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Maternal Feeding Goals Described by Low-Income Mothers

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Abstract

Objective—To identify maternal feeding goals and examine associations of number and type of goals with mother and child characteristics.

Design—Qualitative interviews about child feeding and quantitative assessment of goal prevalence and associations with mother and child characteristics.

Setting—Southeastern Michigan.

Participants—287 low-income mothers (31% Hispanic or non-white) and their 4- to 8-year-old children.

Main Outcome Measure—Maternal feeding goals.

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Analysis—Themes were generated using constant comparative method, individual interviews were coded, and prevalence of feeding goals determined. Regression analyses examined associations of mother and child characteristics with number and type of feeding goals.

Results—Thirteen maternal feeding goals were identified. The most prevalent were to restrict junk food (60%), promote autonomy around eating (54%), prevent obesity (53%), and promote fruits or vegetables (52%). The child being female and heavier with an older, non-Hispanic white, more educated mother with less chaos in the home predicted more maternal feeding goals (all p 's $< .05$). Specific maternal and child characteristics were associated with individual feeding goals.

Conclusions and Implications—Depending on their current goals for child feeding, some mothers may benefit from interventions focused on goal development, whereas other mothers may benefit from interventions designed to facilitate goal implementation.

INTRODUCTION

Parents are important in shaping children's eating behaviors.^{1,2} Understanding parents' attitudes and aspirations for feeding their children may be important in successfully engaging parents in programs focused on promoting healthy eating in children. Parenting goals can be defined as outcomes that parents hope to achieve when interacting with their children.³ While the literature contains diverse terminology, including "goals," "motivations," "aspirations," "intentions," and the general "importance" of behaviors, the concept of parenting goals can include all of these terms. There is broad support in the psychology literature that setting a specific goal is critical to goal attainment⁴ and goal setting can be beneficial in health behavior change.^{5,6} Parental goals can function to organize parenting practices,⁷ for example disciplinary responses to child misbehavior.⁸ One longitudinal study found that parents who rated diabetes-specific goals as more important subsequently took more responsibility for their children's diabetes management.⁹

Despite the importance of parenting goals, few studies have examined goals in the realm of child feeding. Two prior studies suggested that maternal feeding goals predict feeding practices,^{10,11} but they only examined select, narrowly-defined goals. Several qualitative studies have explored maternal feeding goals more broadly. One study used semi-structured interviews to assess feeding goals among 12 mothers, finding that all mothers promoted consumption of food in general.¹² Another study conducted focus groups with 32 low-income mothers and found that mothers aspire to limit children's sugar intake, use feeding to teach children life lessons, and respond to children during mealtimes.¹³ The largest qualitative study on this topic conducted focus groups with 101 socioeconomically diverse women, and found that most mothers aspired to provide good nutrition, "get children to eat," and limit children's sweets intake.¹⁴ While these qualitative studies allowed mothers to define their own feeding goals, 2 were limited by very small sample sizes,^{12,13} and the largest¹⁴ may have influenced how mothers expressed their goals by using a large group format and by directly asking about feeding goals (thereby implying that mothers should have them). Furthermore, as public awareness around childhood obesity has increased in the last decade, it is possible that maternal feeding goals have changed.

Themes that emerge from qualitative research can generate new hypotheses to be tested on a larger scale. Understanding the prevalence and socio-demographic correlates of such themes is important in order to tailor interventions based on mother or child characteristics. Only 1 study of 22 mothers has examined the prevalence of maternal feeding goals; the most common feeding goals centered on practical considerations or general health promotion.¹⁵ No prior studies have examined how mother or child characteristics might relate to maternal feeding goals. The aims of this study therefore were: 1) to identify key maternal feeding goals in low-income mothers; 2) to determine the prevalence of these maternal feeding goals; and 3) to examine associations of mother and child characteristics with the number and type of maternal feeding goals.

METHODS

Participants

Caregiver-child pairs were recruited from Head Start programs (free, federally-subsidized preschool programs for low-income children) in Southeastern Michigan. The majority of participants were drawn from a longitudinal cohort established in 2009–2011. For the original cohort, all families with children enrolled in regional Head Start programs were invited to participate in a study investigating stress and eating in children. For this follow-up study, primary caregivers in the original cohort were contacted by phone and invited to participate in a study about children's eating behaviors with parents (response rate: 74%). Additional caregiver-child pairs (n=17) were recruited in May 2013 by flyers distributed to Head Start locations. Eligibility for all participants was determined by the following criteria: caregiver has less than a 4-year college degree; caregiver and child fluent in English; child born at 35+ weeks gestation without significant perinatal or neonatal complications; child without history of food allergies or serious medical problems; and child not in foster care. Because all child participants were originally recruited from Head Start programs, they were living in poverty at the time of initial recruitment.

Of 301 primary caregivers enrolled in the study, 5 male primary caregivers were excluded from the current analysis, resulting in a sample of 296 female primary caregivers and their children. Within this sample 95% were biological mothers (the other 5% were adoptive mothers, stepmothers, and grandmothers); henceforth the entire group is designated as "mothers." Analysis was limited to those with complete data for all covariates in regression models, resulting in an analytic sample of 287 mother-child pairs, which was determined to be adequate based on the number of variables in the current analysis (5–10 participants per predictor). All mothers gave written informed consent, and were compensated \$150 each for participating in the overall study. The University of Michigan Institutional Review Board approved this study.

Data Collection

Mothers participated in a semi-structured narrative interview (mean length 46.4±16.9 minutes, range 21.4 to 148.2 minutes). The interview approach was selected as opposed to focus groups as this topic can elicit strong emotions.¹⁶ Semi-structured interviews also allow for open-ended responses that then can be coded to yield quantitative data. Children were

not present during the interviews, which were conducted privately at either the participant's home or a local community center. Interviews consisted of a series of structured, yet open-ended questions focused on mothers' beliefs about feeding their children, modeled after the Working Model of the Child Interview wherein mothers are asked to reflect on their relationship with their child and the interviews are coded based on their responses.¹⁷ Following this tradition, the interview structure purposely did not probe for goals about feeding, but was designed instead to encourage mothers to reflect actively on feeding their child while remaining open-ended (interview guide available as Supplementary Material).^{18,19} For example, to minimize social desirability bias, mothers were never directly asked the question "what are your goals for child feeding" but instead asked to describe how mealtimes work in their home and to describe a typical meal. The interview was not cognitively pretested with mothers in the current study but had been developed and revised in prior work by 2 authors who are clinician-researchers in developmental psychology and developmental and behavioral pediatrics.^{18,19}

Interviews were administered by 7 full-time bachelor's-level research assistants (RAs) who were trained by a doctoral-level research psychologist with extensive experience in this method. Training included instructions on establishing rapport and avoiding positive, negative, or leading reactions to mothers' answers. Each RA received feedback until demonstrating acceptable and reliable interview administration skills. Periodic review by the research psychologist ensured ongoing reliability of administration.

Interviews were audiotaped and transcribed verbatim with identifiers removed. All transcripts were reviewed for accuracy by another laboratory staff member. Transcripts were analyzed systematically using the constant comparative method.²⁰ Three readers who did not participate in data collection read the same set of 30 interviews and independently generated lists of maternal feeding goals and supporting quotations. In general, a goal was defined as a current maternal aspiration specifically related to feeding the child enrolled in the study. Discussion of goal definitions took place over a series of group meetings, where readers explored alternative approaches to interpreting and grouping the data (e.g., "splitting" some themes into smaller themes, or "lumping" others together). Any discrepancies were reviewed and discussed until consensus was reached. Theme saturation was determined when new goals were no longer detected. Some themes that emerged were infrequent but were included because they have been highlighted as possible intervention points in the childhood obesity literature. The goal to promote healthy eating in general was articulated by the vast majority of mothers and was felt to be too vague to be coded as a goal. Thus mothers' statements regarding healthy eating were coded as goals only when they described promoting specific types of healthy food.

The readers next created a detailed coding scheme allowing for each maternal feeding goal to be coded as present or absent in each interview (full coding dictionary available upon request). Three additional RAs were trained in the coding scheme. Reliability was achieved by the RAs each double-coding approximately 15% of the interviews and achieving Cohen's $\kappa = 0.65$ for each code (across coders). All RAs trained in the coding scheme then worked independently to complete coding for all 287 interviews in the sample.

Mother and child factors typically associated with childhood obesity risk were selected as variables of interest. Mothers reported demographic information including child birthdate, child sex, maternal birthdate, maternal race/ethnicity, maternal education, and maternal relationship status. Maternal and child age were each calculated by subtracting the reported birth dates from the study date. Maternal race/ethnicity was included as “non-Hispanic white” vs. “Hispanic and/or non-white.” Maternal education was included as “> high school diploma and < 4-year college degree” vs. “ high school diploma”. For relationship status, “committed relationship” included “married” or “in a committed relationship with a partner,” and “single parent” encompassed “single, never married,” “widowed,” or “separated or divorced.” Mothers also completed the Confusion, Hubbub, and Order Scale (CHAOS), a reliable, valid questionnaire²¹ frequently used with low-income families and consisting of 15 true/false statements reflecting level of chaos in the home (original $\alpha=.79$;²¹ $\alpha=.80$ in the current sample). All mothers and children were weighed and measured following standardized procedures. Body mass index (BMI) for mothers was calculated as weight in kilograms divided by height in meters squared, and child BMI z-score was derived from age- and sex-specific norms from Centers for Disease Control growth charts.

Statistical Analysis

Descriptive statistics were calculated for the full sample. Bivariate analyses (Wilcoxon test for group comparisons and Pearson correlation for continuous variables) comparing mother and child characteristics to the total number of maternal feeding goals were completed. Bonferroni corrections were not used as the variables were chosen based on theoretical importance, thus only highly non-significant variables were excluded from further analyses based on bivariate results. Multiple linear regression was used to evaluate the association of each mother and child characteristic of interest with the number of maternal feeding goals, adjusted for the other characteristics. The set of covariates for multivariate analysis included child sex, child BMI z-score, maternal age, maternal BMI, maternal race/ethnicity (non-Hispanic white vs. Hispanic and/or non-white), maternal education (> high school diploma vs. high school diploma), and CHAOS score. To evaluate the association of each mother and child characteristic with individual maternal feeding goal, adjusted for the other characteristics, 4 multiple logistic regression models were conducted to predict the odds of having an individual maternal feeding goal for each of the 4 most prevalent goals. Analyses were conducted using SAS 9.4 (2013; SAS Institute, Cary, NC). *P*-values of < 0.05 were considered statistically significant.

RESULTS

Descriptive Statistics

Mean child age was 70.8 (SD 8.4) months, mean child BMI z-score was 0.86 (SD 1.04), and 42% of children were overweight or obese. Mean maternal age was 31.0 years (SD 7.1), mean BMI was 33.11 (SD 9.42), and 77% of mothers were overweight or obese. Thirty-one percent of mothers were Hispanic and/or non-white. Forty-eight percent of mothers reported no additional education beyond high school.

Maternal Feeding Goals and Prevalence

On average, each mother had 3.3 different goals for child feeding (range: 0–11 goals). Thirteen distinct maternal feeding goals were identified (Table 1).

Multivariate Associations

Number of feeding goals was not related to child age ($p=.50$) or maternal relationship status ($p=.92$) in bivariate analyses so these characteristics were not included in multivariate analyses. In the multiple linear regression model predicting the total number of maternal feeding goals (Table 2), female child sex, child BMI z-score, maternal age, non-Hispanic white maternal race/ethnicity, and maternal education beyond high school were all positively associated with number of maternal feeding goals, while CHAOS score was negatively associated with number of maternal feeding goals. Maternal BMI was not associated with number of goals.

Multivariate logistic regression analyses were limited to the 4 goals that were most prevalent (mentioned by over 50% of mothers). Mothers educated beyond high school (but with <4-year college degree) had greater odds of having the goal to restrict junk food. Girls' mothers and non-Hispanic white mothers had greater odds of having the goal to promote autonomy around eating, while mothers reporting higher home chaos had lower odds of having the goal to promote autonomy around eating. Children with higher BMI z-scores had mothers with greater odds of having the goal to prevent obesity. Mothers with higher BMIs had lower odds of having the goal to promote fruits or vegetables, as did mothers reporting higher home chaos.

DISCUSSION

More than half of the mothers reported restricting junk food, preventing obesity, and promoting fruits or vegetables as feeding goals. Findings are consistent with prior work (e.g., restricting sweets^{13,14}) and suggest that public health messaging around these topics is familiar to low-income mothers. Yet, having such goals may not translate into strategies that prevent obesity.²²

The goal to promote child autonomy around eating and food choices has emerged in prior qualitative work^{13,15,23} and has been increasingly promoted by nutrition policymakers.²⁴ Encouraging child autonomy around food (i.e., responsive feeding) is an important component of feeding;²⁵ overly controlling feeding styles that ignore child autonomy may increase desire for restricted foods²⁶ and decrease child ability to self-regulate intake.²⁷ Yet, it is also essential to recognize that some parental control is still important. For example, parental feeding styles characterized by nondirective or covert control are associated with greater child consumption of healthy foods,²⁸ whereas indulgent feeding styles are associated with greater consumption of fat and sugar-sweetened beverages in toddlers.²⁹

Some goals were infrequent, including goals to promote hunger and satiety recognition (18%), restrict portions (18%), restrict eating out (17%), restrict sweet beverages (12%), and model healthy eating (6%). There is evidence behind all of these as strategies for obesity prevention.^{30–34} The fact that mothers infrequently mentioned them suggests either that

public health messaging has not adequately conveyed this content knowledge or the rationale behind it,²² or that mothers did not endorse these goals for other reasons, perhaps due to limited resources or perceived barriers.

Findings regarding child BMI z-score and maternal feeding goals were intriguing: mothers of children with higher BMI z-scores had more goals, and higher child BMI z-score was the only maternal or child characteristic associated with higher likelihood of the mother articulating the goal to prevent childhood obesity. Possible explanations include: 1) mothers articulate the goal to prevent obesity because it is the socially desirable response, rather than because it is a strongly held view; 2) this goal does not translate into healthy feeding practices (e.g., due to misunderstanding the rationale or details behind the recommendation,²² or lack of self-efficacy, resources or supports to implement the goal); 3) the goal is translated into healthy feeding practices, but biological predispositions overcome the mother's efforts to prevent obesity; or 4) the nature of association may be in the opposite direction, such that heavier children prompt mothers to endorse obesity prevention goals.

Strengths of the current study include its diverse participants, larger sample size than prior studies, open-ended one-on-one interview format that minimized social desirability bias and qualitative analysis that allowed maternal feeding goals to emerge from the data. The novel coding scheme allowed for quantification of maternal feeding goals and testing of their associations with mother and child characteristics, important steps in theory generation and the process of translating qualitative research into intervention. This study also had several limitations. It is possible that the interview primed mothers to respond more with some goals than others. For example, the interview may have primed mothers to comment about concerns about their child not eating enough of certain foods, but did not prompt mothers to reflect on modeling of healthy eating. The cross-sectional study design did not allow for assessment of the temporality of associations between maternal feeding goals and mother and child characteristics. This study also did not use an objective measure of implementation of feeding goals or ask mothers whether or how long they had been implementing the goals. Additionally, results may not be generalizable outside of low-income families in Southeastern Michigan who have a high prevalence of maternal and child obesity.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Results indicate that low-income mothers appear to endorse many healthy feeding goals, but not all goals shown to be important in childhood obesity prevention were widely mentioned. Additional work is needed to understand how to encourage the less-frequently mentioned, yet evidence-based behaviors as goals in child feeding. Providing public health messaging around less frequently-mentioned goals, as well as developing more concrete interventions to help mothers implement their goals, may be helpful. Several strategies for childhood obesity prevention are suggested by these findings, but whether they would be effective and which should be prioritized is unknown. For example, it is unclear if it is more important to enhance the public health focus on the goals identified as lower prevalence, or if it is best to help parents translate the top 4 goals into action. Given the finding that BMI_z was higher among children whose mothers who had more goals, it is not clear whether having more goals is better, or if it would be more productive to encourage mothers to adopt a smaller but

more focused set of goals and specific strategies to achieve these goals. Better understanding of goal development and implementation is needed. Valuable next steps for the public health and medical communities may be to assist low-income mothers with tangible and effective behavior change strategies so that they can achieve healthy feeding goals. Further, longitudinal research with larger samples is needed to determine whether stated goals relate to observed maternal feeding behavior or child outcomes over time. Mothers are critical partners in childhood obesity prevention and treatment, and addressing maternal feeding goals may help to engage them and tailor interventions based on existing knowledge and motivations.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Feeding Goals Expressed by Low-income Mothers in Semi-Structured Narrative Interviews (n=287).

Goal	Sample quotes	Prevalence, N (%)
Restrict junk food Mother expressed desire to restrict child's intake of junk food, defined as any food mother considered to be unhealthy.	<i>"I worry on the junk food. So I don't allow candy in my house. But they sneak it...[s]o I'm always finding it and throwing it away."</i>	171 (60)
Promote autonomy around eating Mother expressed desire for child to develop independence in eating (e.g., encouraging child to make choices about food selection, participate in meal preparation).	<i>"CHILD helped me do the mashed potatoes, he did them himself...I wouldn't have it any other way [than him] being...beside me and helping me and learn[ing]...independence" "I let [CHILD] choose how she wants to eat...So that's up to her if she doesn't want something."</i>	154 (54)
Prevent obesity Mother expressed desire to control child's intake to prevent obesity and associated health (e.g., diabetes) or social/psychological problems (e.g., bullying).	<i>"I was worried about him eating too much and him gaining too much weight cause we're a family of chubby people...so I worry about that, in the sense I worry about the weight affecting his health."</i>	152 (53)
Promote fruits or vegetables Mother described actions to promote child's intake of fruits or vegetables (e.g., verbal encouragement, easy access).	<i>"I just try to make sure that...every meal he gets his vegetables...so that I know that he's getting what he needs." "...he used to never eat green beans and then...I sat down to talk to him about the nutrients of green beans of growing up big and strong and healthy and now he loves green beans."</i>	148 (52)
Promote meat or protein Mother described actions to promote child's intake of meat or other protein.	<i>"...for a typical dinner I always have a meat...I get really good steaks and that's one of CHILD'S favorites is steaks."</i>	60 (21)
Promote hunger and satiety recognition Mother expressed desire to shape meals/snacks around child's hunger and satiety, with the ultimate goal of teaching child to recognize such cues and self-regulate intake later in life.	<i>"If you're full you're full...You know I'm not going to sit there and say you need to eat all of that right now I've never been one to, because I don't know when they're full, I'm not them. You know everybody's got a different level."</i>	53 (18)
Restrict portions Mother expressed desire to restrict child's portions (size or number).	<i>"Yes, she likes to eat. I tell her all the time, you can't have two of everything...But a lot of times she wants to keep on going and she gets upset because I tell her, "I think you [have] had enough.""</i>	53 (18)
Restrict eating out Mother expressed desire to restrict child's intake of food from commercial establishments (e.g., fast food, restaurants, take-out, delivery).	<i>"Yeah I don't like to feed 'em fast food and I don't like the hydrogenated oils 'cause their body doesn't know how to process it."</i>	50 (17)
Restrict sweet beverages Mother expressed desire to restrict child's intake of sugar-sweetened beverages (i.e. soda, flavored milk) or juice.	<i>"I don't give my kids candy [or] juice and juice is no better than candy because of all the sugar. I try to give them stuff with low sugar with not a lot of sugar in it."</i>	34 (12)
Promote dairy Mother described actions to promote child's intake of dairy products.	<i>"And then milk, everybody [all of her children] wants something to drink [and] whether they have cereal or not they still have to have a glass of milk."</i>	26 (9)
Model healthy eating Mother expressed desire to serve as a role model for child in the way she prepares/eats food (includes those who hope children follow their example and mothers who want to improve their own eating to set a better example).	<i>"...I try to eat healthy to set a good example for my kids so no matter whether I want a bag full of chocolate you know I'm not gonna eat that because I don't want my kids to see it, so I try to set the best example I can you know."</i>	16 (6)
Restrict overeating Mother expressed desire to restrict child from overeating to prevent negative short-term gastrointestinal effects (e.g., stomachache; vomiting).	<i>"Sometimes with her favorite foods she does eat too much and she'll get a belly ache... but I tell her like when we get full we need to stop eating and that would be the best is when you feel full is not to eat anymore."</i>	12 (4)
Promote whole grains Mother described actions to promote child's intake of whole grains.	<i>"...I always got brown bread [when mother was a child] and that's something I do a lot of whole wheat items in my household [now]."</i>	9 (3)

Table 2

Multiple Linear Regression Models Predicting Number of Maternal Feeding Goals and Most Prevalent Individual Feeding Goals (n=287).

Predictor	Beta (95% CI) for total number of maternal feeding goals	OR (95% CI) for goal to restrict junk food	OR (95% CI) for goal to promote autonomy around eating	OR (95% CI) for goal to prevent obesity	OR (95% CI) for goal to promote fruits or vegetables
Female child sex (vs. male)	0.44 (0.02, 0.86)*	0.99 (0.61, 1.62)	2.31 (1.42, 3.78)*	1.47 (0.91, 2.39)	1.06 (0.66, 1.72)
Child BMI z-score	0.24 (0.03, 0.45)*	0.98 (0.76, 1.24)	1.05 (0.82, 1.33)	1.52 (1.18, 1.94)*	1.17 (0.92, 1.49)
Maternal age	0.05 (0.02, 0.08)*	1.03 (1.00, 1.07)	1.02 (0.98, 1.06)	1.01 (0.98, 1.05)	1.02 (0.98, 1.05)
Maternal BMI	-0.02 (-0.04, 0.004)	1.00 (0.98, 1.03)	1.00 (0.97, 1.02)	1.00 (0.98, 1.03)	0.96 (0.94, 0.99)*
Mother non-Hispanic white (vs. Hispanic and/or non-white)	0.56 (0.11, 1.01)*	1.66 (0.98, 2.80)	1.77 (1.04, 3.00)*	1.20 (0.71, 2.02)	1.11 (0.66, 1.86)
Maternal education > high school diploma but < 4-year college degree (vs. high school diploma)	0.48 (0.06, 0.90)*	1.90 (1.17, 3.09)*	0.85 (0.52, 1.38)	0.86 (0.53, 1.39)	1.65 (1.02, 2.66)
CHAOS score	-0.07 (-0.14, -0.004)*	0.98 (0.90, 1.06)	0.91 (0.84, 0.985)*	1.03 (0.96, 1.11)	0.93 (0.86, 1.00)*

CI = Confidence interval; BMI = Body mass index; CHAOS = Confusion, Hubbub, and Order Scale.

* P < 0.05.