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Do Parents Treat Siblings Similarly or Differently with Regard to Feeding Practices, Weight-Related Conversations, and Support for Physical Activity? An Exploratory Analysis

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Abstract

Background: It is unknown if parents with more than one adolescent child use similar or different parenting practices of relevance to weight-related health with different children. In particular, it is unclear whether parenting practices differ based on whether siblings are discordant on weight status (i.e., one is overweight/obese, one is nonoverweight/obese) or are different sexes.

Methods: Data from two linked population-based studies, Eating and Activity in Teens (EAT) 2010 and Families and Eating and Activity in Teens (F-EAT), were used in this exploratory cross-sectional analysis. Participants included socioeconomically and racially/ethnically diverse parents ($n = 57$; 93% females) and adolescent siblings ($n = 57$ pairs; 60% girls; mean age = 14.5, range = 11–18). Students filled out surveys and had anthropometric measures taken in school. Parents filled out mailed surveys in their homes.

Results: Overall, results from this exploratory study showed limited evidence that parents use different parenting practices with adolescents of different weight status or sex. However, potentially important patterns emerged when exploring parenting practices and siblings' weight status. For example, within sibling dyads with discordant weight status, parents reported significantly more negative weight-related conversations with overweight/obese siblings compared to nonoverweight/obese siblings ($p < 0.05$). Although observed differences were not statistically significant, parents also reported higher levels of food restriction ($p = 0.05$) and encouragement to diet ($p = 0.07$) with overweight/obese siblings compared to nonoverweight/obese siblings. There were no significant differences in parenting practices by adolescent sex.

Conclusions: Results generally suggest that parents use similar parenting practices with adolescent siblings. However, notable patterns emerged when examining parenting practices and siblings' weight status that may be important to explore in future research.

Introduction

Many families have at least two children living in their household.[1] However, very little is known about how parents respond to more than one child in the home with regard to weight and weight-related issues. For example, do parents adapt their feeding practices to accommodate siblings in the same household? Do parents talk about weight and weight-related topics similarly with siblings? And do parents provide similar levels of support for physical activity with siblings? Furthermore, it is unknown if parents adapt their feeding practices, conversations about weight and weight-related topics, or their support for physical activity depending on the weight status (i.e., one child is nonoverweight/obese and the other child is overweight/obese vs two siblings of similar weight status) or sex of the siblings.[2] Such information has been critically missing in the field of childhood obesity and is relevant for designing effective family-based parenting obesity prevention interventions.

Although it is widely recognized that parents play an important role in shaping child weight and weight-related

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behaviors,[2–11] previous research has been limited regarding how parents influence and differentially respond to two children (i.e., sibling dyads) within the same household with regard to parent feeding behaviors, weight-related conversations, or support for physical activity.[4,12] The few studies that have been conducted have primarily focused on parent feeding practices. These studies have shown mixed findings. For example, some studies have found that parents used more restrictive feeding practices with children who were pickier than their siblings and applied more pressure to eat with children who enjoyed food less, were slower to eat, and were thinner than their siblings.[13,14] Other research has shown no differences in maternal feeding practices between overweight/obese and nonoverweight/obese siblings[15] or that mothers used restrictive feeding practices with both of their children (i.e., siblings), not contingent on siblings' weight status.[16] These inconsistent results may be due to different measures being used, varying sample sizes (range = 15–80 participants), or the variety of age ranges (range = 3–12 years) included in samples. Additionally, these sibling studies have not examined differences by child sex or explored differential treatment between siblings on other potentially weight-related issues such as parent-adolescent weight conversations or parental support for physical activity. Finally, to our knowledge, there have been no studies exploring weight-related parenting practices within samples of adolescent sibling dyads.

Examining differences by sibling weight status and sex is important, given previous research with one child showing parents restrict more often with overweight/obese children and pressure more with nonoverweight/obese children[2,17–20] and showing parents engage in more weight-related conversations with overweight/obese children and with boys.[11,21] Additionally, previous studies have shown significant associations between parent weight-related conversations and food restriction with more adolescent disordered eating behaviors and higher weight status.[11,21–24] Thus, even if unintentional, differential treatment by sibling weight status or sex could lead to more adolescent overweight/obesity or disordered eating over time in the sibling experiencing restriction or weight-related conversations. More research is needed to address these important unanswered questions regarding parental response to sibling dyads in the home environment and to address inconsistencies in previous study findings.

Based on the limited research, inconsistent findings from previous studies examining parenting practices with siblings, and because it is common for children to have a sibling, it is critical to understand whether parent feeding practices, weight-related conversations, or support for physical activity with siblings in the home differ based on child weight status or sex. The main exploratory research question being examined in the current study is: Do parents engage in different feeding practices, weight-related conversations, or levels of support for physical activity with sibling dyads if they are discordant on weight status or of the opposite sex? Results from this exploratory study will provide an incremental next step in understanding the relationship between parenting practices with siblings in the home and may set the stage for future intervention research regarding how to intervene in parenting practices when there are siblings in the home.

Methods

Study Design and Population

Data for this exploratory analysis were drawn from two coordinated, population-based studies.[11,25,26] Eating and Activity in Teens (EAT) 2010 was designed to examine dietary intake, physical activity, weight control behaviors, weight status, and factors associated with these outcomes in adolescents. Families and Eating and Activity in Teens (Project F-EAT) was designed to examine factors within the family and home environment (e.g., parent behaviors, family functioning, home food and physical activity resources) of potential relevance to adolescents' weight and weight-related behaviors.[25,27] Survey development for both EAT 2010 and F-EAT are described elsewhere.[25,27] Drafts of the surveys were pre-tested by 56 adolescents and 35 parents from diverse backgrounds for clarity, readability, and relevance, and reviewed by an interdisciplinary team of experts. After revisions, the survey was additionally pilot tested with a different sample of 129 middle school and high school students and 102 parents to examine the test-retest reliability of measures over a one- to two-week period. All study procedures were approved by the University of Minnesota's Institutional Review Board Human Subjects Committee and the participating school districts.

For EAT 2010, surveys and anthropometric measures were completed by 2793 adolescents from 20 public middle schools and high schools in the Minneapolis/St. Paul metropolitan area of Minnesota during the 2009–2010 academic year. For Project F-EAT, data were collected by surveying up to two parents/caregivers ($n = 3709$) of the adolescents in EAT 2010 by mail or phone interviews. In total, 2382 EAT 2010 (85%) adolescent participants had at least one parent respond and there were two parent respondents for 1327 adolescents. Following data collection and database management for EAT 2010 and F-EAT, it became clear that the EAT 2010 dataset contained siblings. It was not originally anticipated that a substantial number of siblings would enroll in EAT 2010. It was not until parent data were collected for Project F-EAT that we were able to ascertain sibling status of EAT 2010 adolescents. Thus, a unique opportunity to investigate siblings arose, and research questions for the current study were formulated.

The study population for the current analysis was restricted to siblings in the EAT survey with the same primary parent in the F-EAT survey ($n = 57$ triad sets) without missing information and who lived with their parent 100% of the time. Triads were identified by matching the addresses of the primary parents of the adolescents in the EAT 2010 survey. The birthdate of the primary parent was

Table 1. Measures of Parent Feeding Practices, Parent-Adolescent Weight and Weight-Related Conversations, Parent Support for Physical Activity, and Control Variables Used in the Analyses

Measure	Description/questions
Parent feeding practices	Parent feeding practices including *pressure-to-eat* and *food restriction* were measured using an adapted version of the CFQ created specifically for adolescents.[28] This adolescent version of the CFQ has been used in other studies.[17,18,28,29]
Parent pressure to eat	• Pressure-to-eat food-related parenting practices were measured using all four items from the Pressure-to-Eat Subscale of the CFQ, a subscale designed to measure the degree to which the parent encourages their child to eat more food (Birch et al., 2001). Examples of self-report items include (1) "My child should always eat all the food on his/her plate" and (2) "If my child says, 'I'm not hungry,' I try to get him/her to eat anyway." Individual items were measured using a four-point Likert scale, with each point on the scale represented by a word anchor (disagree, slightly disagree, slightly agree, and agree). • An *overall parental pressure-to eat* scale was created by averaging responses to each of these four questions to assign an overall pressure score ranging from 1 (low pressure) to 4 (high pressure) (test-retest r = 0.73, Cronbach's alpha = 0.70).
Parent restriction	• Restrictive food-related parenting practices were measured using six items from the eight-item Restriction Subscale of the CFQ, a subscale designed to measure a parent's attempt to control a child's eating by restricting access to palatable foods. Two items from the subscale were dropped based on recommendations from a validation study conducted within a diverse adolescent population (Kaur et al., 2006). Examples of the self-report items include (1) "I have to be sure that my child does not eat too many high fat foods" and (2) "If I did not guide or regulate my child's eating, he/she would eat too many junk foods." • Individual items were measured using a four-point Likert scale, with each point on the scale represented by a word anchor (disagree, slightly disagree, slightly agree, and agree). For the current analyses, an *overall parental restriction* scale was created by averaging responses to each of these six questions to assign an overall restriction score ranging from 1 (low restriction) to 4 (high restriction) (test-retest r = 0.72, Cronbach's alpha = 0.86).
Parent encouragement to diet	• Parents were asked, "To what extent do you encourage your child to diet to control his/her weight?" [Not at all, A little bit, Somewhat, Very much]. (test-retest r = 0.68)
Parent-adolescent conversations about eating, physical activity, and weight	Positive parent-adolescent eating and physical activity conversations and negative parent-adolescent weight conversations were assessed using two items that were modeled after items in the Parental Energy Index.[28]
Positive parent-adolescent eating and physical activity conversations	• Mothers and fathers were asked, "How often in the past year… [Never or rarely, A few times a year, A few times a month, A few times a week, Almost every day] (1) Have you had a conversation with your child about healthy eating habits? (test-retest r = 0.48) and (2) Have you had a conversation with your child about being physically active? (test-retest r = 0.64). • An overall score was created by averaging responses between the two questions ranging from 1 (Never / rarely) to 5 (Almost every day)
Negative parent-adolescent weight Conversations	• Example items, asked for both mothers and fathers, include "How often in the past year… [Never or rarely, A few times a year, A few times a month, A few times a week, Almost every day] (1) Have you mentioned to your child that he/she weighs too much? (test-retest r = 0.73) and (2) Have you mentioned to your child that he/she should exercise in order to lose weight or to keep from gaining weight?" (test-retest r = 0.71). • An overall score was created by averaging responses between the four questions ranging from 1 (Never / rarely) to 5 (Almost every day).
Parent support for physical activity	
Frequency of physical activity with child/ helping child be physically active	• Frequency of parents engaging in physical activity with their child was assessed with the following questions.[29] "In a typical week, how many hours do you spend doing the following: [None, Less than ½ hour, ½ – 2 hours, 2 ½ – 4 hours, 4 ½ – 6 hours, 6+ hours} Being physically active with your child (e.g., throwing a ball around, taking a walk, or bike ride together)?" Each category was recoded to the midpoint of the range for a possible numeric range of 0–6.5 hours of all six categories (test-retest r = 0.58).

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Table 1. Measures of Parent Feeding Practices, Parent-Adolescent Weight and Weight-Related Conversations, Parent Support for Physical Activity, and Control Variables Used in the Analyses *continued*

Measure	Description/questions
	• Frequency of parents helping their child to be physically active was assessed by asking,[29] "In a typical week, how many hours do you spend doing the following: [None, Less than ½ hour, ½ – 2 hours, 2 ½ – 4 hours, 4 ½ – 6 hours, 6+ hours] Helping your child to be physically active (e.g., driving them to the gym or sport practice, watching them play a sport)?" Each category was recoded to the midpoint of the range for a possible numeric range of 0–6.5 hours of all six categories. (test-retest r = 0.62). A final total score was used in analyses by adding the two items together for a total number of hours.
Control variables	
Sociodemographic characteristics	• Adolescents' and parents' race/ethnicity, age, and parents' educational attainment were assessed by self-report in adolescents and parents, respectively. • Race/ethnicity was assessed with the item, "Do you think of yourself as (1) white, (2) black or African American, (3) Hispanic or Latino, (4) Asian American, (5) Hawaiian or Pacific Islander, or (6) American Indian or Native American?" and respondents were asked to check all that apply. Participants who checked "white" and another option were included in the "other" category. Those who checked two nonwhite options were categorized as "mixed/other race." Additionally, those checking "Hawaiian/Pacific Islander" or "American Indian/Native American" were also categorized as "mixed/other race" due to their small numbers in this dataset. • Highest level of parent educational attainment was used as a proxy for socioeconomic status and was assessed using the following question: "What is the highest level of education you have completed?" Response options included less than high school, high school/GED, vocational/technical school, associate degree, bachelor's degree, graduate or professional degree.[30] • Parent and adolescent age was calculated using self-reported birth date and survey completion date.

CFQ, Child Feeding Questionnaire.

used to ensure the same parent was responding to the questionnaire for both adolescents. Sibling 1 participants were predominantly female (54%), Asian American (25%), nonoverweight (63%), with a mean age of 14.4 years (range = 11–18 years). Sibling 2 participants were 65% female, 25% Asian American, 61% nonoverweight, with a mean age of 14.7 years (range = 11–18 years). Primary parents were predominantly female (93%), white (25%), finished college or more (42%), and had a mean age of 42.4 years (range = 33–64 years). All measures used in analyses including parent feeding practices, weight-related conversations, support for physical activity, and siblings weight status, are listed in Table 1.

Statistical Analyses

Means and standard deviations (SDs) of parental feeding practices, weight conversations, and support for physical activity were calculated for the full sample of sibling pairs ($n = 57$ pairs). Additionally, subgroup analyses identified sibling pairs that were discordant on weight status (overweight/nonoverweight; $n = 19$ pairs) or sex (female/male; $n = 22$ pairs) and examined whether parental feeding practices, weight conversations, and support for physical activity differed between these groups. Adolescent weight status was determined by categorizing adolescent BMI percentile greater than 0.85 as overweight (mean [SD] BMI percentile: 0.51 [0.24]) and those less than or equal to 0.85 as nonoverweight (mean [SD] BMI percentile: 0.92 [0.04]). Adolescent pairs with one sibling overweight and the other sibling nonoverweight were included in the weight discordant subgroup analysis. Paired t-tests and 95% confidence intervals were used to compare differences in means of each parenting practice between adolescents and their siblings in the subgroup analyses for discordant weight status and discordant gender, separately. Because of the small sample size, only unadjusted results are presented.

Results

Parent Feeding Practices

Results indicated limited evidence that parents use different feeding practices with siblings who are discordant on weight status or sex (Table 2). However, parents reported using more food restriction feeding practices with overweight/obese siblings compared to nonoverweight/obese siblings, but these observed differences were not statistically significant (2.7 vs 2.3; $p = 0.05$). In addition, there were no significant associations between parental use of pressure to eat feeding practices and adolescent discordant weight status. Additionally, comparisons in feeding practices of parents of opposite sex siblings revealed nonsignificant differences.

Table 2. Means of Parenting Practices among All Siblings ($N = 114$) and Means of Parenting Practices and Difference Scores with 95% Confidence Intervals of Subgroups of Siblings Discordant on Weight Status ($N = 38$) or Sex ($N = 44$), EAT 2010[a]

		Discordant weight ($n = 38$)			Discordant sex ($n = 44$)		
	All kids ($n = 114$)	Overweight/ obese sibling ($n = 19$)	Nonoverweight sibling ($n = 19$)	Difference (95% CI)	Male sibling ($n = 22$)	Female sibling ($n = 22$)	Difference (95% CI)
Parent feeding practices							
Parent restriction	2.6 (0.8)	2.7 (0.9)	2.3 (0.7)	0.4 (–0.0, 0.8)	2.9 (0.6)	2.6 (0.9)	0.2 (–0.1, 0.5)
Parent pressure to eat	2.2 (0.8)	2.0 (0.8)	2.3 (0.8)	–0.2 (–0.6, 0.2)	2.1 (0.9)	2.2 (0.8)	–0.1 (–0.4, 0.2)
Parent-adolescent weight and weight-related conversations							
Positive parent-adolescent eating and physical activity conversations	3.1 (1.1)	3.0 (1.4)	3.0 (1.4)	0.1 (–0.4, 0.5)	3.7 (0.8)	3.7 (0.9)	–0.1 (–0.5, 0.4)
Negative parent-adolescent weight conversations	1.9 (1.0)	**1.8 (1.0)**	**1.5 (0.5)**	**0.4 (0.0, 0.7)***	2.0 (1.0)	1.9 (1.0)	0.1 (–0.3, 0.4)
Parent encourages child to diet	1.8 (1.1)	1.6 (0.9)	1.2 (0.4)	0.4 (–0.0, 0.9)	1.9 (1.1)	1.9 (1.1)	0.0 (–0.5, 0.5)
Parent support of adolescent physical activity							
Frequency of physical activity with child/ helping child be physically active	2.1 (2.7)	2.2 (2.8)	1.8 (2.4)	0.4 (–0.2, 1.0)	1.9 (2.4)	2.3 (3.1)	–0.4 (–1.2, 0.5)

[a]Estimates are unadjusted means and standard deviations, mean (SD).

*Results that are bold are significantly different using paired t-tests at $p < 0.05$.

EAT, Eating and Activity in Teens.

Parent-Adolescent Weight and Weight-Related Conversations

Results indicated some evidence suggesting parents used more weight and weight-related conversations with siblings who were discordant on weight status or sex (Table 2). Specifically, among discordant weight status siblings, parents reported significantly higher levels of negative weight and weight-related conversations with their adolescents who were overweight/obese compared to adolescents who were nonoverweight/obese (1.8 vs 1.5; $p < 0.05$). In addition, while not statistically significant, parents tended to report more encouragement to diet conversations with overweight/obese siblings compared to nonoverweight/obese siblings (1.6 vs 1.2; $p = 0.07$). Comparisons in parent-adolescent conversations about healthy eating within weight discordant sibling pairs and opposite sex siblings revealed nonsignificant differences. Comparisons in weight-related conversations of parents of opposite sex siblings revealed nonsignificant differences.

Parental Support of Adolescent Physical Activity

Results indicated no evidence of differences in parental support for adolescent physical activity by sibling discordant weight status or sex (Table 2).

Discussion

In general, we found limited evidence that parents use different parenting practices with adolescents of different weight status or sex. However, potentially important patterns emerged in the data including more negative parent-adolescent weight and weight-related conversations, parental food restriction, and encouragement to diet with overweight/obese siblings compared to nonoverweight/obese siblings. While only one of these differences by sibling weight status reached statistical significance, these patterns may warrant further discussion and are important issues to consider for future research.

These findings may lend some evidence to the hypothesis that parents respond differently to siblings based on their weight status when engaging in parent-adolescent weight-related conversations and using feeding practices. While it is likely that the use of different food-related parenting practices with siblings of discordant weight status are a reflection of well-intentioned efforts by parents to help their adolescent achieve a healthy weight, differential treatment by sibling weight status could lead to adolescent overweight/obesity or disordered eating over time in the sibling experiencing restriction or weight-related conversations. This hypothesis aligns with prior literature showing that parents, in general, tend to engage in pressure

to eat practices with children who are nonoverweight/obese and food restriction practices with children who are overweight/obese, and that using food restriction/pressure techniques can have unintended effects, including more disordered eating behaviors and overweight/obesity in adolescents.[2,11,17–24] Exploring these issues further is important because understanding whether parents use one universal feeding style with both siblings regardless of their weight status or whether they adapt their feeding practices in response to the sibling's weight status will inform interventions that target feeding practices with parents with multiple children.

Additionally, there were notable patterns in the findings related to parent-adolescent weight and weight-related conversations. For example, parents reported significantly higher levels of negative weight and weight-related conversations with overweight/obese adolescents compared to nonoverweight/obese siblings. Additionally, parents reported more encouragement of overweight/obese siblings to diet compared to nonoverweight/obese siblings, although the finding was not significant. These differences are important to examine further because prior research has suggested that overweight/obese adolescents who are encouraged to diet or who experience weight-based talk (e.g., parent mentions that adolescent weighs too much, tells their child to exercise to lose weight) by their parents are at higher risk of excessive weight gain over time and the use of disordered eating behaviors.[11,21–24,28]

Patterns in the findings for parental support for physical activity provide little support for the hypothesis that parents respond differently to adolescent siblings with regard to engaging in physical activity, regardless of adolescent weight status or sex. Thus, it may be the case that food/eating-related parenting practices (e.g., feeding practices, encouragement to diet) may be more influenced by factors such as discordant child weight status. Or, it may be that encouragement or support for physical activity may be seen more for health benefits than for weight concerns.

Overall, findings from the current study may be useful for guiding future research and family-based interventions. Specifically, while parents with one overweight/obese adolescent appeared to be more likely to engage in negative weight-related conversations, food restriction, and encouragement to diet, these behaviors may have counterintuitive outcomes based on previous literature [2,11,17–21,24] and parents may want to focus their parenting practices on household-level behavior (i.e., all children in the household) and not direct restriction, pressure to eat, or weight-related conversations at a particular child regardless of weight status. However, more research is needed in order to make recommendations to providers.

This study had several strengths. First, this data set included parent, adolescent, and sibling triads, which is rare. Thus, this study provides a first look at parenting practices with adolescent siblings in order to inform family-based interventions with parents with siblings. Second, data used in the study were participant-specific weight-related variables, whereas previous studies have primarily used the mother's report of child weight and weight-related variables. There were also study limitations. First and foremost, the study sample was small. It is important to consider the possibility that this small sample size limited our power to detect important differences in parenting practices; that said, it may also be true that there were no true differences to find. Further, because of the small sample size we were unable to adjust our associations for possible confounding factors. In addition, because of the cross sectional nature of this study, we do not know when examining parenting practices and adolescent weight status whether the parenting practices are a cause or consequence of adolescents' weight status.

Conclusions

Overall, in this exploratory study we found limited evidence that parents use different parenting practices with adolescents of different weight status or sex. However, there was some suggestion of patterns including more negative parent-adolescent weight-related conversations, parental food restriction, and encouragement to diet with overweight/obese siblings compared to nonoverweight/obese siblings. For future research, it will be important to use larger samples of siblings to further examine differences in parent restricting and pressure to eat feeding practices, parent-adolescent conversations about weight and weight-related behaviors, and parent encouragement of dieting by sibling dyad concordant/discordant weight status. It is also important to examine consequences of parental differential treatment by sibling weight status. For example, parental differential treatment by sibling weight status may be associated with higher risk of overweight/obesity for the adolescent sibling who is already overweight/obese. Because this is one of the first studies including siblings in examining parenting practices and sibling weight status, and the first with adolescents, the findings set the stage for future research with a larger sample. Furthermore, it would be important to examine differential parent feeding practices in younger children when parents are shaping children's eating patterns on a more regular basis.

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Author Disclosure Statement

Drs. Berge and MacLehose had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. None of the authors have financial disclosures to declare, and none of the authors have conflicts of interest to declare.

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