



Adolescent health brief

Does Body Satisfaction Help or Harm Overweight Teens? A 10-Year Longitudinal Study of the Relationship Between Body Satisfaction and Body Mass Index



Katie A. Loth, Ph.D., M.P.H., R.D.^{a,b,c,*}, Allison W. Watts, Ph.D.^a,
 Patricia van den Berg, Ph.D., M.P.H.^d, and Dianne Neumark-Sztainer, Ph.D., M.P.H., R.D.^a

^a Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, Minneapolis, Minnesota

^b Department of Psychiatry, University of Minnesota, Minneapolis, Minnesota

^c Department of Family Medicine and Community Health, University of Minnesota Medical School, Minneapolis, Minnesota

^d Department of Obstetrics and Gynecology, The University of Texas Medical Branch, Galveston, Texas

Article history: Received May 20, 2015; Accepted July 14, 2015

Keywords: Body satisfaction; Overweight; Obesity; BMI; Body acceptance; Weight management; Weight gain; Longitudinal

See Related Editorial p. 451

A B S T R A C T

Purpose: This study examines the relationship between body satisfaction of overweight adolescents and 10-year changes in body mass index (BMI).

Methods: Participants who were overweight as adolescents ($n = 496$) were drawn from Project Eating and Activity in Teens and Young Adults (Project EAT), a 10-year longitudinal study.

Results: Among overweight girls, a significant difference in 10-year BMI change across baseline body satisfaction quartiles was observed. Overweight girls with the lowest body satisfaction at baseline had a nearly three unit greater increase in BMI at follow-up, compared with overweight girls in the high body satisfaction quartile; this difference has important clinical significance. Among overweight boys, no significant associations between body satisfaction quartile and change in BMI were not observed.

Conclusion: Overall, findings indicate that among overweight adolescents, a high level of body satisfaction during adolescence was not harmful, and in fact may be beneficial for girls, in terms of long-term weight management. These findings refute the commonly held notion that overweight young people should be dissatisfied with their bodies to motivate positive change.

© 2015 Society for Adolescent Health and Medicine. All rights reserved.

IMPLICATIONS AND CONTRIBUTION

Contrary to the suggestion that low body satisfaction may lead to better weight control over time, our findings suggest that high body satisfaction among overweight girls is associated with less weight gain over time compared with girls with very low satisfaction.

Conflicts of Interest: The authors have no conflicts of interest or financial disclosures to report.

Disclaimer: The contents of this presentation are solely the responsibility of the authors and do not necessarily represent the official views of the National Heart, Lung, and Blood Institute or the National Institutes of Mental Health.

* Address correspondence to: Katie A. Loth, Ph.D., M.P.H., R.D., Department of Family Medicine and Community Health, 717 Delaware Street SE, Room 424, Minneapolis, MN 55455.

E-mail address: kloth@umn.edu (K.A. Loth).

Adolescent girls and overweight adolescents of both genders have been shown to have very low levels of body satisfaction [1]. Research has revealed associations between low body satisfaction during adolescence and a number of negative health outcomes, including low self-esteem, depression, and the development of disordered eating [1]. However, it is sometimes argued that experiencing low levels of body satisfaction might be

beneficial for overweight adolescents as this lack of body satisfaction might serve to motivate overweight adolescents to engage in weight-loss efforts [2].

In a previous study by our research group, we aimed to provide some clarity to this issue by asking the simple, yet important, question: How is body satisfaction longitudinally associated with body mass index (BMI) in overweight adolescent girls? Study findings, published in a 2007 issue of *The Journal of Adolescent Health* [3], demonstrated that overweight girls with higher body satisfaction gained less weight over the 5-year follow-up, as compared with overweight girls with lower levels of body satisfaction [3]. The present study expands on this previous work by exploring the association between body satisfaction and weight gain at 10-year follow-up and by examining this association in boys.

Methods

Study design and data collection

Participants were drawn from Project Eating and Activity in Teens and Young Adults (EAT), a longitudinal study of 2,516 adolescents. Participants were surveyed and height and weight were measured at baseline (1998–1999), and participants responded via online survey at follow-up (2009–2010). Details regarding the study methodology have been previously described [4].

Sample

Project EAT participants who were at or above the 85th percentile for BMI at baseline and completed survey assessments at follow-up were included in the current analytic sample ($n = 496$; 275 females; 221 males). At baseline, participants had an average age of 14.8 years (standard deviation [SD] = 1.8); 34.4% were nonwhite and 30.3% were from low or low–middle socioeconomic status (SES) backgrounds.

Measures

Body satisfaction was measured using a modified version of the Body Shape Satisfaction Scale [5], in which participants rated their satisfaction with 10 different body parts (Cronbach $\alpha = .93$). BMI from measured height and weight at baseline was used to select participants into the study. BMI from self-reported height and weight was used as a covariate (baseline BMI) and as the outcome variable (follow-up BMI). Self-reported and measured BMI values at baseline were highly correlated at both baseline [6] and follow-up [7]. Age, ethnicity/race, and SES [8] were based on self-report at baseline.

Statistical analysis

Mean change in BMI from baseline to follow-up across quartiles of body satisfaction was estimated using linear regression. Body satisfaction quartiles were created for male and female participants separately using the entire EAT sample. Analyses were stratified by gender and adjusted for baseline BMI, race/ethnicity, age, age squared, and SES. Participants who were lost to follow-up were more likely to be female, white, and from a high SES category; therefore, all analyses were weighted to account for these differences [9].

Results

Mean body satisfaction at baseline for this sample of overweight girls was 27.6 (SD = 8.5), significantly lower ($p < .01$) than the mean of 33.9 (SD = 8.8) for the nonoverweight girls in Project EAT ($p < .01$). Mean body satisfaction at baseline for this sample of overweight boys was 34.2 (SD = 8.5), significantly lower ($p < .01$) than the mean of 38.5 (SD = 8.2) for the nonoverweight boys in Project EAT.

Examination of the mean change in BMI over the 10-year follow-up across baseline body satisfaction quartiles indicated that overweight girls with the lowest level of body satisfaction had a significantly greater increase in BMI (6.4 BMI units), compared with girls in the high body satisfaction quartile (3.5 BMI units; mean difference = 2.9 BMI units; $p < .01$; Figure 1), after controlling for baseline BMI, race/ethnicity, age, age squared, and SES. Among overweight boys, no statistically significant associations were observed between body satisfaction quartile and change in BMI (Figure 2).

Discussion

This study examined the association between body satisfaction during adolescence and change in BMI over a 10-year follow-up among overweight adolescents. Among girls, a statistically significant difference in 10-year BMI change across baseline body satisfaction quartiles was observed; overweight girls with very low body satisfaction at baseline had a significantly greater increase in BMI 10 years later compared with overweight girls in the high body satisfaction quartile at baseline. Although a very high body satisfaction did not confer additional benefits, the difference between the very low satisfaction and the high satisfaction quartiles in mean BMI change over 10 years—a difference of nearly 3 BMI units—has important clinical

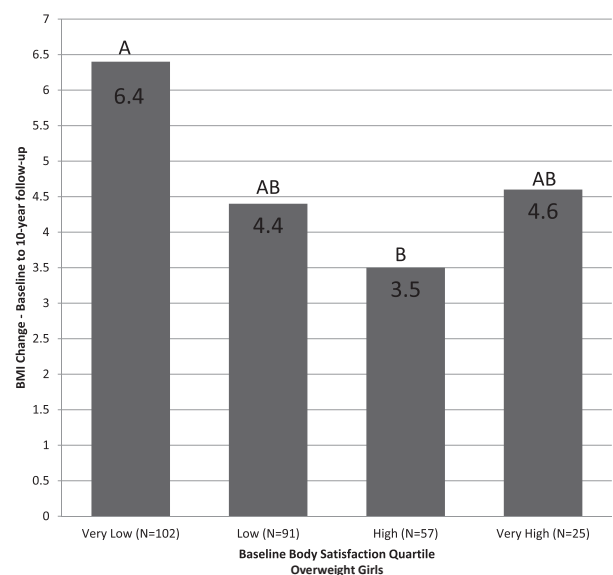


Figure 1. Adjusted mean BMI change between baseline and 10-year follow-up, by baseline body satisfaction quartile in overweight adolescent girls. Models adjusted for continuous BMI at baseline, age, age squared, SES, and race/ethnicity. All models are weighted for nonresponse. Different letters above each bar indicate statistically significant differences observed between bars. Statistically significant difference set at $p < .05$ level.

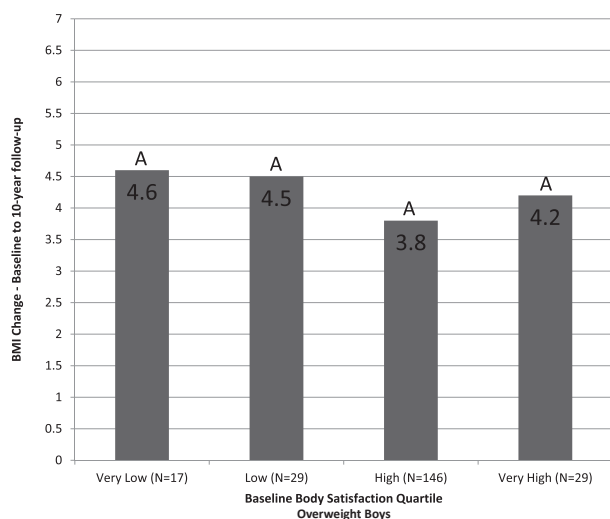


Figure 2. Adjusted mean BMI change between baseline and 10-year follow-up, by baseline body satisfaction quartiles in overweight adolescent boys. Models adjusted for continuous BMI at baseline, age, age squared, SES, and race/ethnicity. All models are weighted for differential nonresponse. Different letters above each bar indicate statistically significant differences observed between bars. Statistically significant difference set at $p < .05$ level.

significance for these young women. Overall findings indicate that among overweight girls, a high level of body satisfaction during adolescence was not harmful, and in fact may be beneficial, in terms of weight control over 10 years. For the most part, these findings align with our previous study [3], which demonstrated that overweight girls with high body satisfaction gained less weight (2 BMI units) over the 5-year follow-up, as compared with overweight girls with very low body satisfaction. Taken together, these two studies suggest that, among overweight adolescent girls, a high level of body satisfaction continues to be beneficial with regard to mean BMI change well into young adulthood.

Among overweight boys, no significant associations were observed between baseline body satisfaction quartile and change in BMI from baseline to follow-up. These nonsignificant findings indicate that boys' weight status is not related as strongly to their body satisfaction in adolescence as it is among girls, who generally experience greater levels of societal pressure regarding weight and appearance [1]. It might be that girls with low body satisfaction reduce participation in regular physical activity, whereas boy's engagement in physical activity is consistent across levels of body satisfaction. Furthermore, boys' body satisfaction is known to be influenced by both a desire to have less body fat and a desire to be more muscular [1], which may have different consequences for weight gain

over time than females' primary focus on body fat. The difference in mean BMI change across body satisfaction quartiles was not explored for boys in our 2007 study; thus, no comparisons can be made.

Contrary to the suggestion that low body satisfaction may lead to better weight control over time, our findings suggest that high body satisfaction among overweight girls is associated with less weight gain over time compared with girls with very low satisfaction. Our findings, along with other studies, suggest that it may be fruitful for future research to examine the effectiveness of body image interventions to prevent unhealthy weight gain among overweight adolescent girls. Eating disorder prevention programs for adolescent girls have been found to increase body satisfaction [10], and some recent studies have had promising results in terms preventing weight gain [10]. In addition, clinicians working with overweight adolescent girls should stress the importance of a positive body image.

Funding Sources

The project described was supported by grant number R01 HL084064-04 (PI: D.N.-S.) from the National Heart, Lung, and Blood Institute. K.A.L.'s time was funded by grant T32 MH082761-01 from the National Institute of Mental Health.

References

- [1] Thompson JK, Heinberg LJ, Altabe M, Tantleff-Dunn S. *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. Washington, D.C.: American Psychological Association; 1999. Available at: <http://psycnet.apa.org.ezp1.lib.umn.edu/psycinfo/1999-02140-000>. Accessed April 4, 2015.
- [2] Heinberg LJ, Thompson JK, Matzon JL. Body image dissatisfaction as a motivator for healthy lifestyle change: Is some distress beneficial? In: Striegel-Moore RH, Smolak L, eds. *Eating disorders: Innovative directions in research and practice*. Washington, D.C.: American Psychological Association; 2001. Available at: <http://psycnet.apa.org.ezp1.lib.umn.edu/books/10403/011>. Accessed April 4, 2015.
- [3] Van den Berg P, Neumark-Sztainer D. Fat 'n happy 5 years later: Is it bad for overweight girls to like their bodies? *J Adolesc Health* 2007;41:415–7.
- [4] Loth KA, MacLehose R, Bucchianeri M, et al. Predictors of dieting and disordered eating behaviors from adolescence to young adulthood. *J Adolesc Health* 2014;55:705–12.
- [5] Pingitore R, Spring B, Garfield D. Gender differences in body satisfaction. *Obes Res* 1997;5:402–9.
- [6] Himes JH, Hannan P, Wall M, Neumark-Sztainer D. Factors associated with errors in self-reports of stature, weight, and body mass index in Minnesota adolescents. *Ann Epidemiol* 2005;15:272–8.
- [7] Larson NI, Wall MM, Story MT, Neumark-Sztainer DR. Home/family, peer, school, and neighborhood correlates of obesity in adolescents. *Obesity* 2013;21:1858–69.
- [8] Neumark-Sztainer D, Story M, Hannan PJ, Croll J. Overweight status and eating patterns among adolescents: Where do youths stand in comparison with the healthy people 2010 objectives? *Am J Public Health* 2002;92:844.
- [9] Little RJA, Rubin DB. *Statistical analysis with missing data*, 2nd ed. Hoboken, NJ: John Wiley & Sons; 2002.
- [10] Stice E, Becker CB, Yokum S. Eating disorder prevention: Current evidence-base and future directions. *Int J Eat Disord* 2013;46:478–85.