

RESEARCH

Impact of Depressive Symptoms and Alcohol Use on Disordered Eating and Suicidality: A Moderated Mediation Study

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While previous studies have tested the mediating or moderating effects of select factors on disordered eating pathologies, no empirical studies have examined a moderated mediation model. Thus, filling a gap in the literature base, the current study examined a moderated mediation model to test the associations among disordered eating, depressive symptoms, alcohol use, and suicidality. The current study sample included 1,598 students (mean age 21.3 years; 80.9% female) across major universities in the United States. Results showed that disordered eating was significantly associated with suicidality, and the association was mediated by depressive symptoms. Further, the indirect effect of disordered eating via depressive symptoms varied in magnitude as a function of alcohol use. Findings suggest that clinical mental health counselors and other providers working with emerging adults should be vigilant in recognizing behaviors and thoughts associated with disordered eating and related signs and symptoms, including depressive symptoms and alcohol use.

Eating disorders are some of the most serious mental disorders described in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; American Psychiatric Association [APA], 2013), with significant life-threatening medical and psychiatric morbidity and mortality (Boughtwood & Halse, 2010; Hudson, Hiripi, Pope, & Kessler, 2007). The short- and long-term pernicious effects of eating disorders and the related signs and symptoms have been comprehensively described in the literature. The National Eating Disorders Association (2005) reported that in the United States, as many as

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10 million women and one million men are fighting a life-and-death battle with an eating disorder, and millions more are struggling with a binge eating disorder. Researchers have found that individuals with eating disorders are at an increased risk of suicide attempts (Corcos et al., 2002; Miotto, De Coppi, Frezza, & Preti, 2003).

Importantly, eating disorders are among the most prevalent disorders among emerging adults, with prevalence estimates ranging from 8% to 17% (Eisenberg, Nicklett, Roeder, & Kirz, 2011; Reinking & Alexander, 2005). Boughtwood and Halse (2010) reported that anorexia nervosa is the third most common illness among adolescent girls and has the highest mortality rate of all mental disorders. Most often, disordered eating attitudes include body, shape, or weight concerns, whereas disordered eating behaviors include extreme weight- or shape-control practices such as caloric restriction, extreme exercising, binge eating, purging, the use of laxatives, and other compensatory behaviors (Striegel-Moore & Bulik, 2007).

Notably, within the past decade, body image dissatisfaction has been increasingly considered as a potential risk factor for the development of depression among young adults (Crow, Eisenberg, Story, & Neumark-Sztainer, 2008; Lamis, Malone, Langhinrichsen-Rohling, & Ellis, 2010). For instance, Stice, Marti, & Rhode (2013), in a longitudinal study composed of 1,124 high school students aged 13.0 to 16.9 years, found that body dissatisfaction and disordered eating at baseline predicted onset of subsequent depression among initially nondepressed emerging adults. The researchers also found evidence of a positive relation between disordered eating and suicide risk (Stice et al., 2013). The importance of empirical studies examining disordered eating and related mental health corollaries and outcomes in college and university samples cannot be overstated.

DEPRESSION AMONG COLLEGE STUDENTS

Depressive symptoms among college students are also prevalent (Arria et al., 2009; Eiser, 2011). According to the American College Health Association–National College Health Assessment, a nationwide survey administered to college students, approximately 30% of college students reported experiencing feelings of depression in the past year (American College Health Association, 2012). Stress among young adults, especially college students, arises from a variety of factors, including changes related to the transition from high school and, in many cases, living independently for the first time (Reynolds, MacPherson, Tull, Baruch, & Lejuez, 2011) and uncertainty regarding acceptance by peers and even in family relationships. When individuals experience stressful situations, they rely on various resources and strategies to alter these situations and lessen their impact. Some individuals may turn to resources such as interpersonal networks, including family and/or friends. However, others may adopt negative coping strategies (e.g., alcohol or drug use) or other maladaptive behaviors (e.g., disordered eating) as means of coping with various emotional and social problems. Negative emotions such as those typically asso-

ciated with depressive symptoms have also been found to increase the tendency for disordered eating (Gluck, Geliebter, Hung, & Yahav, 2004).

ALCOHOL USE AMONG COLLEGE STUDENTS

The use of alcohol is present in all age groups. However, the problem may be greater among emerging adults attending college, where alcohol intake is often considered to be an integral part of their higher education experience. The 2015 National Survey on Drug Use and Health in the United States found that 58% of college students ages 18–22 had consumed alcohol in the past month, and 38% had engaged in binge drinking during that same time frame (Center for Behavioral Health Statistics and Quality, 2015). Substance abuse is associated with a myriad of negative consequences, including increases in risky sexual behaviors, emotional problems, and suicide attempts. Indeed, the association between alcohol use and depressive symptoms is well documented both in the general population (Boden & Fergusson, 2011; Danzo, Connell, & Stormshak, 2017) and among college students (Geisner, Larimer, & Neighbors, 2004). The co-occurrence of depression and alcohol abuse has been associated with an increased risk for suicide (Archie, Kazemi, & Akhtar-Danesh, 2012; Brière, Rohde, Seeley, Klein, & Lewinsohn, 2014). Studies have found that, in addition to the high rates of co-occurrence between eating disorders and alcohol use disorders (Franko et al., 2005; Gadalla & Piran, 2007), the co-occurrence of eating disorders and alcohol abuse is a significant predictor of suicide behaviors and mortality (Keel et al., 2003). Thus, in addition to depression being a predictor of suicidality by itself, having an alcohol use problem in conjunction with being depressed further increases the risk of suicidality.

SUICIDE AMONG COLLEGE STUDENTS

Suicide is the second leading cause of death among adolescents and young adults (15–34 years old) in the United States (Heron, 2016). Further, some researchers indicate that suicide rates in this group have been increasing in recent years (Dervic, Brent, & Oquendo, 2008; Spirito & Esposito-Smythers, 2006). Longitudinal studies show that adolescents reporting depressive symptoms at baseline reported later effects of suicide ideations (e.g., 1 year later; Reifman & Windle, 1995), and it is a commonly reported axiom that current suicide behaviors are predictive of future suicide behaviors (Hooper et al., 2015). Ross, Heath, and Toste (2009) found that compared to emerging adults who did not self-injure, those who self-injured not only reported being more dissatisfied with the shape and size of their body but also reported greater feelings of inadequacy, insecurity, and worthlessness, which are all feelings associated with depression. Indeed, Spirito and Esposito-Smythers (2006) observed that mental disorders—including depression—are associated with over 90% of suicides.

Extant research reveals several positive associations among the constructs of disordered eating symptoms, depressive symptoms, and suicidality within the

college population. The most significant gap in the literature is the intersection of these constructs with alcohol use among college women and men. The confluence of these constructs necessitates closer examination due to the grave nature and pernicious outcomes of eating disorders and suicidality. Further, given the known exacerbating effects of alcohol use on depressive symptomatology, a consideration of its effect on the relations among the study constructs is warranted (Keel et al., 2003).

THE CURRENT STUDY: CONCEPTUAL MODEL, AIMS, AND HYPOTHESES

The aims of the current study are threefold: (a) to investigate to what extent disordered eating symptoms predict suicidality in an emerging adult sample, (b) to clarify the role of depressive symptoms as a mediator of the relation between disordered eating symptoms and suicidality, and (c) to explore whether the mediating role of depressive symptoms varies by the level of alcohol use (i.e., problematic vs. nonproblematic). To conceptualize these pathways, we developed a moderated mediation model (see Figure 1). Based on this model, we hypothesized that individuals with disordered eating will have higher odds of suicidality (Hypothesis 1) and that the relation between disordered eating and suicidality will be mediated by depressive symptoms (Hypothesis 2). We also examined whether this mechanism applies to a greater extent to individuals with problematic alcohol use. Thus, we hypothesized that the indirect effect of disordered eating on suicidality through depressive symptoms would be greater for individuals with problematic alcohol use (Hypothesis 3). Lastly, we examined whether the direct association between disordered eating and suicidality was moderated by level of alcohol use (Hypothesis 4).

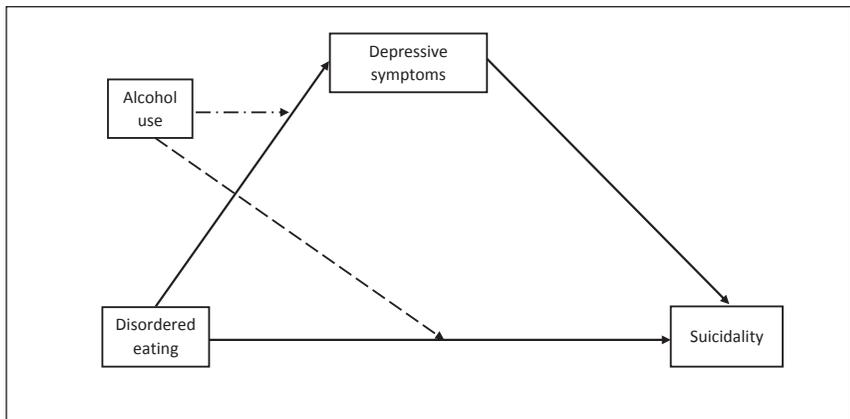


Figure 1. Conceptual model.

METHOD

Participants and Procedure

The study sample included 1,598 students across major universities in the United States. The mean age of the participants was 21.3 years ($SD = 5.5$). A majority of the participants were female (80.9%; $n = 1,293$). The racial or ethnic background of the participants was 79.4% White American ($n = 1,269$), 10.6% Black American ($n = 170$), 3.8% Hispanic or Latino ($n = 60$), 2.8% mixed race/ethnicity ($n = 45$), 2.1% Asian or Asian American ($n = 34$), 0.31% Native American ($n = 5$), and 0.81% other ($n = 15$).

Following institutional review board approval, participants were recruited for a study on childhood roles, responsibilities, and relationships and adult psychological functioning. A Web-based survey was used. The electronic invitation included a description of the study, a link to the survey, and an informed consent form. Extra course credit was provided as an incentive and as compensation for the time devoted to participation in the study. The complete procedure took approximately 30 minutes.

Measures

Demographic survey. The questionnaire, created for the purposes of this research study, asked for information regarding gender and current age. Participants were also asked to report their race and ethnicity.

Disordered eating symptoms. Eating behaviors and symptoms were assessed using the Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982). The EAT-26 is a 26-item self-report questionnaire developed to assess patterns of problematic eating. Participants respond to the questions using a 6-point Likert scale, from 1 (*always*) to 6 (*never*). Sample items include “I feel extremely guilty after eating” and “I have the impulse to vomit after meals.” Responses for each item are weighted from 0 to 3. Higher scores on the EAT-26 reflect a greater degree of disordered eating behaviors and symptomatology and a greater likelihood of a diagnosis of an eating disorder. A score of 26 or above is utilized as an indication of disordered eating. Evidence for validity and reliability of the EAT-26 scores in college student samples has been established (Garner et al., 1982; Ocker, Lam, Jensen, & Zhang, 2007). For the current study, we calculated a Cronbach’s alpha of .86. Scores on the EAT-26 were dichotomized in the current study and coded 0 = *EATS Score* < 26 and 1 = *EATS Score* \geq 26.

Depressive symptoms. The Beck Depression Inventory (BDI-II; Beck, Steer, Ball, & Ranieri, 1996) was used to measure psychological distress. The BDI-II consists of 21 self-rated questions that assess for depressive symptomatology consistent with the criteria for major depressive disorder delineated in the *DSM-5* (APA, 2013). Participants were asked to select the option that best corresponded to the way they had been feeling during the preceding 2 weeks. Responses were self-rated on a 4-point Likert-type scale: 0 (*absence of symptoms*) to 3 (*severe presence of symptoms*). The BDI-II was scored by summing the participant’s responses for each of its 21 items (Beck et al., 1996). Scores

ranged from 0 to 63; higher scores reflect greater severity of depressive symptomatology and a greater probability of a clinical diagnosis of major depression. With regard to reliability, scores from the BDI-II have been shown to have sound internal stability (e.g., .77 to .92; Carmody, 2005; Hooper & Doehler, 2011). For comparison, the original validation study—composed in part of college student participants—reported a Cronbach's alpha value of .93 (Beck et al., 1996). For the current study, we calculated a Cronbach's alpha of .93.

Alcohol use. The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) was used to measure problematic alcohol use. The AUDIT consists of 10 questions covering a wide range of issues associated with alcohol, including frequency of alcohol consumption, drinking behavior, and alcohol-related problems (e.g., “How many drinks containing alcohol do you have on a typical day when you are drinking?” “Have you or someone else been injured as a result of your drinking?”). The first eight questions are scored 0, 1, 2, 3, or 4, while Questions 9 and 10 are scored 0, 2, or 4 (see Saunders et al. [1993] for a detailed explanation). The responses for each item are summed, leading to a maximum score of 40 and a minimum score of 0. A score of 8 or more is used as an indication of a high likelihood for problematic alcohol consumption. Kokotailo et al. (2004) found the cutoff score of 8 had sensitivity and specificity of .82 and .72, respectively, among college students. Utilizing a cutoff score of 8 in the current study, the Alcohol Use Scale was dichotomized and coded 0 = *AUDIT Score* < 8 and 1 = *AUDIT Score* ≥ 8. For the current study, we calculated a Cronbach's alpha of .83.

Suicidality. The suicidality variable was constructed using questions about suicide behavior from the BDI-II (Beck et al., 1996) and EATS-26 (Garner et al., 1982) questionnaires. In the BDI-II questionnaire, participants were asked to pick a statement that best described the way they had been feeling in the previous 2 weeks, including the day of the survey, in regard to suicidal thoughts or intentions from the following options: 0, *I don't have any thoughts of killing myself*; 1, *I have thoughts of killing myself, but I would not carry them out*; 2, *I would like to kill myself*; and 3, *I would kill myself if I had the chance*. In the EATS-26 questionnaire, participants were to respond to the question: “Have you recently thought of or attempted suicide?” and were directed to give a *yes* or *no* response. Individuals who indicated that they did not have any thoughts of killing themselves (option 0 on the BDI-II) and a *no* response to whether they had recently thought of or attempted suicide (EATS-26) were coded as 0. Those who reported some suicidal thoughts (options 1 through 3 in BDI-II) and provided a *yes* response to recent thoughts or attempts of suicide on the EATS-26 were coded as 1. The dependent variable was thus described as 0 = *Reported no suicidal thoughts or attempts* and 1 = *Reported some suicidal thoughts or attempts*.

Data Analyses

Descriptive statistics were first used to describe the characteristics of the study population. Zero-order correlations were then conducted. Hypotheses 1 through 4 were tested using the moderated mediation statistical methods (e.g., Baron & Kenny, 1986; Edwards & Lambert, 2007; Preacher, Rucker, & Hayes, 2007) and PROCESS for SPSS macro (Hayes, 2012; Preacher et al., 2007).

RESULTS

Descriptive Characteristics and Zero-Order Correlations

Descriptive statistics and bivariate correlations are presented in Table 1. Approximately 16% (N = 250) of the participants scored 26 or above on the EATS-26 (Garner et al., 1982), indicating that they met criteria for disordered eating. Study participants' mean score for depressive symptoms as measured by the BDI-II (Beck et al., 1996) was 10.3 with a standard deviation of 9.4. More than a quarter of the participants (27.6%; N = 440) had an AUDIT (Saunders et al., 1993) score of 8 or more, indicating that they had a high likelihood for problematic alcohol consumption, and 13.8% (N = 220) of the study sample reported suicidal thoughts or attempts. Results of bivariate correlations showed that disordered eating behaviors, depressive symptoms, and alcohol use were all significantly and positively correlated with suicidality. Conversely, gender was significantly and negatively correlated with suicidality. That is, compared to male participants, female participants were less likely to report or attempt suicide.

Mediation

Age and gender were entered as control variables in our analyses. Hypothesis 1 predicted that students meeting criteria for disordered eating would have higher odds of suicidality compared to those who did not meet criteria for disordered eating. This hypothesis was confirmed by results indicating that the total effect of disordered eating on suicidality (Figure 2; Path c) was

Table 1 Descriptive Statistics and Bivariate Correlations

	Percentage	Mean (SD)	1	2	3	4	5
1. Female	80.9	—	—				
2. Depressive symptoms	—	10.3 (9.4)	.013	—			
3. With disordered eating	15.7	—	.061*	.291**	—		
4. Problematic alcohol use	27.6	—	-.130**	.129**	.106**	—	
5. Suicidality	13.8	—	-.078**	.552**	.176**	.097**	—

Note. N = 1,595.

*Correlation is significant at the .05 level (two-tailed). **Correlation is significant at the .01 level (two-tailed).

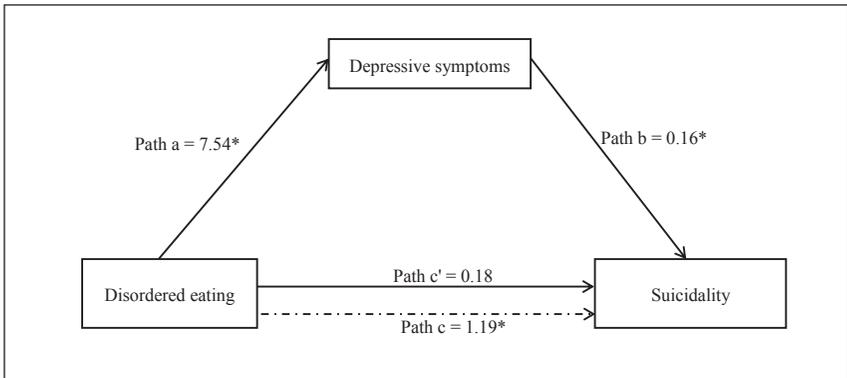


Figure 2. Simple mediation. Dotted lines show the effect of disordered eating on suicidality when depressive symptoms are not included as a mediator (i.e., total effect). * $p < .01$.

statistically significant (coefficient = 1.19, $p < .01$). In other words, participants meeting criteria for eating disorders (i.e., those with an EATS score ≥ 20) were 1.19 units more likely to engage in suicide behaviors than those not meeting criteria for eating disorders (i.e., EATS score < 20).

Table 2 and Figure 2 show the results for the test of mediation in the absence of moderation, indicating Paths a, b, c, and c' in addition to indirect effect via depressive symptoms (Hypothesis 2). Disordered eating significantly predicted depressive symptoms (coefficient = 7.54, $p < .01$; Path a). Depressive symptoms significantly predicted suicidality, after controlling for disordered eating (coefficient = 0.16, $p < .01$; Path b), indicating that two individuals whose score is similar for eating disorders (e.g., both with EATS score ≥ 20), but who differ by one unit in depressive symptoms, will differ by 0.16 unit on their risk of suicidality. The indirect effect, which is a product of Paths a and b (i.e., $7.54 \times 0.16 = 1.23$), was positively and statistically different from zero,

Table 2 Regression Results for Testing Mediation by Depressive Symptoms

	Outcome: Depressive symptoms			Outcome: Suicidality		
	Coeff.	SE	p	Coeff.	SE	p
Female (ref.: male)	-0.11	0.04	.96	-0.81	-3.79	< .01
Disordered eating	7.54	0.62	< .01	0.18	0.22	.42
Depressive symptoms	—	—	—	0.16	0.01	< .01
Constant	10.24	1.01	< .01	-3.58	0.45	< .01
	$R^2 = .085$			Nagelkerke $R^2 = .425$		
	$F(3, 1547) = 32.21, p < .01$			-2 log likelihood = 842.71		
Indirect effect of disordered eating \rightarrow suicidality: coeff. = 1.23, boot 95% CI [0.96–1.52]						

as evidenced by a 95% bias-corrected bootstrap confidence interval, through generating 5,000 bootstrap coefficient estimates that were entirely above zero (0.96, 1.52). This implies that those who had high concern for eating disorders were 1.23 units more likely to have high levels of suicidality than those with low concern for eating disorders, as a result of the effect of depressive symptoms, which in turn influenced suicidality. Finally, according to Baron and Kenny (1986), the strength of the relation between the predictor and outcome should be significantly reduced when the mediator is added to the model (i.e., Path c', coefficient = 0.18, $p = .42$), as opposed to when there was no mediator, (i.e., Path c, coefficient = 1.19, $p < .01$). The reduction in our analysis was 84.9%, which is substantial but not a reduction to zero, indicating that depressive symptoms partially mediated the relation between eating disorders and suicidality. Thus, there was partial support for Hypothesis 2.

Moderated Mediation

To assess for moderated mediation, we examined the conditional indirect effect of disordered eating on suicidality through depressive symptoms as well as the direct effect of alcohol use on the relationship between disordered eating and suicidality. According to Preacher et al. (2007), the first part of the test is the essence of moderated mediation, and it establishes whether the strength of the mediation via depressive symptoms differs across the two levels of alcohol use (i.e., problematic and nonproblematic alcohol use). Thus, moderated mediation is demonstrated when the conditional indirect effect of disordered eating on suicidality, via depressive symptoms, differs in strength across levels of alcohol use (i.e., problematic vs. nonproblematic alcohol use). As shown in Table 3, there was a statistically significant interaction between disordered eating and alcohol use in the model with depressive symptoms as the outcome (coefficient = 3.32, $p < .01$). This significant interaction is indicative of moderated mediation (Preacher & Hayes, 2008), meaning that the magnitude of the indirect effect of disordered eating (predictor), via the depressive symptoms (mediator), varies in magnitude as a function of alcohol use (moderator).

To further validate the moderation of alcohol use on the indirect effect of disordered eating on suicidality through depressive symptoms, Preacher et al. (2007) recommended estimating conditional indirect effects and testing whether these indirect effects differ from zero at specific values of the moderator using bootstrap confidence intervals. Utilizing the bootstrap method with 5,000 samples, the results (see Table 3) showed that the conditional indirect effect of disordered eating on suicidality via depressive symptoms was stronger and significant among the problematic alcohol-use group, coefficient = 1.81, 95% CI [1.31–2.33], $p < .01$, when compared to nonproblematic alcohol-use group, coefficient = 1.11, 95% CI [0.84–1.40], $p < .05$. Thus, Hypothesis 3 was supported.

Lastly, the moderation of the direct relation between disordered eating and suicidality by alcohol use (Hypothesis 4) was not supported. This was

Table 3 Regression Results for Testing the Moderation and Mediated Moderation of the Relation Between Depressive Symptoms and Suicidality

	Outcome: Depressive symptoms			Outcome: Suicidality		
	Coeff.	95%	CI	Coeff.	95%	CI
Female (ref.: male)	0.26	-0.87	1.38	-0.76**	-1.19	0.34
Depressive symptoms	—	—	—	0.16**	0.14	0.19
Disordered eating	6.07**	4.57	7.59	0.48	-0.05	1.02
Alcohol use	1.53**	0.41	2.65	0.45*	0.001	0.89
Disordered eating × alcohol use	3.32**	0.81	5.84	-0.85 [†]	-1.69	-0.001
	Conditional direct effect			Conditional indirect effect		
	Coeff.	95%	CI	Coeff.	95%	CI
Alcohol abuse						
Problematic	-0.66	-1.51	0.18	1.81	1.31	2.33
Nonproblematic	0.15	-0.29	0.60	1.11	0.84	1.40

[†] $p < .1$. * $p < .05$. ** $p < .01$.

evidenced by the nonsignificant results of the interaction between disordered eating and alcohol use, coefficient = -0.85 , 95% CI $[-1.69-0.11]$, *ns*.

DISCUSSION

The current study examined a moderated mediation model to test a proposed mechanism for the associations among disordered eating, depressive symptoms, alcohol use, and suicidality. The current study allows for clarification on how and for whom disordered eating is associated with suicidality. Importantly, a strength of the current study is the consideration of the correlational and predictive strength of signs and symptoms from multiple diagnostic categories on suicidal behaviors. Another strength of the present study is both the use of a nonclinical population (i.e., college students) and a relatively large sample size. Galaif, Newcomb, Vega, and Krell (2007), in a review of studies assessing the associations among depression, alcohol use, and suicidality, identified two factors (i.e., utilization of clinical populations and small sample size) that serve as noteworthy limitations in the studies addressing the interrelations among these constructs. Thus, the aims and findings of the current study preliminarily fill a gap in the literature. The following is a discussion of our results in light of the current literature base.

First, our finding that students who met criteria for probable disordered eating had higher odds of suicidality compared to their peers who did not meet the criteria for disordered eating concurs with previous studies (e.g., Brausch &

Gutierrez, 2009; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011). Disordered eating among emerging adults can be attributed—in part—to the importance they place on, and the attention they pay to, body image and to how their peers think and feel about their bodies (Kirsch, Shapiro, Conley, & Heinrichs, 2016). While this hyperfocus may be viewed as “normal” emerging adult behavior, it can unfortunately lead to and exacerbate destructive behaviors such as disordered eating, which have far-reaching consequences, including suicidality. This view was shared by youth in a study by Laye-Gindhu and Schonert-Reichl (2005), where participants, who were adolescents, noted that disordered-eating behavior constituted self-harm. Similar to respondents in the current study, 15% of their sample ($N = 424$) reported self-harm behaviors.

Second, the finding that depressive symptoms mediated the relation between disordered eating and suicidality supports Brausch and Gutierrez’s (2009) assertion that disordered eating constitutes a reflection of attitudes and feelings about the self. Indeed, Ross et al. (2009) noted that disordered eating behaviors such as “binging may provide a more indirect, nevertheless concrete way of relieving feelings of distress” (p. 88). Thus, disordered eating behaviors appear to be a reflection of the underlying distress within the individual, which can then lead to suicide. Our findings related to depression mediating the association between disordered eating and suicidality among college students are consonant with the findings described by Miotto and Preti (2007) in their sample of 930 older adolescents (aged 15–18). In their study, depression and aggressiveness fully mediated the relation between eating disorders and suicidality. Similarly, the long-reported proposition that depressive symptoms account for suicide behaviors when the depressive symptomatology is comorbid with other disorders and symptoms was evidenced in the current study, although in our study—different than Miotto and Preti’s (2007) study—we found partial mediation, not full mediation.

Third, we found some support for our hypothesized moderated mediation models. More specifically, we found that the strength of the mediated association between disordered eating and suicidality via depressive symptoms was impacted by the level of alcohol use (problematic use vs. nonproblematic use). Our findings are consistent with the research that indicates alcohol use may be a risk factor for suicide behaviors (Keel et al., 2003). Thus, in our study, problematic alcohol use had an exacerbating effect on the relations between mental health symptoms (depressive symptoms) and suicidality.

Fourth, our hypothesis that alcohol use will moderate the strength of the direct relation between disordered eating and suicidality (direct effect), such that the association will be stronger for problem alcohol use than non-problem alcohol use, was not supported. This result concurs with Locke and Newcomb’s (2005) study involving 349 young Latino men ($M = 19$ years, $SD = 3.97$ years). The researchers found that alcohol use had an indirect but not a direct influence on suicidality. Locke and Newcomb (2005), however, did find a direct association between “hard drug use” and suicidality. In a study assessing the severity of alcohol abuse (and not just the presence of alcohol), Keel et al. (2003) found that the severity of alcohol use disorder, in addition

to suicide gestures and attempts, was among the strongest and most consistent predictors of fatal mortality.

Finally, gender was implicated in the study's findings. Results showed that after controlling for all study variables, female emerging adults were significantly less likely to report suicidality when compared to male emerging adults. This finding contradicts previous studies indicating that female emerging adults, and emerging adults in general, typically report higher levels of suicidal behavior than male adolescents and emerging adults (Fitzpatrick et al., 2008; Rhodes et al., 2014). While this finding needs further research, it indicates that college and university counselors and other health care providers working with emerging adults should consider male and female clients equally when evaluating suicidal risks. This is especially true based on past research findings indicating that while reports of suicide behaviors may be higher among female than among male youth (e.g., suicidal ideations; Tomek et al., 2015), death by suicide is more common in young men than in young women (Rhodes et al., 2014).

LIMITATIONS AND FUTURE RESEARCH

Weighing the limitations of the current study can help extend and inform future research on the psychological and physical health of college students. In the current study, five specific limitations ought to be considered. First, the current study used a cross-sectional design, and thus it is not possible to make inferences or provide information related to causality. Second, the current study is composed of self-report information and therefore could have introduced bias and error in the data. Third, the study is composed of a convenience sample of students who may have had a specific interest in the study foci. This may have created a potential selection bias for the current study. Future studies should aim to include more objective measures (e.g., clinical diagnostic interviews) to capture disordered eating, depressive symptoms, and substance use. Fourth, we created a measure for our outcome variable, suicidality. Future studies may consider using a different measure to capture suicide behaviors. A fifth limitation is that the current study failed to consider cultural factors that may further explain for whom these relations are most salient. Although we considered gender, future studies should consider cultural factors, such as race, ethnicity, and sexual orientation (Franko et al., 2005; Hooper et al., 2015). The direct relationship between alcohol abuse and suicidality needs further investigation. Future studies may consider evaluating whether it is the severity of alcohol use and not just the presence of alcohol use that influences suicidality.

IMPLICATIONS FOR CLINICAL MENTAL HEALTH COUNSELORS

Notwithstanding the limitations, findings from the current study indicate that professionals, including clinical mental health counselors and other health care providers, working with emerging adults must be vigilant in recognizing behaviors and thoughts associated with eating disorders and related signs and

symptoms. These findings point to the need for counselors to consider when, how, and for whom suicide behaviors emerge. The moderating role of alcohol use is an important factor that ought to be considered in the assessment process when disordered eating symptoms are present. Counselors as well as other mental health providers ought to screen for disordered eating symptoms, depressive symptoms, and alcohol use, given that all of these mental health conditions could serve as antecedents and outcomes to commonly experienced distress among emerging adults (Weitzman, 2004). In addition, some emerging adults may use disordered eating and suicide behaviors as coping methods to contend with commonly observed issues (e.g., academic challenges; financial strain; peer, romantic, and family relationships; and on- and off-campus discrimination) among emerging adults (Eiser, 2011).

Disordered eating behaviors are common in emerging adults, and thus these behaviors also could serve as antecedents to depressive symptoms. Further, there is a need for college campuses to eliminate the shame and/or stigma associated with eating disorders, as some emerging adults may not feel comfortable discussing issues related to this diagnostic category. Toward this end, Swanson et al. (2011) found that while a majority of youth with eating disorders sought treatment for emotional or behavioral problems, many did not. Assessing for suicidality when clients present with depressive symptoms is commonly done and considered best practice among college and university counseling center providers. Findings from the current study show it is equally important to assess for suicidality, comorbid depressive symptoms, and substance use among both female and male clients who present with disordered eating signs and symptoms.

CONCLUSION

While extant literature examines disordered eating symptoms, depressive symptoms, suicidality, and gender differences among adolescents, these constructs have rarely been studied jointly (Grossbard, Atkins, Geisner, & Larimer, 2013) or among emerging adults. The present study represents a step in documenting that depressive symptoms, substance use, and suicidality should be considered jointly when assessing for and treating disordered eating symptoms and behaviors. Importantly, the current study adds to literature indicating that the presence of comorbid disorders likely increases the odds of suicide behavior among emerging adults—in particular, depressive symptoms and alcohol use along with disordered eating.

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