

Research paper

Body mass index, depression, and suicidality: The role of self-esteem in bariatric surgery candidates



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ABSTRACT

Background: Previous research suggests a relationship between weight and depression/suicidality, although few studies have examined the mechanisms underlying this association. This study examined the mediating role of self-esteem in the relationship between BMI and depression/suicidality, as well as the moderating role of gender in the mediated pathways.

Methods: As part of a screening process in consideration for bariatric surgery, 3,101 adults (81.4% female, 18.6% male) were assessed one time. Five univariate mediation and five univariate moderated-mediation models were hypothesized and analyzed. For the mediation models, we entered five outcome variables separately: 1) severity of depressed mood, 2) diagnosis of Major Depressive Disorder, 3) lifetime history of suicide attempts, 4) suicidal ideation at the time of evaluation, and 5) severity of suicidality, BMI as the independent variable, and self-esteem as the mediator. For the moderated-mediated models, gender was examined as a moderator to examine whether self-esteem was a stronger mediator for one gender, compared to the other.

Results: Findings supported the mediating role of self-esteem across all five outcomes. Further, the mediated effect was moderated by gender, such that the mediation effect was stronger for males, compared to females.

Limitations: The majority of the sample consisted of White females, limiting broad applicability of findings. All variables were assessed simultaneously, at baseline, limiting the ability to make causal attributions.

Conclusions: Study findings suggest that self-esteem may help explain the relationship between BMI and depression/suicidality, particularly for men. Thus, interventions targeting self-esteem may be useful for improving psychological outcomes among those presenting for bariatric surgery.

1. Introduction

According to the Centers for Disease Control (CDC) (2014), more than one-third of U.S. adults (34.9%) and 12.7 million children and adolescents (17%) meet criteria for obesity. The CDC estimated that the annual medical cost of obesity in the U.S. was \$147 billion, posing a severe societal and economic issue. The medical cost for obese individuals is approximately \$1,429 higher than for those of normal weight. In addition to costs and health ramifications associated with obesity, studies have revealed an association between obesity and mental health problems (e.g., Duarte et al., 2010; Scott and Happell, 2011). Such associations have often been attributed to obesity stigma (e.g., Puhl and Heuer, 2010), which in turn are related to maladaptive mental health outcomes (e.g., Cameron et al., 2011; Gundersen et al.,

2011; Jacka et al., 2011; Sanderson et al., 2011; Vander Wal and Mitchell, 2011). Numerous correlational studies have confirmed a reciprocal relationship between mental and physical health (e.g., Faith et al., 2011; Grundy et al., 2014; Pan et al., 2011; de Wit et al., 2010). Further, studies have revealed that obesity was related to decreased quality of life and in turn, increased odds of developing depression (e.g., Jia and Lubetkin, 2010; Taylor et al., 2013). Notably, one meta-analysis revealed that obesity increased the risk of depression, while depression was also predictive of developing obesity (Luppino et al., 2010). Taken together, these findings underscore the reciprocal relationship between physical weight and mental health, suggesting the need to examine its underlying processes.

Multiple studies have similarly revealed an association between body mass index (BMI) and suicidality, although the vast body of

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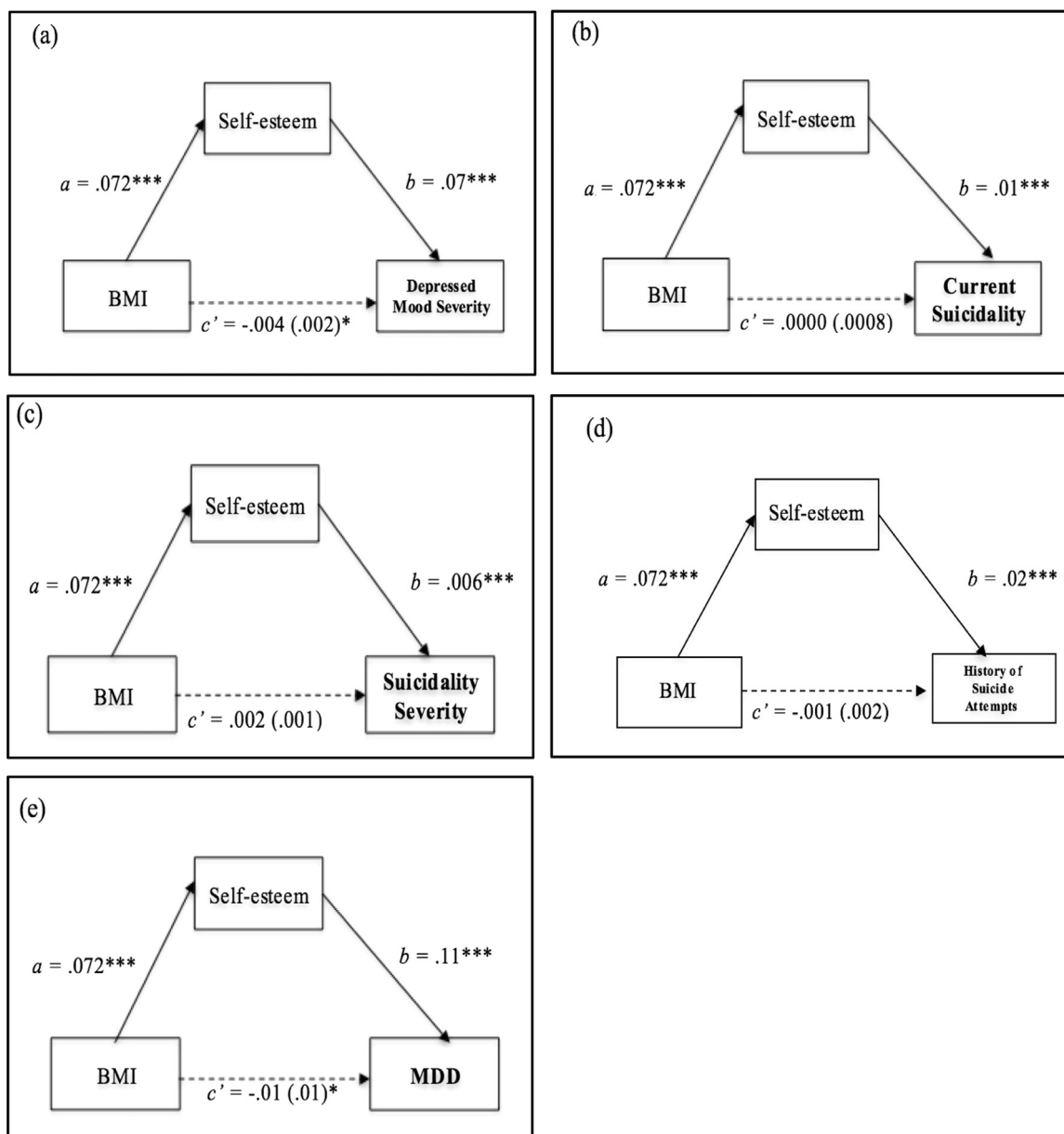


Fig. 1. Results of testing the hypothesized mediation models, with self-esteem as the mediator. *Note.* Standardized regression coefficients for the association between BMI and (a) severity of depressed mood, (b) current suicidality, (c) suicidality severity, (d) history of suicidality, and (e) MDD, with self-esteem as a mediator. Values in parentheses are standard errors of the path coefficients. Adjusted models (depicted) simultaneously controlled for alcohol abuse, alcohol dependence, and smoking. * $p < .05$; ** $p < .01$; *** $p < .001$.

literature on this association reveals contradictions with regard to its directionality, magnitude, and outcomes (e.g., Brunner et al., 2006; Carpenter et al., 2000; Dutton et al., 2013; Goldney et al., 2009; Kaplan et al., 2007; Klinitzke et al., 2013; Mather et al., 2009; Mukamal et al., 2007, 2010; Mukamal and Miller, 2009; Zhang et al., 2013; Zhao et al., 2012). Notably, several large, epidemiological studies have revealed a negative association between BMI and suicidality (e.g., Mukamal et al., 2007, 2010; Mukamal and Miller, 2009; Zhang et al., 2013), such that individuals with a higher BMI have a *decreased* risk of suicide. For instance, Kaplan et al. (2007) revealed an 18% and 24% decrease in suicide risk, for men and women, respectively, for each 5 kg/m² increase in BMI. Similarly, a cohort study of over one million Swedish men demonstrated an inverse association between BMI and suicide, such that risk of suicide decreased by 15% for every 5 kg/m² increase in BMI. Interestingly, a prospective cohort study of 74,332 individuals demonstrated that increased BMI was associated with an increased risk of depression, but reduced risk of suicide in men and women (Bjerkset et al., 2008). On the other hand, numerous studies

have revealed positive associations, such that those with increased BMI exhibited *increased* suicidality (e.g., Brunner et al., 2006; Dutton et al., 2013; Mather et al., 2009; Zhao et al., 2012). Further, some studies have shown mixed findings, including differential results for men and women (Carpenter et al., 2000; Goldney et al., 2009; Klinitzke et al., 2013). Collectively, these findings highlight the need to examine and clarify the observed association between body weight and depression/suicide by uncovering potential mechanisms.

Some research has examined potential reasons for increased suicidality in individuals who are overweight or obese. For example, Dutton et al. (2013) used the interpersonal theory of suicide to examine suicidality in 271 individuals and found that individuals with higher BMI had increased suicidal ideation and greater feelings of perceived burdensomeness, compared with individuals with lower BMI. Studies have examined the association between BMI and depression. One study revealed that depression is associated with increased or decreased food intake and/or physical activity (de Wit et al., 2009), while Dragan and Akhtar-Danesh (2007) revealed that depression was associated with

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