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Original article

A Multisite 2-Year Follow Up of Psychopathology Prevalence, Predictors, and Correlates Among Adolescents Who Did or Did Not Undergo Weight Loss Surgery

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A B S T R A C T

Purpose: We aimed to characterize prevalence, change, predictors, and correlates of psychopathology and associations with weight loss in adolescents with severe obesity 24 months after weight loss surgery (WLS) utilizing a controlled multisite sample design.
Methods: Adolescents undergoing WLS (n = 139) and nonsurgical comparisons with severe obesity (NSComp; n = 83) completed validated questionnaires assessing psychopathology and potential predictors and correlates at presurgery/baseline and 24 months postoperatively/follow-up.
Results: At 24 months, 34.7% of WLS and 37.7% of nonsurgical comparisons were categorized as "symptomatic" (Youth Self-Report ≥ borderline on at least one DSM scale). The majority maintained their symptomatic or nonsymptomatic status from baseline to 24 months postbaseline. Remission of symptoms was more common than the development of new symptomatology at 24 months. Beyond demographics, separate models of baseline predictors and concurrent correlates of 24-month psychopathology identified baseline psychopathology and loss of control (LOC) eating as significant. Alcohol use disorder (AUD) and LOC eating emerged as correlates in the concurrent model. For the WLS group, preoperative, postoperative, and change in symptomatology were not related to 24-month percent weight loss.
Conclusions: At 2 years, approximately one in three adolescents were symptomatic with psychopathology. Maintenance of symptomatic/nonsymptomatic status over time or remission was more common than new incidence. Although symptomatology was not predictive of surgical weight loss outcomes at 2 years, preoperative psychopathology and several other predictors (LOC eating) and

IMPLICATIONS AND CONTRIBUTION

A notable minority of adolescents present with persistent mental health impairment following bariatric surgery, even in the presence of significant weight loss. Like any coexisting condition that does not remit postoperatively (i.e., elevated blood pressure, dyslipidemia), monitoring and management of symptoms by subspecialists is warranted.

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correlates (LOC eating, AUD) emerged as signals for persistent mental health risks, underscoring the importance of pre- and postoperative psychosocial monitoring and the availability of adjunctive intervention resources.

The increasing prevalence of adolescent severe obesity (body mass index [BMI] ≥ 120% of the 95th percentile for age/gender) is a serious public health concern, as it signals increased risk for high comorbidity burden, poor quality of life, and premature mortality in adulthood [1–4]. Unfortunately, once severe obesity is established, lifestyle modification and pharmacotherapy have limited effectiveness in producing durable and clinically meaningful weight loss (>5%) [5]. Based on a growing empirical literature, bariatric surgery is emerging as a safe and efficacious weight loss strategy for adolescent patients, with promising reductions in medical comorbidity burden (e.g., type 2 diabetes, dyslipidemia) [6–8]. In contrast, our understanding of adolescent bariatric surgery outcomes in mental health domains and their associations with weight loss are limited.

A small literature has demonstrated that rates of psychopathology, including symptoms that are internalizing (i.e., anxious, depressed) or externalizing (i.e., oppositional, disruptive) in nature, are present but not widespread in adolescents with severe obesity [9–13]. Yet, the presence of clinically impaired subgroups is clear [14,15]. Initial outcome studies, limited to the Roux-en-Y gastric bypass (RYGB) and laparoscopic adjustable gastric band (LAGB), demonstrated that as a group, adolescents experienced improvements in internalizing and externalizing symptoms from presurgery to 1–2 years postoperatively, although a pattern of persistent psychopathology was observed for some patients [15–17]. For example, in the Swedish Adolescent Morbid Obesity Study, approximately 20% of adolescents presented with "poor mental health" 2 years post-RYGB, which was predicted by greater symptoms of anxiety and depression prior to surgery but unrelated to weight loss [15]. Similarly, a small pilot study (n = 14 RYGB adolescents) in the United States demonstrated that nearly half (n = 5) of adolescents with baseline symptom elevations (n = 11) persisted with symptoms outside of a healthy range at 2 years [18].

Replications of these initial findings where clinical pathways are examined over time (i.e., those who maintain their preoperative status vs. those who improve or decline) in a contemporary sample are needed. The literature can also be advanced in a number of key ways. The vertical sleeve gastrectomy (VSG) procedure is increasingly being utilized for surgical weight loss, for which there are no published adolescent psychosocial outcome data. Moreover, the use of a controlled study design would add scientific rigor and allow examination of psychosocial factors that may be unique to surgical patients versus attributable to the natural course of adolescent development. Finally, elucidating potential explanatory factors for poorer mental health outcomes will inform prevention/intervention efforts in clinical care during the first two postoperative years.

The aims of the present study were to characterize types/rates of psychopathology at the 24-month postoperative time point in a large multisite sample of adolescents who had undergone bariatric surgery (weight loss surgery group: "WLS") and to examine changes in symptomatic status from presurgery/baseline. The inclusion of a nonsurgical group of adolescents with severe obesity ("NSComp") followed over the same course of time provided a critical comparison group. It was hypothesized that at 24 months, (1) a minority subgroup would present with psychopathology outside of the normal range, with mean levels of symptomatology lower in WLS than NSComp; and (2) for both groups, change in psychopathology from preoperative status would be characterized by varying clinical pathways (maintenance, improvement, deterioration). Given expected weight loss in the WLS group [19], the association between psychopathology and percent weight loss was also examined. Finally, exploratory analyses examined baseline and concurrent correlates of increased risk of poorer mental health outcomes at 2 years. These potential correlates were chosen based on their association with greater psychopathology in the broader adolescent literature as well as in this clinical population of adolescents with severe obesity, and include earlier (i.e., preoperative/baseline) psychopathology [16], child maltreatment history [20], family dysfunction [11], perceived social support [21], and loss of control (LOC) eating [22]. Alcohol use disorder (AUD) was also included as a potential correlate, given it often co-occurs with adolescent internalizing and externalizing symptomatology [23] and was recently shown to be an emerging area of risk for this clinical population [24].

Methods

Study design overview

The present study was based on data obtained from TeenView, an ancillary study to the Teen Longitudinal Assessment of Bariatric Surgery Consortium (Teen-LABS). Teen-LABS is a prospective, observational cohort study evaluating the safety and efficacy of bariatric surgery in adolescents at five academic medical centers (2007–2012) in the United States [6]. It represents the observation of outcomes for three surgical procedures (RYGB, VSG, and LAGB), but was not significantly powered to examine between-procedure differences. TeenView (2008–2012) assessed psychosocial risks and benefits in a subgroup of Teen-LABS participants (M_{age} = 16.86) along with a demographically similar comparator group with severe obesity (M_{age} = 16.11) with ages ranging from 13 to 18 enrolled in nonsurgical lifestyle intervention programs at each of the five sites. TeenView was not designed as a comparative trial (i.e., surgical vs. nonsurgical), but rather to better understand the psychosocial outcomes of bariatric surgery relative to the natural course of severe obesity. Preoperative/baseline and 24-month data were used in the present analyses. Institutional Review Boards at all sites approved the study protocols.

Participants

Eligibility criteria and recruitment/participation rates are detailed in Figure 1, along with information regarding samples used in analyses (see Statistical Methods). TeenView comparator adolescents were drawn from a registry of study eligible youth from nonsurgical lifestyle intervention programs who were willing to