

**COVID-19-Anxiety and Using Substances to Cope: Differences Across Race and Gender in  
a New York State College Student Sample**

Laura M. Longo, Ph.D.

Cara L Fresquez, MAC-P

Jessica L. Martin, Ph.D.

M. Dolores Cimini, Ph.D.

Natalie Sumski, MPH

Book Chapter Submission: Addressing Differential Impacts of COVID-19 in New York State

University at Albany

Albany, NY

November 18, 2022

## **COVID-19-Anxiety and Using Substances to Cope: Differences Across Race and Gender in a New York State College Student Sample**

### **Introduction**

College students are a high-risk group for initiation of substance use and misuse (Lipari and Jean-Francois 2016, 5) and experiencing problems as a result of substance use (White and Hingston 2013, 208). Approximately 55% of 18 – 25 year olds report alcohol use, and 35% report heavy episodic drinking (HED, i.e., consuming four+/five+ drinks for females/males in a sitting; Center for Disease Control 2016, under “What is binge drinking?”). HED is concerning given the association with a range of academic, social, and physical consequences such as decreased academic performance, relationship disruption, physical/sexual assault, and death (White and Hingson 2013, 208; Substance Abuse and Mental Health Services Administration 2020a, 1-6). About 23% of college students report using marijuana, in the past month (SAMHSAa 2021, table 3). College student marijuana use is associated with challenges connected to academic performance, such as challenges with attention and memory, increased time to graduation (Palmer et al. 2012, 5), and safety concerns related to driving under the influence (e.g., increased risk for car crashes; see review, Hall 2014, 21, 23,25). Less is known about the prevalence of substance use among graduate students, but in one large study, 85% of graduate students reported past year alcohol use, and 7% reported HED, and 20% reported past year marijuana use (Allen et al. 2022, 69). National data indicate differences in reports of alcohol and marijuana use based on race and gender identity. More specifically, college student men report higher rates of HED and marijuana use compared to women (SAMHSAb 2020, 52, 64), and White young adults tend to have the highest rates of HED and marijuana use, while Asian/Asian Americans report the lowest frequencies of HED and marijuana use (Schulenberg et

al. 2021, 417, 420).

National surveys indicate heightened mental health concerns for college students over the past few years (Oswalt et al. 2020, 41). In the past 12 months, 45% of college students report moderate to serious psychological distress within the past 30 days (11), 23% report suicidal behavior (e.g., thoughts of suicide) (13), and 2% report a suicide attempt (13) (American College Health Association 2020). For some students, experiencing psychological distress can lead to poor academic performance (decrease in GPA, poorer attendance, dropping out of school; Eisenberg et al. 2009, 522-523; Rosenbaum and Liebert 2015, 187).

Substance misuse and mental health concerns tend to co-occur (Cranford et al. 2009, 141; RachBeisel et al. 1999, 1428). From a stress-coping model perspective, individuals use substances to cope with stress and reduce negative affect (e.g., depressed or anxious mood) (Lazarus and Folkman 1984, 216). The use of substances to cope is a substantial risk factor for future substance use disorder (Patrick et al. 2011, 107). Furthermore, the stress-coping model postulates that the expectation that using substances will help relieve negative emotional experiences informs one's motivation to use substances to cope (Cooper et al. 1995, 991). Patrick and colleagues' 2011 study found that coping motives, specifically drinking to cope with anger or frustration, was correlated with increased symptoms of alcohol use disorder 17 years later (114). Hence, identifying those students using substances to cope so as to intervene early to prevent problematic use and the development of substance use disorders is important.

In addition to the stress coping model, health behaviors (e.g., substance use, using substances to cope) can also be understood within the context of systems of oppression. Studies examining health outcomes demonstrate that individuals with marginalized identities (e.g., race, gender, sexuality; Baciu et al., 2017, 57) experience significant health disparities, or decreased

opportunities to reach “optimal health” (US Department of Health and Human Services, 2022, 9), as a result of structural inequities that limit distribution and access to resources and power (Baciu et al., 2017a, 58; Baciu et al., 2017b, 100). Furthermore, individuals with multiple marginalized identities may be at greater risk of negative health outcomes due to the multiple effects of health inequities (e.g., Black Women compared to White Men; Williams et al., 2012, 1258). Thus, it is important to consider the ways health outcomes may differ for individuals across intersectional or multiple marginalized identities.

### **Substance Use and Mental Health During the Pandemic**

The pandemic has impacted the mental health of undergraduate and graduate students in myriad ways. Studies have documented differential impacts of the pandemic on students’ depression and anxiety as well as their substance use behaviors. Studies examining substance use behaviors during the pandemic have primarily focused on undergraduate student samples and no known studies have examined substance use patterns among graduate students. Findings regarding undergraduate student substance use yield inconsistent findings. For example, some research has found reports of increased use of alcohol (Charles et al. 2020, 5; Son et al. 2020, under “Self-management”) and marijuana (Jones et al. 2021, 5; Firkey et al. 2021, 4) among college students, while other studies find decreases in substance use (Graupensperger et al. 2021b, 4; Jackson et al. 2021, 757) or fail to find significant changes (Graupensperger et al. 2021a, 660). Decreases in substance use during the pandemic have been linked to less social opportunity and accessibility to substances in at-home environments, whereas increases have been linked to experiences of boredom and coping with negative affect (Jackson et al. 2021, 759). More specifically, reports of using alcohol (McPhee et al., 2020, 11; Mohr et al., 2021, 183) and marijuana (Chong et al., 2022, 597) to cope increased over the pandemic, and some

students attributed increases in their use to coping with pandemic-related stress (Lanza et al., 2022, 14; Martinez et al., 2022, 5; Patrick et al., 2022, 343). Thus, there appears to be an important connection between substance use, environment, and contextual factors related to the COVID-19 pandemic.

Research on undergraduate and graduate student's mental health during the COVID-19 pandemic documents increased levels of stress and anxiety compared to previous years (Charles et al. 2020, 5; Son et al. 2020, under "Challenges to College Students' Mental Health During COVID-19"; Swanson et al., 2022, 2233; Wilson et al. 2021; Wang et al., 2020). Given structural inequities leading to health disparities for women and racial and ethnic minorities, it is perhaps of little surprise that early data indicate that groups have been affected by the pandemic differently, with college women reporting significantly lower levels of well-being than college men (Hoyt et al. 2020, 272). Findings of the effects of the pandemic on mental health of racial minority students is mixed. Fruehwirth and colleagues' 2021 longitudinal study looking at the effects of the pandemic for first-year college students found depression increased 89% for Black students. Interestingly, they found social isolation decreased for Hispanic and first-generation college students, which also decreased their anxiety and depression over time. Another study by Trammell and colleagues (2021, 4) documented a higher likelihood of social and economic stress as a result of the pandemic for racial minorities, however, minority students did not report an increase in depression. Finally, Asian and Asian American adults report significant increases in experiences of racial discrimination and hate crimes related to the pandemic, which have been associated with increases in reports of anxiety and depression (Lee and Waters 2021, 73-76). Hence, the pandemic has impacted individuals' mental health across racial groups in different ways.

Public health data examining COVID-19 infections and mortality have demonstrated disparities in health outcomes across racial identities (Gross et al. 2020, 3097) such that there are disproportionate numbers of infections and mortality among people of color (Pathak et al. 2020, under “Discussion”; Hooper et al. 2020, 2466). Given the disproportionate ways in which minoritized groups have experienced distress due to health inequities (Purtle 2020, 969) and experiences of discrimination related to the pandemic outbreak (Lee and Waters 2021, 73), they may also be at increased risk for experiencing negative affect or using substances to cope during the pandemic.

### **The Present Study**

There are documented health disparities in mental health and substance use outcomes during the pandemic but nuanced information about whether men and women from different racial and ethnic groups report differing levels of covid-related anxiety and different reported levels of using substances to cope (i.e., a significant risk factor for substance use disorders later in life) is unknown. Further, very little is known about the substance use or the impact of the pandemic on graduate student health outcomes. The purpose of this study was to (1) examine prevalence rates of alcohol use, marijuana use, and reports of using substances to cope with the pandemic among a diverse groups of graduate and undergraduate students, and (2) examine whether COVID-related anxiety, defined as anxiety specific to the pandemic, and alcohol- and marijuana-coping motives, differed as a function of race and gender after controlling for general psychological distress.

### **Method**

The present study utilized data from the Recent Issues and Student Experiences (RISE) Survey, an anonymous online survey conducted between October and December of 2020 that

aimed to investigate a range of New York State college student experiences related to COVID-19, including mental health and substance use. A randomly selected, representative sample of undergraduate and graduate students enrolled at a majority-minority State University of New York campus were emailed an invitation to participate in the study; 91% of participants were recruited through email invitation. Participants were also recruited through social media and flyers on campus (9% of participants). Upon survey completion, participants were eligible to enter a raffle to win one of two \$100 Amazon e-gift cards; additionally, one of every 25 students who completed the survey received a \$20 Amazon e-gift card. Registered students who were at least 18 years of age and provided informed consent were eligible to participate. A total of 1,607 students completed the survey. The survey response rate, based on email recruitment, was 16.58% which is typical of other similar types of surveys conducted at this institution.

After removing participants with missing data on the independent variables of race and gender identity ( $N = 67$ ), as well as American Indian/Native American ( $n = 3$ ) and gender diverse ( $n = 53$ ) participants due to insufficient sample sizes for analysis, the final sample of participants were 1,487 undergraduate (65.4%) and graduate (33.3%) students (cis-women = 71.4%, cis-men = 28.6%) ranging in age from 18 to 64 years ( $M_{\text{age}} = 23.34$ ,  $SD = 6.76$ ). Participants with multiple racial identities were condensed into a single “multiracial” category due to small sample sizes of unique multiracial identity groups. Participants identified as Asian or Asian American (13.9%), Black or African American (13.2%), Hispanic or Latinx (8.8%), White (54.3%), and multiracial (9.8%); 66% reported local residence in New York State’s Capital Region, 29% lived in other regions of New York State, and 3% chose not to answer or lived outside of New York State.

### **Substance Use**

Participants were asked to report their frequency of alcohol and marijuana use over the last 30 days with the items, “Within the last 30 days, on how many days did you use [alcohol/marijuana]?”; response options included, “never”, “have used but not in the last 30 days”, “1-2 days”, “3-5 days”, “6-9 days”, “10-29 days”, “20-29 days”, and “used daily”. Participants who reported past month alcohol use were provided the definition of “a standard drink” (Saunders et al. 1993, 794) and asked about the number of drinks consumed per day of the week using the Daily Drinking Questionnaire (Collins et al. 1985, 191). The number of past week heavy episodic drinking (HED) episodes was calculated based on the total number of days participants reported consuming more than 4/5 (females/males) drinks per sitting in the past month (CDC, 2016). Finally, a single item created for this study was used to assess increase in substance use due to pandemic-related distress, “Have you started using substances or increased substance use to cope with stress or emotions related to COVID-19?” Response options included, “yes”, “no”, “don’t know”, or “I choose not to answer”; those who selected “don’t know” or “I choose not to answer” (n = 26) were excluded from analyses.

### **Alcohol Coping Motives**

The Drinking Motives Questionnaire-Revised (Cooper, 1994) assesses four primary motives for alcohol use (i.e., social, coping, enhancement, and conformity). The present study used the 5-item coping motives subscale (122) (Cronbach's  $\alpha = .86$ ); it was administered to participants who reported past month alcohol use. Response options include a five-point Likert scale (1 = Almost Never/Never, 2 = Some of the Time, 3 = Half of the Time, 4 = Most of the Time, 5 = Almost Always/Always). A sample item includes, “You drink because it helps you when you feel depressed or nervous”. The total score was calculated; higher scores indicate higher alcohol coping motives.

### **Marijuana Coping Motives**

The Marijuana Motives Measure (Simons et al. 1998) assesses five primary motives for marijuana use (i.e., social, coping, enhancement, conformity, and expansion) (118). The present study used the 5-item coping motives subscale (Cronbach's  $\alpha = .83$ ); it was administered to participants who reported past month marijuana use. Response options include a five-point Likert scale (1 = Almost Never/Never, 2 = Sometimes, 3 = Often, 4 = Almost Always/Always). A sample item includes, "I use marijuana to cheer me up when I am in a bad mood". The total score was calculated; higher scores indicate higher marijuana coping motives.

### **Psychological Distress**

The Kessler Psychological Distress Scale (Kessler et al. 2003) is a 6-item measure used to screen for global distress, mood, and anxiety disorders based on experiences over the last 30 days using a five-point Likert scale (185). A sample item includes, "During the past 30 days, about how often did you feel so depressed that nothing could cheer you up?" The total score was calculated. Scores ranging from 0 - 8 indicate no to low psychological distress, 9 - 12 indicate moderate psychological distress, and scores 13 - 24 indicate serious psychological distress. Participant responses demonstrated good internal consistency (Cronbach's  $\alpha = .91$ ).

### **COVID-Related Anxiety**

COVID-related anxiety was assessed using Keeter's (2020, 1) adapted version of the Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al. 2006, 1094). The seven-item measure assesses anxiety related to COVID-19 over the past seven days using a four-point Likert scale (0 = Rarely or None of the Time, 1 = Some or a Little of the Time, 2 = Occasionally or a Moderate Amount of the Time, 3 = Most of the Time). A sample item includes, "When thinking about the COVID-19 outbreak, in the past seven days I felt nervous, anxious, or on edge." One item was

reverse scored (i.e., “When thinking about the COVID-19 outbreak, in the past seven days I felt hopeful about the future.”). The total score was calculated; higher scores indicate higher levels of COVID-related anxiety. Score ranges utilize those for the GAD-7: 1-4 = minimal, 5-9 = mild, 10-14 = moderate, and 15-21 = severe COVID-related anxiety symptoms. Responses demonstrated good internal consistency (Chronbach’s  $\alpha = .79$ ).

## Results

Data were examined to assess statistical assumptions of MANCOVA (i.e., independence of observation, linear relationship of the dependent variables, homogeneity of variance-covariance matrices, and no multivariate outliers), which were all met. Although distributions for dependent variables violated assumptions of normality, the *F*-test is robust to violations of the normality assumption (Haase and Ellis 1987, 404-413), and therefore the data was not transformed. Correlations were performed to examine the relationships among the dependent variables and covariates (i.e., psychological distress, COVID-related anxiety, and alcohol and marijuana coping motives).

Prevalence rates of substance use, COVID-related anxiety, and psychological distress by race and gender are presented in Table 1. White students reported the highest frequencies of alcohol use (i.e., days per week), whereas Hispanic/Latinx students reported the highest rates of risky alcohol use (i.e., HED). About 25% of multiracial and Hispanic/Latinx students reported past month marijuana use, which was the highest among the racial groups. Multiracial students reported the highest rates of psychological distress, COVID-related anxiety, and increased substance use due to COVID-related stress. Asian/Asian American students reported the lowest rates of substance use across all indices. About 20% of cis-women and cis-men reported past month marijuana use. In comparison to Cis-men, Cis-women reported higher frequencies of past

month alcohol use, risky alcohol use, psychological distress, COVID-related anxiety, and increased substance use due to COVID-related stress.

Table 1

Frequencies of Substance Use and Means of COVID-related anxiety and Psychological Distress

	n	Alc Use	HED	MJ Use	↑AOD	COVID-related Anxiety		Psych Distress	
		%	%	%	%	M	SD	M	SD
Total Sample	1487	49.2	36.4	20.5	16.7	6.98	41	9.03	6.20
Cis-men	426	46.2	34.7	20.4	13.8	5.51	26	7.49	5.97
Cis-women	1061	52.7	37.3	20.5	17.9	7.55	55	9.65	6.18
Asian/Asian American	206	28.6	19.2	9.2	10.0	6.54	45	8.55	6.31
Black/African American	197	32.0	21.4	21.3	18.8	6.53	30	9.18	6.66
Hispanic/Latinx	131	41.2	57.1	25.2	14.2	6.14	97	7.40	5.69
White	807	62.6	38.6	21.6	16.9	7.18	44	9.13	6.04
Multiracial	146	51.4	32.0	25.3	24.1	7.82	54	10.40	6.38

NOTE: Frequencies of alcohol use (Alc Use), heavy episodic drinking (HED), and marijuana use (MJ Use) are based on reports of substance use over the past 30 days. ↑AOD = increased alcohol and other drug use due to COVID stress.

Primary analyses were conducted using two MANCOVAs. In these models the independent variables were race (Asian, Black, Hispanic, White, Multiracial) and gender (cis-women, cis-men), the covariate was psychological distress, and dependent variables were covid-related anxiety and using alcohol to cope (Model 1) or covid-related anxiety and using marijuana to cope (Model 2). Responses on the Kessler-6 (i.e., psychological distress) were controlled for

in analyses to remove any impact that general psychological distress may have on the relationship between the independent variables (i.e., race, gender) on the dependent variables (i.e., covid related anxiety, using alcohol to cope (Model 1)/marijuana (model 2) to cope). To protect against Type I error, the family wise alpha level for the four follow-up univariate tests was set to .05; therefore, the per-comparison alpha level was set to .0125.

For model 1, the full model was significant ( $F_{8, 1398} = 1.93, p = .05$ ; Wilks'  $\Lambda = .978$ ), demonstrating that COVID-related anxiety and alcohol coping motives were affected differently based on race and gender group membership when controlling for general psychological distress. The main effects for race ( $F_{8, 1398} = 2.59, p = .008$ , Wilks'  $\Lambda = .971$ , partial  $\eta^2 = .015$ ) and gender ( $F_{2, 699} = 8.79, p = .000$ , Wilks'  $\Lambda = .975$ , partial  $\eta^2 = .025$ ) were significant, with slightly larger effect sizes for gender in comparison to race. There was a significant race by gender interaction for alcohol coping motives ( $F_{4, 700} = 2.82, p = .024$ , partial  $\eta^2 = .016$ ), such that the highest reports of alcohol coping motives were for Black men, followed by Asian men, and then Multiracial men and women (see figure 1 for full graphical representation of the race x gender interaction). Subsequent univariate tests examining COVID-related anxiety demonstrated no significant differences among racial groups ( $p = .071$ ), but revealed significant gender differences ( $F_{1, 700} = 11.63, p = .001$ , partial  $\eta^2 = .016$ ) where cis-women ( $M = 7.30$ ) scored significantly higher on reports of COVID-related anxiety compared to cis-men ( $M = 5.97$ ).

Figure 1

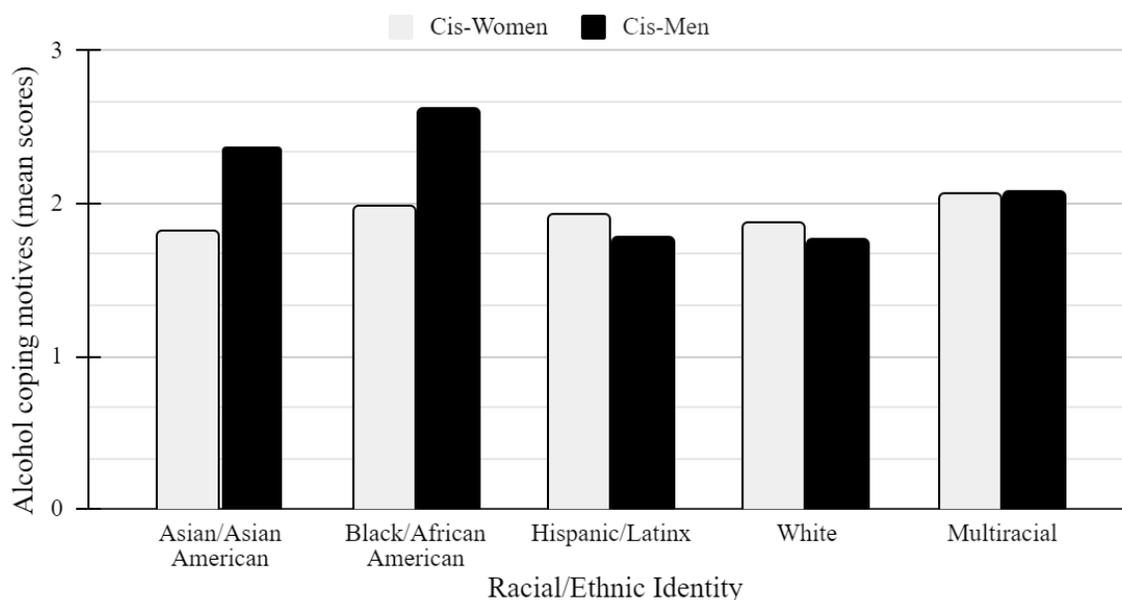


Figure 1. Alcohol coping motives by race/ethnicity and gender identity.

Model 2 failed to demonstrate a significant race by gender interaction ( $p = .585$ ) on COVID-related anxiety and marijuana coping motives, however main effects for race ( $F_{8, 550} = 3.117, p = .002, \text{Wilks}'\Lambda = .915, \text{partial } \eta^2 = .043$ ) and gender ( $F_{2, 275} = 4.12, p = .017, \text{Wilks}'\Lambda = .971, \text{partial } \eta^2 = .029$ ) were significant, with larger effect sizes for race in comparison to gender. Similar to the previous model, follow-up univariate tests failed to find significant racial group differences in reports of COVID-related anxiety ( $p = .474$ ), but demonstrated significant differences in marijuana coping motives ( $F_{4, 276} = 5.35, p = .000, \text{partial } \eta^2 = .072$ ). Specifically, White ( $M = 1.90$ ) students reported significantly lower scores in marijuana coping motives compared to Black ( $M = 2.49$ ), Hispanic ( $M = 2.31$ ), and Multiracial ( $M = 2.31$ ) students; Asian ( $M = 1.75$ ) students reported significantly lower scores in marijuana coping motives in comparison to Black students. With regard to gender, follow-up univariate tests revealed that cis-women ( $M = 8.33$ ) reported significantly higher COVID-related anxiety compared to cis-men [ $M = 6.51$ ; ( $F_{4, 276} = 8.07, p = .005, \text{partial } \eta^2 = .028$ )]; there were no significant gender differences in

marijuana coping motives ( $p = .581$ ). Descriptives of alcohol and marijuana coping motives, and COVID-related anxiety are presented in Table 2.

Table 2

	Model 1				Model 2			
	COVID-related Anxiety		Alcohol Coping Motives		COVID-related Anxiety		Marijuana Coping Motives	
	M	SE	M	SE	M	SE	M	SE
Cis-men	5.97 <sup>a</sup>	.35	2.12 <sup>a</sup>	.09	6.51 <sup>a</sup>	.57	2.11	.13
Cis-women	7.30 <sup>a</sup>	.18	1.91 <sup>a</sup>	.05	8.33 <sup>a</sup>	.30	2.19	.07
Asian/Asian American	7.03	.43	2.10 <sup>b</sup>	.12	8.21	1.06	1.75 <sup>f</sup>	.25
Black/African American	5.52	.47	2.23 <sup>c</sup>	.13	6.46	.60	2.49 <sup>bf</sup>	.14
Hispanic/Latinx	6.68	.56	1.92	.15	7.33	.68	2.31 <sup>d</sup>	.16
White	6.94	.15	1.86 <sup>bc</sup>	.04	7.58	.28	1.90 <sup>bd</sup>	.07
Multiracial	6.98	.45	2.06	.12	7.53	.75	2.31 <sup>e</sup>	.17

NOTE: <sup>a</sup>Significant pairwise comparison between cis-men and cis-women. <sup>b</sup>Significant pairwise comparison between Asian/Asian American and White students. <sup>c</sup>Significant pairwise comparison of White and Black students. <sup>d</sup>Significant pairwise comparison between White and Hispanic/Latinx students. <sup>e</sup>Significant pairwise comparison between White and Multiracial students. <sup>f</sup>Significant pairwise comparison between Asian and Black students.

## Discussion

Results of the present study suggest the presence of both gender and racial disparities in the impact of the pandemic on undergraduate and graduate level students. Women and multiracial college students appear to have been differentially impacted by the pandemic. These disparities point to the need for further research on factors contributing to health disparities among women and racial minority students, as well as engagement in critical inquiry regarding how to quickly and effectively address the mental health concerns of these particularly at-risk populations, especially during the COVID-19 pandemic. Our sample adds to the limited literature available on the experiences of both undergraduate and graduate students' mental

health and substance use during the pandemic, however findings do not allow for comparisons among studies that examine these populations separately.

College student women reported higher frequencies of past month alcohol use, risky alcohol use, psychological distress, COVID-related anxiety, and initiated or increased substance use to cope with COVID-related stress. Nationally, college women tend to report higher psychological distress than college men (ACHA 2020, 11), and the same is true for college students on the campus at which this study was conducted (57.3% cis-women vs 39% of cis-men report moderate to severe psychological distress; Center for Behavioral Health Promotion and Applied Research, 2020). Beyond greater general psychological distress, women in the study sample also reported greater COVID-related anxiety and increased substance use due to COVID-related stress compared to men. Our findings are consistent with Hoyt et al.'s (2020) findings of lower overall well-being among women compared to men (272), though our results demonstrate a more nuanced picture of how women are struggling with COVID-related anxiety in particular. Within traditional gender roles and norms, women are socialized and expected to care for those around them (e.g., younger siblings, older family members, friends; McConnon et al., 2022, 49). This sense of heightened responsibility for others, especially while many are living and attending school from home, may contribute to higher levels of COVID-related anxiety and using substances to cope. At the same time, our findings related to COVID-related anxiety need to be interpreted with caution due to the insufficient measurement of psychometric properties associated with the newly adapted scale (Keeter 2020). Finding greater substance use among women is inconsistent with the majority of prior research, which finds that while the gender gap is closing, alcohol use and substance use disorders are more prevalent among men than women of all ages (Hoeppner et al. 2013, 6; Johnston et al. 2016). Approximately 20% of women

reported past month marijuana use, which is consistent with national and New York State statistics (SAMHSA 2020, Table 3). To address this increasing concern, it is important to develop, implement, and evaluate evidence-based prevention and intervention programs that are relevant and responsive to the unique needs of women and that address the myriad factors that precipitate gender-related alcohol and other drug use. Universities could readily create support groups for college women that address mental health and substance use among women in the context of gender-specific norms, expectations, roles etc.

While women reported greater alcohol use, results indicated that men and particularly Black men, followed by Asian/Asian American men reported the highest levels of drinking to cope after controlling for general psychological distress. High levels of drinking to cope within these groups could be associated with the racially charged events involving Black Americans occurring nationally and the racial discrimination targeting Asian Americans due to the origin of the pandemic in China during the time of data collection. Prevention efforts and interventions with individuals identifying as Black and Asian should explicitly consider the the impact of racial discrimination and (currently) the impact of the pandemic and other cultural factors impacting individuals's substance use and mental health. Frequencies of alcohol use across racial groups were consistent with national studies (Vaeth et al. 2017, 3). With regard to marijuana use, approximately 25% of Multiracial and Hispanic/Latinx students reported past month marijuana use, which is consistent with the 22% of individuals between the ages of 18-25 years old in the US and 24% of 18-25 year-olds in New York State who endorsed past month marijuana use in 2019 before the start of the pandemic (SAMHSA 2020, table 3). To address these critical concerns, it is important for colleges and universities to implement targeted evidence-based prevention programs inclusive of both undergraduate and graduate students that

are responsive to the rich diversity of students across a variety of racial and ethnic identities; central in such an effort is the engagement of students themselves in the development, implementation, and evaluation of culturally-informed prevention and intervention efforts. Finally, research on a large graduate student sample is needed to better understand gender and racial differences among this population's experiences of mental health and substance use behaviors. Such information can be used to further inform prevention and intervention approaches in the future.

Similar to women, Multiracial students reported the highest rates of psychological distress, COVID-related anxiety, and increased substance use due to COVID-related stress. Multiracial students, along with Black and Hispanic participants reported significantly higher marijuana coping motives than their White counterparts after controlling for general psychological distress. Racial and ethnic minority students are engaging in alcohol and marijuana use to cope with negative affect more than White students, which is problematic given drinking to cope is associated with alcohol-related problems and future alcohol use disorder (Patrick et al. 2011, 107). Racial minority students may benefit from assistance in developing alternative, healthy, and culturally appropriate strategies to cope with negative affect to replace the use of substances for this purpose. Future studies are needed to expand the field's understanding of the connection between discrimination, mental health, and substance use among minoritized college students (Su et al. 2021, 523). Additionally, as marijuana use for recreational purposes has been legalized in New York State effective April 1, 2021, it is critical to monitor the impact of this legislative change on marijuana use among college students.

There is little research on mental health and substance use among Multiracial college students nor is there data documenting health disparities among this population. However,

research on Multiracial adults has identified an increased risk of experiencing negative effects and consequences of systemic inequities, racial identity invalidation, and health risk behaviors (Franco & McElroy-Heltzel, 2021, 100; Shih & Sanchez, 2021, 8), which can exacerbate mental health concerns (Franco et al., 2021, 350-351). Our findings suggest like the adult population of multiracial people, Multiracial college students may be struggling more than those from other racial/ethnic groups. More research is needed to understand the causes and best approaches to preventing substance use and mental health concerns among multiracial students. Future research should explore how such efforts should be targeted to meet the unique needs and concerns of this population of students.

#### **Addressing Health-Risk Behaviors through a Comprehensive Prevention Framework**

The advancement of prevention science and the concurrent refinement of the prevention landscape underscore the critical role of evidence-based prevention practice in promoting the health of our nation. The effectiveness of prevention to enhance human functioning and reduce psychological and physical distress has been demonstrated clearly (Catalano et al. 2002, 7; National Research Council and Institute of Medicine 2009). Successful preventive interventions are typically theory driven, culturally relevant, developmentally appropriate, and delivered across multiple contexts. Preventive services and interventions help to further the health and well-being of individuals, communities, and nations (Satcher 2000, 1; World Health Organization 2008, 6). There is clear evidence that expanding preventive services reduces the costs of substance misuse and mental health care by addressing problems early, before costly treatment is necessary (Tolan and Dodge 2005, 606).

The importance of prevention is affirmed by the U.S. National Prevention Strategy, which provides an unprecedented opportunity to move “the nation from a focus on sickness and

disease to one based on prevention and wellness” (National Prevention Council 2011, 7) throughout the lifespan. Preventive services and interventions also address issues of health, educational, and social inequities that reflect disparities across demographic groups such as those based on race, gender, disability, socioeconomic class, and other factors. Environmental prevention strategies, such as consultation to improve community–family–school coordination or interventions to help communities create health promotion programs, can inform social policy, which can minimize or eliminate factors contributing to unhealthy functioning.

Within the United States, prevention practice takes place across a wide range of professions and types and levels of education, each being essential to driving and solidifying a strong and stable network of supports for our communities, families, and individuals. The prevention workforce today consists of representation from several specialties, including public health, community health, health education, social work, psychology, and medicine, as well as community health workers. As our nation embraces service models based on comprehensive care, risk reduction, and promotion of health and safety within our communities, prevention-focused content is beginning to be integrated into course curricula, practice, and internships, offering potential opportunities for new partnerships to be developed and enhanced, ultimately opening new doors to the expansion of the prevention workforce across numerous settings, including institutions of higher education.

Addressing health risk behaviors using a comprehensive prevention framework is a familiar concept to many college and university administrators and prevention practitioners working within college and university settings. In its landmark document addressing alcohol use among college students, the Task Force on College Drinking of the National Institute on Alcohol Abuse and Alcoholism (2002, IX) indicates that it is useful and important to view comprehensive

prevention efforts using a “3-in-1 Framework;” that is, efforts must be able to reach individual students who may be at risk, the student body as a whole, and the college or university campus and surrounding community. Moreover, the public health approach defines comprehensive prevention activities as occurring simultaneously at multiple levels: with the entire campus community (universal prevention), with students at risk (early intervention), and with students who have already developed problems requiring treatment and referral indicated (specialized prevention). For example, within a comprehensive prevention model on a college campus, universal strategies might include social norms and social marketing campaigns that attempt to correct misperceptions about typical or normative use of substances across the study body, early interventions might include mental health and problematic substance use screenings, and bystander intervention programs that aim to empower those in risky situations to speak up or act to prevent harm, and specialized interventions might include counseling services, referral for medication treatment, and responding to urgent or emergent mental health and substance use-related concerns on campus.

In the above framework, comprehensive prevention activities take place in the context of a feedback loop. That is, each key element delivered across the prevention spectrum interfaces with the other under the umbrella of an overarching set of goals and objectives, and the evaluation of each component strategy informs the implementation of future prevention strategies or modifications of existing strategies. Of course, data from the present study indicate clearly that the implementation of a “one size fits all” prevention strategy on a college campus is insufficient in addressing the unique needs of students identifying as racial and ethnic minorities, and men and women; it is incumbent on prevention professionals and clinical service providers alike to understand the intersections among race, ethnicity, gender, and other diversity factors on

the delivery of and response to interventions across institutions of higher education. Hence, while it is important to gather campus-wide data on health behaviors, it is critically important to disaggregate the data, and examine group differences and the impacts of intersectional identities on various health behaviors. Disaggregated data can be used to understand the unique needs of specific sub-populations of students, provide guidance for tailored prevention efforts to reduce health disparities, and advocate for where Universities need to be investing. Tailored and culturally responsive prevention programming can be embedded in offices on campus that support graduate students (e.g., graduate student lounges, graduate student associations), at-risk students (e.g., multicultural resource centers, educational opportunity programs), should address all areas of well-being, not just those related to mental or emotional health (e.g., intellectual, social, environmental), and utilize participatory approaches with student involvement at all stages of development. Finally, universities need to examine and address policies and structures that maintain systems of oppression and inequity that affect student well-being, and consider the principles and actions associated with being a health promoting university as outlined in the Okanagan charter (Okanagan Charter, 2015).

## References

- Allen, Hannah K., Flavius Lilly, Kerry M. Green, Faika Zanjani, Kathryn B. Vincent, and Amelia M. Arria. "Substance use and mental health problems among graduate students: Individual and program-level correlates." *Journal of American College Health* 70, no. 1 (2022): 65-73.
- American College Health Association. 2020. *American College Health Association-National College Health Assessment III: Reference Group Executive Summary Fall 2020*. Silver Spring, MD: American College Health Association.  
[https://www.acha.org/documents/ncha/NCHA-III\\_Fall\\_2020\\_Reference\\_Group\\_Executive\\_Summary.pdf](https://www.acha.org/documents/ncha/NCHA-III_Fall_2020_Reference_Group_Executive_Summary.pdf).
- Baciu, Alina, Yamrot Negussie, Amy Geller, James N. Weinstein, and National Academies of Sciences, Engineering, and Medicine. "The state of health disparities in the United States." In *Communities in action: Pathways to health equity*. National Academies Press (US), 2017.
- Bradizza, Clara M., Alan Reifman, and Grace M. Barnes. "Social And Coping Reasons For Drinking: Predicting Alcohol Misuse In Adolescents." *Journal of Studies On Alcohol* 60, no. 4 (1999): 491-499.
- Broman, Clifford L. "Stress, Race and Substance Use In College." *College Student Journal* 39, no. 2 (2005): 340-353.
- Catalano, Richard F., Lisa M. Berglund, Jeanne A. M. Ryan, Heather S. Lonczak, and J. David Hawkins. 2002. "Positive Youth Development In The United States: Research Findings On Evaluations Of Positive Youth Development Programs". *Prevention & Treatment*, no. 5. (June) doi:10.1037/1522-3736.5.1.515a.
- Center for Behavioral Health Promotion and Applied Research. 2020. *UAlbany Student Health Survey*. Unpublished data set.
- Centers for Disease Control. 2016. "Frequently asked questions." Centers for Disease Control. Last modified February 16, 2021. <http://www.cdc.gov/alcohol/faqs.htm>.
- Charles, Nora E., Stephanie J. Strong, Lauren C. Burns, Margaret R. Bullerjahn, and Katherine M. Serafine. 2021. "Increased Mood Disorder Symptoms, Perceived Stress, And Alcohol Use Among College Students During The Covid-19 Pandemic." *Psychiatry Research* 296 (February): 113706. <https://doi.org/10.1016/j.psychres.2021.113706>.
- Chong, Wendy Wing-Yee, Zeynep Ilgaz Acar, Meghan Lee West, and Francis Wong. "A scoping review on the medical and recreational use of cannabis during the COVID-19 pandemic." *Cannabis and Cannabinoid Research* (2022).
- Collins, R. Lorraine, George. A. Parks, and G. Alan Marlatt. 1985. "Social Determinants Of Alcohol Consumption: The Effects Of Social Interaction And Model Status On The Self-

- administration Of Alcohol.” *Journal of Consulting and Clinical Psychology* 53, (April): 189–200. <http://dx.doi.org/10.1037/0022-006X.53.2.189>.
- Cooper, M. Lynne. 1994. “Motivations for Alcohol Use Among Adolescents: Development and Validation of a Four-Factor Model.” *Psychological Assessment* 6, no. 2 (June): 117-128. <https://search-proquest-com.libproxy.albany.edu/reports/motivations-alcohol-use-among-adolescents/docview/62710923/se-2?accountid=14166>.
- Cooper, M. Lynne, Michael R. Frone, Marcia Russell, and Pamela Mudar. "Drinking To Regulate Positive And Negative Emotions: A Motivational Model Of Alcohol Use." *Journal Of Personality And Social Psychology* 69, no. 5 (1995): 990.
- Cranford, James A., Daniel Eisenberg, and Alisha M. Serras. 2009. “Substance Use Behaviors, Mental Health Problems, And Use Of Mental Health Services In A Probability Sample Of College Students.” *Addictive Behaviors* 34, no. 2 (February): 134-145. <https://doi.org/10.1016/j.addbeh.2008.09.004>.
- Eisenberg, Daniel, Marilyn F. Downs, Ezra Golberstein, and Kara Zivin. "Stigma And Help Seeking For Mental Health Among College Students." *Medical Care Research and Review* 66, no. 5 (2009): 522-541.
- Franco, Marisa, Myles Durkee, and Stacey McElroy-Heltzel. "Discrimination comes in layers: Dimensions of discrimination and mental health for multiracial people." *Cultural Diversity and Ethnic Minority Psychology* 27, no. 3 (2021): 343.
- Firkey, Madison K., Alan Z. Sheinfil, and Sarah E Woolf-King. 2020. “Substance Use, Sexual Behavior, And General Well-being Of Us College Students During The Covid-19 Pandemic: A Brief Report.” *Journal of American College Health* 12 (February): 1-7. <https://doi.org/10.1080/07448481.2020.1869750>.
- Fruehwirth, Jane Cooley, Siddhartha Biswas, and Krista M. Perreira. "The Covid-19 Pandemic And Mental Health Of First-year College Students: Examining The Effect Of Covid-19 Stressors Using Longitudinal Data." *PloS one* 16, no. 3 (2021): <https://doi.org/10.1371/journal.pone.0247999>.
- Graupensperger, Scott, Charles B. Fleming, Anna E. Jaffe, Isaac C. Rhew, Megan E. Patrick, and Christine M. Lee. 2021a. “Changes In Young Adults’ Alcohol And Marijuana Use, Norms, And Motives From Before To During The Covid-19 Pandemic.” *Journal of Adolescent Health* 68, no. 4 (April): 658-665. <https://doi.org/10.1016/j.jadohealth.2021.01.008>.
- Graupensperger, Scott, Anna E. Jaffe, Charles N. Fleming, Jason R. Kilmer, Christine M. Lee, and Mary E. Larimer. 2021b. “Changes In College Student Alcohol Use During The Covid-19 Pandemic: Are Perceived Drinking Norms Still Relevant?.” *Emerging Adulthood*. (March): 1-10. <https://doi.org/10.1177/2167696820986742>.
- Gross, Cary P., Utibe R. Essien, Saamir Pasha, Jacob R. Gross, Shi-yi Wang, and Marcella Nunez-Smith. 2020. “Racial And Ethnic Disparities In Population-level Covid-19

- Mortality.” *Journal of General Internal Medicine* 35, no. 10 (August): 3097-3099. <https://doi.org/10.1007/s11606-020-06081-w>.
- Haase, Richard F. and Michael V. Ellis. 1987. “Multivariate Analysis of Variance.” *Journal of Counseling Psychology* 34, no. 4 (October): 404-413. <https://doi.org/10.1037//0022-0167.34.4.404>.
- Hall, Wayne. 2014. “What Has Research Over The Past Two Decades Revealed About The Adverse Health Effects Of Recreational Cannabis Use?”. *Addiction* 110, no. 1. (October): 19-35. <https://doi.org/10.1111/add.12703>.
- Hoepfner, Bettina, B. Anna L. Paskausky, Kristina, M. Jackson, and Nancy P. Barnett. 2013. “Sex Differences in College Student Adherence to NIAAA Drinking Guidelines.” *Alcoholism, Clinical and Experimental Research* 37, 10 (May): 1779–1786. <https://doi.org/10.1111/acer.12159>.
- Hooper, Monica W., Anna M. Nápoles, and, Eliseo J Pérez-Stable. 2020. “COVID-19 and Racial/Ethnic Disparities.” *Jama* 323, no. 24 (May): 2466-2467. <https://doi.org/doi:10.1001/jama.2020.8598>.
- Hoyt, Lindsay T., Alison K. Cohen, Brandon Dull, Elena M. Castro, and Neshat Yazdani. 2020. “‘Constant Stress Has Become the New Normal’: Stress and Anxiety Inequalities Among US College Students in the Time of COVID-19.” *Journal of Adolescent Health* 68, no. 2 (February): 270-276. <https://doi.org/10.1016/j.jadohealth.2020.10.030>.
- Jackson, Kristina M., Jennifer E. Merrill, Angela K. Stevens, Kerry L. Hayes, and Helene R. White. 2021. “Changes in Alcohol Use and Drinking Context Due to the COVID-19 Pandemic: A Multimethod Study of College Student Drinkers.” *Alcoholism: Clinical and Experimental Research*. (February): 1-13. <https://doi-org.libproxy.albany.edu/10.1111/acer.14574>.
- Johnston, Lloyd D., Patrick M. O’Malley, Jerald G. Bachman, John E. Schulenberg, and Richard A. Miech. 2016. “Monitoring The Future National Survey Results On Drug Use, 1975-2015: Volume Ii, College Students And Adults Ages 19-55.” Ann Arbor: Institute for Social Research, The University of Michigan. <https://files.eric.ed.gov/fulltext/ED578539.pdf>.
- Jones, Heidi E., Meredith Manze, Victoria Ngo, Patricia Lamberson, and Nicholas Freudenberg. 2021. “The Impact Of The Covid-19 Pandemic On College Students’ Health And Financial Stability In New York City: Findings From A Population-based Sample Of City University Of New York (Cuny) Students.” *Journal of Urban Health* (February): 1-10. <https://doi.org/10.1007/s11524-020-00506-x>.
- Keeter, Scott. “People financially affected by COVID-19 outbreak are experiencing more psychological distress than others,” last modified March 30, 2020, <https://www.pewresearch.org/fact-tank/2020/03/30/people-financially-affected-by-covid-19-outbreak-are-experiencing-more-psychological-distress-than-others/>.

- Kessler, Ronald C., Peggy R. Barker, Lisa J. Colpe, Joan F. Epstein, Joseph C. Gfroerer, Eva Hiripi, Mary J. Howes, Sharon-Lise T. Normand, Ronald W. Manderscheid, Ellen E. Walters, and Alan M. Zaslavsky, 2003. "Screening For Serious Mental Illness In The General Population." *Archives of General Psychiatry* 60, no. 2 (February): 184-189. <https://doi.org/10.1001/archpsyc.60.2.184>.
- Lanza, Stephanie T., Whetzel, Courtney A., Linden-Carmichael, Ashley N., and Craig J. Newschaffer. "Change in college student health and well-being profiles as a function of the COVID-19 pandemic." *PLOS ONE* 17, no. 5 (2022): e0267724. <https://doi.org/10.1371/journal.pone.0267724>.
- Lazarus, Richard S. and Susan Folkman. 1984. *Stress, Appraisal, and Coping*. New York: Springer publishing company.
- Lee, Suyeon, and Sara F. Waters. 2021. "Asians And Asian Americans' Experiences Of Racial Discrimination During The Covid-19 Pandemic: Impacts On Health Outcomes And The Buffering Role Of Social Support." *Stigma and Health* 6 (1): 70-78. <https://doi.org/10.1037/sah0000275>.
- Lipari, Rachel N., and Beda Jean-Francois. 2016. "The CBHSQ report: A Day In The Life Of College Students Aged 18 To 22: Substance Use Facts." *Substance Abuse and Mental Health Services Administration*. [https://permanent.fdlp.gov/gpo93259/Bookshelf\\_NBK396154.pdf](https://permanent.fdlp.gov/gpo93259/Bookshelf_NBK396154.pdf).
- Mangrum, Laurel F., Richard T. Spence, and Steinley-Bumgarner, Michelle D. "Gender Differences In Substance-Abuse Treatment Clients With Co-occurring Psychiatric And Substance-use Disorders." *Brief Treatment and Crisis Intervention* 6, no. 3 (2006): 255-267. <https://doi.org/10.1093/brief-treatment/mhl006>.
- Martinez, Amanda and Sophie Nguyen. 2020. "The Impact of Covid-19 On College Student Well-Being." *The Healthy Minds Network and American College Health Association*. [https://healthymindsnetwork.org/wp-content/uploads/2020/07/Healthy\\_Minds\\_NCHA\\_COVID\\_Survey\\_Report\\_FINAL.pdf](https://healthymindsnetwork.org/wp-content/uploads/2020/07/Healthy_Minds_NCHA_COVID_Survey_Report_FINAL.pdf).
- Martinez, Priscilla, Katherine J. Karriker-Jaffe, Yu Ye, Deidre Patterson, Thomas K. Greenfield, Nina Mulia, and William C. Kerr. "Mental health and drinking to cope in the early COVID period: Data from the 2019–2020 US National Alcohol Survey." *Addictive behaviors* 128 (2022): 107247.
- McCabe, Sean Esteban, Michele Morales, James A. Cranford, Jorge Delva, Melnee D. McPherson, and Carol J. Boyd. "Race/Ethnicity And Gender Differences In Drug Use And Abuse Among College Students." *Journal Of Ethnicity In Substance Abuse* 6, no. 2 (2007): 75-95. [https://doi.org/10.1300/J233v06n02\\_06](https://doi.org/10.1300/J233v06n02_06).

- McConnon, Annie, Allegra J. Midgette, and Clare Conry-Murray. "Mother Like Mothers and Work Like Fathers: US Heterosexual College Students' Assumptions About Who Should Meet Childcare and Housework Demands." *Sex Roles* 86, no. 1 (2022): 49-66.
- McPhee, M. D., Keough, M. T., Rundle, S., Heath, L. M., Wardell, J. D., & Hendershot, C. S. (2020). Depression, environmental reward, coping motives and alcohol consumption during the COVID-19 pandemic. *Frontiers in psychiatry*, 1128.
- Mohr, C. D., Umemoto, S. K., Rounds, T. W., Bouleh, P., & Arpin, S. N. (2021). Drinking to cope in the COVID-19 era: an investigation among college students. *Journal of studies on alcohol and drugs*, 82(2), 178-187
- National Institute on Alcohol Abuse and Alcoholism. 2002. *A Call To Action: Changing the Culture of College Drinking*. National Institutes of Health. <https://www.collegedrinkingprevention.gov/media/taskforcereport.pdf>.
- National Research Council and Institute of Medicine. Preventing Mental, Emotional, and Behavioral Disorders Among Young People. Washington, DC: National Academies Press. <https://www.ncbi.nlm.nih.gov/books/NBK32775/>
- National Prevention Council. 2011. *National Prevention Strategy: America's Plan For Better Health And Wellness*. Washington, DC: US Department of Health and Human Services. <https://www.hhs.gov/sites/default/files/disease-prevention-wellness-report.pdf>.
- Oswalt, Sara B., Alyssa M. Lederer, Kimberly Chestnut-Steich, Carol Day, Ashlee Halbritter, and Dugeidy Ortiz. 2020. "Trends In College Students' Mental Health Diagnoses And Utilization Of Services, 2009–2015." *Journal of American College Health* 68, no. 1 (January): 41-51. <https://doi.org/10.1080/07448481.2018.1515748>.
- Palmer, Rebekka S., Thomas J. McMahon, Danielle I. Moreggi, Bruce J. Rounsaville, and Samuel A. Ball. 2012. "College Student Drug Use: Patterns, Concerns, Consequences, And Interest In Intervention." *Journal Of College Student Development* 53, no. 1 (January): 124-131. <https://doi.org/10.1353/csd.2012.0014>.
- Pathak, Ishaan, Yoonjung Choi, Dazhi Jiao, Diana Yeung, and Li Liu. 2020. "Racial-ethnic Disparities In Case Fatality Ratio Narrowed After Age Standardization: A Call For Race-ethnicity-specific Age Distributions In State Covid-19 Data." *MedRxiv*. (October). <https://doi.org/10.1101/2020.10.01.20205377>.
- Patrick, Megan E., John E. Schulenberg, Patrick M. O'malley, Lloyd D. Johnston, and Jerald G. Bachman. 2011. "Adolescents' Reported Reasons For Alcohol And Marijuana Use As Predictors Of Substance Use And Problems In Adulthood." *Journal of Studies on Alcohol and Drugs* 72, no. 1 (January): 106-116. <https://doi.org/10.15288/jsad.2011.72.106>.
- Patrick, Megan E., Parks, Michael J., Fairlie, Anne M., Kreski, Noah T., Keyes, Katherine M., and Richard Miech. "Using Substances to Cope With the COVID-19 Pandemic: U.S.

- National Data at Age 19 Years." *Journal of Adolescent Health* 70, no. 2 (2022): 340-344. <https://doi.org/10.1016/j.jadohealth.2021.11.006>.
- Pearson, Matthew R., Bruce S. Liese, Robert D. Dvorak, and Marijuana Outcomes Study Team. (2017). "College Student Marijuana Involvement: Perceptions, Use, And Consequences Across 11 College Campuses." *Addictive behaviors* 66 (March): 83-89. <https://doi.org/10.1016/j.addbeh.2016.10.019>.
- Priester, Mary Ann, Teri Browne, Aidyn Iachini, Stephanie Clone, Dana DeHart, and Kristen D. Seay. "Treatment Access Barriers And Disparities Among Individuals With Co-occurring Mental Health And Substance Use Disorders: An Integrative Literature Review." *Journal of Substance Abuse Treatment* 61 (2016): 47-59. <https://doi.org/10.1016/j.jsat.2015.09.006>.
- Purtle, Jonathan. 2020. "Covid-19 And Mental Health Equity In The United States." *Social Psychiatry and Psychiatric Epidemiology* 55, no. 8 (August): 969-971. <https://doi.org/10.1007/s00127-020-01896-8>.
- Quimby, Dakari, Maryse Richards, Catherine DeCarlo Santiago, Darrick Scott, and Dhara Puvar. "Positive Peer Association Among Black American Youth And The Roles Of Ethnic Identity And Gender." *Journal of research on adolescence* 28, no. 3 (2018): 711-730. <https://doi.org/10.1111/jora.12363>.
- RachBeisel, Jill, Jack Scott and Lisa Dixon. 1999. "Co-Occurring Severe Mental Illness And Substance Use Disorders: A Review Of Recent Research." *Psychiatric Services* 50, no. 11 (November): 1427-1434. <https://doi.org/10.1176/ps.50.11.1427>.
- Rosenbaum, Philip J., and Heather Liebert. "Reframing The Conversation On College Student Mental Health." *Journal of College Student Psychotherapy* 29, no. 3 (2015): 179-196. <https://doi.org/10.1080/87568225.2015.1045780>.
- Satcher, David. 2000. Foreword. *U.S. Public Health Service, Report of the Surgeon General's Conference on Children's Mental Health: A National Action Agenda*. Washington, DC: U.S. Department of Health and Human Services. 1-2. <https://www.ncbi.nlm.nih.gov/books/NBK44233/>.
- Satre, Derek D., Cynthia I. Campbell, Nancy P. Gordon, and Constance Weisner. "Ethnic disparities in accessing treatment for depression and substance use disorders in an integrated health plan." *The International Journal of Psychiatry in Medicine* 40, no. 1 (2010): 57-76.
- Saunders, John B., Olaf G. Aasland, Thomas F. Babor, Juan R. de la Fuente, and Marcus Grant. 1993. "Development Of Alcohol Use Disorders Identification Test (Audit): Who Collaborative Project On Early Detection Of Persons With Harmful Alcohol Consumption - ii." *Addiction* 88, no. 6 (June): 791-804. <https://doi.org/10.1111/j.1360-0443.1993.tb02093.x>.
- Schulenberg, John E., Megan E. Patrick, Lloyd D. Johnston, Patrick M. O'Malley, Jerald G. Bachman, and Richard A. Miech. 2021. "Monitoring The Future National Survey Results On Drug Use, 1975–2020: Volume II, College Students And Adults Ages 19–60." *Ann*

Arbor: Institute for Social Research, The University of Michigan.  
[http://monitoringthefuture.org/pubs/monographs/mtf-vol2\\_2020.pdf](http://monitoringthefuture.org/pubs/monographs/mtf-vol2_2020.pdf).

- Shih, Margaret, and Diana T. Sanchez. "When race becomes even more complex: Toward understanding the landscape of multiracial identity and experiences." *Journal of Social Issues* 65, no. 1 (2009): 1-11.
- Simons, Jeffery S., Christopher J. Correia, Kate B. Carey, and Brian E. Borsari. 1998. "Validating A Five-factor Marijuana Motives Measure: Relations With Use, Problems, And Alcohol Motives." *Journal of Counseling Psychology* 45, no. 3: 265–273. <http://dx.doi.org/10.1037/0022-0167.45.3.265>.
- Skidmore, Chloe R., Erin A. Kaufman, and Sheila E. Crowell. 2016. "Substance Use Among College Students." *Child and Adolescent Psychiatric Clinics* 25, no. 4 (October): 735-753. <https://doi.org/10.1016/j.chc.2016.06.004>.
- Son, Changwon, Sudeep Hegde, Alec Smith, Xiaomei Wang, and Farzan Sasangohar. 2020. "Effects Of Covid-19 On College Students' Mental Health In The United States: Interview Survey Study." *Journal of medical internet research* 22, no. 9 (September): e21279. <https://doi.org/10.2196/21279>.
- Spitzer, Robert L., Kurt Kroenke, Janet B. W. Williams, and Bernard Löwe. "A Brief Measure For Assessing Generalized Anxiety Disorder: The Gad-7." *Archives Of Internal Medicine* 166, no. 10 (May): 1092-1097. doi:10.1001/archinte.166.10.1092.
- Su, Jinni, Eleanor K. Seaton, Chelsea D. Williams, Danielle M. Dick, and Spit for Science Working Group. 2021. "Racial Discrimination, Depressive Symptoms, Ethnic–racial Identity, And Alcohol Use Among Black American College Students." *Psychology of Addictive Behaviors* 35, no. 5 (August): 523. <https://doi.apa.org/doiLanding?doi=10.1037%2Fadb0000717>.
- Substance Abuse and Mental Health Services Administration. 2019. *Behavioral Health Among College Students Information & Resource Kit*. Rockville, MD: Substance Abuse and Mental Health Services Administration. <https://store.samhsa.gov/sites/default/files/d7/priv/sma19-5052.pdf>.
- Substance Abuse and Mental Health Services Administration. Behavioral Health Barometer: United States, Volume 6: Indicators as measured through the 2019 National Survey on Drug Use and Health and the National Survey of Substance Abuse Treatment Services. HHS Publication No. PEP20-07-02-001. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2020.
- Substance Abuse and Mental Health Services Administration. 2020. *Key Substance Use And Mental Health Indicators In The United States: Results From The 2019 National Survey On Drug Use And Health*. Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration.

<https://store.samhsa.gov/product/key-substance-use-and-mental-health-indicators-in-the-united-states-results-from-the-2019-national-survey-on-drug-use-and-health/PEP20-07-01-001>.

- Substance Abuse and Mental Health Services Administration. 2021. "2018-2019 National Survey on Drug Use and Health."  
<https://www.samhsa.gov/data/sites/default/files/reports/rpt32879/NSDUHsaeTotal2019/2019NSDUHsaeTotal.pdf>.
- Swanson, Helena L., Catherine Pierre-Louis, Lidia Y. Monjaras-Gaytan, Kayleigh E. Zinter, Rebecca McGarity-Palmer, and Margaret H. Clark Withington. "Graduate student workload: Pandemic challenges and recommendations for accommodations." *Journal of Community Psychology* 50, no. 5 (2022): 2225-2242.
- Tolan, P. H., and Kenneth A. Dodge 2005. "Children's Mental Health As A Primary Care And Concern: A System For Comprehensive Support And Service". *American Psychologist*, 60, (September): 601– 614. doi:10.1037/0003-066X.60.6.601.
- Trammell, Janet P., Nataria T. Joseph, and Jennifer A. Harriger. 2021. "Racial And Ethnic Minority Disparities In Covid-19 Related Health, Health Beliefs And Behaviors, And Well-being Among Students." *Journal of American College Health* (2021): 1-7.
- US Department of Health and Human Services. "Health Equity and Health Disparities Environmental Scan." (2022): 2022-04.
- Vaeth, Patrice A. C., Meme Wang-Schweig, and Raul Caetano. 2018. "Drinking, Alcohol Use Disorder, and Treatment Access and Utilization among U.S. Racial/Ethnic Groups". *Alcoholism, Clinical and Experimental Research* 41, no. 1 (January): 6–19.  
<https://doi.org/10.1111/acer.13285>.
- Wang, Xiaomei, Sudeep Hegde, Changwon Son, Bruce Keller, Alec Smith, and Farzan Sasangohar. "Investigating mental health of US college students during the COVID-19 pandemic: cross-sectional survey study." *Journal of medical Internet research* 22, no. 9 (2020): e22817.
- White, Aaron, and Ralph Hingson. 2013. "The Burden Of Alcohol Use: Excessive Alcohol Consumption And Related Consequences Among College Students." *Alcohol Research: Current Reviews* 35, no. 2 (Summer): 201–218.  
<https://link.gale.com/apps/doc/A382084212/AONE?u=albanyu&sid=AONE&xid=c817cb75>.
- White, Helene R., Erich W. Labouvie, and Vasiliki Papadaratsakis. 2005. "Changes In Substance Use During The Transition To Adulthood: A Comparison Of College Students And Their Noncollege Age Peers." *Journal of Drug Issues* 35, no. 2 (April): 281-306.  
<https://doi.org/10.1177/002204260503500204>.

Wills, Thomas A., and A. Elizabeth Hirky. 1996. "Coping And Substance Abuse: A Theoretical Model And Review Of The Evidence." In *Handbook Of Coping: Theory, Research, Applications*, edited by Moshe Zeider and Norman S. Endler, 279–302. John Wiley & Sons.

World Health Organization. 2008. *Primary Health Care: Now More Than Ever*.  
[https://www.who.int/whr/2008/08\\_overview\\_en.pdf](https://www.who.int/whr/2008/08_overview_en.pdf).