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Original article

## Psychological contributors to noncompletion of an adolescent preoperative bariatric surgery program

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### Abstract

**Background:** Noncompletion of preoperative bariatric programs is a significant problem among adolescents. Adult studies suggest that psychological factors contribute to noncompletion of preoperative bariatric programs.

**Objective:** The aim of this study was to determine the association between adolescent psychological functioning and completion of the preoperative phase of a bariatric program.

**Setting:** The study was conducted at a tertiary care children's hospital affiliated with a university medical center.

**Methods:** Seventy-four adolescents and their parents completed an assessment measure of psychological functioning with the Behavior Assessment System for Children, Second Edition. We compared these scores between adolescents who completed the preoperative phase of the bariatric program and proceeded to surgery (completers) to those who did not (noncompleters) using multivariate analysis of covariance and logistic regression analyses, adjusting for demographic characteristics and baseline body mass index.

**Results:** The mean age was 16.0 (1.1) years, most were female (79.8%), and the group was diverse (48.6%, Caucasian; 33.8%, black; 17.6%, other, including Hispanic, Asian, and biracial). Average body mass index was 50.5 (7.6) kg/m<sup>2</sup>. Forty-two percent of participants were noncompleters. Noncompleters were reported by parents to have more clinically significant externalizing and internalizing behaviors and fewer adaptive behaviors. Noncompleters self-reported more clinically significant internalizing symptoms, emotional problems, and poor personal adjustment.

**Conclusion:** Adolescents who did not complete the preoperative phase of a bariatric surgery program had more clinically significant psychological symptoms across multiple domains compared with those who successfully proceeded to bariatric surgery. Early identification and treatment of psychological symptoms may be important in helping adolescents successfully proceed to surgery. (Surg Obes Relat Dis 2016;■:00–00.) © 2016 American Society for Metabolic and Bariatric Surgery. All rights reserved.

### Keywords:

Weight loss Surgery; Adolescence; Pediatric obesity; Attrition

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There has been a threefold increase in the prevalence of obesity among youth in the United States over the past 40 years [1], with 1.3% of adolescents between the ages of 12 and 19 having class III obesity (body mass index [BMI] ≥ 140% above the 95% for age) [2]. Bariatric surgery is a promising treatment for adolescents with class III obesity

who often are not successful with lifestyle intervention alone [3]. Adolescents who undergo bariatric surgery experience significant weight loss, reduction in associated morbidities, and improved psychological functioning [3–5]. Despite these documented benefits, only approximately 1000 adolescent bariatric surgery cases are performed each year in the United States [6]. Many adolescents referred for bariatric surgery do not successfully complete the mandatory preoperative phase of bariatric programs [7], typically consisting of at least 6 months of behavioral and lifestyle education and treatment with an interprofessional team, contributing to low rates of adolescent bariatric surgery.

In adults referred for bariatric surgery, there are high rates of noncompletion of preoperative bariatric programs, with only 49% to 69% of adults referred for surgery ultimately undergoing surgery [8]. Studies have found that adults who do not complete the preoperative phase of bariatric programs have higher levels of preoperative anxiety [8]. Although studies have not assessed whether psychological factors influence noncompletion of the preoperative phase of bariatric programs among adolescents, studies do suggest that adolescents with more depressive symptoms and lower self-esteem are at increased risk for noncompletion of weight-management programs based on lifestyle and behavior [9,10].

Because adolescents presenting for bariatric surgery may present with psychological co-morbidities [11–13], it would be important to determine whether psychological factors contribute to noncompletion of preoperative bariatric programs. Therefore, the aim of this study is to determine if there are differences in psychological symptoms between adolescents who successfully complete the preoperative phase of a bariatric program compared with those who do not. We hypothesize that adolescents who do not complete the preoperative phase of the bariatric program will have more psychological symptoms compared with adolescents who are able to successfully proceed to bariatric surgery.

## Methods

### *Participants*

The present study is part of a larger U.S. Food and Drug Administration-approved investigational device exemption trial investigating the safety and efficacy of the laparoscopic adjustable gastric band. One hundred thirty-six adolescents were enrolled in the parent study between 2007 and 2013. Eligible participants included adolescents between the ages of 14 and 18 with a BMI of  $>40$  or  $>35$  with the diagnosis of a serious co-morbid medical condition (sleep-disordered breathing, diabetes, hypertension, nonalcoholic fatty liver disease, or polycystic ovaries). All patients provided assent, and their legal guardian provided consent to participate in this study. This study was approved by the hospital's Institutional Review Board.

Of the adolescents enrolled, 74 (54.4%) completed psychological testing and comprised the cohort for this study. Sixty-two adolescents did not complete psychological testing for one of 4 reasons: they were enrolled in the program before the institution of psychological testing ( $n = 8$ ), they did not attend the program beyond 1 visit (with psychological testing typically performed at the second visit;  $n = 21$ ), they did not have insurance coverage for psychological testing ( $n = 22$ ), or they were enrolled in the program at a time when the program was without a psychologist to perform the testing (either due to medical leave or staffing change;  $n = 11$ ). Adolescents who completed psychological testing did not significantly differ from adolescents who did not complete psychological testing in terms of age, sex, race, BMI, or type of insurance. Adolescents who did not complete psychological testing were significantly less likely to complete the preoperative bariatric program (adjusted odds ratio [aOR] 3.4, confidence interval [CI] 1.6–7.2,  $P < .01$ ), but there was no difference after excluding adolescents who only came to 1 visit (aOR 1.6, CI .7–3.6,  $P = .3$ ).

### *Categorization of patients based on completion of preoperative bariatric program*

Adolescents underwent an initial medical and psychological evaluation before initiation of the preoperative program. To be considered for surgery, adolescents were required to complete a minimum of 6 months in an interprofessional preoperative program, as recommended by an expert task force on bariatric surgery, demonstrating adherence to monthly clinic visits and ability to maintain or lose weight through adherence to lifestyle and behavioral recommendations [14,15]. There was no maximum limit to the time that an adolescent was allowed to participate in the preoperative program and demonstrate requirements for proceeding to surgery. Clinic visits were comprised of family meetings with the physician, psychologist, registered dietician, or exercise physiologist. Adolescents could meet with one or all team members each month, based on the clinical needs of the adolescent as determined by joint decision making among the team and the family. Typical clinic visits lasted 1 to 2 hours. Adolescents who completed the preoperative program and underwent bariatric surgery were categorized as “completers” and those who did not proceed to surgery were categorized as “noncompleters.” Noncompleters included adolescents who left the program voluntarily and those who were unable to demonstrate adherence to the preoperative program guidelines during the entire duration of being in the program, whether it be 6 months or longer.

## Measures

### *Anthropometrics*

Height and weight without shoes or excess clothing (e.g., jackets, bulky sweaters) were measured by a medical

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