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Changes in depressive symptoms among adolescent bariatric candidates from preoperative psychological evaluation to immediately before surgery

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Abstract

Background—The preoperative psychological evaluation (including the assessment of depressive symptoms) is an important component in determining adolescent bariatric candidacy. The adult bariatric data have suggested that candidates can engage in “impression management” and under-report depressive symptoms during their preoperative evaluation. The present study examined whether adolescent depressive symptoms among bariatric candidates change during preoperative preparation compared with adolescents with extreme obesity who were not seeking surgery.

Methods—Adolescent candidates for bariatric surgery ($n = 30$; 60% female; mean age 16.5 ± 1.4 years) completed the Beck Depression Inventory-II (BDI-II) at initial consultation (time 1, mean body mass index [BMI] 64.5 ± 11.5 kg/m²) and again immediately preoperatively (time 2, mean interval 4.7 ± 2.9 months; mean BMI 64.4 ± 10.4 kg/m²). Comparators ($n = 25$; 64% female; mean age 16.2 ± 1.2 years; mean BMI 46.5 ± 4.8 kg/m²) were studied at enrollment in a research protocol and again 6 months later (mean interval 6.2 ± 0.4 months; mean BMI 46.8 ± 5.0 kg/m²). The height and weight were also taken.

Results—We found a small, but statistically significant, difference in the BDI-II scores at time 1, with bariatric candidates reporting greater depressive symptoms (mean 16.6 ± 12.9) than the comparators (mean 10.6 ± 9.0 ; $P < .05$). No difference was seen in the BDI-II scores between the bariatric candidates (mean 14.4 ± 12.1) and the comparators (mean 10.4 ± 8.2) at time 2 ($P = .09$). The change in BDI-II scores for the bariatric candidates showed a trend toward significance ($P = .09$).

Conclusion—These results reinforce the position that the adult bariatric literature does not necessarily generalize to the adolescent bariatric population. They further suggest that impression management might not be a significant concern in the assessment of adolescent bariatric candidates. Future research should examine whether preoperative changes in psychological functioning predict the postoperative outcomes.

Approximately 4% of adolescents in the United States meet the criteria for severe obesity (body mass index 99th percentile for age and gender), a proportion that has increased

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>300% since 1976 [1]. Given the relative ineffectiveness of conventional methods for sustained weight loss among the severely obese, attention has shifted to more aggressive forms of weight management [2–4]. Initial evidence has suggested bariatric surgery is a safe and effective method for substantial and sustainable weight loss among adolescents with severe obesity [5,6], with a threefold increase in procedures performed from 2000 to 2003 [7].

Recommendations by several expert committees have stressed the importance of the preoperative psychosocial evaluation for determining adolescent bariatric candidacy [8–11]. The assessment of depressive symptoms is a critical aspect of the evaluation, with clinical range symptoms not an exclusionary criterion, but rather, an indication for adjunctive care before surgery [11]. Although the adolescent bariatric psychosocial data are limited, 2 retrospective studies [12,13] have indicated that during the preoperative psychosocial evaluations, most adolescents endorsed depressive symptoms on the Beck Depression Inventory-II (BDI-II) within the minimal range (52–78%; BDI-II score <14).

Studies from the adult bariatric literature have provided some evidence that the evaluation of depressive symptoms before surgery might not always be straightforward. For instance, Fabricatore et al. [14] have suggested that adult bariatric candidates might engage in impression management (ie, the activity of controlling information to steer others' opinions in the service of personal or social goals), as indicated by a significant increase in self-reported depressive symptoms between the initial psychological evaluation and several weeks after surgery approval [14]. The investigators suggested that bariatric candidates might underreport symptoms of psychological distress initially to appear good candidates and secure approval for surgery. Additional empirical support for impression management has come from Rosik et al. [15], who found that adults seeking candidacy for bariatric surgery had a greater mean score on the Marlowe-Crowne Social Desirability Scale (indicative of greater social desirability) than nonforensic norms and that those who had greater social desirability scores also reported fewer psychiatric symptoms and were more likely to proceed to surgery [16]. These studies have substantiated considering impression management as a factor in symptom presentation among those seeking bariatric surgery, a topic not yet examined among adolescents.

The purpose of the present study was to examine whether adolescent bariatric candidates' self-report of depressive symptoms changed between the preoperative psychological evaluation to determine surgical candidacy (time 1) and their subsequent self-report just before surgery (time 2) compared with a sample of obese adolescents (comparators) who did not receive surgery during a similar period.

Methods

The present study used retrospective chart review and data from a prospective, controlled, longitudinal study of 30 adolescents undergoing Roux-en-Y gastric bypass (RYGB) surgery at a large Midwestern pediatric hospital and 25 nonoperative extremely obese adolescents (BMI ≥ 40 kg/m²) who had sought behavioral weight management. The larger study included assessment of adolescent psychosocial functioning [17] over time, from

preoperatively/baseline to the 6- and 12-month follow-up visits. For the bariatric group, a retrospective abstraction of the clinical data from the preoperative psychosocial evaluation was conducted (time 1) and compared with their baseline (preoperatively) data (time 2). The corresponding points for the comparators group was the baseline (time 1) and 6-month (time 2) study visits.

Participants and procedures

Bariatric cohort—Adolescents with a BMI of $\geq 40 \text{ kg/m}^2$ were referred for an intake evaluation at a hospital-based bariatric program for adolescents (time 1). RYGB candidacy was determined by previously described adolescent patient selection guidelines [9]. The study inclusion criteria (time 2) required that adolescents were approved for RYGB, were 13–17 years old, and had no physical impairments unrelated to obesity or developmental disability. Participants were informed that their consent/assent included access to medical information related to their care in the bariatric program. The participants completed the time 1 questionnaire packets in the clinic in conjunction with their required preoperative psychological evaluation. Their time 2 questionnaires were completed during a preoperative research visit.

Of the 32 consecutive adolescent bariatric patients meeting the inclusion criteria, 31 (97%) adolescent/caregiver dyads agreed to participate and completed the baseline measures. One participant was excluded from the analyses because of incomplete data. The average interval between time 1 and time 2 was 4 months (mean 4.7 ± 2.9). The eligible bariatric candidates underwent surgery from May 2004 to January 2007.

Comparison cohort—Adolescents meeting the study inclusion criteria and their primary caregivers were initially recruited from consecutive families initiating treatment at a behavioral weight management clinic. This recruitment strategy did not yield sufficient numbers of white, non-Hispanic youth within the time-limited study period. Therefore, those youth meeting the study eligibility who had previously initiated treatment in the behavioral program and had recently participated in 1 of our studies (M.Z.) characterizing health-related quality of life and its psychosocial correlates in obese youth [18,19] were invited to participate. The study inclusion criteria required participants to be 13–17 years of age, have a BMI of $\geq 40 \text{ kg/m}^2$ percentile, with no developmental disabilities. Participants completed the time 1 questionnaires in a clinical research space, and follow-up data (time 2) were collected in locations most convenient to the participant, including both clinical research space (80%) and their home (20%).

Of the 31 potential comparison families meeting the study inclusion criteria, 28 (90%) adolescent/caregiver dyads agreed to participate in the study and completed the time 1 measures. Three participants were excluded from analyses because of incomplete data, resulting in a final comparator sample of 25 ($n = 17$ active treatment, 8 previous treatment). The average interval between times 1 and 2 was 6 months (mean $6.2 \pm .4$).

All data were collected by trained research assistants. After providing informed consent/assent, adolescents completed the questionnaires and had their height and weight measured. The institutional review board approved the present study.

Measures

Beck Depression Inventory-II—The BDI-II [20] is a 21-item self-report questionnaire of symptoms of depression for those aged 13 years. The BDI has well-established psychometric properties [20,21] and has been found to be a reliable and valid screening tool for depressive symptoms in adolescents. This instrument has been recommended by clinicians and obesity researchers [22,23], with data suggesting that regardless of whether the somatic items are included in the total score, it appears to be a reasonable screening measure for depressive symptoms among bariatric surgery candidates [24]. The total raw score was used, with greater scores reflecting more depressive symptoms. The ranges of symptom severity were determined by the total score and categorized as minimal (0–13), mild (14–19), moderate (20–28), and severe (>29). The test-retest reliability in the present study was .92 for the bariatric group, and .79 for the comparators group, suggesting sufficient reliability.

Demographic background questionnaire—The demographic background questionnaire was a parent-report instrument that assessed basic family demographic characteristics, including adolescent race, date of birth, education level, and family composition.

Anthropometric data—The height and weight were measured in triplicate using standard anthropometric procedures [25] by a trained measurer or a nurse in the clinic setting. For participants who had data collected in a home setting at time 2, the weight was measured by trained research assistants using a portable SECA digital scale (SECA, Hamburg, Germany) with the standing height measured using a calibrated custom portable stadiometer (Creative Health Products, Plymouth, MI). These data were used to calculate the BMI.

Statistical analysis

Descriptive statistics were used to characterize the demographic variables. A paired-samples *t* test was conducted to assess the differences between the BDI-II scores from time 1 to time 2. Independent samples *t* tests were conducted to assess the differences in the BDI-II scores between the bariatric recipients and comparators at times 1 and 2 and to assess the differences in the BMI change scores. Chi-square analyses were used to test whether the percentage of participants scoring in each range of symptom severity on the BDI-II (ie, minimal, mild, moderate, severe) was different between times 1 and 2. The data were analyzed using PASW Statistics, version 17.

Results

The sample characteristics are listed in Table 1. The bariatric participants and comparators were primarily female. The bariatric candidates were more likely to be white non-Hispanic than were the comparators [$\chi^2(1, N = 55) = 9.33, P = .01$]. The bariatric group also had significantly greater BMI than did the comparators group at time 1 [$t(54) = 7.77, P < .01$] and time 2 [$t(54) = 8.16, P < .01$]. No significant difference was seen in the BMI change scores between the 2 groups [$t(54) = .64, P = \text{NS}$]. Also, no association was seen between

the BMI and BDI-II scores at time 1 for the combined sample ($r_{\text{combined}} = .08, P = .57$) or either group ($r_{\text{comparators}} = -.05, P = .80$; $r_{\text{bariatric}} = -.18, P = .33$).

When examining the mean BDI-II scores for the bariatric participants over time, paired-sample t tests revealed a non-significant reduction in depressive symptoms from the initial evaluation to immediately preoperatively ($P = .09$). No statistically significant change was seen in the mean BDI-II scores for the comparators. Between-group analyses revealed a small, but statistically significant, difference in BDI-II scores at time 1, with the bariatric candidates reporting greater depressive symptoms (mean 16.6 ± 12.9) than the comparators [mean 10.6 ± 9.0 ; $t(54) = 2.02, P < .05$]. No difference was seen in the BDI-II scores between the bariatric candidates (mean 14.4 ± 12.1) and the comparators (mean 10.4 ± 8.2) at time 2 ($P = .17$).

The percentage of participants classified into each symptom severity group using the BDI-II was not significantly different between the 2 groups at time 1 or 2. At time 1, 28% of the comparators were in the mild, moderate, or severe range of depressive symptoms compared with 53% of the bariatric candidates [chi-square (3, $N = 55$) = 5.66, $P = .13$]. At time 2, the corresponding rates were 36% and 43% [chi-square (3, $N = 55$) = 2.67, $P = .44$]. From time 1 to time 2, 16% of the comparators versus 30% of the bariatric candidates reported moving to a lower BDI-II symptom severity range [chi-square (1, $N = 55$) = 1.48, $P = .22$]. The percentage of adolescent bariatric candidates scoring in each range of symptom severity on the BDI-II closely resembled the proportion of adult bariatric candidates scoring in each range of symptom severity reported by Fabricatore et al. [14] at time 2 (Figs. 1 and 2).

Discussion

With the published adolescent bariatric surgery data in its infancy, investigators and clinicians alike have studied the adult data for direction. The present study sought to replicate the work of Fabricatore et al. [14] in an adolescent sample. Additionally, our research design included a comparison group of adolescents with extreme obesity who were not candidates for bariatric surgery to provide an age-and context-relevant contrast over time.

Our initial findings demonstrated little change in the adolescent depressive symptoms, with, in fact, a trend toward a reduction of symptoms from the preoperative psychosocial evaluation to immediately before surgery. This was in contrast to the findings of Fabricatore et al. [14] of adult bariatric candidates who reported an overall increase in depressive symptoms during the same relative period. Our comparison group of extremely obese adolescents who were not undergoing surgery had symptoms that remained relatively stable. These data suggest that impression management might be less of a concern among adolescents than adults when presenting for their preoperative psychological evaluation as a part of the approval process for bariatric surgery. The results of the present study have also suggested the trajectory of improvement in psychosocial functioning identified among adolescent bariatric patients [5] might begin preoperatively (a statement made cautiously, recognizing that the BDI-II scores remained in the clinical range). Improvements in psychosocial functioning, however small, might be a function of optimism that the surgery

will result in substantial, sustained weight loss. It could also be attributable to the preoperative care provided by the adolescent bariatric program. The interdisciplinary program from which this sample was drawn allowed adolescent bariatric candidates to receive services from a dietician, nurse practitioner, and pediatric psychologist, as well as the opportunity to participate in an adolescent support group before surgery. These services, save the support group, were comparable to the services provided to adolescents in the behavioral weight management program.

Additional research is needed to determine to what extent these services are used and how much effect each component has in contributing to preoperative functioning. Future research should also assess whether preoperative psychosocial functioning predicts the postoperative psychosocial and health outcomes.

The present study had several limitations worth noting that provide additional direction for future research. First, these findings should be considered preliminary, given our small sample size and that these data represent 1 adolescent bariatric center of care. The replication of these data with a larger, multicenter sample is necessary. Second, the bariatric sample consisted primarily of white non-Hispanic female adolescents. Although this was representative of the cohort seeking bariatric surgery at our center, the results might not be generalizable to other demographic groups. Third, although all adolescents in the present study were classified as obese, the bariatric group had a significantly greater BMI than that of the comparator group. The implications of this difference in regard to overall functioning are currently unknown; however, the lack of an association between the BMI and BDI-II scores at time 1 for the combined or individual group samples suggested that this difference was inconsequential to the aims of the present study. Finally, although a reduction in the percentages of participants who scored in the symptomatic range occurred, the clinical relevance of this change remains in question.

Conclusion

These results reinforce the position that the adult bariatric literature does not necessarily generalize to the adolescent bariatric population. They further suggest that impression management might not be a significant concern in the assessment of adolescent bariatric candidates. Future research should examine whether preoperative changes in psychological functioning predict the postoperative outcomes.

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Fig. 1. Percentage of adolescent bariatric candidates, adult bariatric candidates (data from Fabricatore et al. [14]), and adolescent comparators who scored in each range of depressive symptom severity at time 1.

Fig. 2. Percentage of adolescent bariatric candidates, adult bariatric candidates (data from Fabricatore et al. [14]), and adolescent comparators who scored in each range of depressive symptom severity at time 2.

Table 1

Descriptive statistics for demographic and outcome variables

Characteristic	Bariatric candidates		Comparators	
	Mean $\pm$ SD	Percentage	Mean $\pm$ SD	Percentage
Age (yr)	16.5 $\pm$ 1.4	—	16.1 $\pm$ 1.2	—
Female	—	60	—	64
Non-Hispanic white	—	83	—	44
BMI (kg/m ²)				
Time 1 *	64.5 $\pm$ 11.5	—	46.5 $\pm$ 4.8	—
Time 2 *	64.4 $\pm$ 10.4	—	46.8 $\pm$ 5.0	—
Change score	-.1 $\pm$ 2.5	—	.3 $\pm$ 2.1	—
BDI-II				
Time 1 †	16.6 $\pm$ 12.9	—	10.6 $\pm$ 9.0	—
Time 1 score >13	—	53	—	28
Time 2	14.4 $\pm$ 12.1	—	10.4 $\pm$ 8.2	—
Time 2 score >13	—	43	—	36
Interval between times 1 and 2 (mo)	4.7 $\pm$ 2.9	—	6.2 $\pm$.4	—

SD = standard deviation; BMI = body mass index; BDI-II = Beck Depression Inventory-II.

* $P < .01$, significant difference between bariatric candidate and comparator groups, as indicated by t test.† $P < .05$, significant difference between bariatric candidate and comparator groups, as indicated by t test.