



Addictive personality and maladaptive eating behaviors in adults seeking bariatric surgery

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ABSTRACT

This study examined the relationship between addictive personality and maladaptive eating behaviors in bariatric surgery candidates. Ninety-seven bariatric surgery candidates completed the Eysenck Personality Questionnaire (EPQ-R) Addiction Scale, the Overeating Questionnaire (OQ), binge-eating questions from the Questionnaire of Eating and Weight Patterns (QEWP-R), and the Eating Attitudes and Behaviors Questionnaire. Participants with Binge Eating Disorder (BED) displayed addictive personality scores comparable to individuals addicted to substances ($M = 17.5$, $SD = 5.3$). Addictive personality was associated with Overeating ($r = .45$, $p < .001$), Cravings ($r = .31$, $p = .005$), Affective Disturbances ($r = .62$, $p < .001$) and Social Isolation ($r = .53$, $p < .001$). Addictive personality was associated with maladaptive eating behaviors, suggesting the potential for addictive eating.

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1. Introduction

Discourse on addictive behaviors traditionally focuses on substance dependence and gambling; however, empirical support for addictive eating continues to emerge (Corsica & Pelchant, 2010; Gearhardt, Corbin & Brownell, 2009; Gearhardt et al., 2011; Johnson & Kenny, 2010). Potential criteria proposed for addiction to highly palatable food include symptoms of tolerance and withdrawal (Ilfand et al., 2009). Biological perspectives on addiction and overeating compare the neural reward pathways of food consumption with the reward pathways implicated in substance dependence (Avena, Rada, & Hoebel, 2008; Blumenthal & Gold, 2010; Volkow & Wise, 2005). Neural imaging studies of obese individuals compared to substance dependent populations show similar reductions in striatal dopamine (D2) receptors, suggesting the potential for deficits in reward system circuitry (Wang, Volkow, Thanos, & Fowler, 2004).

Moreover, salient parallels exist in the clinical presentations of binge eating (BED) and substance dependence, including overuse, ingestion of larger amounts than intended, and consumption despite knowledge of potentially negative consequences (Gold, Frost-Pineda, & Jacobs, 2003). Feelings of guilt following consumption and cycles of recovery and relapse may also accompany both conditions. Studies suggest that individuals with BED have addictive personalities, defined as “a profile of psychological characteristics that describe

individuals across a broad range of addictions” (Davis & Claridges, 1998, p. 465; Davis et al., 2008). The personality cluster of individuals with addictive tendencies includes low extroversion and high levels of social anxiety, depression, sensitivity, moodiness, and manipulation of others (Gossop & Eysenck, 1980).

Previous research has not evaluated whether obesity, beyond BED, is associated with addictive personality. Given the substantial rates of obesity and the significant medical risks associated with elevated BMI, it would seem to be of great importance to recognize the psychopathological components of compulsive eating. At the moment, the extent of this recognition in the *DSM-IV-TR* is limited to binge eating, a condition characterized by excessive consumption of food with a loss of control (American Psychiatric Association, [DSM-IV-TR], 2000). Perhaps bariatric surgery candidates, some of the most extreme and refractory cases of obesity, display addictive eating behaviors.

We hypothesized that 1) bariatric surgery candidates would display addictive personalities; 2) BMI would be associated with addictive personality; and 3) addictive personality would be associated with Overeating, Cravings, Expectations About Eating, Rationalizations about weight, and Social and Affective Disturbances.

2. Material and methods

2.1. Participants

Recruitment was conducted through advertisements on social networking sites and on ObesityHelp.com, a Web site for bariatric surgery candidates. We recruited 167 participants online for this study; however, 31 (19%) had already completed bariatric surgery,

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15 (9%) did not meet BMI requirements for bariatric surgery, 21 (13%) did not complete at least 60% of the survey or did not include critical height or weight information, and 3 scored above the threshold for inconsistent responding. Ninety-seven bariatric surgery candidates were included in analyses.

2.2. Materials and procedure

Participants were informed of study aims and length and that participation was voluntary. No identifying information was collected. Protocol was approved by the College of Medicine's Committee on Clinical Investigations (CCI# 2008–893). Assessments were administered via SurveyMonkey.com. Data was analyzed using SPSS 17.0 for Mac.

2.2.1. Eysenck Personality Questionnaire—Revised (EPQ-R) Addiction Scale

Addictive personality was assessed using the 32-item Addiction Scale of the Eysenck Personality Questionnaire—Revised (Eysenck & Eysenck, 1991; Gossop & Eysenck, 1980). This scale has been utilized in eating disordered and substance abuse populations, and has adequate reliability (Davis & Claridges, 1998; Eysenck & Eysenck, 1991; Gossop & Eysenck, 1980; Ogden, Dundas, & Bhat, 1989).

2.2.2. Overeating Questionnaire (OO)

Eating behaviors and psychosocial functioning were assessed using the Overeating Questionnaire, an 80-item Likert-scale self-report questionnaire (O'Donnell & Warren, 2004; internal consistency = .82; test–retest = .88). Height, weight, age, education, race/ethnicity, gender, eating disorders, diet history, medical conditions, and substance abuse problems are also included in this questionnaire. Six subscales were used in this study:

1. Overeating (OVER): Continuing to eat despite feelings of satiety;
2. Craving (CRAV): Food cravings;
3. Expectations About Eating (EXP): Expected positive results of food consumption;
4. Rationalizations (RAT): Rationalizations about body weight;
5. Social Isolation (SOCIS): Low levels of social support and interaction; and
6. Affective Disturbance (AFF): Stress, depression and anxiety.

2.2.3. Questionnaire on Eating and Weight Patterns—Revised (QEWP-R)

BED status based on DSM-IV-TR proposed diagnostic criteria was obtained from the QEWP-R (Spitzer, Yanovski, & Marcus, 1993).

2.2.4. Eating Behaviors and Attitudes Questionnaire

Ten questions on eating behaviors and attitudes were developed by study investigators to address food-related tolerance and withdrawal symptoms. The questionnaire required a forced choice “yes” or “no” to each question.

2.3. Calculation

Linear regression analyses evaluated the relationship between addictive personality, eating behaviors and affective/social disturbances. Non-parametric tests were used when assumptions for parametrics were not met. For hypotheses with multiple outcomes, significance levels were lowered to $p < .01$ using the Bonferroni correction.

3. Results

3.1. Sample characteristics

Most participants were female (85.6%) with a mean age of 41 years ($SD = 11.3$). No differences in primary outcomes were found based on age, gender or race (Caucasian v. minorities). Mean weight was 274.0 lbs ($SD = 50.1$) and BMI was 45.2 ($SD = 7.96$). Female participants reported significantly higher BMI than males, $t(96) = -2.96, p = .004$. Twenty-two participants (23%) met criteria for BED (Table 1).

3.2. Addictive personality

Mean EPQ-AS scores were 13.9 ($SD = 5.19$). Published norms (non-addicts) are 11.6 ($SD = 4.96$) in males and 12.6 ($SD = 4.18$) in females (Gossop & Eysenck, 1980). Our sample scored higher than female norms on the EPQ-AS scale but did not reach significance ($Z = -1.82, p > .05$). Individuals who met clinical criteria for BED ($n = 22$) had a mean APS score of 17.5 ($SD = 5.3$), which was significantly higher than female norms ($Z = -3.26, p = .001$). BMI was not associated with addictive personality, $r = -.14, p > .01$.

3.3. Maladaptive eating behaviors, affective disturbances and social isolation

The mean Overeating scale (OVER) T-score was 62, indicating reported levels of overeating of clinical interest. OVER in bariatric surgery candidates with BED was higher than the overall sample mean, $T = 70$. The Cravings (CRAV) scale for the overall sample mean fell in the borderline range ($T = 59$), while the BED subset displayed clinically elevated CRAV ($T = 64$). Expectations About Eating (EXP) were elevated in the entire group ($T = 61$) and in the BED subset ($T = 66$). Both the overall cohort ($T = 60$) and the BED subset ($T = 65$) displayed clinically significant scores on the Affective

Table 1
Demographics of an online sample of bariatric surgery candidates ($N = 97$).

	Mean (SD)	%
Age (yrs)	41.0 (11.3)	
Gender		
Males ($n = 14$)		14.4
Females ($n = 83$)		85.6
Race/ethnicity		
Caucasian/White		67.0
African-American/Black		15.5
Hispanic/Latino		8.2
Native American/Alaska Native		3.1
Asian		1.0
Other/undisclosed		5.2
Education completed (yrs)		
<12		16.5
12		13.4
13–15		45.4
16		12.4
>16		12.3
Body Mass Index (kg/m^2)	45.2 (8.0)	
Stage of bariatric surgery preparation		
Considering bariatric surgery ($n = 52$)		53.6
Met with a doctor/surgeon about bar. surgery ($n = 29$)		29.9
Scheduled for bariatric surgery ($n = 16$)		16.5
Serious health problems		
Yes		43.2
No		55.8
Currently smoke		8.2
History of:		
Alcohol problems		6.2
Drug problems		7.2
Gambling/shopping problems		20.6
Attend(ed) Eating Support Groups		32.0

Disturbance (AFF) subscale. Rationalizations (RAT) and Social Isolation (SOCIS) scales were clinically significant only in the BED subset ($T = 60$ and $T = 64$, respectively).

3.4. Addictive personality and maladaptive eating, affective disturbances and social isolation

EPQ-R Addiction Scale (EPQ-R AS) scores were associated with Overeating ($r = .45$, $p < .001$; Table 2) and explained a significant proportion of the variance ($R^2 = .21$, $F(1, 76) = 19.7$, $p < .001$). EPQ-R AS scores were associated with Cravings ($r = .31$, $p = .005$) and Affective Disturbances ($r = .62$, $p < .001$), and explained a significant proportion of the variance in the Cravings ($R^2 = 0.10$, $F(1, 79) = 8.25$, $p = .005$) and Affective subscales ($R^2 = .39$, $F(1, 77) = 48.93$, $p < .001$). EPQ-R AS scores were associated with Social Isolation ($r = .53$, $p < .001$) and explained much of the variance ($R^2 = .28$, $F(1, 74) = 28.57$, $p < .001$). EPQ-R AS scores were associated with Expectations About Eating ($r = .32$, $p = .005$) and explained a significant part of the variance ($R^2 = .10$, $F(1, 75) = 8.33$, $p = .005$). EPQ-R AS scores were not associated with Rationalizations, $p > .01$.

Individuals who chose to eat over other activities, endorsed feeling anxious when not around food, and required more and more food to feel satisfied as measured by the Eating Behaviors and Attitudes Questionnaire had significantly higher addictive personality scores than those who did not ($p < .01$).

4. Discussion

Bariatric surgery candidates with BED displayed addictive personalities ($M = 17.5$) comparable to individuals addicted to substances (Feldman & Eysenck, 1986; Gossop & Eysenck, 1980; Ogden et al., 1989). As addictive personality scores increase, overeating behaviors also increase. Individuals who endorsed requiring more and more food to feel satisfied displayed higher addictive personality scores. Consuming larger amounts for longer periods of time than intended, as well as requiring more of the substance for desired effects, is an essential aspect of substance dependence (American Psychiatric Association [DSM-IV-TR], 2000). Further, 68.5% of participants reported needing more and more food to feel satiated.

Spending large amounts of time obtaining, using, or recovering from substances is also one criterion for substance dependence (American Psychiatric Association [DSM-IV-TR], 2000). Approximately 60% of responders endorsed choosing to spend time eating over conducting other activities. Participants who endorsed spending more and more time eating rather than engaging in other activities had significantly higher addictive personality scores.

Higher addictive personality scores were also associated with more cravings in bariatric surgery candidates with BED, and higher expectations surrounding food consumption. Proposed changes to the upcoming DSM-V regarding classification of substance use disorders provide timely applications to addictive eating behavior research (Curley, 2010). Specifically, the symptom of “drug craving” will be added as one potential criterion, which appears to be an

important component of addictive behaviors (Avena et al., 2008; Pelchant, 2002).

Addictive personality was associated with social and affective disturbances, which were accordingly more profound in bariatric surgery candidates with BED. While the affective disturbance scale included some symptoms of depressive and anxiety disorders, we did not determine whether individuals met clinical criteria for these conditions.

Our findings do not suggest BMI to be associated with addictive personality or with addictive eating behaviors, as found in studies of pediatric populations (Merlo, Klingman, Malasanos, & Silverstein, 2009). Perhaps other factors, such as genetics, exert more of an influence on BMI than addictive behaviors.

In our sample, 23% of participants met clinical criteria for BED. Previous studies of pre-bariatric surgery patients report a wide range of estimates of BED in this population ranging from 10% to 39%, but with similar addictive personality scores (Davis et al., 2008; Kalarchian, Wilson, Brodin & Bradley, 1998; Saunders, 1999). Though the impact of BED on bariatric outcomes remains unclear, addressing binge eating behaviors before and after surgery may help promote positive post-surgical outcomes (Niego, Kofman, Weiss, & Geliebter, 2007; Wadden et al., 2011).

Several limitations are noteworthy. Weight data was self-reported, which tends to be underreported in women (Ezzati, Martin, Skjold, Hoorn, & Murray, 2006). The sample size did not allow for meaningful sub-analyses by race or ethnicity and the majority of participants were Caucasian (67%). The highest rates of bariatric surgery are in African-American women (29.4/10,000) followed by Caucasian women (21.3/10,000), suggesting our sample may not have been representative of the general bariatric surgery population (Birkmeyer & Gu, 2010).

5. Conclusions

Further investigation into addictive personality, eating behaviors, and in turn, excess weight, is warranted. Clinicians may benefit from utilizing addiction treatment approaches to obese patients who display addictive eating behaviors to maximize weight loss outcomes.

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Contributors

Charles Swencionis, PhD, and Michelle Lent, MA, designed the study and wrote the protocol. Michelle Lent conducted literature searches and summarized previous research on this topic. Michelle Lent conducted statistical analyses and wrote the first draft of the manuscript. All authors contributed to and approved the final manuscript.

Conflict of interest

All authors have no conflicts of interest to disclose.

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Table 2

EPQ-R Addiction Scale effect sizes and correlations with select Overeating Questionnaire (OQ) subscales ($N = 97$).

OQ Scale	R^2	Correlation (r)	p value
Overeating	.21	.45	<.001*
Cravings	.10	.31	=.005*
Expectations	.10	.32	=.005*
Rationalizations	.01	.12	=.349
Affective	.39	.62	<.001*
Social Isolation	.28	.53	<.001*

* Indicates significance at the $p < .01$ levels.

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