associations between child feeding beliefs and behaviors and the types of recipes.

METHODS

This study was reviewed by the Pennsylvania State University Institutional Review Board and was classified as exempt. Consistent with the guidelines presented by the Association of Internet Researchers,[34] this article does not disclose inherently identifying information (eg, blog names, Web addressees) in an effort to protect the privacy of bloggers whose content was included in this observational study. Specific demographic characteristics of the bloggers and their children (eg, race and ethnicity, family size) are also not disclosed; combined with the small sample size and highly specific sampling criteria, this information may lead to identification of the blogs included in this study.

Sampling Procedure

The researchers used purposive snowball sampling[35] to identify blogs. The Figure displays the results of the sampling procedure. Blogs were eligible for study inclusion if they satisfied the following criteria: (1) the blog was publicly available and updated within the past month; (2) blog content represented the views of the blogger, not those of a business or other organization; (3) the blog description stated or implied that its primary focus was on child and/or family feeding; (4) the blogger was parenting at least 1 preschool-aged child (approximately aged 2–5 years) in 2013; and (5) a minimum of 25% of blog posts were relevant to child feeding during each quarter of the study period: March 1, 2013 to February 28, 2014.

To identify an initial sample of blogs that were relevant to the study aims and could be accessed easily by mothers through a general Web search, the first author entered the phrase *food blogs for moms* into multiple Web search engines (ie, Google, Yahoo, DuckDuckGo) in May, 2013. An article entitled "The Top 100 Mom Food Blogs of 2013!" published in April, 2013 by a parenting Web site, *Babble*,[36] was among the top search results across search engines. The 100 blogs included in this article were selected as the initial sample. Similar to a previous study of health-related blogs,[37] the hyperlinked lists of blog recommendations (ie, blog rolls) included in eligible blogs from the initial sample were used to identify a snowball sample. Six of 16 eligible blogs from the initial sample included blog rolls, which yielded 168 unique blogs for the snowball sample. A total of 24 blogs from the initial and snowball samples satisfied the first 4 inclusion criteria. These blogs had a mean of 98 posts during the study period (range, 11–247; SD, 61; median, 82).

To determine whether blogs satisfied the fifth inclusion criteria, the study team developed a coding manual that included descriptions and examples of blog posts that were relevant or not to child feeding. Posts that mentioned topics related to child feeding (eg, children's food preferences, recipe suggestions for children, managing mealtime behaviors) at least once were coded as relevant. Coders (ie, the first author and a research assistant) trained by

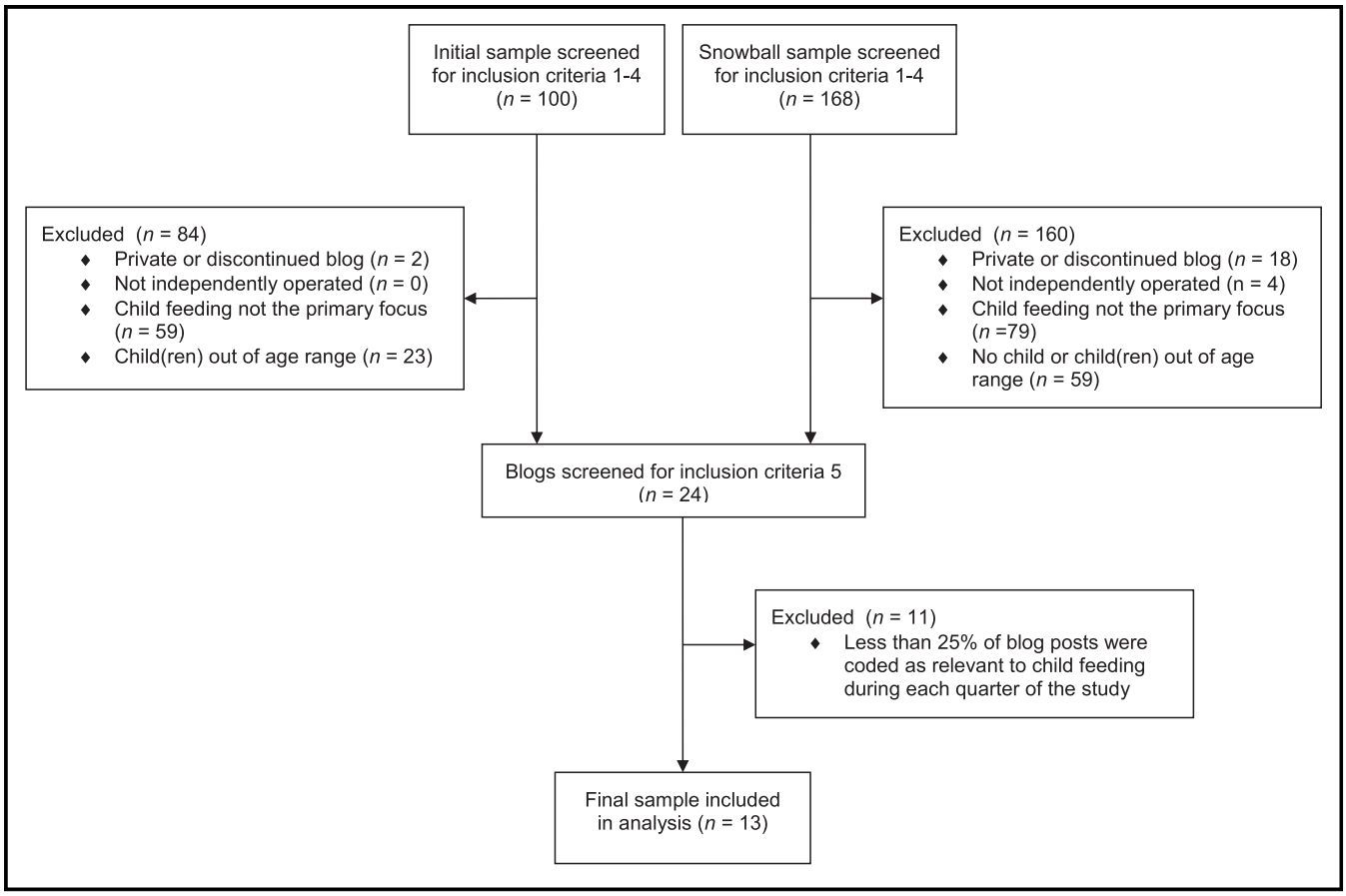

Figure. Flow diagram of purposive snowball sampling procedure used to select blogs for study inclusion.

independently coding a random sample of blog posts until agreement was > 85%. Coders met regularly to compare and discuss coding decisions. After training, all posts from the study period (n = 2,345) were coded. All posts from 4 randomly selected blogs (about 15% of the blog sample; n = 417 posts) were double-coded and demonstrated high inter-rater reliability (Cohen's kappa = 0.91). The first author completed confirmatory coding on all posts that were coded as relevant to child feeding by either coder to determine the final coding assignment. Disagreements were resolved by discussion between coders.

Across the 24 blogs, 39% of all posts (n = 909) were coded as relevant to child feeding. The percentage of posts coded as relevant to child feeding varied across and within blogs (mean, 40%; SD, 18%; range, 0% to 100%/quarter). Thirteen of 24 blogs included child feeding topics in ≥ 25% of posts across all 4 quarters of the study period and were included in the study. A random sample of 20% of posts coded as relevant to child feeding (n = 158) was sampled from each of the 13 eligible blogs for further analyses (mean, 12 posts/blog; SD, 3 posts). Two blogs had few posts overall during the study period (ie, 36 and 11 posts) from which 50% (n = 13) and 100% (n = 8) of posts relevant to child feeding, respectively, were sampled to ensure that the sampled posts were representative of the blog's typical content.

Measures

To measure child feeding beliefs and behaviors, the text included in blog posts was coded using directed qualitative content analysis[38,39] for phrases, sentences, and/or paragraphs that conveyed information about child feeding. The authors developed an a priori coding scheme from existing qualitative and quantitative survey measures of maternal child feeding beliefs and behaviors.[40-44] Open coding was also conducted to capture emergent child feeding beliefs and behaviors.[39] One additional code emerged: the belief that food is fun. All child feeding beliefs and behaviors that occurred within each post were assigned codes. Child feeding beliefs and behaviors were coded by the first author, who repeatedly read all posts and has training and expertise in child feeding practices. The first author also conducted confirmatory coding after all posts had been coded once. The authors discussed ambiguous or challenging text segments to determine the final coding assignment.

Recipes in blog posts (ie, the portion of the post that contained a distinct recipe title, list of ingredients, and step-by-step instructions) were coded using a food categorization coding scheme similar to the 2002 and 2008 Feeding Infants and Toddlers Study.[45,46] Each recipe included in a post was assigned the code that best reflected its ingredients. Recipes were coded by the first author and a research assistant. Coders trained by independently coding a random

sample of blog posts until agreement was ≥ 85%. Coders met to compare and discuss codes. During the final coding period, a random sample of about 20% of all recipes (n = 54) was double-coded for inter-rater reliability. Because there were many possible codes and a low frequency of each code, overall percent agreement was calculated to be 83%. The first author performed confirmatory coding on all recipe codes assigned by either coder to determine the final coding assignment. Disagreements were resolved by discussion between coders.

Data Analyses

Blog posts were coded using MAXQDA (version 11 for Mac, VERBI Software, Berlin, Germany, 2014) software for qualitative analysis. A dataset containing 1 row for each blog post and 1 column for each code was created using the code matrix browser feature. Each code was counted only once per post, meaning it was considered present (1) or absent (0). These data were imported into SPSS (version 22, IBM, Armonk, NY, 2013). The frequency of each code was computed. The researchers conducted Pearson chi-square tests for independence to explore whether the child feeding beliefs and behaviors codes included in recipe posts were significantly different from those that occurred in posts not including recipes. Chi-square analyses also explored whether the types of recipes included in blog posts were significantly different based on child feeding belief and behavior codes that were present. Chi-square analyses included only the child feeding beliefs, child feeding behaviors, and recipe types that represented ≥ 10% of the code categories. Significance values were corrected for multiple tests using Bonferroni correction: $P < .05/(\text{N tests})$. All quotations in this article are paraphrased for blogger confidentiality.

RESULTS

Child Feeding Beliefs

Table 1 lists child feeding belief code descriptions and results. Codes for child feeding beliefs were present in 78% of blog posts (n = 123). A total of 199 codes were assigned within these 123 blog posts, indicating that multiple child feeding beliefs were described in some blog posts. Approximately half of all blog posts included text segments related to beliefs about children's food preferences, such as whether children were likely to enjoy the recipe included in the blog post. The belief that child health (eg, cognitive development, bone density) is an important factor in child feeding decisions was the next most frequent belief code. Text segments that conveyed the belief that mothers are responsible for child feeding tasks (eg, providing meals) were also common. Notably, concern for child weight was coded in only 1 of 158 sampled posts and reflected concern for child underweight. Child food preferences, health values, and responsibility represented ≥ 10% of child feeding belief codes and thus were included in the chi-square analyses.

Child Feeding Behaviors

Table 2 displays child feeding behavior code descriptions and results. Child feeding behavior codes were assigned in 49% of blog posts (n = 77). In total, 100 codes were assigned within these 77 blog posts, indicating that multiple child feeding behaviors were described in some blog posts. Child involvement in food preparation through activities such as stirring or adding ingredients was the most frequently coded child feeding behavior. Encouraging balance and variety was the next most frequently coded behavior, in which bloggers modeled or endorsed feeding children an array of foods to expose them to many flavors and to avoid food monotony. Bloggers also discussed how they responded to their children's developing nutritional needs and eating behavior. Child involvement, encouraging balance and variety, and responsiveness represented ≥ 10% of child feeding behavior codes and thus were included in the chi-square analyses.

Types of Recipes

Recipe code descriptions and results are listed in Table 3. Recipes were included in 66% of blog posts (n = 104). Four posts contained 2 recipes; thus, a total of 108 recipe codes were assigned. Nearly 1 in 3 recipes were for mixed dishes. A wide variety of recipes were identified with this code, including pasta- or noodle-based dishes (n = 7), Mexican-inspired wrap dishes (eg, burritos, tacos [n = 6]), sandwiches (n = 5), rice-based dishes (eg, rice and beans [n = 4]), and multicomponent salads (eg, quinoa with vegetables [n = 4]). Sweets and desserts were the next most frequent type of recipe, followed by grains and grain products. Notably, 14 of 17 grains and grain products recipes were for foods that contained added sugars, such as muffins and pancakes. Recipes for vegetables and meat or other protein sources were also common. One third of vegetable recipes contained a deep yellow vegetable (eg, sweet potato) and one quarter contained a dark green vegetable (eg, kale). Mixed dishes, sweets and desserts, grains and grain products, vegetables, and meat or other proteins represented ≥ 10% of codes and thus were included in the chi-square analyses.

Associations Between Child Feeding Beliefs and Behaviors and Types of Recipes

Table 4 displays full results of the chi-square analyses exploring whether child feeding beliefs and behaviors included in recipe posts were different from those in non-recipe posts. Responsiveness was more likely to occur in blog posts that contained recipes than in those that did not (χ^2 [1, n = 158] = 7.36; $P = .007$; $\varphi = 0.22$). Table 5 lists full results of chi-square analyses exploring whether the types of recipes included in blog posts were significantly different based on the child feeding belief and behavior codes that were present. Recipes for vegetables were more likely to occur in posts in which the code for encouraging balance and variety was present (χ^2 [1, n = 104] = 23.45; $P < .001$; $\varphi = 0.48$). Recipes for vegetables occurred in 50% of blog posts in which bloggers modeled and/or endorsed feeding children a balance and variety of foods, compared with 6% of posts in which the encourage balance and variety code was not assigned. Recipes for sweets and desserts were

Table 1. Child Feeding Beliefs Coding Scheme: Code Names, Descriptions, Examples, Frequencies, and Percentages of Codes

Code	Description	Example	Frequency, n	All Belief Codes (%) (n = 199)	All Blog Posts (%) (n = 158)
Children's food preferences	Perceptions of children's likes or dislikes of foods, flavors, or textures	*All of my kids like eggs, so this makes a great afternoon snack.* *This recipe is sure to be a hit with the whole family.*	75	38	48
Health values	Child health and nutrition portrayed as important; includes health claims	*Avocados are a quick and healthy way to fill up your kids.* *This recipe provides kids with their daily dose of vitamin C.*	35	18	22
Responsibility	Parents/mothers are responsible for child feeding tasks (eg, cooking)	*Packing lunch is part of motherhood.* *It's hard making kids meals 3 times per day in the summer, but it's something moms have to do!*	22	11	14
Food and family	Child feeding creates family cohesion and memories; includes family meals	*I hope my kids make this family meal for their own kids one day.* *We make this lunch as a family after going to the market each week.*	19	10	12
Food and fun	Food is portrayed as source of entertainment or fun	*We made these cookies as a fun way to pass time on a snow day.* *Adding sprinkles is a sure way to bring smiles and fun to your child's celebration.*	15	8	10
Food and culture	Frames food as a way to promote/share culture/ holidays with children	*It wouldn't be summer without ending the day with ice cream.* *This is the perfect dish to make to get everyone into the holiday spirit.*	13	7	8
Picky eating	Perceives children as picky, selective, or difficult-to-please eaters	*My son is a terribly picky eater.* *I made this side knowing my son wouldn't touch the entrée I was serving.*	11	6	7
Food and indulgence	Food is viewed as decadent, indulgent, rich; a way to treat or spoil children	*This decadent dessert is reserved for a holiday treat.* *Treat yourself by adding some hot fudge.*	8	4	5
Concern for child weight	Expresses worry or concern about child being overweight or underweight	*My daughter is small for her age, so I make lunch easy to eat.*	1	< 1	< 1

somewhat more likely to occur in posts with child involvement in food preparation codes (χ^2 [1, n = 104] = 7.85; $P = .005$; $\varphi = 0.28$). Recipes for sweets and desserts occurred in 38% of blog posts in which bloggers described behaviors regarding engaging children in food preparation, compared with 13% of blog posts in which child involvement in food preparation was not coded. Although this finding was significant at $P < .05$, it did not maintain significance at the Bonferroni corrected level.

Table 2. Child Feeding Behaviors Coding Scheme: Code Names, Description, Examples, Frequencies, and Percentages of Codes

Code	Description	Example	Frequency, n	All Behavior Codes (%) (n = 100)	All Blog Posts (%) (n = 158)
Child involvement	Engages children in food preparation (eg, selecting ingredients, stirring)	*I let the kids pick out their own toppings for these tacos.* *This 1 bowl cake is perfect for little hands that want to help stir.*	42	42	27
Encourage balance and variety	Encourages children to eat balanced and varied diet, particularly one that includes healthy foods (eg, vegetables)	*I try to offer my kids as many different veggies as possible.* *I make this fruit smoothie to brighten up the lunchbox midweek.*	22	22	14
Responsiveness	Responds to children's hunger and fullness cues and taste preferences in developmentally appropriate ways	*We've found a way to serve this veggie so that everyone in the family tries it.* *Now that I have children, I make these sandwiches in a smaller size for their little hands.*	13	13	8
Indulgence	Children decide what, when, and where food is eaten; does not want to spend much time or energy on child feeding	*I make a big batch of this pudding so that my son can have it whenever he wants.* *My son sneaked into the kitchen and helped himself to a cookie. I couldn't get mad because I made them for him.*	7	7	4
Food literacy	Explicitly teaches children about food, nutrition, and/or ingredients	*We visited a farm so that my kids could see where their food comes from.* *My plan is to let each kid pick out a different herb seed and we'll talk about how we could use it in a favorite dish.*	5	5	3
Pressure to eat	Attempts to get children to eat more food regardless of hunger or satiety cues	*The kids have to take 3 bites of everything on their plate.* *I bribed him to eat more of the sandwich by promising some chips.*	3	3	2
Modeling eating behavior	Intentionally demonstrates how to eat, particularly healthy food	*Parents—you have to eat your veggies, too!* *I don't believe in fad diets and don't want to model that lifestyle for my children.*	2	2	1
Overt restriction	Limits children's intake of type or amount of food through obvious methods (eg, will not serve more of a food)	*My son asked for ice cream and I told my son he had enough sugar for the day.* *After making these treats together, I hid them in the back of the freezer. I'm surprised the kids aren't sneaking them.*	2	2	1
Monitoring	Keeps track of what, when, where, and how much children eat, particularly high-fat, high-sugar foods	*To avoid feeding your children too much sugar, you have to read the food labels.* *My kids get so many treats at school, parties, and even at practice for sports.*	2	2	1
Instrumental feeding	Uses food to reward good behavior, bribe, or soothe negative emotions or promote positive affect	*I'll bribe my kids for good behavior by telling them we can get a treat at the end.*	1	1	< 1
Covert restriction	Limits children's intake of type or amount of food through methods not perceptible to child	*You can cut sugar out of this recipe easily without your little one even noticing.*	1	1	< 1

Table 3. Recipe Type Coding Results: Frequency, Foods/Beverages Coded, and Percentages of Codes

Code	Foods Included in Coded Recipes	Frequency, n	Recipe-Type Codes (%) (n = 108)	Blog Posts (%) (n = 158)
Mixed dishes	Pasta/noodle-based dishes (eg, lasagna); Mexican-inspired wrap dishes (eg, enchiladas); sandwiches; rice-based dishes (eg, rice and beans); multicomponent salads, soups, and breakfast dishes (eg, quiche)	35	32	22
Sweets and desserts	Cookies, cake, pie, cheesecake, donuts, ice cream, pudding	21	19	13
Grains and grain products	Sweetened grains (eg, muffins, pancakes), rice, biscuits, crackers	17	16	11
Vegetables	Cauliflower, summer and winter squashes, sweet potatoes, kale, asparagus, tomatoes, cucumbers, radishes	12	11	8
Meat or other proteins	Beef, chicken, seafood, pork, yogurt, cheese	12	11	8
Condiments	Syrup, jam, dip	4	4	3
Beverages	Sweetened milk and fruit-flavored drinks	3	3	2
Fat/oils	Flavored oil and mayonnaise	2	2	1
Fruits	Strawberries	1	< 1	< 1
Salty snacks	Popcorn	1	< 1	< 1

Table 4. Comparison of Child Feeding Belief and Behavior Codes by Recipe and Non-Recipe Posts

Code	Recipe Posts Including Code (n [%]) (n = 104)	Non-Recipe Posts Including Code (n [%]) (n = 54)	*P*
Children's food preferences	51 (49)	24 (44)	.580
Health values	19 (18)	16 (30)	.100
Responsibility	13 (13)	9 (17)	.470
Child involvement	29 (28)	13 (24)	.610
Encourage balance and variety	14 (14)	8 (15)	.820
Responsiveness	13 (13)	0	.007*

*Significant at Bonferroni corrected level (.05/6 tests = $P < .008$).
Note: *P* associated with Pearson's chi-square test result.

DISCUSSION

Child Feeding Beliefs and Behaviors

Bloggers conveyed a relatively narrow range of beliefs and behaviors about child feeding and focused on children's food preferences and involving children in food preparation. Mothers reported in previous qualitative research that children's food preferences can make mealtimes challenging (eg, managing picky eating, preparing multiple meals for different family members).[43,47] Bloggers framed child feeding as an opportunity to create positive mealtime environments and family cohesion. Blog readers may perceive these outcomes as rewarding and prioritize recipes that are likely to appeal to children's taste preferences rather than recipes that may be more nutritious. Whereas positive for childhood obesity,[48] overly permissive, child-controlled feeding has been associated with increased obesity risk in preschool-aged children.[8,49]

The single occurring code for concern about child weight reflected concern about child underweight. Combined with the large proportion of recipes for foods that are typically high in energy density, childhood obesity prevention did not appear to be a salient topic in the sampled blog posts. It is unknown whether children of the bloggers whose posts were included in this study were normal weight, overweight, or obese; thus, the sparse occurrence of concern for child weight code may have occurred because bloggers' children were of normal weight or bloggers were otherwise unconcerned with child weight status. An encouraging finding was that some child feeding behaviors that have been associated with increased obesity risk (ie, restriction)[3] and decreased intake of target foods (ie, pressuring)[50] were rarely to never observed in the sampled blog posts. However, indulgent feeding occurred in a few posts.

Types of Recipes

Sweets and desserts, and grains and grain products comprised approximately one third of all recipes. Conversely, just over 1 in 10 recipes were for dishes that featured vegetables

Table 5. Comparison of Child Feeding Beliefs and Behaviors Codes, by Recipe Type

Recipe Type	Recipe Posts (n [%])		*P*
Children's food preferences	**Including children's food preferences (n = 51)**	**Not including children's food preferences (n = 53)**	
Mixed dish	19 (37)	16 (30)	.450
Dessert	10 (20)	11 (21)	.880
Grain	6 (12)	11 (21)	.220
Vegetables	6 (12)	6 (11)	.940
Protein	7 (14)	5 (9)	.490
Health values	Including health values (n = 19)	Not including health values (n = 85)	
Mixed dish	8 (42)	27 (32)	.390
Dessert	2 (11)	19 (22)	.250
Grain	3 (16)	14 (17)	.940
Vegetables	2 (11)	10 (12)	.880
Protein	4 (21)	8 (9)	.150
Responsibility	Including responsibility (n = 13)	Not including responsibility (n = 91)	
Mixed dish	7 (54)	28 (31)	.100
Dessert	3 (23)	18 (20)	.780
Grain	0	17 (18)	.090
Vegetables	2 (15)	10 (11)	.640
Protein	1 (8)	11(12)	.640
Child involvement	Including child involvement (n = 29)	Not including child involvement (n = 75)	
Mixed dish	7 (24)	28 (38)	.200
Dessert	11 (38)	10 (13)	.005
Grain	2 (7)	15 (20)	.110
Vegetables	2 (7)	10 (13)	.360
Protein	3 (10)	9 (12)	.810
Encourage balance and variety	Including balance and variety (n = 14)	Not including balance and variety (n = 90)	
Mixed dish	2 (14)	33 (37)	.100
Dessert	1 (7)	20 (22)	.190
Grain	1 (7)	16 (18)	.320
Vegetables	7 (50)	5 (6)	< .001*
Protein	1 (7)	11 (12)	.580
Responsiveness	Including responsiveness (n = 13)	Not including responsiveness (n = 91)	
Mixed dish	3 (23)	32 (35)	.390
Dessert	3 (23)	18 (20)	.780
Grain	4 (31)	13 (14)	.130
Vegetables	2 (15)	10 (11)	.640
Protein	0	12 (13)	.160

*Significant at Bonferroni corrected level (.05/30 tests = $P < .002$).
Note: *P* associated with Pearson's chi-square test result.

or fruit as the main ingredient. This recipe distribution is not aligned with the 2010 US Department of Agriculture Dietary Guidelines for Americans, which recommend reduced consumption of refined grains and added sugars and increased consumption of vegetables and fruits.[51] Vegetables and fruits may be underrepresented on food blogs because many are ready to eat (ie, can be consumed raw or with minimal preparation) and do not necessarily require a recipe to prepare. Notably, recipes for vegetables were more likely to occur in posts in which the encourage balance and variety behavior code was present. Thus, there was consistency in mothers' healthy feeding beliefs and their offering vegetable-based dishes to their children, which aligns with a previous study that found that healthy feeding goals were directly associated with mothers' reports of child consumption of vegetables and fruit.[12]

Associations Between Child Feeding Beliefs and Behaviors and Types of Recipes

Content about responsive feeding behaviors was more likely to occur in blog posts that contained recipes than those that did not. In many cases, posts that included the responsive feeding behavior code described the blogger's knowledge of and response to her child's food preferences in developmentally appropriate ways (eg, preparing vegetables a certain way after noticing that the child was more likely to consume them with that preparation method). Bloggers may use children's food preferences as a rationale for sharing a particular recipe. The positive association between sweets and dessert recipes and child involvement in food preparation suggests that bloggers are more likely to model child involvement in food preparation with foods that children already accept easily (ie, sweets and desserts) than with foods children have difficulty accepting (ie, green vegetables).

There are a few limitations to this study related to the sampling and coding procedures. Only 6 of 16 blogs in the initial sample contained blog rolls to generate a snowball sample. Sampled blogs may not be

representative of all food blogs written by mothers of young children, particularly blogs that are less well known. Photos, videos, advertisements, and comments were not coded, although they may contain information relevant to child feeding. The coding schemes used in this study were developed a priori from previous survey and qualitative research, which constrained the scope and depth of the analyses. Thematic qualitative coding approaches (eg, grounded theory)[35] may result in different insights. Finally, data on the readership of these blogs were not collected, which would improve understanding of the reach of this content.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Blog posts predominantly described feeding children foods that are easily accepted and involving children in food preparation. In addition, the majority of recipes were for foods that are typically high in energy density. Thus, mothers who read food blogs focused on child feeding might not be exposed to information that could help protect against childhood obesity, such as information on age-appropriate portion sizes, children's energy needs, or how to recognize and respond to children's hunger and fullness cues appropriately. Future studies should explore whether blog content promotes positive mealtime environments at the expense of promoting healthier diets among blog readers. Descriptive research is also needed on bloggers' motivations for sharing recipes from various food categories, as well as blog reader interest in and demand for different types of recipes.

Results revealed several natural opportunities to intervene with bloggers to promote positive child feeding practices. Bloggers could be encouraged to include recipes that pair familiar foods with unfamiliar ones (eg, serving novel vegetables with a familiar dip), which increases children's willingness to try unfamiliar foods.[52,53] Bloggers could be prompted to model child involvement in preparing foods that are lower in energy density, such as mixing vegetable-based salads, so that readers can observe child involvement with more nutritious foods. Increasing the amount of vegetables included in mixed-dish recipes in blog posts, many of which already include at least some vegetables as part of the dish, may be a strategy that could increase children's vegetable consumption while decreasing their overall energy intake.[54]

Overall, more qualitative and quantitative research is needed to examine the extent to which mothers use blogs to inform their child feeding practices and whether blog information actually affects mothers' child feeding beliefs, behaviors, and types of foods they offer to their children. Results from studies conducted along these lines of research could inform interventions that aim to leverage food blogs and other social media for childhood obesity prevention.

ACKNOWLEDGMENTS

This material is based on work supported by the National Science Foundation Graduate Research Fellowship under Grant DGE1255832. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. Data for this research article were collected as part of the first author's master's thesis.

REFERENCES

1. Ogden C, Carroll M, Kit B, Flegal K. Prevalence of childhood and adult obesity in the United States, 2011-2012. *JAMA*. 2014;311:806-814.
2. Dattilo AM, Birch L, Krebs NF, Lake A, Taveras EM, Saavedra JM. Need for early interventions in the prevention of pediatric overweight: a review and upcoming directions. *J Obes*. 2012;2012:123023. http://dx.doi.org/10.1155/2012/123023. Epub 2012 May 17.
3. Faith MS, Scanlon KS, Birch LL, Francis LA, Sherry B. Parent-child feeding strategies and their relationships to child eating and weight status. *Obes Res*. 2004;12:1711-1722.
4. Gerards SMPL, Kremers SPJ. The role of food parenting skills and the home food environment in children's weight gain and obesity. *Curr Obes Rep*. 2015;4:30-36.
5. Gevers DWM, Kremers SPJ, de Vries NK, van Assema P. Clarifying concepts of food parenting practices: a Delphi study with an application to snacking behavior. *Appetite*. 2014;79:51-57.
6. Cawley J, Liu F. Maternal employment and childhood obesity: a search for mechanisms in time use data. *Econ Hum Biol*. 2012;10:352-364.
7. Rodgers RF, Paxton SJ, Massey R, et al. Maternal feeding practices predict weight gain and obesogenic eating behaviors in young children: a prospective study. *Int J Behav Nutr Phys Act*. 2013;10:24-33.
8. Chaidez V, McNiven S, Vosti SA, Kaiser LL. Sweetened food purchases and indulgent feeding are associated with increased toddler anthropometry. *J Nutr Educ Behav*. 2014;46:293-298.
9. Wehrly SE, Bonilla C, Perez M, Liew J. Controlling parental feeding practices and child body composition in ethnically and economically diverse preschool children. *Appetite*. 2014;73:163-171.
10. Hurley KM, Cross MB, Hughes SO. A systematic review of responsive feeding and child obesity in high-income countries. *J Nutr*. 2011;141:495-501.
11. Paul IM, Williams JS, Anzman-Frasca S, et al. The Intervention Nurses Start Infants Growing on Healthy Trajectories (INSIGHT) study. *BMC Pediatr*. 2014;14:184.
12. Kiefner-Burmeister AE, Hoffmann DA, Meers MR, Koball AM, Musher-Eizenman DR. Food consumption by young children: a function of parental feeding goals and practices. *Appetite*. 2014;74:6-11.
13. Fox MK, Condon E, Briefel RR, Reidy KC, Deming DM. Food consumption patterns of young preschoolers: are they starting off on the right path? *J Am Diet Assoc*. 2010;110:S52-S59.
14. Hoerr SL, Hughes SO, Fisher JO, Nicklas TA, Liu Y, Shewchuk RM. Associations among parental feeding styles and children's food intake in families with limited incomes. *Int J Behav Nutr Phys Act*. 2009;6:55. http://dx.doi.org/10.1186/1479-5868-6-55.
15. Patrick H, Nicklas TA, Hughes SO, Morales M. The benefits of authoritative

feeding style: caregiver feeding styles and children's food consumption patterns. *Appetite*. 2005;44:243-249.
16. McPhie S, Skouteris H, Daniels L, Jansen E. Maternal correlates of maternal child feeding practices: a systematic review. *Matern Child Nutr*. 2014;10:18-43.
17. Francis LA, Hofer SM, Birch LL. Predictors of maternal child-feeding style: maternal and child characteristics. *Appetite*. 2001;37:231-243.
18. Cachelin FM, Thompson D. Predictors of maternal child-feeding practices in an ethnically diverse sample and the relationship to child obesity. *Obesity (Silver Spring)*. 2013;21:1676-1683.
19. Blissett J, Haycraft E. Parental eating disorder symptoms and observations of mealtime interactions with children. *J Psychosom Res*. 2011;70:368-371.
20. Haycraft EL, Blissett JM. Maternal and paternal controlling feeding practices: reliability and relationships with BMI. *Obesity (Silver Spring)*. 2008;16:1552-1558.
21. Blissett J, Farrow C. Predictors of maternal control of feeding at 1 and 2 years of age. *Int J Obes*. 2007;31:1520-1526.
22. Carnell S, Benson L, Driggin E, Kolbe L. Parent feeding behavior and child appetite: associations depend on feeding style. *Int J Eat Disord*. 2014;47:705-709.
23. Haycraft E, Blissett J. Predictors of paternal and maternal controlling feeding practices with 2- to 5-year-old children. *J Nutr Educ Behav*. 2012;44:390-397.
24. Webber L, Cooke L, Hill C, Wardle J. Child adiposity and maternal feeding practices: a longitudinal analysis. *Am J Clin Nutr*. 2010;92:1423-1428.
25. Davison KK, Jurkowski JM, Lawson HA. Reframing family-centred obesity prevention using the Family Ecological Model. *Public Health Nutr*. 2013;16:1861-1869.
26. Harrison K, Bost KK, McBride BA, et al. Toward a developmental conceptualization of contributors to overweight and obesity in childhood: the Six-Cs Model. *Child Dev Perspect*. 2011;5:50-58.
27. Asiodu IV, Waters CM, Dailey DE, Lee KA, Lyndon A. Breastfeeding and use of social media among first-time African American mothers. *J Obstet Gynecol Neonatal Nurs*. 2015;44:268-278.
28. Duggan M, Lenhart A, Lampe C, Ellison NB. *Parents and Social Media*. Pew Research Center. 2015. http://www.pewinternet.org/2015/07/16/parents-and-social-media/. Accessed September 25, 2015.
29. McDaniel BT, Coyne SM, Holmes EK. New mothers and media use: associations between blogging, social networking, and maternal well-being. *Matern Child Health J*. 2012;16:1509-1517.
30. Hohman KH, Price SN, Sonneville K, et al. Can the Internet be used to reach parents for family-based childhood obesity interventions? *Clin Pediatr (Phila)*. 2012;51:314-320.
31. Radey M, Randolph KA. Parenting sources: how do parents differ in their efforts to learn about parenting? *Fam Relat*. 2009;58:536-548.
32. Lee SH, Samdanis M, Gkiousou S. Hybridizing food cultures in computer-mediated environments: creativity and improvisation in Greek food blogs. *Int J Hum-Comput Stud*. 2014;72:224-238.
33. Schneider EP, McGovern EE, Lynch CL, Brown LS. Do food blogs serve as a source of nutritionally balanced recipes? An analysis of 6 popular food blogs. *J Nutr Educ Behav*. 2013;45:696-700.
34. Markham A, Buchanan E. *Ethical Decision-Making and Internet Research: Recommendations From the AoIR Ethics Working Committee (Version 2.0)*. Association of Internet Researchers. http://www.aoir.org/reports/ethics2.pdf. Accessed September 25, 2015.
35. Patton MQ. *Qualitative Research & Evaluation Methods*. Thousand Oaks, CA: Sage; 2002.
36. Babble. Top 100 mom food blogs of 2013. *Babble*. http://www.babble.com/best-recipes/top-100-food-mom-blog-2013/full-listfood-blogs-2013/. Accessed May 1, 2013.
37. Miller EA, Pole A, Bateman C. Variation in health blog features and elements by gender, occupation, and perspective. *J Health Commun*. 2011;16:726-749.
38. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15:1277-1288.
39. Schreier M. *Qualitative Content Analysis in Practice*. Thousand Oaks, CA: Sage; 2012.
40. Musher-Eizenman D, Holub S. Comprehensive feeding practices questionnaire: validation of a new measure of parental feeding practices. *J Pediatr Psychol*. 2007;32:960-972.
41. Black MM, Aboud FE. Responsive feeding is embedded in a theoretical framework of responsive parenting. *J Nutr*. 2011;141:490-494.
42. Birch LL, Fisher JO, Grimm-Thomas K, Markey CN, Sawyer R, Johnson SL. Confirmatory factor analysis of the Child Feeding Questionnaire: a measure of parental attitudes, beliefs and practices about child feeding and obesity proneness. *Appetite*. 2001;36:201-210.
43. Sherry B, McDivitt J, Birch LL, et al. Attitudes, practices, and concerns about child feeding and child weight status among socioeconomically diverse white, Hispanic, and African-American mothers. *J Am Diet Assoc*. 2004;104:215-221.
44. Thompson AL, Mendez MA, Borja JB, Adair LS, Zimmer CR, Bentley ME. Development and validation of the Infant Feeding Style Questionnaire. *Appetite*. 2009;53:210-221.
45. Fox MK, Pac S, Devaney B, Jankowski L. Feeding infants and toddlers study: what foods are infants and toddlers eating? *J Am Diet Assoc*. 2004;104:22-30.
46. Briefel RR, Kalb LM, Condon E, et al. The Feeding Infants and Toddlers Study 2008: study design and methods. *J Am Diet Assoc*. 2010;110:S16-S26.
47. Hoerr S, Utech AE, Ruth E. Child control of food choices in Head Start families. *J Nutr Educ Behav*. 2005;37:185-190.
48. Fiese BH, Hammons A, Grigsby-Toussaint D. Family mealtimes: a contextual approach to understanding childhood obesity. *Econ Hum Biol*. 2012;10:365-374.
49. Hughes SO, Shewchuk RM, Baskin ML, Nicklas TA, Qu H. Indulgent feeding style and children's weight status in preschool. *J Dev Behav Pediatr*. 2008;29:403-410.
50. Galloway AT, Fiorito LM, Francis LA, Birch LL. "Finish your soup": counterproductive effects of pressuring children to eat on intake and affect. *Appetite*. 2006;46:318-323.
51. US Department of Agriculture and US Dept of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; December 2010.

52. Anzman-Frasca S, Savage JS, Marini ME, Fisher JO, Birch LL. Repeated exposure and associative conditioning promote preschool children's liking of vegetables. *Appetite*. 2012;58:543-553.

53. Savage JS, Peterson J, Marini M, Bordi PL, Birch LL. The addition of a plain or herb-flavored reduced-fat dip is associated with improved preschoolers' intake of vegetables. *J Acad Nutr Diet*. 2013;113:1090-1095.

54. Spill MK, Birch LL, Roe LS, Rolls BJ. Hiding vegetables to reduce energy density: an effective strategy to increase children's vegetable intake and reduce energy intake. *Am J Clin Nutr*. 2011;94:735-741.

JNEB's call for Reviewers in Nutrition Economics

With the recently expanded scope of *Journal of Nutrition Education and Behavior* (JNEB), we are planning a special issue devoted to nutrition economics. Dr. Joanne Guthrie will author the opening Perspective, and we are hoping for many excellent articles to progress through our peer review. To manage this effectively, we are encouraging new reviewers to sign up and current reviewers to expand their classifications.

To sign up to be a new reviewer, go to http://ees.elsevier.com/jneb/ and **Register** (menu at top of screen) in our peer-review system. If you already have an account, update your personal classifications under the Change Details link or contact Susan Pollock and Shauna Miller (managingeditor@jneb.org) for assistance.

Questions should be directed to the Editor-in-Chief, Dr. Karen Chapman-Novakofski at editor@jneb.org.

CONFLICT OF INTEREST

The authors have not stated any conflicts of interest.