

UC San Diego

UC San Diego Previously Published Works

Title

Parent Binge Eating and Depressive Symptoms as Predictors of Attrition in a Family-Based Treatment for Pediatric Obesity

Permalink

<https://escholarship.org/uc/item/3rx626v9>

Journal

Childhood Obesity, 11(2)

ISSN

2153-2168

Authors

Braden, Abby L
Madowitz, Jennifer
Matheson, Brittany E
[et al.](#)

Publication Date

2015-04-01

DOI

10.1089/chi.2014.0109

Copyright Information

This work is made available under the terms of a Creative Commons Attribution-NonCommercial-NoDerivatives License, available at <https://creativecommons.org/licenses/by-nc-nd/4.0/>

Peer reviewed

Parent Binge Eating and Depressive Symptoms as Predictors of Attrition in a Family-Based Treatment for Pediatric Obesity

Abby L. Braden, PhD,¹ Jennifer Madowitz, BA,^{1,2} Brittany E. Matheson, MS,^{1,2}
Kristie Bergmann, MA,^{1,3} Scott J. Crow, MD,^{4,5} and Kerri N. Boutelle, PhD^{1,6}

Abstract

Background: Attrition is a significant problem in family-based treatment (FBT) for childhood obesity. Despite this, very few studies have examined factors associated with attrition. The current study examined parent symptoms of depression and binge eating as predictors of attrition in FBT.

Methods: Participants included 77 parents of overweight children enrolled in FBT for childhood obesity. Data were collected at baseline and post-treatment. Binary logistic regression was used to assess associations between parent binge eating symptoms, depressive symptoms, and attrition.

Results: Results showed that parent binge eating symptoms ($p=0.02$), but not depressive symptoms ($p=0.07$), were significantly associated with attrition, after controlling for parent BMI, treatment group assignment, and family income.

Conclusions: Higher reported parent binge eating symptoms were significantly related to attrition in FBT. Assessment of parent binge eating may be important in identifying families at risk for dropping out of FBT. Further, FBT may need to be adapted for families with parents who have a high level of psychopathology.

Introduction

Although lifestyle interventions for childhood obesity demonstrate efficacy for improving weight outcomes,¹ participant attrition is high, presenting a major barrier to treatment success.² Up to 42% of participants drop out of controlled pediatric obesity trials, with comparable rates in clinic-based programs.² Moreover, 25–50% of participants drop out after the first visit alone.³ Despite these staggering statistics, only a few studies have examined factors predictive of attrition, and those have yielded mixed results to date. Low family socioeconomic status (SES; *e.g.*, ethnic minority status, lower income, or Medicaid insurance), greater distance to treatment site, and poor overall physical and mental health status in children

(*e.g.*, greater child BMI and weight-related comorbidities, child behavioral issues, depressive symptoms, and poor school performance) are associated with higher attrition rates.^{3–6} Higher parent BMI at baseline also predicts attrition in weight loss treatment programs for adolescents.⁷ However, findings are not consistent across studies.^{3,4} Further, the impact of parent psychiatric functioning on treatment attrition has been largely absent from previous investigations. Given that parent involvement is critical to childhood obesity treatment, it is surprising that the impact of parent psychosocial factors on attrition has not been more extensively studied.

In adult weight loss studies, two important psychological factors—binge eating and depression—are both associated with attrition^{8,9} and thus could be associated with

¹Department of Pediatrics, University of California San Diego, La Jolla, CA.

²Joint Doctoral Program in Clinical Psychology, San Diego State University/University of California San Diego, San Diego, CA.

³Alliant International University, San Diego, CA.

⁴Department of Psychiatry, University of Minnesota, Minneapolis, MN.

⁵Emily Program, Minneapolis, MN.

⁶Department of Psychiatry, University of California San Diego, La Jolla, CA.

attrition from pediatric obesity treatment programs. Family-based treatment (FBT),¹⁰ the current gold-standard intervention for pediatric obesity, incorporates dietary and physical activity (PA) recommendations along with behavior modification strategies. In FBT, parents are expected to consistently attend treatment sessions and implement behavioral changes at home, including recording food intake, modifying the food environment, and increasing PA. Moreover, FBT emphasizes parent responsibility for modeling healthy behaviors and reinforcing positive child weight loss behaviors. Whereas the impact of parental factors on child weight loss success has been well documented,^{11,12} much less is known about how parent factors may impact attrition from FBT programs. Given that attrition rates are related to weight loss outcomes,¹³ it is imperative to investigate parental factors that may attribute to attrition in order to improve weight loss outcomes for children in pediatric obesity treatment programs. A recent study showed that approximately one third of parents enrolled in a clinic-based weight loss program for their children identified their own emotional and physical health as influencing attrition.¹⁴ Therefore, it is possible that parent psychological factors, such as binge eating and depression, may contribute to attrition rates in FBT.

Binge eating is associated with cognitive deficits that could interfere with treatment compliance and attendance in FBT.¹⁵ In obese individuals, binge eating has been associated with poor executive functioning, including reduced problem-solving abilities, higher levels of impulsivity, and attentional deficits.^{16,17} Among overweight women, binge eating is associated with risky decision making and difficulty incorporating helpful feedback during a computerized task.¹⁸ Cognitive deficits could interfere with parents' ability to effectively organize their schedule, plan transportation and child care, and complete other tasks that would maximize their likelihood of attending treatment sessions. However, no studies have examined the impact of parent binge eating on attrition in FBT.

In addition to binge eating, depression is associated with impairments in cognitive functioning^{19,20} and decreased motivation that could interfere with treatment attendance in FBT. Cognitive symptoms of depression, such as impaired concentration and difficulty making decisions, may negatively impact treatment attendance. In obese women, reduced mental flexibility and problems with sustained attention are related to depressed mood.²¹ Additionally, other depressive features, including reduced motivation and sleep disturbance, could contribute to treatment dropout. The impact of depression on cognitive functioning may have far-reaching implications for weight loss treatment compliance and attendance, given the complexity of treatment requirements and the number of components included in interventions targeting both adult and child weight loss. One study found that maternal depression was associated with treatment nonresponse and dropout in FBT.²² However, additional studies are needed

to replicate this finding and further investigate the impact of parent depressive symptoms on attrition in FBT.

Another important reason to examine both parent depression and binge eating as predictors of attrition in FBT is because depression, binge eating, and obesity are closely related constructs. Depression and binge eating are strongly associated in weight loss, treatment-seeking samples.^{23,24} Similarly, obesity is closely linked with depression and binge eating. Prospective studies show that depression is a risk factor for obesity and vice versa.²⁵ In one clinical sample of obese adults, 17% had depression, 13% had binge eating, and 17% had both depression and binge eating.²⁶ High rates of depression and binge eating are also observed among parents in FBT. In one sample of mothers in FBT, 25% endorsed significant binge eating and 27.6% endorsed clinically significant psychiatric symptoms.²⁷ Thus, rates of psychopathology in parents of overweight children are high, which may have an important influence on treatment dropout. One previous study showed that parent psychiatric symptoms negatively, indirectly affected child weight loss in FBT,²⁸ but their impact on treatment attendance is unknown.

Given the active role of parents in FBT, their impact on child weight loss, and the high prevalence of psychiatric disorders in FBT parents, the evaluation of parent psychological factors that may be associated with attrition is critical. Therefore, the present study seeks to evaluate the impact of parent symptoms of binge eating and depression on attrition in a family-based intervention targeting child weight loss.

Methods

Study Design

Parents and children included in the present study were participants in the Parents as Agents of Change study,²⁹ a randomized, controlled trial comparing a parent-only to a parent-child treatment for childhood obesity. In the parent-child intervention, both parents and children attended treatment sessions. In the parent-only intervention, only parents attended sessions, and they were taught to apply weight management skills at home to assist their child. Both treatment arms included 16, weekly 1-hour group therapy sessions and a 10-minute individual session with a behavioral coach that focused on goal setting. The same content was presented to all participants. This study was approved by the institutional review boards at the University of California San Diego (La Jolla, CA) and the University of Minnesota (Minneapolis, MN).

Participants

Eighty participants were included in the primary study; however, the current study included a sample of 77 parent-child dyads. Three dyads were excluded due to missing data on the primary study measures. The sample consisted of overweight and obese children who were 8–12 years of age and their parents (Table 1). Most participants were enrolled at the University of Minnesota ($N=63$), with a smaller portion

Table 1. Demographics of Families Enrolled in FBT^a

Child gender (% female)	58.4
Child age (mean [SD])	10.0 (1.0)
Child BMI percentile (mean [SD])	98.0 (2.1)
Parent gender (% female)	88.3
Parent age (mean [SD])	42.7 (5.3)
Parent BMI (mean [SD])	32.0 (7.8)
Marital status (% married)	77.9
Yearly income (% above \$60,000)	63.6
Parent ethno-racial identification (%)	
Caucasian	75.3
Black or African American	3.9
Hispanic or Latino	7.8
Asian	3.9
Hawaiian or Pacific Islander	2.6
American Indian or Native American	0
Other	6.5
^a n = 77.	
FBT, family-based treatment; SD, standard deviation.	

enrolled at the University of California, San Diego ($N=14$). Study participants were recruited from physician referrals, direct mailings, advertisements, and media announcements from Minneapolis and San Diego. Eligibility requirements included an overweight or obese child (BMI > 85th percentile), ages 8–12 years and a parent or guardian willing to participate. Exclusion criteria included the presence of a psychiatric or physical condition that would interfere with treatment, use of medications that may alter weight or appetite, and current psychological or weight loss treatment by the parent or child. Families were randomized into parent-only or parent-child treatment.²⁹ Informed consent and assent was obtained by the parents and children, respectively.

Measures

Parent binge eating. The Binge Eating Scale (BES) is a 16-item self-report measure that was used to assess parent binge eating symptoms.³⁰ The BES has been found to have good reliability and validity.³¹ In the present study, Cronbach's alpha for the BES was 0.88. Approximately one fifth (19.2%; $N=18$) of parents endorsed moderate-to-severe binge eating symptoms.

Parent depression. Parent depressive symptoms were assessed using the Center for Epidemiological Studies Depression Scale (CES-D).³² The CES-D is a 20-item self-report survey of depression that has demonstrated good

psychometric properties.³² Cronbach's alpha for the CES-D in this study was 0.70. Almost half of parents (45%; $N=35$) were identified as at risk for clinical depression.

Body mass index. Height and weight were obtained from parents and children at baseline and averaged over two measurements. BMI was calculated (kg/m^2) for adults, and BMI percentile was calculated for children.³³

Demographics. Demographics assessed included parent and child age, parent and child gender, parent marital status, ethnicity, and income.

Attrition. Attrition was defined as nonattendance at the post-treatment assessment³ as in other pediatric obesity studies.

Statistical Analyses

All statistical analyses were performed using SPSS software (version 18; SPSS, Inc., Chicago, IL). Descriptive analyses were calculated to examine demographic characteristics of the families (Table 1). A logistic regression analysis was conducted to examine the impact of both parent binge eating and depression on attrition, controlling for parent BMI, treatment group, and family income. Given the significant correlation between parent binge eating behaviors and depressive symptoms in our sample ($r=0.29$; $p=0.01$), we included both predictors of interest in the same model. Parent BMI was chosen as a covariate because higher BMI is a risk factor for depression and binge eating.³⁴ Analyses were considered significant at the $p < 0.05$ level.

Results

Seventy-seven families were enrolled in treatment and 26 (34%) dropped out. Of the 16 total treatment sessions, treatment completers attended an average of 12.0 sessions and noncompleters attended an average of 3.3 sessions. Group differences in attrition were reported in the main outcome article.²⁹ After randomization, but before starting treatment, families in the parent-only group were more likely than families in the parent-child group to drop out of treatment. However, after treatment commenced, attrition rates were similar between groups.

Logistic regression analysis showed significant associations between parent binge eating and attrition, controlling for parent BMI, treatment group, and family income (Table 2). The model was statistically significant ($\chi^2[5]=17.96$; $p < 0.001$), and it explained between 20.8% and 28.8% of the variance in attrition. Parent binge eating at baseline was significantly, positively associated with attrition ($p=0.02$). Parents who reported greater binge eating behaviors at baseline were 1.10 times more likely to drop out of treatment. However, parent depressive symptoms at baseline were not significantly associated with treatment attrition in this sample ($p=0.11$).

Table 2. Logistic Regression Model Examining the Association between Parent Binge Eating and Depressive Symptoms and Attrition, after Controlling for Treatment Group, Parent BMI, and Family Income

Variable	OR (95% CI)	p value
Treatment group	0.56 (0.19, 1.69)	0.30
Parent BMI	0.90 (0.82, 0.98)	0.01
Family income	0.56 (0.29, 1.08)	0.09
Parent depressive symptoms	1.10 (0.98, 1.23)	0.11
Parent binge eating symptoms	1.10 (1.01, 1.20)	0.02

OR, odds ratio; CI, confidence interval.

Discussion

The present study examined the impact of parent psychological factors (*i.e.*, symptoms of depression and binge eating) on attrition from family-based childhood obesity treatment. After accounting for treatment group, parent BMI, and family income, parent binge eating symptoms at baseline were significantly associated with attrition, whereas parent depressive symptoms at baseline were unrelated to attrition.

To our knowledge, this is the first study demonstrating that parent binge eating is related to attrition in childhood obesity treatment. Parent binge eating is a key factor to consider when identifying families at risk for attrition. Impulsivity and other executive functioning deficits are believed to influence binge eating behavior,^{16,17} which may explain why parents with binge eating are susceptible to dropout. Further, adhering to dietary recommendations may be especially challenging for parents with binge eating symptoms. If parents with binge eating are unable to implement dietary recommendations, they will not succeed in modeling healthy dietary behaviors for their children, and they may also have difficulty directly guiding and supporting their child's dietary modifications. Although not directly tested in the present study, these challenges could result in decreased treatment satisfaction and compliance, thus contributing to dropout.

Our study findings differ from another study that found that greater maternal depressive symptoms were significantly associated with treatment nonresponse (*i.e.*, poor weight loss and attrition) in a family-based childhood obesity program.²² However, this association did not account for the impact of other potentially important constructs, such as family income. Further, scheduling and transportation have been cited by parents as reasons for treatment dropout.¹⁴ It may be important to control for socioeconomic factors when examining the independent effect of parent depressive symptoms on attrition from

childhood obesity treatment programs. In the present study, parent depressive symptoms were unrelated to dropout after controlling for family income.

Although the present study was not designed to examine the potential impact of SES on attrition, it is interesting to note that family income was unrelated to treatment attrition, after taking into account parent BMI and parent symptoms of binge eating and depression. Previous studies have yielded opposing findings regarding the impact of family SES on attrition, with some studies showing an increased risk of attrition in families of lower SES^{6,35} and others reporting no relationship.^{4,7} Contradictory results could be explained by the use of different measures to assess SES. For example, our study used yearly household income, whereas other studies have used Medicaid insurance and Hollingshead scores. Despite this, our study results suggest that family income may be less important than parent binge eating symptoms, when identifying families at risk for treatment dropout.

Strengths of this study include a moderately sized, treatment-seeking sample. Limitations include a lack of racial diversity, the use of self-report measures, and the provision of treatment in a research-based setting. Further, results may not generalize to diverse families or traditional medical settings.

Conclusions

These results suggest several future areas of research and clinical significance. Parents enrolled in FBT who exhibit binge eating may need additional support to ensure treatment retention. Future research studies may evaluate associations between parent psychopathology and treatment completion in FBT, focusing on diverse samples and settings. Attrition in FBT may be better explained by parent psychopathology than problems with the treatment modality. Despite this, FBT may need modified for parents with disinhibited eating behaviors in order to increase its effectiveness.

Acknowledgments

This research was funded, in part, by the University of Minnesota Obesity Center (NIH NIDDK/5P30-DK050456-14) and University of California San Diego Academic Senate Award.

Author Disclosure Statement

No competing financial interests exist.

References

1. Janicke DM, Steele RG, Gayes LA, et al. Systematic review and meta-analysis of comprehensive behavioral family lifestyle interventions addressing pediatric obesity. *J Pediatr Psychol* 2014 May 13. doi: 10.1093/jpepsy/jsu023.

2. Oude Luttikhuis H, Baur L, Jansen H, et al. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2009;(1):CD001872.
3. Skelton JA, Beech BM. Attrition in paediatric weight management: A review of the literature and new directions. *Obes Rev* 2011;12:e273–e281.
4. Skelton JA, Goff DC, Jr., Ip E, et al. Attrition in a multidisciplinary pediatric weight management clinic. *Child Obes* 2011;7:185–193.
5. Dolinsky DH, Armstrong SC, Ostbye T. Predictors of attrition from a clinical pediatric obesity treatment program. *Clin Pediatr* 2012;51:1168–1174.
6. Zeller M, Kirk S, Claytor R, et al. Predictors of attrition from a pediatric weight management program. *J Pediatr* 2004;144:466–470.
7. Jelalian E, Hart CN, Mehlenbeck RS, et al. Predictors of attrition and weight loss in an adolescent weight control program. *Obesity* 2008;16:1318–1323.
8. Gorin AA, Niemeier HM, Hogan P, et al. Binge eating and weight loss outcomes in overweight and obese individuals with type 2 diabetes: Results from the Look AHEAD trial. *Arch Gen Psychiatry* 2008;65:1447–1455.
9. Faulconbridge LF, Wadden TA, Rubin RR, et al. One-year changes in symptoms of depression and weight in overweight/obese individuals with type 2 diabetes in the Look AHEAD study. *Obesity* 2012;20:783–793.
10. Epstein LH, Paluch RA, Roemmich JN, et al. Family-based obesity treatment, then and now: Twenty-five years of pediatric obesity treatment. *Health Psychol* 2007;26:381–391.
11. Boutelle KN, Cafri G, Crow SJ. Parent predictors of child weight change in family based behavioral obesity treatment. *Obesity* 2012;20:1539–1543.
12. Wrotniak BH, Epstein LH, Paluch RA, et al. The relationship between parent and child self-reported adherence and weight loss. *Obes Res* 2005;13:1089–1096.
13. Luttikhuis HO, Baur L, Jansen H, et al. Interventions for treating obesity in children. *Sao Paulo Med J* 2009;127:321–321.
14. Hampl S, Demeule M, Eneli I, et al. Parent perspectives on attrition from tertiary care pediatric weight management programs. *Clin Pediatr* 2013;52:513–519.
15. Mobbs O, Iglesias K, Golay A, et al. Cognitive deficits in obese persons with and without binge eating disorder. Investigation using a mental flexibility task. *Appetite* 2011;57:263–271.
16. Duchesne M, Mattos P, Appolinário JC, et al. Assessment of executive functions in obese individuals with binge eating disorder. *Rev Bras Psiquiatr* 2010;32:381–388.
17. Nasser JA, Gluck ME, Geliebter A. Impulsivity and test meal intake in obese binge eating women. *Appetite* 2004;43:303–307.
18. Danner UN, Ouwehand C, van Haastert NL, et al. Decision-making impairments in women with binge eating disorder in comparison with obese and normal weight women. *Eur Eat Disord Rev* 2012;20:e56–e62.
19. Gotlib IH, Joormann J. Cognition and depression: Current status and future directions. *Annu Rev Clin Psychol* 2010;6:285–312.
20. Austin MP, Mitchell P, Goodwin GM. Cognitive deficits in depression: Possible implications for functional neuropathology. *Br J Psychiatry* 2001;178:200–206.
21. Cserjési R, Luminet O, Poncelet AS, et al. Altered executive function in obesity. Exploration of the role of affective states on cognitive abilities. *Appetite* 2009;52:535–539.
22. Pott W, Albayrak O, Hebebrand J, et al. Treating childhood obesity: Family background variables and the child's success in a weight-control intervention. *Int J Eat Disord* 2009;42:284–289.
23. Marcus MD, Wing RR, Ewing L, et al. Psychiatric disorders among obese binge eaters. *Int J Eat Disord* 1990;9:69–77.
24. Yanovski SZ, Nelson JE, Dubbert BK, et al. Association of binge-eating disorder and psychiatric comorbidity in obese subjects. *Am J Psychiatry* 1993;150:1472–1479.
25. Luppino FS, de Wit LM, Bouvy PF, et al. Overweight, obesity, and depression: A systematic review and meta-analysis of longitudinal studies. *Arch Gen Psychiatry* 2010;67:220–229.
26. Pagoto S, Bodenlos JS, Kantor L, et al. Association of major depression and binge eating disorder with weight loss in a clinical setting. *Obesity* 2007;15:2557–2559.
27. Epstein LH, Myers MD, Anderson K. The association of maternal psychopathology and family socioeconomic status with psychological problems in obese children. *Obes Res* 1996;4:65–74.
28. Epstein LH, Wisniewski L, Weng R. Child and parent psychological problems influence child weight control. *Obes Res* 1994;2:509–515.
29. Boutelle KN, Cafri G, Crow SJ. Parent-only treatment for childhood obesity: A randomized controlled trial. *Obesity* 2011;19:574–580.
30. Gormally J, Black S, Daston S, et al. The assessment of binge eating severity among obese persons. *Addict Behav* 1982;7:47–55.
31. Timmerman GM. Binge Eating Scale: Further assessment of validity and reliability. *J Appl Biobehav Res* 1999;4:1–12.
32. Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. *Appl Psychol Measur* 1977;1:385–401.
33. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al. CDC growth charts: United States. *Adv Data* 2000;(314):1–27.
34. Mason TB, Lewis RJ. Profiles of binge eating: The interaction of depressive symptoms, eating styles, and body mass index. *Eating Disord* 2014;22:450–460.
35. Jensen CD, Aylward BS, Steele RG. Predictors of attendance in a practical clinical trial of two pediatric weight management interventions. *Obesity* 2012;20:2250–2256.

Address correspondence to:

Abby L. Braden, PhD

Center for Healthy Eating and Activity Research

University of California San Diego

9500 Gilman Drive

MC 0874

La Jolla, CA 92093

E-mail: abraden@ucsd.edu