

Associations of Maternal Controlling Feeding Practices with Child Internalizing Symptoms and Body Mass Index in Ethnically-Diverse Mother-Child Dyads

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ABSTRACT

Mothers may use controlling feeding practices (*i.e.*, pressure to eat and restriction) to regulate their child's weight. However, these practices may have unintended consequences on the weight and mental health of children. The first aim of this study was to investigate differences in maternal controlling feeding practices by child gender, age, and maternal ethnicity. The second aim was to examine cross-sectional associations among maternal controlling feeding practices, child body mass index z-scores (BMI-z), global internalizing symptoms (*i.e.*, depression and anxiety symptoms), and self-esteem. The third aim was to determine whether child sex and mother ethnicity moderate these associations. A sample of 202 ethnically diverse mother-child dyads (children ages 8-12; 49% female) completed self-report questionnaires and had weight and height measurements taken. Results showed no differences in maternal controlling feeding practices by gender, ethnicity, or age. Pressure to eat was negatively related to child BMI-z, and restriction was positively related to BMI-z. Moreover, pressure to eat was negatively related to child self-esteem. There were no associations between maternal controlling feeding practices and global internalizing symptoms. Further, no associations differed by child gender or mother ethnicity. Maternal controlling feeding practices may be used to move a child's weight toward a healthy weight range. Overall, there was little evidence for associations between feeding practices and poor mental health; although, pressure to eat was related to poorer self-esteem in children.

KEYWORDS

Maternal; Feeding; Practices; Child; BMI-z; Mental; Health; Controlling; Restricting

INTRODUCTION

Obesity is increasingly becoming a concern in children of all ages, genders, and ethnicities.^{1,2} Similar to statistics for obesity, approximately one in every five children and adolescents have a mental health problem.³⁻⁶ Higher body weight and mental health problems, both of which have been found to correlate with controlling feeding practices, can lead to numerous health complications that may persist well into adulthood.^{5,6,7} Further, studies have found associations between higher body weight in childhood and an increased prevalence of anxiety and mood disorders later in life.⁸ Particularly, middle childhood is a time where mental health disorders and weight gain begin developing.^{6, 8, 11-13}

While obesity itself may lead to negative consequences such as depression, anxiety disorders, and chronic disease risk,^{8, 14-16} it is possible that efforts used to control children's weight, such as controlling feeding practices, may contribute to these factors and pose an even greater risk for these physical and mental health problems.⁸ Previous studies have found that controlling feeding practices can contribute to a failure to appropriately respond to hunger or fullness signals, which can lead to weight gain. Research suggests that children tend to overeat when given free access to foods that are typically restricted from their diet.^{17,18} Further, feeding practices may lead to the development of weight and eating behavior concerns and a lack of autonomy.¹⁹ Additional research in adolescents found that maternal controlling feeding practices were positively correlated with bulimic symptoms (in females) and negatively correlated with self-esteem.^{6,20-21}

Given healthcare providers' focus on the importance of proper nutrition and maintenance of a healthy weight in children,^{9,10} parents may use controlling feeding practices (*i.e.*, restricting child's food intake and pressuring a child to eat) in order to help their child achieve and maintain a healthy weight, which is defined by body mass index (BMI) for age and sex from the 5th through the 85th percentile.¹¹ Parents may restrict eating by limiting meal portions and commenting on the large intake of food by their child,

or parents may pressure their child to eat by forcing their child to consume an entire meal or punishing their child for failure to finish a meal.^{12,20,22-24} Among infants and toddlers, controlling feeding practices, both restriction and pressure to eat, have been shown to predict lower weight in children.¹¹⁻¹² Despite being predictive of lower weight in infants, restrictive and controlling feeding practices may be associated with poor weight and mental health-related outcomes in older children.^{8, 12-13}

Research findings have not been consistent regarding the relationship between parental controlling feeding practices and child weight status. Some research has found positive associations between restrictive feeding practices and weight and negative associations between pressure to eat and weight in early childhood.^{13,25-26} This finding could be due to child overeating behavior when given the opportunity to eat away from the supervision of a restrictive parent.²⁷ Pressure to eat may reduce weight due to the development of aversion or anxiety towards food; in the absence of parental pressure, the child refuses to eat.²⁷⁻²⁸ In contrast, other studies of toddlers found no relation between child BMI-z scores and maternal controlling feeding practices;²⁷ Similarly, in separate studies of Hispanic preschool children, there was no relation between maternal controlling feeding practices and BMI-z scores.^{23,29}

Empirical research has primarily focused on how maternal feeding practices can affect the physical weight of a child. Thus, there is a lack of data on the relationship between maternal feeding practices and child internalizing symptoms and self-esteem. One study found a positive relationship between increased maternal internalizing symptoms and increased controlling feeding practices,³⁰ but studies have yet to look at child internalizing symptoms. Studies have found positive correlations between restrictive maternal feeding practices and disordered eating, such as binge eating in adolescents.^{20,24} Although disordered eating is highly associated with internalizing symptoms,³¹ it is unclear if the link between maternal controlling feeding practices extends to internalizing symptoms, such as mood and anxiety symptoms.

The Role of Child Gender

Gender may be an important variable to consider when examining the associations between maternal feeding practices and child internalizing symptoms and weight. Findings on gender and maternal feeding practices are varied; some studies suggest that maternal restriction is associated with self-esteem in girls with obesity and also associated with food intake control in girls, yet no significant associations were found for boys.³² This finding suggests that girls may be disproportionately affected by controlling feeding practices. Additional research observed that maternal pressure to eat in children 7-12 years old was linked to greater consumption of food in the absence of hunger, and a stronger correlation was observed for boys compared to girls.^{21,33-34} One study found that fathers reported more pressure to eat for boys than girls.³⁵ However, in a separate study comparing maternal and paternal feeding practices among parents of boys and girls, there were no differences.²⁰ Additional research found that maternal feeding is more likely to occur between mother-daughter than mother-son relationships; one possible explanation for this difference is the societal pressure to adhere to gender-related dietary norms.³⁶⁻³⁸ These associations provide preliminary evidence of gender being a possible variable to consider when assessing maternal controlling feeding practices and their relation to child weight and internalizing symptoms.

The Role of Ethnicity

In addition to gender, ethnicity may be an important factor to consider. Lifestyle differences between Hispanic and non-Hispanic families may lead to behavior that results in varied child weight and internalizing symptoms. Findings are mixed. However, some evidence suggests that non-White Hispanic mothers restrict foods less than White mothers. Other studies did not find evidence to support this; some research has found that Hispanic mothers were more likely to pressure their children to eat.³⁸⁻³⁹ One study found that non-White parents, including Hispanic parents, engaged in more restrictive and pressuring feeding practices.⁴⁰

Differences between Hispanic and non-Hispanic mothers may be linked to Hispanic culture, which emphasizes social eating.⁴¹⁻⁴³ In Hispanic culture, the ideal maternal figure is closely associated with feeding children; the more food, the more nurturing a mother is.⁴⁴ This can lead to maternal pressuring to eat. Research suggests that Hispanic mothers have a different idea of what being overweight is, and thus they participate in pressuring to eat at times when non-Hispanic parents would not.⁴⁵⁻⁴⁶ Studies indicate that non-White Hispanic mothers may prefer their children to be heavier. They believe that this indicates child health and strength; this mentality can lead to more pressuring and less restrictive feeding practices.^{41, 45-47}

The Current Study

Varying patterns of feeding practices by gender and ethnicity have led us to expect differences between Hispanic and non-Hispanic children in relation to how maternal feeding patterns affect child internalizing symptoms and weight. We expect these differences due to cultural differences; for example, Hispanics regard food as a core part of their culture and thus are less likely to restrict it.¹⁹ Gender differences are expected due to the societal norms placed on females and males, such as that females should eat less than males, as well as the difference in mother-daughter and mother-son relationships.^{36-37, 48} These patterns could explain

differences in child obesity and internalizing symptoms, thus establishing the importance of the further study of these associations.¹⁵

Studying the effect of maternal controlling feeding practices on adolescents, ages 8-12, is important because adolescence is a time where children strive to be more independent; they make their own decisions, yet decisions are still influenced by decisions made for them growing up. Additionally, mental health disorders are emerging in this age group, and it is important to study the role of controlling feeding practices in this trend.^{6, 8, 11-13}

The current study had several goals. The first research question examined differences in maternal controlling feeding practices by child gender, age, and maternal ethnicity. Age was examined as children become more independent as they get older, and mothers' controlling feeding practices may change due to increased autonomy.⁴⁹ The second research question was examined to see if bivariate associations were among maternal feeding practices, child BMI, child internalizing symptoms (i.e., depressive and anxiety symptoms), and self-esteem. The third research question examined child gender and maternal ethnicity as moderators of associations between maternal controlling feeding practices and child BMI, internalizing symptoms, and self-esteem. The study aims to add knowledge to a topic that has not been extensively studied. Specifically, findings will allow us to understand the effect of controlling feeding practices on children's mental health and how this may differ for children of different gender and ethnicity. Findings may be used to develop interventions to educate parents on controlling eating habits that best promote healthy child weight and mental health, thus bettering health outcomes during adolescence and into adulthood.

METHODS AND PROCEDURES

Participants and Procedure

The current study sample was drawn from Wave one of the Mothers, and Their Children's Health (MATCH) study, which includes 202 dyads of ethnically diverse mothers and their 8–12-year-old children (age range during baseline assessment). The sample included 103 boys and 99 girls, and the mean age of children was 9.60 ($SD=0.91$). There were 99 mothers (49% of dyads) who indicated being Hispanic or Latina, with 103 being non-Hispanic. Mother-child dyads were recruited from urban schools in the greater Los Angeles community. Children were in third through sixth grade. Inclusion criteria included $\geq 50\%$ custodianship of the child with the mother and ability of mothers and children to read in either English or Spanish. The study exclusion criteria for children or mothers: (1) currently taking medications for thyroid function or psychological conditions such as depression, anxiety, mood disorders, and ADHD, (2) health issues that limit physical activity, (3) enrolled in special education programs, (4) currently using oral or inhalant corticosteroids, (5) pregnancy, (6) mother works more than two weekday evenings per week (e.g., between 5 and 9 pm) or more than eight hours on any weekend day, and (7) child classified as underweight by a BMI percentile $< 5\%$ adjusted for age and sex.

The study was reviewed and approved by the institutional review board at the University of Southern California and Northeastern University. Dyads were recruited. Mothers provided consent for their own participation and parental consent for their child. Children provided assent. After this process, dyads completed paper and pencil questionnaire measures. A trained research assistant took weight and height measures. Dyads were given additional paper and pencil measures to take home to complete and return to the researchers. Mothers and children each received \$100 compensation for their time and effort in the first wave of the study.

Measures

Child BMI. Height and weight were measured using an electronically calibrated digital scale and professional stadiometer. These measures were used to calculate BMI (kg/m^2) for mothers and age- and gender-specific body mass index percentiles for children.

Child internalizing symptoms. The Revised Children's Anxiety and Depression Scale (RCADS)⁵⁰ was used to assess child internalizing symptoms. The following subscales were measured: generalized anxiety, major depression, panic disorder, and separation anxiety. Some sample items include: "I feel sad or empty" and "I worry that bad things will happen to me." This 47-item questionnaire utilizes a response scale ranging from 0 (*never*) to 3 (*always*) for each item. A total score was calculated with higher scores indicating greater internalizing symptoms. A systematic review and meta-analysis showed that the RCADS has adequate psychometric properties across various assessment settings, languages, and locations.⁵¹

Child self-esteem. The Rosenberg Self-Esteem (RSE)⁵² scale was used to assess child global self-esteem. This 10-item scale asks participants to reflect on their feelings about themselves on a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Sample items include: "I feel that I have a number of good qualities" and "I am able to do things as well as most other people." The RSE has shown good convergent validity for students in high school and college students, men, women, various ethnic groups, and reliability and concurrent validity for high school students.⁵³⁻⁵⁴

Maternal controlling feeding practices. The Child Feeding Questionnaire (CFQ)⁵⁵ utilizes self-reported measures to determine parental beliefs, attitudes, and practices and their effects on child feeding. Restrictive & Pressure to Eat subscales were used in the current study. The eight-item Restriction Eating subscale assessed restrictive pressures enforced by parents on the type and amount of food a child eats. A sample item is, “I have to be sure that my child does not eat too many high-fat foods.” The eight-item Pressure to Eat subscale assesses the frequency of pressuring the child to eat more food. A sample item is, “My child should always eat all of the food on her plate.” Mothers indicated on a scale from 1 (*disagree*) to 5 (*agree*) as to how much they engaged in various feeding behaviors. Studies found good psychometric properties of the CFQ in Hispanic and non-Hispanic mothers.^{29,55-56}

Statistical Analyses

Analysis of covariance (ANCOVA) models were calculated to examine main effects and two- and three-way interactions among child gender, child age, and mother ethnicity in relation to maternal feeding practices (*i.e.*, restrictive eating and pressure to eat). Age was used as a covariate given developmental influences on maternal feeding practices.⁴⁹ To answer the second research question, bivariate Pearson correlations and descriptive statistics were calculated among maternal feeding practices and BMI-z, global internalizing symptoms, and self-esteem. Three hierarchical linear regression analyses were used to examine differences in the effect of maternal feeding practices on internalizing symptoms, self-esteem, and BMI-z, moderated by gender and ethnicity. Two-way interaction terms were created between gender and maternal feeding practices and ethnicity and maternal feeding practices. Age was included as a covariate in regression analyses. In the hierarchical linear regression, the first step included age; the second step included age, gender, ethnicity, and maternal feeding practice main effects; the third step added the interactions between gender and maternal feeding practices and ethnicity and maternal feeding practices. Significance tests were conducted at $p < .05$ level.

RESULTS

Research Question 1

There were no significant two- or three-way interactions among child age, child gender, and mother ethnicity in relation to pressure to eat or restriction. Thus, interactions were removed from models. Neither child gender ($p = .96$) nor mother ethnicity ($p = .52$) were related to pressure to eat. Older children had mothers who reported greater pressure to eat ($p = .01$). Neither child gender ($p = .17$) nor mother ethnicity ($p = .38$) were related to restriction. Older children had mothers who reported greater restriction ($p = .04$).

Research Question 2

Bivariate correlations are presented in **Table 1**. Pressure to eat and restriction were only weakly positively correlated. Pressure to eat was significantly related to lower BMI-z scores and lower child self-esteem scores. Greater restriction was significantly, yet weakly, associated with higher BMI-z scores. There were no associations between maternal controlling feeding practices and global internalizing symptoms.

	1	2	3	4	5
1. Maternal pressure to eat	-	.16*	-.41***	.07	-.23**
2. Maternal restriction		-	.20**	.09	-.04
3. Child BMI-z			-	.12	-.09
4. Child internalizing symptoms				-	-.59***
5. Child self-esteem					-
<i>M</i>	2.39	3.03	0.52	0.58	31.88
<i>SD</i>	1.07	0.97	1.05	1.05	5.31
Minimum	1.00	1.00	-2.63	0.00	13.00
Maximum	5.00	5.00	2.61	2.23	40.00
Skewness	0.36	-0.24	-0.16	1.36	-0.78
Kurtosis	-0.95	-0.73	-0.51	2.42	0.64

Note. BMI=body mass index. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 1. Descriptive Statistics among Study Variables.

Research Question 3

Results of hierarchical linear regression analyses are displayed in **Table 2**. Older children had fewer internalizing symptoms and better self-esteem across steps. There were no significant statistical interactions among maternal controlling feeding practices and gender or ethnicity in relation to any dependent variables. Further, results showed similar patterns on findings as bivariate correlations.

	BMI-z			Internalizing Symptoms			Self-Esteem		
	B	SE	p	B	SE	p	B	SE	p
Step 1									
Child Age	.09	.08	.26	-.76	.25	.003	1.31	.44	.003
Step 2									
Child Age	.02	.07	.82	-.75	.26	.01	1.00	.44	.02
Pressure to eat	-.46	.06	<.001	.16	.23	.47	-1.12	.37	.003
Restriction	.31	.07	<.001	.18	.25	.47	-.10	.41	.81
Female	.15	.13	.25	.10	.47	.83	-1.50	.77	.05
Hispanic	.34	.13	.01	.82	.47	.08	-.83	.77	.28
Step 3									
Child Age	.01	.07	.93	-.76	.27	.01	.99	.45	.03
Pressure to eat	-.45	.11	<.001	-.26	.38	.49	-.68	.64	.29
Restriction	.33	.12	.01	.31	.42	.45	.32	.71	.66
Female	.13	.13	.31	.10	.47	.83	-1.47	.78	.06
Hispanic	.37	.13	.01	.90	.47	.06	-.91	.78	.25
Pressure to eatXFemale	.20	.13	.12	.60	.45	.19	-.70	.74	.35
Pressure to eatXHispanic	-.25	.13	.05	.20	.45	.66	-.09	.74	.90
RestrictionXFemale	-.11	.14	.45	-.57	.50	.26	.28	.83	.74
RestrictionXHispanic	.11	.14	.46	.34	.50	.49	-1.10	.83	.19

Table 2. Hierarchical Linear Regressions of Outcomes on Maternal Controlling Feeding Practices, Gender, Ethnicity, and Interactions.

DISCUSSION

This cross-sectional study examined how maternal controlling feeding practices were associated with weight, global internalizing symptoms, and self-esteem among 8–12-year-old children and how child gender and mother ethnicity may moderate these relationships. There were no differences in reported maternal controlling feeding practices by child gender or mother ethnicity, but older children had mothers who reported greater restriction. This pattern of findings suggests that other factors may be more salient as to which mothers are more likely to use these practices with children of this age range, such as maternal mental health and parenting styles.^{30,57}

Maternal pressure to eat was associated with lower child BMI z-scores, and maternal restriction was associated with higher child BMI-z scores. Mothers may be more likely to pressure lower weight children to eat more food as they may perceive their child as not getting appropriate nutrition. However, of note, severely underweight children were excluded. Oppositely, mothers may restrict the food intake of higher weight children given the health detriments and social stigma associated with being overweight and obese. Some prior research has shown no associations between maternal controlling feeding practices and BMI among Hispanics²³⁻²⁹; however, the current results found that ethnicity did not moderate the significant associations. Given the increasing public health focus on maintaining healthy child weight,⁴³ mothers of children, regardless of ethnicity, may become more focused on using controlling feeding practices with children outside of prescribed weight ranges.

Results indicated that pressure to eat and self-esteem scores were negatively correlated. One study showed that higher parental pressure to achieve was related to lower child self-esteem suggesting that undue parental pressure could potentially decrease child self-esteem.⁵⁹ Results of the current study show that this may extend to pressure to eat. Perhaps maternal pressuring reduces a child's feelings of autonomy, which then decreases their self-esteem and confidence to make decisions.⁶⁰

There were no significant relationships among maternal controlling feeding practices and global internalizing symptoms. This is the first study to our knowledge that has examined this relation; however, studies have found associations between maternal controlling feeding practices and child bulimic symptoms and emotional eating scores.^{20,24} It is possible that controlling feeding practices are limited to being associated with eating psychopathology and no other forms of psychopathology. Furthermore, maternal controlling feeding practices may be more detrimental to older adolescents' mental health or only in children at risk for eating disorders. Given the dearth of literature in this area, it is important to conduct more research on these relationships in diverse samples of mother-child dyads.

This study did not find any differences in the association of controlling feeding practices and weight and internalizing symptoms by gender and ethnicity. It is possible that differences between boys and girls may emerge later into adolescence. Continuous exposure to controlling feeding patterns at ages 13-15 has been correlated with unhealthy eating attitudes, such as restriction (more prevalent in boys as compared to girls) and pressuring oneself to eat (more prevalent in girls as compared to boys)⁶¹⁻⁶² Girls are more likely to diet during adolescence, as compared to boys; a past review indicated that 41-66% adolescent girls diet, and 20-31% adolescent boys diet, both for the purpose of weight loss. Girls are more likely to diet because of society's perception of the ideal, extremely thin female body. Popular adolescent dieting methods, especially for girls, include crash diets, fasting, slimming tablets, diuretics, and laxatives. Peer pressure, media pressure, and perception of the harmlessness of dieting strategies perpetuate these behaviors.⁶³⁻⁶⁴ Internalized symptoms starting at a young age become the norm for these adolescents and thus follow them into adulthood. Further, ethnic differences may be more likely to emerge in Hispanic families who are less acculturated to Western society.⁴⁴ More research is needed in adolescents and diverse groups of Hispanic dyads with regard to acculturation.

A limitation of the current study includes a cross-sectional analytic strategy, which limits the ability to infer causation and directionality of effects. This was a community-based sample that was generally well-adjusted and had fewer mental health problems compared to clinical samples. Samples with greater numbers of children with mental health problems may produce differing results. Thus, future studies will be improved by sampling from clinical populations, and future studies should consider examining differences between overt (*i.e.*, controlling a child's food intake in a way that can be detected by the child such as verbally restricting or encouraging eating) versus covert (*i.e.*, controlling a child's food intake in a way that cannot be detected by the child such as placing smaller portions on plates or reducing amounts of snack food available in-home) forms of pressure to eat and restricting, which differ in whether the child can detect the controlling behavior.^{34,65} Overt and covert control can be measured with a 9-item questionnaire that asks about direct and indirect controlling feeding practices.⁶⁵ These constructs are difficult to measure, and further research needs to be done to improve current measures. Future studies may be improved by utilizing more accurate video observational methods, as compared to self-reporting of intake; this may aid in the standardization of measures.⁶⁶ Finally, parental stress, home environment, socioeconomic standing, single versus dual-parent households, food scarcity, and cultural versus ethnic differences should be considered in future studies as possible moderators or mediators.

While future studies are necessary to explore the relationships between maternal controlling feeding practices and child weight and internalizing problems, this study provided new insights into these associations and showed that associations are similar across gender and ethnicity.

CONCLUSIONS

Maternal pressure to eat was correlated with lower child BMI z-scores, and maternal restriction was correlated with higher child BMI-z scores. In general, there were no significant correlations between maternal controlling feeding practices and internalizing symptoms, as well as no significant differences based on gender and ethnicity of a child. However, more maternal pressure to eat was related to lower self-esteem. This is the first study, to our knowledge, that studied the effect of controlling feeding practices

on global internalizing symptoms and self-esteem. Results provide some evidence that controlling feeding practices may be associated with less self-esteem in middle childhood, but there were no differences in relation to internalizing symptoms. More research will be needed to determine if controlling feeding practices impact mental health into adolescence. Also, results were similar across gender and ethnicity, suggesting that controlling feeding practices do not have a differential impact on mental health and weight in middle childhood. Future studies must be done to further explore the relationship between maternal feeding practices, child weight, and mental health, as well as the effect of gender and ethnicity, particularly in older children and samples with more variability in internalizing symptoms.

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PRESS SUMMARY

Mothers may attempt to control their children’s food intake in order to make the child gain or lose weight. The purpose of this study was to determine if these practices have an association with weight and mental health of children. Results were based on 202 pairs of mothers and their children. The following findings were determined as part of the results: mothers pressuring their children to eat was related to a lower child body mass, restricting children from eating certain foods was related to a higher child body mass, and mothers pressuring their children to eat was related to lower child self-esteem.