



HHS Public Access

Author manuscript

Am J Drug Alcohol Abuse. Author manuscript; available in PMC 2021 February 18.

Published in final edited form as:

Am J Drug Alcohol Abuse. 2010 May ; 36(3): 175–179. doi:10.3109/00952991003793869.

Drinking Game Behaviors among College Students: How Often and How Much?

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Abstract

Background: Participation in drinking games (DG) has been identified as a common health-risk behavior among college students. However, research suggests that the frequency of DG participation alone may not pose a significant health risk; rather, gaming may be most hazardous when large amounts of alcohol are consumed.

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Declaration of Interest

We report no conflicts of interest and we alone are responsible for the content and writing of this article.

Objectives: The present study was designed to examine whether specific gaming behaviors (frequency of play and amount of consumption) place gamers at elevated risk for negative drinking outcomes.

Method: Students from 30 U.S. colleges completed self-report questionnaires via the Internet about their drinking attitudes and behaviors. Four groups of student gamers ($N = 2,230$) were examined: low frequency/low consumption ($n = 1,047$), low frequency/high consumption ($n = 453$), high frequency/low consumption ($n = 326$), and high frequency/high consumption ($n = 404$).

Results: Multilevel regression analyses indicated that the frequency x consumption interaction emerged as a significant predictor of negative drinking consequences. Follow-up analyses indicated that quantity of alcohol consumed during DG predicted negative drinking consequences for high-frequency gamers only. **Conclusions/Scientific Contribution:** The present results challenge the assumption that *all* drinking-gaming practices pose equivalent health risks for gamers. Considering only participation in or level of consumption during DG may not tell the complete story with respect to the health hazards involved with gaming behaviors among college students.

Keywords

college students; drinking games; hazardous alcohol use

INTRODUCTION

Drinking games (DG) represent a social context consisting of a set of rules and guidelines that facilitate heavy alcohol use (1). Involvement in DG can lead to a “reversal of competence;” that is, as players become more intoxicated, their skills diminish (2). Moreover, the nature of most DG is such that as participants start losing the game, they are forced to drink more as a penalty, which in turn further diminishes their skills, thus exacerbating the consumption cycle. Given these characteristics, it is hardly surprising that playing DG can place college students at elevated risk for heavy alcohol consumption (3, 4) and negative alcohol-related outcomes (5).

It remains unclear, however, whether participation in DG alone places students at elevated risk for negative drinking outcomes—or whether the amount of alcohol consumed is also important to consider. Past research has suggested that the amount of alcohol consumed while playing DG may be a key factor in understanding the association between participation in DG and negative drinking outcomes (6). Thus, it appears that experiencing negative drinking outcomes (e.g., “losing control of drinking,” “becoming depressed after drinking”) is directly related to the amount of alcohol consumed while gaming.

The present study builds on prior research and contributes to the emerging literature on DG with the purpose of refining our understanding of the implications of specific gaming behaviors. We conducted this study with a large multisite sample of college gamers to fully ascertain whether or not specific kinds of gaming practices place them at increased risk for negative drinking outcomes. This aspect of gaming behavior is frequently overlooked because it is often assumed that *all* gaming practices pose equivalent health risks for all

gamers. As such, we tested whether there would be differences in the extent to which gamers experienced negative drinking outcomes as a function of how often they played DG *and* how much alcohol they consumed while gaming. For instance, a student gamer might participate in DG often and may consume high or low amounts of alcohol when s/he plays (i.e., high frequency/high consumption; high frequency/low consumption). Conversely, a student gamer may participate in DG infrequently; however, when s/he does play, s/he consumes large amounts of alcohol (i.e., low frequency/high consumption).

A close examination of the interaction between frequency of DG participation and the amount of alcohol consumed while gaming can help refine researchers' and health service providers' understanding of these specific gaming practices and may allow them to better distinguish the relevance of such practices to negative drinking consequences. For example, infrequent gamers who consume high amounts of alcohol when they play (i.e., low frequency/high consumption) could be considered a high-risk group because their elevated levels of consumption place them at great risk for negative drinking outcomes despite their infrequent participation in DG. Similarly, frequent gamers who consume small amounts of alcohol when they play (i.e., high frequency/low consumption) might also be considered a high-risk group because of their frequent participation; yet be at lower risk for negative outcomes given their low levels of consumption. Such knowledge has important clinical implications for college gamers with respect to (a) identifying which types of gamers warrant intervention for their gaming behavior, and (b) knowing when to implement a global assessment of a gamer's overall hazardous drinking behavior. Such a global assessment could include assessments focused on all aspects of drinking behavior (e.g., quantity and frequency of alcohol consumption, symptoms of alcohol dependence) rather than only DG-related behaviors. Based on prior research (6), we hypothesized that those who consumed low quantities of alcohol while gaming, regardless of how often they played, would report fewer negative drinking consequences than those who consumed high amounts of alcohol while playing DG.

METHOD

Participants and Procedures

Participants for this study were drawn from a sample of 10,573 college students from 30 different U.S. colleges and universities. Sites were selected in order to represent various regions of the United States, types of schools (major flagship universities, smaller state universities, major private universities, and smaller private colleges), and setting (urban, suburban, and college town). Given the specific aims of this study, we restricted the sample to traditional-aged college students (ages 18–25) who reported playing DG since beginning college. Therefore, the analytic sample for the present study consisted of 2,230 student gamers (mean age = 19.9, *SD* = 1.55; 70% women, 30% men). Respondents provided information about their alcohol use and related attitudes and experiences in response to an online survey that included other psychological and psychosocial measures. At each college/university site, printed or e-mailed announcements were used to direct participants to the study website. Participants received course credit or other incentives (e.g., were entered into a drawing for a prize) for participation, and completion time for the entire survey ranged

from 1 to 2 hours. Students were asked to provide their e-mail addresses and student identification numbers for crediting purposes, but this information was kept separate from the data and was not linked with participants' responses.

Measures

Drinking Games Participation—We measured frequency of DG participation and amount of alcohol consumed while gaming using two items drawn from previous research (7). Participants reported how often they played drinking games using a 7-point Likert-type scale (1 = Less Than Once a Month, 2 = Once a Month, 3 = Two to Three Times a Month, 4 = Once a Week, 5 = Two to Three Times a Week, 6 = Four to Five Times a Week, 7 = Daily or Nearly Daily). Participants also indicated how much alcohol they typically consumed while playing DG using a 5-point Likert-type scale (1 = One Drink, 2 = Two Drinks, 3 = Three to Four Drinks, 4 = Five to Six Drinks, 5 = Seven or More Drinks). Participation in DG has been documented in the literature as a risky drinking behavior (5). As such, we sought to differentiate between distinguishable types of gamers based on frequency of participation: those who reported playing DG once a month or less were categorized as low frequency gamers, and those who indicated playing once a week or more were classified as high frequency gamers. Also, as evident in prior research, the amount of alcohol consumed while gaming is an important consideration when evaluating the negative effects of DG participation (6). Thus, students who reported drinking two drinks or less during a typical DG were classified as low consumption gamers, whereas those who reported five drinks or more, while playing DG were categorized as high consumption gamers. Given the specific aims of this study, gamers who did not fall into these categories were, therefore, excluded from the analyses. This categorization allowed us to create four groups of gamers: Low Frequency/Low Consumption (LFLC; $n = 1,047$; 78% women, 22% men), Low Frequency/High Consumption (LFHC; $n = 453$; 65% women, 35% men), High Frequency/Low Consumption (HFLC; $n = 326$; 70% women, 30% men), and High Frequency/High Consumption (HFHC; $n = 404$; 57% women, 43% men).

Negative Drinking Consequences—Participants completed the Alcohol Use Disorders Identification Test (AUDIT) (8). This instrument is designed to detect hazardous alcohol use and consists of 10 items that ask participants about the quantity and frequency of their alcohol consumption, symptoms of alcohol dependence (e.g., “How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?”), and negative consequences of alcohol use (e.g., “Have you or someone else been injured as a result of your drinking?”). Given the specific aims of this study, we used the AUDIT subscales that refer to dependence (e.g., alcohol-related problems subscale) and social consequences (e.g., adverse reactions subscale) as an index of negative drinking consequences. Because quantity and frequency were assessed as part of the DG items, we did not include these items in our computation of AUDIT scores. Scores for each item are summed, and high scores reflect greater reporting of incidences of dependence and social consequences. For the present study, the alpha coefficient for this index of negative drinking outcomes is .80 (Mean score = 4.17, $SD = 4.65$, range = 0–28). The bivariate correlations of negative drinking consequences with frequency of DG participation and the amount of alcohol consumed while gaming were .31 and .39, respectively (both p values $<.001$).

RESULTS

We first calculated the Intraclass Correlation Coefficient (ICC) to estimate the extent to which variability in negative drinking consequences would be due to between-site differences. We found that the ICC was .014, which suggested the presence of nonignorable nesting (9). As an additional check for the presence of nonignorable between-site differences, we estimated a random-intercept model. The variance of the random intercept was statistically significant, $z = 2.03$, $p < .05$, again suggesting that the mean drinking consequences score differed significantly across sites. Therefore, to control for the clustering of participants within data collection sites, we conducted a two-level random effects regression model. At the between-person level (level 1), we included the main effect terms for frequency of DG (high vs. low) and for amount of alcohol consumed while playing DG (high vs. low), as well as an interaction term computed by centering and multiplying the two main effect terms. At the between-site level (level 2), only the intercept was modeled, to allow the level-1 intercept to vary randomly across sites. No level-2 predictors were included. Negative drinking consequences served as the dependent variable. We estimated the model using the Proc Mixed procedure within SAS version 9.1. To ensure that only a random intercept, and not random slopes, would be needed, we compared the fit of a “random-intercept-only” model against that of a “random-intercept and random slope” model. The log likelihood ratio test indicated that these two models provided equivalent model fit to the data, $\chi^2(3) = 5.1$, $p = .17$. Thus, we present and interpret the results from the simpler “random-intercept-only model.” To explore the interaction between frequency of DG participation and amount of alcohol consumed while playing DG, we used the “slice” option in SAS Proc Mixed to test simple effects of consumption, sliced by frequency.

Findings indicated that the interaction term was statistically significant, $F(1, 25) = 12.25$, $p < .002$. Results of data slicing analyses showed that high quantity of alcohol consumed was a significant predictor of negative drinking consequences for high-frequency gamers (adjusted mean negative drinking consequences scores were 7.2 for high consumption gamers and 5.4 for low consumption gamers), $F(1, 25) = 29.39$, $p < .0001$; conversely, high quantity of alcohol consumed was not a significant predictor of negative drinking consequences for low-frequency gamers (adjusted mean of negative drinking consequences score was 3.4 for high consumption gamers, and 3.0 for low consumption gamers), $F(1, 25) = 1.81$, $p = .19$. Adjusted means for the four quantity-frequency groups are displayed in Fig. 1.

We re-analyzed the primary model with age and gender entered as covariates, given that DG participation tends to be more prevalent among younger students (18–19 years old) than among older students (20+ years old) (6) and that women report experiencing more negative consequences as a result of DG than men (10). Results did not change when age and gender were added to the model.

DISCUSSION

DG are common activities among college students, and prior research has shown that participation in this type of drinking behavior can result in negative outcomes. Given the

paucity of research on DG, however, it remains unclear whether certain gaming behaviors (how often they play *and* how much they drink) place gamers at elevated risk for negative drinking consequences. The current findings reveal that the extent to which frequency of DG participation is associated with more alcohol-related problems depends on how much the person consumes while playing DG. Specifically, quantity of alcohol consumed was a significant predictor of negative drinking consequences for high-frequency gamers only. In accordance, high-frequency gamers who consumed elevated amounts of alcohol reported relatively more negative drinking consequences compared to both high- and low-frequency gamers who consumed low amounts of alcohol while gaming, as well as compared to low-frequency gamers who drank high amounts of alcohol while gaming. The present results differ somewhat from the findings reported by Nagoshi and colleagues (6), who found that elevated consumption while gaming was associated with more alcohol-related problems, regardless of how often the person plays DG.

It should also be noted that the AUDIT scores we calculated for this study did not include the consumption amount, frequency of consumption, or binge drinking items, allowing for an independent examination of negative drinking consequences. Participants who frequently participated in DG and consumed high amounts of alcohol while gaming scored, on average, 7.18 on the negative drinking outcome subscales of the AUDIT. This score does not include all of the AUDIT items, yet researchers have argued that a score of 5 or 6 on the AUDIT (using all items) could be considered hazardous use among college students (1,11,12). As such, it appears that, on average, students who engage in this type of gaming behavior report scores that rise to the level of hazardous alcohol use as indexed by the negative drinking outcome subscales on the AUDIT, even without including their scores for the remaining consumption items. This finding highlights the riskiness of high frequency/high consumption gaming behavior.

Limitations and Implications

The present findings should be interpreted in light of the following limitations. First, data were collected from self-report surveys, so participants may have under- or over-estimated their frequency of participation in DG or the amount of alcohol consumed while playing. Additionally, the cross-sectional design used in the present study precludes the examination of causality or directionality between DG participation and negative drinking consequences. Finally, we acknowledge that our measure of hazardous drinking consequences may not comprehensively assess all of the social, health, psychological, and academic problems students may experience as a result of elevated alcohol consumption while playing DG. Future research could, therefore, examine how this array of problems might unfold as a direct result of DG participation and the amount of alcohol consumed while gaming.

One factor that we did not address in this article is the variability in specific DG played by college students (e.g., flip cup, beer pong, kings) and their unique association with health consequences. Certain DG, such as power hour (i.e., players drink an ounce of beer per minute for up to an hour) or “Edward 40-Hands” (i.e., two 40 ounce beers are duct taped to each hand and only removed once the beverages are completely consumed), revolve primarily around heavy consumption, and as a result, low consumption would not be

relevant to these types of DG. Moreover, we did not address the context in which a DG is played (e.g., party, dorm room, fraternity house). Assessing the venue could also be a useful consideration given that college drinking behaviors can be heavily influenced by context (13–15). As such, these are important areas for future research inquiry.

Despite these limitations, the present findings contribute to the emerging (though still limited) literature on DG among college students. Specifically, the present study, using a large, multisite sample of college gamers, helps to further refine our understanding of the effects of both participation in DG *and* consumption of alcohol while playing DG in a large multisite sample of college gamers. Although many drinking behaviors associated with DG are considered risky, the present findings provide evidence that some gamers are more at risk than others to experience elevated negative drinking outcomes. In particular, the combination of high frequency *and* high consumption posed the greatest risk for increased negative drinking consequences, especially in comparison to other types of gaming practices (high- and low-frequency gaming with low alcohol consumption; low-frequency gaming with elevated alcohol consumption). Such findings challenge the assumption that *all* gaming practices pose equivalent health risks for all gamers. As such, health practitioners should consider targeted intervention as well as a global assessment of alcohol use (which would entail examining both DG and non-DG alcohol-related behaviors) of college students who engage in this kind of gaming behavior. Targeted intervention programs for these gamers could address both frequency of DG participation and consumption during DG to ameliorate some of the health risks to college gamers. Research on DG is in its infancy, but thus far it is clear that there are multiple aspects to gaming behaviors, and it appears that the *what*, *why*, and now *how often* and *how much*, are all important factors when considering the potential health hazards of DG participation.

ACKNOWLEDGMENTS

Members of the collaborative not listed on the author byline include the following: Vicky Phares and Ariz Rojas, University of South Florida; Anthony D. Greene, University of North Carolina–Charlotte; Elissa Brown, St. John’s University; Michelle K. Williams and V. Bede Agocha, University of Connecticut; Susan Krauss Whitbourne, University of Massachusetts; Britton Brewer, Springfield College; Liliana Rodriguez, Williams College; Jacquelyn D. Wiersma, Pennsylvania State University; M. Brent Donnellan, Michigan State University; Alexander T. Vazsonyi, Auburn University; Russell D. Ravert, University of Missouri–Columbia; Richard M. Lee and Stephanie Pituc, University of Minnesota; S. Jean Caraway, University of South Dakota; Gustavo Carlo and Maria Iturbide, University of Nebraska–Lincoln; Miguel Cano, Texas A&M University; Thao N. Le, Colorado State University; Sam A. Hardy, Brigham Young University; Adriana Umaña-Taylor, Arizona State University; Eric Hurley, Pomona College; and Nolan Zane and Gloria Wong, University of California–Davis.

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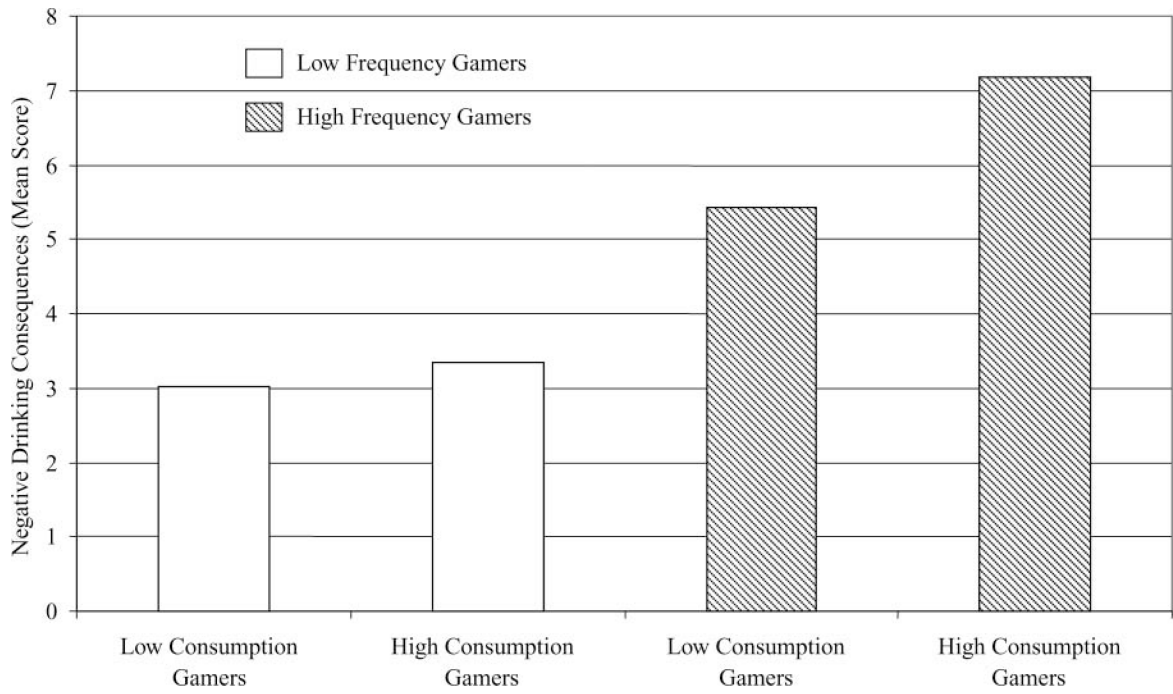


Figure 1. Negative drinking consequences across specific types of gaming behaviors.