

Drunkorexia: An Exploratory Investigation of College Students With Alcohol-Related Infractions

Victor E. Tuazon, Sterling P. Travis, Eleni M. Honderich, Amy E. Williams,
Sarah E. I. Menefee, and Charles F. Gressard

The construct of drunkorexia, caloric restriction prior to or during alcohol consumption, was examined in 411 college students who experienced alcohol-related infractions. Analyses were conducted to examine differences in demographic prevalence distributions, alcohol-related consequences, and alcohol consumption between a subsample of participants who reported drunkorexia behaviors and a subsample who did not.

Keywords: drunkorexia, alcohol consequences, college students, eating disorders, substance use disorders

Alcohol abuse and disordered eating are two primary health concerns on college campuses (Pedrelli, Nyer, Yeung, Zulauf, & Wilens, 2015), and there is a high comorbidity between the two, showing increased risk for having problematic drinking and eating behaviors (Fouladi et al., 2015). In 2013, the National Eating Disorders Association reported that the rate of eating disorders had risen to 10%–20% of college women and 4%–10% of college men. The pressures to be thin and get drunk on college campuses (Carter, Brandon, & Goldman, 2010; Young, Morales, McCabe, Boyd, & D'Arcy, 2005) may lead to compensatory weight-control behaviors when consuming calorically dense alcoholic drinks (Eisenberg & Fitz, 2014). *Drunkorexia*, a term used to describe eating and drinking behaviors of “‘weight conscious’ drinkers” (Barry & Piazza-Gardner, 2012, p. 236), is commonly characterized by compensating for caloric intake of alcohol by (a) skipping meals, (b) excessive exercising, and/or (c) purging consumed food (Chambers, 2008).

Roosen and Mills (2015) found that 46% of university students intentionally changed eating behaviors before drinking alcohol. Limiting caloric intake prior to drinking puts college students at an increased risk for becoming intoxicated and subsequently experiencing negative alcohol-related consequences; female students who engage in this behavior are likely to report memory loss, injury, having unprotected sex, and being taken advantage of sexually, while men are likely to engage in physical fights (Giles, Champion, Sutfin, McCoy, & Wagoner, 2009). Giles et al. (2009) found that 39% of college-age drinkers reported restricting calories within the previous 30 days when planning to

Victor E. Tuazon, Sterling P. Travis, Sarah E. I. Menefee, and Charles F. Gressard, School Psychology and Counselor Education, William & Mary; Eleni M. Honderich, Department of Behavioral Health, Walden University; Amy E. Williams, Department of Counseling, Youngstown State University. Victor E. Tuazon is now at Department of Counselor Education, New Jersey City University. Sterling P. Travis is now at Department of Counseling & Human Services, Johns Hopkins University. Eleni M. Honderich is now at The Family Institute, Northwestern University. Correspondence concerning this article should be addressed to Victor E. Tuazon, Department of Counselor Education, New Jersey City University, 2039 Kennedy Boulevard, Rossey Hall 536, Jersey City, NJ 07305 (email: vtuzon@njcu.edu).

© 2019 by the American Counseling Association. All rights reserved.

drink alcohol, with 67% of these drinkers restricting calories because of weight concerns. Research has also highlighted motivations for caloric restriction, linking it to a desire to avoid weight gain and to enhance the effects of alcohol (Burke, Cremeens, Vail-Smith, & Woolsey, 2010).

Although some studies have found no gender differences in college students' motivations for caloric restriction when drinking (Burke et al., 2010), other research supports that women are more concerned than men are about weight (Eisenberg & Fitz, 2014) and are significantly more likely to restrict eating before drinking (Barry, Whiteman, Piazza-Gardner, & Jensen, 2013; Giles et al., 2009). Roosen and Mills (2015) found that female college students who restrict eating prior to drinking to avoid weight gain score higher on disordered eating measures and that female students who restrict eating to become intoxicated faster score higher on alcohol abuse measures. Furthermore, female college students who reported using exercise to compensate for alcohol consumption reported more alcohol consumption, binge-drinking episodes, alcohol-related problems, impulsivity, body dissatisfaction, and dietary restraint than women who did not use exercise to compensate (Buchholz & Crowther, 2014). However, when examining gender differences, Barry et al. (2013) found that male college students were more likely to exercise due to alcohol consumption. Despite the literature describing increased prevalence of binge drinking among highly active peers (Barry & Piazza-Gardner, 2012; Piazza-Gardner & Barry, 2012), there has been little research on the relationship between drunkorexia and athletic status. In addition, fraternity-sorority life (FSL) affiliation has been associated with increased alcohol consumption (Brown-Rice & Furr, 2015), with recent literature indicating higher propensity toward drunkorexia behaviors (Ward, Galante, Trivedi, & Kahrs, 2015).

Although research has been conducted on the relationship between drunkorexia and consequences, motives, and demographic variables, the construct itself is relatively new (Kershaw, 2008). Research that confirms previous results and addresses current gaps in the literature is important. One such gap is the lack of research on drunkorexia with college students who have experienced alcohol-related infractions. An integral component of drunkorexia is increased alcohol consumption, and researchers have noted increased alcohol consequences for those engaging in drunkorexia behaviors (Buchholz & Crowther, 2014). In the present study, we sought to further explore the construct of drunkorexia in college students who were referred to counseling for alcohol violations, paying specific attention to demographic differences (i.e., gender, FSL affiliation, and athletic affiliation) and to differences in alcohol-related consequences between two groups: those who were defined as being drunkorexic and those who were not.

Current Research

The informal, nonmedical term drunkorexia was first used by popular media to describe behavior by college students who restricted their diet or engaged in purging to compensate for planned bingeing on alcohol or alcohol and food (CBS, 2008; Kershaw, 2008). News outlets reported anecdotal accounts of

these behaviors and interviewed medical and mental health professionals who confirmed that drunkorexia could be an issue for many college-age students and clients with eating disorders (CBS, 2008). Overnight, drunkorexia made its way into the public eye with little or no confirming empirical research. Researchers over the last decade have been making efforts, however, to define and explore drunkorexia.

Eating and substance use disorders have reached epidemic proportions on college campuses (Barry et al., 2013; Burke et al., 2010), with alcohol cited as a major contributor to accidental deaths of young adults ages 18 to 24 (Giles et al., 2009). Researchers examining eating issues have found that 91% of college students diet, with 25% of these students reporting dieting and weight related concerns (Giles et al., 2009). Drunkorexia is a construct that may help contextualize this relationship (Ward & Galante, 2015). Burke et al. (2010) found that 14% of college freshmen reported restricting calories prior to drinking, with 6% using this behavior to avoid weight gain and 10% using it to enhance the effects of alcohol. Although these findings are compelling, inconsistencies in the definition of drunkorexia have been a barrier to research. Piazza-Gardner and Barry (2013) proposed that the lack of a systematic definition leads to subjective interpretation of the term and an inability to operationalize it as a behavior. They found that “some scholars indicate drunkorexia consists of food/caloric restriction and alcohol-related behaviors, whereas others contend the term is inclusive of alcohol-related behaviors, dieting, and physical activity” (p. 312). Although research into drunkorexia behaviors should continue, Piazza-Gardner and Barry suggested, the use of the misnomer—which is not recognized by medical communities—hinders consistent research efforts and the translation of research into clinical practice.

As drunkorexia remains a nonmedical term, there is no standard definition used in conducting research on drunkorexia, and limited research exists focused on individual motivation to engage in drunkorexia behaviors (Dierks & Ward, 2013; Ward & Galante, 2015). The majority of research on drunkorexia has maintained the general definition of drunkorexia as weight-conscious drinking (Barry & Piazza-Gardner, 2012). Without a standardized definition to guide research efforts, researchers have used operational definitions of drunkorexia that focus on specific aspects of drunkorexia to be researched. For instance, Burke and colleagues (2010) focused on calorie restriction preceding alcohol consumption by college freshmen. Rahal, Bryant, Darkes, Menzel, and Thompson (2012) described drunkorexia as eating and exercising behaviors used to compensate for alcohol consumption following or preceding the event. Some researchers view drunkorexia behaviors as engaging in restricting/binge purge behaviors, while others include excessive exercise in their definition (Dierks & Ward, 2013; Ward & Galante, 2015). These inconsistencies make it difficult to explore drunkorexia. Although there have been efforts to more clearly define drunkorexia, such as Chambers’s (2008) characterization of drunkorexia as alcohol-caloric compensation achieved by skipping meals, excessive exercise, and/or purging. However, these definitions remain informal and require more research to provide for a more operationalized definition.

Ward and Galante (2015) noted that little is known regarding the motivation for students to engage in activities typically associated with one or more operational definitions of drunkorexia. Ward and Galante developed an instrument to measure drunkorexia behaviors and motives and investigated whether behaviors occurred prior to, during, or following alcohol consumption. This research provided evidence of reasons college students engage in drunkorexia behavior; they found that drunkorexia stems from social conformity behaviors and that males have higher motivation for drunkorexia behaviors (Ward & Galante, 2015).

Purpose of the Study

The current study examined the construct of drunkorexia by comparing those participants who met an operational definition of drunkorexia with those who did not within a sample of college students who were referred to counseling for campus alcohol offenses. Research Questions 1 through 4 examined whether differences existed between the subsamples in the areas of (a) gender, (b) athletic status, (c) FSL affiliation, and (d) alcohol-related consequences. Research Question 5 examined whether differences existed in participants' weekly alcohol consumption averages and consequences as contingent on factors of drunkorexia and/or gender.

Method

Participants

Participants were students attending a medium-sized, public university in the Southeast who had been referred for clinical services because of alcohol-related infractions. These students participated in the Brief Alcohol Screening Intervention for College Students (BASICS) program from October 2011 to January 2016, from which archival data were obtained. As part of the BASICS program, participants completed a variety of measures and demographic questions. Clinical referral was made by the university's dean of student conduct office for alcohol-related offenses, including underage possession of alcohol, open container, and public intoxication, which occurred either on or off campus. Services were provided in an on-campus alcohol intervention clinic grounded in motivational interviewing. We identified 427 potential participants, 16 of whom were considered ineligible due to incomplete responses. A total of 411 participants (96.3%) were included in the present study. The sample was categorized into two subsamples: those participants who demonstrated drunkorexia behavior and those who did not.

The drunkorexia subsample was operationally defined as participants who (a) responded affirmatively that they sometimes, rarely, or never ate before drinking and (b) showed concern about their current body image/size (e.g., currently/often dieting, shape/weight influencing self-efficacy, and/or fear of gaining weight) either currently or on a sometimes/slightly, often/moderately,

or always/extremely level. Participants not meeting these criteria were operationally defined as nondrunkorexia participants. Of the 411 participants, 47 (11.4%) met the operational definition for drunkorexia; the remaining 364 participants were used as a comparative sample.

Instruments and Survey Items

Alcohol Use Disorders Identification Test (AUDIT). Developed in collaboration with the World Health Organization, the AUDIT (Saunders & Aasland, 1987) measures problematic alcohol use, including frequency/quantity of use, depression-related symptomatology, and consequences such as shame or physical injury (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Consisting of 10 items, the AUDIT has a Cronbach's alpha internal reliability coefficient of .86 and a test-retest correlation coefficient of .90 (Rubio, Bermejo, Caballero, & Santo-Domingo, 1998). AUDIT scores range from 0 to 40: Scores ranging from 8 to 15 are appropriate for informal resolution (e.g., feedback related to reducing hazardous drinking); scores ranging from 16 to 19 suggest the need for brief intervention and continued monitoring; and scores equal to or greater than 20 suggest the potential for an alcohol use disorder/dependence and warrant further evaluation (Babor et al., 2001).

Rutgers Alcohol Problem Index (RAPI). Developed with a sample of college-age students and young adults, the RAPI (White & Labouvie, 1989) measures symptoms and consequences stemming from potential problematic drinking. Tangible (e.g., social, school) consequences are measured (White, Labouvie, & Papadaratsakis, 2005). Consisting of 23 items, the RAPI yields scores ranging from 0 to 92, with higher scores indicating increased severity/frequency of consequences. Researchers have found a Cronbach's alpha internal reliability coefficient of .92 for the RAPI (White & Labouvie, 1989).

Daily Drinking Questionnaire (DDQ). The DDQ (Collins, Parks, & Marlatt, 1985) measures alcohol consumption patterns by tabulating the number of drinks and hours spent drinking for each day of a typical week within the previous 30 days. DDQ scores represent average weekly drinking patterns across the domains of quantity, frequency, and total consumption (Collins et al., 1985). For the purpose of the present study, average alcohol consumption was tabulated by summing the quantity of alcoholic drinks consumed throughout the week and dividing that by the number of reported days of weekly drinking behavior.

Demographics, body-image concerns, and eating behavior when drinking. Participants were asked to identify the following demographic information: (a) gender, (b) age, (c) weight, (d) educational class, (e) athletic sport affiliation, and (f) FSL affiliation. Six items were used to determine potential body-image and weight-related concerns, and a seventh item was used to assess behavior. The first four items (i.e., "Have you felt fat?" "Have you had a definite fear that you might gain weight or become fat?" "Has your weight influenced how you think about [judge] yourself as a person?" and "Has your shape influenced how you think about [judge] yourself as a person?") were assessed

on a 7-point Likert scale, with possible responses ranging from *not at all* to *extremely*. The fifth item (i.e., “How often are you dieting?”) was assessed on a 5-point Likert scale, with responses ranging from *never* to *always*. The sixth item (i.e., “Are you on a diet now?”) allowed a binary response of no or yes. To assess whether they limited caloric intake when drinking, participants were asked, “Do you eat before and/or during drinking?” These responses were measured on a 5-point Likert scale ranging from *never* to *always*.

Procedure and Data Analysis

An archival data set was used for the present study, and initial data collection occurred for the purpose of service provision in the BASICS program. Following institutional review board approval, we used SPSS software (Version 24.0) for analysis, computing overall and subsample measures of central tendency. We examined differences between drunkorexia and nondrunkorexia subsamples within the demographic categories of gender, athletic status, and FSL affiliation; Pearson chi-square tests were conducted followed by phi statistics, examining the strength of the association. We used an independent-samples *t* test to analyze mean differences between the groups on alcohol consequences, as measured on the RAPI, and conducted a two-way analysis of variance (ANOVA) to examine differences of weekly alcohol consumption and consequences, as measured on the DDQ and AUDIT contingent on the variables of drunkorexia and gender. We conducted two-tailed analyses and set initial alpha levels at .05.

Ethical Considerations

Original data collection was conducted in a clinical setting; therefore, consent to participate in this research could not be obtained prior to this study. Despite this, measures were already in place to protect participants' privacy, including (a) data storage on an encrypted network and (b) the use of random, computer-generated identification numbers for participants. In addition, as all data were collected via a secure online survey, the clinic had provided computer technology for participants to complete the required surveys, eliminating potential identification through IP addresses.

Results

Participant Descriptive Statistics

Drunkorexia behavior group. Of the total sample ($N = 411$), 47 participants met criteria for placement in the group demonstrating drunkorexia behavior. Of these, 46.8% ($n = 22$) identified as female and 53.2% ($n = 25$) as male. Ages ranged from 18 to 26 years ($M = 19.64$, $SD = 1.85$), and reported weight ranged from 105 to 304 pounds ($M = 163.43$, $SD = 42.56$). With respect to affiliation with a university athletic team (e.g., team member), 10.6% ($n = 5$) of the drunkorexia group participants indicated affiliation, and the remaining 89.4%

($n = 42$) reported no athletic affiliation. Regarding FSL membership, 55.3% ($n = 26$) identified as nonmembers and 44.7% ($n = 21$) identified as members.

Nondrunkorexia behavior group. Of the total sample, 364 participants were in the group that did not demonstrate drunkorexia behavior. Of these, 31.3% ($n = 114$) identified as female and 68.7% ($n = 250$) as male. Ages ranged from 13 to 56 years ($M = 19.80$, $SD = 2.68$), and reported weight ranged from 95 to 320 pounds ($M = 161.13$, $SD = 35.56$). With respect to affiliation with a university athletic team, 7.4% ($n = 27$) of nondrunkorexia group participants indicated affiliation, and the remaining 92.6% ($n = 337$) reported no athletic affiliation. Regarding FSL membership, 48.4% ($n = 176$) identified as nonmembers and 51.6% ($n = 188$) identified as members.

Instruments' Descriptive Statistics

AUDIT. Based upon both groups of participants' responses for the AUDIT, total-derived scores ranged from 1 to 26 ($M = 9.72$, $SD = 4.75$). Internal consistency reliability analysis for the sample yielded a Cronbach's alpha of .70. The data were nonnormally distributed, with significant skewness of 0.77 ($SE = 0.12$) and significant kurtosis of 0.50 ($SE = 0.24$). Pictorial representation illustrated overall lower mean scores with few outliers and flatness of data with more values located in one of the tails of the distribution. Nonnormal distribution of data may be explained by the scoring and content of this specific instrument; lower scores located on the left side of the tail are indicative of an individual having less severe and fewer alcohol-related consequences when compared with potential maximum scores.

RAPI. Participants' total-derived scores on the RAPI ranged from 0 to 46 ($M = 6.56$, $SD = 6.53$). Internal consistency reliability analysis yielded a Cronbach's alpha of .85. The data were nonnormally distributed, with significant skewness of 1.98 ($SE = 0.12$) and significant kurtosis of 6.05 ($SE = 0.24$). Similar to the AUDIT, nonnormal distribution of RAPI scores illustrates that, although participants experience alcohol-related consequences, the overall mean for the RAPI was not representative of a moderate frequency/severity.

DDQ. Average number of drinks was calculated by summing the quantity of drinks divided by number of days in which consumption occurred within a week. Participants' mean drinks consumed per drinking day equaled 3.19 ($SD = 1.60$). Participants within the drunkorexia subpopulation reported a mean of 3.25 drinks per day ($SD = 1.60$), compared with a mean of 3.18 ($SD = 1.60$) for the nondrunkorexia group. Total alcohol consumption mean scores were nonnormally distributed as evidenced by significant skewness of 1.61 ($SE = 0.12$) and kurtosis of 4.31 ($SE = 0.24$).

Demographics, Alcohol Consequences, and Consumption Differences

Gender. To determine whether gender distribution differences existed in the drunkorexia and nondrunkorexia subsamples, a Pearson chi-square was run.

The results indicated a significant relationship between gender and drunkorexia, $\chi^2(1, N = 411) = 4.51, p = .03$. Female participants were more likely to meet drunkorexia criteria. The effect size for this finding, ϕ , was considered weak, 0.11 (Rea & Parker, 2005). Research Question 1 revealed that female students made up 46.8% of the drunkorexia behavior group, but only 31.3% of the nondrunkorexia group; thus, there was a significantly higher proportion of women in the drunkorexia subsample.

Athletic status. A Pearson chi-square was conducted to determine whether distribution differences in athletic status existed between drunkorexia and nondrunkorexia subsamples. The results indicated a nonsignificant relationship between FSL affiliation and drunkorexia, $\chi^2(1, N = 411) = 0.60, p = .44$. The effect size for this finding, ϕ , was considered negligible, 0.04 (Rea & Parker, 2005). Regarding Research Question 2, we found that the percentage of participants who participated in athletics did not vary between the drunkorexia and nondrunkorexia groups.

FSL affiliation. To determine whether distribution differences in FSL affiliation existed between drunkorexia and nondrunkorexia subsamples, a Pearson chi-square was conducted. The results indicated a nonsignificant relationship between FSL affiliation and drunkorexia, $\chi^2(1, N = 411) = 0.81, p = .37$. The effect size for this finding, ϕ , was considered negligible, 0.04 (Rea & Parker, 2005). In examining Research Question 3, we found that the percentage of participants who participated in FSL did not vary between the drunkorexia and nondrunkorexia groups.

Alcohol consequences. An independent-samples t test was conducted to analyze differences between drunkorexia and nondrunkorexia subsamples based upon alcohol-related consequences as measured by the RAPI. Levene test results for the RAPI were statistically significant ($p = .001$ and $p < .001$, respectively); therefore, interpretation of the t statistic was conducted using results when equal variances were not assumed. The t test yielded a statistically significant difference in alcohol-related consequences between the drunkorexia subsample ($M = 10.60, SD = 9.61$) and the nondrunkorexia subsample ($M = 6.04, SD = 5.84$), $t(50.48) = 3.18, p = .003$, with a large effect size ($d = 0.57$) observed.

Gender-related alcohol consumption and drunkorexia. Statistical analyses, per Research Question 5, were conducted to assess mean differences of alcohol consumption and consequences as measured by the DDQ and AUDIT based on the independent variables of drunkorexia (i.e., met criteria vs. did not meet criteria) and gender (i.e., male vs. female). A two-way ANOVA revealed a significant main effect related to gender for the number of drinks consumed $F(1, 410) = 15.42, p = .001, d = 0.41$. Results by gender were not statistically significant for the AUDIT, $F(1, 410) = 1.15, p = .28$. A nonsignificant main effect was observed for drunkorexia for drinks consumed, $F(1, 410) = 0.80, p = .37$. A statistically significant main effect for AUDIT scores for drunkorexia was observed, $F(1, 410) = 9.30, p = .002, d = 0.47$. There was a nonsignificant interaction effect between the variables for drinks consumed, $F(1, 410) = 0.00, p = .99$, and AUDIT scores, $F(1, 410) = 0.00, p = .99$. In

examining the main effect of gender for the total sample, analyses indicated that male participants ($n = 275$) reported higher weekly average alcohol consumptions ($M = 3.56$, $SD = 0.16$) compared with female participants ($n = 136$, $M = 2.64$, $SD = 0.18$). The mean AUDIT score for individuals in the drunkorexia subsample was greater ($M = 11.60$, $SD = 6.29$) than the mean AUDIT score for individuals in the nondrunkorexia subsample ($M = 9.47$, $SD = 4.47$).

Discussion

The results indicate that for this study's participants—that is, college students who experienced alcohol-related infractions on campus—the proportion of female students who demonstrated drunkorexia behavior was significantly higher than the proportion who did not. These findings are congruent with previous research showing that women are more likely to restrict caloric intake prior to drinking (Barry et al., 2013; Giles et al., 2009). Although female students represented an increased proportion in the drunkorexia subsample when comparing the two subsamples, demographic distribution within the drunkorexia subsample revealed comparable gender representation of men and women. This finding is of particular interest as it may reflect a lack of differentiation based upon gender for drunkorexia in populations experiencing alcohol-related infractions. As the literature indicates, although women outrank men in terms of body dysmorphia and issues related to eating disorders, the number of men suffering from related issues is increasing (Strother, Lemberg, Stanford, & Turberville, 2012). In addition, it has been shown that men tend to have different means and motivations for caloric restriction prior to eating (Eisenberg & Fitz, 2014). As such, further investigation utilizing qualitative methodology may be fruitful to more carefully examine these gender-related differences. Although women may show higher prevalence rates of issues related to body image (Wilfley, Agras, & Taylor, 2013), such as drunkorexia, better understanding the motivational drive of caloric restriction between and within the genders may help inform treatment or intervention protocol.

The results of this study also indicate comparable distributions of FSL and athletic affiliation within drunkorexia and nondrunkorexia groups. When interpreting these findings, the population parameter representing college students seeking alcohol treatment services warrants consideration. For example, more than half of the study's participants indicated FSL affiliation. Such high prevalence rates are congruent with other research indicating increased alcohol consumption rates for FSL members (Brown-Rice & Furr, 2015). As such, the population parameters of this study might indicate an unknown moderating variable and explain results in recent literature that show an association with FSL and drunkorexia (Ward et al., 2015). In addition, Barry and Piazza-Gardner (2012) found that highly active college students, such as athletes, are more likely to binge drink, and noted the drunkorexia perspective to explain the association. This speaks to the need for more focused research

in the realm of athletics, which has been linked to increased prevalence of body-image issues (Greenleaf, Petrie, Carter, & Reel, 2009; Petrie, Greenleaf, Reel, & Carter, 2008). Considering limited research on athletic and FSL affiliation within the context of drunkorexia, further research that examines the general population and specific subpopulations is warranted.

The results from the RAPI indicated that participants with drunkorexia had higher alcohol-related consequences compared with participants in the non-drunkorexia group. These findings may indicate that participants with drunkorexia have an increased risk of experiencing alcohol-related consequences. In interpreting these findings, it is important to note that there were no differences between participants with drunkorexia and without drunkorexia in terms of alcohol consumption means. In other words, although participants in both drunkorexia and nondrunkorexia groups consumed, on average, the same amount of alcohol, these findings show that participants with drunkorexia experienced more alcohol-related consequences. The heightened risk may be due to drinking on an empty stomach or consuming drinks with higher alcohol content and fewer calories. Furthermore, if participants with drunkorexia were at a low body weight, they would have had a higher blood alcohol content than individuals who weighed more when consuming the same number of drinks. This study, however, does not address cause and effect, and more research should be conducted to identify which specific aspects of drunkorexia contribute to higher risk of alcohol-related consequences.

Furthermore, the results of this study showed that male participants in the overall sample reported higher weekly average alcohol consumption when compared with female participants in the overall sample; these results are consistent with literature that found that college men are more likely to drink, to drink more frequently, to drink larger quantities of alcohol, and to experience more drinking problems than college women (Engs & Hanson, 1990). Incongruent with the literature, the results of our study show no gender differences on the AUDIT scores; in other words, although male students drank more than female students, the results indicate that there may not have been increased consequences based on gender. The consideration that, on average, men weigh more, have less body fat, and have higher body water content than women and thus require higher quantities of alcohol to achieve the same levels of intoxication is important to note (Smarandescu, Walker, & Wansink, 2014). Additionally, men have higher levels of the enzyme gastric alcohol dehydrogenase, which assists in the metabolism of alcohol, breaking down alcohol in the stomach before it reaches the blood stream (Parlesak, Billinger, Bode, & Bode, 2002). However, gender differences of drunkorexia are important to explore when researchers have controlled for biological differences.

Implications for Universities and Practitioners

Previous research has identified that college students are at higher risk for substance abuse, as well as for developing eating disorder symptomatology

(Barth, 2003; Dawson, Grant, Stinson, & Chou, 2004). The present study supports these findings by identifying that drunkorexia may be an issue for some college students. Furthermore, these findings demonstrated that students with drunkorexia have an increased risk for experiencing alcohol-related consequences when compared with students without drunkorexia. These findings support the need for universities to provide specific programming related to the risks of drunkorexia.

Although drunkorexia is a relatively new term and is not a clinical diagnosis, as research continues to identify the risks associated with drunkorexia, universities must provide students with information regarding those risks. University officials need to be aware of the risks surrounding limiting or compensating caloric intake related to drinking. Programming should be developed to help raise the awareness of risks that college students face in engaging in drunkorexia behaviors. Existing programming on alcohol education can incorporate and emphasize the pressures to both be thin and get drunk on college campuses. Moreover, programming can promote the protective factor of eating before drinking. Conversations around body image, eating disorders, alcohol abuse, and thus drunkorexic behaviors can be created systemically through programs enforced and promoted by university officials and various campus organizations. Similarly, university programming focused on educating students regarding the risks associated with eating disorders and on treating students who are struggling with eating disorder symptomatology can incorporate conversations related to caloric restriction and alcohol consumption.

Furthermore, college counselors should be aware of risks that students face related to drunkorexia and should incorporate appropriate screening procedures into general intake processes. University officials that handle alcohol-related infractions of students should also be aware of the risks of drunkorexic behaviors and incorporate screening procedures into their intake and interviewing procedures. Additionally, college counseling centers can promote the awareness of drunkorexia by educating university officials and partnering with college organizations such as athletics, FSL, and health organizations.

Limitations

This study used archival data from students attending a medium-sized, public university in the Southeast who were referred for clinical services due to alcohol-related infractions from October 2011 to January 2016. The general college population was not included, and thus, a less comprehensive representation of current drunkorexia behaviors was captured in this study; generalizability of the findings is limited due to these sample characteristics (e.g., students with alcohol-related infractions). Moreover, the use of archival data limited the scope of the questions about body image and the lack of eating before/when drinking that were used to identify participants with drunkorexia behaviors in this study. Although the drunkorexia subsample included participants who showed concern about their current body image as evidenced by dieting, weight

influencing their self-efficacy, and/or the fear of gaining weight, an eating disorder assessment was not used to identify drunkorexia behaviors. Athletic affiliation was evaluated in this study, but it does not explore behaviors related to exercise; questions about exercise-related behaviors were not utilized, and thus, the study was unable to screen for excessive exercise behaviors that may contribute to drunkorexia behaviors. Finally, the sample size of the athletic subpopulation was limited; further exploration of drunkorexia in students with athletic affiliations is needed.

Future Research

To continue expanding on the cultural understanding of drunkorexia, future researchers might consider analysis of this study's research questions in a general college-student population or other subpopulations. Even though the results of this study indicated a nonrelationship between drunkorexia and athletics or FSL affiliation, continued analysis of such cultures warrants investigation, placing consideration on increased sample representation of subsamples. Considering inconsistent definitions of drunkorexia used within the literature (Piazza-Gardner & Barry, 2013), the use of specific drunkorexia measures by researchers, such as the one under development by Ward and Galante (2015), might increase comparability between different research studies. In addition, the Ward and Galante drunkorexia measure might capture a more inclusive drunkorexia construct that acknowledges increased exercise and/or purging as drunkorexic behaviors, along with acknowledging individual motivations for engaging in such behaviors.

Summary

Drunkorexia, a term that has been used to describe caloric restriction prior to or after drinking alcohol, is a relatively new construct in the literature (Kershaw, 2008). Although previous research has examined demographic differences and motivations related to drunkorexic behaviors (Ward & Galante, 2015), there has been limited research examining drunkorexia in college students who have experienced alcohol-related infractions. This study assessed differences in demographic prevalence frequencies, alcohol-related consequences, and alcohol consumption patterns between drunkorexia and nondrunkorexia subsamples. The results of this study indicate gender-related differences and alcohol-related consequences in the drunkorexia subsample, along with gender-related differences in alcohol consumption for the overall sample.

References

- Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *The Alcohol Use Disorders Identification Test. Guidelines for use in primary care*. Geneva, Switzerland: World Health Organization.

- Barry, A. E., & Piazza-Gardner, A. K. (2012). Drunkorexia: Understanding the co-occurrence of alcohol consumption and eating/exercise weight management behaviors. *Journal of American College Health*, 60, 236–243. doi:10.1080/07448481.2011.587487
- Barry, A. E., Whiteman, S., Piazza-Gardner, A. K., & Jensen, A. C. (2013). Gender differences in the associations among body mass index, weight loss, exercise, and drinking among college students. *Journal of American College Health*, 61, 407–413.
- Barth, F. D. (2003). Separate but not alone: Separation-individuation issues in college students with eating disorders. *Clinical Social Work Journal*, 31, 139–153.
- Brown-Rice, K., & Furr, S. (2015). Differences in college Greek members' binge drinking behaviors: A dry/wet house comparison. *The Professional Counselor*, 5, 354–364.
- Buchholz, L. J., & Crowther, J. H. (2014). Women who use exercise as a compensatory behavior: How do they differ from those who do not? *Psychology of Sport & Exercise*, 15, 668–674. doi:10.1016/j.psychsport.2014.06.010
- Burke, S. C., Cremeens, J., Vail-Smith, K., & Woolsey, C. (2010). Drunkorexia: Calorie restriction prior to alcohol consumption among college freshman. *Journal of Alcohol and Drug Education*, 54, 17–34.
- Carter, A. C., Brandon, K. O., & Goldman, M. S. (2010). The college and noncollege experience: A review of the factors that influence drinking behavior in young adulthood. *Journal of Studies on Alcohol & Drugs*, 71, 742–750.
- CBS. (2008, January 23). *Drunkorexia: Health danger for women*. Retrieved from <http://www.cbsnews.com/news/drunkorexia-health-danger-for-women>
- Chambers, R. A. (2008). Drunkorexia. *Journal of Dual Diagnosis*, 4, 414–416. doi:10.1080/15504260802086677
- Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology*, 53, 189–200.
- Dawson, D. A., Grant, B. F., Stinson, F. S., & Chou, P. S. (2004). Another look at heavy episodic drinking and alcohol use disorders among college and noncollege youth. *Journal of Studies on Alcohol*, 65, 477–488.
- Dierks, A., & Ward, R. M. (2013). A risky cocktail: An examination of drunkorexia behaviors and alcohol consumption based on gender. *Proceedings of the National Conference on Undergraduate Research*, 26, 851–855.
- Eisenberg, M. H., & Fitz, C. C. (2014). “Drunkorexia”: Exploring the who and why of a disturbing trend in college students' eating and drinking behaviors. *Journal of American College Health*, 62, 570–577. doi:10.1080/07448481.2014.947991
- Engs, R., & Hanson, D. (1990). Gender differences in drinking patterns and problems among college students: A review of the literature. *Journal of Alcohol & Drug Education*, 35, 36–47.
- Fouladi, F., Mitchell, J. E., Crosby, R. D., Engel, S. G., Crow, S., Hill, L., . . . Steffen, K. J. (2015). Prevalence of alcohol and other substance use in patients with eating disorders. *European Eating Disorders Review*, 23, 531–536.
- Giles, S., Champion, H., Sutfin, E., McCoy, T., & Wagoner, K. (2009). Calorie restriction on drinking days: An examination of drinking consequences among college students. *Journal of American College Health*, 57, 603–609.
- Greenleaf, C., Petrie, T. A., Carter, J., & Reel, J. J. (2009). Female collegiate athletes: Prevalence of eating disorders and disordered eating behaviors. *Journal of American College Health*, 57, 489–496.
- Kershaw, S. (2008, March 2). Starving themselves, cocktail in hand. *The New York Times*. Retrieved from <http://www.nytimes.com/2008/03/02/fashion/02drunk.html>
- National Eating Disorders Association. (2013). *Results of college survey show unmet need for campus resources for eating disorders* [Blog post]. Retrieved from <https://www.nationaleatingdisorders.org/blog/results-college-survey-show-unmet-need-campus-resources-eating-disorders>
- Parlesak, A., Billinger, M. H., Bode, C., & Bode, J. C. (2002). Gastric alcohol dehydrogenase activity in man: Influence of gender, age, alcohol consumption and smoking in a Caucasian population. *Alcohol & Alcoholism*, 37, 388–393.
- Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: Mental health problems and treatment considerations. *Academic Psychiatry*, 39, 503–511.

- Petrie, T. A., Greenleaf, C., Reel, J., & Carter, J. (2008). Prevalence of eating disorders and disordered eating behaviors among male collegiate athletes. *Psychology of Men & Masculinity*, 9, 267–277.
- Piazza-Gardner, A. K., & Barry, A. E. (2012). Examining physical activity levels and alcohol consumption: Are people who drink more active? *American Journal of Health Promotion*, 26, 95–104.
- Piazza-Gardner, A. K., & Barry, A. E. (2013). Appropriate terminology for the alcohol, eating, and physical activity relationship. *Journal of American College Health*, 61, 311–313. doi:10.1080/07448481.2013.792259
- Rahal, C. J., Bryant, J. B., Darkes, J., Menzel, J. E., & Thompson, J. K. (2012). Development and validation of the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale. *Eating Behaviors*, 13, 83–87.
- Rea, L. M., & Parker, R. A. (2005). *Designing and conducting survey research: A comprehensive guide*. San Francisco, CA: Jossey-Bass.
- Roosen, K. M., & Mills, J. S. (2015). Exploring the motives and mental health correlates of intentional food restriction prior to alcohol use in university students. *Journal of Health Psychology*, 20, 875–886. doi:10.1177/1359105315573436
- Rubio, V. G., Bermejo, V. J., Caballero, S. S. M., & Santo-Domingo, C. J. (1998). Validation of the Alcohol Use Disorders Identification Test (AUDIT) in primary care. *Revista Clínica Española*, 198, 11–14.
- Saunders, J. B., & Aasland, O. G. (1987). *WHO collaborative project on the identification and treatment of persons with harmful alcohol consumption. Report on Phase I: Development of a screening instrument*. Geneva, Switzerland: World Health Organization.
- Smarandescu, L., Walker, D., & Wansink, B. (2014). Mindless drinking: How gender and BMI relate to the consumption of alcohol. *International Journal of Drug Policy*, 25, 1131–1134. doi:10.1016/j.drugpo.2014.08.018
- Strother, E., Lemberg, R., Stanford, S. C., & Turberville, D. (2012). Eating disorders in men: Underdiagnosed, undertreated, and misunderstood. *Eating Disorders*, 20, 346–355.
- Ward, R. M., & Galante, M. (2015). Development and initial validation of the Drunkorexia Motives and Behaviors scales. *Eating Behaviors*, 18, 66–70.
- Ward, R. M., Galante, M., Trivedi, R., & Kahrs, J. (2015). An examination of drunkorexia, Greek affiliation, and alcohol consumption. *Journal of Alcohol and Drug Education*, 59, 48–66.
- White, H. R., & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol*, 50, 30–37.
- White, H. R., Labouvie, E. W., & Papadaratsakis, V. (2005). Changes in substance use during the transition to adulthood: A comparison of college students and their noncollege age peers. *Journal of Drug Issues*, 35, 281–305.
- Wilfley, D. E., Agras, W. S., & Taylor, C. B. (2013). Reducing the burden of eating disorders: A model for population-based prevention and treatment for university and college campuses. *International Journal of Eating Disorders*, 46, 529–532.
- Young, A. M., Morales, M., McCabe, S. E., Boyd, C. J., & D'Arcy, H. (2005). Drinking like a guy: Frequent binge drinking among undergraduate women. *Substance Use & Misuse*, 40, 241–267.