



Published in final edited form as:

J Am Diet Assoc. 2010 April ; 110(4): 619–623. doi:10.1016/j.jada.2009.12.018.

Controlling maternal feeding practices associated with decreased dieting behavior in 6th grade children

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Abstract

Controlling maternal feeding practices (CMFPs) have been linked to increased caloric intake, disinhibited eating, and obesity in children. Its relationship to child dieting behavior however is unknown. Using the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development, this study examined whether controlling feeding practices are associated with increased or decreased dieting behavior in children. CMFP was assessed in 3rd grade by the question, “Do you let your child eat what he/she feels like eating?”. Answers ranged from 1–4; higher scores were reverse coded to indicate greater control. Child dieting behavior was assessed in 6th grade and dichotomized into “any dieting behaviors” vs. “none”. Multiple logistic

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regression was used to investigate the relationship between CMFP and dieting behavior and included the covariates sex, race, maternal education, maternal weight status, child weight status in 3rd grade and change in BMI z-score between 3rd and 6th grade. In 6th grade (n=776), 41.5% of children engaged in dieting behavior. In the multivariate analysis, greater maternal control over child eating predicted lower odds of child dieting in 6th grade (OR = 0.79, 95% CI = 0.64–0.97). There was no interaction between CMFP and child sex or baseline obesity status. Exerting more control over what a child eats in 3rd grade may protect against future dieting behavior in children, independent of child weight status or rate of weight gain. Further work is needed to better define which controlling feeding practices are beneficial for the child.

Keywords

Dieting; Controlling feeding practices; parent feeding practices; child eating behavior

Introduction

Parents play an important role in the development of child eating behaviors [1]. With the rise in childhood obesity, there has been much interest in the effect of specific parent feeding practices on these eating behaviors and attitudes. Parents who are concerned about their child's weight may employ controlling or restrictive feeding practices to help limit their child's caloric intake [2]. However, these practices are thought to have a counterproductive effect, resulting in increased caloric intake and eating in the absence of hunger, or disinhibited eating [2,3]. This relationship was found to be particularly salient among girls (age 5–9 years) who were already overweight [4], and related to increasing body mass index (BMI) z-scores among children (age 5–7 years) with overweight mothers [5]. The concern has been that by exercising restrictive control over what a child eats, parents may undermine their child's self-regulatory competence regarding caloric intake and that this might lead to uncontrolled eating, excessive weight gain and obesity. If controlling maternal feeding practices do diminish self-regulatory ability in early childhood, they could theoretically lead to other more severe eating problems in the future.

More recently however, controlling maternal feeding practices have been associated with healthier child eating behaviors, like consumption of more fruits and vegetables and fewer snack foods [6,7]. The form of control described in these studies is considered covert control, e.g. removing snack foods from the house or not eating at fast food restaurants. In addition, studies that have examined the construct of monitoring have reported that this form of control is associated with a lower risk of children being overweight [5,8]. Therefore, depending on the nature of the controlling practice being utilized and how it is delivered, controlling practices may actually be protective, guiding children to eat in a healthier manner. Furthermore, in the setting of behavioral weight control interventions, a parent's use of more controlling practices is not related to increased weight gain, but weight loss [9]. Children in these interventions also did not have worsening eating disorder symptoms.

To date, no studies have examined the role of controlling feeding practices in the development of child dieting behavior. Dieting behaviors in children can be concerning because of their association with the later development of eating disorders, like binge eating [10], particularly in the setting of low-self-esteem, body dissatisfaction, and emotional eating [11]. Unfortunately, many of these potentiating factors are also found in overweight children [12,13], who have a higher prevalence of dieting as well [14,15]. Research shows that parents can promote the development of child dieting behaviors through the use of verbal encouragement to diet [16,17], conveying to the child that being thin is important to his or her parent [18,19], and in some studies, via modeling of their own dieting behaviors

[20,21]. However, the relationship between controlling feeding practices and the later development of dieting behavior remains unknown.

Our goal was to examine prospectively the relationship between controlling maternal feeding practices and future dieting behavior in children. Given the previous literature, this study tested whether controlling maternal feeding practices in third grade are associated with increased versus decreased child dieting behavior by sixth grade. If controlling maternal feeding practices promote disinhibited eating, as has been hypothesized, they may lead to excessive child weight gain and/or dysregulated eating behaviors [22] which in turn may promote childhood dieting. If, however, controlling maternal feeding practices guide the child's developing ability to self-regulate intake in a healthy manner, they may be associated with a lower risk of childhood dieting.

Methods

Participants and Design

Data were obtained from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD). This is a national study designed to examine child behavior and development over time, particularly with respect to childcare experiences. Originally, 1364 children and families were recruited at birth from 10 sites across the United States and followed through adolescence. No additional children have been added to this cohort. Information about the original cohort is presented elsewhere [23]. Only subjects with complete data through wave 3 (ending in 2005), when the children were in 6th grade, were used for this analysis. Basic demographic characteristics including child gender, birth date, maternal-reported race and ethnicity, and maternal education in years were reported via interview with the mother either at the first visit in the hospital at the time of the child's birth or at the first study home visit when the infant was one month old. Throughout the 15 years of the study, all data were double entered into an on-line data system and verified [24]. The study was approved by the Institutional Review Boards of all relevant institutions.

Measures

In 3rd grade, CMFP was measured using the question, "Do you let your child eat what he/she feels like eating?" from the Raising Children Questionnaire [25], a simplified revision of Greenberger's Raising Children Checklist [26], which is a standardized measure of parenting strategies. This question was scored using a four-point scale: 1-definitely no, 2-mostly no, 3-mostly yes, 4-definitely yes. Scores were reverse coded so that higher CMFP scores indicated greater maternal control. Principal components factor analysis followed by varimax rotation revealed that the CMFP item loaded strongly onto the larger dimension of "lax control" (factor loading = 0.55, correlation with total = 0.38), which included questions such as, "Do you let your child go to bed whenever he/she wants?" and "Do you let your child watch whatever he/she wants on TV?". Therefore CMFP is likely an indicator of the larger dimension of parental control that is manifested by setting rules and guidelines so that children can function within a framework of set expectations.

In 6th grade, dieting behavior was assessed by asking children whether they were "Dieting to lose weight or keep from gaining weight" in the past month. This question was modified from the Youth Risk Behavior Survey [27]. A four-point scale was used to score the responses: 0-not at all, 1-a little, 2-a lot, 3-almost every day. Most of the sample (58.1%) reported no dieting behavior with a sample mean of 0.58 (S.D. 0.82). Responses were therefore dichotomized into "none" (score of 0) and "any dieting behaviors" (score of 1-3).

Child heights and weights were measured during laboratory visits scheduled in 3rd and 6th grade, when children were 9.0 ± 0.3 and 11.9 ± 0.3 years old. The protocol for anthropometric measures was standardized across sites [24]. Children were asked to remove their shoes and any heavy clothing (i.e. sweaters and jackets). Two measurements for weight (to the nearest 1/4 pound) and height (to the nearest 1/8 inch) were obtained for each child and averaged. BMI z-scores and percentiles were derived based on norms from the National Center for Health Statistics growth curves [28] and BMI $\geq 95^{\text{th}}$ percentile was considered obese [29].

The NICHD SECCYD data set does not include measured maternal weight or height. To include maternal weight status as a covariate, videotaped images of the mother were coded for maternal weight status using the 9-point Stunkard Figure Rating Scale [30]. Each tape lasted about 10 minutes and was obtained when the child was 15 (n=1114), 24 (n = 1161) and 36 (n = 1175) months old. Each tape was coded by at least two raters and there was high inter-rater reliability (intraclass correlation coefficient 0.90, 0.83 and 0.80 at 15, 24 and 36 months respectively). Pictorial figure ratings coded from women on videotapes using the FRS correlate with actual measured BMI ($r = 0.87$) [31]. FRS codes generated from these tapes also correlated with mother's self-reported BMI when children in this cohort were 15 years old ($r = 0.74$). Scores ranged from 1–9 with higher scores representing a higher BMI.

Statistical analysis

Chi-square statistics and *t*-tests were used to describe the sample and multiple logistic regression in SAS v9.1. (Cary, NC) was used to evaluate the effect of CMFP on child dieting. Sex, two-category race (white and not white), maternal education in years (continuous), and maternal FRS (continuous) were included in the model. We also included child weight status in 3rd grade (categorized as “obese” (BMI $\geq 95^{\text{th}}$ percentile) vs. “not obese”) and change in BMI z-score between 3rd and 6th grade to control for any effect of baseline obesity status and increasing relative weight gain leading to the use of more controlling feeding practices by the mother or increased dieting behavior by the child.

Results and Discussion

The sample included 776 children. Slightly over half the sample was female (52.2%) and the majority was white (82.7%) (Table 1). Mothers had a mean education of 14.49 years (S.D. 2.38 years) and mean CMFP score of 1.90 (S.D. 0.73). By sixth grade, 41.5% of the total sample had dieted in the last month to lose weight or keep from gaining weight. In the unadjusted comparisons (Table 1), children who dieted, compared to those who did not, were more likely to have been obese in 3rd grade and had a greater increase in BMI z-score between 3rd and 6th grade. Dieters also had mothers with less controlling feeding practices and higher weight status.

Risk and protective factors of dieting behavior

In the multivariate analysis, children who were obese in 3rd grade or had increasing BMI z-scores between 3rd and 6th grade were more likely to engage in dieting behavior in 6th grade (Table 2). These findings are similar to previous reports that link increased weight status with increased dieting awareness [32] and risk for engaging in dieting behaviors [14]. Furthermore, young girls and overweight children with high levels of weight concerns and body dissatisfaction are also more likely to report dietary restraint, poor eating attitudes, disinhibited eating, and dieting behaviors at a later age [14,15,33]. The combination of negative eating attitudes, poor self-esteem, and the onset of dieting behaviors may place these children at a heightened risk for future eating disorders.

However, in the multivariate analysis, mothers who displayed more control over child eating had lower odds of having children who engaged in dieting behavior (OR = 0.79, 95% CI 0.97–0.64, $p=0.03$) (Table 2). In other words, 57.8% of children with mothers who essentially reported no control over their child's intake were dieting, while only 36.2% of children with mothers reporting the highest degree of control were dieting. Neither interaction between CMFP and sex or CMFP and child obesity status was significant. Given previous associations between controlling feeding practices and the development of disinhibited eating in young children [2,3], it would not have been surprising to find that greater controlling feeding practices were associated with *more* dieting behavior as children try to limit the amount of food that they take in. However, this study found that controlling feeding practices seem to be protective and reduce the risk of later dieting. Since the adoption of dieting behaviors may be a first step towards the development of more serious eating disorders like binge eating [10,11], relatively greater controlling feeding practices during middle childhood may have a role in the prevention of disordered eating behaviors.

Control over eating in other contexts

Several studies have also demonstrated that controlling behaviors within the context of behavioral weight control programs do not lead to worsening eating disorder symptoms [9], can decrease symptoms of bulimia [34], and improve child psychosocial functioning [9,35]. These studies suggest that a more controlled and supervised method of food consumption which involves a structured eating plan rather than cycles of restriction and binging, may help children lose weight in a healthy manner and develop healthier eating habits. Our findings may also reflect a similar relationship in that maternal involvement in child eating behavior, to the extent that she sets rules and does not allow her child to eat whatever he or she wants, acts as a guideline for the child to help determine what he/she should eat in other settings. So rather than being an aversive or reactive behavior that restricts child eating, controlling feeding practices may be characterized by the setting of rules and structure that proactively guide daily eating behavior. Thus, children can develop a more regulated pattern of eating and not have to revert to dieting.

Limitations

This study is limited by the fact that child dieting behavior was assessed with one question and one point in time. How this question was interpreted by the children may have varied and could have affected the outcomes. This study also did not have more detailed information on the duration of child dieting behaviors or their understanding of what dieting means, which would have allowed for more insight regarding the forms of dieting behavior that are likely to occur with less parental control. In addition, no information was available on the mother's dieting or eating behaviors, which again could have influenced the development of child dieting behaviors. Maternal controlling feeding practices were also assessed with a single question and how it relates to other commonly used measures like the Child Feeding Questionnaire [36] is unknown. However, other studies have also used a single question to capture the concept of maternal feeding practices [37,38] and using a construct with more than one item does not necessarily protect against misinterpretation of these items [39]. Finally, although the study was longitudinal and prospective, it was simply an observational study. While the results suggest that controlling feeding practices lead to less frequent dieting behaviors in children, this study cannot say with certainty that there is a causal relationship between these factors.

Conclusion

In conclusion, this study found that controlling feeding practices are not associated with increased dieting behavior in children, but instead act as a protective factor. Since most children learn about food and dieting from their parents some time prior to adolescence [40–42], early parental education regarding the impact of feeding practices on current and future eating behaviors may be invaluable. While excessive or more extreme forms of control would likely have negative outcomes on child eating behaviors and development overall, the results of this and other studies point to the need for some degree of control or regulation. However, more work needs to be done on the exact nature of these controlling practices and the degree to which they are being used before more specific recommendations can be made. Employing such strategies may help deter the development of unhealthy eating behaviors.

Abbreviations

CMFP	Controlling maternal feeding practices
BMI	Body Mass Index
NICHD SECCYD	National Institute of Child Health and Human Development Study of Early Child Care and Youth Development
SD	Standard Deviation
FRS	Stunkard Figure Rating Scale

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Characteristics of NICHD SECCYD^a mothers and children with complete data through wave 3 categorized by child dieting status in sixth grade

Table 1

	Total Sample (n=776)	Not Dieting (n=454; 58.5%)	Dieting (n=322; 41.5%)	P-value ^b	Effect sizes (Cohen's d)
Gender: n (%)					
Male	371 (47.8)	223 (49.1)	148 (46.0)	NS ^c	
Female	405 (52.2)	231 (50.9)	174 (54.0)	NS	
Race: n (%)					
White	642 (82.7)	371 (81.7)	271 (84.2)		
Other	134 (17.3)	83 (18.3)	51 (15.8)	<0.001	
Obese in 3 rd Grade: n (%)					
Yes	125 (16.1)	38 (8.4)	87 (27.0)		
No	651 (83.9)	416 (91.6)	235 (73.0)		
CMFP ^d : mean (SD)	1.90 (0.73)	1.95 (0.73)	1.81 (0.73)	0.01	0.19
Maternal education: mean (SD)	14.49 (2.38)	14.64 (2.36)	14.27 (2.41)	0.03	0.15
Maternal FRS ^e : mean (SD)	4.57 (1.41)	4.40 (1.34)	4.82 (1.46)	<0.001	0.30
Change in BMI ^f z-score (3 rd to 6 th Grade): mean (SD)	0.01 (0.49)	-0.03 (0.52)	0.08 (0.45)	0.001	0.23

^aNICHD SECCYD= National Institute of Child Health and Human Development Study of Early Child Care and Youth Development

^b χ^2 tests were used to determine significance for categorical variables (expressed in frequencies) and *t* tests were used to determine significance for continuous variables (expressed as means).

^cNS=not significant

^dCMFP=controlling maternal feeding practices; measured in third grade by the question, "Do you let your child eat what he/she feels like eating?" from the Raising Children Questionnaire [25], a simplified revision of Greenberger's Raising Children Checklist [26], which is a standardized measure of parenting strategies. This question was scored using a 4-point scale: 1=definitely no, 2=mostly no, 3=mostly yes, 4=definitely yes. Scores were reverse coded so that higher CMFP scores indicated greater maternal control.

^eMaternal FRS=maternal weight status was measured using the Stunkard Figure Rating Scale [30]. Scores ranged from 1–9 with higher scores representing a higher BMI.

^fBMI=body mass index; calculated as kg/m²

Table 2

Multiple logistic regression model using NICHD SECCYD^a data to predict the effect of controlling maternal feeding practices in third grade on child dieting behavior in sixth grade

Predictors of child dieting behavior in sixth grade	Odds ratio	95% Confidence Interval	P value
CMFP ^b	0.79	0.64–0.97	0.03
Sex (Female vs. Male)	1.28	0.94–1.73	NS ^c
Race (Other vs. White)	0.68	0.45–1.03	NS
Maternal education (y)	0.96	0.90–1.02	NS
Maternal FRS ^d	1.12	1.00–1.26	0.05
Child weight status in third grade (Obese vs Not)	3.93	2.54–6.08	<0.001
Change in child BMI ^e z score (third to sixth grade)	1.64	1.20–2.24	<0.01

^a NICHD SECCYD=National Institute of Child Health and Human Development Study of Early Child Care and Youth Development.

^b CMFP=controlling maternal feeding practices; measured in third grade by the question, “Do you let your child eat what he/she feels like eating?” from the Raising Children Questionnaire [25], a simplified revision of Greenberger’s Raising Children Checklist [26], which is a standardized measure of parenting strategies. This question was scored using a 4-point scale: 1=definitely no, 2=mostly no, 3=mostly yes, 4=definitely yes. Scores were reverse coded so that higher CMFP scores indicated greater maternal control.

^c NS=not significant

^d Maternal FRS - maternal weight status was measured using the Stunkard Figure Rating Scale [30]. Scores ranged from 1–9 with higher scores representing a higher BMI.

^e BMI=body mass index; calculated as kg/m²