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The Association between Distress Tolerance and Eating Expectancies among Trauma-Exposed College Students with Obesity

Brooke Y. Kauffman, M.A.^a, Jafar Bakhshaie, M.D. Ph.D.^b, Michael J. Zvolensky, Ph.D.^{a,c,d}

^aDepartment of Psychology, University of Houston, Houston, United States.

^bMenninger Department of Psychiatry & Behavioral Sciences, Baylor College of Medicine, Houston, United States.

^cDepartment of Behavioral Sciences, University of Texas MD Anderson Cancer Center, Houston, Texas, United States.

^dHealth Institute, University of Houston, Houston, Texas, United States.

Abstract

Objective: Obesity is a significant health concern among college populations, and trauma-exposed students are particularly at risk for behaviors associated with weight gain. There is need for further understanding of factors that may contribute to increased obesity among this population.

Participants: Participants included 139 trauma-exposed college students with obesity (76.3% females; $M_{\text{age}} = 25.4$ years, $SD = 8.07$).

Method: The current cross-sectional study examined distress tolerance in terms of expectancies of eating to help manage negative affect to lead to feeling out of control among trauma-exposed college students with obesity.

Results: Results indicated that lower perceived distress tolerance was associated with greater expectancies of eating to help manage negative affect and to lead to feeling out of control.

Conclusions: These findings suggest that distress tolerance may be a clinically significant target for treatment in order to better understand and treat expectancies of eating among trauma-exposed college students with obesity.

Keywords

Obesity; Distress; Eating; Trauma; College

*Correspondence may be sent to Michael J. Zvolensky, The University of Houston, 126 Heyne Building, Houston, Texas 77204-5502, United States. mjzvolen@central.uh.edu (Phone): 713-743-8056; (Fax): 713-743-8588.

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According to the most recent American College Health Association-National College Health Assessment II, 37% of college students in the United States (U.S.) are considered overweight or obese as indicated by a Body Mass Index (BMI) of 25 or greater.¹ Moreover, trauma exposure is alarmingly high among the college population with an estimated 59% of students who have reportedly been exposed to a DSM-5 post-traumatic stress disorder (PTSD) Criterion A trauma (e.g., “serious accident, fire or explosion” “life-threatening illness”).^{2,3} Further, a growing body of research suggests that trauma exposure may predispose individuals for the onset and maintenance of obesity.^{4–14} For example, Williamson and colleagues⁷ found that adults who reported previous childhood trauma (e.g., physical abuse, sexual abuse) were at higher risk for obesity as an adult. In line with this work, Gustafson and colleagues¹¹ suggested that exposure to traumatic events, such as sexual abuse, may be a risk factor for subsequent weight gain in adulthood as a result of disordered eating (e.g., binge eating) or the possibility that obesity may provide an adaptive function (e.g., defense against sexual advances).

Disordered eating behaviors, such as binge eating, have been found to be associated with more severe and earlier onset of obesity.¹⁵ Thus, given that a history trauma exposure is a risk factor for maladaptive eating behaviors such as binge eating,¹⁴ a better understanding of cognitive processes (i.e., eating expectancies) that may precede these behaviors may have salient clinical implications in the treatment and maintenance of obesity. Eating expectancies represent one important domain in need of further study as applied to trauma-obesity research. Eating expectancies represent beliefs about the expected consequences of eating, including eating to manage negative affect or leading to a loss of control (i.e., expectancies of eating to help manage negative affect and expectancies of eating to lead to feeling out of control).¹⁶ Eating expectancies are clinically important and may help explain maladaptive eating behaviors (e.g., binge eating)¹⁷ that may put individuals at risk factor for excessive weight gain.¹⁵ For instance, extant work has found that an experience of loss of control is a salient feature in binge eating disorder.¹⁸ Moreover, eating in response to aversive symptoms (e.g., negative affect) has been found to be related to higher levels of binge eating behavior.¹⁷

Although eating expectancies may play an important role in understanding maladaptive eating behaviors, there is highly limited work related to individual differences factors that may explain eating expectancies among trauma-exposed college students with obesity. One promising construct is distress tolerance, which reflects one’s perceived or objective inability to withstand aversive emotional or physical states.¹⁹ Transdiagnostic models of the affective mechanisms involved with the maintenance of maladaptive eating suggest that distress intolerance is a possible vulnerability factor.^{20,21} Specifically, research has found that perceived distress tolerance was inversely related to emotional eating, external eating (i.e., eating in response to environmental cues), and disinhibition (i.e., general overeating) among college students considered overweight/obese²⁰ and among a community sample.²¹ However, this work did not focus on eating expectancies or trauma-exposed samples.

The experience of a traumatic event has been identified as a risk factor for lower distress tolerance for negative emotions.²² Accordingly, college students with obesity who have experienced a traumatic event may be at greater risk for engaging in maladaptive coping

behaviors in response to perceived inability to tolerate distress.^{20,21} For example, students with lower distress tolerance may perceive themselves to be less capable of managing negative emotions, such as PTSD symptoms, irritability, or anxiety, and consequently, may be more motivated to eat to cope with such distress.^{23,24} Furthermore, students with lower distress tolerance may experience a lack of control while eating due to the use of eating as a comfort or distraction strategy.^{25,26} Theoretically, given this repeated pattern of behavior as a result of lower distress tolerance, trauma-exposed students with obesity may form distinct cognitive expectancies related to the function and their control of eating,¹⁶ which may further perpetuate maladaptive behaviors associated with weight gain (e.g., greater calorie consumption).²⁷ Thus, there is clinical significance in the investigation of the role of distress tolerance and eating expectancies among trauma-exposed college students in order to better understand factors that may contribute to or maintain obesity.

The current study sought to provide an initial empirical test of the relationship between distress tolerance and eating expectancies among trauma-exposed college students with obesity. We hypothesized that lower perceived distress tolerance would be significantly related to eating expectancies to manage negative affect and eating to lead to feeling out of control. Moreover, it was expected that the observed relations would be evident after controlling for sex,²⁸ BMI,²⁹ and PTSD symptom severity.^{30,31}

Materials and Methods

Participants

The current sample consisted of 139 undergraduate and post-baccalaureate students enrolled at a large, southwestern university. Participants were majority females (76.3%) with an average age of 25.4 years ($SD = 8.07$) and reported exposure to at least one traumatic event ($M = 2.2$, $SD = 1.50$) defined by the DSM-IV-TR PTSD Criterion A.³² For the current analysis, participants were selected for the current study by obesity status (defined as a BMI ≥ 30) with the final sample consisting of participants with an average BMI of 35.24 ($SD = 25.03$). Participants were asked to indicate the traumatic life event that they found most disturbing and indicated the following: disaster (35.2%), sexual assault with someone you know (13.6%), sexual contact under 18 with someone 5 or more years older (7.9%), accident (7.2%), non-sexual assault by a stranger (5.7%), life-threatening illness (3.6%), sexual assault by a stranger (2.9%), combat (2.1%), non-sexual assault with someone they know (2.1%), and other (19.4%).

Measures

Demographic Questionnaire.—A demographic questionnaire was used to collect data including age, sex (assigned at birth), and race/ethnicity.

Body Mass Index (BMI).—Participants self-reported their height and weight. BMI for each participant was then calculated ($703 \text{ [weight (pounds)]/[height (inches)}^2\text{)]}$ per World Health Organization (WHO) recommendations.³³

Posttraumatic Diagnostic Scale (PDS).³⁴—The PDS is a 49-item self-report measure of trauma. Respondents are asked to indicate if they have been exposed to a DSM-IV-TR PTSD Criterion A³² traumatic event as well as any associated PTSD symptoms based on DSM-IV criteria.³² PTSD symptom severity was assessed with 17-items of the PDS in which participants were asked to report the frequency of bothersome symptoms experienced in the past month related to the most upsetting traumatic event. In past work, the PDS has evidenced excellent psychometric properties³⁵ and the 17-item PDS total severity score yielded excellent internal consistency ($\alpha = .97$) in the current study.

Distress Tolerance Scale (DTS).³⁶—The DTS is a 15-item self-report measure of the following domains: (1) perceived ability to tolerate emotional distress (Tolerance); (2) attention being absorbed by negative emotions (Absorption); (3) subjective appraisal of distress (Appraisal); and (4) regulation efforts to alleviate distress (Regulation). Respondents are asked to indicate on a 5-point Likert-type scale the extent to which they agree or disagree with items. A DTS total score is created by taking the mean of the four domains with lower scores indicative of lower tolerance for distress. The DTS has demonstrated good psychometric properties in previous work.³⁶ In the current study the DTS total score demonstrated excellent internal consistency (Cronbach's $\alpha = .94$).

Eating Expectancy Inventory (EEI).¹⁶—The EEI is a 34-item self-report measure of the cognitive expectancies related to eating. The EEI consists of five subscales: (1) eating helps manage negative affect; (2) eating is pleasurable and useful as a reward; (3) eating leads to feeling out of control; (4) eating enhances cognitive competence; and (5) eating alleviates boredom. Participants are asked to rate on a 7-point Likert-type scale whether they agree or disagree with each cognitive expectancy item. The EEI subscales have demonstrated strong psychometric properties among college, clinical, and adolescent samples.^{16,37} The subscales expectancies of eating to help manage negative affect (Cronbach's $\alpha = .94$) and expectancies of eating to lead to feeling out of control (Cronbach's $\alpha = .70$) were utilized in the current study.

Procedure

Participants were part or full time undergraduate or post-baccalaureate students at a large, southwestern university between the ages of 18 and 64, who reported exposure to at least one lifetime traumatic event per DSM-IV-TR PTSD Criterion A and were proficient in English. Participants were recruited via flyers and website postings indicating extra credit towards their psychology course as compensation. Prior to participation, informed consent was obtained from all participants. The study protocol was approved by the Institutional Review Board at the university where the study took place.

Analytic Strategy

Analyses for the current study were conducted in SPSS version 25.0. Quality assurance checks were conducted and cases with inappropriate or careless responding were excluded (e.g., nonsensical responses; $n = 6$). To address missing data ($n = 16$ of BMI data), Little's missing completely at random (MCAR) test was conducted and was non-significant signaling that missing data were missing at random. As a result, missing data was imputed

using the expectation-maximization algorithm in SPSS 25.0. Participants were then selected by including respondents with a BMI of ≥ 30 from the expectation-maximization data set (although this was not a criterion for inclusion in the larger study). The final sample consisted of 139 trauma-exposed college students with obesity.

Sample descriptive statistics and zero-order/point-biserial correlations were first examined. Second, three 2-step hierarchical regressions were conducted for the two continuous criterion variables: (1) expectancies of eating to help manage negative affect and (2) expectancies of eating to lead to feeling out of control. Specifically, step 1 included covariates only (sex, BMI, and PTSD symptom severity). Step 2 included the addition of distress tolerance. The F statistic was utilized for each step as an indicator of model fit. Further, change in R^2 was utilized as a measure of increase in variance accounted for, whereas the squared semi-partial correlations (sr^2) for each predictor variable was used as a measure of effect size.

Results

Bi-variate Relations

Correlations for all study variables are presented in Table 1. Distress tolerance was negatively correlated with PTSD symptom severity ($r = -.50, p < .001$), expectancies of eating to help manage negative affect ($r = -.27, p < .01$), and expectancies of eating to lead to feeling out of control ($r = -.30, p < .001$).

Regression Analyses

Regression results are presented in Table 2. For expectancies of eating to help manage negative affect, step 1 of the model including covariates only was not significant. In step 2, the model was significant ($R^2 = .10, F(4, 134) = 3.60, p = .008$) and accounted for a significant increase in R^2 ($R^2 = .06, F(1, 134) = 8.65, p = .004$). Distress tolerance significantly predicted expectancies of eating to help manage negative affect ($b = -7.15, SE = 2.43, p = .004, sr^2 = .06$; see Table 2).

For expectancies of eating to lead to feeling out of control, step 1 of the model with covariates was not statistically significant. In step two, the model was significant ($R^2 = .09, F(4, 134) = 3.38, p = .011$); and accounted for a significant increase in R^2 ($R^2 = .06, F(1, 134) = 8.93, p = .003$). Distress tolerance significantly predicted expectancies of eating to lead to feeling out of control ($b = -1.68, SE = 0.56, p = .003, sr^2 = .06$; see Table 2).

Discussion

Despite existing work examining the relationship between distress tolerance and eating behaviors more generally,^{20,21} there is limited understanding of the role of distress tolerance and expectancies related to the function and control of eating among trauma-exposed college students with obesity. To help bridge this gap, the current study examined the association between distress tolerance and eating expectancies among trauma-exposed college students with obesity.

As predicted, lower perceived distress tolerance was related to expectancies of eating to help manage negative affect and eating to lead to feeling out of control. The observed effect sizes indicated that distress tolerance explained 6% of unique variance in both eating expectancies outcomes. The present study uniquely adds to the literature by highlighting the role distress tolerance may have on cognitive processes that may predispose individuals to unhealthy eating behaviors. These data are consistent with affect-oriented models of eating, which suggest that maladaptive eating behaviors (e.g., binge episodes) are often utilized as a form of affect regulation³⁸ which may arise from perceived inability to manage such distress. Theoretically, trauma exposed college students with obesity may be at risk for lower tolerance for distress.^{22,39–41} As such, these individuals may be more likely to cope through eating in an effort to reduce the distress caused by these experiences.^{20,21} The repeated pairing of eating to manage distress may lead to a learned expectation that eating helps to manage negative affect.^{23,24} Moreover, the repeated incidence of a lack of control while eating due to the use of eating as a comfort or distraction strategy may lead to expectancies related to the loss of control while eating.^{25,26} Thus, it may be clinically useful to address distress tolerance among this segment of the population to change cognitive expectancies related to eating, which may further perpetuate problems associated with weight gain such as greater calorie consumption.²⁷

When developing interventions for college students with obesity who have experienced traumatic events, it may be beneficial to employ tactics aimed at increasing distress tolerance. Some work has found that dialectical behavior therapy for binge eating (DBT-BE), which include distress tolerance components, is efficacious in reducing binge eating among individuals seeking weight-management services.⁴² Moreover, extant work has found that brief dialectical behavior therapy (DBT)-based skills training interventions and group DBT interventions^{43,44} reduced emotional eating and other markers of eating psychopathology among individuals with obesity. Finally, acceptance-based behavioral treatment (ABBT) for obesity, which incorporates components of both Acceptance and Commitment Therapy (ACT)⁴⁵ and DBT,⁴⁶ has shown some initial efficacy for weight loss among populations with obesity.⁴⁷ Future work is needed to further examine these interventions among college students with obesity who have been exposed to traumatic events.

The present study has several limitations. First, the sample was largely female (76.3%) who may have chosen to participate in order to earn extra credit for their psychology course. Thus, future work should include a larger proportion of males and recruit individuals from samples such as the general college population not necessarily seeking extra credit and the general community. Second, all measures were collected via self-report, including height and weight. Therefore, this method of collection may impose some limitations including underestimation of objective weight status⁴⁸ and the possibility of shared method variance. Future work should employ other data collection methodologies such as behavioral indices of distress tolerance (e.g., mirror-tracking, breath holding) and objective measures of height and weight to test the observed relations. Third, all data was collected at one time point. Future work should examine the observed relations longitudinally to allow for temporal sequencing. Fourth, the current study utilized DSM-IV criteria when assessing trauma definitions and symptomology. Thus, future work would benefit from utilizing the more

recent DSM-V criteria. Finally, BMI and PTSD symptom severity were not significantly related which is inconsistent with previous work.^{4,6–9} This finding may be due, in part, to the restricted range of both BMI and PTSD symptom severity evidenced in the current study. Thus, future work may benefit from examining the relations among college students across different BMI's and with clinical PTSD.

Overall, the current study provides initial empirical support in the relationship between distress tolerance and eating expectancies among trauma-exposed college students with obesity. These findings suggest that greater attention could be focused on distress tolerance as an individual difference factor relevant to better understanding specific eating expectancies. Future work is needed to extend this finding to determine if eating expectancies may serve as a mediator between distress tolerance and disordered eating behavior (e.g., binge eating). Such work may further elucidate the importance of distress tolerance in the treatment and intervention of adapting cognitive expectancies related to eating that may contribute to the onset and maintenance of obesity among trauma-exposed individuals with obesity.

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Table 1.

Descriptive Statistics and Bivariate Correlations between Study Variables (N = 139)

Variable	Observed Range	Mean/n (SD/%)	1	2	3	4	5	6
1. Sex ^a		106 (76.3%)	-					
2. BMI ^a	30.04 – 58.57	35.24 (5.03)	.02	-				
3. PTSD Symptom Severity ^a	0 – 51	11.16 (12.79)	.06	.16	-			
4. Distress Tolerance ^b	1 – 5	3.48 (0.97)	-.15	-.05	-.50***	-		
5. Eating Expectancies-Negative Affect ^c	18 – 120	56.21 (24.64)	-.10	.09	.15	-.27**	-	
6. Eating Expectancies-Control ^c	4 – 28	12.48 (5.68)	.02	.06	.173*	-.30***	.526***	-

Note.

 $p < .001$,**
 $p < .01$,*
 $p < .05$.^a Covariate;^b Predictor;^c Criterion;

Sex: % listed as females (Coded: 0 = male and 1 = female); BMI = Body Mass Index; PTSD Symptom Severity = Posttraumatic Diagnostic Scale-Total Severity Score²⁸; Distress Tolerance = Distress Tolerance Scale³⁰; Eating Expectancies-Negative Affect = Eating Expectancy Inventory-Eating Helps Manage Negative Affect subscale¹⁰; Eating Expectancies-Control = Eating Expectancy Inventory-Eating Leads to Feeling out of Control subscale.¹⁰

Table 2.**Hierarchical Regression Results**

<i>Eating Expectancies: Negative Affect</i>									
Model		<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	<i>CI (l)</i>	<i>CI (u)</i>	<i>sr</i> ²
1	Sex	−6.09	4.88	−0.11	−1.25	.214	−15.73	3.56	.01
	BMI	0.35	0.42	0.07	0.83	.410	−0.48	1.17	.00
	PTSD Symptom Severity	0.28	0.16	0.15	1.71	.090	−0.04	0.61	.02
2	Sex	−8.08	4.79	−0.14	−1.68	.094	−17.55	1.40	.02
	BMI	0.39	0.41	0.08	0.96	.337	−0.41	1.20	.01
	PTSD Symptom Severity	0.01	0.18	0.01	0.07	.941	−0.35	0.38	.00
	Distress Tolerance	−7.15	2.43	−0.28	−2.94	.004	−11.96	−2.34	.06
<i>Eating Expectancies: Control</i>									
Model		<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	<i>CI (l)</i>	<i>CI (u)</i>	<i>sr</i> ²
1	Sex	0.09	1.13	0.01	0.08	.938	−2.14	2.32	.00
	BMI	0.04	0.10	0.03	0.40	.689	−0.15	0.23	.00
	PTSD Symptom Severity	0.07	0.04	0.17	1.94	.054	0.00	0.15	.03
2	Sex	−0.38	1.11	−0.03	−0.34	.732	−2.57	1.81	.00
	BMI	0.05	0.09	0.04	0.53	.598	−0.14	0.24	.00
	PTSD Symptom Severity	0.01	0.04	0.03	0.26	.793	−0.07	0.10	.00
	Distress Tolerance	−1.68	0.56	−0.29	−2.99	.003	−2.79	−0.57	.06

N for analyses is 139 cases. BMI = Body Mass Index; PTSD Symptom Severity = Posttraumatic Diagnostic Scale-Total Severity Score²⁸; Distress Tolerance = Distress Tolerance Scale³⁰; Eating Expectancies-Negative Affect = Eating Expectancy Inventory-Eating Helps Manage Negative Affect subscale¹⁰; Eating Expectancies-Control = Eating Expectancy Inventory-Eating Leads to Feeling out of Control subscale.¹⁰