

UC San Diego

UC San Diego Previously Published Works

Title

Change in eating disorder symptoms following pediatric obesity treatment

Permalink

<https://escholarship.org/uc/item/9br491d0>

Journal

International Journal of Eating Disorders, 52(3)

ISSN

0276-3478

Authors

Eichen, Dawn M

Strong, David R

Rhee, Kyung E

et al.

Publication Date

2019-03-01

DOI

10.1002/eat.23015

Peer reviewed



Published in final edited form as:

Int J Eat Disord. 2019 March ; 52(3): 299–303. doi:10.1002/eat.23015.

Change in Eating Disorder Symptoms Following Pediatric Obesity Treatment

Dawn M. Eichen¹, David R. Strong², Kyung Rhee¹, Cheryl L. Rock², Scott J. Crow³, Leonard Epstein⁴, Denise E. Wilfley⁵, and Kerri N. Boutelle^{1,2,6}

¹Department of Pediatrics, UC San Diego

²Department of Family Medicine and Public Health, UC San Diego

³Department of Psychiatry, University of Minnesota

⁴Department of Pediatrics, University of Buffalo

⁵Department of Psychiatry, Washington University St Louis

⁶Department of Psychiatry, UC San Diego

Abstract

Objective: The purpose of this study is to evaluate whether children with overweight or obesity participating in an evidence-based treatment, Family based Behavioral Treatment (FBT) for obesity, or a parent-only variant of FBT (PBT), experience an increase of eating disorder symptoms during and following treatment.

Method: Children (N=150) participating in a randomized controlled trial of FBT or PBT completed measures of eating disorders attitudes and behaviors at baseline, following 6-months of treatment, 6 months and 18 months after treatment.

Results: Linear mixed effects models suggest that eating disorder attitudes did not significantly increase. Rather, significant decreases of shape, weight and eating concerns were shown following treatment. Loss of control over eating significantly decreased over treatment and follow-up. No participant endorsed purging at any time point.

Discussion: Results confirm the hypothesis that eating disorder symptoms do not increase after participating in FBT or a FBT-based treatment. These findings should help assuage fears of parents that enrolling their child will exacerbate eating disorder symptoms and aid children to access evidence-based treatments that may help reduce significant physical and psychosocial complications of childhood obesity.

Address correspondence to: Dawn Eichen, Department of Pediatrics, UC San Diego, 9500 Gilman Drive, MC 0874, La Jolla, CA 92093, [deichen@ucsd.edu], 858 534 8322.

Conflict of Interest:

The authors have no conflicts of interest to disclose

Clinical Trial: NCT 01197443 – Parents as the Agents of Change for Childhood Obesity (PAAC)

Keywords

Feeding and Eating Disorders; childhood obesity; family based behavioral treatment; Loss of control eating; purging

Introduction

One-third of children in the United States have overweight or obesity (Ogden, Carroll, Kit, & Flegal, 2014). Childhood obesity is strongly associated with adult obesity and is linked to significant negative physical and psychosocial consequences (Dietz, 1998). Intervening in children is essential to change their weight trajectory and try to prevent adult obesity and subsequent physical and mental health sequelae. However, anecdotally, many parents are hesitant to enroll their child in a weight-loss program due to concerns that participating will encourage the development of eating disorder (ED) behaviors and attitudes within the child.

ED attitudes (e.g., dietary restraint, shape/weight concerns) are more prevalent in youth with overweight compared to their peers in the normal weight range (Goldschmidt, Aspen, Sinton, Tanofsky-Kraff, & Wilfley, 2008). Additionally, adolescents (grades 6-12) with obesity and overweight are more likely to engage in unhealthy weight-control behaviors than adolescents in the normal weight range (Lampard et al., 2016; Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002). Of note, the perception of overweight is also related to engaging in weight-control behaviors (Eichen, Conner, Daly, & Fauber, 2012; Neumark-Sztainer et al., 2002). Among adolescents with overweight (grades 9-12), accurate perception was associated with ED behaviors, whereas among normal-weight adolescents, overestimation of weight was associated with ED behaviors (Eichen et al., 2012). Thus, it appears that adolescents who believe themselves to be overweight, whether or not they are, are more likely to engage in weight control behaviors (both healthy and unhealthy) to try to influence their weight.

Given the prevalence and co-occurrence of obesity and ED behaviors and attitudes, it is important to understand how participation in a weight-loss program impacts ED symptomatology. Two early review articles suggested that participating in a child weight-loss program did not increase ED symptomatology; however, because only a few studies were included (Butryn & Wadden, 2005) and the ED variables were inconsistently assessed (Carter & Bulik, 2008) both encouraged the need for additional research. A more recent review (Hayes et al., 2018) evaluated how family based-behavioral treatment for obesity (FBT), the current recommended treatment for childhood obesity (O'Connor et al., 2017), is positioned to both reduce weight and discourage EDs. One recent study that assessed change in ED symptoms following FBT in children 7-11 years old, showed that weight concerns decreased across the entire sample, while shape concerns decreased in those who had high shape and weight concerns before treatment (Balantekin et al., 2017). No change in loss of control eating episodes over the past month was found either.

The current study aims to expand the literature by not just evaluating the change in ED symptoms over the course of FBT, but through the 18 months following treatment (24 month duration). We hypothesized that ED symptoms would not increase, and some may decrease.

Results from this study could help assuage parental concerns about enrollment in pediatric weight-loss treatments.

Methods

Participants

Participants were 150 children ages 8-12 with overweight (n=22) or obesity (n=128) (i.e., BMI percentile between 85 and 99.9) who participated with a parent in the FRESH study (Families, Responsibility Education Support and Health), a randomized controlled weight-loss trial comparing FBT for obesity (treatment provided to both parent and child) and parent-based treatment (PBT; treatment provided to parent only)(Boutelle et al., 2017). Participants were recruited through physicians, listservs, flyers, and local advertisements. One parent needed to have a BMI >25 kg/m² and one parent and the child had to be available to attend study treatment meetings. Notable exclusion criteria included a major psychiatric condition in the participating parent or child, physical illness that could interfere with physical activity participation, or significant food restrictions in the household.

Procedures

All procedures (NCT 01197443) were approved by the IRBs at University of California San Diego and Rady Children's Hospital. Parents provided written consent and all children provided assent to participate. In-person assessments occurred at baseline (month 0), immediately post-treatment (month 6), 6-month follow-up (month 12) and 18-month follow-up (month 24). Measures used were the Child Eating Disorder Examination(Bryant-Waugh, Cooper, Taylor, & Lask, 1996) (ChEDE - assessed at all timepoints except 6-month follow-up) and the Youth Eating Disorder Examination Questionnaire (Goldschmidt, Doyle, & Wilfley, 2007)(YEDEQ -assessed at all four time points). The ChEDE was administered by trained graduate students and postdoctoral fellows supervised by a licensed psychologist and included only the items related to assessing overeating and purging behaviors. The objective binge episodes and subjective binge episodes over the past three months were combined to create a variable that represented total loss of control over eating (LOC) over the past three months. This variable was dichotomized to evaluate the presence or absence of LOC at each time point. ED attitudes were measured by the subscales derived from the YEDEQ (restraint, eating concern weight concern and shape concern, scores range from 0-6) as well as the global score. Reliability for all subscales ranged from $\alpha = .67-.94$. Demographic data were reported by the participating parent at baseline and anthropometric data were collected by trained research assistants at each of the assessments(Boutelle et al., 2017).

Statistical Analyses

We conducted generalized linear mixed effects models (glm) to evaluate change in eating behaviors (LOC, purging) and linear mixed effects models (lme) to evaluate change in ED attitudes (YEDEQ subscales and global score). To evaluate whether ED symptom change was influenced by change in BMIz, the relation between post-treatment ED attitudes/ behaviors and post-treatment BMIz were evaluated in linear models adjusted for corresponding baseline values and planned covariates. A square root transformation was applied to the eating disorder attitude outcomes to improve model fit due to the skewness of

the original data. All models included baseline BMIz, race/ethnicity, age, sex, and treatment condition as planned covariates. All analyses were conducted using R with maximum likelihood estimation for missing data and Bonferroni correction to adjust for multiple comparisons.

Results

Sample Characteristics

Participants' mean age was 10.4 years (SD=1.3). Two-thirds (66.7%) were girls. Per parent report, children identified as 43% non-Hispanic White, 31% Hispanic, 24% non-Hispanic other race. Mean BMI was $26.4 \pm 3.6 \text{ kg/m}^2$ and BMIz (Kuczmarski et al., 2002) was 2.0 ± 0.34 . The consort diagram has previously been published for the main outcome analysis of weight (Boutelle et al., 2017). Of the 150 enrolled, data from at least 80%, 83% and 73% is available for the ChEDE/YEDEQ at the post-treatment, 6-month and 18-month follow-up, respectively.

Loss of Control Eating

The glm model showed that LOC eating decreased from baseline to post-treatment ($B=-.709$; $SE=.328$; $z=-2.16$; $p=.031$) and baseline to 18-month follow-up ($B=-.662$; $SE=.336$; $z=-1.970$; $p=.049$). No covariate was related to change in LOC over time.

Purging Behaviors

No participants endorsed self-induced vomiting at any of the assessments, thus purging behaviors did not increase over the course of treatment.

Eating Disorder Attitudes

Descriptive statistics of the ED attitudes at each time point are shown in Table 1. Global ED attitudes significantly decreased over time ($F(3,356)=3.72$; $p<.013$). Global ED scores decreased significantly from baseline at each subsequent time point: post-treatment ($B=-.090$; $SE=.034$; $t=-2.65$; $p<.009$, $d=-.29$); 6-month follow-up ($B=-.090$; $SE=.034$; $t=-2.66$; $p<.009$, $d=-.26$) and 18-month follow-up ($B=-.095$; $SE=.036$; $t=-2.68$; $p<.008$; $d=-.26$). Restraint did not significantly change over time ($F(3,36)=1.32$, $p=.99$). Eating concerns significantly decreased over time ($F(3,360)=10.84$; $p<.001$) at each assessment time point: post-treatment ($B=-.222$; $SE=.046$; $t=-4.79$; $p<.001$, $d=-.38$) 6-month follow-up ($B=-.161$; $SE=.046$; $t=-3.50$; $p<.001$; $d=-.24$) and 18-month post-treatment ($B=-.232$; $SE=.048$; $t=-4.82$; $p<.001$; $d=-.37$). Weight concerns significantly decreased over time ($F(3,359)=4.13$; $p<.027$). The decrease was significant between baseline and post treatment ($B=-.144$; $SE=.044$; $t=3.24$; $p<.002$; $d=-.31$) and baseline and 6-month follow-up ($B=-.119$; $SE=.044$; $t=-2.70$; $p<.008$; $d=-.23$) but not baseline and 18-month follow-up ($p=.051$). Lastly, shape concerns significantly decreased over time ($F(3,356)=5.19$; $p<.007$). The decrease was significant between baseline and post-treatment ($B=-.160$; $SE=.046$; $t=-3.49$; $p<.001$; $d=-.31$) and baseline and 6-month follow-up ($B=-.145$; $SE=.046$; $t=-3.18$; $p<.002$; $d=-.25$) but not between baseline and 18-month follow-up ($p=.094$).

Weight and Eating Disorder Symptoms

Post-treatment BMIz was not related to post-treatment global eating attitudes ($B=.203$; $SE=.128$, $p=.11$) or LOC ($B=.359$; $SE=1.110$; $p=.75$), accounting for baseline BMIz. Thus, change in attitudes or LOC are not explained solely by change in BMIz.

Discussion

This study evaluated change in ED behaviors and attitudes in 150 children participating in a randomized controlled trial of FBT or PBT for obesity. Participating in a treatment study was not related to any increases in ED symptoms. LOC eating significantly decreased at post-treatment and through the 18-month follow-up. No purging behaviors were reported across all timepoints. Overall ED attitudes decreased over time; with each subscale decreasing overtime except for restraint, which showed no significant differences over time. Change in ED symptoms was not related to weight change. Taken together, results suggest that participating in a child obesity treatment study does not increase ED symptoms.

The results in this study support previous research that pediatric behavioral weight-loss treatment does not appear to exacerbate ED symptomatology (Balantekin et al., 2017; Butryn & Wadden, 2005; Carter & Bulik, 2008; Epstein, Paluch, Saelens, Ernst, & Wilfley, 2001; Hayes et al., 2018). These results contribute to the literature by further evaluating FBT, the current recommended treatment for childhood obesity. Consistent with Balantekin et al. (2017), this study shows that ED symptoms did not increase immediately following treatment. This study extended upon previous research to demonstrate symptoms did not increase, and in fact decreased, in several domains through six months following treatment and 18 months following treatment. The current study included participants in the recommended treatment for childhood obesity (FBT) and PBT, a FBT variant in which parents only attend treatment. Of note, the analyses did include treatment condition to account for the design of the study and treatment condition was not related to the change in any ED symptoms. Thus, whether children obtain weight-loss information directly through treatment or indirectly from their parents, does not seem to have an impact on ED symptoms. FBT and PBT may be effective at reducing ED symptoms since they encourage moderate vs rigid restraint (e.g., no forbidden foods), encourage establishing regular eating patterns, and teach skills like problem solving to anticipate and work through challenging situations.

Several researchers have called for the unification of childhood obesity and ED prevention programs given the co-occurrence of symptoms, shared risk factors, and potential cost-effectiveness of tackling both public health concerns in one program (Austin, 2011; Sánchez-Carracedo, Neumark-Sztainer, & López-Guimerà, 2012). These results support those efforts as they show that participating in a childhood obesity treatment does not increase eating disorder symptomatology. Future research, specifically designed to evaluate whether FBT could concurrently serve as an effective ED prevention program or whether modifications to FBT are needed to serve as an effective ED prevention program.

The current study has several strengths, including a large sample size, good retention of participants over the follow-up period (at least 70%), follow-up extending to 18-months

following treatment, and evaluating a treatment (FBT) that is recommended by national guidelines. However, the study does include some limitations, including that this is a secondary data analysis of a randomized control trial, which did not include a control group that did not undergo treatment. Thus, while it is clear that participating in treatment was not associated with increased symptoms, without a group of participants who did not attend treatment, it is impossible to confirm whether treatment was responsible for the decrease or whether symptoms tend to decrease in this population over time; however, given developmentally seen increases in ED symptoms in early adolescence (Bucchianeri, Arikian, Hannan, Eisenberg, & Neumark-Sztainer, 2013), the decrease is not likely due to a function of time. Further, the level of ED pathology was limited in this sample as participants with EDs would not have been eligible; however, this does not undervalue the importance of evaluating these risk behaviors throughout treatment.

In conclusion, the results of this study demonstrate that participating in FBT or PBT does not lead to an increase in ED symptomatology for up to 18 months following treatment. In fact, it appears that participating in weight-loss treatment may help decrease certain ED attitudes and reduce LOC over eating behaviors. In collaboration with previous research, these findings should alleviate concerns parents may have that participating in an evidence-based pediatric weight-loss treatment will contribute to their child developing an ED and thus promote children receiving early intervention to prevent sequelae associated with obesity. Future research including a group of participants who do not receive treatment is needed to further evaluate whether participating in an evidence-based treatment has substantial preventative effects on developing EDs.

Acknowledgement:

The authors would like to thank the families who participated in the research and the staff at CHEAR who made this possible. Funding for this study was provided by R01DK075861 and K23DK114480 and the opinions expressed in this paper are those of the author

References

- Austin SB (2011). The Blind Spot in the Drive for Childhood Obesity Prevention: Bringing Eating Disorders Prevention Into Focus as a Public Health Priority. *American Journal of Public Health*, 101(6), e1–e4. doi:10.2105/ajph.2011.300182
- Balantekin KN, Hayes JF, Sheinbein DH, Kolko RP, Stein RI, Saelens BE, ... Wilfley DE (2017). Patterns of Eating Disorder Pathology are Associated with Weight Change in Family-Based Behavioral Obesity Treatment. *Obesity*, 25(12), 2115–2122. doi:doi:10.1002/oby.22028 [PubMed: 28984076]
- Boutelle KN, Rhee KE, Liang J, Braden A, Douglas J, Strong D, ... Crow SJ (2017). Effect of Attendance of the Child on Body Weight, Energy Intake, and Physical Activity in Childhood Obesity Treatment: A Randomized Clinical Trial. *JAMA Pediatrics*, 171(7), 622–628. doi:10.1001/jamapediatrics.2017.0651 [PubMed: 28558104]
- Bryant-Waugh RJ, Cooper PJ, Taylor CL, & Lask BD (1996). The use of the eating disorder examination with children: A pilot study. *International Journal of Eating Disorders*, 19(4), 391–397. doi:doi:10.1002/(SICI)1098-108X(199605)19:4<391::AID-EAT6>3.0.CO;2-G [PubMed: 8859397]
- Bucchianeri MM, Arikian AJ, Hannan PJ, Eisenberg ME, & Neumark-Sztainer D (2013). Body dissatisfaction from adolescence to young adulthood: findings from a 10-year longitudinal study. *Body image*, 10(1), 1–7. doi:10.1016/j.bodyim.2012.09.001 [PubMed: 23084464]

- Butryn ML, & Wadden TA (2005). Treatment of overweight in children and adolescents: Does dieting increase the risk of eating disorders? *International Journal of Eating Disorders*, 37(4), 285–293. doi:doi:10.1002/eat.20098 [PubMed: 15856498]
- Carter FA, & Bulik CM (2008). Childhood Obesity Prevention Programs: How Do They Affect Eating Pathology and Other Psychological Measures? *Psychosomatic Medicine*, 70(3), 363–371. doi: 10.1097/PSY.0b013e318164f911 [PubMed: 18378876]
- Dietz WH (1998). Health Consequences of Obesity in Youth: Childhood Predictors of Adult Disease. *Pediatrics*, 101(Supplement 2), 518–525. Retrieved from http://pediatrics.aappublications.org/content/pediatrics/101/Supplement_2/518.full.pdf [PubMed: 12224658]
- Eichen DM, Conner BT, Daly BP, & Fauber RL (2012). Weight Perception, Substance Use, and Disordered Eating Behaviors: Comparing Normal Weight and Overweight High-School Students. *Journal of Youth and Adolescence*, 41(1), 1–13. doi:10.1007/s10964-010-9612-8 [PubMed: 21113735]
- Epstein LH, Paluch RA, Saelens BE, Ernst MM, & Wilfley DE (2001). Changes in eating disorder symptoms with pediatric obesity treatment. *The Journal of Pediatrics*, 139(1), 58–65. doi:10.1067/mpd.2001.115022 [PubMed: 11445795]
- Goldschmidt AB, Aspen VP, Sinton MM, Tanofsky-Kraff M, & Wilfley DE (2008). Disordered Eating Attitudes and Behaviors in Overweight Youth. *Obesity*, 16(2), 257–264. doi:doi:10.1038/oby.2007.48 [PubMed: 18239631]
- Goldschmidt AB, Doyle AC, & Wilfley DE (2007). Assessment of binge eating in overweight youth using a questionnaire version of the child eating disorder examination with instructions. *International Journal of Eating Disorders*, 40(5), 460–467. doi:doi:10.1002/eat.20387 [PubMed: 17497710]
- Hayes JF, Fitzsimmons-Craft EE, Karam AM, Jakubiak J, Brown ML, & Wilfley DE (2018). Disordered Eating Attitudes and Behaviors in Youth with Overweight and Obesity: Implications for Treatment. *Current obesity reports*, 7(3), 235–246. doi:10.1007/s13679-018-0316-9 [PubMed: 30069717]
- Kuczumski RJ, Ogden CL, Guo SS, Grummer-Strawn L, Flegal KM, Mei Z, ... Johnson CL (2002). 2000 CDC Growth Charts for the United States: methods and development. *Vital and health statistics. Series 11, Data from the National Health Survey*, 246, 1–190.
- Lampard AM, Macle hose RF, Eisenberg ME, Larson NI, Davison KK, & Neumark-Sztainer D (2016). Adolescents who engage exclusively in healthy weight control behaviors: Who are they? *The International Journal of Behavioral Nutrition and Physical Activity*, 13, 5. doi:10.1186/s12966-016-0328-3 [PubMed: 26767362]
- Neumark-Sztainer D, Story M, Hannan PJ, Perry CL, & Irving LM (2002). Weight-related concerns and behaviors among overweight and nonoverweight adolescents: Implications for preventing weight-related disorders. *Archives of Pediatrics & Adolescent Medicine*, 156(2), 171–178. doi: 10.1001/archpedi.156.2.171 [PubMed: 11814380]
- O'Connor EA, Evans CV, Burda BU, Walsh ES, Eder M, & Lozano P (2017). Screening for obesity and intervention for weight management in children and adolescents: Evidence report and systematic review for the us preventive services task force. *JAMA*, 317(23), 2427–2444. doi: 10.1001/jama.2017.0332 [PubMed: 28632873]
- Ogden CL, Carroll MD, Kit BK, & Flegal KM (2014). Prevalence of childhood and adult obesity in the united states, 2011–2012. *JAMA*, 311(8), 806–814. doi:10.1001/jama.2014.732 [PubMed: 24570244]
- Sánchez-Carracedo D, Neumark-Sztainer D, & López-Guimerà G (2012). Integrated prevention of obesity and eating disorders: barriers, developments and opportunities. *Public Health Nutrition*, 15(12), 2295–2309. doi:10.1017/S1368980012000705 [PubMed: 22455792]

Table 1:

Descriptive Data of Eating Disorder Attitudes and Behaviors Assessed Across Assessment Time Points

	Baseline (n=149-150)	Post-Tx (n=122 or 123)	6-mo FU (n=125)	18-mo FU (n=109-111)
ED Attitudes M(SD)				
Global	1.39(.98)	1.11(.83) **	1.14(.93) **	1.14 (.98) **
Restraint	1.25 (1.13)	1.28 (1.08)	1.11 (1.05)	1.09 (1.03)
Eating Concern	.85 (.98)	.48 (.67) ***	.61 (.8) ***	.49 (.76) ***
Weight Concern	1.72 (1.17)	1.36 (1.12) **	1.45(1.2) **	1.52 (1.28)
Shape Concern	1.76 (1.39)	1.33 (1.25) ***	1.41 (1.35) **	1.53 (1.38)
ED Behaviors %				
LOC	27.5%	16.3% *	---	16.2% *
Self-Induced Vomiting	0%	0%	---	0%

Note: ED = Eating Disorder; LOC = Loss of Control; Post-Tx = Post-Treatment; 6-mo FU = 6-month follow-up; 18-mo FU = 18-month follow-up;

*
p<.05.

**
p<.01.

p<.001