Published in final edited form as:

Suicide Life Threat Behav. 2012 October ; 42(5): 541–549. doi:10.1111/j.1943-278X.2012.00110.x.

Factors Associated with Suicide Ideation in Severely Obese Bariatric Surgery-Seeking Individuals

Eunice Y. Chen, PhD,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, and Department of Psychology, Temple University, Philadelphia PA, USA

Karla C. Fettich, MA,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, and Department of Psychology, Temple University, Philadelphia PA, USA

Megan Tierney, PsyD,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, and Department of Psychology, Roosevelt University, Chicago, IL, USA

Hakeemah Cummings, MA,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL

Johnny Berona, BA,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, and Psychology Department, University of Michigan, Ann Arbor, MI, USA

Jessica Weissman, BA,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, and Department of Clinical Psychology, Columbia University Teachers College, NY, USA

Amanda Ward, MS,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, and Department of Psychology, Loyola University Chicago, Chicago, IL, USA

Kara Christensen, BA,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, and Brigham and Division of Women's Health, Women's Hospital, Boston, MA, USA

Matthew Southward, BA,

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, and Department of Psychology, Ohio State University, Columbus, OH, USA

Kathryn H. Gordon, PhD,

Department of Psychology, North Dakota State University, Fargo, ND

James Mitchell, MD, and

Neuropsychiatric Research Institute, University of North Dakota School of Medicine and Health Sciences, Fargo, ND, USA

Emil Coccaro, MD

Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL

Abstract

There are high rates of suicide ideation and/or behavior in severely obese individuals. The potential contributors to suicide ideation in a sample of 334 severely obese bariatric surgery candidates was explored. Lack of college education, a history of suicide ideation and/or behavior, psychological distress, hopelessness, loneliness, history of physical and/or sexual abuse, and lifetime major depression were associated with current suicide ideation. Some of the correlates of suicide ideation in severely obese bariatric surgery-seeking samples are similar to those found in the general community and this knowledge may serve to improve the psychological assessment and care for this group.

Severe or Class III obesity (body mass index [BMI] ≥ 40 ; World Health Organization [WHO], 1995) is the fastest growing group of overweight in the United States. Severe obesity is associated with a twofold increase in mortality (Sturm, 2007) and can be treated with bariatric surgery. However, Omalu et al. (2007) found an excess of deaths by suicide in postbariatric surgery individuals as compared with matching community controls, and rates were particularly elevated in women. Similar findings were reported by Adams et al. (2007). In a small study by Rosen and Aniskiewicz (1983), severely obese women seeking bariatric surgery (compared with those who did not) reported a higher rate of suicide attempts. In another study, of 121 severely obese bariatric surgery candidates, 9.1% reported a lifetime history of suicide attempts (Sansone, Wiederman, Schumacher, & Routsong-Weichers, 2008). This was greater than reported in studies involving the community (2.4%, Baca-Garcia et al., 2008; 4.8%, Mather, Cox, Enns, & Sareen, 2009) and in heart transplant patients (1.95%, Owen, Bonds, & Wellisch, 2006).

Epidemiological studies report positive associations between BMI and suicide ideation (defined as thoughts of harming or killing oneself; Mather et al., 2009) and suicide attempts (Dong, Li, Li, & Price, 2006), especially among women (Carpenter, Hasin, Allison, & Faith, 2000). However, other studies have found a negative association with completed suicide (Kaplan, McFarland, & Huguet, 2007; Mukamal, Wee, & Miller, 2009). These inconsistent findings may be due to different factors being associated with suicide ideation and suicide attempts compared with completed suicide (Van Orden et al., 2010) and highlight the need for further research in this area.

With this study we add to previous postbariatric surgery suicide studies (Adams et al., 2007; Omalu et al., 2007), presurgery studies examining suicide attempts (Sansone, Schumacher, Wiederman, & Routsong-Weichers, 2008; Sansone, Wiederman, et al., 2008), and community studies examining suicide ideation and/or behavior in individuals with a range of BMIs (Mather et al., 2009). We examined suicide ideation in bariatric surgery-seeking, severely obese individuals and this study is the first to our knowledge to explore the individual factors associated with suicide ideation in this sample. The factors examined in this study were selected from the suicide literature (Van Orden et al., 2010) and from those that have been associated with severely obese individuals (Chen, Fettich, Harold, &

Mitchell, 2010; Jones-Corneille, Wadden, & Sarwer, 2007). A history of suicidal behavior (deliberate behavior causing physical damage with intent to die, including suicide attempts) (Borges, Angst, Nock, Ruscio, & Kessler, 2008) is associated with suicide ideation in community samples and bariatric samples (Omalu et al., 2007; Sansone, Schumacher, et al., 2008; Sansone, Wiederman, et al., 2008). Similarly, current psychological distress (Beghi & Rosenbaum, 2010) and major depression are associated with suicide ideation (Brown, Beck, Steer, & Grisham, 2000) and high rates of major depression are seen in individuals undergoing bariatric surgery (e.g., 42%, Kalarchian et al., 2007). Cognitive factors examined include hopelessness and loneliness, which are associated with suicide ideation and/or behavior (Beck, Brown, Berchick, Stewart, & Steer, 1990; Van Orden et al., 2010) and are elevated in obese people (Lauder, Mummery, Jones, & Caperchione, 2006; Murphy et al., 2009). As chronic physical conditions such as obesity have been found to elevate the chance for suicide, even in the absence of psychopathology (Scott et al., 2010), we examined this as a predictor of suicide ideation. Finally, given that up to two-thirds of bariatric surgery-seeking candidates report childhood physical and/or sexual abuse (Grilo, White, Masheb, Rothschild, & Burke-Martindale, 2006), and that this is associated with suicide ideation and/or behavior (Brodsky & Stanley, 2008), this factor was also examined.

The aim of this study was to explore the factors associated with current suicide ideation in severely obese bariatric surgery-seeking individuals. We hypothesized that suicide ideation would be associated with older age given previous findings (Conwell, 2001), while minority status (Kessler, Borges, & Walters, 1999), marital status, and higher education status (Nock et al., 2008) would be protective. We hypothesized that greater BMI (discussed earlier) and female gender (Carpenter et al., 2000) would be positively associated with suicide ideation. Finally, we hypothesized that a history of suicide ideation and/or behavior, current psychological distress, lifetime major depression, hopelessness, loneliness, poorer physical functioning, and a history of sexual and/or physical abuse would also be associated with greater current suicide ideation in this sample.

METHOD

Participants

We utilized data from 334 severely obese individuals who consecutively enrolled in screening for bariatric surgery at the Center of Surgical Treatment of Obesity from September 2008 to January 2010. The University of Chicago institutional review board approved the protocol and all participants provided written informed consent prior to enrollment in the study.

Instruments

The Beck Depression Inventory (BDI-II; Beck, Brown, & Steer, 1996) is a psychometrically validated 21-item scale assessing depressed mood over the last 2 weeks, with answers rated on a 4-point Likert scale. Assessment of current suicide ideation used the question asking about suicidal thoughts/wishes in the last 2 weeks with responses ranging from 0 (*I do not have any thoughts of killing myself*) to 3 (*I would kill myself if I had the chance*).

A demographics questionnaire assessed age, gender, minority status, marital status, education status, weight, and height. Self-reported weight and height were validated by clinician assessment, the latter of which was used in instances of discrepancy.

The Suicidal Behaviors Questionnaire (SBQ; Addis & Linehan, 1989) assesses current and lifetime suicide ideation and behavior. We utilized the 7-point Likert scale question asking, “Have you thought about or attempted to kill yourself in your lifetime?” as a measure of lifetime suicide ideation and/or behavior. On this question, higher scores reflected greater severity with responses ranging from 0 (No) to 6 (*I attempted to kill myself, and I think I really hoped to die*).

The Brief Symptom Inventory (BSI; Derogatis, 1993) is a well-established 53-item self-report questionnaire assessing current psychological status and distress that yields a Global Severity Index (GSI), with higher scores indicating greater distress. The GSI was used because of its sensitivity to various levels of symptomatology across all nine symptom dimensions.

A clinical interview was conducted by doctoral trainees and attending clinicians assessing history of physical and/or sexual abuse and lifetime major depressive disorder using questions from the *Structured Clinical Interview for DSM-IV* (First, Spitzer, Gibbon, & Williams, 1995).

The Beck Hopelessness Scale (BHS; Beck, 1998) is a 20-item true–false self-report measure. Higher scores indicate greater hopelessness. The measure has high internal consistency (KR-20 coefficient = .93) and acceptable validity (r_s ranging from .60 to .74).

The University of California Loneliness Scale (UCLA Loneliness Scale-3; Russell, 1996) is a 21-item self-report measure assessing the degree to which subjects feel lonely. Participants rate how often they identify with each item on a 4-point Likert scale from 1 (*Never*) to 4 (*Always*) to generate a global loneliness score. It has strong consistency (Cronbach’s alpha ranging from .89 to .94) and reliability ($r = .73$ over a 1-year period).

The Impact of Weight on Quality of Life-Lite (IWQOL-Lite; Kolotkin, Crosby, Koslowski, & Williams, 2001) assesses obesity-specific quality of life including physical functioning, with higher scores indicating greater impairment. This measure is well-validated and reliable (Kolotkin et al., 2001). This study used the Physical Functioning subscale, which has high internal consistency ($\alpha = .94$; Kolotkin et al., 2001).

Procedure

Subjects completed questionnaires online prior to a presurgery multidisciplinary interview. Licensed clinicians contacted individuals who reported suicide ideation.

Data Analysis

Our preliminary analysis compared suicide ideation and nonsuicide ideation groups on demographic variables and potential factors associated with suicide ideation using independent t tests and chi-square tests. The suicide ideation group was defined by a score of

1 or over on the suicide ideation question of the BDI-II. As this was an exploratory analysis, we then examined the independent contribution of each potential predictor of suicide ideation. We conducted separate linear regressions for each potential independent variable of interest: age, BMI, minority status, marital status, education status, gender, physical functioning, current and lifetime suicide ideation, psychological distress, loneliness, hopelessness, history of sexual and/or physical abuse, and lifetime major depression. In each of these linear regressions, the continuous score of the question on suicide ideation (BDI-II) was utilized as the dependent variable (p values are for two-sided and $p < .05$).

RESULTS

The average age of the sample was 43.8 ($SD = 11.4$) years, with the majority being women (76.0%), Caucasian (50.3%), married (53.9%) with some college education (82.9%). The mean BMI of the sample was 49.22 ($SD = 9.89$). Of the total sample, 8.4% reported having a plan for killing themselves in their lifetime and 6.3% reported suicide ideation in the last 2 weeks (see Table 1 for results of the preliminary analysis comparing suicidal and nonsuicidal groups).

The results of each separate linear regression with suicide ideation as the dependent variable and each independent variable entered separately are detailed in Table 2. A history of suicide ideation and/or behavior, current psychological distress, loneliness, hopelessness, a history of sexual and/or physical abuse, and lifetime major depression was significantly associated with greater suicide ideation in this sample. A history of suicide ideation and/or behavior predicted the greatest amount of variability in suicide ideation scores (7.4%), followed by current psychological distress (7.1%). Some college was significantly protective and there was a trend for minority status to be also protective.

DISCUSSION

In this sample, 6.29% reported suicide ideation in the last 2 weeks, which may be greater than in obese community-drawn samples (e.g., 4.99% in the last year, Mather et al., 2009) although the timeframes are different. Additionally, 8.4% reported planning suicide in a lifetime, similar to rates in bariatric surgery candidates (Sansone, Schumacher, et al., 2008; Sansone, Wiederman, et al., 2008) but greater than other surgery and community samples.

Some college protected severely obese bariatric surgery-seeking individuals from suicide ideation, which is consistent with previous findings (Nock et al., 2008). Similarly, there was a trend for minority status to be protective (Kessler et al., 1999). Unlike previous findings, (Nock et al., 2008), marital status did not have a significantly protective effect from suicide ideation, which may have been due to relationship quality, a factor that was not assessed here. Age, BMI, gender, and weight-related physical functioning were not significantly associated with suicide ideation in this sample. Lifetime history of suicide ideation and/or behavior and current psychological distress were significantly associated with suicide ideation; these factors accounted for the most variance in suicide ideation scores. Loneliness, hopelessness, history of sexual and/or physical abuse, and lifetime major depression were

associated with suicide ideation, although each of these variables independently did not account for a large proportion of the variance in suicide ideation scores.

Overall, the factors found to be associated with suicide ideation are similar to those seen in community samples. Lifetime history of suicide ideation and behavior were most strongly associated with current suicide ideation, which is similar to previous findings (Brown et al., 2000), including a 10-year longitudinal study utilizing the National Comorbidity Survey showing that the strongest factor for suicide-related outcomes was baseline reports of these behaviors, particularly for suicide ideation (Borges et al., 2008). Psychological problems and lifetime major depression were associated with suicide ideation as in previous studies (Beghi & Rosenbaum, 2010; Borges et al., 2008; Omalu et al., 2007), although the former relationship was stronger. This suggests psychological problems other than depression may be associated with suicide ideation in this sample. Future studies should examine which forms of psychopathology and psychological distress are uniquely associated with suicide ideation and severe obesity.

Both cognitive factors examined—hopelessness and loneliness—were associated with suicide ideation and/or behavior in this sample, which fits with the general suicide literature (Beck et al., 1990). Future studies could explore if hope for the future and suicide ideation are mediated by facing the serious consequences of severe obesity and a potentially dangerous operation. With regards to loneliness, further exploration of related concepts theorized to be specifically associated with suicide, such as a sense of thwarted belongingness, is warranted (Van Orden et al., 2010).

Childhood maltreatment was associated with current suicide ideation although this rate did not appear as high as in previous studies (Grilo et al., 2006). Maltreatment is associated with major depressive disorder and general psychological distress, both of which were examined in the present study and seem to have a stronger proximal contribution to suicide ideation that could obfuscate the effects of such distal factors.

Age, BMI, female gender, and weight-related physical functioning were not associated with suicide ideation. This may have resulted from the nature of the sample gathered. The bariatric surgery clinic mainly enrolls women (almost 4/5 of the sample) in their 40s, which may have obscured specific relationships with suicide ideation. Additionally, bariatric surgery is recommended only for those with BMIs ≥ 40 or BMIs ≥ 35 with high risk comorbid medical conditions, which limits the weight range enrolled in the study and made a strong linear association with suicide ideation less likely. On average, our subjects also had poor physical functioning because of their severe obesity. Thus, there may have been a ceiling effect. In addition, there is the suggestion that medical illness may not be independently associated with suicide ideation and behavior above and beyond their associations with mental illness (Harris, Barraclough, & Winslow, 1994).

These findings contribute to the literature exploring the mechanisms of suicide ideation in this population; however, there are limitations to this study. The assessment of current and lifetime suicide ideation and/or behavior was limited, respectively, to one item on the BDI-II and one item on the SBQ, and distinctions could not be made between true suicide attempts

and a past history of self-injury. Additionally, we could have improved our choice of versions of the SBQ, with the SBQ-Revised (Osman et al., 2001) being a psychometrically superior choice. Assessment of the presence and severity of other Axis I and II disorders known to be associated with suicide ideation such as eating disorders (Pompili, Girardi, Tatarelli, Ruberto, & Tatarelli, 2006; Preti, Rocchi, Sisti, Camboni, & Miotto, 2011) and borderline personality disorder (Sansone, Schumacher, et al., 2008) could have improved this study. Furthermore, presurgical assessment in this sample is always limited by clients' concerns for potential consequences of disclosure that may lead to denial of the surgery, leading to the possible underestimation of psychological factors associated with suicide ideation. This study was also limited by only assessing individuals presurgery and not postsurgery. Preoperative suicide ideation or psychopathology may predict postsurgery suicide ideation and/or behavior and assessing this may provide useful clinical indicators of postsurgery suicide (Adams et al., 2007; Omalu et al., 2007).

Future research is needed to further understand the link between preoperative and postoperative suicide ideation and/or behavior. Future research should also examine suicide ideation and behavior in severely obese bariatric surgery-seeking individuals compared with matched severely obese nonsurgery-seeking individuals or to obese individuals seeking other surgeries (e.g., heart bypass surgery). Despite these limitations, the large size and diverse ethnic composition of the sample are strengths of this study. These results replicate factors associated with suicide ideation in the general population, suggesting that these are applicable to bariatric surgery-seeking individuals. The factors found in this study are informative for clinicians working with surgery candidates to identify those who are suicidal who may benefit from psychological services prior to surgery.

References

- Adams TD, Gress RE, Smith SC, Halverson RC, Simper SC, Rosamond WD, et al. Long-term mortality after gastric bypass surgery. *The New England Journal of Medicine*. 2007; 357:753. [PubMed: 17715409]
- Addis, M., Linehan, MM. Predicting suicidal behavior: Psychometric properties of the Suicidal Behaviors Questionnaire. Poster presented at the Annual Meeting of the Association for the Advancement of Behavior Therapy; Washington, DC. 1989.
- Baca-Garcia E, Perez-Rodriguez MM, Keyes KM, Oquendo MA, Hasin DS, Grant BF, et al. Suicidal ideation and suicide attempts in the United States: 1991–1992 and 2001–2002. *Molecular Psychiatry*. 2008; 15:250–259. [PubMed: 18779820]
- Beck, AT. Beck hopelessness scale. San Antonio, TX: The Psychological Corporation; 1988.
- Beck A, Brown G, Berchick R, Stewart B, Steer R. Relationship between hopelessness and ultimate suicide: A replication with psychiatric outpatients. *The American Journal of Psychiatry*. 1990; 147:190–195. [PubMed: 2278535]
- Beck, AT., Brown, GK., Steer, RA. Beck Depression Inventory-II (BDI-II). San Antonio, TX: The Psychological Corporation; 1996.
- Beghi M, Rosenbaum JF. Risk factors for fatal and nonfatal repetition of suicide attempt: A critical appraisal. *Current Opinion in Psychiatry*. 2010; 23:349. [PubMed: 20520547]
- Borges G, Angst J, Nock MK, Ruscio AM, Kessler RC. Risk factors for the incidence and persistence of suicide-related outcomes: A 10-year follow-up study using the National Comorbidity Surveys. *Journal of Affective Disorders*. 2008; 105:25–33. [PubMed: 17507099]
- Brodsky BS, Stanley B. Adverse childhood experiences and suicidal behavior. *Psychiatric Clinics of North America*. 2008; 31:223–235. [PubMed: 18439446]

- Brown GK, Beck AT, Steer RA, Grisham JR. Risk factors for suicide in psychiatric outpatients: A 20-year prospective study. *Journal of Consulting and Clinical Psychology*. 2000; 68:371. [PubMed: 10883553]
- Carpenter KM, Hasin DS, Allison DB, Faith MS. Relationships between obesity and DSM-IV major depressive disorder, suicide ideation, and suicide attempts: Results from a general population study. *American Journal of Public Health*. 2000; 90:251–257. [PubMed: 10667187]
- Chen, EY., Fattich, K., Harold, S., Mitchell, JE. Severe obesity, bariatric surgery and suicide. In: Rogers, JT., editor. *Gastric bypass: Surgical procedures, health effects and common complications*. Hauppauge, NY: Nova Science; 2010. p. 181-194.
- Conwell Y. Suicide in later life: A review and recommendations for prevention. *Suicide and Life-Threatening Behavior*. 2001; 31:32–47.
- Derogatis, LR. BSI, Brief Symptom Inventory: Administration, scoring, and procedures manual. 4. Minneapolis, MN: National Computer Systems; 1993.
- Dong C, Li WD, Li D, Price RA. Extreme obesity is associated with attempted suicides: Results from a family study. *International Journal of Obesity*. 2006; 30:388–390. [PubMed: 16231027]
- First, MB., Spitzer, RL., Gibbon, M., Williams, JBW. Structured clinical interview for axis I DSM-IV disorders—patient edition (SCID-I/P). New York: Research Department, NY State Psychiatric Institute; 1995.
- Grilo C, White M, Masheb R, Rothschild B, Burke-Martindale C. Relation of childhood sexual abuse and other forms of maltreatment to 12-month postoperative outcomes in extremely obese gastric bypass patients. *Obesity Surgery*. 2006; 16:454. [PubMed: 16608610]
- Harris EC, Barraclough BM, Winslow F. Suicide as an outcome for medical disorders. *Medicine*. 1994; 73:281. [PubMed: 7984079]
- Jones-Corneille LR, Wadden TA, Sarwer DB. Risk of depression and suicide in patients with extreme obesity who seek bariatric surgery. *Obesity Management*. 2007; 3:255–260.
- Kalarchian MA, Marcus MD, Levine MD, Courcoulas AP, Pilkonis PA, Ringham RM, et al. Psychiatric disorders among bariatric surgery candidates: Relationship to obesity and functional health status. *American Journal of Psychiatry*. 2007; 164:328. [PubMed: 17267797]
- Kaplan MS, McFarland BH, Huguet N. The relationship of body weight to suicide risk among men and women: Results from the US National Health Interview Survey linked mortality file. *The Journal of Nervous and Mental Disease*. 2007; 195:948–951. [PubMed: 18000458]
- Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry*. 1999; 56:617–626. [PubMed: 10401507]
- Kolotkin RL, Crosby RD, Koslowski KD, Williams GR. Development of a brief measure to assess quality of life in obesity. *Obesity Research*. 2001; 9:102–111. [PubMed: 11316344]
- Lauder W, Mummery K, Jones M, Caperchione C. A comparison of health behaviours in lonely and non-lonely populations. *Psychology, Health & Medicine*. 2006; 11:233–245.
- Mather AA, Cox BJ, Enns MW, Sareen J. Associations of obesity with psychiatric disorders and suicidal behaviors in a nationally representative sample. *Journal of Psychosomatic Research*. 2009; 66:277–285. [PubMed: 19302884]
- Mukamal KJ, Wee CC, Miller M. BMI and rates of suicide in the United States: An ecological analysis. *Obesity*. 2009; 17:1946–1950. [PubMed: 19390524]
- Murphy JM, Horton NJ, Burke JD, Monson RR, Laird NM, Lesage A, et al. Obesity and weight gain in relation to depression: Findings from the Stirling County study. *International Journal of Obesity*. 2009; 33:335–341. [PubMed: 19139752]
- Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, et al. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *The British Journal of Psychiatry*. 2008; 192:98. [PubMed: 18245022]
- Omali BI, Ives DG, Buhari AM, Lindner JL, Schauer PR, Wecht CH, et al. Death rates and causes of death after bariatric surgery for Pennsylvania residents, 1995 to 2004. *Archives of Surgery*. 2007; 142:923. [PubMed: 17938303]

- Osman A, Bagge CL, Gutierrez PM, Konick LC, Kopper BA, Barrios FX. The Suicidal Behaviors Questionnaire-Revised (SBQ-R): Validation with clinical and nonclinical samples. *Assessment*. 2001; 8:443. [PubMed: 11785588]
- Owen JE, Bonds CL, Wellisch DK. Psychiatric evaluations of heart transplant candidates: Predicting post-transplant hospitalizations, rejection episodes, and survival. *Psychosomatics*. 2006; 47:213. [PubMed: 16684938]
- Pompili M, Girardi P, Tatarelli G, Ruberto A, Tatarelli R. Suicide and attempted suicide in eating disorders, obesity and weight-image concern. *Eating Behaviors*. 2006; 7:384–394. [PubMed: 17056416]
- Preti A, Rocchi MBL, Sisti D, Camboni MV, Miotto P. A comprehensive meta-analysis of the risk of suicide in eating disorders. *Acta Psychiatrica Scandinavica*. 2011; 124:6–17. [PubMed: 21092024]
- Rosen LW, Aniskiewicz AS. Psychosocial functioning of two groups of morbidly obese patients. *International Journal of Obesity*. 1983; 7:53. [PubMed: 6840967]
- Russell DW. UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*. 1996; 66:20–40. [PubMed: 8576833]
- Sansone RA, Schumacher D, Wiederman MW, Routsong-Weichers L. The prevalence of binge eating disorder and borderline personality symptomatology among gastric surgery patients. *Eating Behaviors*. 2008; 9:197–202. [PubMed: 18329598]
- Sansone RA, Wiederman MW, Schumacher DF, Routsong-Weichers L. The prevalence of self-harm behaviors among a sample of gastric surgery candidates. *Journal of Psychosomatic Research*. 2008; 65:441–444. [PubMed: 18940374]
- Scott KM, Hwang I, Chiu WT, Kessler RC, Sampson NA, Angermeyer M, et al. Chronic physical conditions and their association with first onset of suicidal behavior in the world mental health surveys. *Psychosomatic Medicine*. 2010; 72:712. [PubMed: 20498290]
- Sturm R. Increases in morbid obesity in the USA: 2000–2005. *Public Health*. 2007; 121:492–496. [PubMed: 17399752]
- Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner TE Jr. The interpersonal theory of suicide. *Psychological Review*. 2010; 117:575–600. [PubMed: 20438238]
- World Health Organization. Report of a World Health Organization Expert Committee. Geneva: Author; 1995. Physical status: The use and interpretation of anthropometry.

TABLE 1
Means, Standard Deviations, and Ranges or Rates for Demographic and Independent Variables, Comparing Suicidal and Nonsuicidal Groups

	Nonsuicidal (<i>n</i> = 313)	Suicidal ^a (<i>n</i> = 21)	Total (<i>N</i> = 334)	Range for <i>N</i> = 334	<i>t</i> / χ^2	<i>p</i>
Age <i>M</i> (<i>SD</i>)	43.92 (11.42)	42.14 (12.05)	43.81 (11.44)	19.00–73.00	.66	.518
Body mass index <i>M</i> (<i>SD</i>)	48.79 (8.98)	52.28 (9.77)	49.00 (9.06)	33.74–91.85	–1.60	.125
Minority (Black, Hispanic, Asian, Pacific Islander, Native American or other) <i>n</i> (%)	159 (50.8)	7 (33.3)	166 (49.7)	Not applicable	2.40	.121
Marital status married <i>n</i> (%)	172 (55.0)	8 (38.1)	180 (53.9)	Not applicable	2.25	.134
Education—some college and above <i>n</i> (%)	264 (84.3)	13 (61.9)	277 (82.9)	Not applicable	7.00	.008*
Gender—female <i>n</i> (%)	236 (75.4)	18 (85.7)	254 (76.0)	Not applicable	1.15	.284
History of suicide ideation and/behavior <i>n</i> yes (%) ^b	.65 (1.39)	2.43 (11.54)	.76 (1.46)	.00–6.00	–5.16	<.001***
Current psychological distress <i>M</i> (<i>SD</i>) ^c	0.48 (.45)	1.11 (.52)	0.52 (.48)	.00–2.40	–5.42	<.001***
Lifetime major depressive disorder <i>n</i> yes (%) ^d	109 (34.8)	12 (57.1)	121 (36.2)	Not applicable	4.24	.039*
Beck Hopelessness Scale total <i>M</i> (<i>SD</i>)	2.95 (2.27)	4.57 (3.04)	3.05 (2.36)	1.00–17.00	–2.40	.026*
UCLA loneliness total <i>M</i> (<i>SD</i>)	36.55 (9.35)	44.86 (10.82)	37.07 (9.65)	20.00–68.00	–3.43	.002**
Weight-related physical functioning <i>M</i> (<i>SD</i>) ^e	37.54 (9.97)	39.38 (8.02)	37.66 (9.85)	15.00–55.00	–0.83	.327
History of physical and/or sexual abuse <i>n</i> yes (%)	57 (18.2)	7 (33.3)	64 (19.2)	Not applicable	2.91	.088
Beck Depression Inventory total <i>M</i> (<i>SD</i>)	10.80 (7.43)	26.43 (9.38)	11.78 (9.45)	.00–43.00	–7.48	<.001***

M, Mean; *SD*, standard deviation.

^a A score of 1 or over on the BDI question asking about suicide ideation was used as a cutoff for the presence of any suicide ideation in this study.

^b Suicidal Behaviors Questionnaire asking “Have you thought about or attempted to kill yourself in your lifetime?”

^c Brief Symptom Inventory—Global Severity Index.

^d From the clinical interview utilizing questions from the Structured Clinical Interview for *DSM-IV* (First et al., 1995).

^e Impact of Weight on Quality of Life—Physical Functioning subscale. *t* uses equal variances not assumed.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

TABLE 2

Separate Linear Regressions for Each Independent Variable of Interest with Suicide Ideation as the Dependent Variable (N = 334)^a

Independent variable	R^2	B	b	p
Age	.0001	.0003	-.011	.844
Body mass index	.006	.003	.002	.165
Minority status ^b	.010	-.059	-.098	.074
Marital status ^b	.001	-.023	-.039	.482
Education—some college ^b	.017	-.104	-.130	.018 *
Gender—female ^b	.002	.029	.041	.458
History of suicide ideation and/behavior ^c	.077	.057	.277	<.001 ***
Current psychological distress	.074	.170	.271	<.001 ***
Lifetime major depression ^b	.017	.082	.130	.017 *
Beck Hopelessness Scale	.025	.020	.160	.003 **
UCLA total—loneliness	.028	.005	.167	.002 **
Weight-related physical functioning	.001	.001	.038	.494
History of sexual and/or physical abuse ^b	.019	.104	.136	.013 *

B , beta coefficients (standardized regression equation); b , unstandardized coefficients; R^2 , % of variance in suicide ideation explained by an independent variable.

^aUtilized the Beck Depression Inventory question asking about suicide ideation.

^bCoded 0 = *no*; 1 = *yes*.

^cSuicide Behaviors Questionnaire asking “Have you thought about or attempted to kill yourself in your lifetime?”

* $p < .05$;

** $p < .01$;

*** $p < .001$.