Original Article

Psychological Distress and Heavy Alcohol Consumption Among U.S. Young Women During the COVID-19 Pandemic

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A B S T R A C T

Introduction: The predictors of heavy drinking among U.S. young women during the coronavirus disease 2019 (COVID-19) pandemic are not well-examined. This study aims to determine the prospective relationship between COVID-19 psychological distress and heavy alcohol use among U.S. young adult women.
Design: This study used the COVID-19 Adult Resilience Experiences Study (CARES) data collected from April 13, 2020, to August 31, 2020 (T_1) and September 21, 2020, to March 15, 2021 (T_2). Among the young adults (ages 18–30) who participated in both surveys, a total of 684 identified as women (including transgender women) were included in the analysis. Three or more drinks as a typical intake were defined as heavy drinking. Psychological distress in T_1 was measured using scores for financial stress, COVID-19–related worry, and COVID-19–related grief. A series of logistic regression analyses were performed to identify risk factors associated with young women's heavy drinking during the pandemic.
Results: Twenty-two and one-half percent of young women reported heavy drinking in a typical intake. After controlling for covariates, women who reported high levels of COVID-19–related grief were more likely to report heavy drinking (odds ratio, 1.06; 95% confidence interval [CI], 1.01–1.13; $p < .05$). Those with high levels of COVID-19–related worry were less likely to report drinking heavily (odds ratio, 0.90; 95% confidence interval, 0.85–0.97; $p < .01$).
Conclusions: Those who suffer from a deeper sense of COVID-19–related grief are particularly at risk of heavy drinking and should be targeted for outreach and clinical intervention. Further research is necessary to determine the long-term impacts of the pandemic on heavy drinking among young women and should include a more comprehensive assessment of psychological distress.
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Heavy drinking is considered the riskiest form of alcohol consumption and is defined as the consumption of four or more drinks on any day for men and three or more drinks on any day for women (National Institute on Alcohol Abuse and Alcoholism, 2021). According to the National Survey on Drug Use and Health, the highest rate of alcohol use between 2019 and 2020 was found among individuals, both men and women, between the ages of 18 and 25. (Substance Abuse and Mental Health Services Administration, 2022).

Heavy drinking is a known risk for problematic behaviors and poor health outcomes, including interpersonal violence, property crimes, motor vehicle crashes, suicide, heart disease, sexually transmitted infections, liver disease, and cancer (Centers for Disease Control and Prevention [CDC], 2021). The financial cost of heavy alcohol use was estimated at approximately $249 billion in 2010 (Sacks, Gonzales, Bouchery, Tomedi, & Brewer, 2015). Thus, from legal, financial, and public health standpoints, it is critical to understand the factors associated with heavy drinking among young adults.

Women with heavy drinking problems are particularly vulnerable to multiple dimensions of suffering. They are more

likely than their male counterparts to experience depression (King, Bernardy, & Hauner, 2003; Boykoff et al., 2010), develop a higher risk of psychiatric and physical comorbidities (Erol & Karpyak, 2015; Peltier et al., 2019), attempt suicide (Glasheen, Pemberton, Lipari, Copello, & Mattson, 2015), experience greater physiological consequences (Erol & Karpyak, 2015; Peltier et al., 2019), suffer from a higher level of sexual victimization and revictimization (Bryan et al., 2016), and report stigma as an alcohol treatment barrier (Khan et al., 2013). Women's alcohol consumption is associated with an increased risk of having liver disease, breast and other cancers, and negative impacts on the brain and heart (CDC, 2020). Furthermore, heavy alcohol use in pregnant women can lead to a higher risk of stillbirth, miscarriage, and sudden infant death syndrome after birth (CDC, 2020). Despite documented gender differences in alcohol use, few studies have examined the specific factors associated with heavy drinking among women during the COVID-19 pandemic (CDC, 2020). Given the evidence that women are more susceptible to alcohol-related health consequences (Peltier et al., 2020), it is essential to investigate young women's risk factors for heavy drinking during the COVID-19 pandemic.

The COVID-19 pandemic led to an enormous amount of stress owing to the rapid transmission of the disease and its associated morbidity and mortality (Sharif Nia et al., 2022). Combined with the unpredictable nature of the disease, a number of COVID-19–specific distresses have emerged, including worries about the health of self and loved ones, increased fear of transmission, feeling a sense of loss and grief, and financial stress (Bertuccio & Runion, 2020; Lechner et al., 2021). The stress and coping hypothesis indicate that individuals often cope with stress with either adaptive or maladaptive behaviors (Cohen & Wills, 1985). Alcohol use may be a behavior that mitigates COVID-19–related distress. In fact, the COVID-19 pandemic led to a dramatic increase in alcohol consumption; the average number of drinks between February and April of 2020 increased by 29% (Barbosa, Cowell, & Dowd, 2021). Studies demonstrate that compared with men, women are more likely to drink in response to stress (Becker & Koob, 2016; Peltier et al., 2019), which is a concerning trend given that women are more vulnerable to experiencing pandemic-related psychological distress (Brooks et al., 2020; Taylor, 2019).

Evidence showed that the pandemic exacerbated the gender imbalance in the division of labor such that women disproportionately absorbed the caregiving obligations for homeschooling their children as well as handled more domestic responsibilities. As a result, women were less able to contribute to the paid workforce (Stefanova, Farrell, & Latu, 2021). In May 2020, 11% of women faced underemployment compared with 7% of men (Golden & Kim, 2020). Additionally, women have endured more severe stress owing to health and childcare issues (Connor et al., 2020). As intimate partner violence increased during the pandemic, women were more likely to be victimized, placing their mental and physical well-being at risk (Lyons & Brewer, 2021; McNeil, Hicks, Yalcinoz-Ucan, & Browne, 2022). Studies suggest that, during the initial months of the COVID-19 pandemic, a greater proportion of women compared with men exceeded their drinking limits through engaging in heavy drinking (Barbosa et al., 2021) and that women drank alcohol more frequently than men in general (Pollard, Tucker, & Green, 2020). Thus, a gender-specific approach to better understand the role of COVID-19 distress on young women's heavy alcohol use is warranted.

In this study, we hypothesized that three specific types of psychological distress during the COVID-19 pandemic would predict women's heavy drinking. First, COVID-19–related grief may be linked to heavy drinking. During the pandemic, the loss of life, opportunities, and vital resources coupled with general uncertainties, all contributed to a collective sense of grief (Bertuccio & Runion, 2020). Drinking may be one coping mechanism used by individuals against unexpected losses and grief. Second, COVID-19–related worry (e.g., fear of contracting COVID, being unable to maintain contact with loved ones) may also be associated with increased drinking. Rogers, Shepherd, Garey, and Zvolensky (2020) found that those who initiated using substances during the pandemic had greater COVID-19–related worry than those who never used substances. Finally, COVID-19–related financial stress may be a critical factor when considering that financial stress was also associated with alcohol-related problems during the COVID-19 pandemic among U.S. adults (Rodriguez, Litt, & Stewart, 2021). Another study found that financial-related distress was the sole factor associated with an increase in risky drinking patterns over time among U.S. adults (Lechner et al., 2021).

In addition, women's poor mental health status—including the risk factors of depression and anxiety—may be associated with heavy drinking. Several studies found that preexisting mental health diagnoses and mental health problems (e.g., substance use disorders, anxiety, depression) were associated with elevated alcohol consumption during the pandemic (Capasso et al., 2021; Hansel, Saltzman, Melton, Clark, & Bordnick, 2022; Holmes et al., 2020; Pfefferbaum & North, 2020; Yazdi, Fuchs-Leitner, Rosenleitner, & Gerstgrasser, 2020). During the COVID-19 pandemic, high anxiety and depression were associated with increased drinking (Devoto, Himelein-Wachowiak, Liu, & Curtis, 2022). Overall, those with a preexisting mental health diagnosis may be at greater risk for increased alcohol use. Last, loneliness may be another risk factor among young women during the pandemic. One multicountry study found that loneliness is strongly associated with high alcohol use among women during the pandemic, suggesting that alcohol is used to cope with loneliness (O'Sullivan et al., 2021).

Studies have generally demonstrated an association between these risk factors and heavy drinking. However, no published research is based on longitudinal data to understand the extent to which COVID-19–related distress (grief, worry, and financial stress) is associated with heavy alcohol intake after controlling for other risk factors among young women during the pandemic. This study uses the longitudinal data from the COVID-19 Adult Resilience Experiences Study (CARES 2020 Project) that tracked the cohort panel of young adults in the U.S. in 2020 and 2021 to document changes in their health and well-being over time. The objectives of the present study are to 1) estimate the prevalence of heavy alcohol use among U.S. young women and 2) determine the relationship between COVID-19–related distresses, mental health status, and loneliness during T_1 and heavy alcohol consumption during T_2 among U.S. young women. Understanding these potential factors will help to design strategies and interventions to decrease excessive alcohol use for young women in the United States.

Methods

Recruitment and Procedure

The present study draws from CARES (see previous papers for details; Liu, Stevens, Conrad, & Hahm, 2020a; Liu, Zhang, Wong,

Hyun, & Hahm, 2020b; Hahm et al., 2021a; Hahm et al., 2021b), which follows young adults across two time points after their initial enrollment in 2020 when they were 18–30 years of age. Participants were recruited online via listservs and Facebook groups for the school organizations or various clubs, alumni groups, classes, and churches. Although the initial recruitment took place in the New England area, additional listservs in the Midwest, South, and West were used to make the sample more geographically diverse. During the study, participants were asked to complete a 30-minute online survey about their COVID-19–related experiences, risk and resilience, and physical and mental health outcomes. All participants completed an electronic consent form. For the T_1 survey, one out of every 10 participants received a $25 gift card. The first invitation to the second survey was sent approximately 5.5 months after the T_1 completion date. Participants were given $10 gift cards when they completed the T_2 survey. Three different attention checks were embedded in the survey to ensure data quality. Study approval was obtained from the Institutional Review Board of Boston University.

A total of 1,221 young adults took part in the T_1 survey (T_1 defined as April 13, 2020, to August 31, 2020). Participants who agreed to be contacted again during CARES T_1 were invited to participate in T_2 (T_2 defined as September 21, 2020, to March 15, 2021). Among those who were contacted, 65.9% completed surveys for T_2, for a total of 805 participants. For this study, those who identified themselves as women (including transgender women) were selected for the analysis ($n = 684$). Between T_1 and T_2, no significant differences in demographic characteristics were observed except for participants' student status, because many of them had graduated (students at T_1, 70.2% vs. students at T_2, 56.9%; $p < .001$).

Measures

Covariates
Demographics. Covariates were age, race/ethnicity, current student status (college/graduate students), and income from the previous year, including all sources such as social security/disability, stocks, alimony, and child support.

Duration of the pandemic. The pandemic duration was calculated by counting the number of days from the date when COVID-19 was declared as a global pandemic (March 11, 2020) by the World Health Organization. The pandemic duration was included as one of the covariates to consider possible correlations between the date when the survey was conducted and the outcome variables.

Psychological distress measures
COVID-19–related grief. A newly developed six-item measure adapted from the Inventory of Complicated Grief (Prigerson et al., 1995) assessed COVID-19–related feelings of grief and loss. After viewing six grief–or loss–related statements, participants rated their sense of agreement on a scale of 1 (strongly disagree) to 5 (strongly agree). Statements included missing out on significant life events, losing vital resources (e.g., housing, mentorship, food access), feeling stunned over COVID-19, and feeling bitter over loss in daily routines and activities (Liu et al., 2020a,b). Sum scores of measures ranged from 6 to 30. Cronbach's α for measure items was 0.75, indicating good reliability.

COVID-19–related worry. We chose four items from a new measure developed by Liu et al. (2020a,b). Participants were asked to

indicate their level of worry for each item on a scale of 1–5, with 1 being not worried at all and 5 being very worried. Items include, "Having enough groceries during city lockdowns/social distancing protocols," "obtaining a COVID-19 test if I become sick," "getting treated for COVID-19 if I contract it," and "keeping in touch with loved ones during social distancing protocols" (Liu et al., 2020a,b). Two items related to financial worry (worry about maintaining employment during the subsequent economic downturn; worry about having enough money to pay for rent and buy necessities) were omitted because these items were similar to the items on COVID-19–related financial stress. Sum scores were calculated with a possible range of 6–30 and recoded into a dichotomous variable with a cutoff score of 24 or greater as highly worried. Cronbach's α for measure items was 0.72, indicating good reliability.

COVID-19–related financial stress. Two questions were used to measure participants feeling stressed about personal finances and worrying about being able to pay monthly expenses on a scale ranging from 1 (strongly disagree) to 4 (strongly agree). Two items were summed to create the total score. The observed values ranged from 2 to 8. The correlation between these two items was 0.67.

Mental health status measures
Preexisting diagnosis. Respondents were asked whether they had ever been diagnosed with generalized anxiety disorder, depression, or post-traumatic stress disorder. For each disorder, respondents were asked to indicate yes, diagnosed but not treated, yes, diagnosed and treated, suspected, but not diagnosed, or no. We developed a dichotomous variable for each disorder. If respondents indicated either yes, diagnosed and treated or yes, diagnosed and untreated, they were coded as 1, indicating that they have a preexisting diagnosis for each of the disorders. If they responded as suspected, but not diagnosed or no, they were coded as 0, indicating not having a preexisting diagnosis for each disorder.

Depressive symptoms. The prevalence of depression and its severity in the past two weeks was measured using the 8-item Patient Health Questionnaire depression scale (Kroenke et al., 2009), and participants rated each item on a scale of 0 (not at all) to 3 (nearly every day). Items include, "How often in the past 2 weeks were you bothered by little interest or pleasure in doing things," "feeling down, depressed, or hopeless," and "poor appetite or overeating." The scores for each item were summed and ranged from 0 to 24 points. The scores were recoded dichotomously, with a cutoff of 10 or higher indicating major depression. The internal reliability of the eight-item Patient Health Questionnaire depression scale was excellent, with a Cronbach's α of 0.87.

Anxiety symptoms. Using the widely used Generalized Anxiety Disorder Scale (Spitzer, Kroenke, Williams, & Löwe, 2006), participants' frequency of anxiety symptoms in the past 2 weeks was assessed. The frequency of each symptom was rated on a scale of 0 (not at all) to 3 (nearly every day). Sum scores ranged from 0 to 21 and were recoded dichotomously to determine elevated anxiety based on a cutoff score of 10 or higher. This was based on previous cutoff conventions for this scale (Plummer et al., 2016). The internal consistency of the Generalized Anxiety Disorder Scale was excellent (Cronbach α = 0.90).

Loneliness. Participants' sense of loneliness was assessed with the adapted three-item UCLA Loneliness Scale Short Form

(Hughes, Waite, Hawkley, & Cacioppo, 2004). Questions included, "How often do you feel that you lack companionship," "feel left out," and "feel isolated from others?" Participants responded on a scale of 1 (hardly ever) to 3 (often). The total score for loneliness ranged from 3 to 9 and recoded dichotomously with a cutoff score of 6 or greater, indicating high loneliness (Cronbach $\alpha = 0.79$).

Heavy drinking. Participants were asked, "How many drinks containing alcohol do you have on a typical day when you are drinking?" Participants selected a value from the following options: 1, or 2, 3; or 4 or 5; or 6 or 7; or 8, 9, or 10; or 10 or more drinks per day. We dichotomized scores ranging from 1 to 2 as no heavy drinking and scores ranging from 3 or 4 and beyond as heavy drinking.

Data Analytic Plan

Those who identified as women (including transgender women) were included in the analysis. Variables were checked for normal distribution and acceptable levels of collinearity (Variance Inflation Factor of <5). We performed t tests and Pearson χ^2 tests to compare the prevalence of demographics, mental health status, and COVID-19–related distress based on the participants' heavy alcohol use. Next, we fit a multiple logistic regression model to estimate the relative contribution of COVID-19–related distress to heavy alcohol use, controlling for covariates. The unadjusted model only included COVID-19–related distress (financial stress, COVID-19–related worry, and COVID-19–related grief at T_1). In addition to these predictors, the adjusted model included demographics, pandemic duration, preexisting diagnosis, depressive symptoms, anxiety symptoms, and loneliness at T_1. Analyses were conducted using SPSS 28.0.

Results

Table 1 displays the frequency of the sample characteristics. Among the total analytic sample of women, approximately 62% were White, followed by 22% Asians, 5% Black, and 5% Latinx. Between T_1 and T_2, no significant differences in demographic characteristics were observed, except for participants' student status. The mean of COVID-19–related worry scores was 9.9 (range, 6–30), and the mean of COVID-19–related grief scores was 19.2 (range, 6–30). Approximately 42% of the total sample had at least one preexisting mental health diagnosis. Among all participants, 27.5% of women at T_1 and 22.5% of women at T_2 reported heavy drinking.

Paired sample t tests were conducted to determine whether there is a significant difference in key variables between those in the no heavy drinking and heavy drinking groups (Table 2). Young women who reported heavy drinking, on average, reported statistically significantly higher levels of depressive and anxiety symptoms, loneliness, and COVID-19–related grief than those who did not.

Table 3 shows results from the unadjusted and adjusted regression models. We present the detailed findings from the adjusted model. After controlling for covariates (demographic variables, pandemic duration, preexisting diagnoses, depressive and anxiety symptoms, and loneliness), COVID-19–related grief was significantly associated with greater odds of heavy drinking (odds ratio, 1.06; 95% confidence interval, 1.01–1.13; $p < .05$), whereas COVID-19–related worry was associated with lower

Table 1
Characteristics of Respondents ($N = 684$) With Data from Times 1 and 2 of CARES 2020

Variables	Means ± SD or % (n)
Age (mean years) at T_1	24.2 ± 3.3
Race	
White	62.3 (426)
Asian	21.5 (147)
Latinx	5.3 (36)
Black	4.8 (33)
Mixed	6.1 (42)
Student status at T_1	
No	29.8 (204)
Yes	70.2 (480)
Income at T_1	
<$25,000	62.7 (428)
$25,000–$49,999	23.3 (159)
$50,000–$250,000+	14.1 (96)
Pandemic duration*	63.0 (27.0–171.0)
Mental health status at T_1	
Preexisting diagnosis	
No	57.9 (396)
Yes	42.1 (288)
Depression (PHQ-8)	8.7 ± 5.5
Anxiety (GAD-7)	9.4 ± 5.5
Loneliness	6.1 ± 1.9
COVID-19–related distress at T_1	
COVID-19–related financial stress	5.0 ± 1.7
COVID-19–related worry	9.9 ± 3.6
COVID-19–related grief	19.2 ± 4.6
Heavy drinking	
Heavy drinking at T_1	
No	72.5 (471)
Yes	27.5 (179)
Heavy drinking at T_2	
No	77.5 (507)
Yes	22.5 (147)

Abbreviations: COVID-19, coronavirus disease 2019; *GAD*, Generalized Anxiety Disorder Scale; *PHQ-8*, 8-item Patient Health Questionnaire depression scale; SD, standard deviation; T_1, April 13, 2020, to August 31, 2020; T_2, September 21, 2020, to March 15.
Note: May not add up to the total owing to missing.
 * Pandemic duration indicates days from March 11, 2020, to T_1 survey completion.

odds of heavy drinking (odds ratio, 0.90; 95% confidence interval, 0.85–0.97; $p < .01$). Financial stress was not significantly associated with heavy drinking.

Discussion

This study represents one of the few targeted epidemiological studies of heavy alcohol use among U.S. young women during the COVID-19 pandemic. Our results show that 27.5% of women (T_1 defined as April to August 2020) and 22.5% (T_2 defined as September 2020 to March 2021) reported three drinks or more as their typical intake, the definition of heavy drinking. This difference in rates between the two time points may reflect a higher prevalence of heavy drinking among women during T_1, the earlier period of the pandemic that included the enactment of stay-at-home orders, compared with T_2. Although no known longitudinal study observed and measured heavy alcohol use consistent with our two time periods, one study showed a similar prevalence of heavy drinking among U.S. adults, at 27.7% during April 2020 (Barbosa et al., 2021).

Guided by prior findings showing a link between COVID-19–related psychological distress and women's levels of drinking

Table 2
Characteristics by Young Women's Alcohol Consumption ($N = 684$)

Variables	No Heavy Drinking at T_2 (≤2 drinks)	Yes Heavy Drinking at T_2 (≥3 drinks)	χ^2 or t
Age at T_1	24.7 ± 3.19	22.7 ± 3.14	$t = 6.69^‡$
Race			
White	61.3 (311)	68.7 (101)	$\chi^2 = 3.06$
Asian	22.3 (113)	16.3 (24)	
Other (Latinx, Black, mixed)	16.4 (83)	15.0 (22)	
Student status at T_1			
No	33.7 (171)	18.4 (27)	
Yes	66.3 (336)	81.6 (120)	$\chi^2 = 12.74^‡$
Income at T_1			
<$25,000	58.8 (298)	75.5 (111)	$\chi^2 = 13.65^‡$
$25,000–$49,999	25.6 (130)	15.6 (23)	
$50,000–$250,000+	15.6 (79)	8.8 (13)	
Mental health status at T_1			
Preexisting diagnosis			
No	55.8 (283)	62.6 (92)	
Yes	44.2 (224)	37.4 (55)	$\chi^2 = 2.13$
Depression (PHQ-8)	8.43 ± 5.49	9.60 ± 5.47	$t = -2.27^*$
Anxiety (GAD-7)	9.16 ± 5.37	10.35 ± 5.77	$t = -2.32^*$
Loneliness	5.94 ± 1.87	6.49 ± 1.91	$t = -3.13^†$
COVID-19–related distress at T_1			
COVID-19–related financial stress	4.93 ± 1.73	5.16 ± 1.72	$t = -1.42$
COVID-19–related worry	9.99 ± 3.56	9.73 ± 3.74	$t = 0.78$
COVID-19–related grief	18.79 ± 4.64	20.56 ± 4.18	$t = -4.17^‡$

Abbreviations: COVID-19, coronavirus disease 2019; *GAD*, Generalized Anxiety Disorder Scale; *PHQ-8*, 8-item Patient Health Questionnaire depression scale; T_1, April 13, 2020, to August 31, 2020; T_2, September 21, 2020, to March 15.
Note: May not add up to the total owing to missing. Values are% (*n*) or mean (standard deviation).
  * $p < .05$.
  † $p < .01$.
  ‡ $p < .001$.

Table 3
Odds Ratios and Confidence Intervals for Young Women's Heavy Drinking at T_2 ($N = 684$)

Variables	Unadjusted OR	Adjusted OR[§]
Age at T_1	–	0.82 (0.75–0.89)[‡]
Race		
White	–	1.0
Asian	–	0.60 (0.35–1.04)
Other (Latinx, Black, mixed)	–	0.68 (0.39–1.20)
Income at T_1		
<$25,000		1.0
$25,000–$49,999		1.18 (0.63–2.22)
$50,000–$250,000+		1.69 (0.71–4.00)
Student status at T_1		
No	–	1.0
Yes	–	1.43 (0.78–2.61)
Pandemic duration[‖]		1.00 (1.00–1.01)
Mental health status at T_1		
Preexisting diagnosis		
No	–	1.0
Yes	–	0.74 (0.48–1.14)
Depression (PHQ-8)		1.01 (0.96–1.07)
Anxiety (GAD-7)		1.02 (0.97–1.08)
Loneliness	–	1.02 (0.90–1.16)
COVID-19–related distress at T_1		
COVID-19–related financial stress	1.08 (0.96–1.22)	1.13 (1.00–1.28)
COVID-19–related worry	0.91 (0.85–0.97)[†]	0.90 (0.85–0.97)[†]
COVID-19–related grief	1.12 (1.07–1.18)[‡]	1.06 (1.01–1.13)[*]

Abbreviations: COVID-19, coronavirus disease 2019; *GAD*, Generalized Anxiety Disorder Scale; *PHQ-8*, 8-item Patient Health Questionnaire depression scale; T_1, April 13, 2020, to August 31, 2020; T_2, September 21, 2020, to March 15.
  * $p < .05$.
  † $p < .01$.
  ‡ $p < .001$.
  § Adjusted for age, race, income, student status, pandemic duration, preexisting mental health diagnosis, depressive and anxiety symptoms, and loneliness at T_1.
  ‖ Pandemic duration indicates days from March 11, 2020, to T_1 survey completion.

(Rodriguez, Litt, & Stewart, 2020), our main research objectives were to test whether distinctive types of COVID-19–related distress—grief, worry, and financial stress—were associated with women's heavy drinking behavior. In our study, COVID-19–related grief was significantly associated with heavy drinking. This relationship remained significant after controlling for pre-existing mental health diagnoses, depressive and anxiety symptoms, loneliness, and demographic variables. Our measure of COVID-19–related grief captured degrees of reactions reflecting a sense of loss and bitter sentiments related to the pandemic, such as missing out on significant life events or experiencing the loss of vital resources. With sudden disruptions to various celebrations, networking opportunities, relationships, or academic engagements likely leading to such grief, alcohol may have been used as a temporary remedy to compensate for lost pleasures and to regulate feelings of vulnerability related to the unknownness stemming from the pandemic. Our finding supports the self-medication hypothesis in that an individual may engage in substance use as a coping device to help relieve or numb negative emotions, including one's own pain and suffering (Khantzian, 1997).

However, contrary to our hypothesis, we found that participants with higher levels of COVID-19–related worry were more likely to report nonheavy drinking than heavy drinking. Our measure of COVID-19–related worry is composed of concerns related to inaccessibility of COVID-19 tests or treatments, not having enough groceries, or an inability to keep in touch with loved ones. For many individuals, these are concerns that threaten their safety and well-being, but it does not seem that participants tried to cope with them by drinking heavily.

Similarly, Lechner et al. (2021) also found a negative relationship, where a greater level of COVID-19–related fear (i.e., fear of catching COVID-19) was associated with lower drinking rates among college students. A study in the UK also found that being worried about becoming seriously ill from COVID-19, being diagnosed with COVID-19, and having suspected COVID-19 were all associated with lower levels of alcohol use (Garnett et al., 2021). It is plausible that individuals with greater COVID-19–related worry or fear were more vigilant about their health and overall well-being, thereby refraining from heavy drinking. Additional research that examines the mechanisms of COVID-19–related worry in relation to heavy drinking is needed to identify intervention targets for reducing heavy drinking among young women.

Contrary to our hypothesis, there was no evidence that COVID-19–related financial stress measured in T_1 is associated with heavy drinking in T_2. One plausible explanation is that the U.S. government responded to the economic crisis with several stimulus checks and policies for individuals during our T_1 period (April to August 2020). As a result, financial stress perceived by these young adults during this time might not have had a significant impact on heavy drinking behaviors. An alternative interpretation is that those who are financially stressed or stretched were living at their parents' home and, therefore, not necessarily in an environment where they would engage in binge drinking. Future research should explore the role of financial stress measured in T_2 in heavy drinking among women, especially as it captures stress related to the prolonged nature of the pandemic.

It is worthwhile to mention that we conducted an exploratory analysis to test whether COVID-19–related psychological distress was associated with heavy drinking in young men ($n = 121$). We found that none of the psychological distress variables were significantly associated with men's heavy alcohol use during the pandemic. This finding may add to the growing evidence that women are more vulnerable to experiencing pandemic-related psychological distress. However, given the small sample size of young men ($n = 121$), future studies should further explore the factors associated with young men's heavy drinking during the COVID-19 pandemic.

Study limitations are the following. First, our measures were based on self-reports that may have been subject to biases, including social desirability bias and recall bias that may underestimate alcohol consumption. Second, considering that White women comprised the majority of our study sample, caution must be taken in the generalization of our study findings to the broader U.S. young adult population. Third, owing to the limitations of CARES data on alcohol use measures, we could not explore the range of alcohol-related problem behaviors. For future research, a comprehensive measure of alcohol use that includes the frequency and quantity of regular consumption, frequency and quantity of the largest amount consumed, and frequency of binge drinking should be used. Fourth, our COVID-19–related grief measure generally captures explicit and self-evident (or definite) types of grief. Future COVID-19–related grief measures should examine specific features of grief, including anticipatory or ambiguous loss (i.e., uncertainty about the current situation) and complicated grief (i.e., a persistent sense of loss) (Bertuccio & Runion, 2020). This process could help to distinguish the contributing role of each unique grief feature versus overall COVID-19–related grief in health risk behaviors during a pandemic. Finally, in terms of drinking behavior, CARES data are limited by a lack of measures exploring motivation and attitudes on drinking or genetic predispositions. Going forward, researchers should include a more comprehensive assessment to develop a greater nuanced understanding of coping-motivated drinking behaviors.

Implications for Practice and/or Policy

Despite these limitations, this study has some methodological strengths. Using two time points allowed us to predict heavy alcohol consumption because all predictors preceded the heavy drinking variable. With approximately one in four women reporting heavy drinking during the pandemic, this finding points to the need for alcohol reduction support for women. In addition, this study sheds light on the differential effects of various COVID-19–related distresses on alcohol-related behaviors. The finding that young women reporting higher levels of COVID-19–related grief were more likely to report heavy drinking suggests that mental health clinicians should address this form of COVID-19–related distress as the pandemic continues to claim lives and cause prolonged economic and mental health consequences. Women should be informed about the negative effect of pandemic-related grief on alcohol intake. In particular, clinicians and researchers should pay greater attention to screening COVID-19–related distress in women and design subsequent clinical interventions focusing on COVID-19–related grief to ensure an appropriate response to alcohol problems. Ongoing observation of drinking behavior trends across time is warranted to determine the long-term mental health and alcohol-related impacts of the COVID-19 pandemic.

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