Characterizing alcohol-related disordered eating behaviors in adults with binge eating

Megan L. Wilkinson (mlm582@drexel.edu)
Drexel University https://orcid.org/0000-0001-5207-6021

Laura E. Boyajian
Drexel University

Adrienne S. Juarascio
Drexel University

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Abstract

Purpose - Alcohol-related disordered eating behaviors (ADEBs; i.e., engagement in dietary restriction or excessive exercise before or after drinking alcohol to avoid weight gain) are associated with negative psychosocial and medical consequences. Previous research has primarily studied ADEBs among community samples. Individuals with clinically-significant binge eating may also engage in ADEBs given high rates of alcohol use and inappropriate weight-control behaviors. The current study aimed to characterize the prevalence and psychological correlates (i.e., weight and shape concerns, alcohol consumption, binge eating frequency) among individuals with clinically-significant binge eating.

Methods – Participants were 166 treatment-seeking individuals who engaged in once weekly binge eating over the past three months. Participants completed a clinical interview to assess eating disorder symptoms and self-report measures of alcohol consumption patterns and ADEB engagement.

Results - Over one-fourth of participants endorsed at least one ADEBs in the past three months. Participants who endorsed ADEBs reported greater alcohol consumption than participants who drank alcohol but did not endorse ADEBs, after controlling for eating disorder diagnosis. Greater frequency of ADEBs was related to higher weight and shape concerns among individuals who endorsed ADEBs in the past three months. Presence of ADEBs and ADEBs frequency were not related to binge eating frequency.

Conclusion - Results suggest that clinicians treating individuals with binge eating who drink alcohol should screen for ADEBs and assess how ADEBs may contribute to an individual's eating pathology. Further research is necessary to explain how ADEBs may maintain binge eating or affect treatment outcomes.

Level of Evidence: Level V, descriptive studies

What Is Already Known On This Subject?

Previous research has highlighted the prevalence and associated psychosocial and health consequences of alcohol-related disordered eating behaviors (ADEBs) among college and community samples. There is some preliminary evidence to suggest that ADEBs may also be present among individuals with clinically significant binge eating, however no research has characterized the prevalence and psychological correlates of ADEBs in clinical binge-eating samples.

What this study adds?

While more research is needed in this area, the current study adds to the literature on ADEBs by demonstrating that a notable subset of participants with binge eating engage in ADEBs. Furthermore, our results indicate that participants who endorse ADEBs report greater alcohol consumption, and that higher ADEBs frequency is associated with greater weight and shape concerns. Clinicians treating individuals

with binge eating should screen for ADEBs, particularly among individuals with BN-spectrum diagnoses, and assess how ADEBs may contribute to the maintenance of the patient's eating pathology.

Introduction

Alcohol-related disordered eating behaviors (ADEBs), also referred to as "drunkorexia" or "food and alcohol disturbance", describe the behavioral pattern by which individuals engage in dietary restriction or excessive exercise before or after a drinking episode to offset their caloric intake and avoid weight gain from alcohol [1,2]. Engagement in these behaviors is associated with several negative medical consequences, including alcohol poisoning, blackouts, and cognitive impairment [3]. Although ADEBs have been primarily studied among community samples (e.g., college students) [4-6], there is evidence to suggest that ADEBs occur within clinical binge-eating samples. For instance, higher rates of alcohol use have been endorsed among those with binge eating when compared to the general population [7,8], and individuals with binge eating are likely to already be engaging in disordered eating behaviors (e.g., dietary restriction, excessive exercise) to compensate from calories from eating episodes [9]. Only one study to date has examined ADEBs in a clinical binge-eating sample [10]. In an ecological momentary assessment study of women with binge eating, individuals who endorsed fasting to control one's weight at a given timepoint were also likely to report binge drinking. However, there are still unanswered questions regarding the prevalence of other ADEBs outside of fasting (e.g., reducing food intake, excessive exercise) and whether engagement in ADEBs is associated with more severe eating disorder symptoms or alcohol use in clinical samples.

Prior research implicates weight and shape concerns, alcohol use patterns, and binge eating frequency as potentially relevant psychological correlates of ADEBs among clinical binge-eating samples [1,4,5]. Heightened concern about weight and shape may cause individuals to use ADEBs to make up for calories consumed when drinking alcohol. Additionally, because an individual believes they can use ADEBs to make up for alcohol calories, they may relax strict dietary rules about calorie consumption during drinking episodes and consume more drinks when drinking than individuals who drink alcohol but do not use ADEBs. The calorie deficit resulting from ADEBs may increase the likelihood for binge eating in response to physiological hunger, resulting in more frequent binge-eating episodes for individuals regularly engaging in ADEBs. Previous research from non-clinical college samples has reliably demonstrated that higher weight and shape concerns and problematic or frequent alcohol use predict ADEBs engagement [6]. Additionally, theoretical models of ADEBs propose that ADEBs may contribute to the maintenance of binge eating through similar mechanisms as identified by Fairburn's transdiagnostic model of eating disorder maintenance [1]. Although there is reason to hypothesize that individuals with binge eating who engage in more frequent ADEBs will report higher weight and shape concerns, greater alcohol use, and greater binge eating frequency, these relationships have not yet been tested in clinical binge-eating samples.

Given the severe health consequences associated with ADEBs, characterizing the frequency, types, and psychological correlates of ADEBs among individuals with binge eating is an important next step for

clarifying the prevalence and associated consequences of this behavior pattern in clinical samples. The current study plans to test the following aims among treatment-seeking adults with transdiagnostic binge eating: (1) characterize the frequency and types of ADEBs in clinical binge-eating sample, (2) test the hypothesis that individuals who engage in ADEBs endorse higher weight and shape concern, greater alcohol use, and more frequent binge-eating episodes in the past three months compared to individuals who drink alcohol but do not engage in ADEBs, and (3) test the hypothesis that, among individuals who engage in ADEBs, greater frequency of ADEBs is associated with higher weight and shape concern, greater alcohol use, and more frequent binge eating.

Methods

Participants and Procedures

The current study was a secondary data analysis of baseline data from two ongoing clinical trials for binge eating. Participants were recruited from the community using radio and social media advertising and completed a phone screen with a trained assessor to determine initial eligibility. Participants then completed a baseline assessment where final eligibility was determined via the Eating Disorder Examination interview [11]. Participants were included if they were at least 18 years old and experienced at least one objectively- or subjectively-large binge-eating episode per week over the past three months. Participants were excluded if they had recent changes in any psychiatric medications, were pregnant or planning to become pregnant, or were currently enrolled in or planning to enroll in other psychotherapy for binge eating or weight loss treatment. Self-report measures of alcohol consumption and ADEBs were administered at the baseline assessment. Baseline assessments took place remotely via videoconferencing software. All study procedures were approved by the university Institutional Review Board, and all participants provided informed consent and were compensated for their participation.

The sample for the current study included 166 treatment-seeking adults with at least one binge-eating episode per week. 4 participants did not complete the self-report questionnaires and were excluded from the sample. 70.4% participants identified as women, with others identifying as men (19.1%), non-binary (3.1%), transgender (0.6%), questioning or unsure (2.5%), or none of the above (0.6%); 6 participants did not complete the item. Participants were between the ages of 18 – 70 years old (*M (SD)* = 42.81 (13.82)) years old. The majority of the sample identified as White (70.4%), with others identifying as Black or African American (13.6%), Asian (7.4%), American Indian/Alaskan Native (0.6%), more than one race (6.2%), or unknown or prefer not to say (3.1%); 13 participants did not complete the item. Participants received the following eating disorder diagnoses at baseline: Bulimia Nervosa (BN; 21.0%), Binge-Eating Disorder (BED; 35.8%), Other Specified Feeding or Eating Disorders - BN of low frequency (OSFED-BN; 21.6%), OSFED - BED of low frequency (OSFED-BED; 21.6%).

Measures

Eating Pathology. The EDE 17.0 [12], a semi-structured diagnostic interview, was used to assess binge eating frequency and weight and shape concerns. Binge eating frequency was calculated as the total

number of objectively and subjectively large binge-eating episodes in the past three months. EDE Weight Concerns and Shape Concerns subscales were calculated. Subscale scores ranged from 0 – 6, and higher scores indicated greater weight and shape concerns. The EDE is a valid and reliable instrument that has been used extensively in studies of individuals with eating disorders.

Alcohol Consumption. Alcohol consumption over the past three months was assessed via the National Institute on Alcohol Abuse and Alcoholism (NIAAA) three question screener. Participants were provided with examples of a standard alcoholic drink and asked to rate the frequency of drinking episodes (Likert scale from 0 (“Never”) to 8 (“Every day”)) and typical number of drinks per episode (Likert scale from 1 (“1 drink”) to 10 (“25 or more drinks”)) over the past three months. Alcohol consumption was calculated by multiplying the frequency of drinking episodes over the past three months by the typical number of drinks per episode (range 0 – 80). These screening items are consistent with items used in other brief alcohol screeners (e.g., Alcohol Use Disorders Identification Test-Concise) which have demonstrated validity and reliability in a variety of samples [13,11].

Alcohol-Related Disordered Eating Behaviors (ADEBs). ADEBs was assessed using self-report items from the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS) [14]. Participants reported how often they skipped meals, limited food intake, or exercised before and after drinking to avoid weight gain over the past three months. Frequency was rated on a Likert scale from 0 (“Never”) to 4 (“Almost all the time”). ADEBs frequency for the current study was calculated as the average of the 6 items. The CEBRACS has been demonstrated sound psychometric properties [15,14].

Statistical Analyses

SPSS 26.0 was used for all analyses. Analysis of variance (ANOVAs) were used to assess whether ADEBs frequency was related to demographic characteristics (i.e., gender, age, eating disorder diagnosis). There were no significant differences in ADEBs frequency based on gender or age. ADEBs frequency significantly differed by eating disorder diagnosis ($F(3, 117) = 9.87$, $p < .001$). Post-hoc analyses found that participants with BN reported significantly more ADEBs than participants with BED or OSFED-BED, but did not significantly differ from participants with OSFED-BN. Based on these analyses, eating disorder diagnosis was included as a covariate in all regression analyses.

Descriptive statistics were calculated to characterize the type and frequency of ADEBs in the sample in Aim 1. Stepwise linear regressions were used for Aims 2 and 3. In all regression models, eating disorder diagnosis was included as a covariate in Step 1, and presence of ADEBs or ADEBs frequency was added as a predictor in Step 2.

Results

Aim 1 Results

121 participants (74.7%) reported alcohol use in the past three months, and 44 participants (27.2%) endorsed engaging in ADEBs at least one time over the past three months. Descriptive statistics for the type and frequency of each ADEBs item are displayed in Table 1. Participants frequently engaged in multiple types of ADEBs, with participants reporting on average 3.57 different types of ADEBs (SD = 1.66). Additionally, over two-thirds (68.2%, *N* = 30) of participants engaged in ADEBs both before and after drinking episodes to avoid weight gain.

Table 1
Type and Frequency of ADEBs among individuals who endorsed at least one ADEBs in the past three months (*n* = 44)

ADEBs	**Number of Participants** *n* **(%)**	**Frequency Rating (0–4)** M (SD)
Skipped meal prior to drinking episode	27 (61.4%)	0.95 (1.06)
Limited food intake prior to drinking episode	35 (79.5%)	1.45 (1.17)
Exercised prior to drinking episode	25 (56.8%)	1.00 (1.14)
Skipped meal after drinking episode	18 (49.9%)	0.61 (0.92)
Limited food intake after drinking episode	27 (61.4%)	1.09 (1.18)
Exercised after drinking episode	25 (56.8%)	1.18 (1.30)
Total	**44**	**1.05 (0.80)**

Aim 2 Results

Results for Aim 2 are presented in Table 2. Of the participants who reported drinking alcohol in the past three months (*N* = 121), the presence of ADEBs was significantly related to greater alcohol consumption when controlling for eating disorder diagnosis. Adding the presence of ADEBs as a predictor in the regression model predicting alcohol consumption significantly improved the model, and the presence of ADEBs explained an additional 6.8% of the variance in alcohol consumption (R^2 = 0.073, R^2 change = 0.068, F change (1, 118) = 8.63, $p < 0.01$). The presence of ADEBs did not significantly contribute to the regression models predicting weight concerns, shape concerns, or binge eating frequency.

Table 2
Results from Aims 2 and 3 Regression Models.

Predictor	Dependent Variable	Coef.	SE	Std. Coef.	t	*p*
ADEBs Presence/Absence	Weight Concerns	< 0.01	0.21	< 0.01	0.02	0.985
	Shape Concerns	-0.02	0.21	-0.01	-0.10	0.925
	Alcohol Consumption	**3.92**	**1.33**	**0.26**	**2.94**	**0.004**
	BE Frequency	-17.22	10.64	-0.15	-1.62	0.108
ADEBs Frequency	**Weight Concerns**	**0.08**	**0.04**	**0.30**	**2.04**	**0.048**
	Shape Concerns	**0.07**	**0.03**	**0.35**	**2.37**	**0.022**
	Alcohol Consumption	-0.01	0.25	-0.01	-0.05	0.961
	BE Frequency	1.16	1.61	0.11	0.72	0.476

Abbreviations: Coef, coefficient; SE, standard error; Std Coef, standardized coefficient; BE, binge eating.

Bold-type font indicates models with significant predictor ($p < 0.05$) after controlling for eating disorder diagnosis.

Aim 3 Results

Results for Aim 3 are presented in Table 2. Among individuals who reported engaging in ADEBs ($N = 44$), greater ADEBs frequency significantly predicted higher weight concerns and higher shape concerns when controlling for eating disorder diagnosis. Adding ADEBs frequency as a predictor significantly improved the regression models for weight concerns and shape concerns, and ADEBs frequency explained an additional 9.1% of the variance in weight concerns ($R^2 = 0.099$, R^2 change = 0.091, F change (1, 41) = 4.15, $p = 0.048$) and an additional 12.0% of the variance in shape concerns ($R^2 = 0.123$, R^2 change = 0.120, F change (1, 41) = 5.63, $p = 0.022$). Greater ADEBs frequency did not significantly contribute to the regression model predicting alcohol consumption or binge eating frequency.

Discussion

ADEBs are a serious concern due to their association with severe health consequences and their potential to contribute to the maintenance of binge eating. The current study aimed to characterize the type, frequency, and psychological correlates of ADEBs in a clinical binge-eating sample. Over one-fourth of the participants in the current study reported engagement in ADEBs in the past three months. Limiting food intake prior to drinking episodes was reported most frequently, while skipping meals after drinking was reported least frequently. Most participants did not engage in ADEBs frequently, with the average frequency rating reported as “Rarely, about 25% of the time”. Although these participants did not report

frequent engagement in these behaviors, participants engaged in a variety of types of ADEBs before and after drinking episodes to compensate for alcohol-related calories. In sum, a notable subset of participants with binge eating in our sample reported engagement in ADEBs. Considering the negative consequences of ADEBs [3], our results suggest a need for clinicians treating individuals with binge eating to screen for ADEBs and assess how ADEBs may contribute to an individual's eating pathology.

In addition to characterizing the types and frequency of ADEBs, the current study examined the psychological correlates of ADEBs among individuals with binge eating. The results demonstrated that participants who endorsed ADEBs in the past three months reported significantly greater alcohol consumption than participants who drank alcohol but did not endorse ADEBs. Because the current study used cross-sectional measures, we are unable to interpret the causal relationships between alcohol consumption and ADEBs. Greater consumption of alcohol could result in a higher concern about alcohol-related calories and greater likelihood of using ADEBs to avoid weight gain from drinking. On the other hand, individuals who engage in ADEBs may be at risk for drinking more alcohol during drinking episodes because they know they can use ADEBs to compensate for alcohol-related calories. Future research should use momentary assessment methods to elucidate how alcohol consumption and ADEBs influence each other.

Our results also found that higher ADEBs frequency among individuals who endorsed ADEBs was associated with greater weight and shape concerns, but not alcohol consumption or binge eating frequency. Since the items we used to assess ADEBs asked about behaviors used to avoid weight gain, it makes sense clinically that individuals who use these behaviors more frequently are more concerned about their weight and shape. These results are also consistent with theoretical models that suggest overvaluation of shape and weight contributes to the maintenance of ADEBs. Given that ADEBs frequency was not related to alcohol consumption or binge eating frequency in our sample, there is reason to think that the maintenance of ADEBs is not dependent on these factors. However, it is still important to understand how ADEBs might contribute to the maintenance of eating disorder symptoms for the subset of individuals engaging in ADEBs. For example, ADEBs may tax an individual's self-control resources prior to drinking and result in the individual being at a greater risk for binge eating when disinhibited by alcohol. Momentary assessment methods may be useful for exploring the temporal relationship between ADEBs and eating disorder symptoms (e.g., binge eating, dietary restraint, compensatory behaviors in response to food calories).

Strengths And Limits

The current study was strengthened by using a clinical binge-eating sample and validated measures of eating pathology, alcohol use patterns, and ADEBs. However, the results of the study should also be considered in light of the study limitations. First, our sample primarily identified as White and female, limiting our ability to generalize findings to other demographics. Second, the current study only included ADEBs items assessing use of ADEBs to avoid weight gain and did not assess whether ADEBs were used

to enhance intoxication effects. Third, the cross-sectional design limited our ability to interpret causal effects. Fourth, the use of retrospective self-report measures may be subject to inaccuracies of participant memory recall. Lastly, there was limited variability in ADEBs in the current sample. Future research may benefit from studying ADEBs among patients with BN-spectrum diagnoses (e.g., BN, OSFED-BN), given that our study found higher prevalence of ADEBs among participants with these diagnoses.

Statements And Declarations

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Ethics Approval: The parent studies were approved and overseen by the Drexel University Institutional Review Board (IRB Protocols #2009008088 and #2001007570), and all participants provided informed consent and were compensated for their participation.

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