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Parent Changes in Diet, Physical Activity, and Behavior in Family-Based Treatment for Childhood Obesity

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Currently, more than one third of US children are overweight or obese,[1] and parental overweight is the strongest risk factor for child overweight.[2] Family-based treatment (FBT), the gold standard treatment for pediatric obesity, is a treatment approach that relies heavily on parent involvement.[3] In FBT, parents are often considered the agents of change, holding considerable responsibility for their child's weight loss. Since parent weight change is the best predictor of child weight loss in FBT,[4] identification of factors related to parent weight change in FBT is a valuable goal. A more thorough understanding of parent behavior change in FBT may be of clinical importance, as this information could ultimately improve both parent and child weight loss outcomes.

Many of the treatment components in FBT resemble treatment recommendations included in traditional, adult behavioral weight loss (BWL) treatments.[5] Both FBT and BWL include dietary and physical activity changes and several behavioral techniques including stimulus control and self-monitoring. On average, BWL results in an average weight loss of 7% to 10% of body weight after 6 months of treatment.[5] FBT also targets parent weight loss, and parents are asked to adhere to similar diet and activity changes as their children. For example, it is recommended that parents record food intake, complete weekly home weigh-ins, decrease consumption of high calorie foods and increase physical activity. Additionally, parent behavior change and weight loss are monitored in conjunction with their child's. Consequently, parents frequently lose weight in FBT, even though FBT was designed to target pediatric obesity.[6,7]

Prior studies have examined parent behavior changes that occur during FBT. However, research has primarily focused on the association between parent behaviors and child weight loss. For example, the most effective child weight loss interventions are characterized by a high level of parent participation, responsibility,[8] and acceptance.[9] To our knowledge, only 1 prior study has examined the relationship between FBT-prescribed parent behaviors and parent weight loss in FBT.[7] In this study, parent modeling of healthy behaviors was associated with their own weight loss at a 24-month follow-up visit.[7] The current study adds

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to the literature on parent change in FBT by examining FBT-prescribed parent behaviors that are most predictive of parent weight loss at the immediate conclusion of FBT.

Method

Study Design

The current study is a secondary data analysis examining behavior changes endorsed by 52 parents who completed FBT. All parents completed 5 months of weekly, 1-hour group therapy and a 10-minute individual behavioral coaching session. Parents were randomized to a parent + child treatment or a parent-only treatment.[6] Standardized manuals were used to ensure that parents in both groups learned the same material. The institutional review boards at the University of Minnesota and the University of California, San Diego approved the study.

Participants

Parents of overweight (>85th percentile) children aged 8 to 12 years were recruited from Minneapolis and San Diego through physician referrals, direct mailings, advertisements, and media announcements. To be eligible, parents had to be willing to complete all assessments and attend treatment sessions. Informed consent was collected from all parents.

Measures

Weight Status—Height and weight of parents were measured at baseline and post-treatment. Height was measured using a portable Schorr measuring board and body weight was measured on a Tanita Digital Scale. Height and weight were converted to body mass index (BMI, kg/m^2).

Parent Behaviors—Questionnaires that assessed parent behaviors were completed at baseline and post-treatment. Parents were asked to endorse the frequency of engaging in various behaviors prescribed in FBT, and responses were dichotomized. A total of 19 items were used to measure calorie reduction, intake of fruits, vegetables, and high fat foods, exercise and sedentary behavior, availability of healthy and high-calorie foods, self-monitoring of weight and calories, and frequency of exercising and eating dinner with their child. Items were categorized into 5 subscales: (*a*) diet, (*b*) physical activity, (*c*) stimulus control, (*d*) self-monitoring, and (*e*) parent involvement.

Statistical Analyses

Frequencies were calculated to examine FBT-prescribed parent behaviors endorsed at baseline and at post-treatment. McNemar's test was used to calculate differences in the frequency of each of the five domains of behavior endorsed by parents at post-treatment, as compared to baseline. The final analysis was a series of linear regression models examining the association between parent behaviors and post-treatment BMI in parents, after controlling for baseline BMI. For this analysis, five subscales were created to represent the parent behaviors assessed (ie, diet, physical activity, stimulus control, self-monitoring, and parent involvement) by summing the total number of behaviors endorsed in each category. Then, change scores were calculated by subtracting the baseline score from the post-

treatment score to show the change in parent behaviors during FBT. Change scores were added as independent variables in the regression model. A second model was also performed that included treatment group as a covariate. The alpha level for significance was set at $P < .05$. All calculations were performed using SPSS 20.0 (www.SPSS.com).

Results

The sample of parents was primarily comprised of middle aged ($M = 43.71$ years, $SD = 4.84$), Caucasian (78.8%) mothers (90.4%). Although parent weight status did not influence study eligibility, most parents were overweight or obese at the start of treatment (81%, $M = 32.75$ kg/m^2, $SD = 8.06$). Most parents were married (82.7%) with an annual household income >US$60 000 (61.5%). Parent weight loss was similar between the two groups (7).

Table 1 shows that the most frequently endorsed FBT-prescribed parent behaviors prior to participation in FBT were eating more fruits and vegetables (82.7%), eating less high-fat food (82.7%), and eating fewer calories (76.9%). After participation in FBT, the most frequently endorsed FBT-prescribed parent behaviors were eating less high fat foods (100%), eating less calories (94.2%), and self-weighing (92.3%). As compared with before participation in FBT, after FBT, a significantly greater number of parents endorsed the following: eating less calories, eating a certain number of calories per day, removal of cookies, chocolate, and cake from the home, weekly self-weighing, self-monitoring of food intake, counting calories, and weekly engagement in physical activity with their child.

Table 2 describes the association between changes in FBT-prescribed parent behaviors and post-treatment BMI, after controlling for baseline BMI. Changes in self-monitoring ($P = .02$) and parent involvement ($P = .02$) were significantly predictive of post-treatment BMI in parents. After adjustment for design ($P = .08$), self-monitoring fell just below traditional level of significance ($P = .07$), although the estimated parameters were similar, suggesting any influence from treatment assignment was small.

Discussion

The present study is the first to examine the association between change in FBT-prescribed parent behavior and parent weight loss at the conclusion of FBT. Current findings show that adults can also benefit from participation in child obesity treatment, and they often incorporate weight control strategies as part of participation. As compared with before FBT, at the conclusion of FBT, parents were significantly more likely to endorse the use of several self-monitoring strategies and a few dietary and stimulus control recommendations. Parents who completed FBT did not report a change in general physical activity, but they did report a greater likelihood of exercising with their child.

Changes in self-monitoring and parent involvement were the FBT-prescribed behaviors most strongly associated with parent weight loss in FBT. Previous research has shown that self-monitoring is an important predictor of successful weight loss.[10] In the current sample, there was a noticeable shift in this practice such that prior to FBT, only about 3 out of 10 of parents recorded what they ate as a weight control strategy, but after FBT, more than 8 out of 10 parents reported the use of self-monitoring of intake. Weekly self-weighing and counting

calories also significantly changed, with more than 75% of parents endorsing these behaviors at the end of treatment. Not surprisingly, parents who learn and implement self-monitoring in FBT may be more likely to achieve weight loss. Furthermore, parents who became more involved in exercising and eating dinner with their child also lost more weight. The association between parent involvement and weight loss could be indirectly explained by higher parent motivation, enhanced accountability, or social support, all of which could facilitate greater adherence to behavior changes.

Although the present study is strengthened by the use of a moderate sample size, some limitations should be noted. The sample includes parents who completed FBT. Thus, results may not generalize to nontreatment seeking parents or parents who discontinue treatment participation. Furthermore, the study relied on the use of self-report questionnaires that were used to create scales from 1-item questions. Despite these limitations, this study identifies FBT-prescribed parent behaviors that may be most critical to yielding weight loss, which could have implications for both parent and child responsiveness to FBT. Findings also suggest that there may be value in bolstering the parent behavior change component of FBT, as a method of increasing parent and child weight loss. Future research may want to examine strategies for enhancing parent commitment to self-monitoring and involvement with their children in FBT.

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Table 1

Changes in Family-Based Treatment–Prescribed Parent Behaviors Endorsed by Parents Before and After Treatment.

	Baseline (n = 52)	Post-treatment (n = 52)
Percentage of parents who endorsed:		
Diet		
I eat less calories	76.9	94.2*
I eat a certain amount of calories per day	21.2	61.5***
I eat more fruits and vegetables	82.7	84.6
I eat less high fat foods	82.7	100.0
Physical activity		
I increase my exercise level	71.2	82.7
I spend less time watching TV	36.5	51.9
I walk more, take the stairs	73.1	78.8
I spend less time on the computer	13.5	21.2
Stimulus control strategies		
Fruits are always available at my home	71.2	82.7
Vegetables are always available at my home	76.9	76.9
Sugar-sweetened drinks are never available at my home	23.1	34.6
Potato chips or other salty foods are never available at my home	1.9	7.7
Chocolate or other candy is never available at my home	1.9	15.4**
Cookies or cake are never available at my home	3.8	21.2**
Self-monitoring		
I weigh myself at least every week	61.5	92.3***
I count calories or fat	31.4	74.5***
I write down what I eat	26.9	82.7***
Parent involvement		
I engage in physical activity with my child at least one time per week	40.8	65.3**
I eat dinner with my child at least 5 times per week.	67.2	71.2

*$P < .05$.

**$P < .01$.

***$P < .001$.

Table 2

Linear Regression Model Examining the Relationship Between Change in FBT-Prescribed Parent Behaviors and Post-treatment BMI, After Controlling for Baseline BMI.

Weight Control Strategy	B (95% CI)	*P*
Diet	−0.01 (−0.34, 0.32)	.95
Physical activity	−0.02 (−0.45, 0.17)	.37
Stimulus control	0.02 (−0.17, 0.40)	.45
Self-monitoring	−0.06 (−0.68, −0.07)	.02
Parent involvement	−0.06 (−1.04, 0.11)	.02

Abbreviations: FBT, family-based treatment; BMI, body mass index; CI, confidence interval.