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Factors Influencing Alcohol Use During COVID-19 With College Students

Nikki Davis
Western Michigan University

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Nikki M. Davis

Western Michigan University

Honors Thesis Committee:

      Amy Naugle, Ph.D., Chair

      Tabitha DiBacco, M.A.

      Thomas Fisher, B.A.

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Abstract

The COVID-19 pandemic has had adverse mental health implications. Young adults have been identified as a particularly high-risk group for increased alcohol use during the pandemic (Capasso et al., 2021). Psychological distress, motives for drinking, experiential avoidance, COVID-19 related fears, and campus connectedness may all be factors related to drinking in college students; however, many of these factors have not been examined during COVID-19. The current study surveyed a sample of full-time, WMU college students (N = 235) who were 18 years old or older (*M* = 21.13, *SD* = 3.33). The majority of the sample identified as women (71.9%) and as White (77.4%). The survey asked participants to self-report information about their alcohol use, psychological distress, motives for drinking, experiential avoidance, COVID-19 related fears, and campus connectedness during the COVID-19 pandemic. Alcohol use was significantly related to stress, anxiety, depression, campus connectedness, and all motives for drinking. Experiential avoidance and COVID-19 related fears were not significantly related to alcohol use in this sample but were significantly related to adverse mental health. Overall, social motives to drink were the most common among college students, coping motives were second, enhancement motives were third, and conformity motives were the least common. These results suggest that motives for drinking may be shifting back to pre-pandemic levels, but that increases in coping motives are still prominent. Interventions with college students focused on reducing alcohol use may be most effective when they target social motivators for alcohol use and seek to create change in larger social environments. Targeting mental health symptoms in addition to alcohol use may also increase effectiveness.

Factors Influencing Alcohol Use During COVID-19 With College Students

The coronavirus (COVID-19) pandemic is a worldwide health crisis and has generated increased uncertainty and potential long-term impacts. Increased mental health symptoms among vulnerable groups have been a key adverse outcome during the pandemic (Holmes et al., 2020). Research has found an increase in psychological symptoms such as isolation, stress, anxiety, and a lack of motivation in university students (Browning et al., 2021). Chronic isolation and stress have increased during the pandemic and have been linked to alcohol misuse (Clay & Parker, 2020). Research also shows the frequency of alcohol use has risen since the beginning of the pandemic (Gruapensperger et al., 2021; Koopmann et al., 2020). Due to this increase in alcohol use, stress, and other adverse psychological symptoms, monitoring factors related to wellbeing is important, especially among vulnerable groups.

Alcohol Use and COVID-19

Koopmann and colleagues (2020) examined alcohol use during the pandemic's initial lockdown and found use had risen by 34.7%. Participants reported they either drank more than normal or much more than normal since the start of the lockdown (Koopmann et al., 2020). In a more recent study looking at the young adult population, 29% reported an increase in their alcohol use and those with depression symptoms had a 64% increased likelihood of reporting increases in alcohol use (Capasso et al., 2021). In comparison with older adults, young adults were found to have an increased likelihood to report increases in their alcohol use (Capasso et al., 2021). Rodríguez-Rey and colleagues (2020) found more than a third of young adults in their sample reported psychological distress due to pandemic stressors. These findings show the importance of examining factors related to alcohol use in young adults during health crises.

Although research has examined alcohol use during the COVID-19 pandemic, there is limited research assessing what mechanisms have led to this increase. Research has not examined alcohol use in relation to quantified COVID-19 related fears. Therefore, it is unclear if COVID-19 related anxiety has directly led to increased alcohol use or if the pandemic has exacerbated other factors that have led to the increased use. In addition, the use of alcohol in college students during the pandemic has not been extensively explored. Exploring factors that could affect alcohol use, such as COVID-19 related fears, can help elucidate what leads to increased substance use during health crises and how to intervene.

Experiential Avoidance

Experiential avoidance is defined as an individual's unwillingness to remain in contact with certain private events and attempts to alter the frequency, context, and form of which the private events occur (Hayes et al., 1996). Several forms of adverse psychological symptoms have been associated with increased experiential avoidance such as depression (Cribb et al., 2006; Moroz & Dunkley, 2019), anxiety (Santanello & Gardner, 2007; Zvolensky et al., 2016), post-traumatic stress (Orcutt et al., 2005), eating disorders (Rawal et al., 2010), lower subjective well-being (Machell et al., 2015), and self-harm (Anderson & Crowther, 2012; Zvolensky et al., 2016). Research on experiential avoidance has recently been conducted in the context of the pandemic. During COVID-19, the combination use of acceptance and commitment therapy and aerobic exercise with adolescents was evaluated (Xu et al., 2021). Post-treatment, the intervention group showed lower levels of psychological distress and experiential avoidance (Xu et al., 2021). Another study conducted after the COVID-19 outbreak demonstrated that experiential avoidance mediated the relationship between obsessive compulsive disorder and COVID-19 fear (Seçer & Ulaş, 2020). In addition, greater experiential avoidance levels were

found to be the best predictor of negative affect, depression, anxiety, and lower quality of life during the pandemic when compared with positivity approaches, approach coping, and other coping strategies (Ferreira et al., 2021; Luoma et al., 2020; Shamblaw et al., 2020).

Prior to the pandemic, the relationship between experiential avoidance and alcohol use has been well-established in the current literature. Those who present with higher experiential avoidance levels are more likely to report higher levels of alcohol use and abuse (Feingold & Zerach, 2021; Levin et al., 2012). Pertaining to college students, first year students who presented with alcohol abuse showed significantly higher levels of experiential avoidance (Levin et al., 2012). The relationship between experiential avoidance and alcohol use is found in both older and younger adults. However, only one study examined both alcohol use and experiential avoidance during COVID-19. U.S. adults who are financially vulnerable may be at an increased risk for alcohol misuse if they are avoidant or not accepting of their distress (Gratz et al., 2021).

Past research has shown increased experiential avoidance has a positive relationship with increased mental health symptoms. Only one study has examined this relationship during COVID-19 and suggests experiential avoidance levels may mediate whether increased mental health symptoms occur due to the presence of COVID-19 related fears. However, COVID-19 related fears were not directly examined within Gratz et al. (2021). Additionally, these variables have not been examined in college students who may be particularly at risk for increased alcohol use. Due to the associations between greater alcohol abuse, higher experiential avoidance levels, and adverse psychological outcomes, examining these variables together could inform future interventions during health crises.

Motives to Drink

Alcohol use, particularly in college students, has several negative implications associated with its abuse. Greater alcohol use in the college student population has been associated with problems in academia, issues with relationships, and damage to mental status (Castaño-Perez & Calderon-Vallejo, 2014). What motivates alcohol use may be related to the severity of difficulties resulting from use. For example, Kuntsche and colleagues (2005) found coping motives to drink predicted alcohol-related problems. Motives for drinking can include social, coping, enhancement, and conformity motives. Enhancement motives indicate consumption to improve positive mood and well-being and social motivations indicate consumption for a desired social reward (Kunstche et al., 2005). Kunstche and colleagues (2005) define conformity motives as avoiding social rejection and coping motivations as avoiding negative internal experiences and events.

Prior to the COVID-19 pandemic, research indicated the majority of college students drank for social motives and very few reported drinking for coping motives (Kuntsche et al., 2005). However, following the start of the pandemic, young adults have reported increases in the frequency of alcohol use, increases in coping motives to drink, and subsequent decreases in social, conformity, and enhancement motives to drink (Graupensperger et al., 2021). Wardell et al. (2020) found that increases in coping motives among a sample of adults in Canada during the pandemic were associated with increased alcohol-related problems. Examining motives to drink may aid in understanding the increases in alcohol use and problems during the pandemic (Wardell et al., 2020).

Due to the rise in coping motives to drink in young adults, it is important to gather more data on its relationship with alcohol use in the college student population. If there is a relationship between motives to drink and levels of drinking, it may be that increased coping

motives in response to COVID-19 fear may explain greater alcohol use. No current study looks

at the relationship between COVID-19 related fears and motives to drink, but rather motives to

drink in the context of COVID-19. The motives for drinking that are most associated with

increased alcohol use during health crises could then result in better targeted treatment. One past

study also reveals that higher levels of avoidance likely increases coping motives to drink in

college students (Ehrenberg et al., 2016). There would be a benefit to exploring whether the

relationship between coping motives to drink and avoidance levels replicates as well.

Campus Connectedness

In addition to factors affecting alcohol use in the general population, there may be factors

specific to alcohol use in college students. Campus connectedness is one factor that has been

examined with alcohol use and yielded mixed results. Campus connectedness can be defined as a

student's attitude toward campus or having a strong bond within the campus community

(Brenner et al., 2009). A previous study conducted with collegiate student athletes indicated that

higher campus connectedness was associated with drinking five or more alcoholic drinks in one

setting within the last two weeks (Brenner et al., 2009). In contrast, research with collegiate

student athletes during the pandemic found that remaining connected with peers was important

for mental health (Graupensperger et al., 2020). Remaining connected was associated with

psychological, social, and emotional well-being (Graupensperger et al., 2020). These conflicting

results may be explained by the use of different measures for evaluating campus connectedness

and further research is needed to clarify the impact of this variable on drinking.

No study has evaluated the association between campus connectedness and COVID-19

related fears in the general college student population. Campus connectedness and its

relationship with motives to drink has also not been evaluated in college students. Clarifying the

relationships campus connectedness may have with alcohol use, mental health, and COVID-19 related fears in the general campus population may aid in understanding its role in college student well-being, especially during health crises.

The Present Study

Health crises such as the COVID-19 pandemic can have a significant impact on well-being. The college student population has already been shown to exhibit adverse mental health outcomes during the pandemic (Rodríguez-Rey et al., 2020). However, limited research exists on how COVID-19 related fears, experiential avoidance, motives for drinking, and campus connectedness may be influencing alcohol use in the college student population during the pandemic. No current research has evaluated the associations between these variables and COVID-19 related fears. Contradictory results have been found concerning the benefits of remaining connected to campus during health crises. The current study examined relationships between COVID-19 related fears, psychological distress, experiential avoidance, campus connectedness, alcohol use, and motives for drinking among college students. Examining these factors during a global pandemic may inform future interventions for substance use during localized and large-scale health crises.

<div align="center">

Measures

</div>

Participants

Based on having 80% power and an alpha of 0.05, 194 participants were needed to detect correlations of 0.20 or greater and this number was obtained in the sample. Participants consisted of undergraduate students currently attending Western Michigan University (WMU). To be considered eligible to participate, individuals had to be full-time, undergraduate students at WMU enrolled in at least 12 credit hours. Additionally, the student had to be at least 18 years or

older to participate. Two hundred sixty individuals consented to participate and seven were

determined to be ineligible. An additional 17 participants were excluded from the analyses due to

stopping the survey midway and one participant was excluded due to random responding. Based

on this, 235 participants were included in conducting analyses. Participants' average age was

21.13 ($SD = 3.33$, range 18 to 42). The average number of semesters attended for participants

was 4.49 ($SD = 2.73$). Average GPA for participants' was 3.55 ($SD = 0.44$, range 2.0 to 4.0). See

Table 1 for participant demographic data.

Demographics	n	%
Gender		
Women	169	71.9%
Men	52	22.1%
Non-Binary	11	4.7%
Prefer not to answer	3	1.3%
Race		
White	182	77.4%
Black	11	4.7%
Hispanic/Latino	7	3%
Asian	15	6.4%
Middle Eastern	2	1%
Multiracial	15	6.4%
Prefer not to answer	3	1.3%

Table 1. Displays gender and racial information for the 235 participants included in analyses.

Procedures

      Recruitment email requests (see Appendix J and M) were sent to relevant organizations to

request distributions of the flyer by email. This included WMU student organizations, the WMU

psychology department, directly to undergraduate students, and other university email lists.

Recruitment also included announcements in WMU undergraduate courses by the course

instructor using the study's recruitment flyer (Appendix I) or recruitment slide (Appendix N).

Recruitment for the study was also conducted in courses by a research team member using the

recruitment script (Appendix L). Interested students were able to access the link to the survey either through the recruitment flyer or email.

Students consented to participate by reading the informed consent document (see Appendix A) and by clicking continue if they consented to participate. The informed consent document was listed first in the Qualtrics survey and ended if the potential participant indicated that they did not agree to participate. All responses remained anonymous. If the student agreed to participate, they were then directed to complete a series of questionnaires including a Demographics Questionnaire (see Appendix B); the Alcohol Use Disorders Identification Test (see Appendix C); the Brief Experiential Avoidance Questionnaire (see Appendix D); the Campus Connectedness Scale (see Appendix E); the Perceived Coronavirus Threat Questionnaire (see Appendix F); the Depression, Anxiety, and Stress Scale (see Appendix G); and the Drinking Motives Questionnaire-Revised (see Appendix H).

Measures

Demographics Questionnaire. The Demographics Questionnaire is a student investigator created measure to collect demographic information about participants. It contains questions seeking information about the participant's age, education level, ethnicity, gender, religious beliefs, undergraduate status, semesters attended, credit hours enrolled in, overall GPA, and the format of the classes they are currently enrolled in. This measure also asks participants about their living arrangements and their involvement in campus organizations.

Alcohol Use Disorders Identification Test (AUDIT). The AUDIT is a 10-item measure intended to assess alcohol consumption, alcohol-related problems, and drinking behaviors. This self-report measure encourages respondents to answer the questions while referencing a standard drink chart. The measure is scored based on a point system from 0-40. Scores ranging from 1-7

indicate low-risk consumption, scores between 8-14 indicate hazardous or harmful consumption, and scores 15 or greater typically indicate an alcohol dependency or disorder. In previous studies, the AUDIT demonstrated convergent validity with the Michigan Alcohol Screening Tool (MAST) and the MacAndrew alcoholism screening tests (Bohn et al., 1995). The AUDIT also demonstrated sensitivity when discriminating between medical patients who did and did not struggle with alcoholism (Bohn et al., 1995). Good internal consistency was exhibited with alpha coefficients between .74 to .94 (Allen et al., 1997; Tomás et al., 2017).

Brief Experiential Avoidance Questionnaire (BEAQ). The BEAQ is a 15-item measure designed to evaluate experiential avoidance. Experiential avoidance can be defined as trying to control internal experiences such as thoughts and feelings by suppressing or avoiding them despite possible harm (Gámez et al., 2014; Hayes et al., 1996). Items are scored on a six-point Likert scale ranging from 1: strongly disagree to 6: strongly agree. Scores range anywhere from 15 to 90 points with higher scores indicating greater experiential avoidance levels. The BEAQ is a shorter version of the previously established 62-item Multidimensional Experiential Avoidance Questionnaire (MEAQ). The BEAQ demonstrated good internal consistency and also convergent validity when compared to the 6 dimensions of the MEAQ (Gámez et al., 2014). The measure demonstrated strong divergent validity when compared with constructs of negative affect and neuroticism and showed positive associations with expected factors of psychopathology, poor quality of life, and avoidance (Gámez et al., 2014). Good reliability was established with a Cronbach's alpha of .80 to .89 (Vázquez-Morejón et al., 2019).

Campus Connectedness Scale (CCS). The Campus Connectedness Scale is a 14-item self-report measure scored on a six-point Likert scale with 1 representing strongly disagree and 6 representing strongly agree. This scale is designed to measure campus connectedness, which

refers to the sense of belonging a student experiences to the campus atmosphere or environment. The CCS had a Cronbach's alpha of .92 in past research, indicating strong internal consistency and reliability (Lee & Davis, 2000). The CCS has displayed convergent validity through statistically significant correlations with measures of related factors such as self-esteem, stress, and sense of community (Lee & Davis, 2000).

Perceived Coronavirus Threat Questionnaire (PCTQ). The PCTQ is a newly developed measure designed to assess the level of threat, fear, and worry individuals are experiencing related to COVID-19. The measure includes questions such as, "thinking about the coronavirus (COVID-19) makes me feel threatened" and "I am afraid of the coronavirus (COVID-19)". In total, the self-report questionnaire consists of six questions and is scored on a seven-point scale with 1 indicating "not true of me at all" and 7 indicating "very true of me". Initial validation of the measure included confirmatory and exploratory factor analyses. The analyses indicated the one-factor PCTQ measures (i.e., perceived threat of COVID-19) had excellent psychometric properties, demonstrating a good fit with the data and good factor structure (Conway et al., 2020).

Depression, Anxiety, and Stress Scale (DASS-21). The DASS-21 is a 21-item measure comprised of three separate 7-item subscales to assess depression, anxiety, and stress. Items are scored on a four-point Likert scale with 0 representing "did not apply to me at all" and 4 representing "applied to me very much or most of the time". The DASS-21 has demonstrated good internal validity and reliability with Cronbach's alpha values of 0.81, 0.89, and 0.78 for the three subscales of depression, anxiety, and stress respectively and 0.91 for the entire measure (Coker et al., 2018). The DASS-21 demonstrated convergent validity through correlations

between the depression subscale and the Zung Self-Rating Depression Scale (SDS) and the

anxiety subscale with the State-Trait Anxiety Inventory (STAI) (Coker et al., 2018).

Drinking Motives Questionnaire-Revised (DMQR). The DMQR is a 20-item measure

intended to identify reasons individuals may be inclined to drink alcohol. Scoring is determined

by a five-point Likert scale with 1 representing "almost never/never" and 5 representing "almost

always/always". The measure includes four subscales to assess for four different drinking

motives including coping, conformity, enhancement, and social motives. Previous research has

demonstrated convergent validity of the DMQR through associations with alcohol use and

alcohol-related problems within college students in the United States and supported its factor

structure (Cooper, 1994; Martens et al., 2008). Adequate internal consistency was also found

with alpha coefficients ranging from .82 to .86 (Martens et al., 2008).

Data Analytic Plan

Descriptive Statistics. Descriptive statistics were conducted for all variables to

understand reporting for the sample. These included statistics such as calculating the mean and

standard deviation as well as organizing scores into categories for measures with severity ranges

(i.e., alcohol use, stress, anxiety, depression).

Spearman's Rank Correlation Coefficient. Spearman correlations were used to analyze

the relationships between the variables of alcohol use, motives for drinking, campus

connectedness, COVID-19 related fear, psychological distress, and experiential avoidance due to

the data not being normally distributed for these measures.

Linear Regression. Linear regression analyses were originally planned to understand the

potential contribution of motives for drinking, campus connectedness, COVID-19 related fear,

psychological distress, and experiential avoidance in predicting alcohol use. However, the

assumptions for linear regression were not met and attempted transformations to the data were

unsuccessful. Due to this, linear regression analyses were not conducted for the data obtained.

Results

Descriptive Analyses

Descriptive statistics were utilized to examine participant reporting for alcohol use,

campus connectedness, motives for drinking, psychological distress, experiential avoidance, and

COVID-19 related fears. The means and standard deviations are presented in *Table 2* for alcohol

use and other factors that may influence alcohol use. Means and standard deviations for motives

for drinking are presented in *Table 3*.

Variable	Mean	Standard Deviation
AUDIT	4.17	4.58
BEAQ	49.87	10.92
CCS	53.11	15.65
PCTQ	21.96	9.27
Stress	11.68	11.06
Anxiety	10.94	10
Depression	15.79	10.01

Table 2. AUDIT = Alcohol Use Disorders Identification Test; BEAQ = Brief Experiential Avoidance Questionnaire; CCS = Campus Connectedness Scale; PCTQ = Perceived Coronavirus Threat Questionnaire. Descriptive information is included for all 235 participants.

Variable	Mean	Standard Deviation
Social	14.79	5.61
Coping	12.3	5.42
Enhancement	7.61	3.4
Conformity	9.4	4.72

Table 3. Displays scores for the four drinking motive scales included on the Drinking Motives Questionnaire. Data is included for the 194 participants who endorsed some level of alcohol use.

Clinical ranges were also analyzed for the AUDIT and DASS-21. The number of

participants who fell into each clinical range for the DASS-21 can be viewed in *Table 5*. For the

AUDIT, the percentage of participants who fell into each clinical range is presented in *Figure 1*.

Clinical Ranges	Depression	Anxiety	Stress
Normal	123	112	94
Mild	26	9	59
Moderate	40	43	47
Severe	12	27	25
Extremely Severe	34	44	10

Table 5. Displays the number of participants from the sample (N = 235) who feel into each clinical range for the three DASS subscales.
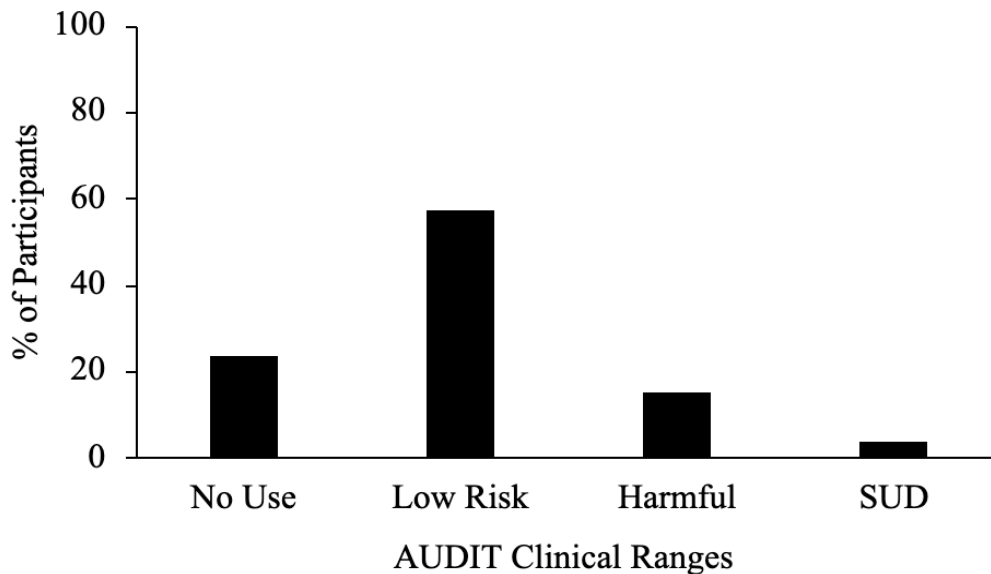

Figure 1. Displays the percentage of participants who fell into each AUDIT (Alcohol Use Disorders Identification Test) clinical range categories for the 235 participant sample. SUD = Substance Use Disorder.

Spearman Correlations

Spearman's Rank Correlation Coefficient test was used to examine the correlations between the main study variables due to all variables, except experiential avoidance, not meeting the assumption of normality in parametric statistical testing. Spearman correlations are a non-parametric alternative to Pearson correlations. *Table 6* displays correlations between alcohol use, experiential avoidance, campus connectedness, COVID-19 related fear, and psychological distress. Correlations between the previously stated variables and drinking motives are displayed

in *Table 7* due to this information only being collected from participants who endorsed some

level of alcohol use (n = 194).

Variables	1	2	3	4	5	6	7
1. AUDIT	1.0						
2. BEAQ	.018	1.0					
3. CCS	.144*	-.267**	1.0				
4. PCTQ	-.074	.330**	-.116	1.0			
5. Stress	.130*	.487**	-.425**	.291**	1.0		
6. Anxiety	.155*	.468**	-.233**	.361**	.666**	1.0	
7. Depression	.141*	.454**	-.290**	.322**	.752**	.717**	1.0

Table 6. Displays the Spearman Correlations between the AUDIT (Alcohol Use Disorders Identification Test) and variables that may influence alcohol use. BEAQ = Brief Experiential Avoidance Questionnaire; CCS = Campus Connectedness Scale; PCTQ = Perceived Coronavirus Threat Questionnaire. All 235 participants were included for these analyses.

*Indicates significance at the .05 level (2-tailed)
**Indicates significance at the .01 level (2-tailed)

Drinking Motives	AUDIT	BEAQ	CCS	PCTQ	Stress	Anxiety	Depression
Social	.591**	.039	.173*	-.121	.137	.111	.193**
Coping	.553**	.108	.039	-.013	.281**	.149*	.214**
Enhancement	.191**	.230**	-.083	.009	.179*	.211**	.247**
Conformity	.516**	.201**	-.023	-.003	.306**	.241**	.272**

Table 7. Displays the Spearman Correlations for drinking motives and other main study variables. AUDIT = Alcohol Use Disorders Identification Test; BEAQ = Brief Experiential Avoidance Questionnaire; CCS = Campus Connectedness Scale; PCTQ = Perceived Coronavirus Threat Questionnaire. The 194 participants who endorsed some level of alcohol use were included in these analyses.

*Indicates significance at the .05 level (2-tailed)
**Indicates significance at the .01 level (2-tailed)

Discussion

Motives for Drinking

To evaluate factors that may influence alcohol use, survey responses were analyzed from

235 participants. Of these 235 participants, 194 indicated some level of alcohol use. Social

motives for drinking were the most commonly reported in university students prior to the

COVID-19 pandemic and coping motives were not as likely to be reported (Kuntshce et al., 2005). Research conducted early in the pandemic found that coping motives to drink were rising in the college student population and social, enhancement, and conformity motives were decreasing (Graupensperger et al., 2021). Of the 194 participants that indicated some level of alcohol use, social motives for drinking were the most commonly reported among the present sample followed by coping, enhancement, and conformity motives respectively. Social, coping, and conformity motives all had strong correlations with increased alcohol use while enhancement had a weak correlation with increased use.

These results suggest that motives for drinking may be shifting back to pre-pandemic levels, but that increases in coping motives are still prominent. An increase in social motives for drinking may be explained by the shift back to in-person classes and activities on campus. This is further supported by social motives for drinking being the only drinking motive that was significantly related to campus connectedness. Social motives for drinking may then explain the significant relationship between campus connected and increased alcohol use. This finding may suggest that those who feel more connected to campus are also more likely to drink for social reasons.

Coping motives for drinking were the second most commonly reported drinking motive in the sample. This contrasts with prior, pre-pandemic research suggesting that only a very small amount of college students report drinking to cope (Kuntsche et al., 2005). These findings also contrast with previous research that found higher levels of avoidance likely increases coping motives for drinking in college students as coping motives were not significantly related to experiential avoidance (Ehrenberg et al., 2016). COVID-19 related fear was also not significantly related to any of the drinking motives within the sample. This may be due to the ease of COVID-

19 restrictions nationwide and locally. These results may suggest that the shift to increased

alcohol use for coping during COVID-19 has now persisted for reasons other than COVID-19

related stress or that COVID-19 related stress impacts alcohol use indirectly through other

variables (e.g., mental health symptoms).

The relationship between alcohol use and experiential avoidance is well established in the

current literature. Several findings show that increased alcohol use has been associated with

increased experiential avoidance (Feingold & Zerach, 2021; Levin et al., 2012). This has also

been previously shown within a college student sample with those who reported alcohol abuse

also reporting significantly higher levels of experiential avoidance (Levin et al., 2012). Despite

these past findings, the present results indicated no significant relationship between alcohol use

and experiential avoidance within the sample. Why experiential avoidance was not related to

coping motives or alcohol use in the present sample is unclear and warrants further exploration

of the relationship between maladaptive coping and experiential avoidance. Given the significant

relationship of experiential avoidance to enhancement and conformity motives, it is possible the

role of experiential avoidance in indirectly impacting alcohol use during the pandemic may be

shifting.

Based on these findings, future interventions looking to decrease alcohol use in college

students should target social motivators for drinking. These interventions targeting social

motivations should seek to create group change to change the social environments that may be

maintaining increased alcohol use. Due to the increased reporting in coping motives for drinking

among college students, future interventions should also give alternatives for coping.

Mental Health and Alcohol Use

Young adults have been found to be at increased risk for reporting more drinking when compared with older adults following the start of the COVID-19 pandemic (Capasso et al., 2021). Adverse mental health effects were also exhibited within the college student population at the beginning of the pandemic (Rodríguez et al., 2020). Pre-pandemic research indicates the presence of mental health symptoms, such as anxiety and depression, are often comorbid with problematic alcohol use (Hasin et al., 2005). The present study's results align with these past research findings on mental health symptoms and alcohol use.

Among the 235 participants, 37% of participants fell within the moderate to severe ranges for depression, 49% fell within the moderate to severe ranges for anxiety, and 35% were within the moderate to severe ranges for stress. While the majority of the 194 participants who indicated some level of alcohol use were within the low-risk range, 36 participants fell within the clinical range of harmful alcohol use and 9 participants were within the range indicating the likelihood of a substance use disorder. Stress, anxiety, and depression were all significantly related to alcohol use in the sample. Additionally, stress, anxiety, and depression were significantly related to most motives for drinking. The exception was that social motives to drink were only significantly related to depression and not stress or anxiety. The strongest relationships between motives to drink and alcohol use were stress and conformity; stress and coping; and depression and conformity. These correlations were in the weak to moderate range. The current findings and past research suggest that treating alcohol use alone may not be fully effective. Instead, future interventions may be most effective if they target both mental health and alcohol use in this population. This may be most important for those who identify coping, enhancement, and conformity motives as part of their motives for drinking.

Stress, anxiety, and depression were also negatively related to campus connectedness. This fits with past findings on campus connectedness in student athletes that it appears to be related to improved mental health, but also related to increased alcohol use (Brenner et al., 2009; Graupensperger et al., 2020). These findings replicated these relationships in this general college student sample. This outcome may be logical with social motives for drinking being the highest motive for drinking among college students. This also shows the complicated relationship of campus connected to college student well-being when considering its relationship to both mental health and alcohol use. These results further highlight the importance of interventions creating social change giving the capacity for campus connectedness to result in desirable outcomes (e.g., improved mental health) and undesirable outcomes (e.g., increased alcohol use).

Findings also demonstrated that stress, anxiety, and depression were all significantly related to experiential avoidance and perceived coronavirus threat. The relationship between experiential avoidance and increased mental health symptoms has been previously demonstrated in college students (Cribb et al., 2006; Santanello & Gardner, 2007). These results show the relationship between adverse mental health and increased alcohol use has persisted during the pandemic. Although COVID-19 related fear and experiential avoidance were not directly related to alcohol use, these findings suggest these factors could still impact alcohol use indirectly through increased mental health symptoms within this population. These results could also mean those already experiencing increased mental health symptoms were particularly susceptible to developing increased COVID-19 related fear and were at an increased likelihood to respond with experiential avoidance to this stress. Interventions within this population should consider potential long-term impacts from the COVID-19 pandemic on mental health symptoms.

Limitations

There were several limitations within the present study. This study used a non-experimental research design, taking cross-sectional data from one time point. Therefore, causal relationships and temporal order between alcohol use and other factors that may influence it cannot be determined form these findings. Significant findings in this study and hypothesized temporal order to these relationships are conceptual in nature. Future research should examine these variables experimentally in order to determine causal relationships and temporal order. Taking repeated measures from individuals over time during a crisis may yield helpful results in how these variables causally impact alcohol use during crises.

External validity is also impacted by the disproportionate gender and racial characteristics within the sample. The sample was obtained from only one university and used convenience sampling for part of the study's recruitment efforts. The majority of participants identified as women (71.9%) and White (77.4%). According to a 2021 Western Michigan University diversity report, the full-time undergraduate population was comprised of 51% men and 49% women (College Factual, 2022). Additionally, 68.4% were White, 10.7% were Black or African American, and 7.1% were Hispanic (College Factual, 2022). This shows that the present sample was not entirely representative of the university student population from which the sample was taken. Thus, there is the possibility that this sample may not represent the experiences of all undergraduate college students at this institution or at other institutions. Future researchers should consider using random sampling methods when possible and assure the sample obtained is representative of the campus population they are sampling from.

There are also consequences and stigma tied to higher alcohol use. Although the present survey was anonymous, it is possible that social desirability or fear of consequences may have impacted honest reporting of alcohol use. This could be especially true for those under the legal

drinking age. Attempts were made to minimize this through marketing the study as a survey about coping during COVID-19 rather than alcohol use during COVID-19. However, it is still possible desirability effects could have taken place since participants were informed participation would involve reporting on alcohol use. Therefore, these results should be interpreted with the possibility in mind that actual alcohol consumption within the sample may be higher than was reported. Future research in this area should continue to take steps to ensure stigma and possible identification in participating is minimized to maximize the likelihood of accurate reporting.

Finally, the particular stage of the pandemic in which the participants took the survey may also be a limitation. The restrictions and changes throughout the COVID-19 pandemic have been fluid and evolving even within short periods of time. These data were collected in February and March of 2022 and even between those two months, there have been substantial changes in safety protocols in the state of Michigan and the sampled university. It is possible that participants who completed the survey during these different months may have been attending to the COVID-19 pandemic and related restrictions in different ways. Repeated data collection across the course of a health crisis within a localized area may help future researchers understand the course of how a crisis may differentially impact variables of interest over time. Further research may also be beneficial in evaluating any potential long-term effects from the COVID-19 pandemic.

Conclusions

The present findings and past research suggest those who report mental health symptoms such as anxiety, stress, and depression are also more likely to report increased alcohol use. It is important to examine ways in which both alcohol use and psychological distress can be targeted in future interventions and research within this specific population. It is also notable the number

of participants who indicated problematic alcohol use and moderate to severe levels of anxiety, stress, and depression. This emphasizes the need for mental health and alcohol use interventions within this population. Findings on motives for drinking indicate social and coping motives may be the most important targets for reducing alcohol use in college students. With this information, universities may seek to combat problematic alcohol use and psychological distress through creating specific programs meant to impact campus connectedness to change the social environment leading to increased drinking while maximizing support for mental well-being. For future localized and large-scale health crises, interventions and research should consider assessing alcohol use, mental health symptoms, and related factors over time during the crisis.

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Appendix A: Informed Consent

<div align="center">

Western Michigan University
Psychology Department

</div>

Principal Investigator: Amy Naugle, Ph.D.

Student Investigator: Nikki M. Davis

Additional Investigator: Tabitha DiBacco, M.A.

You are invited to participate in this research project titled "*Factors Influencing Alcohol Use During COVID-19 With College Students*"

STUDY SUMMARY: This consent form is part of an informed consent process for a research study and it will provide information that will help you decide whether you want to take part in this study. Participation in this study is completely voluntary. You may choose to not answer any question. The purpose of the research is to learn more about those who have and have not drank during the COVID-19 pandemic, examine relationships between COVID-19 related fears, psychological distress, experiential avoidance, campus connectedness, alcohol use, and motives for drinking among college students. This project will serve as Nikki Davis' honors thesis for the requirements of the Western Michigan University (WMU) Bachelor of Science degree.

If you take part in the research, you will be asked to complete a series of questionnaires that will ask you about whether or not you have consumed alcohol, your connection to campus, your emotions, and your mental health during COVID-19. There will also be questions about basic demographic information such as your age and gender. Your replies will be completely anonymous, so do not put your name anywhere on the survey. The study will take approximately 10-20 minutes to complete.

Possible risks to taking part in the study may include discomfort from answering questions about your mental health or alcohol use, but participation is voluntary and you can choose to skip any question you do not wish to answer. There are no direct benefits to participants for participating in this research study. However, this research may inform future supports for college students'

well-being during health crises. You may also choose to enter a drawing for a $10 incentive or receive extra credit if your professor offers it for participating in research. Your alternative to taking part in the research study is to not take part in it.

The de-identified (anonymous) information collected for this research may be used by or distributed to investigators for other research without obtaining informed consent from you.

Should you have any questions prior to or during the study, you can contact the principal investigator, Dr. Amy Naugle, at 269-387-4726 or amy.naugle@wmich.edu or the student investigator, Nikki Davis, at 248-624-0839 or nikki.m.davis@wmich.edu. You may also contact the Chair, Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298.

This consent has been approved by the Western Michigan University Institutional Review Board (WMU IRB) on "2/14/22."

Participating in this survey online indicates your consent for use of the answers you supply.

Add buttons to click:

I agree to participate in this research study   (Survey following upon clicking)

I do not agree to participate in this research study   (Browser closes)

Appendix B: Demographics Questionnaire

You will now be asked to provide some demographic and personal history information.

1. Are you 18 years or older?

   a. Yes

   b. No

2. How old are you? _____

3. What is your highest level of education?

   a. Less than a high school diploma

   b. High school diploma or GED

   c. Some college coursework, no degree

   d. Completed an associate's degree

   e. Completed a bachelor's degree

   f. Completed a master's degree

   g. Completed a professional degree

   h. Completed a doctorate degree

4. Are you a current, full-time undergraduate student at Western Michigan University?

   a. Yes

   b. No

5. Including the current semester, how many semesters have you attended WMU?

   _____

6. Which of the following would you describe yourself as? (select all that apply)

   a. African American/Black

   b. Native American or Alaskan Native

   c. Asian

   d. Hispanic/Latino

   e. Native Hawaiian or Pacific Islander

   f. Caucasian/White

   g. Middle Eastern

   h. Prefer not to answer

   i. Self-describe: _____

7. How would you describe your gender?

    a. Man

    b. Woman

    c. Non-binary

    d. Prefer not to answer

    e. Self-describe: _____

8. How do you identify your religious beliefs? (select all that apply)

    a. Atheist

    b. Agnostic

    c. Buddhist

    d. Christian (e.g., Catholic, Evangelical, Protestant, Lutheran)

    e. Hindu

    f. Jewish

    g. Mormon

    h. Muslim

    i. Orthodox (e.g., Greek, Russian)

    j. Prefer not to answer

    k. Self-describe: _____

9. How many credits are you currently enrolled in during the current semester? _____

10. What is your overall GPA? Please estimate if you are unsure. _____

11. How many of your classes are hybrid, including both online and in person components? If none, write zero. _____

12. How many of your classes are completely online? If none, write zero. _____

13. How many of your classes are completely in person? If none, write zero. _____

14. Are you a student athlete?

    a. Yes

    b. No

15. Are you a member of any campus clubs or organizations, other than sports? If yes, please state how many.

    a. Yes, I am involved in: _____

    b. No

16. Do you currently reside on campus or off campus?

    a. On campus

    b. Off campus, nearby campus

    c. Off campus, more than 45 minutes away from campus

17. Do you currently live with anyone? Check all that apply.

    a. Other WMU college students

    b. College students who attend a college other than WMU

    c. Family

    d. Roommates who are not family or college students

    e. I do not live with anyone

    f. Other: _____

Appendix C: Alcohol Use Disorders Identification Test (AUDIT)

Questions	0	1	2	3	4	
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week	
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more	
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
5. How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
8. How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
9. Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year	
					Total	

STANDARD DRINK EQUIVALENTS	APPROXIMATE NUMBER OF STANDARD DRINKS IN:	
BEER or COOLER		
12 oz. ~5% alcohol	12 oz. = 1 16 oz. = 1.3 22 oz. = 2 40 oz. = 3.3	
MALT LIQUOR		
8-9 oz. ~7% alcohol	12 oz. = 1.5 16 oz. = 2 22 oz. = 2.5 40 oz. = 4.5	
TABLE WINE		
5 oz. ~12% alcohol	a 750 mL (25 oz.) bottle = 5	
80-proof SPIRITS (hard liquor)		
1.5 oz. ~40% alcohol	a mixed drink = 1 or more* a pint (16 oz.) = 11 a fifth (25 oz.) = 17 1.75 L (59 oz.) = 39 *Note: Depending on factors such as the type of spirits and the recipe, one mixed drink can contain from one to three or more standard drinks.	

Appendix D: Brief Experiential Avoidance Questionnaire (BEAQ)

Please indicate the extent to which you agree or disagree with each of the following statements

1----------------2----------------3----------|--------4----------------5----------------6
strongly   moderately   slightly   slightly   moderately   strongly
disagree   disagree   disagree   agree   agree   agree

1.	The key to a good life is never feeling any pain	1 2 3 | 4 5 6
2.	I'm quick to leave any situation that makes me feel uneasy	1 2 3 | 4 5 6
3.	When unpleasant memories come to me, I try to put them out of my mind	1 2 3 | 4 5 6
4.	I feel disconnected from my emotions	1 2 3 | 4 5 6
5.	I won't do something until I absolutely have to	1 2 3 | 4 5 6
6.	Fear or anxiety won't stop me from doing something important	1 2 3 | 4 5 6
7.	I would give up a lot not to feel bad	1 2 3 | 4 5 6
8.	I rarely do something if there is a chance that it will upset me	1 2 3 | 4 5 6
9.	It's hard for me to know what I'm feeling	1 2 3 | 4 5 6
10.	I try to put off unpleasant tasks for as long as possible	1 2 3 | 4 5 6
11.	I go out of my way to avoid uncomfortable situations	1 2 3 | 4 5 6
12.	One of my big goals is to be free from painful emotions	1 2 3 | 4 5 6
13.	I work hard to keep out upsetting feelings	1 2 3 | 4 5 6
14.	If I have any doubts about doing something, I just won't do it	1 2 3 | 4 5 6
15.	Pain always leads to suffering	1 2 3 | 4 5 6

Appendix E: Campus Connectedness Scale (CCS)

<u>Directions</u>: The following statements reflect various ways in which you may describe your experience on this <u>entire</u> college campus. Rate the degree to which you agree or disagree with each statement using the following scale (1 = Strongly Disagree and 6 = Strongly Agree). There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered.

Strongly Disagree	Disagree	Mildly Disagree	Mildly Agree	Agree	Strongly Agree
1	2	3	4	5	6

		Strongly Disagree					Strongly Agree
1.	There are people on campus with whom I feel a close bond...	1	2	3	4	5	6
2.	I don't feel that I really belong around the people that I know on campus......................................	1	2	3	4	5	6
3.	I feel that I can share personal concerns with other students..	1	2	3	4	5	6
4.	I am able to make connections with a diverse group of people..	1	2	3	4	5	6
5.	I feel so distant from the other students................	1	2	3	4	5	6
6.	I have no sense of togetherness with my peers........	1	2	3	4	5	6
7.	I can relate to my fellow classmates.....................	1	2	3	4	5	6
8.	I catch myself losing all sense of connectedness with college life...........................	1	2	3	4	5	6
9.	I feel that I fit right in on campus.........................	1	2	3	4	5	6
10.	There is no sense of brother/sisterhood with my college friends....................................	1	2	3	4	5	6
11.	I don't feel related to anyone on campus...............	1	2	3	4	5	6
12.	Other students make me feel at home on campus…	1	2	3	4	5	6
13.	I feel disconnected from campus life....................	1	2	3	4	5	6
14.	I don't feel I participate with anyone or any group..	1	2	3	4	5	6

	Strongly Disagree			Strongly Agree

Appendix F: Perceived Coronavirus Threat Questionnaire (PCTQ)

1	2	3	4	5	6	7
Very untrue of me	Untrue of me	Somewhat untrue of me	Neutral	Somewhat true of me	True of me	Very true of me

1. Thinking about the coronavirus (COVID-19) makes me feel threatened.

2. I am afraid of the coronavirus (COVID-19).

3. I am not worried about the coronavirus (COVID-19).

4. I am worried that I or people I love will get sick from the coronavirus (COVID-19).

5. I am stressed around other people because I worry I'll catch the coronavirus (COVID-19).

6. I have tried hard to avoid other people because I don't want to get sick.

Appendix G: Depression, Anxiety, and Stress Scale (DASS-21)

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0   Did not apply to me at all
1   Applied to me to some degree, or some of the time
2   Applied to me to a considerable degree or a good part of time
3   Applied to me very much or most of the time

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth	0	1	2	3
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3
6 (s)	I tended to over-react to situations	0	1	2	3
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 (d)	I felt that I had nothing to look forward to	0	1	2	3
11 (s)	I found myself getting agitated	0	1	2	3
12 (s)	I found it difficult to relax	0	1	2	3
13 (d)	I felt down-hearted and blue	0	1	2	3
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 (a)	I felt I was close to panic	0	1	2	3
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3
17 (d)	I felt I wasn't worth much as a person	0	1	2	3
18 (s)	I felt that I was rather touchy	0	1	2	3
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20 (a)	I felt scared without any good reason	0	1	2	3
21 (d)	I felt that life was meaningless	0	1	2	3

Appendix H: Drinking Motives Questionnaire-Revised (DMQR)

Have you had at least one alcoholic beverage within the last two years?

- Yes
- No

INSTRUCTIONS: Listed below are 20 reasons people might be inclined to drink alcoholic beverages. Using the five-point scale below, decide how frequently your own drinking is motivated by each of the reasons listed.

YOU DRINK...	Almost Never/Never	Some of the time	Half of the time	Most of the time	Almost Always/Always
1. To forget your worries.	1	2	3	4	5
2. Because your friends pressure you to drink.	1	2	3	4	5
3. Because it helps you enjoy a party.	1	2	3	4	5
4. Because it helps you when you feel depressed or nervous.	1	2	3	4	5
5. To be sociable.	1	2	3	4	5
6. To cheer up when you are in a bad mood.	1	2	3	4	5
7. Because you like the feeling.	1	2	3	4	5
8. So that others won't kid you about *not* drinking	1	2	3	4	5
9. Because it's exciting.	1	2	3	4	5
10. To get high.	1	2	3	4	5
11. Because it makes social gatherings more fun.	1	2	3	4	5
12. To fit in with a group you like.	1	2	3	4	5
13. Because it gives you a pleasant feeling.	1	2	3	4	5
14. Because it improves parties and celebrations.	1	2	3	4	5
15. Because you feel more self-confident and sure of yourself.	1	2	3	4	5
16. To celebrate a special occasion with friends.	1	2	3	4	5
17. To forget about your problems.	1	2	3	4	5
18. Because it's fun.	1	2	3	4	5
19. To be liked.	1	2	3	4	5
20. So you won't feel left out.	1	2	3	4	5

Appendix I: Recruitment Flyer

Appendix J: Recruitment Email

Hello,

My name is Nikki Davis and I am an honors psychology undergraduate student at Western Michigan University. I am writing to ask if you would be willing to share information about a research study I am conducting for my honors thesis project. The goal of this research is to better inform interventions during future health crises and learn more about those who have or have not drank during COVID-19.

Full-time undergraduate students attending WMU who are 18 years or older are eligible for the study. Participation includes completing a series of anonymous questionnaires that should take approximately 10-20 minutes to complete. This study was approved by WMU's IRB board on 2/14/2022. Participants will be offered to enter a raffle for a $10 incentive or elect for extra credit if the instructor offers it.

If you would be willing to share information about the study, I have attached a study flyer that can be shared by email or printed out and posted.

If you have any questions about the study, I would be more than happy to share further information about it.

Sincerely,

Nikki Davis
Psychology Major
Undergraduate Honors Student
Western Michigan University

Appendix K: Social Media Recruitment Script

Western Michigan University psychology researchers are currently seeking full-time undergraduate students for a research study! Please see the attached flyer and consider sharing with any other WMU undergraduate students who may qualify.

Appendix L: Class Recruitment Script

Hello, my name is Nikki Davis and I am a current undergraduate honors student at WMU majoring in psychology. I am currently recruiting participants for my honors project and would like to invite you to participate.

Participants for the study must be current undergraduate students at WMU, enrolled in at least 12 credit hours. Participants must also be at least 18 years or older. There are no other requirements to participate in this study.

If you would like to participate, you can access the survey using the QR code or direct link to the survey that can be found on the recruitment flyer and slide from your instructor. Once you reach the survey, there will be an informed consent document and if you consent to participate, participation will involve completing several questionnaires that will take approximately 10 to 20 minutes. These questionnaires will ask you about your well-being, mental health, alcohol use, and emotions during COVID-19. Some general demographic information such as your gender and age will also be collected. No identifiable information will be collected, and the survey responses will be anonymous.

At the end of the survey, you will have the opportunity to enter a raffle for $10 gift cards or to receive extra credit if your instructor allows for this.

Thank you for your time in hearing about my study. Are there any questions?

Appendix M: Class Recruitment Email

Hello,

My name is Nikki Davis and I am an honors psychology undergraduate student at Western Michigan University. I am writing to ask if you would be willing to share information about a research study I am conducting for my honors thesis project. The goal of this research is to better inform interventions during future health crises and learn more about those who have or have not drank during COVID-19.

Full-time undergraduate students attending WMU who are 18 years or older are eligible for the study. Participation includes completing a series of anonymous questionnaires that should take approximately 10-20 minutes to complete. This study was approved by WMU's IRB board on 2/14/2022. Participants will be offered to enter a raffle for a $10 incentive or elect for extra credit if you allow this in your course.

If you would be willing to share information about the study, I have attached a study flyer and recruitment slide that can be shared by email or posted on Elearning. I can also arrange a time to attend your class to announce the study if you would prefer.

If you have any questions about the study, I would be more than happy to share further information about it.

Sincerely,

Nikki Davis
Psychology Major
Undergraduate Honors Student
Western Michigan University

Appendix N: Class Recruitment Slide